 **ARCADIS** | Design & Consultancy
for natural and built assets

LOWER ALLEN STORMWATER FEE STUDY

Presentation to Board of Commissioners

6/11/18

Meeting Agenda

-  What is Stormwater?
-  Why is a Stormwater Program Needed?
-  Stormwater Program
-  Credit Policy
-  Next Steps


 ARCADIS



What is Stormwater?

ARCADIS Design & Consultancy for natural and built assets

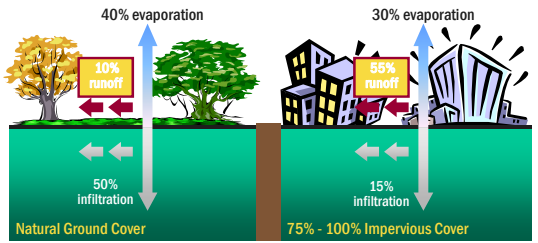
- The flow of water that results from precipitation and which occurs immediately following rainfall or as a result of snowmelt.



© Arcadis 2018

Impervious Cover Impacts Stormwater Runoff

ARCADIS Design & Consultancy for natural and built assets



Ground Cover Type	Evaporation	Runoff	Infiltration
Natural Ground Cover	40%	10%	50%
75% - 100% Impervious Cover	30%	55%	15%

© Arcadis 2018

Impervious Cover in Residential and Commercial Areas

ARCADIS Design & Consultancy for natural and built assets



© Arcadis 2018

Municipal Separate Storm Sewer System (MS-4)

MS4 System consists of public and private infrastructure

- 110,600 LF of Storm Pipe
- 111 Storm Manholes
- 89 Outfalls
- 634 Inlets
- ~ 100 BMPs (mostly private)
- ~60 miles of Township Roads



© Arcadis 2018

MS-4 Permit Financial Requirements

Section 2.g.:

“The permittee shall maintain adequate funding and staffing to implement and manage all provisions of the ... Stormwater Management Program”

© Arcadis 2018


Where Does the Water From the Stormwater System Go?

- Streams and wetlands 
- Best Management Practices (BMPs)
 - Quantity controls
 - Quality controls 

© Arcadis 2018

ARCADIS Design & Consultancy
for natural and
built assets

Local waterways and Chesapeake Bay



© Arcadis 2018

ARCADIS Design & Consultancy
for natural and
built assets

Quantity Controls



Dry Extended Detention Basin Wet Pond / Retention Basin

© Arcadis 2018

ARCADIS Design & Consultancy
for natural and
built assets

Quality Controls



Bioretention Basin Vegetated Swale






© Arcadis 2018



B. Why is a Stormwater Program Needed?

ARCADIS | Design & Consultancy
for natural and built assets

Benefits of an Effective Stormwater Program

-  Reduce local flooding damage/basement backups
-  Cleaner/healthier streams & improved water quality
-  Improved recreational and aesthetic values
-  Protect property values
-  Compliance with regulatory mandates

© Arcadis 2018

Chesapeake Bay Pollution Reduction Plan

- Pollutant Removals
 - TSS (10%) ~ 317,000 lb/yr
 - N (5%)
 - P (3%)
- Types of BMPs
 - Convert 10 dry detention basins to bioretention facilities
 - 4 are Twp-owned and 6 are privately owned

LOWER ALLEN TOWNSHIP
CUMBERLAND COUNTY
PENNSYLVANIA

National Pollutant Discharge
Elimination System (NPDES)

Small Municipal Separate Storm
Sewer System (MS4)

Pollution Reduction Plan (PRP)
September, 2017

Page 4 of 27

ARCADIS

Stormwater Services 

- Operations & Maintenance
 - Stormwater/drainage system and BMP maintenance
 - MS4 Permit and water quality compliance
 - Review and inspection services
- Capital
 - Stormwater compliance projects
 - Drainage and watershed projects






