

May 29, 2012

BOARD ACTION/DISCUSSION ITEMS **JUNE 2012 – AUGUST 2012**

PRIORITY*	PROJECT/ISSUE	TYPE OF ACTION	TIMING**
<i>AS NEEDED</i>			
H	Update on wastewater treatment capacity evaluation/steering committee	Status Report	As needed
H	Acquisition/Growth Strategy Activities	Status Report	As needed
H	Jordan Creek Wastewater Plant	Status Report	As needed

<i>WITHIN 45 DAYS</i>			
H	SCARP Program – Basis of Rehabilitation for existing CCTV work <i>Professional Services Authorizations</i>	Approval	June (B)
H	PADOT RT 309 & Sand Spring Improvements - Water Main Relocations - Design Phase <i>Project & Professional Services Authorizations and Budget Amendment</i>	Approval	June (B)
H	RT 309 Crossing @Sand Spring Road - Design Phase <i>Project & Professional Services Authorizations</i>	Approval	June (B)
H	Western Weisenberg WTP (re-bid) <i>Project Authorization Amendment Construction Phase & Contract Awards</i>	Approval	June (B)
H	Approval of Hillwood developer's contribution agreement in regard to Western Weisenberg WTP	Approval	June (B)
M	Upper Milford Central Division Radon Mitigation Study <i>Project & Professional Services Authorizations</i>	Approval	June (B)
H	Wastewater Capacity Act 537 Planning <i>Professional Services Authorization</i>	Approval	June (B)
H	Wastewater Capital Recovery Fees	Approval	June (B)

<i>WITHIN 75 DAYS</i>			
H	SCARP Program -- Rehabilitation Effectiveness Evaluation <i>Professional Services Authorizations</i>	Approval	July (W/B)
H	Knowledge Sharing Skills Development Project <i>Project & Professional Services Authorizations</i>	Approval	July (B)

06/18/12 June Board Meeting

07/09/12 July Workshop Meeting

* **H** – High
M – Medium
L – Low

** **(W)** – Workshop
(B) – Board
(W/B) - Either

LEHIGH COUNTY AUTHORITY
WORKSHOP AGENDA
Monday, June 4, 2012 – 12:00 PM

INITIAL ITEMS (Collectively 5 Minutes)

1. Identify items for June Board Meeting

- Review Board Discussion items, June 2012 – August 2012

ACTION/DISCUSSION ITEMS

1. 2011 1st Quarter Financial Statements (Statements) (Acceptance)

Acceptance of the 1st Quarter Unaudited Financial Statements is requested.

2. 2011 Risk Management (RM) Annual Report (Approval)

The 2011 RM Annual Report is attached for approval (*pink*). There were no reportable accidents, involving injury in 2011. The Risk Management Team remains committed to the safety of LCA employees and the protection of LCA assets. As such, the Team will continue to stress safety and will investigate and monitor all insurance options that promise reduced costs and maintain adequate protection.

3. SCADA Communication Design (Approval)

Full Project Overview

In light of rapidly changing communication channels and technology, changing FCC licensing, loss of line-of-sight radio communications and a geographically expanding LCA territory, LCA proposed a review of the existing communications for the mission critical operations. LCA engaged TuWay Communications to perform a high level SCADA Communication study in 2011(\$3900). That study included an existing system assessment and future needs analysis, a computer model analysis of RF (radio frequency) line-of-sight for RF transmission of SCADA data and a list of recommendations (Attached). The overall project will include engineering design and construction services for system upgrades and enhancements.

Next Phase – Engineering Design

Scope of Work: To perform the detailed engineering, including site visits, final path profiles, generation of equipment lists, determination of equipment and antenna installation locations, cabling requirements, etc. to implement the RF SCADA recommendations contained in the February 2012 report.

Staff is recommending approval via the Capital Projects Authorization for this phase of the project (*gray*).

4. GIS Mobile Application- Wendel Duchscherer Professional Services Amendment No. 1 (Approval)

Our consulting engineer Wendel Duchscherer will provide GIS application development services to create and implement an ArcGIS Server Silverlight web map that will run in conjunction with the previously created mobile Android mapping application. Please reference attached Memo and PSA Amendment No. 1 for additional information (*purple*).

5. Little Lehigh Relief Interceptor (LLRI) Pipe Condition Assessment (Approval)

A Professional Services Authorization for Malcolm Pirnie is being presented to the Board for consideration (*green*). The work is for the physical condition assessment (PCA) of 20,000 LF of the Little Lehigh Relief Interceptor from Keck's Bridge to the Park Pump Station as shown on the attached map. In previous authorizations, the LCA team provided the CCTV work. This authorization includes the CCTV work to be provided by Malcolm Pirnie and includes an allowance of \$25,000 for heavy cleaning and bypass pumping that may be necessary. This will complete the authorizations for the WLI PCA program for 2012.

6. Single Audit Report

Because the Authority received more than \$500,000 in federal funds during 2011, a single audit needed to be conducted by auditors for all the projects which received these funds. Projects included within the separate audit were the Vera Cruz Sanitary Sewer System, the Flow Equalization Basin, and the Water Meter Upgrade. One deficiency was reported where the Authority received more reimbursement than expenses incurred. A request for reimbursement submitted in 2012 was reduced to correct the deficiency.

