Appendix A: Watres Hall Adaptive Reuse Study & Master Site Plan Update 2017

Update to the Master Site Plan for Lacawac Sanctuary, October 2009

Wayne County, Pennsylvania

Lacawac Sanctuary
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Section 1. Introduction

1.1. Watres House as a new environmental science education center for Lacawac Sanctuary

When the son of Lacawac founder Arthur Watres decided to sell the home to Lacawac that he inherited from his father, it was an opportunity to for Lacawac Sanctuary to advance a major element of its 2009 Master Site Development Plan (MSDP) for the campus – to adaptively re-use the former residence as an environmental education facility.

The Lacawac Board of Directors and staff maintain the original vision expressed in the 2009 MSDP to adapt the residence to include public access improvements, a conference meeting space, classroom space, and environmental education teaching space to education various groups including but not limited to PreK - 12 grades, boy and girl scouts, civic groups and science organizations.

FINDING – This MSDP Update 2017 finds that the Watres House structure and site are sound, suitable, and feasible to adapt as “Watres Hall” as a signature environmental education facility for Lacawac Sanctuary, with provisions as described in this report.
1.2. Metamorphosis strategy for the Watres House

The Pennsylvania Department of Conservation and Natural Resources (DCNR) helped fund the 2009 MSDP and recognized the landmark opportunity for Lacawac Sanctuary to finally take the next step toward creating a modern Environmental Education / Research Center on campus – that could help fulfill its primary research, education and advocacy missions.

DCNR advisors recommended that Lacawac Sanctuary prepare an “update” to the 2009 MSDP
 Specifically to focus on potential Watres House adaptive reuse options – as pre-requisite for a 2017 grant application from Lacawac to design the preferred adaptive reuse plans.

This 2017 Appendix A, an update to the 2009 MSDP, represents the most recent program planning by the Lacawac directors and staff, coupled with planning expertise from the project technical team – Simone Collins Landscape Architecture, the authors of the original 2009 MSDP, with support from John Ruff, structural engineer.

This report presents at least one feasible strategy for adaptive reuse, which is intended as the initial step in an inevitable evolution of the project program and design of the Watres House Environmental Education Center as it progresses through multiple phases of development.

This update sets a viable strategy to adapt the Watres House as a modern environmental education / research facility, but should not be considered a final program and design.
Section 2. Stakeholder Involvement

2.1. Meeting with Committee

A meeting was held on-site on April 27, 2017 with Executive Director Craig Lukatch and Environmental Educator Manager Jamie Reeger to review the previous and most recent program ideas compiled by the staff and board of directors for potential facilities and uses that might be possible to adaptively convert from the Watres House into a multi-use, environmental education / research facility.

Potential activities and facilities identified – for an adapted Watres House structure:

- Conference meeting (for up to 50 persons)
- Teaching areas (new classroom(s) / research space(s)
- Smaller meeting rooms / spaces
- Education display areas
- Library
- House Museum (interpretation of founder’s legacy)
- Storage (if possible)
- Wildlife observation (view of Heron Pond)
- ADA accessibility

Potential activities and facilities identified – for the Watres House site:

Entry upgrade

- Drive improvements (minor widening, grading, drainage, gravel surfacing)
- Bus drop off / turnaround area
- Stormwater BMPs (isolate roadway drainage, divert to heron pond watershed)
- Pedestrian circulation improvements
- Walks, paths, trails
- ADA access route (between first and lower floor levels)
- Observation deck (wildlife, environmental buffering, outdoor teaching / social space
- Environmental education / green demonstrations (facilities as pedagogy)
- Native plant species
- Energy conservation
- Alternative energy
- Micro-climate design
Section 3. Observations / Analyses

3.1. Structure

3.1.1. Engineering Evaluation

The Watres House was observed by a structural engineer and is considered structurally sound and in general good repair.

The primary modification needed to make the existing structure capable of serving institutional (commercial) uses is the installation of a new mid-span support beam in the basement below the Living/Dining room floor joist system. This improvement is identified in the engineering assessment (see Exhibit A of this report) and in the schematic diagrams developed to display adaptive reuse opportunities.

Additional engineering analyses will be needed during subsequent design phases for all potential structural improvements such as:

- Modifying roofs
- Adding solar panels / access walkways
- Changes to foundations
- Upgrade of makeshift structural columns under the west wing floor system (bearing on bedrock)
- Electrical and plumbing fixtures modifications to meet public use codes (during design)

3.1.2. Architecture Assessment

The Watres House is reminiscent of a “Mid-Century Modern” aesthetic, in its low-profile, one story style.

The exterior is unassuming brick facades with a series of moderately-pitched, intersecting gable roofs. The front porch under the primary gable roof overhang is an awkward depth – not quite useful as
a sitting area or graceful. However, the entry roof canopy offers an important adaptive reuse potential.

