

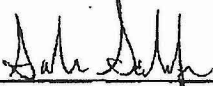
Quality Assurance Project Plan for Engineering Design and Permitting
Services for Construction of a Fish Passage at the Upper Mills Dam

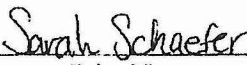
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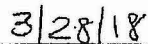
Under Contract Agreement to:
Suffolk County Department of Health Services
On behalf of the Peconic Estuary Program
360 Yaphank Road, Suite 2B
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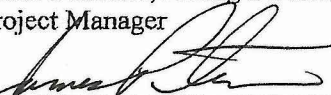
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Sarah Schaefer
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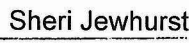

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QA Officer


JAMES PETERMAN
Print Name


6/1/18
Date


Sheri Jewhurst
EPA Project Manager/Officer


Sheri Jewhurst
Print Name


6/19/2018
Date


Donna Ringel
EPA QA Manager/Representative

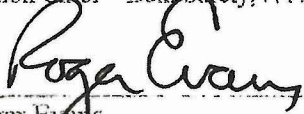

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Alon Dominitz
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4/2/18
Date


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NYSDEC Representative


Roger Evans
Print Name


6/1/18
Date

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USEPA Region 2
290 Broadway
New York, NY 10007
Primary

Approvals Signatures:

Sarah Schaefer, Acting Director, PEP Project Manager	Print Name	Date
Jim Peterman, P.E. QA Officer	Print Name	Date
Sheri Jewhurst EPA Project Manager/Officer	Print Name	Date
Donna Ringel EPA QA Manager/Representative	Print Name	Date
Alon Dominitz Section Chief – Dam Safety, NYSDEC	Print Name	Date
Roger Evans NYSDEC Representative	Print Name	Date:

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REFERENCES

A3. Distribution List

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A4. Project Task/Task Organization

Robert Steele, P.E., of L.K. McLean Associates (LKMA) will serve as the Project Manager and be responsible for maintaining the official, approved QA project plan. In addition, he will validate the data generated from this project.

Raymond DiBiase, P.E., of LKMA will serve as Project Officer. He will provide the executive point of contact with Suffolk County and monitor project progress, milestone achievement, deliverable schedules, and client satisfaction.

Daniel Jedlicka, P.L.S. is LKMA's Survey and Mapping Supervisor. His involvement will include acting as the primary survey manager responsible for seeing this project through from inception to close out including client support and contract administration.

Tamara Stillman, P.L.S. is LKMA's Senior Surveyor. She will provide the office services necessary to prepare topographic base mapping and the digital terrain model (DTM) necessary for permitting and the development of contract documents.

Keith Masseria, P.E., LKMA's Project Engineer, will be responsible for watershed mapping and the development of computer drainage models using EPA's Storm Water Management Model (SWMM) methodology. Keith will also assist Bob Steele in tasks of analyzing the dam's upland watershed, developing a hydrologic and hydraulic model of the existing and proposed conditions, and preparing design drawings.

Gary Gentile, R.L.A., is LKMA's Senior Landscape Architect. Gary has extensive experience in wetlands flagging and mitigation and will be responsible for flagging the freshwater wetlands on this project.

Jim Peterman, P.E. is LKMA's Quality Assurance Engineer. He will be responsible for QA/QC oversight.

Sarah Schaefer, Acting Peconic Estuary Program (PEP) Director. She will be responsible for technical review, participation in meetings and communication with the United States Environmental Protection Agency (USEPA).

Elizabeth Hornstein, PEP State Coordinator, Se will be responsible for management of this project for PEP, technical review, participation in meetings and communication with the USEPA.

Kyle Swaringen, P.E., Director of Bridges & Structures Engineering for the Suffolk County Department of Public Works, will be responsible for reviewing LKMA's proposed fish passage design.

Sheri Jewhurst, Clean Water Division, USEPA, Region 2, Peconic Estuary Program Project Officer. She will participate in technical reviews and internal PEP communication of results.

Syed Alam, NYSDEC Dam Safety Section, will be responsible for reviewing LKMA's proposed fish passage design.

Alon Dominitz, NYSDEC Dam Safety Section, will be responsible for reviewing LKMA's proposed fish passage design.

Roger Evans, NYSDEC, will be responsible for reviewing LKMA's proposed fish passage design.