INFORMATION ITEMS

1. Education and Training

Aurel Arndt	AWWA Annual Conference & Exposition – Dallas, TX	6/10-14; \$2,156
-------------	---	------------------

OTHER ITEMS

None.

CAPITAL PROJECT AUTHORIZATION

PROJECT NO.:	<u>A-5</u>	BUDGET FUND:	<u>Administration Water Capital</u>
PROJECT TITLE:	<u>SCADA Communications</u>	PROJECT TYPE:	
TOTAL PROJECT	\$ \$177,700	<input type="checkbox"/> Construction	
THIS AUTHORIZATION	\$ \$17,700	<input checked="" type="checkbox"/> Engineering Study	
		<input type="checkbox"/> Equipment Purchase	
		<input type="checkbox"/> Amendment	

DESCRIPTION AND BENEFITS:

Full Project Overview:

In light of rapidly changing communication channels and technology, changing FCC licensing, loss of line-of-sight radio communications and a geographically expanding LCA territory, LCA proposed a review of the existing communications for the mission critical operations. LCA engaged TuWay Communications to perform a high level SCADA Communication study in 2011(\$3900). That study included a existing system assessment and future needs analysis, a computer model analysis of RF (radio frequency) line-of-sight for RF transmission of SCADA data and a list of recommendations (Attached). The overall project will include engineering design and construction services for system upgrades and enhancements.

Next Phase -Engineering Design

Scope of Work.

To perform the detailed engineering, including site visits, final path profiles, generation of equipment lists, determination of equipment and antenna installation locations, cabling requirements, etc. to implement the RF SCADA recommendations contained in the February 2012 report (please refer to the attached spreadsheet for specific item references).

Tasks and Deliverables

TuWay proposes to perform the following tasks:

- 1) Perform 15- 20 site visits as required to determine equipment locations, cabling requirements, etc.
- 2) Hold 3- 5 engineering review discussions with LCA personnel, as required.
- 3) Development of necessary network diagrams, IP addressing schemes, etc. including one revision cycle.
- 4) Development of equipment lists and installation Scope of Work documents, as needed.

Fees

Item 1: RF link b/w SB Wastewater and SB Meter: \$1,700

Item 2: RF links between Lehigh St., Trout Cr. and SB Wastewater Treatment: Included in Item 1

Item 3: Fogelsville Water Tank: \$8,000

Item 4: Microwave Backhaul Link: Included in Item 3

Total for Items 1 thru 4: \$9,700.

REQUESTED THIS AUTHORIZATION	
Design Phase	
Staff	\$ 5,000
Engineering Consultant (1)(2)	9,700
Miscellaneous	1,000
Contingency	2,000
Total This Authorization	\$ 17,700

Future Authorization	
Procurement/Construction Phase(s)	\$160,000

Total Estimated Project	\$177,700
-------------------------	-----------

REVIEW AND APPROVALS:

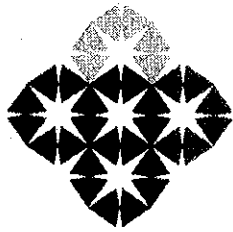
<u>Joe McMahon III</u>	<u>5/24/12</u>		
Project Manager	Date	General Manager	Date
<u>Capital Works Manager</u>	<u>Date</u>	<u>Chairman</u>	<u>Date</u>

LCA SCADA Network Proposed Solution Overview:

- 1) Install RF link to replace the SB Wastewater Treatment to SB Meter dedicated copper pair
- 2) Install RF link to replace the Lehigh St. - Trout Creek - SB Wastewater Treatment dedicated copper pair
- 3) Replace existing 4710 @ LCA with SD Series Master Station (UHF) at Fogelsville Water Tower, use existing UHF antenna at water tank
- 4) Either install unlicensed microwave link from Water Tower to LCA, or utilize Telco provided dedicated IP connection, if available

