

## LEHIGH COUNTY AUTHORITY

August 27, 2012

### BOARD MEETING AGENDA

1. Call to Order
2. Review of Agenda
  - *Public Participation Sign-In Request*
3. Executive Sessions
4. Approval of Minutes
  - *July 23, 2012 Regular Meeting Minutes*
  - *August 13, 2012 Workshop Meeting Minutes*
5. Public Comments
6. Action / Discussion Items

#### **FINANCE AND ADMINISTRATION**

- *Water Capital Recovery Fees – Resolution 8-2012-1 (Approval)*

#### **WATER**

- *None*

#### **WASTEWATER**

- *LCA Wastewater Capacity Program – Act 537 Facilities Planning (Approval)*
  - *LCA WTP – Digester Mixer Replacement (Approval)*
  - *Rehabilitation Effectiveness Evaluation (Approval)*
7. System Operations Overview
  8. Staff Comments
  9. Solicitor's Comments
  10. Other Comments
  11. Adjournment

#### **SEPTMEBER MEETINGS**

Workshop Meeting  
Board Meeting

September 10 – 12:00 p.m.  
September 24 – 12:00 p.m.

#### **PUBLIC PARTICIPATION POLICY**

In accordance with Authority policy, members of the public shall record their name, address, and discussion item on the sign-in sheet at the start of each meeting; this information shall also be stated when addressing the meeting. Members of the public will be allowed 5 minutes to make comments/ask questions regarding non-agenda items, but time may be extended at the discretion of the Chair; comments/questions regarding agenda items may be addressed after the presentation of the agenda item. Members of the public may not request that specific items or language be included in the meeting minutes.

## FINANCE & ADMINISTRATION

### ACTION ITEMS

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1. **Water Capital Recovery Fees – Resolution 8-2012-1 (Approval)**

Attached are calculations for the Authority's Water Tapping fees (**blue**). The current charges for the Central Lehigh, North Whitehall, Washington Township and small systems were last changed in April 2006. The shaded areas compare the current charge to the new proposed charge. Resolution 8-2012-1 establishes the various components of the Authority Capital Recovery Fees.

### DISCUSSION ITEMS

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1. ***None.***

### INFORMATION ITEMS

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1. **Knowledge Sharing Skills Development**

This project will kick off the week of August 20, with GHD consultants on-site for 3 days to conduct interviews and planning sessions with the internal knowledge management (KM) team. The outcome of the first meeting is intended to be a preliminary project plan, which will be finalized after GHD's second visit in September. The second visit will focus on identifying key elements and participants in the mentoring and coaching program. After the project plan is finalized, all employees will then be engaged to begin the knowledge sharing work.

2. **Recently Purchased Investments – Certificates of Deposit (CDs)**

Fund	Bank	Location	Gross Amount	Date of Purchase	Date Due	Net Rate %
WDSR	Ally Bank	Midvale, Ut	99,000.00	8/22/12	8/22/14	0.85
WW Capac	Customers Bank	Phoenixville, Pa	240,000.00	8/22/12	2/22/13	0.45

Fund Descriptions for Investments:

WDSR	Water Debt Service Reserve
WW Capac	Wastewater Capacity

## WATER

### **ACTION ITEMS**

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1. ***None.***

### **DISCUSSION ITEMS**

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1. ***None.***

### **INFORMATION ITEMS**

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1. ***Interconnection with Allentown***

*Phase 2 - Connection to City Transmission System at 26<sup>th</sup> and Chew Streets* – The final piece of 24” pipe interconnecting the City and LCA systems was laid on August 15. We expect testing and disinfection to be completed by August 31. Restoration work is ongoing.

*DRBC:* - On August 3 we submitted a plan to DRBC outlining how we intend to calculate the volume of surface water LCA receives via the interconnection and the volume that is subject to DRBC surface water charges. DRBC is currently reviewing the submittal.

2. ***Water Main Replacement Project – Oakland Park (UMT)***

A pre-bid meeting was held on August 14. The bid opening date is August 30. We anticipate requesting Construction Phase approval (which includes the construction contract award) at the September 2012 Workshop meeting. Construction would begin as early as the last week of September. We expect to have all water main replacement work completed by December 31, though final restoration will not occur until May 2013.

3. ***Water Main Relocation Project – Slatedale***

Our water facilities on West Grant Street were successfully relocated in June of 2011. Work on Main Street was completed in May 2012. Staff is assembling costs for presentation to PaDOT in consideration of the cost sharing agreement. Our exposure, by PaDOT Agreement, is about \$25,000.

4. ***Water Meter Replacement Project***

*Phase 2* - TSE, Inc. has replaced 3,848 out of 3,868 aging meters, radio-read units and backflow preventers through July 11. There were 15 accounts removed from the project where the water has been turned off. This leaves 5 accounts where meters must be upgraded. TSE is also addressing accounts that were identified as incomplete and/or had deficiencies identified in our quality control checks. Substantial completion was issued on June 9, 2012.

5. ***Arcadia West Pumping Station Modifications***

We returned comments on the contract plans and technical specifications for the pumping station improvements that T&M Associates had submitted. A meeting is scheduled for August 24 to review equipment layout and permitting issues with T&M.

6. ***Route 309 Crossing @ Sand Spring Road (formerly @ Education Park Drive)***

Review comments have been received from PaDOT and have been addressed.

7. **Sand Spring Road Waterline Relocation**

Review comments have been received from PaDOT and have been addressed. Staff is preparing documentation for easements acquisitions necessary for the relocation.

8. **Upper Milford Central Division Radon Mitigation Study**

Board authorized this project in June and our consultant (Cowan Associates) is currently evaluating the existing wells in Buss Acres. Final report for this project is expected by the end of the year.

9. **Lehigh County Authority Facilities Emergency Power Capabilities Project**

Board authorized this project in May and our consultant (Hanover Engineering) is currently surveying and preparing all necessary documents for the placement of emergency standby power at each of the 12 satellite facilities in the project. Hanover Engineering has provided a 30% Preliminary Report which is currently being reviewed. Final design and bidding documents for this project is expected by the end of November 2012.