A5. Problem Definition/Background

The Upper Mills Dam is approximately 2.9 miles from the mouth of the Peconic River in Flanders Bay. It is an earthen embankment with an asphalt/concrete road on top and two (2) parallel spillways. The northern banks of the Peconic River at this location are located in the Town of Riverhead, while the southern banks are located in Southampton. The dam is currently owned by PSEG but is maintained by the Town of Riverhead. The United States Geological Survey (USGS) maintains a concrete weir two-hundred and fifty (250) feet downstream of the dam in order to measure the stage and discharge of the Peconic River (gaging station #01304500). Upper Mills Dam and the USGS gauging station, located along the Peconic River, obstruct the migration of species such as Alewife, Blueback Herring and American Eel. These two locations were identified as such by a volunteer monitoring program which was undertaken by the Peconic River Restoration Commission in 2010 to document the alewife spring spawning run in the Peconic River (Young. 2010). In 2011 the Upper Mills Dam Feasibility Report, was completed by Inter-Fluve, Inc. to determine which type of fish passage would be best suited for each of the two locations (Inter-Fluve, Inc. 2011).

These two reports provide justification for installing a fish passage at each of the two previously mentioned locations. As a result, the Suffolk County Department of Health Services contracted LKMA to provide all survey, design and permitting services necessary to provide final design

plans and specifications for the construction of a fish passage at Upper Mills Dam and the USGS gauging weir located on the Peconic River in Riverhead. The intent of the Services is to assist the Peconic Estuary Program (PEP) in its goal to restore and improve the ecosystem and fisheries of the Peconic River, which contains State-designated Significant Coastal Fish and Wildlife Habitats. This project will open forty (40) acres of historic spawning and maturation habitat for diadromous fish within the Peconic River. Target species that will benefit from the restoration are the Alewife (*Alosa pseudoharengus*), Blueback herring (*Alosa aestivalis*), and American eel (*Anguilla rostrata*).

A6. Project/Task Description

This project consists primarily of the following components: topographic survey, site investigations, Watershed Mapping & Hydrologic/Hydraulic Modeling and development of construction plans. The final product of all work associated with this project will be existing and proposed drainage models, construction plans, specifications and an engineer's estimate. The above documents will be used to procure required environmental permits which will include communication and submission of permits to the New York State Department of Environmental Conservation (NYSDEC), United States Army Corps of Engineers (USACE), US Fish and Wildlife Service (USFWS), and Suffolk County Council on Environmental Quality review for compliance with the State Environmental Quality Review Act (SEQRA).

A7. Quality Objectives and Criteria

This project consists of three main tasks to develop design parameters for the fish passage; topographic survey, site investigations and Hydrologic/Hydraulic Modeling.

Topographic Survey

LKMA will provide the office and field services required to prepare topographic base mapping and the digital terrain model (DTM) necessary for permitting and the development of contract documents. Prior to the start of field survey, LKMA will contact the NYSDEC so that the freshwater wetland boundary can be flagged. Alternatively, LKMA's in-house Senior Landscape Architect, Gary Gentile, R.L.A., is certified to delineate freshwater wetlands. After flagging is complete, all flags will be surveyed and mapped as necessary for freshwater permitting purposes. Similarly, all utility companies will be contacted so that mark-out inside project limits can be performed prior to the start of the field survey.

Prior to performing the collection of topographic features, LKMA surveyors will establish NAD 83 and NAVD 88 survey datum control points inside the project limits and create a survey baseline. Bench marks will be established throughout the project area on permanent objects outside the proposed work area, at intervals of 1,000 feet or less and a survey control plan will be developed with baseline ties to the benchmarks. The accuracy of the survey shall not be less than one part in twenty thousand.

All survey equipment shall be properly maintained and calibrated, and checked frequently. Survey equipment Trimble S6 was cleaned adjusted and calibrated on 1-3-2018 by Long Island Survey Equipment Service, Inc. Equipment calibration and adjustment records and reports (not exceeding one year) shall be maintained by LKMA and submitted to the County as requested.

The limits of the topographic survey will extend approximately 100 feet upstream of the Upper Mills Dam and 100 feet downstream of the USGS gauging weir and will extend approximately 100 feet south and 100 feet north of the Peconic River's banks. Additionally, the survey will include the entire dam, which may extend beyond the limits of the Peconic River's banks. Stream cross sections between the dam and the USGS gauging weir will be performed at 50 foot intervals. A detailed topographic survey will be performed within the limits described above, so that all necessary features required for the permitting and design of the fish passage are located and properly identified. The area of the topographic survey determined to be sufficient for the needs of the project will include:

- Underground and above ground utilities
- Spillways
- Culverts
- Dam topography features
- Drainage and hydraulic structures

- Trees $\geq$ 4" in diameter
- Rip-Rap
- Roadway Features
- Weirs
- Buildings
- Signs

All survey data will be generated and provided digitally in Autodesk Civil 3D Software (version 2017) to the County for review. Additionally, LKMA shall submit survey reports to the County for review and approval before the survey data is used for the design. These shall include: Primary and Secondary Project Control Report, Photogrammetric Ground Control Report, and all raw and edited survey files (RW5, FBK files).