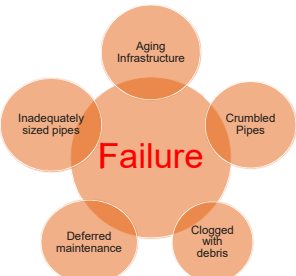
© Arcadis 2018

When stormwater infrastructure fails, there are great consequences 



© Arcadis 2018

A stormwater system failure can be caused by many things 



© Arcadis 2018





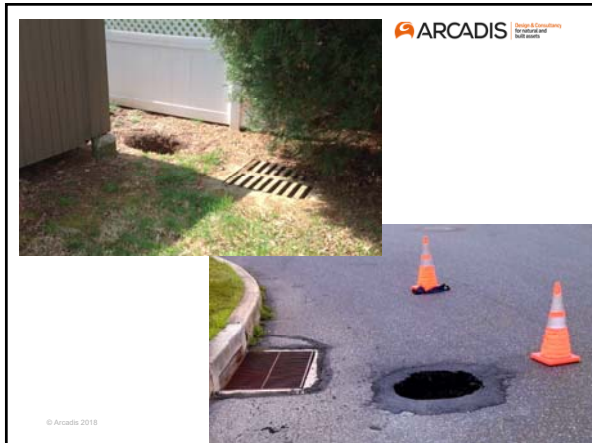















Level of Service – Full O&M *Preliminary*

Activity	Current	Target
Street Sweeping	4-5 times/yr	No change
MH & Inlet Cleaning	Annual	No change
MH & Inlet Repair	Reactive repairs < 5/yr	Rehab 19 structures/yr (2.5% system)
Pipe Inspection/ Assessment	Minimal, reactive	Pole camera screen 110,600 ft (100%) over 2 yrs; then 20%/yr. Full inspect CCTV 5,530 ft/yr (5% system), proactive
Pipe Rehab	Minimal, reactive	1,600 ft/yr (1.5% system) for 5 yrs, then 2,765 ft/yr (2.5% system)
Flood Abatement	Limited	No change


* - Includes pipes that take public road/stormwater system drainage across private property to outfall. This does NOT include private stormwater networks.



Level of Service – Streamlined *Preliminary*


Activity	Current	Target
Street Sweeping	4-5 times/yr	No change
MH & Inlet Cleaning	Annual	No change
MH & Inlet Repair	Reactive repairs < 5/yr	Deferred 5 years
Pipe Inspection/ Assessment	Minimal, reactive	Deferred 5 years
Pipe Rehab	Minimal, reactive	Deferred 5 years
Flood Abatement	Limited	No change

* - Includes pipes that take public road/stormwater system drainage across private property to outfall. This does NOT include private stormwater networks.



Level of Service – MS4 *Preliminary*

Activity	Current	Target (5-yr avg)
New BMP – Design & Construction	\$0	\$675,000
New BMPs – O&M	\$0	\$13,000
Other MS4 Permit Work (outfall inspections, public outreach, reporting)	\$170,000	\$186,000



ARCADIS Design & Consultancy
for natural and built assets

5-Year Budget - Full O&M

Current

Expense	2018	2019	2020	2021	2022	2023
Street Cleaning	\$23,768	\$24,481	\$25,215	\$25,971	\$26,751	\$27,553
Operations & Maintenance	\$144,500	\$304,724	\$331,466	\$321,371	\$331,012	\$340,942
MS4 Permit Compliance	\$87,300	\$185,870	\$726,649	\$1,234,586	\$887,170	\$890,198
Fee Program Admin/billing	\$0	\$85,000	\$45,300	\$30,609	\$26,077	\$26,860
Legacy Transaction Costs	\$0	\$65,000	\$0	\$0	\$0	\$0
Total	\$255,568	\$665,074	\$1,128,630	\$1,612,537	\$1,271,010	\$1,285,553

2024 budget to drop based on completion of CBPRP projects.