10. **Developments**

Water system construction is occurring at the following developments:

Trexler Fields, Phases 2, 3, 4 & 5 (Partial), 35 residential lots (sfa & sfd), UMT  
Valley West Estates, Phases 4, 5 & 6, 46 residential lots (sfd), UMT (*There has not been any construction activity at this development in over two years.*)

Water system plans are being reviewed for the following developments:

Above & Beyond (personal care facility), 2 commercial lots, UMT  
Diocesan Pastoral Center, 2 commercial lots, 3 additional lots, & residual lot for existing cemetery, LMT  
Grant Street Townes, 18 sfa residential lots, WashT  
Hamilton Crossings, 2 commercial lots with 20 buildings having retail, financial, convenience and restaurant uses, LMT  
Hickory Park Estates, 3 residential lots (sfd), UMT  
Highgate, Phase 3 (Dunbar Tract), 63 sfa & 22 sfd residential lots, UMT  
Hillview Farms, 31 residential lots (sfd), LMT/SWT  
Indian Creek Industrial Park, 6 commercial lots, UMiIT, water and sewer  
Lehigh Hills, 247 residential lots (sfa/sfd), UMT  
Morgan Hills, 40 residential lots (sfd), Water & Sewer, WeisT  
North Whitehall Commercial Center (Walmart), 5 commercial lots, NWT, water & sewer  
Parkland Fields (formerly Rabenold Farms I), 205 residential lots (sfd), (Portion south of I-78), UMT  
Rabenold Farms II, 288 apartment units and clubhouse, (Portion north of I-78), UMT  
Route 100 Bypass & Cetronia Road Proposed Commercial Development, 1 commercial lot with 4 buildings having auto, convenience, financial and day care uses, UMT  
Shepherd's Corner, 1 commercial lot, LMT  
Spring Creek Properties Subdivision 1, 14 commercial and industrial lots, LMT  
Trexler Business Center, Lot 1, 1 commercial building, LMT  
Trexler Senior Living Center, 2 commercial lots, LMT (*In bankruptcy*)  
Weilers Road Twins, 82 residential lots (sfa), UMT  
West Hills Business Center, 8 industrial lots, WeisT  
Woodmere Estates, 60 residential units (sfd), UMT

## WASTEWATER

### ACTION ITEMS

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1. **LCA Wastewater Capacity Program – Act 537 Facilities Planning** (Approval)

LCA and the City have agreed to the development of a common, regional Plan to encompass both LCA's and the City's wastewater service areas for the purpose of adding 4 mgd of wastewater capacity for LCA use. LCA and the City are currently negotiating with ARRO Consulting to prepare the Plan and expect to have the final cost and scope of work prior to the Board Meeting. A description of the consultant selection process will be provided to the Board via memorandum.

Both LCA and the City have agreed to utilize our own wastewater consultants to represent our individual interests related to the Study. Therefore, Malcolm Pirnie has been asked for a scope and budget for on-call assistance related to the 537 Plan. There will be times when we need to bring Malcolm Pirnie in for review of reports and will also need Malcolm Pirnie for providing background information to ARRO so that previously completed work is not duplicated. All modeling work associated with analyzing the conveyance capacity and costs related to capacity increases necessary for the additional 4 mgd will be performed by the City and LCA wastewater consultants. The Malcolm Pirnie proposal includes costs for modeling the LCA system as directed by ARRO as part of the study. LCA is currently finalizing the scope and budget with Malcolm Pirnie for this 537 Planning Assistance and modeling.

A Memorandum to the Board, Capital Project Authorization, and Professional Services Authorizations will be provided under separate cover prior to the Board Meeting. If the final proposal and cost are not ready, the request for Board approval will be delayed until October.

2. **LCA WTP- Digester Mixer Replacement** (Approval)

Procurement of six 24-inch diameter digester mixers was awarded to Olympus Technologies at the April Board meeting. The construction (installation) contracts were advertised on July 25, 2012 and bids were received on Monday, August 20, 2012. The Installation of the mixers is expected to take 280 days from the date of the Notice to Proceed. Board approval of CPA & PSA Amendments and contract awards will be requested at the August 27, 2012 Board meeting. The applicable documentation will be mailed under separate cover or distributed at the Board meeting.

3. **Rehabilitation Effectiveness Evaluation** (Approval)

This task is for Malcolm Pirnie to determine the reduction in peak flows obtained as a result of the pipe lining projects scheduled for late 2012. Malcolm Pirnie will provide an evaluation of the pre- and post-flow monitoring to determine the effectiveness of the rehabilitation by measuring the amount of I & I eliminated from the system. The evaluation will determine the allocation flow credits attributable to the rehabilitation. The allocation flow credits will be added to the existing allocation flow credit pool for allowing new users to connect to the LCA conveyance system as part of the SCARP program. The Professional Services Authorization, Capital Project Authorization, memo to the Board, and Malcolm Pirnie scope of work dated May 4, 2012 are attached (*pink*).

### DISCUSSION ITEMS

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1. **None.**

**INFORMATION ITEMS**

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**1. Vera Cruz Area Sewer Project**

Construction was complete in June. To date, PACT has earned \$2,156,341.02 of the initial \$2,332,090.00 contract amount. As of the end of July, 208 properties, out of 271 to be served, have connected.

The Project Team and PACT have met to discuss closeout documents for the project. PACT is claiming charges for additional work that could exceed \$528,000. However, they have not substantiated their claims in the change order requests filed to date. Staff has directed them to complete the requests and submit with appropriate justification and documented costs. The largest item on their list is the cost of final pavement restoration in PaDOT right of way. Once complete, Change Orders will require Board action for approval.

**2. Infiltration and Inflow (I&I) Program Update**

Several meetings were held with the SCARP Partners to identify potential projects for 2012 that will provide an immediate reduction in the peak wet weather flows. The Partners were in agreement to initiate these “low hanging fruit” projects that may require LCA capital funding but have not committed to the projects at this point. A Partner meeting is scheduled for August to make a final determination on the 2012 work.

Areas have been identified as needing CCTV work to determine the extent of the leakage and for determining the basis of rehabilitation. The total footage includes over 57,000 LF of pipe and is located in Upper Macungie Township and Lower Macungie Township with a few segments in Macungie Borough. The CCTV work is expected to be completed in 2012.

The WLI Physical Condition Assessment of the Alburdis/Macungie Branch has been completed. The results and report were presented to LCA in May 22. Malcolm Pirnie is currently reviewing that CCTV work completed on three other areas of the WLI and will provide the report later this year. LCA will decide on the method and schedule for rehabilitation of the areas identified through the PCA when the final reports are presented. The LLRI CCTV work by an outside contractor is 95% complete. Initial reports by the CCTV crew indicate that the pipe is in good condition. All four siphons were packed with grease and needed to be cleaned by the contractor.