The interior is a high-style rustic cabin aesthetic with finished wood walls and floors, fire place, and built-in shelves, bunks and other features. The primary views from the open-plan living/dining room, master bedroom and kitchen is almost directly south toward Heron Pond.

The kitchen is recently renovated and capable of service for future event catering (especially if the east-facing kitchen porch is adapted as a service loading area and kitchen support facility.)

The library room is small and offers a museum/interpretive opportunity if conserved as originally used and populated with materials of the founder.

The existing basement is constructed with a “headroom” clearance between the slab and the bottom of first floor joists – in the east and central wings.

Native bedrock is exposed in the “crawlspace” beneath the west wing.

### 3.1.3. ADA Assessment

- Several ADA challenges were identified for the Watres House to be adaptively reused as a public facility, including:
  - Front porch / front door threshold – elevation difference
  - First Floor to potential lower level finished floor – elevation difference
  - Bathroom – hallway access spaces, bathroom fixtures
  - Powder room – no ADA access possible without expansion
  - Garage – slab elevation difference (lower than first floor level)
  - Kitchen - porch threshold – elevation difference

As seen at the step onto the front porch of the house there are many ADA challenges that the design of the new building will need to overcome.
Figure 3.2  Slope Analysis Map

Legend
- 1" = 300'

North

Slope
- 0% - 5%
- 5% - 8%
- 8% - 15%
- 15% - 25%
- 25% - 100%

Water
Project Site

Watershed Boundary

Road
Trail
### 3.1.4. Utilities

PPL Electric Utilities Company has an easement corridor for electric transmission lines that runs east-west through the Sanctuary north of the Watres House parcel. Electrical service to the Watres Site is provided by overhead lines along a corridor originating from the main easement running south along the ridge of the rock ledge formation located to the west of the house. Year-round internet access is currently available at the Watres House.

With the exception of the composting toilets at the Great Camp, wastewater treatment for all buildings consists of conventional septic tanks, piping and sand mounds.

The Sanctuary has worked with the Paupack Township to identify a future suitable septic location.

Currently potable water is supplied via well that is located in the southwest corner of the garage addition. Lacawac Sanctuary will need to test the well for capacity to serve an estimated 50-70 non-resident, to the new Watres Center on a daily basis. If the facility is ever to be used as partially residential, the water supply system would need to be assessed to serve up to 24 overnight residents.

### 3.1.5. Deeds

The Watres House is a single parcel that is surrounded by the Lacawac Sanctuary holdings.

A copy of the deed is attached to this appendix as Exhibit B. There are no easements or covenants associated with the parcel or deed.

### 3.1.6. Zoning

Like the rest of the Lacawac Sanctuary the Watres House parcel is zoned the same as the rest of Lacawac Sanctuary: S-1 Conservation District Zoning. However the 0.8 acre lot is does not conform to the development standards of a 10 acre lot minimum. Due to the small size of the lot this house placement on the lot does not meet the current side yard minimum side, front, and rear yard setbacks.

Once LSF agrees upon a conceptual building plan, they should present a concept plan to the Paupack Township and ask for advice on how to proceed with the zoning application. If the Township suggests that LSF should proceed with a “conditional use” or “special exception” application, which may be likely, the application should be for the entire project envisioned, rather than for a single phase. This strategy will eliminate the need to acquire multiple zoning approvals. Once zoning approval has been granted, Lacawac Sanctuary will need to submit land development plans as typical of any development.

### Table: Zoning Building Regulations

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**Figure 3.2 Zoning Building Regulations**
Figure 3.3 Study Area Existing Circulation Map
3.2. Site Conditions

3.2.1. Topography

Newer topographic information was provided by the Lacawac Sanctuary and in conjunction with the Watres parcel planning a new slope analysis was generated for the entire Sanctuary. The updated slope analysis map more clearly denotes the level areas and locations of steep cliff / ledge rock formations within the Sanctuary.

The Watres parcel is situated along a natural ridge line that runs west-east through the Sanctuary and over looks Heron Pond. The existing house structure is located within a gently sloped area (0-8%). The rear of the lot has a steeper slope (8-25%) leading down to the edge of Heron Pond. Along the western property edge a dramatic stone cliff / ledge running north-south overlooks the site.

3.2.2. Vehicular Access & Trails

Since the 2009 MSDP, Lacawac Sanctuary has remapped its trail and road system and created an official trail map. Within the area around the Watres House there are a number of trails that border or cross the parcel. To the north of the Watres House is the Great Camp Trail Road, running east-west from the visitor’s center to the Lodge – that serves as the main access road into the cultural areas of the site.

The driveway to the Watres House is located along a bend of the Camp Trail Road prior to entering the formal ‘Camp Area’. The existing driveway is an informal gravel circular drive with a natural stone outcrop located in the middle of the two drives. The stone outcrop extends into the eastern drive creating a rugged irregular condition. The driveway geometry currently does not accommodate for bus turn-around.