© Arcadis 2018

ARCADIS Design & Consultancy
for natural and built assets

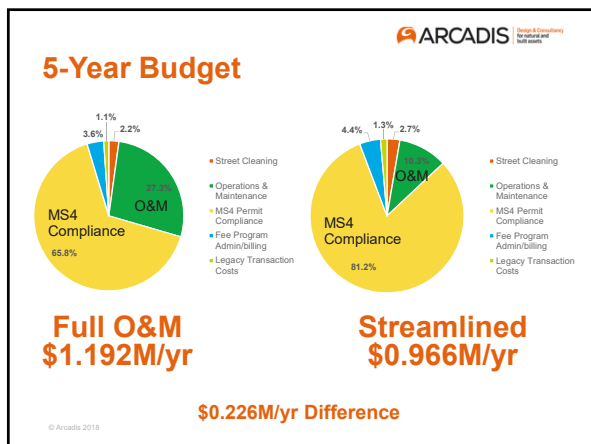
5-Year Budget-Streamlined

Current

Expense	2018	2019	2020	2021	2022	2023
Street Cleaning	\$23,768	\$24,481	\$25,215	\$25,971	\$26,751	\$27,553
Operations & Maintenance	\$84,500	\$94,035	\$96,856	\$99,762	\$102,755	\$105,837
MS4 Permit Compliance	\$87,300	\$185,870	\$726,649	\$1,234,586	\$887,170	\$890,198
Fee Program Admin/billing	\$0	\$85,000	\$45,300	\$30,609	\$26,077	\$26,860
Legacy Transaction Costs	\$0	\$65,000	\$0	\$0	\$0	\$0
Total	\$195,568	\$454,386	\$894,020	\$1,390,928	\$1,042,753	\$1,050,448

2024 budget to drop based on completion of CBPRP projects.

© Arcadis 2018



Rate Structure

ARCADIS | Design & Consultancy for natural and built assets

Designed to Meet Township Needs:

Keep it simple

- Accurate, fair, and defensible
- Representative of local conditions

Link to benefits

- Service area
- Program
- Projects

© Arcadis 2018

Rate Structure Based on Impervious Surface Area

ARCADIS | Design & Consultancy for natural and built assets

© Arcadis 2018

Digitizing

ARCADIS | Design & Consultancy for natural and built assets

- Impervious Area digitized includes building, sidewalks and driveways
 - 7.3% of 4,762 Single-Family Residential
 - 100% of 640 Condos (+43 common spaces)
 - 100% of 643 Non-Residential/Multi-family
- Calculated ERU = **3,088 sf** of impervious area
- Commercial properties range from 1 to 871 ERUs.
- Eight properties have 200+ ERUs.

© Arcadis 2018

Impervious Area Typical Residence Defines the Base Unit

ARCADIS | Design & Consultancy
for natural and built assets

Equivalent Residential Unit (ERU)

ERU Size Preliminary
Calculated ERU = 3,088 SF

Impervious Area = 3,088 ft²

Single Family Residential

© Arcadis 2018

Impervious Area Commercial Properties

ARCADIS | Design & Consultancy
for natural and built assets

ERU Size Preliminary

Billed as Multiples of the Base Unit

Impervious Area = 21,500 ft²

Nonresidential Parcel

© Arcadis 2018

Calculation of ERUs
21,500 sf / 3,088 sf/ERU = 6.96 = 7 ERUs

Parcels

ARCADIS | Design & Consultancy
for natural and built assets

Usage Type	Total IA	Total Parcels	Charged Fee?
Commercial	38,664,301	643	Yes
Condo	49,181	640	Yes
Condo Common	1,065,970	43	No*
Condo_Under_Construction	-	71	Yes
SFR	8,312,453	4,424	Yes
SFR_Sample	1,129,656	350	Yes
Township	97,299	41	No
Vacant(Undeveloped)	-	221	Yes

* - Impervious area on condo common spaces is factored into the average amount of impervious area per condo dwelling unit.

© Arcadis 2018

ERU Calculation Preliminary

Parcel size LL (ac)	Parcel size UL (ac)	Total Number SFR Parcels	% of Group Sampled	Avg IA per Sampled Parcel (sf)	Est. Total IA for group (sf)	
Condo		640	100%	1,742	1,115,151	
>0	<=0.1	282	6%	2,026	571,237	
>0.1	<=0.25	2,151	8%	2,431	5,229,073	
>0.25	<=0.5	1,618	6%	3,277	5,301,832	
>0.5	<=1	427	11%	3,934	1,679,656	
>1	>1	284	6%	9,799	2,782,984	
Developed Total		5,402	18%		16,679,933	
		Total IA	# Parcels	sf		
ERU =		16,679,933	/	5,402	=	3,088