**3. Wastewater Treatment Capacity**

LCA has not yet received the executed Memo of Understanding regarding working together on a joint Act 537 Plan from the City. It is my understanding that the document is in the City’s Solicitor’s office. The City representatives participated in the recommendation of the consultant despite not having an executed MOU. The scope of work and cost of the 537 planning are being finalized and will be presented to the Board for approval.

Whole Effluent Toxicity Testing was completed in July on the LCA WTP effluent to determine if there are any toxicity issues related to the plants effluent that could limit the plants ability to discharge directly into the Jordan Creek or Lehigh River. It will take several months to receive the report from the laboratory.

Talks with Coplay-Whitehall Sewer Authority and Salisbury Townships may result in the sale and/or lease of allocation. An offer was presented to Salisbury for consideration several months ago and LCA received a counter offer from the Manager from Salisbury. LCA has responded to the counter-offer and is awaiting a response.

4. **Northern Lehigh Wastewater System**

The project is proceeding in a number of areas:

Wastewater Treatment Plant (on a 5 acre tract at Kids Peace)

In March, LCA representatives met with NWT Supervisor, Steve Panny; Solicitor, Lisa Young; and Township Manager, Jeff Bartlett to discuss the Act 537 Plan. In summary, for the westside of Rt. 309 (the 1-5 year service area) LCA has agreed to limit the size of the WTP to 200,000 GPD which in essence reflects the need for this area. Any expansion beyond 200,000 GPD would require NWT approval). For the eastside of Rt. 309, LCA has agreed to work with NWT in developing a solution for the wastewater treatment needs for this area, which may include one (or more) WTP(s) that discharge to the Coplay Creek. NWT wills the lead on this effort, with LCA providing support and expertise. After which NWT would amend the Act 537 Plan.

On April 2, 2012 LCA submitted a Conditional Use application which was accepted by NWT. The Planning Commission at their May 22, 2012 meeting recommended the Conditional Use to the Board of Supervisors. The Conditional Use hearing in front of the Board of Supervisors started at the June 4, 2012 meeting was continued to June 12, July 2, July 17, August 6, 2012 and August 21, 2012. LCA has presented its side of the case. The Opposition has completed their expert testimony and will continue presenting their case at the August 6<sup>th</sup> meeting. We expect that the August 21<sup>st</sup> meeting will conclude the hearing, after which the North Whitehall Board of Supervisor will render their decision.

The total cost of the WTP including soft costs and Kids-Peace acquisition costs is estimated at \$4.69 million. We are currently evaluating various Wastewater Treatment Plant options to identify cost savings.

Offsite Conveyance Facilities (OSCF)

- a) Wal-Mart has stopped design of the necessary conveyance facilities, which includes gravity sewers, a pump station and force main to deliver the wastewater from their proposed development and other future wastewater customers to the wastewater treatment facilities until a cost sharing agreement is reached with LCA. Wal-Mart has proposed that LCA assume the responsibility of designing, permitting and constructing the OSCF, which is a change from the previous plan where Wal-Mart had the responsibility. Ongoing cost-sharing negotiations are still on hold while Wal-Mart internally reevaluates the proposed store's financial viability.

The construction cost of the conveyance facilities is estimated at \$1.354 million.

Kids Peace Agreement

- a) An amendment to the agreement with KidsPeace is being negotiated to reflect the changed circumstances since the original agreement was signed in 2006.

5. **Park Pump Station Improvements**

Fuel Tank Replacement – Staff has received and is reviewing the plans for replacement of the fuel tank at the Park Pump Station. We are in the process of acquiring additional easement area from the COA for the tank. The project is anticipated to go to bid in late 2012.

6. **LCA WTP- Truck Waste Receiving Station**

Truck Waste Receiving Station (TWRS): The project design is underway.

The current schedule anticipates completion of the TWRS in the second quarter of 2013.

7. **Arcadia West WWTP Improvements**

The three apparent low bidders have submitted the necessary signed agreements, bonds, and insurances, which are under review.

At their July 18 meeting PENNVEST declined to increase the loan amount by \$317,465 to \$3,248,635, to cover the increases in construction contract values since the time of the funding application. Loan settlement has been delayed while we explore avenues of funding the shortfall.

8. **Wynnewood Terrace Pump Station Replacement**

Staff has initiated Requests for Proposals to engineering consulting firms for the replacement of the primary pumping station along Wynnewood Drive in Wynnewood Terrace, North Whitehall Township. Proposals will include design, permitting and all regulatory approvals necessary for the construction to be placed to bid.

Also included with the proposal, will be an evaluation of the existing concrete tanks at the Wastewater Treatment Plant, for flow equalization and/or sludge holding uses. We anticipate requesting approval for the Design Phase at the September 2012 Board Meeting.



# **RESOLUTION No. 8-2012-1**

(Duly adopted 13 August 2012)

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***A RESOLUTION ESTABLISHING THE VARIOUS COMPONENTS  
OF THE LEHIGH COUNTY AUTHORITY  
CAPITAL RECOVERY FEES FOR VARIOUS WATER SYSTEMS.***

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WHEREAS, Lehigh County Authority ("Authority") is a Pennsylvania municipal authority incorporated by the County of Lehigh in accordance with the Municipality Authorities Act to provide, among other services, water services; and

WHEREAS, the Authority owns and operates water systems throughout the Lehigh Valley of Pennsylvania; and

WHEREAS, the Authority charges certain rates and fees for use of and connection to its systems; and

WHEREAS, the Authority desires to establish its fees in accordance with §5607 of the Municipality Authorities Act, as amended by legislative action in December 2003, setting forth the appropriate fee components; and

WHEREAS, the Authority has calculated the allowable basis for such fees for certain of its water systems in accordance with the attached calculations and its Summary of Tapping, Connection and Customer Facilities Fees (Appendices A through K), the current version of which, as well as any future changes thereto, is made a part hereof as if included herein; and

NOW THEREFORE, the Lehigh County Authority, pursuant to powers invested in it by the Pennsylvania Municipality Authorities Act, as amended, hereby resolves that:

1. The capital recovery fees for water service in the Authority's various systems shown on Appendices A through D, with supporting calculations reflected on Appendices E through K, attached hereto and made a part hereof, are adopted effective 1 September 2012.

2. The Authority's and Water Schedules of Rates and Charges shall be amended to reflect the fees hereby adopted.

On motion of \_\_\_\_\_, seconded by \_\_\_\_\_, this Resolution was adopted the 13<sup>th</sup> day of August 2012.