To the south of the site the Big Lake Trail runs from the Visitor’s Center, and skirts the southern edge of Heron Pond before continuing to the edge of Lake Wallenpaupack.

Just west of the site and Heron Pond two trails branch off of the Big Lake Trail. The first is the Arthur Watres Trail; running north-south – connecting the Great Camp Trail to the Big Lake Trail. The second is the Osprey Trail: running east-west from the Arthur Watres Trail between the Watres House and Heron Pond - as it skirts the northern edge of Heron Pond. An offshoot of the Osprey Trail runs north along the eastern edge of the Watres Parcel and connects to the Great Camp Trail.

3.2.3. Hydrology

The Watres Parcel falls within the Wallenpaupack Creek watershed and does not contribute to the Lake Lacawac sub-watershed. The site over looks Heron Pond, the larger of two ponds constructed by the Watres family on a former wetland. The ponds are spring fed and drain into Lake Wallenpaupack.

3.2.4. Vegetation

In general, the Watres Parcel falls within an area of the Sanctuary characterized as Red Oak/Mixed Hardwood. There are large areas of Hemlock/ White Pine forest surround the site as well specifically along the rock ledge to the west of the property and located opposite the site along Big Camp Trail Road.

Surrounding the existing house is a landscape typical of a disturbed and cultivated residential area. Areas that had been mown lawn are transitioning to the annual meadow. The shady area to the west and north of the house is dominated by moss. In the ‘island’ created by the two driveways a stone outcrop is providing unique habitat for plants that thrive in the shallow soils.
View of Heron Pond from the Watres Site

View of forest conditions surrounding the Watres Site.
Section 4. Adaptive Reuse – Preferred Alternative

4.1. Flexibility Strategy

Multiple alternative programmatic ideas were discussed for how various rooms and spaces within the Watres House might be modified for a future new uses – and it was determined that the optimum strategy for adapting existing facilities and creating new facilities was “flexibility.”

The preferred alternative for adapting the Watres House as a multi-use environmental education facility is to add a new 2-level, south “wing” to the existing structure – and plan (and ultimately design) for multiple uses to be possible within each space, as needed over time. This new wing is called the Pavilion Room at the first floor level, with an open classroom / research space recommended below at the “lower” walkout (basement) level.

4.2. Structure

4.2.1. New Additions

Pavilion Room

The proposed Pavilion Room is the primary new addition and multi-use meeting space recommended within a new Watres Hall. The new wing is conceived to be a 2-story structure attached to the south side of the Watres House – with the new Pavilion Room as ADA-accessible, at a finished floor elevation flush with the existing living room space – and converting the two south-facing picture windows into gracious french doors.

The Pavilion Room would fit between the east and west wings and the new roof-line would be a shed design that would be hidden visually behind the primary gable peak from most vantage points along the north entry area into the new Hall – thus conserving most of the original shapes and the original sense of scale of the Watres home.

The Pavilion Room is envisioned as a clear span space approximately 40x40 feet – with simple but dramatic shed roof planes that allow light in from the south and focus views on Heron Pond. The new shed roof is envisioned as a “green roof” stormwater BMP with rainwater collection system and with the possibility of serving as a teaching station.

The interior space would be designed as an open plan for flexible use, and include storage space and fire-rated stairway to the lower level classroom area with an exit to grade on the south side.

One floor plan layout option for meeting uses is displayed where the podium and screen are along an opaque west wall – which turns the audience away from facing into the sun direction.

The east side can be used for buffet or support tables, leaving the south wall to be operable glass doors that open onto an exterior deck.

Classroom / Research space

The Pavilion Room wing is envisioned as a 2-story structure with walk-out access to grade at both the First Floor and Lower Levels. A large open area is envisioned below the Pavilion Room to serve multiple potential functions.

The Lower Level space is envisioned as 40x40 feet with columns spaced to support the Pavilion Room floor structure above. The finished floor to ceiling height is envisioned as 8 feet clear. At least one ADA-rated toilet is recommended at this level.

Windows are envisioned on the south and east sides – and the walkout access would also occur along these elevations. Excavation and grading of the rear yard will be required to create the lower level and walkout access, but the opportunity to
create 1600 additional square feet of flexible space – without adding additional building “footprint” deserves serious consideration.

One unknown potential constraint to creating a new lower level under the new Pavilion Room is the possible presence of shallow bedrock along the western and southern sides of the existing Watres House. Bedrock is visible in the existing basement below the west (bedroom) wing. There is an excavated greenhouse / cold frame along the southern façade of the west wing – which indicates that the bedrock may incline steeply downward and away toward Heron Pond. The southern exterior terrace appears to be created from fill material excavated for the house basement. Exploratory test pits should be dug early in the design process to advise cost estimate and specification development.

The new lower level space would have a finished floor elevation lower than the elevation of existing basement floor level, and a new access door opened between the two spaces is recommended to improve the existing cellar door access on the east side.