LKMA shall perform all calculations which may be necessary to reduce, balance, and adjust raw field data. This includes adjusting horizontal traverses and generating coordinates for the horizontal baseline points. It also entails reduction of data to produce elevations for vertical control points based on the datum of mean sea level using the most current general adjustment. Presentation of all data or output shall be in a plotted and digital form, or other form acceptable to the County for the purpose intended. All calculations and data shall be consistent with the NAD 83 N.Y.S. Plane Coordinate System, L.I. Zone (US Survey Feet) for Horizontal and NAVD 88 for Vertical.

Site Investigations

LKMA's engineering team will perform site investigations, including documentation of the existing conditions with site photographs and evaluation of the existing dam conditions. LKMA will perform a visual inspection of the Dam to identify any cracks, slides, cave-ins or sink holes, areas of erosion, structural deterioration and seepage. In addition, any existing trees and vegetation located along the top of the dam and its side slopes will be documented so that they can be evaluated for potential removal. The inspection of the dam will be in accordance with the NYSDEC Publication by the Division of Water, An Owners Guidance Manual for the Inspection and Maintenance of Dams in New York State. Additionally, the inspection of the dam will meet the requirements of Part 673.12 "Safety Inspections".

It is estimated that approximately three soil borings, each 30 feet in depth, will be required along the top of the dam to assess/identify soil characteristics of the dam. LKMA will solicit bids from well qualified soil boring contractors and enter contract with the lowest responsible bidder to perform the required work. LKMA will follow the procedure outlined in the NYSDEC document, Guidelines for Design of Dams, to determine the exact location of the soil borings. Borings will be logged with respect to blow counts and classified in accordance with the Unified Soil Classification System (USCS).

Hydrologic/Hydraulic Modeling

LKMA will provide Professional Engineers and technical staff to engineer and design the project with plans, specifications and estimates. Historical flow records from the downstream USGS gauging Station (#01304500) will be used to verify minimum and maximum flows within which the proposed fishway and modified spillway will function in tandem. Existing flow through the gauging station is equal to that required to flow through both the existing dam/culvert at Upper Mills Road and the proposed fishway. The flow through the proposed fish passage will not be included in the calculation of the spillway capacity.

In 2005, Dunn Engineering Associates, P.C. Consulting Engineers completed a report of the 5 dams on the Peconic River. Included within the report are spillway calculations for the Upper Mills Dam. According to the report, an event with a 100-year recurrence frequency results in approximately 215cfs as the design storm event. LKMA will investigate using this data in lieu of performing a conventional hydrologic study for the 100 year storm 24-hour rainfall.

Furthermore, stream flow data at the USGS gauging Station (#01304500) will be used to determine the design flows for the proposed fish passage. Streamflow data will be obtained for the spawning period (March 15 to June 15) and will be used to determine the fish passage operating range. The low design flow defines the lower limit of river flow that can achieve safe, timely and effective fish passage. The low design flow will be defined as the mean daily average river flow that is equaled or exceeded 95% of the time during the migrating period for alewife. The high design flow defines the upper limit of river flow that can achieve safe, timely, and effective fish passage. The high design flow will be defined as the mean daily average river flow that is equaled or exceeded 5% of the time.

Hydrologic and hydraulic analysis of the existing and proposed spillway configurations will be prepared by LKMA using Autodesk Storm and Sanitary Analysis Software. This software is capable of utilizing the USEPA Storm Water Management Model (SWMM) or TR-55 methodology as its engine for hydrologic calculations, and is a complete dynamic flow routing model that performs accurate flow and hydraulic grade line calculations. Hydrologic and hydraulic analysis of the proposed changes to the spillway will be analyzed in accordance with the NYSDEC Guidelines for Design of Dams to ensure that the proposed modifications do not negatively impact the upstream or downstream areas adjacent to the Upper Mills Dam. Results of the hydraulic analysis will yield design parameters such as velocities, flow depths, freeboard and flow rates necessary for the design of protective measures against scour and undermining of the existing structures. Additionally, the calculated flow velocities and depths inside the fish ladder and downstream culvert are essential for determining the feasibility of the fish passage itself for the target species' swimming ability. All model inputs will be presented in the Basis of a Design Report, and electronic copies of all models will accompany the report.