© Arcadis 2018

ERUs - Commercial Preliminary

OWNER	Total IA (SF)	ERUs
1 PA INDUSTRIAL SCHOOL	2,589,101	871
2 PR CC LIMITED PARTNERSHIP	1,818,727	589
3 2850 APPLETON ASSOCIATES INC	905,225	293
4 EXETER 4501 WESTPORT LLC	755,534	245
5 SKYLINE STEEL LLC	745,596	241
6 WEST SHORE AREA SCHOOL	694,297	225
7 ASBURY ATLANTIC INC	638,996	207
8 CHRISTIAN LIFE ASSEMBLY OF GOD	636,025	206
9 WETTER COURT ENTERPRISES LLC	606,022	196
10 ARMERACH LP	536,864	174
11 ASBURY ATLANTIC INC	493,803	160
12 WEIS MARKET INCORPORATED	460,753	149
13 LISBURN DEVCO I LP	460,149	149
14 LFCC, INCORPORATED	453,451	147
15 PA BUSINESS CENTER LP	419,836	136
16 ASBURY ATLANTIC INC	416,617	135
17 PENNSYLVANIA POWER & LIGHT	413,635	134
18 ROMAN CATHOLIC DIOCESE OF TR	411,390	133
19 SMITH LAND & IMPROVEMENT CORP	390,201	126
20 LOWER ALLEN BUS CNTR LP	381,447	124
21 WARRELL CORPORATION	377,507	122
22 WITRAN PENNSYLVANIA LLC	351,689	114
23 JMSI INVESTORS	349,944	113
24 ALSTORES REALTY CORPORATION	337,152	109
25 WEST SHORE AREA SCHOOL	337,092	109

• 643 Parcels
 • # ERUs = IA / 3,088 SF
 • 12,542 Gross ERUs
 • Assume 10% loss to credit program
 • 11,288 Net ERUs

• Other Rate options


- Total Area and Runoff Coefficient
- Formula using IA and Total Area

© Arcadis 2018
 PennDOT and PA Turnpike roads are not included as fee-generating properties.

ERUs – Residential


- Total # ERUs depends on the residential rate structure
 - Flat (all SFRs pay same fee)
 - Tiered on parcel size
- Total Area times a runoff coefficient
- Rate Structure that factors in Gross Area and Impervious Area (e.g. Philadelphia)
- Assume 5% of Gross ERUs to be lost to a credit program

© Arcadis 2018



ERUs – Residential 

- **Flat rate** or **2-tier** option were selected as most favorable to further evaluate because:
 - Simple to explain
 - Fewer appeals anticipated
 - Less effort to collect and verify data in order to generate bills
 - Less effort spent administering the program


© Arcadis 2018

Residential ERUs – Flat Rate 

- 5,402 Parcels = **5,402 Gross ERUs**
- Simplest to explain.
- Few appeals anticipated.
- Small properties pay same as large properties.

© Arcadis 2018

ERUs – 2 Tier 

Parcel size LL	Parcel size UL	Total Number SFR Parcels	% of Group Sampled	Avg IA per Sampled Parcel (sf)	IA as % of ERU	ERUs/ parcel	# Billed ERUs per Group
Condo &	<=1	5118	19%	2,715	88%	1.0	5,118
>1		284	6%	9,799	317%	2.0	568
Total		5402	18%	3,088	-	-	5,686

"Gross ERUs"

- Relatively Simple to explain.
- Larger properties pay more.
- Some potential for appeals due to discrepancies in deeded acreage vs calculated area.

© Arcadis 2018

ERUs – Undeveloped

ARCADIS Design & Consultancy for natural and built assets

- ~297 Parcels
- Options
 - No charge
 - Flat charge of 1 ERU
 - Structure fee to be proportionate to both IA and Total Area
- Recommendation is for 1 ERU flat charge since all properties produce some runoff and simpler and less effort to administer than a fee structure proportionate to IA and Total Area.
- **297 ERUs**

© Arcadis 2018

Total ERUs Estimate

ARCADIS Design & Consultancy for natural and built assets
Preliminary

Category	# ERUs
SFR*	5,402
SFR Credits	-270 [5%]
Non-Residential/ Multi-Family	12,542
NR/MF Credits	-1,254 [10%]
Undeveloped	297
Total	16,717

© Arcadis 2018

*Based on Flat SFR Rate Structure


Rate and Cash Flow Projection – Full O&M

ARCADIS Design & Consultancy for natural and built assets
Preliminary

	2019	2020	2021	2022	2023
ERU Rate Change	N/A	0%	0%	0%	0%
ERU Rate (\$/qtr)	\$ 19.00	\$ 19.00	\$ 19.00	\$ 19.00	\$ 19.00
ERU Rate (\$/yr)	\$ 76.00	\$ 76.00	\$ 76.00	\$ 76.00	\$ 76.00
Net ERUs	16,717	16,717	16,717	16,717	16,717
Total Billed Revenue	\$ 1,270,492	\$ 1,270,492	\$ 1,270,492	\$ 1,270,492	\$ 1,270,492
Revenue Collected	\$ 1,235,935	\$ 1,235,935	\$ 1,235,935	\$ 1,235,935	\$ 1,235,935
Net Revenue	\$ 570,860	\$ 107,305	\$ (376,603)	\$ (35,075)	\$ (49,618)
Year End Cash Balance	\$ 570,860	\$ 678,165	\$ 301,562	\$ 266,487	\$ 216,869
Cash Balance as % of Annual Budget	86%	60%	19%	21%	17%