The existing basement should be considered to house all new utility fixtures – if possible, so that the classroom / research space can be maximized for those uses.

Below, an insulated slab / radiant heating system is one option for heating this new space. Radiant heating in the Pavilion Room Floor should also be investigated.

If the Lower Level were ever to be considered as a potential interim residence space, an ADA toilet facility should be designed as an ADA bathroom(s). This facility will be heavily used by students and researchers. A wet sink in this area may be desired – and if so at least the rough plumbing should be installed at the before the floor slab.

It is assumed that all wastewater effluent from both the First Floor and Lower Levels will need to be pumped to the new treatment facility located to the east of the new Watres Hall.

**ADA Ramp**

An ADA ramp is recommended to be located to the west of the front door. The ramp is conceived to originate from the front elevation of the building at the entrance plaza and wrap around the western
and rear facades of the Watres House, to create an ADA accessible route to the classroom / research area housed in the proposed lower level walkout basement.

Architectural studies will be beneficial along the ramp-way facades to determine if and how a roof canopy might be added over the ADA ramp – by using extended roof eave lines or new shed roofs to help buffer ramp users from the elements.

Observation Deck

A new observation deck is envisioned to be created as a treated wood structure that extends an outdoor space from the eastern and southern sides of the Pavilion Room. The deck structure would be multi-purpose, and serve as wildlife observation station of Heron Pond, teaching station, and for outdoor social events.

If the First Floor level deck is designed to also function as a “roof,” the covered area below it at the classroom / research lower level could become a valuable outdoor “buffer” space for teaching, staging and informal exterior uses under shelter.

The deck is envisioned to have the potential to serve as a micro-climate buffer – including an enclosed seasonal cold frame growing space at the Lower Level and seasonal deciduous “green wall” shading device at the First Floor level above the south-facing glass façade.

4.2.2. Existing Structure Modifications

Front Porch Enclosure

The existing open front porch can be modified to create a deeper enclosed “buffer” entry space – as a more gracious “airlock” for people entering the new “Living Room” lobby space located directly inside the existing front door.

A new shed roof is envisioned to extend over a new enclosed front porch façade that is flush with the north elevation of the West Wing.

The porch deck will need to be extended and the elevation of the deck should be ADA accessible with the First Floor elevation.

The new space can be used as a functional entry area that is capable of getting groups out of the weather within a space to remove and store outer garments before entering the Watres Hall Living
Room Lobby. The new porch as a transition entry space is considered essential to help reduce wear and tear on the interior of the Watres house as a new environmental hall.

There may be space for displays and brochures in this front porch space. The new enclosed porch space would be the interior transition space between the new Living Room/Lobby and a rehabilitated flex-use garage space.

The north façade of the new porch is envisioned as largely glass and the new outer entry door should be designed to be harmonious within the new fenestrated porch façade. A connection between the new enclosed porch space and the new ADA ramp around the west side, needs architectural studies – especially in terms of new roof-lines.

Living (Dining) Room – Lobby

The concept for adaptively re-using the existing Living(Dining) Room is to make it a gracious interior lobby space – by relocating the dining room table to near the fireplace for a small, open meeting area.

The former dining table area will open up lobby space where people can orient and mingle before entering the great Pavilion Room or other spaces in the new Watres Hall.

There should be design consideration to modifying / protecting the existing wood floor surfaces from inevitable increased traffic. The existing western door to the southern exterior terrace may be modified as the fire stair door to the new lower classroom / research space below the Pavilion Room.

Bath (Bedroom) – West Wing

The existing bathroom in the West Wing is a large enough area to be modified as an ADA-rated toilet or bathroom. All plumbing and electrical fixtures will need to be replaced. The existing hallway in the West Wing can be enlarged for ADA access by removing the closet behind the fireplace to widen the area at the bathroom entrance.

Bedrooms (2)

The two bedrooms in the west wing can remain flexible to serve as environmental education meeting rooms or classroom spaces.

Kitchen

The recently renovated kitchen appears highly functional to facilitate meal / entertainment services at a new Watres Hall. The service corridor between the Kitchen and the Pavilion Room could be via exclusive use of the existing eastern door to the outdoor southern terrace.

Kitchen Porch

The Kitchen Porch is important as the service entrance to the Watres Hall for catering events. The porch deck level should be made ADA-accessible to the kitchen door threshold – so that wheeling objects between the porch, the kitchen, and the exterior deck is seamless.

The Porch may be enclosed as an unheated service area in the future. The design of a new service loading area directly east of the Kitchen Porch needs to be carefully considered regarding grading. Cut materials from the Pavilion Room excavation may be used to grade the service drive / loading area – but regrading will cover the existing basement door. Access to the existing basement space will likely be improved via a new doorway cut through from the new lower level classroom area.
The existing kitchen of the Watres house was recently renovated by the family.