USGS 01304500 PECONIC RIVER AT RIVERHEAD NY

Available data for this site

SUMMARY OF ALL AVAILABLE DATA

Stream Site

DESCRIPTION:

Latitude 40°54'49", Longitude 72°41'12" NAD83
Suffolk County, New York, Hydrologic Unit 02030202
Drainage area: 74.7 square miles
Datum of gage: 6.54 feet above NGVD29.

AVAILABLE DATA:

Data Type	Begin Date	End Date	Count
Current / Historical Observations (availability statement)	2007-10-01	2017-08-22	
Daily Data			
Discharge, cubic feet per second	1942-06-21	2017-08-21	27456
Daily Statistics			
Discharge, cubic feet per second	1942-06-21	2017-02-13	27267
Monthly Statistics			
Discharge, cubic feet per second	1942-06	2017-02	
Annual Statistics			
Discharge, cubic feet per second	1942	2017	
Peak streamflow	1943-02-15	2016-03-15	74
Field measurements	1942-06-25	2017-06-26	754
Field/Lab water-quality samples	1966-05-13	2000-09-12	278
Water-Year Summary	2005	2016	11

Existing USGS gauging station downstream of Upper Mills Dam

A8. Special Training/Certification

All topographic surveys will be processed by a Licensed Land Surveyor. Watershed Mapping, Hydraulic Modeling, and design will be performed by a Licensed Professional Engineer. Freshwater wetlands will be flagged by LKMA's Senior Landscape Architect, Gary Gentile, R.L.A., who has a Wetland Delineation Certification from the US Army Corp. of Engineers.

Soil borings will be performed by a well-qualified soil boring contractor. All involved with the soil boring operation will be required to have the OSHA 10 hour course. In addition, all drillers must be certified through the National Groundwater Association as Certified Well Drillers and the company must be licensed by NY State. An LKMA Engineer will be on site to verify that the soil borings are performed in accordance with ASTM Standards and to perform a visual inspection of the soils.

All involved with this project will be required to read and familiarize themselves with the QAPP contents.

A9. Documents and Records

The topographic survey will be performed using Trimble Robotic Instruments with 360 degree prism poles and the Trimble R6 GPS heads with TSC3 Data Collectors. The topographic survey and DTM will be developed from this information using the latest version of the AutoCAD Civil 3D software compatible with the County's current AutoCAD version. Contract Plans will be

prepared in accordance with the County's "A Guide for the Preparation of Highway Construction Plans, Acquisition Maps, and Parcel Descriptions for Consultant Services." Base mapping will be prepared at a scale of 1"=40' horizontal and 1"=5' vertical unless otherwise approved by the County.

All soil boring data will be recorded in conformance with Section 8, of American Society for Testing and Materials (ASTM) Specification for the Standard Penetration Test (D-1586). Soil borings will be provided by the contractor in the form of Soil Boring Logs.

Data collected in the field will be recorded on iPads or waterproof field notebooks. All data will be made available to the Director of the Peconic Estuary Program and Sheri Jewhurst of the EPA. Once the data have been compiled, and field work, data analysis, and conceptual plans have been completed, a final report will be issued to Suffolk County and the Peconic Estuary Program, and a presentation will be made to the Peconic Estuary Program Technical Advisory Committee.

B. DATA GENERATION AND ACQUISITION

B1. Sampling Process Design (Experimental Design)

Flows through the Peconic River and alewife passage along the Peconic River are well documented at this location. In 2010, a volunteer monitoring program was undertaken to document the alewife spring spawning run in the Peconic River. Observations and sampling conducted at the Upper Mills Gauging Station are documented in that report. Additionally, the USGS maintains a concrete weir 250ft downstream of Upper Mills Dam in order to measure the stage and discharge of the Peconic River. This gauging station (#01034500) has been active for approximately 75 years and is currently managed by the USGS New York Water Science Center. The data recorded over the 75 year period from this gauging station is available for use and will be adequate to confirm design flows for the two new fish passages. Relevant data recorded at this station includes stream flow in cubic feet per second. This information is periodically validated by the USGS and is labeled as "period of approved data" on provided discharge graphs on their website.