Budgetary Costs:	Capital Costs	Total Cost of Ownership (TCO)		10 Year Net Savings	Remarks
		Ownership (TCO)	10 year MRC Savings		
1) RF link b/w SB Wastewater and SB Meter	\$5,500.00	\$7,500.00	\$49,200.00	\$41,700.00	Includes engineering and \$2,000 maintenance over 10 years
2) RF links between Lehigh St., Trout Cr. and SB Wastewater Treatment	\$12,500.00	\$14,500.00	\$45,720.00	\$31,220.00	Contingent on obtaining permission to install equipment on Slatington tower, includes engineering, \$2,500 tower climb & \$2K maintenance
3) Fogelsville Water Tank New SD Network Station	\$10,000.00	\$10,000.00			Protected and Redundant
Antenna and Miscellaneous	\$1,700.00	\$1,700.00			DB408 Antenna
Engineering	\$8,000.00	\$8,000.00			
Labor to Install/Move	\$3,600.00	\$3,600.00			
Project Management	\$1,000.00	\$1,000.00			
3a) Remote Transceivers - installed	\$37,250.00	\$37,250.00			10 radios @ \$3,725 ea. Installed
3b) Estimated incremental maintenance		\$15,000.00			Estimated @ \$1,500 annually
Sub- Total Items 3, 3a & 3b	\$61,550.00	\$76,550.00	\$104,947.20	\$28,397.20	Savings estimate based on 80% of total water and sewer MRC
4) Backhaul					
Microwave @ Water Tower - installed	\$19,000.00	\$19,000.00	\$82,080.00	\$63,080.00	Includes \$10,000 maint. @ \$1K annually
OR					
10 Mbps PenTeleData Point-Point Circuit		\$684.00			\$684. Monthly cost per PTD quote dated 2/29/2012. No install fee.
Totals	\$98,550.00	\$117,550.00			
Contingency @ 25%	\$24,637.50	\$29,387.50			
Project Total	\$123,187.50	\$146,937.50		\$164,397.20	10 Year net does not include contingency
		\$124,937.50		\$91,477.20	

SB= Slatington Borough
RF = Radio frequency
SD = GE radio equipment
MRC = Monthly Recurring Costs



TuWay
Communications™

Always make it work.™

CORPORATE HEADQUARTERS
2115 City Line Road
Bethlehem, PA 18017

610-865-3811 TELEPHONE
610-865-3818 FACSIMILE
800-346-3700 SALES/ SERVICE

www.tuway.com

February 6, 2012

Lehigh County Authority SCADA Evaluation Report

Project Overview

TuWay Communications (TuWay) was engaged by the Lehigh County Authority (LCA) for the purpose of evaluating their present SCADA communications network to assist LCA in determining a plan of action in regards to the following:

- 1) Improving system efficiency, reliability and functionality
- 2) Ensuring compliance with the FCC's upcoming narrowband mandate
- 3) Determining any communications equipment upgrades, including taking advantage of any newer technologies where applicable

Deliverables

At the conclusion of the evaluation, TuWay was contracted to provide:

- 1) An assessment report with communications system upgrade/ migration recommendations, including budgetary costs, for management consideration
- 2) Any supporting drawings, analysis, or other applicable documentation gathered or produced during the evaluation
- 3) Existing equipment inventory summary

Methodology and Tasks

In order to accomplish the above, TuWay worked with LCA personnel to produce a location and inventory summary spreadsheet (attached). Additionally TuWay reviewed various information and documentation detailing how the existing SCADA functions, known communications problems, current communications expenses, etc. We also met with various LCA staff in order to better understand the current system's benefits and deficiencies, as well as future functional desires, plans for system modifications, enhancements, or expansion/ contraction. Based upon this initial review, we performed some cursory Radio Frequency (RF) analysis in order preliminarily understand potential RF coverage issues. This led to the creation of two conceptual system diagrams which we reviewed with LCA management and staff in order to obtain feedback and approval prior to embarking on more detailed analysis and formulation of specific recommendations.

After receiving the feedback and approval we performed a detailed RF analysis, including searching on-line FCC databases of nearby radio frequency license holders, in order to not only determine a design that would provide adequate performance for the communications system, but for which LCA might be able to obtain the necessary FCC licensing to implement.

Disclaimer: We are aware that there are several other strategic initiatives underway at LCA such as implementation of a field based GIS/ asset management application, evaluation of mobile communications (e.g. radio and cellular phone) needs, and installation of video surveillance at select locations. The recommendations in this report may be altered, specifically relative to data backhaul and back-up/ redundancy, depending on strategic decisions made regarding these initiatives.

Recommendations and Conclusions

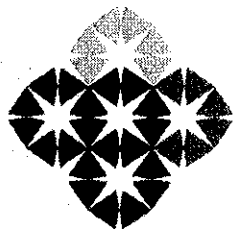
Based upon the above, our recommendations and conclusions are as follows:

- 1) Currently all existing licenses are in compliance with upcoming FCC narrowband regulations, and the radio equipment is narrowband capable. Based on the programming information that we were provided with by LCA, no programming modification are required in order to comply with the narrowband regulations as they currently exist.
- 2) The licenses are not, however, licensed with the proper emissions designation (they are currently licensed for voice *not* data use) and are licensed for mobile only *not* fixed base operation). It is recommended that this be rectified after a final decision is made on the system configuration, and final licensing is sought.
- 3) Install a wireless RF link in either the 900 MHz or 2.4 GHz band to replace the Slatington Borough (SB) Wastewater Treatment to SB Meter (LCA owned) dedicated copper pair. The cost to install this link will be approximately \$7,500 and will save approximately \$5,000 in annual telco fees (\$410/ month).
- 4) If LCA can obtain permission to install equipment on the County's Slatington Tower, install RF links to replace the dedicated copper pairs between Lehigh St., Trout Creek and SB Wastewater Treatment. The cost to install this link will be approximately \$14,500 and will save approximately \$4,600 in annual telco fees (\$381/ month).
- 5) Installation of a new full-duplex and redundant MDS SD Series Master Station at the Fogelsville Water Tank to replace the LCA location as the aggregation point for the remote transceivers is the recommended solution. Alternatively, if budget constraints dictate, LCA could move the existing UHF 4710 transceiver currently at LCA to the Fogelsville Water Tank. However, this option will a) provide lesser bandwidth and b) increase risk of significant network downtime in the event that the 4710 fails. Per discussion with MDS, the SD Series is backwards compatible with LCA's embedded infrastructure of 4710s and 4310As. Per our coverage analysis, this should improve connectivity to many of the existing UHF remote sites reducing monthly recurring telco charges (MRC) and eliminating most of the high communications errors, which we believe are due to poor RF coverage. One of our original thoughts was to install/ move UHF equipment to South Mountain (e.g. Bauer's Rock), however after performing an interference analysis we have concluded that the 400 MHz band is too congested, and obtaining a license at that elevation is not likely. However, it may be possible to obtain licensing in the 900 MHz band, which is addressed below. Utilize either a telco provided dedicated IP connection, microwave link or 900 MHz link (not recommended) to backhaul the data from the water tank. The budgetary cost estimate to implement this recommendation is \$76,000-\$95,000.

- 6) Re-evaluate the network after effecting recommendation #3, and perform a financial analysis to determine if it makes sense to add a 900 MHz transceiver or Master Station on South Mountain (e.g. Bauer's Rock). This is contingent on obtaining suitable FCC licensing (which we think can be obtained in the 900 MHz frequency band) and securing permission to co-locate equipment at a site. Utilize either a telco provided IP connection, microwave link, or existing County fiber (if available) to backhaul the data from the site, whichever makes the most financial sense, and in the context of other strategic initiatives underway at LCA. FCC licensing should be sought as soon as practical.
- 7) As 4710 or 4310A units fail, replace them with SD Series transceivers, which is the most current model (4710s are being discontinued, although MDS did not provide a specific date).

Appendices

- 1) Proposed Network Diagram
- 2) Financial Analysis
- 3) Water Facilities Spreadsheet
- 4) Sewer Facilities Spreadsheet
- 5) UHF Coverage Analysis from Foglesville Water Tank
- 6) UHF Coverage Analysis from LCA Administration Building



**TuWay
Communications™**

Always make it work.™

CORPORATE HEADQUARTERS
2115 City Line Road
Bethlehem, PA 18017

610-865-3811 TELEPHONE
610-865-3818 FACSIMILE
800-346-3700 SALES/ SERVICE

www.tuway.com

May 2, 2012

Statement of Work for Lehigh County Authority Detailed Engineering

Scope of Work

To perform the detailed engineering, including site visits, final path profiles, generation of equipment lists, determination of equipment and antenna installation locations, cabling requirements, etc. to implement the RF SCADA recommendations contained in the February 2012 report (please refer to the attached spreadsheet for specific item references).

Tasks and Deliverables

TuWay proposes to perform the following tasks:

- 1) Perform 15- 20 site visits as required to determine equipment locations, cabling requirements, etc.
- 2) Hold 3- 5 engineering review discussions with LCA personnel, as required.
- 3) Development of necessary network diagrams, IP addressing schemes, etc. including one revision cycle.
- 4) Development of equipment lists and installation Scope of Work documents, as needed.

Fees

Item 1: RF link b/w SB Wastewater and SB Meter: \$1,700

Item 2: RF links between Lehigh St., Trout Cr. and SB Wastewater Treatment: Included in Item 1

Item 3: Fogelsville Water Tank: \$8,000

Item 4: Microwave Backhaul Link: Included in Item 3

Total for Items 1 thru 4: \$9,700.

Note: all of the above were included in the budgetary costs provided in the final report.

Terms and Conditions

Fifty percent (50%) shall be due and payable upon acceptance of this Statement of Work, with the remaining balance invoiced Net 30 upon completion.

Agreed and Accepted for the Lehigh County Authority:

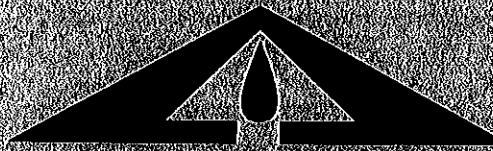
Signature

Printed Name

Title

Date

The information contained herein is TuWay Proprietary and Confidential and may not be disseminated to any third parties without the express written consent of TuWay Communications. Prices valid for 60 days.



Lehigh County Authority

1053 Spruce Street * P.O. Box 3348 * Allentown, PA 18106-0348
(610) 398-2603 * FAX (610) 398-8413 * Email: service@lehighcountyauthority.org

MEMORANDUM

To: Authority Board
From: Emily Gerber
Subject: GIS Future Application Needs Assessment & Mobile Application Development & Implementation – PSA Amendment No. 1

Date: June 4, 2012

MOTIONS / APPROVALS REQUESTED

No.	Motion / Approval Item	Amount
1	Professional Services Authorization (PSA) Amendment No. 1 – Wendel Duchscherer	\$18,300

PROJECT OVERVIEW

In February of 2011, the Board approved the Capital Project Authorization (CPA) for the GIS mobile application project. The project included an update to the existing GIS Needs Assessment and required the consultant to provide recommendations on hardware and software for a mobile application. It was originally envisioned, prior to the start of the project, that Internet enabled hardware such as laptops would be used and the project costs for hardware and software were based on this assumption.