The existing west wing bathroom is a considerable size that will lend itself to an ADA retrofit.
Access to the garage is by the kitchen porch and sits six inches lower than the house.
The existing door from the Kitchen Porch to the garage should be created as an ADA-accessible route by raising the garage finished floor elevation as an essential part of its adaptive reuse. (See Garage)

**Library**

The existing library room should be considered as a museum space and its presentation to the public should be carefully planned – perhaps to interpret the environmental and intellectual resources and influences of the Founder during a specific period in time.

No major changes are proposed to this room, except for display lighting.

**Powder Room**

The water closet located between the Kitchen and the Library should be updated with modern electric and plumbing fixtures for non-ADA complaint use. There is no room for expansion for ADA rating of this facility.

**Garage**

The existing garage space is only accessible from the exterior via the two porches and the overhead door.

Enclosing the front porch would create, at minimum, a buffered (unheated) interior passageway between the interior First Floor elevation of the Watres Hall and an adapted garage space.

The garage floor pad elevation is currently lower than the First Floor elevation by at least 8 inches. Adapting the Garage should include ADA accessible entry routes from all adapted entry ways.

Raising the finished floor elevation of an adapted garage space – by adding a sleeper joist system serves other purposes beyond ADA accessibility, including: space heating options, floor insulation, and plumbing and utility raceways.

The interior of an adapted garage is anticipated to be largely an open space that is flexible for multiple uses including; environmental display area, meeting and teaching spaces.

The space needs to be rehabilitated as “habitable” for any of those uses, including addition of HVAC, electric and plumbing systems.

The Garage adaptive reuse schematic identifies a space for a second ADA-rated toilet (possibly bath) room. This toilet may be designated as a men’s room and the existing bath designated as the Women’s room – regardless of any future uses.

The concrete block-enclosed well room – inside the garage, represents a future maintenance issue when the water pump needs to be replaced.

The preferred ultimate uses for the Garage will help dictate how the north façade with the overhead door is re-articulated architecturally. The former car portal may be treated as insulated glass for viewing interior displays – even when the space is closed.

If the finished floor elevation of the Garage is raised and a door to north is designed to be operable, and ADA-ramp will be needed to reach the front yard grade.

**Roofs**

The existing roofs should be programmed to be replaced. Painted steel roof systems should be considered for economy of capital and maintenance costs – and longevity.

Existing roof pitches should be maintained where possible, and shored structurally where new loads may be imposed – such as shed roof additions and extensions.
The new Pavilion Room roof system is displayed schematically as truss rafters that are capable of creating a clear-span space below – and support a green roof load above. An “extensive” green roof system should be considered as the most hardy and lowest maintenance option.

The new valleys created between the existing roof systems and the new Pavilion roof should be designed with protected geotextile materials, that create deep flashed “reservoirs” that extend under the structural roof materials, in case freezing or debris restrict roof drainage. Electric resistance elements should be considered to be installed in valleys, in case they are someday needed to prevent freezing and damming.

Roofing materials should be protected from abrasion – specifically if a green roof teaching station is created.

4.2.3. Utilities

HVAC systems

The design of heating and cooling systems needed to retrofit the Watres House as an environmental education facility should be considered comprehensively – regardless of whether the entire development will occur in one phase – or maybe be even ultimately achieved.

The Lacawac Board will enable the Architectural / HVAC team to consider all initial and ultimate options – as it refines its program decisions about its preferred uses of spaces and its preferred timing of development phases.

All options including domestic solar hot water, heat pumps, and insulation alternatives should be considered.

Potable Water Supply

This study assumes that sufficient capacity exists using the existing Watres House well and pump system to serve any level of day visitor or residential visitor uses identified as possible. A well test will need to be commissioned to prove quantity and quality of the existing system for the proposed uses in the project permits.

Propane

Lacawac should consider during the design development stage whether the propane service is useful for cooking or backup fuel.

Waste Water

The development of a new waster-water / sand mound system for the campus was developed separately from the Watres House MSDP Update project. Lacawac commissioned the system engineers to design the waste-water system to be capable of handling any potential uses for the adapted Watres House, as well as to meet the demands of new planned on-site residential units.

The treatment system is located near the former tennis court, in the Lake Wallenpaupack sub-watershed. The new pressurized waste line between the Watres Hall and the treatment system should be carefully sited to avoid unnecessary disturbance of existing vegetation and contours.

Electric

The entire electric system within the existing Watres House needs to be assessed by a licensed electrician during the design phase to inform the design team what fixtures might be capable of service for the proposed new public uses.
Photo-voltaic

The south side of the primary gable roof over the Living / Dining room was identified in the schematic plans as suitable location and orientation for installing domestic hot water solar panels or photo-voltaic panels. This south-facing surface will be hidden from ground views below the existing gable ridge from the north and behind the new Pavilion shed roof from southern vantage points.

The panel systems may serve as a teaching opportunity – along with the Pavilion green roof, if a controlled access, stairs / catwalk teaching station can be constructed from the exterior deck to the roof level.