The NYSDEC Dam Safety Division requires a minimum of three soil borings to be performed along the centerline of the dam. One boring will be performed at the center of the dam and one additional boring on either side of it. Borings will be drilled to a minimum depth of 30'. LKMA will follow the procedure outlined in the NYSDEC document, Guidelines for Design of Dams, to determine the exact location of the soil borings. Borings will be logged with respect to blow counts and classified in accordance with the ASTM D 2487, Classifications of Soils for Engineering Purposes (Unified Soil Classification System). This method requires that the

Engineer will follow ASTM D 2488 Standard Practice for Description and Identification of Soils (Visual-Manual Procedure).

B2. Sampling Methods

All soil borings and soil sampling will be performed in accordance with the ASTM Specification for the Standard Penetration Test (D-1586). The borings will be performed utilizing direct push drive casing technique with a tracked mounted Geoprobe unit. Soil samples will be obtained utilizing a 2"x24" split spoon sampler. Since this dam has been classified by the NYSDEC as a class "A" low hazard dam, laboratory testing will not be required. Restoration of the bore holes will consist of backfilling land borings with clean sand and patching at grade if performed through a paved area.

B3. Sampling Handling and Custody

As stated previously, this dam has been classified by the NYSDEC as a class "A" low hazard dam and as a result laboratory testing will not be required. Therefore, it will not be necessary to package and store soil samples for future use.

B4. Analytical Methods

Laboratory testing will not be required for this project.

B5. Quality Control

It is the responsibility of the soil boring contractor to ensure that the split-barrel sampler be replaced or repaired when it becomes dented or distorted as described in ASTM Specification for the Standard Penetration Test (D-1586).

B6. Instrument/Equipment Testing, Inspection, and Maintenance

From our experience, it is estimated that all soil borings required for this job will be completed in a single day. The work will be performed by a well-qualified soil boring contractor. Prior to the start of work the soil boring contractor will be required to provide LKMA management with all necessary documentation which states that the tracked mounted Geoprobe unit has the ability to perform the work in accordance with the ASTM Specification for the Standard Penetration Test (D-1586). No work will begin until this documentation has been received.

B7. Instrument/Equipment Calibration and Frequency

Laboratory testing will not be required for this project, therefore supplies and consumables will not be necessary to perform the work. No calibration is required for the soil boring equipment.

The LKMA survey equipment is serviced/calibrated annually.

B8. Inspection/Acceptance of Supplies and Consumables

Laboratory testing will not be required for this project, therefore supplies and consumables will not be required to perform the necessary work.

B9. Non-direct Measurements

USGS web soil survey maps will be used to aid the LKMA designer in determining the depth of the soil borings which is estimated to be 30 feet for this project.

As mentioned above, USGS gauging station (#01034500) has been active for approximately 75 years and is currently managed by the USGS New York Water Science Center. The data recorded over the 75 year period from this gauging station is available for use and will be adequate to confirm design flows for the two new fish passages. Relevant data recorded at this station includes stream flow in cubic feet per second. This information is periodically validated by the USGS and is labeled as “period of approved data” on provided discharge graphs.

B10. Data Management

All soil boring data will be recorded in conformance with Section 8, of ASTM Specification for the Standard Penetration Test (D-1586).

C. ASSESSMENT AND OVERSIGHT

C1. Assessments and Response Actions

Assessments can be scheduled for any time that is agreeable for Sheri Jewhurst of the EPA, The Director of the PEP and representatives from LKMA.

C2. Reports to Management

Upon preliminary evaluation of the existing site conditions, LKMA will prepare conceptual plans and documents that recommend alternatives which can achieve the goals of the project for consideration. Conceptual plans will determine suitable methods for fish passage of the targeted species and evaluate whether the proposed fish passage will be constructed adjacent to, or integral with, the existing spillway and culvert structure. These plans, which will include the information outlined in Task 3.v. of the services contract, will be submitted to the Director of the PEP and the Steering Committee for review. Upon approval, LKMA will proceed with developing preliminary plans for the recommended alternative. After completion, the preliminary design plans will be submitted for review, comment and approval to the PEP and the Steering Committee. These plans will also be submitted for review by the NYSDEC, NYSDEC Dam Safety Section, US Army Corps of Engineers and the US Fish and Wildlife Service. As soon as the preliminary design comments from both the County and the permitting agencies have been received and addressed, LKMA will develop Advanced Detailed Plans (ADP), specifications and cost estimates for review. Lastly, LKMA will review and address comments

from the ADP submission and develop and submit to PEP final construction plans, specifications and cost estimates in the form of three (3) paper copies and three (3) CDs containing a .pdf of the draft cost estimates and all associated data layers and files.