**SUMMARY OF TAPPING FEES - WATER FUND**  
**WESTERN LEHIGH SERVICE AREA - CENTRAL LEHIGH DIVISION**  
**Effective 10/1/12**

**TAPPING FEES:**

Size of Service Pipe (inches)	DISTRIBUTION - PART 1 (B)			CAPACITY (C)			TOTAL	
	Existing Charge	Maximum Charge	New Charge	Existing Charge	Maximum Charge	New Charge	Existing Charge	New Charge
MFR (A)	\$ 1,000	\$ 1,323	\$ 1,150	\$ 290	\$ 343	\$ 340	\$ 1,290	\$ 1,490
3/4	1,480	2,338	1,880	435	606	605	1,915	2,485
1	2,360	3,740	3,000	780	1,091	1,085	3,140	4,085
1-1/2	3,470	5,494	4,350	1,740	2,924	2,420	5,210	6,770
2	5,100	8,066	6,350	3,080	4,303	4,280	8,380	10,630
3	8,320	13,151	10,190	6,960	9,696	9,675	15,289	19,865
4	11,580	18,295	13,940	12,350	17,210	17,165	23,930	31,105
6	17,350	27,413	20,050	27,840	38,784	38,695	45,490	58,745
8	23,420	36,999	26,000	49,500	68,963	68,805	72,920	97,805
10	28,930	45,708	30,700	77,340	107,746	107,500	106,270	138,200
12	35,075	55,411	35,600	111,360	155,136	154,790	146,435	190,390

**WESTERN LEHIGH SERVICE AREA - UPPER MILFORD CENTRAL DIVISION (BUSS ACRES)**

**Effective 10/1/12**

**TAPPING FEES:**

Size of Service Pipe (inches)	DISTRIBUTION - PART 1 (B)			CAPACITY (C)			TOTAL	
	Existing Charge	Maximum Charge	New Charge	Existing Charge	Maximum Charge	New Charge	Existing Charge	New Charge
MFR (A)	N/A	\$ 1,323	\$ 1,130	N/A	\$ 133	\$ 133	N/A	\$ 263
3/4	1,480	2,338	2,000	389	235	235	1,869	2,235

(A) MFR - Any multi-family residential structure, including a mobile home park, served through a common service pipe and individually metered.

MFR charges are applicable to each unit contained in a MFR structure. An MFR equates to 56.6% of a 3/4" connection.

(B) The ratio between line sizes are based on estimated costs of various distribution line sizes to supply different size service lines (See 1976 report).

(C) Charges are based on ratio of area of nominal pipe size with 3/4" as the base unit. Fees are applicable to all connections except where excluded by an agreement.

**SUMMARY OF TAPPING FEES - WATER FUND  
NORTHERN LEHIGH SERVICE AREA - NORTH WHITEHALL DIVISION  
Effective 10/1/12**

**TAPPING FEES:**

Size of Service Pipe (inches)	DISTRIBUTION - PART 1 (A)			CAPACITY (B)			TOTAL	
	Existing Charge	Maximum Charge	New Charge	Existing Charge	Maximum Charge	New Charge	Existing Charge	New Charge
MFR (C) \$	1,000	\$ 1,205	\$ 1,030	\$ 405	\$ 296	\$ 295	\$ 1,405	\$ 1,325
3/4	1,480	2,338	2,000	610	575	575	2,090	2,575
1	2,360	3,740	3,200	1,090	1,035	1,035	3,450	4,235
1 1/2	3,470	5,494	4,700	2,440	2,300	2,300	5,910	7,000
2	5,100	8,066	6,900	4,330	4,080	4,080	9,430	10,980
3	8,320	13,151	11,250	9,760	9,200	9,200	18,080	20,450
4	11,580	18,295	15,650	17,320	16,330	16,330	28,900	31,980
6	17,350	27,413	23,450	39,040	36,800	36,800	56,390	60,250
8	23,420	36,999	31,650	69,410	65,435	65,435	92,830	97,085
10	28,930	45,708	39,100	108,450	102,235	102,235	137,380	141,335
12	35,075	55,411	47,400	N/A	147,200	147,200	N/A	194,600

**NORTHERN LEHIGH SERVICE AREA - WASHINGTON TOWNSHIP DIVISION  
Effective 10/1/12**

**TAPPING FEES:**

Size of Service Pipe (inches)	DISTRIBUTION - PART 1 (A)			CAPACITY (B)			TOTAL	
	Existing Charge	Maximum Charge	New Charge	Existing Charge	Maximum Charge	New Charge	Existing Charge	New Charge
MFR (C) \$	1,000	\$ 1,000	\$ 855	\$ 395	\$ 713	\$ 430	\$ 1,395	\$ 1,285
3/4	1,480	2,338	1,550	485	1,670	1,000	1,965	2,550
1	2,360	3,740	2,400	870	3,010	1,800	3,230	4,200
1 1/2	3,470	5,494	3,470	1,940	6,680	4,000	5,410	7,470
2	5,100	8,066	5,100	3,440	11,860	7,100	8,540	12,200
3	8,320	13,151	8,320	7,760	26,720	16,000	16,080	24,320
4	11,580	18,295	11,580	13,770	47,430	28,400	25,350	39,980
6	17,350	27,413	17,350	31,040	106,880	64,000	48,390	81,350
8	23,420	36,999	23,420	55,190	190,050	113,800	78,610	137,220
10	28,930	45,708	28,930	86,230	296,930	177,800	115,160	206,730
12	35,075	55,411	35,075	124,160	427,520	256,000	159,235	291,075

(A) Fees are applicable except in situations excluded by an agreement or when a distribution system is contributed to LCA.

(B) Fees are applicable to all connections except where excluded by an agreement.

(C) A Multi-family residential structure.

**SUMMARY OF TAPPING FEES - WATER FUND**  
**NORTHERN LEHIGH SERVICE AREA - HEIDELBERG HEIGHTS DIVISION**  
**Effective 10/1/12**

**TAPPING FEES:**

Size of Service Pipe (inches)	DISTRIBUTION - PART 1 (B)			CAPACITY (C)			TOTAL	
	Existing Charge	Maximum Charge	New Charge	Existing Charge	Maximum Charge	New Charge	Existing Charge	New Charge
	MFR (A) 3/4	\$ 1,000	\$ 1,323	\$ 1,030	\$ -	\$ 364	\$ 364	N/A
	1,480	2,338	2,000	830	708	708	2,510	2,708

**SMALL SYSTEMS TAPPING FEES**  
**Effective 10/1/12**

**TAPPING FEES:**

Size of Service Pipe (inches)	DISTRIBUTION - PART 1 (B)			CAPACITY (C)			TOTAL	
	Existing Charge	Maximum Charge	New Charge	Existing Charge	Maximum Charge	New Charge	Existing Charge	New Charge
	MFR (A) 3/4	N/A	\$ 1,323	\$ 1,130	N/A	\$ 109	\$ 109	\$ -
	\$ 1,480	2,338	2,000	\$ 165	192	192	\$ 1,645	\$ 2,192

(A) MFR - Any multi-family residential structure, including a mobile home park, served through a common service pipe and individually metered. MFR charges are applicable to each unit contained in a MFR structure. Used CLD ratio of 56.6 % ratio of MFR usage to Single family usage.