PP&L may help Lacawac demonstrate photo-voltaic use at this location – including potential inverting capacity for generating power back into the regional grid.

4.3. Proposed Site Improvements

The preferred schematic plan for Watres House site considers how an upgraded facility would accommodate uses of education groups, research and possible residential activities. Recommendations for vehicular access, pedestrian circulation, and site facilities are explained below.

4.3.1. Sanctuary Vehicular Circulation

The recent update of topographic information and trail / road mapping for Lacawac, provided the opportunity to revisit the primary vehicular circulation on the upper campus. The Sanctuary seeks to limit vehicular access into the Lake Lacawac sub-watershed, as one of the southernmost unpolluted glacial lakes on the North American continent.

Hydrologic isolation has kept Lake Lacawac almost pristine and has made it the subject of decades-long scientific study. Site design to limit the risk of contamination from an accident or general road runoff is one of the highest environmental priorities for the Sanctuary.

In response to this priority, it is recommended that the Great Camp Trail be closed to vehicular access, and that a new access cartway be developed upon the Big Lake Trail – similar to the recommendation made in the 2009 MSDP for the main entrance drive alignment to the proposed 21st Century Ecovillage.

Under an updated vehicular circulation strategy, the entrance drive would terminate at a bus drop-off / turn-around, with associated parking area for 30 cars in the Lake Wallenpaupack watershed – situated on the level area just west of the Watres House. The area sits about 14 feet in elevation above the Watres Site and is separated by the dramatic rock ledge. The final location of the turnaround should consider views from the Watres site towards the turnaround area and a mature canopy buffer should be maintained between the two. A walkway and steps would connect the drop-off to the Watres site. The steps/ramp should be designed and constructed to fit naturally into the stone ledge. Material selection for the access way should reflect the design of the architecture while offering lasting durability and low maintenance.

Limited vehicular access would be provided along the Arthur Watres Trail alignment and realign with the Big Camp Trail Road providing for ADA access to the Watres Hall and the Big Camp Area. Maintaining the road fully outside the divide of the Lake Lacawac sub-watershed is not entirely feasible do to a rock ledge that runs along the western edge of the Watres site – and forces the road into the Lake Lacawac watershed. However with modified grading and drainage of the offending segment of roadway, the runoff from that segment of roadway can be collected and treated with careful stormwater BMP design.
4.3.2. Watres Hall Vehicular Circulation

A drop-off / turn-around loop proposed at the new Watres Hall site is planned to accommodate shuttles, buses, and ADA access to the building and site. A turnaround loop would be formed by taking advantage of the natural bend in the road and extend it to the north to complete a loop – with a controlled access spur road that extends to the Lodge.

A pull-off / drop off area on the southern edge of the loop will allow for visitors to safely disembark and enter into the site free of vehicular conflicts. Shifting the vehicular loop to the north of the Big Camp Road offers the added benefit of eliminating the vehicular driveways from the front of the house and opening the space up for gatherings and interpretive landscapes.

To the east of the Watres Hall a controlled, crushed stone service drive is proposed – to terminate at a concrete pad at the kitchen porch. The kitchen porch area would serve as a loading dock area allowing catering trucks to easily load/unload equipment for events.

4.3.3. Watres Hall Site Program

The preferred Watres Hall site plan identifies ways the site can accommodate future education groups, research, camp activities and events. The structure divides the site into two areas – the front yard and the rear yard.

Site improvements suggested for the front yard focus on creating a welcoming arrival sequence that also serves as an educational tool. A central stone dust pathway leads from the drop-off area to the front door – the original front walkway pavers can be set in a flush ADA condition into this walkway.
Visitors to Watres Hall are greeted by the large natural stone outcrop at the edge of Big Camp Trail Road. The suggested landscape treatment is for the outcrop to slowly transition into a natural low annual meadow – similar the current site condition.

The entry path passes from the drop off runs through a stylized interpretive landscape that tells the story of natural forest succession – and crosses an annual meadow and a bold band of tall native warm session grasses. Within the eastern part of the front yard the band of grasses transition into a Vaccinium (blueberry) understory. This understory transitions into a reforestation / tree planting area along the eastern edge of the property.

The entry pathway is graded and surfaced to be ADA accessible and terminates at a small entry plaza at the front door of the Watres Hall – paved with salvaged bluestone pavers from the rear yard, reset to create an ADA plaza surface. The plaza would naturally grade up at 2.0% slope towards the Watres Hall entry and front porch enclosed as a foyer entrance, all graded to create a flush ADA entrance condition into the building.

The 300 square foot entrance plaza is large enough to serve as a group staging area prior to entering the building, but is intimate enough for informal seating for day visitors, campers, or during events.

Located to the right of the Watres Hall front entry is an exterior ADA ramp that originates at the entry plaza / First Floor elevation and extends at standard building code gradients to provide access to the classroom / research interior area housed in

Example butterfly roof line with stormwater harvesting BMP.
the proposed addition lower level – as a walkout basement toward Heron Pond (see above).