In addition to any other reports that may be required pursuant to the items of the Contract, for the duration of the Contract, the Contractor shall submit interim progress reports on a quarterly basis to the Director of the PEP via e-mail.

Upon completion of services, an electronic copy of a draft report will be submitted to the PEP staff and PEP's Natural Resources Subcommittee, for review and comment. The draft report will include: an executive summary; a summary of all methods used; analytical techniques and results; final design drawings and specifications appropriate for construction contracting; recommendations for new PEP Management Committee Conference actions or modifications to existing priority actions resulting from this work and implications for PEP's Comprehensive Conservation and Management Plan implementation; and recommendations for a long-term monitoring program to assess the success of the project. The draft report described above will be amended in accordance with comments provided by PEP and submitted to same as a final written report consisting of three (3) color paper hard-copies and three (3) CDs containing a .pdf of the draft cost estimates and all associated data layers and files.

D. DATA VALIDATION AND USABILITY

D1. Data Review, Verification, and Validation

Data required for this project includes topographical survey, river flow rates and soil borings. The accuracy of the survey will not be less than one part in 20,000. In order to ensure that the survey meets these standards, all survey equipment shall be properly maintained and calibrated, and checked frequently. Survey equipment Trimble S6 was cleaned adjusted and calibrated on 1-3-2018 by Long Island Survey Equipment Service, Inc. Equipment calibration and adjustment records and reports (not exceeding one year) shall be maintained by LKMA and submitted to the County as requested. After the LKMA field crew performs the survey, an LKMA Professional Land Surveyor will process the information for design. Once this information has been processed, the survey crew will review the plans to ensure that there were no transcription errors. Lastly, LKMA's director of Survey and Mapping, Daniel Jedlicka who has 40 years in the industry will provide QA/QC on the completed survey.

An LKMA Engineer will be on site to verify that the soil borings are performed in accordance with ASTM Standards. In addition, the LKMA Professional Engineer will record blow counts in a soil boring log, observe and visually inspect soil samples, verify sample locations and take photographs of the samples. Upon completion of each soil boring, the LKMA Engineer will

compare soil boring logs with the soil boring contractor to ensure there were no errors or discrepancies with the recorded data.

All river flow data obtained from the USGS gauging station (#01034500) has been verified by the USGS New York Water Science Center. This data will also be reviewed by an LKMA Licensed Professional Engineer. This flow data will be reviewed to determine the minimum and maximum stream flows within which the proposed fishway will be operational. All other data to support the installation of fish passages at these locations can be found in the Report on Peconic River Alewife Run and Peconic River, Feasibility Study Report: Alternatives for Fish Passage.

D2. Verification and Validation Methods

LKMA will create a hydrologic and hydraulic model of the watershed and dam system. The model will ensure that maximum velocities in the fish passage are not exceeded, and adequate depths are maintained during the anticipated seasonal flow fluctuations, as well as during rainfall events. The hydrologic and hydraulic model will be created using AutoDesk Storm and Sanitary Analysis software. TR-55 methodology will be used for its hydrologic calculations and can run either steady state or hydrodynamic hydraulic routing calculations. Using historical flow rates and NOAA hourly rainfall precipitation data, this model will be calibrated to replicate the data recorded from known storm events. Results from the computer drainage model will be submitted to the Director of the PEP in digital pdf format on a CD.

Prior to progressing the final design, LKMA will submit the preliminary designs of the proposed fish passages to the United States Fish and Wildlife Service (USFW). From our recent experience on other fish passage projects, the USFW will perform independent calculations to check the hydraulic properties of the proposed fishways. This will serve to validate the findings of the LKMA proposed drainage model. The USFW has extensive experience with the design of fish passages at other locations which are tributaries of the Peconic River.

D3. Reconciliation with User Requirements

Submittals of analysis and reports will be made at the conceptual design phase, advanced detailed design phase and final design phase of the design process to the Director of the PEP, the EPA, and the Technical Advisory Committee of the PEP. All comments which are received from these agencies will be incorporated into the final construction plans and the final report.

REFERENCES

Inter-Fluve, Inc. 2011. Upper Mills Dam – Peconic River, Feasibility Study Report: Alternatives for Fish Passage.

New York State Department of Environmental Conservation, 1989. Guidelines for Design of Dams.

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