(B) Fees are applicable except in situations excluded by an agreement or when a distribution system is contributed to LCA.

(C) Fees are applicable to all connections except where excluded by an agreement.

**Note: Small Systems includes Beverly Hills, Millicreek, Pine Lakes of Lynn, Clearview Farms and Madison Park North systems.**

**2012 SUMMARY OF TAPPING FEES - WATER FUND  
ARCADIA DIVISION**

**Effective 10/1/12**

7/6/12	Fee	Charges			Units
		Existing (A)	Maximum	New	
Capacity	\$	20.40	\$ 1.55	\$ 1.55	Per gallon per day
Distribution		18.10	0.67	0.67	Per gallon per day
Special Purpose Fire Service		0.10	0.12	0.12	Per square foot of Bidg space

(A) Existing fees were calculated in 2003 assuming only 45.7 EDU's in the Arcadia development.

The new fees are based on total system capacity and assumes added growth from interconnecting developments.

**2012 SUMMARY OF CAPACITY FEE  
CENTRAL LEHIGH DIVISION - WATER FUND  
CARRYING COST METHOD**

7/10/12

Fee	Costing Method	Cost Basis	(A) MGD Capacity	Unit Cost
<b><u>Capacity Part</u></b>				
Transmission	HC	\$ 11,506,701	8.504	\$ 1.353
Land	HC	1,057,771	8.504	0.124
Pump Station Structure, Electrical, Purification	HC	7,448,380	8.504	0.876
Wells	HC	1,278,698	8.504	0.150
Reservoir	HC	4,785,292	8.504	0.563
Allentown Interconnection - Phases 1 & 2 (B)	HC/FC	4,243,332	7.000	0.606
<b>Maximum Capacity Fee per Gallon</b>				<b>\$ 3.673</b>

**Calculation of Gallons per Household SF (3/4"):**

Census figure per MFR Household - Lehigh County	2.54
# of Gallons per day per Capita	65
Gallons per Household	165

**Maximum Charge per EDU - Census Method** **\$ 606**

**MFR Calculation of Gallons:**

2011 MFR Usage as ratio to Single family Usage	56.6%
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**Maximum Charge per MFR** **\$ 343**

**DISTRIBUTION PART 1 (C)**

	Costing Method	Cost Basis	Capacity (EDU)	Unit Cost
<b>West Wescosville Project</b>	HC	\$ 519,387	222.15	\$ 2,338

(A) Capacity for HC Projects is equal to safe yield divided by 1.5 peaking factor as of 12/31/11.

(B) Applied West Wescosville Distribution Fee as representative of total system.

(C) Excludes offset for debt because serving new customers. Capacity is ultimate total per agreement with Allentown.

HC = Historical Cost and Financing method. FC = Future Cost for new project.

**BUSS ACRES WATER SYSTEM  
WATER SYSTEM TAPPING FEES**

7/6/12

	<u>Capacity</u>
Acquisition Costs	\$ 84,317
Total Costs	<u>\$ 84,317</u>
ENR Index Increase (A)	1.1813
Total Trended Costs	<u>99,604</u>
<b>Capacity:</b>	
Avg Day Capacity - DEP Criteria	72,000
Maximum Charge per Gallon	\$ 1.38
<b>Calculation of Gallons per Household SF (3/4"):</b>	
<b>Census Method:</b>	
Census figure per SF Household	2.61
# of Gallons per day per Capita	65
Gallons per Household	170
<b>Charge per 3/4' Connection</b>	<b>\$ 235</b>
MFR Usage to Single Family Unit (C)	56.6%
<b>Maximum Charge MFR Connection</b>	<b>\$ 133</b>

Note: System was purchased 4/07.

(A) ENR Index Change:

ENR Index 4/1/07 - Acquisition 7,865

ENR Index 6/1/12 9,291

(B) Equates to System Safe Supply Capacity divided by 1.5 peaking factor.

(C) Per 2011 usage figures in CLD, MFR equates to 56.6% of Single Family.

**2012 SUMMARY OF CAPACITY FEE  
NORTH WHITEHALL DIVISION  
CARRYING COST METHOD**

7/6/12

	Capacity
System Capital	\$ 1,595,878
Planning Costs	196,939
Contributions/PR&I Fees/Misc Cap Inc/Sale of Well Station	(242,746)
Net Costs	1,550,071
Interest Expense (A)	-
Total Capital Cost Basis	1,550,071
Outstanding Debt (A)	-
Total Cost Basis for Capital Recovery Fees	\$ 1,550,071

**Max Day Supply with NBMA Interconnection  
and Wells available for use:**

Est. Maximum Daily Groundwater Supply Available	313,000
NBMA Interconnection	390,000
Total Supply Available Max Day	703,000
Total Supply Available Avg Day (B)	468,667

**Maximum Charge per gallon** **\$ 3.31**

**Calculation of Gallons per Household SF (3/4"):**

Census figure per SF Household - NWT	2.68
# of Gallons per day per Capita	65
Gallons per Household	174

**Maximum Charge per 3/4" Connection** **\$ 575**

**Maximum Charge per MFR Connection (C)** **\$ 296**

(A) All Debt & Interest Expense is included in CLD calculation since CLD division is paying such costs.

(B) Max Daily groundwater supply divided by 1.5 plus 260,000 gpd limit on NBMA supply.

(C) Per 2011 usage figures in NWD, MFR equates to 51.49% of Household SF.



**2012 SUMMARY OF CAPACITY FEE  
WASHINGTON TOWNSHIP SYSTEM  
CARRYING COST METHOD**

41096

	Capacity
<b>Net Costs</b>	\$ 1,369,505
Interest Expense Thru 6/1/12	302,124
Total Capital Cost Basis	1,671,629
<b>Outstanding Debt:</b>	
Bank Loan	(709,104)
Total Cost Basis for Capital Recovery Fees	\$ 962,526
Total System Capacity (A)	93,333
<b>Maximum Charge per Gallon</b>	<b>\$ 10.31</b>
<b>Calculation of Gallons per 3/4" Household:</b>	
Census figure per SF Household	2.50
# of Gallons per day per Capita	65
# of Gallons per Household	162.0
<b>Maximum Charge per 3/4" Connection</b>	<b>\$ 1,670</b>
<b>Multi-family (MFR) Calculation of Gallons:</b>	
2011 MFR Usage as ratio to Single family Usage	42.7%
<b>Maximum Charge per MFR Connection</b>	<b>\$ 713</b>

(A) Total supply available in gallons per day per Slatington Agreement divided by 1.5 peaking factor.