The original approval amounts are as follows:

Capital Project Authorization (CPA)		Amount
	Payroll (Includes application training & testing)	\$70,000
	Professional Services (Wendel Duchscherer)	\$101,880
	Equipment Purchases (hardware / software)	\$90,000
	Misc. Costs (includes purchase of additional licensing)	\$20,000
	Contingency	\$27,120
Total Project Cost		\$309,000

Technology is constantly changing and becoming less expensive and as such, Wendel provided various options and costs for field hardware including larger units like Toughbooks and laptops as well as handheld devices such as tablets and smart phones. The Operations department evaluated the benefits of switching their cell phone technology for all operational personnel from basic "phone call" capabilities to Android-based smart phones that also provide email, Internet access, the ability to run applications such as web-based mapping and much more. It was determined that upgrading to Android based smart phones provided, among other benefits, added value to the GIS mobile project and a platform for future

applications accessible at any time from the field. 25 new phones were purchased in March for \$6,250. This amount was allocated to the GIS mobile project.

In order to deploy web-based mapping to both Android devices and other non-Android internet enabled hardware such as laptops, two individual ArcGIS Server web mapping sites need to be developed – one on an Android platform for the smart phones and one on a Microsoft Silverlight platform for the laptops. In order to support certain field applications that require a higher level of computing power, the Microsoft Silverlight platform is necessary. The original PSA with Wendel only included the development and deployment of a single ArcGIS site.

Wendel has provided us with a Change Order for the additional work to complete the second (MS Silverlight) site. The appearance and functionality of both sites will be identical and some economies of scale are accounted for in the proposal including the site layout, creation of data layers necessary to enable access to existing scanned documents and server and database configuration. The Silverlight site will also be accessible to all LCA employees and will replace the existing .NET GIS Intranet site. This site would have needed to be replaced within the next year as the .NET technology has become outdated and does not function with newer versions of the ArcGIS software (versions 10.1 and higher) and so, in essence, the MS Silverlight site development is simply being accelerated.

Originally \$90,000 was allocated for the purchase of hardware; however adding the Android smart phones has allowed us to delete the purchase of some other more expensive hardware resulting in a net cost reduction which offsets the cost of the Wendel change order. As such, we will not need to amend the original CPA amount.

CHANGE ORDER:

Manhour & Cost Breakdown:

	Wendel Staff Hours				Costs
	Project Manager	GIS Developer	GIS Analyst	Principal in Charge	
Task 1: ArcGIS Development	10	90	25	1	\$15,800
Task 2: Web Map Training	4	4	0	0	\$2,500
Totals	14	94	25	1	\$18,300

PROJECT SCHEDULE:

Wendel Duchscherer has completed the development of the initial, Android-based web map. The Silverlight site will take 8 weeks for development and deployment with another 8 weeks for testing, revisions and staff training. The entire GIS mobile project, as originally approved, is anticipated to be completed by the end of September 2012.

FUTURE AUTHORIZATIONS:

A second phase which includes the scanning and conversion of all Capital Works construction plan files is slated to start later this summer, pending Board approval.



Lehigh County Authority

1063 Spruce Street * P.O. Box 3348 * Allentown, PA 18106-0348
(610)398-2603 * FAX (610)398-8413

PROFESSIONAL SERVICES AUTHORIZATION

Amendment No. 1

Professional: Wendel Duchscherer
1140 John James
Audubon Parkway
Suite 201
Amherst, NY 14228

Date: June 4, 2012

Requested By: Emily Gerber

Approvals
Department Head
General Manager

Description of Services (Work Scope, Steps, Check Points, etc.)

Wendel Duchscherer (Wendel) will provide GIS application development services to create and implement an ArcGIS Server Silverlight web map that will run in conjunction with the previously created mobile Android mapping application. This site will also replace the existing internal ArcGIS Intranet site used by non-field personnel. The following task breakdown shows the project tasks as outlined in the Change Order.

Task / Proposal Item	Description	Manhours	Cost
Task 1	ArcGIS Server Web Map Development (Silverlight)	126	\$15,800
Task 2	Web Map Training	8	\$2,500
		134	\$18,300

Please reference the attached Change Order (Proposal #2) for additional details.

Previous Authorization Limit: \$101,808

Addition with this Amendment No. 1: 18,300

New Authorization Limit: \$120,108

Cost Estimate (not to be exceeded without further authorization): \$120,108

Time Table and Completion Deadline: The Silverlight map development will begin immediately and will take between eight and sixteen weeks for full development, deployment, testing and training to occur. This application shall be completed no later than September 15, 2012. The completion of this Change Order will coincide with the completion of the other tasks included in the Mobile GIS Application Development project.