Based on Flat SFR Rate Structure

© Arcadis 2018

 Design & Consultancy
for natural and built assets


Rate and Cash Flow Projection – Streamlined Program

Preliminary

	2019	2020	2021	2022	2023
ERU Rate Change	N/A	0%	0%	0%	0%
ERU Rate (\$/qtr)	\$ 15.50	\$ 15.50	\$ 15.50	\$ 15.50	\$ 15.50
ERU Rate (\$/yr)	\$ 62.00	\$ 62.00	\$ 62.00	\$ 62.00	\$ 62.00
Net ERUs	16,717	16,717	16,717	16,717	16,717
Total Billed Revenue	\$ 1,036,454	\$ 1,036,454	\$ 1,036,454	\$ 1,036,454	\$ 1,036,454
Revenue Collected	\$ 1,008,262	\$ 1,008,262	\$ 1,008,262	\$ 1,008,262	\$ 1,008,262
Net Revenue	\$ 553,877	\$ 114,243	\$ (382,666)	\$ (34,490)	\$ (42,186)
Year End Cash Balance	\$ 553,877	\$ 668,119	\$ 285,454	\$ 250,964	\$ 208,778
Cash Balance as % of Annual Budget	122%	75%	21%	24%	20%

Based on Flat SFR Rate Structure

© Arcadis 2018

 Design & Consultancy
for natural and built assets


Stormwater Fee

Preliminary

Quarterly fees for various properties could be:

	Residential	Gas Station	Church	Box Store
ERUs	1	6	40	150
Fee – Full O&M	\$19.00	\$114	\$760	\$2,850
Fee - Streamlined	\$15.50	\$93	\$620	\$2,325

© Arcadis 2018

 Design & Consultancy
for natural and built assets

Residential Stormwater Utility Charges for Other Municipalities in Pennsylvania

Rates as of 2017

Chambersburg - \$12/quarter (**revisiting**)
 Hampden \$13.25/quarter
 Lancaster - \$19.35/quarter for 2,001-3,000 SF IA (tiered on IA)*
 Meadville - \$22.50/quarter
 Highspire Borough - \$22.50/quarter
 Mount Lebanon - \$24/quarter
 Radnor - \$7.25 to \$29/quarter (tiered on total area)
 Derry Twp – \$19.50/quarter for 3,000-4,999 SF of IA (tiered on IA)**
 Williamsport – Exploring \$14.10/quarter
 Swatara Twp - \$15/quarter (flat)
Lower Allen - \$15.50-19.00/quarter




* - For properties with greater than 3,000 SF of impervious area charge is proportional to impervious area.
 ** - 500-2,999 SF is \$9.75/qtr.

© Arcadis 2018




Credits

- Encourage private development of Best Management Practices that will help meet MS4 permit requirements
- Account for varying levels of onsite stormwater management
- Capped at an annual maximum of 50%
- O&M agreements and periodic inspection reports required
- No application fee
- Details and policy to be developed.
- Will monitor and adjust policy over time

© Arcadis 2018




 **ARCADIS** | Design & Consultancy
for natural and built assets

Next Steps

1. Select Scope of Program/Finalize Budget
 - Streamlined or Full Scope
2. Confirm Rate Structure & Document in Memo
 - Flat or 2-Tier Residential Rate Structure
 - Undeveloped Parcels = 1 ERU
3. Public Outreach (public mtg)
4. Develop Credit & Appeals Policy
5. Deliver GIS Database to LAT for use in billing setup
6. Approve and Setup Stormwater Authority
7. Pass Rate Resolution/Ordinance
8. Update billing system and issue invoices

© Arcadis 2018

 **ARCADIS** | Design & Consultancy
for natural and built assets

Questions?

Daniel J. Flint, P.E. NSPE
Township Engineer/Public Works Director
717-975-7575 ext. 1101
Dflint@latwp.org

© Arcadis 2018