**2012 SUMMARY OF CAPACITY FEE  
HEIDELBERG HEIGHTS WATER DIVISION  
TRENDED COST METHOD**

	Capacity
Improvement Costs	\$ 275,155
Interest Expense Thru (A)	-
Total Capital Cost Basis	<u>275,155</u>
Trend Factor (B)	1.2713
Trended Cost Basis	<u>349,817</u>
Less:	
Outstanding Debt (A)	-
Contributions	-
Cost Basis for Tapping Fee	<u>349,817</u>
Total System Safe Supply Capacity divided by 1.5. peaking factor)	86,000
<b>Maximum Charge per Gallon</b>	<b><u>\$ 4.07</u></b>
<b>Calculation of Gallons per SF 3/4" Household:</b>	
2010 Census figure per Household	2.68
# of Gallons per day per Capita	65
# of Gallons per Household	174
<b>Maximum Charge per 3/4" Connection:</b>	<b><u>\$ 708</u></b>
Multi-Family (MFR) Usage to Single Family Unit (C)	51.49%
<b>Maximum Charge MFR Connection</b>	<b><u>\$ 364</u></b>
(A) Reserves used to finance costs.	
(B) Improvements were completed 12/13/04.	
ENR Index 12/31/04	7,308
ENR Index 7/1/11	9,291
C) Due to limited number of MFR's in this system, used North Whitehall ratio.	

**2012 SUMMARY OF CAPACITY FEE  
SMALL WATER SYSTEMS  
TRENDING METHOD**

7/6/12

Total Trended Costs	\$ 256,853
Outstanding Debt	-
Total Net Costs	<u>\$ 256,853</u>

**Capacity:**

Avg System Capacity (A)	220,660
Maximum Charge per Gallon	\$ 1.16

**Calculation of Gallons per Household SF (3/4"):**

**Census Method:**

Census figure per SF Household - Lehigh County	2.54
# of Gallons per day per Capita	65
Gallons per Household	165
<b>Charge per 3/4' Connection</b>	<b>\$ 192</b>

Multi-family (MFR) Usage to Single Family Unit (B)	56.6%
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<b>Maximum Charge MFR Connection</b>	<b>\$ 109</b>
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(A) Water System Safe Supply Capacity divided by 1.5 peaking factor.

(B) Used CLD ratio for multi-family usage.

**Note: Includes Beverly Hills, Millcreek, Pine Lakes of Lynn, Clearview Farms and Madison Park North systems.**

**2012 CAPITAL RECOVERY FEES  
ARCADIA WEST WATER SYSTEM  
TRENDING COST METHOD**

9/13/07	<u>Distribution</u>	<u>Capacity</u>	<u>Fire Svc</u>
Total Costs	\$ 84,343	\$ 196,429	\$ 422,425
Trend Factor (A)	1.388	1.388	1.388
	<u>\$ 117,065</u>	<u>\$ 272,635</u>	<u>\$ 586,309</u>
Outstanding Debt (B)	-	-	-
Total Cost Basis	<u>\$ 117,065</u>	<u>\$ 272,635</u>	<u>\$ 586,309</u>
Total System Capacity (C)	176,000	176,000	
Square footage of Buildings			4,875,276
Cost per square footage of Bldgs			\$ 120.12

**Maximum Charge per Gallon**      \$ 0.67      \$ 1.55

- (A) ENR Index 6/30/03 at acquisition      6,694
- ENR Index 6/1/12      9,291
- (B) Since this was a new project, the debt service offset does not apply. All Debt Svc is included  
    In the CLD calculation.
- (C) System Safe Supply Capacity divided by 1.5 peaking factor.



**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](mailto:service@lehighcountyauthority.org)

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**MEMORANDUM**

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**Date:** August 22, 2012

**To:** Board of Directors & Management Staff

**From:** Pat Mandes / Frank Leist

**Re:** Rehabilitation Effectiveness Evaluation

**Approvals Requested**

<b>Approvals Requested</b>	<b>Brief Description</b>	<b>Amount</b>
Capital Project Authorization Amendment (13) Professional Services Authorization (12)	PCA Malcolm Pirnie	\$39,000

**Background**

In 2008, the Department of Environmental Protection (DEP) required LCA and the Signatories to generate a Corrective Action Plan for the areas identified as having significant infiltration and inflow (I/I) conditions. In addition, EPA has issued a Compliance Order to the City of Allentown, LCA and all municipalities tributary to the City WWTP to eliminate all SSOs within a five year period (2014).

The LCA 2009-2017 Signatory I&I Investigation & Remediation Project Capital Plan was developed so that LCA could take the lead in working with the Signatories to address the overload and SSO issues. A Sewer Capacity Assurance & Rehabilitation Program (SCARP) Outline was drafted by Malcolm Pirnie that provides a formalized and planned method of evaluating the LCA and Signatory systems, prioritizing and conducting sewer rehabilitation by all the LCA Signatory Partners.

The SCARP approved by PADEP allows new connections to the LCA wastewater system if adequate allocation flow credits are available. Allocation flow credits are obtained by implementation of successful I&I reduction projects, clearwater elimination projects, and storage/capacity improvement projects. To date, the allocation flow credits have been obtained from the construction of the Flow Equalization Basin and sump pump removals. To obtain allocation flow credits for rehabilitation work that is completed, benefits to peak flow conditions must be shown. To determine the effectiveness of the rehabilitation, pre- and post- rehabilitation flow monitoring must be evaluated to measure the amount of I & I eliminated from the system. The Control Basin Method (CBM) of evaluation is defined in The SCARP document and has been accepted by PADEP.