(For Authority Use Only)

Authorization Completion:

Approval: _____ **Actual Cost:** _____ **Date:** _____



May 3, 2011

Mrs. Emily F. Gerber
Lehigh County Authority
1053 Spruce Street
Allentown, PA 18106

**SUBJECT: CHANGE ORDER PROPOSAL #2
LEHIGH COUNTY AUTHORITY MOBILE GIS IMPLEMENTATION
WDPN: 451201**

Dear Mrs. Gerber:

The Lehigh County Authority Mobile GIS Implementation project is seeking the development of an ArcGIS Server Silverlight Web Map site to run in conjunction with the Android application currently being developed for the project. The following change order for the LCA Mobile GIS project outlines the scope and fee needed to complete the additional work.

BACKGROUND

The Lehigh County Authority Mobile GIS Implementation project will provide LCA staff with water and wastewater GIS information through a mobile Android device. Paper curb box maps are being electronically scanned into a Tiff format so they may be accessible through the mobile GIS application. In order for LCA staff to access the scanned maps through a non-Android device an ArcGIS Server Silverlight Web Map site will need to be developed.

SCOPE OF WORK

TASK 1: ArcGIS Server Web Map Development

Wendel will develop, install and implement an ArcGIS Server Silverlight Web Map site which will allow LCA staff to view existing water and wastewater GIS layers and link to the scanned curb box maps. The password protected Web Map site will reside on LCA's GIS server utilizing the existing water and wastewater GIS layers. The Web Map will be accessible from any computer capable of running Microsoft Silverlight and an internet connection. Wendel will also develop orthoimagery and map baselayer caches to optimize the performance of the web map site. The following base functionality will be included into the LCA Web Map site.

Login and Password Security - In order to improve the accessibility and flexibility of the Web Map site, Wendel will add login and password security to the site. This will allow for LCA staff to securely access the GIS site from any computer with an internet connection. This will also provide the option for field deployment of the Web Map site for staff use.

Zoom to Municipality - A zoom to municipality tool will be added to the ArcGIS Server web map site. It will provide users with a dropdown of predetermined Towns, Villages, or areas of interest which can be selected by the user. Upon selection the map will automatically zoom and center on the selected area.

Google Street View Tool - This tool will provide users of the web map site with the ability to select a specific street location for viewing Google's Street View Imagery where available. The Google Street View Imagery will open in a separate window allowing the user to navigate and view the Imagery separate from the GIS site.

Microsoft Bing Tool - The Bing tool will provide users the ability to view oblique Imagery of the location that was selected on the web map. A new window will automatically open up with the oblique Imagery for the location selected. When the user has completed browsing the oblique Imagery, they can close the window and return to the GIS web map site.

Print Map Tool - The print map tool will allow users to print the existing map view of the Web Map screen in a formatted 8 1/2" x 11" or 11" x 17" layout. The layout will include a map legend, north arrow and scale bar along with a custom title which the user will be able to modify. The map layout can also be rotated between landscape and portrait orientation.

Layer Theme Tool - The Layer Theme tool will allow users to quickly turn on and off specific layer themes such as Sewer, Utilities, and Water.

Mailing Label Tool - The mailing label tool will allow users to quickly create mailing labels for either self-defined selected parcels or for all parcels that fall within a defined buffer distance of a subject property. The user will be able to select a subject property and then enter a buffer distance to create the mailing labels for all properties that are within the buffer. The labels can either be inserted into an excel spreadsheet that can be saved on the users' local computer or can be formatted into a printable mailing label sheet.

Wendel will also add a self-defining selection tool to create mailing notifications. This tool will allow users to draw a polygon on the map and any properties within the polygon will be added to the mailing label list. The user will have the option to export to excel or a printable mailing label format.

Redline Tool - The Redline Tool provides users with the ability to create a redline drawing on the Web Map application. Once the redline drawing is complete the user can export the image to PDF for saving or sharing through email.

Curb Box Map Tool - This tool will allow users to select individual meters to open the related scanned curb box map. Users will be able to view curb box location distances from the scanned map to help locate the curb boxes.

Search Tool - This tool allows LCA staff to search for a property using all or any of the following criteria: Customer Account Number, Billing Address, Street Address, Owner Name, PIN or Street. The criteria can be entered as substring or part of the entry. If multiple properties match the given search criteria, they will be displayed in a tabular format with additional information for the user to choose.



TASK 2: Web Map Training

Wendel will provide a training session for LCA staff on the use of the ArcGIS Server web map site and its functionality. The session will provide staff specific training on how to navigate through the variety of GIS layers and access a particular layers information. The 1-2 hour training session will be held in a classroom setting and participants will receive an easy to follow user manual.

Wendel will also conduct a 1-2 hour training session with the GIS system administrator to review the operation and maintenance of the new GIS web map. Wendel will provide a detailed summary of the system accounts, installation locations and applicable network settings. The training session will also review the shutdown and restart process for the ArcGIS Server software.

OWNERS OBLIGATIONS

Lehigh County Authority shall provide the following information or services for performance of the work. Wendel assumes no responsibility for the accuracy of such information or services and shall not be liable for errors or omissions therein. Should Wendel be required to provide services in obtaining or coordinating of this information, such services shall be charged as additional services as defined herein.