Along the western edge of the entry plaza, taking advantage of the sunnier level area, a 20’x40’ fenced-in demonstration garden is proposed. With gates on each side and a central walk the garden serve as a gateway to the pedestrian walkway leading into the rear yard.

The western walkway comprised of stone dust ADA surface follows along the base of the stone cliff / ledge leading into the rear yard and connects to existing Osprey Trail connecting the site to the Big Lake Trail Road parking and drop off area. As the trail enters into the rear yard it leads into the outdoor classroom / hillside seating area. The informal seating area has a gentle slope and affords views of Heron Pond.

Located at the base of the seating hill is an improved segment of the Osprey Trail. The trail is improved to an eight foot wide ADA stone dust walkway and serve as a major connector of various rear yard activities. A minor improved 5’ wide stone dust loop trail provides ADA access to the edge of Heron Pond’s before reconnect back to Osprey Trail and leads to the entrance to the Classroom / Research area housed in the proposed addition’s walkout basement. A second five foot wide stone dust pathway leads to a stair case providing access to the outdoor observation deck and pavilion room.

4.3.4. Best Management Practices

It is necessary that site improvements consider the management of site stormwater via the implementation of Best Management Practice (BMP). Stormwater is generated from man-made site improvements, with vehicular roads, parking, and building roofs being the two largest generators. BMPs focus on two areas of water management:

1. Water Quality – the filtering of pollutants out of stormwater; and
2. Rate Control – slowing down water’s movement across a watershed.

There are numerous types of BMPs and final selections of BMPs would be determined during design and engineering; however it is important at the master plan level to identify the potential locations and function of BMP’s.

One of the primary stormwater management needs will be to address runoff from new or improved roads. New roads should be developed with either vegetated open swales that help with both water quality and rate control; or infiltration trenches (rate control) were space is tight. The development of swales along roadways within the Lake Lacawac sub-watershed should be a high priority.

At both the drop-off/turn around bus areas the roads should be graded to direct water into an interior rain garden BMP focusing on water quality and rate control. At the larger turnaround the rain garden may take on the look of an open wet meadow. At the smaller Watres House turnaround the rain garden might be planted to mimic the bogs found along the edges of Lake Lacawac. Additionally this bog rain garden overflow could be directed to dissipate water into the Wallenpaupack watershed, minimizing risk to the Lake Lacawac sub-watershed.

The second main area to address with stormwater BMPs will be the roofs of the Watres house. The incorporation of a green roof on the Pavilion Room addition (see sections 4.3.1) will address both water quality and runoff. In addition, the opportunity exists to direct water that is collected in the valley created by the new butterfly roof line into storage cisterns to provide additional rate control. This water can be used as non-potable water to water the demonstration garden or can be dissipated into
the watershed after large rain events.

Last consideration should be given to controlling stormwater run-off from smaller scale facilities such as trails and plazas. The use of permeable stone dust paving system can help to both collect runoff and minimized maintenance of stone dust paths due to wash out of surface material caused by runoff of stormwater; while maintaining a rustic primitive design standards of the Sanctuary.

### 4.4 Cost Estimates – Schematic

Costs for adaptive re-use of the Watres House structure will range widely, depending upon many decisions, including timing, level of development, materials selection, and funding sources.

A program for the Adaptive Reuse elements of the building was created as a series of potentially discrete project elements – as a means to begin to break out the projects and ranges of associated costs into manageable funding campaigns and construction phases.

To secure credible local costs, Lacawac submitted the design schematics and list of elements to a trusted local contractor for a range of development estimates.

These will be held separate of this study report, for several reasons, but will be used as needed to substantiate funding strategies and grant applications by Lacawac

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### Section 5. Next Steps

#### 5.1. After the MSDP Update

Lacawac Sanctuary will use this MSDP Update as the basis for future planning, programming, and design of the Watres Hall, as well as a prerequisite for DCNR to fund the acquisition of the homestead and site for use as an environmental education center facility.

#### 5.2. Funding Partnerships / Phasing Strategy

In addition to the internal Lacawac Sanctuary strategy for private donor funding, there are several sources of partnership funding that should look on the development of Watres Hall as a vital and highly competitive resource that deserves design and development funding

- DCNR – Community Conservation Partnership Program (C2P2) is well known to Lacawac as a historic funding partner.
- DCED – Greenways, Trails and Recreation Program (GTRP) is a companion state agency program that is capable of funding various aspects of the Watres Hall development.