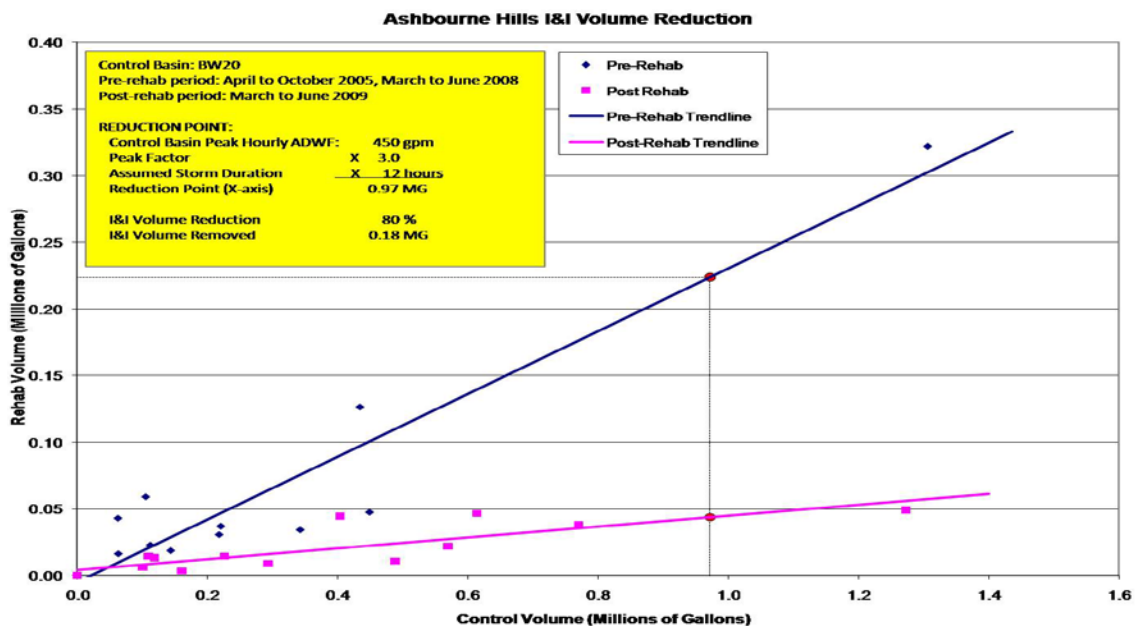
Signatory rehabilitation by cured-in-place lining of approximately 33,000 LF of collector pipe has been scheduled for the fall of 2012 in three of the LCA Signatory collector systems. To receive allocation flow credits for any peak flow reduction benefit, we must provide proof a reduction in the peak flow occurred. Flow meters were installed in March to measure the flow prior to the rehabilitation.

## Engineering Consulting Services - Project Scope

The Western Lehigh SCARP Partnership I & I Consultant, Malcolm Pirnie will provide the flow reduction evaluation and document the allocation flow credit benefit derived from the rehabilitation projects. The evaluation will determine the reduction in total system volume resulting during a rain event and the reduction in the peak flow rate during a rain event. These metrics will be based on actual pre- and post-rehabilitation flow monitoring data.

The flow in each project area is monitored before rehabilitation and again after rehabilitation with the objective of capturing at least six significant wet weather events before and six months after rehabilitation (LCA provides the flow metering data). Metering of a nearby basin where no work is being done is conducted at the same time. The use of control basins will equalize the changing conditions that occur in the basin from the pre- to the post-rehabilitation periods. If we only looked at pre and post, we would likely not see a reduction in flows due to the different conditions (antecedent conditions, type of rain storm, etc.) during the flow metering periods.

Malcolm Pirnie will utilize the Control Basin Method (CBM) analysis to evaluate the response to rehabilitation by comparing the pre-rehab and post-rehab relationship of the two basins (rehab basin and control basin). Scatter plots are generated with the metric values from the rehabilitation basin and the control basin as shown in the example figure below to calculate the flow reductions.



## Project Schedule

The evaluation schedule is dependent upon the completion of the pipe lining projects which are scheduled to be completed before the end of the year. It is expected that the evaluation will be completed in early 2013 so that the allocation credits can be reported to PADEP in the annual report due in March.

## Project Cost

A Professional Services Agreement and Capital Project Authorization Amendment is attached for a "Not to Exceed" amount of \$39,000 for a Rehabilitation Effectiveness Evaluation of the 2012 rehabilitation project (33,000' of cured-in-place lining projects).



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](http://www.arcadis-us.com)

Subject:  
Rehabilitation Effectiveness Evaluation

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 evaluation of the effectiveness of cured-in-place sewer rehabilitation to be performed in Lower Macungie, Upper Macungie and Alburtis in late 2012. The analyses will be based on flow meter and rainfall data to be provided by LCA.

Six flow meters are currently in place to measure flows in basins where rehabilitation is planned. Three flow meters are located in control basins where no rehabilitation is planned. There are also two rain gages in place to collect rainfall data. LCA has contracted with ADS to maintain and collect data from these meters and gages on a regular basis.

### **SCOPE OF WORK**

#### **Task 1 - Meter Data Review**

Malcolm Pirnie will review and evaluate data collected for the purpose of a rehabilitation effectiveness study. This task includes the review of the data collected during the time period before rehabilitation of the sewer mains begins and after rehabilitation is complete.

Malcolm Pirnie will review the quality of the pre-rehabilitation data delivered by ADS on the following schedule.

- After 1 month
- After 3 months
- At the end of the 2012 pre-rehabilitation period

Malcolm Pirnie will review the quality of the post-rehabilitation data delivered by ADS on the following schedule.

- After 1 month
- After 3 months

Date:  
May 4, 2012

Contact:  
Tony Dill

Phone:  
484.688.0380

Email:  
[Anthony.Dill@arcadis-us.com](mailto:Anthony.Dill@arcadis-us.com)

Our ref:  
0247

- At the end of the 2013 post-rehabilitation period

It is expected that ADS will deliver the data within two weeks of each period mentioned above. Malcolm Pirnie will review the data within 10 days of receiving the data from ADS. The data will be reviewed for repeatability/consistent dry day diurnal patterns, sensor drift, data gaps/storm capture and editing of storms. Malcolm Pirnie will work closely with ADS in regards to edited data, focusing on rain events.

Malcolm Pirnie will work with ADS to determine if the amount of rain events collected during the pre-rehabilitation and post-rehabilitation periods is acceptable for the study. If there is a need for more storms, Malcolm Pirnie will recommend to LCA that the pre-rehabilitation and post-rehabilitation metering periods be extended until the necessary amount of usable storms have been gathered for the analyses. In general, it is suggested that both the pre-rehabilitation and post-rehabilitation data sets should contain at least six rain events each of at least 0.5 inches.