- A. LCA will provide Wendel with VPN access to the GIS server for application development and implementation purposes.
- B. Access to ArcGIS Desktop software (ArcEditor or ArcInfo) to configure GIS services on LCA's GIS server.

FEES AND TERMS

Wendel will prepare a project schedule to begin work within 2 weeks of authorization to proceed. We will require approximately 8 to 16 weeks to complete the above proposed scope of work. Wendel will prepare an updated Schedule of Deliverables once authorized and provide the services described above according to the following Fee Schedule:

TASK 1: ArcGIS Server Web Map Development	\$ 15,800	(Lump Sum)
TASK 2: Web Map Training	\$ 2,500	(Lump Sum)
TOTAL FEE	\$ 18,300	

Lehigh County Authority
LCA Mobile GIS Implementation
May 3, 2012
Page 4



If you have any questions or require any additional information regarding this proposal, please contact us at (716) 688-0766.

Sincerely,

WENDEL

A handwritten signature in dark ink, appearing to read "Andrew L. Casolini Dal Bo".

Andrew L. Casolini Dal Bo, PE
Principal-In-Charge

A handwritten signature in dark ink, appearing to read "Jacob T. Needle".

Jacob T. Needle, GISP
Project Manager

ACCEPTANCE/AUTHORIZATION

Lehigh County Authority

Accepted this _____ day of _____, 2012

Print Name: _____

Signature: _____

Title: _____

**Lehigh County Authority**

1053 Spruce Street * P.O. Box 3348 * Allentown, PA 18106-0348
(610)398-2503 * FAX (610)398-8413 * Email: service@lehighcountyauthority.org

MEMORANDUM

Date: May 12, 2012

To: Board of Directors & Management Staff
From: Pat Mandes
Re: WLI Physical Condition Assessment

Approvals Requested

Approvals Requested	Brief Description	Amount
Professional Services Authorization (1)	Consulting Services Malcolm Pirnie	\$99,000

Background:

The Physical Condition Assessment (PCA) Program began in 2004. The purpose of the Program is to inspect the WLI pipe and assess the extent of the defects in order to reduce infiltration and extend the life of the pipe. The Program consists of in-pipe CCTV inspection of the pipe utilizing Pipeline Assessment Certification Program (PACP) ratings and a review of the inspection records by Malcolm Pirnie. The findings are presented along with any recommended follow-up actions.

To date, approximately 120,000 linear feet (LF) of the inspection of the WLI has been authorized out of the 140,000 LF total. A map of the WLI is attached showing the history of the PCA Program. As a result of the assessment several projects were recommended. Rehabilitation by cured-in-place structural lining of 4,258 LF of pipe and seven point repairs was completed in 2008 as a result of the findings. Another 18,000 LF of 36" reinforced concrete pipe where internal corrosion will threaten the structural integrity of the pipe in the future is planned for lining in 2013.

In 2011 and early 2012, the Board approved PCAs for 45,000 LF of the WLI. The LCA staff provided the in-pipe CCTV inspection and has completed the CCTV work. Malcolm Pirnie is providing the assessment and follow-up.

Engineering Consulting Services:

A Professional Services Authorization is attached for Malcolm Pirnie in the amount of \$99,000 for the assessment of 20,000 LF of the LLRI from Keck's Bridge to Park Pump Station. This is the last section of the WLI to be assessed. Malcolm Pirnie is providing the CCTV inspections for this section of the WLI which includes 42 and 48 inch pipe. Malcolm Pirnie will also provide the evaluation of the LLRI consisting of the rating, assessment, and recommended follow-up actions.

Although it has been cost effective for LCA to perform the CCTV work, it is not recommended for the LLRI. This job requires considerable experience with CCTV work of large pipe with high flows. The LCA staff required to perform the CCTV work in the LLRI is expected to include 5 to 6 operators due to easement access issues, significant flow in the interceptor, plugging the interconnections between the

Allentown Emmaus Interceptor and the LLRI, bypassing pumping, operating the Park Pump Station and watching the interceptor for overflows. The LCA staff also has other staffing commitments and does not have the time available to perform the CCTV on the LLRI. LCA staffing commitments include CCTV and sewer cleaning obligations for the LCA Signatories, Washington Township, Lynn Township, CCTV work required for areas identified by Malcolm Pirnie as high leakage areas, and the easement clearing and grubbing preparatory work necessary for the CCTV work.



Lehigh County Authority

1053 Spruce Street * P.O. Box 3348 * Allentown, PA 18106-0348
(610)398-2503 * FAX (610)398-8413

PROFESSIONAL SERVICES AUTHORIZATION

AMENDMENT NUMBER 2

Professional:

Malcolm Pirnie, Inc.
Jim Shelton
824 Market St., Suite 820
Wilmington, DE

Date: 5/14/12

Requested By: Pat Mandes

Approvals

Department Head:

General Manager:

Description of Services (Work Scope, Steps, Check Points, etc.):

Western Lehigh Interceptor; Physical Condition Assessment

Provide a physical condition assessment and report for 20,000 LF of Interceptor on the Little Lehigh Relief Interceptor (LLRI) from Keck's bridge to Park Pump Station.