These two programs are capable of matching each other 1 to 1.
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Exhibits
May 19, 2017

William Collins, RLA
Simone Collins
119 East Lafayette Street
Norristown, PA 19401
Re: Preliminary Floor Framing Evaluation
Lacawac Sanctuary
Lake Ariel, PA

Dear Mr. Collins:

Per your request, Ruff Engineering Company evaluated the floor framing of an existing residential building that is being repurposed by the Lacawac Sanctuary in Lake Ariel, PA. While the end use of the building is not yet known, the floor framing will need to be code compliant for the chosen end use in accordance with Section 907.1 of the 2009 Edition of the International Existing Building Code. Based on conversations with Craig Lukatch of the Sanctuary, it is anticipated that the minimum live load capacity of the floor framing will be 100 PSF based on 1607.1 of the 2009 edition of the International Building Code.

**Description of the Structure**

The structure is a single story ranch-type house that was constructed around 1950. There are three specific sections of the house. The floor joists in each section are Douglas fir 2X12s spaced 16” on center. In the west wing and the center section (see Figure 1) the Joists have a clear span of 16’-0”, and in the east wing (see Figure 2) the joists span 12’-0”. Based on our calculations, the live load capacity of the 16’-0” long joists is 55 PSF, and the live load capacity of the 12’-0” long joists exceeds 100 PSF. This is based on 10 PSF floor dead load and No. 2 grade lumber.

**Recommendation**

Overall, the structure is in good condition; however, the live load capacity of the floor framing must be increased in the west and center sections so that the structure will be safe for the anticipated use. To increase the capacity, steel beams should be located below the joists at mid-span.
The beams can be installed in approximately 14’ long spans to allow for easy installation. Preliminarily, the steel beams will be W8X21 and will be supported by 4” pipe columns on 30” by 30” by 10” footings. The beams are 8” deep and will not make a significant impact on the vertical clearance of the basement.

Figure 3 Typical Joist Framing

Thank you for the opportunity to provide this evaluation. If you have any questions or need further assistance, please contact me.

Very truly yours,

John F. Ruff, Jr., PE
Ruff Engineering
President
DEED

This Deed made this 2d day of July 1999, between

LOUIS ARTHUR WATRES, II, of St. Thomas, U.S. Virgin Islands (the
"Grantor"),

AND

LOUIS ARTHUR WATRES, II, of St. Thomas Virgin Islands and CHAD REED-
WATRES, of R.R. 1, Box 518, Lake Ariel, Pennsylvania 18436, as joint tenants
with right of survivorship (the "Grantees"),

WITNESSETH, that in consideration of the sum of One ($1.00) Dollar in hand paid, the
receipt of which is hereby acknowledged, the Grantor does hereby grant and convey unto the said
Grantees, their heirs and assigns,

ALL THAT CERTAIN piece or parcel of land, situate, lying and being in Paupack
Township, Wayne County, Pennsylvania, more particularly described as follows:

BEGINNING at a stake corner on the edge of a drive, said corner being North two degrees
eleven minutes West (N. 2° 11' W.) 1013.5 feet from a pipe and stones corner, a corner of lands now
or formerly of Watres and a corner of lands of Schoenagel; thence North twenty-seven degrees nine
minutes West (N. 27° 09' W.) 195.1 feet to a point; thence south fifty-eight degrees thirty-seven
minutes West (S. 58° 37' W.) 136.25 feet to a point; thence South twelve degrees fifty-three minutes
West (S. 12° 53' W.) 115.7 feet to a point; thence south seventeen degrees twenty-four minutes East
(S. 17° 24' E.) 79.7 feet to a point; and thence North sixty-seven degrees twenty-five minutes East
(N. 67° 25' E.) 224.45 feet to the place of beginning.

Containing 0.8 acre more or less.

Together with the right reserved unto the parties herein for ingress, egress, and regress across
any and all roadways on premises conveyed to Lacsawee Sanctuary Foundation for Access to said
premises and to other lands of Grantors.

Improved by a dwelling house and out buildings.

Being the same premises as were conveyed by Louis Arthur Watres, II and Isabel E. Watres
to Louis Arthur Watres, II and Isabel E. Watres, by Deed dated October 27, 1972 and recorded in
Wayne County Deed Book 288 at page 840. Said Isabel E. Watres died on March 16, 1999, thereby

BK 535 PG 0231
vesting full title to said property in Louis Arthur Watres, II, the Grantee herein by operation of law.

This conveyance is a conveyance from father to father and son and therefore exempt from the realty transfer tax.

And the Grantor hereby warrants specially the property conveyed.

In Witness Whereof, the Grantor has caused this Deed to be executed the day and year first above written.

WITNESS:

[Signature]
Louis Arthur Watres, II

COMMONWEALTH OF PENNSYLVANIA

WAYNE
COUNTY OF LACKAWANNA

On this 2 day of July 1999, before me, a Notary Public, personally appeared Louis Arthur Watres, II known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged that he executed the same for the purposes therein contained.

In Witness Whereof, I hereunto set my hand and official seal.

[Notary Public Seal]

I hereby certify the precise address of the Grantee herein is:

T.R. #1, Box 518, Lake Ariel, PA 18436

Attorneys for the Grantee

BK1535PG0232
# Phase 1 Estimated Costs of Development

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