After the flow meter data for the review period is complete, Malcolm Pirnie will analyze discrete rain events using Time Series Analyzer (TSA). As part of this analysis, we will develop a diurnal base flow hydrograph to which hydrographs for rain events will be compared. Specific rain events will be identified with the goal of calculating parameters that define the rain event, such as total storm volume and peak flow rate. These parameters will be reviewed to verify that the rain events generated useful data for rehabilitation effectiveness analyses. For basins that show a measurable response to storm events, we will proceed with the rehabilitation effectiveness evaluation study (Task 2).

### **Task 2 - Rehabilitation Effectiveness Study:**

The Rehabilitation Effectiveness Study will be structured in accordance with the Sewer Capacity Assurance & Rehabilitation Program (SCARP). Excerpts from the SCARP are included below.

“Two metrics will be used to determine the effectiveness of projects designed to eliminate I/I:

1. Reduction in total system volume resulting from a rain event - Total system volume resulting from a rain event is calculated by totaling the hourly flow volumes measured during the I/I period.
2. Reduction of peak flow rate during a rain event - Peak flow rates are determined by reviewing the hourly data collected during each rain event and identifying the highest measured flow rate.



...Scatter plots are generated with the metric values from the control basin on the x-axis and the corresponding metric values from the rehabilitation basin on the y-axis. Pre-rehabilitation data is plotted separately from post-rehabilitation data and both sets are linearly regressed. The percentage difference between the slope from the pre-rehab regression and the slope from the post-rehab regression yields the percentage reduction due to rehabilitation.”

For each of the six Rehabilitation Basins, one scatter plot will be provided for “total volume” reduction and one scatter plot will be provided for “Peak Flow” reduction. Each Rehabilitation Meter has been assigned one of the three control meters per the SCARP to complete the study.

Malcolm Pirnie will submit electronically a summary of the rehabilitation effectiveness results for all Rehabilitation Basins, along with the scatter plot. Malcolm Pirnie will participate in a conference call to review the results of the analyses with LCA staff. A formal written report or workshop presentation can be provided upon request, but is not included in the proposed budget.

#### **BUDGET ESTIMATE**

We estimate that the cost of these services will be \$39,000. 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

**CAPITAL PROJECT AUTHORIZATION  
AMENDMENT NUMBER 13**

**PROJECT No.:** S-08-5      **BUDGET FUND:** WLI Sewer Capital

**PROJECT TITLE:** Signatory I & I Investigation/Remediation Program      **PROJECT TYPE:**

**TOTAL PROJECT**      **Prior:**      **\$3,039,031**

**THIS AUTHORIZATION**      **Current:**      **\$179,000**

Construction  
 Engineering Study  
 Equipment Purchase  
 Amendment

**DESCRIPTION AND BENEFITS:**

**Full Project Overview:**

Based on the EPA Compliance Order and the PADEP Chapter 94 requirements, LCA and the LCA Signatories are required to reduce infiltration and inflow from the system and eliminate SSOs from the LCA and Signatory sewer systems within a five year period (2014). The SCARP Program has been developed to investigate the sources of I & I and to remediate areas identified as having excessive I & I. The SCARP Program consists of engineering tasks necessary to define and quantify the problems, to evaluate methods of redress and to determine the corrective actions required to meet the regulatory requirements.

The SCARP approved by PADEP allows new connections to the LCA wastewater system if adequate allocation flow credits are available. Flow credits are obtained by implementation of successful I&I reduction projects, clearwater elimination projects, and storage/capacity improvement projects. To date, the flow credits have been obtained from the construction of the Flow Equalization Basin and sump pump removals. To obtain allocation credits for rehabilitation work that is completed, benefits to peak flow conditions must be shown. To determine the effectiveness of the rehabilitation, pre- and post-rehabilitation monitoring must be evaluated to measure the amount of I & I eliminated from the system by comparing to flows measured in a control basin. The SCARP defines the Control Basin Method (CBM) of evaluation.

**Rehabilitation Effectiveness Evaluation**

This task is to determine the reduction in peak flows obtained through the various pipe lining projects scheduled for late 2012 and the resulting allocation flow credits. The scope is for the evaluation by Malcolm Pirnie of the pre- and post-flow monitoring utilizing the CBM.

The 2012 budget for the I & I Program includes funds for this work.

	<b>Previously Approved</b>	<b>This Amendment</b>	<b>Total Approval</b>
Flow Monitoring Temporary	\$ 1,280,950		\$ 1,280,950
Purchase of Flow Meters (9)	\$63,000		\$63,000
Long Term Metering	\$431,081		\$431,081
Engineering Consulting	\$1,094,000	\$39,000	\$1,133,000
Staff	\$160,000	\$140,000	\$300,000
Contingencies	\$10,000		\$10,000
<b>Totals</b>	<b>\$ 3,179,031</b>	<b>\$ 179,000</b>	<b>\$ 3,218,031</b>

**REVIEW AND APPROVALS:**

Pat Mandes      08/08/12      \_\_\_\_\_      \_\_\_\_\_

Project Manager      Date      General Manager      Date

\_\_\_\_\_      \_\_\_\_\_      \_\_\_\_\_      \_\_\_\_\_

Capital Works Manager      Date      Chairman      Date



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 12**

**Professional:**

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

**Date:** 8/8/12

**Requested By:** Pat Mandes

**Approvals**  
**Department Head:** \_\_\_\_\_

**General Manager:** \_\_\_\_\_

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

**Signatory Collector Systems; Rehabilitation Effectiveness Evaluation**

Provide an evaluation of cure-in-place rehabilitation effectiveness taking place in Signatory communities in late 2012. The evaluation is based on flow metering and rain gage data provided by LCA.

**Meter Data Review** - Data from a total of 9 flow meters and 2 rain gages will be evaluated both before rehab and after rehab. The 9 flow meters include 6 for monitoring the flow in the rehabilitation areas and 3 are control basins where no rehabilitation will take place.

**Rehabilitation Effectiveness Study** – Develop scatter plots for each of the 6 rehabilitation basins for total volume reduction and one scatter plot for each 6 rehabilitation basins for peak flow reduction.

Results of the evaluation will be provided electronically and discussed in a conference call.

Refer to Malcolm Pirnie Scope of Work dated May 4, 2012.

**Cost Estimate (not to be exceeded without further authorization):** Not to exceed \$39,000.

**Time Table and Completion Deadline:**

It is anticipated that this work will be completed by the end of the 1<sup>st</sup> quarter of 2013.

**(For Authority Use Only)**

**Authorization Completion:**

**Approval:** \_\_\_\_\_ **Actual Cost:** \_\_\_\_\_ **Date:** \_\_\_\_\_