An assessment report shall include records of in-pipe video inspection provided by Video Pipe Services, a subcontractor of Malcolm Pirnie, a rating of each pipe segment in accordance with industry standards and recommended follow-up activities. Work shall be accomplished in accordance with the attached scope of work and budget estimate dated May 3, 2012.

This is a continuation of the assessment of the Western Lehigh Interceptor that began in 2004. A map showing the areas of the WLI where the physical condition assessment has been completed is attached.

Cost Estimate (not to be exceeded without further authorization): Not to exceed \$99,000. The \$99,000 includes an allowance of \$25,000 for heavy cleaning and bypass pumping of the LLRI if necessary. The Authority's WLI budget for 2012 includes \$157,000 for the 2012 PCA work. After previous authorizations, \$84,500 remains in the 2012 budget for this work. If the \$25,000 allowance is necessary for the bypass pumping and cleaning, the engineering work for the LLRI PCA by Malcolm Pirnie will be delayed until 2013 so as not to exceed the 2012 budget.

Time Table and Completion Deadline:

It is anticipated that this work will be completed by the end of 2012.

(For Authority Use Only)

Authorization Completion:

Approval: _____ **Actual Cost:** _____ **Date:** _____



Ms. Pat Mandes
Wastewater Services Director
Lehigh County Authority
P.O. Box 3348
Allentown, PA 18106

ARCADIS U.S., Inc.
640 Freedom Business Center
Suite 310
King of Prussia
Pennsylvania 19406
Tel 610.768.5813
Fax 610.768.5817
www.arcadis-us.com

Subject:

Physical Condition Assessment – Little Lehigh Relief Interceptor 2012

Dear Ms. Mandes:

In accordance with a request by Lehigh County Authority (LCA), Malcolm Pirnie, the Water Division of ARCADIS, is pleased to provide you with this scope and budget for a physical condition assessment (PCA) on the Little Lehigh Relief Interceptor. In accordance with the ongoing inspection program, we propose to inspect, rate, assess, and recommend follow-up actions, if required, for the following section:

MH A-16 to MH B-1 (Park Pump Station) – 20,040 LF

SCOPE OF WORK

The work will progress from an upstream to downstream direction starting at the upstream manhole for the inspection area referenced above.

The pipes will be televised using a subcontractor. Although we anticipate that much of the inspection can be performed with plugging of lines and utilizing the FEB, Spring Creek Pump Station and Park Pump Station to manage flows to an acceptable level for inspection, we have included a budget for 5 days of bypass pumping to facilitate inspections.

Consistent with our previous assessment methods from 2004 through 2006, the pipes will not be cleaned as part of this effort, unless necessary to pass a camera through the line. We have budgeted for 10 days of heavy cleaning should we encounter root masses or other debris that preclude the passage of the camera through the pipe.

LCA will provide as-needed assistance for locating manholes. It is assumed that LCA will provide the CCTV subcontractor with a source of water for cleaning free of charge and a dump site for any removed debris.

LCA will provide any necessary permits, including PENNDOT permits.

Date:

May 3, 2012

Contact:

Tony Dill

Phone:

484.688.0380

Email:

Anthony.Dill@arcadis-us.com

Our ref:

0247

Malcolm Pirnie will review the inspection records and prepare a PCA figure showing the findings and any recommended follow-up actions regarding cleaning and rehabilitation.

Malcolm Pirnie will conduct a meeting at LCA to review the findings with LCA staff.

As an optional service, Malcolm Pirnie will provide full-time oversight of the CCTV subcontractor to assist with coordination of flow control, private property access and compliance with CCTV specifications.

BUDGET ESTIMATE

We estimate that the cost of these services will be \$118,000 as indicated below:

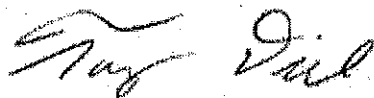
LLRI CCTV Inspection	\$72,000
LLRI Condition Assessment	\$27,000
LLRI CCTV Oversight – Optional	\$19,000
Total	<u>\$118,000</u>

The actual costs may vary from this estimate based on the actual length of pipe inspected and extent of cleaning and bypass pumping required to complete the CCTV inspection. We propose to complete these services on a time and materials basis in accordance with the Agreement between LCA and Malcolm Pirnie, Inc., dated June 17, 1997, and the current Summary of Standard Charges for Lehigh County Authority. We will not exceed this budget without prior authorization from LCA. Payment for services will be based upon the actual labor and expenses incurred.

Please contact me with your authorization to proceed if this scope and budget are acceptable to you. If you have any questions please do not hesitate to call me at 484-688-0380 or 610-761-3253 (mobile).

Sincerely,

ARCADIS U.S., Inc.



Tony Dill, PE, BCEE
Program Manager – Buried Infrastructure Team

C: Jim Shelton, Malcolm Pirnie
Craig Murray, Malcolm Pirnie