Planning Commission
Radnor Township
Wayne, Delaware County, Pennsylvania

Monday
May 5, 2014
7:00 P.M.

Agenda

Minutes of the April 8, 2014 meeting

ZHB Discussion - APPEAL #2914 - The applicant, Cabrini College, property located at 610 King of Prussia Road and zoned PI, seeks a dimensional variance to Section 280-70.B of the Radnor Township Zoning Code regarding building length. The applicant desires to expand the existing Dixon Athletic Center.

Delaware County Act 537 Sewage Facilities Plan Update
Eastern Service Area

Public Participation

Next Regular Planning Commission Meeting

Monday, June 2, 2014 7 PM

Radnor Township Planning Commission
Minutes of the Meeting of April 8, 2014
301 Iven Ave., Wayne, Pa

Chair Julia Hurle called the meeting to order at 7 PM with the following Commission members present: Skip Kunda, Steve Cooper, John Lord, Regina Majercak, Doug McCone, Elizabeth Springer, and Susan Stern. Attendance included: Roger Phillips, PE, Township Engineer; Amy Kaminski, PE, Township Traffic Engineer; Peter Nelson, Esq.; and Stephen Norcini, PE, Director of Public Works. Kathy Bogosian arrived late.

Minutes of the meetings of March 3, 2014

John Lord moved to approve the minutes. Seconded by Steve Cooper, the motion passed.

Presentation
Delaware Valley Regional Planning Commission
Radnor Township Eastern Route 30 Corridor Study

Keith Hartington and Richard Bickel provided a power point presentation. This project is a continuation of the US 30 Corridor Study Creating Linkages and Connecting Communities. Pedestrian crossing and circulation, traffic operations, and build scenarios were shown. Details were of counts for peak hours of traffic and pedestrian crossing in the Villanova University local.

2014-S-03
Alice Downs
30-32 Garrett Avenue
Subdivide existing parcel into two (court ordered separation)

Nick Caniglia appeared on behalf of the applicant. There was no discussion. Steve Cooper moved to approve. Seconded by Susan Stern, the motion passed.

Amendment to Chapter 245 Stormwater Management of the Radnor Township Code
Steve Norcini advised the members of proposed changes for consideration. These changes were introduced to the BoC at their April 7, 2014, meeting and the Board of Commissioners requested comments from the Planning Commission and the Delaware County Planning Department will also receive a copy for their comments. These changes are for a short-term revision while Gannett Fleming Engineers proceeds with the process of re-vamping the existing ordinance as a whole.

Several questions were raised regarding the existing stormwater fee as well as the timing of this introduction and looking for comments from the stormwater advisory committee as well as DCPD.

Kathy Bogosian – the restrictions may be too harsh for residential owners who want to add a small addition to their home.

Regina Majercak – (also a member of the stormwater advisory committee) the requirement to capture 1" of run-off over the entire site is too restrictive. The PABMP Manual has requirements that are more adaptive for the township. It should be tied to all impervious surfaces or new impervious cover, not the entire site. She is also concerned with the 'meadow in good condition' verbiage as being far too restrictive.

John Lord – there is a major stormwater issue in the township and requirements should be stricter.

Susan Stern – wants to know how the verbiage is quantified.

Steve Cooper – there is a sense of urgency, however, this needs more detail and study but allow the changes until the ordinance is re-written. The changes should remain as proposed.

Elizabeth Springer – using volume to calculate the run-off will cause the system to be enormous.

Doug McCone moved to recommend approval as it stands with a suggestion that 245-22 be amended to read that all property be considered to read all impervious surfaces. Discussion continued. John Lord requests that the BoC reconsider the groundwater recharge comments. Seconded by John Lord, the motion was defeated 4-5. Regina Majercak, Julia Hurle, Skip Kunda, Kathy Bogosian and Elizabeth Springer opposed.

Regina Majercak moved to recommend approval with revising 245-22 [A 2 (a)] to add 'all impervious surfaces' and 245-26 [C (2)] to change meadow condition to 25% of the developed portion. Seconded by Elizabeth Spring, the motion passed 5-4.

Regina Majercak recommends education for both the PC and the BoC to better understand the technical issues, as it's difficult to move forward without that knowledge.

Steve Norcini stated that this will be back on the BoC agenda of April 28 with the changes for adoption. He also stated that the proposed amendments were most definitely devised to require more stringent stormwater management in the Township. The Township has serious stormwater issues, and this is a step in the direction of addressing these issues.

Public Participation - none

Respectfully submitted,

Suzan Jones

ZONING HEARING BOARD APPLICATION

TOWNSHIP OF RADNOR
301 IVEN AVENUE
WAYNE, PA 19087
610-688-5600
FAX: 610-971-0450
www.radnor.com
www.radnor.com

TOWNSHIP USE ONLY
APPEAL # 2914
FEE: 900
DATE RECEIVED: 4/15/14

****

GENERAL INFORMATION: Applicants are strongly encouraged to review the "Requirements and Information for Appeals to the Zoning Hearing Board" that are attached to his application. Ten (10) copies of this application and required attachments must be filed with the Community Development Department not less than thirty (30) calendar days prior to the hearing.
INCOMPLETE APPLICATIONS WILL NOT BE ACCEPTED FOR PROCESSING

REQUIRED FEE DUE AT FILING: Please refer to the Consolidated Fee Schedule, as amended, on our website at www.radnor.com for a copy of our current fees.

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TYPE OR PRINT

Property Address: Dixon Athletic Center Cabrini College 610 King of Prussia Road, Wayne, PA

Name of applicant: Cabrini College (Contact: Howard Holden Capital Projects Coord.)

Telephone number: 610) 902-8240 **Email:** howard.holden@cabrini.edu

Property Owner (if different than above): _____

Property address: _____

Telephone number: _____ **Email:** _____

Attorney's name:
Joanne Semeister - Montgomery, McCracken, Walker & Rhoads, LLP

Address: 123 South Broad Street, 24th Floor, Philadelphia, PA 19109

Telephone number: 215-772-7477 **Email:** jsemeister@mmwr.com

Relief requested and/or basis for appearing before the Zoning Hearing Board including *specific citation to any and all sections of the Zoning Code relevant to the appeal. (attach additional pages if necessary)*

Cabrini is seeking a dimensional variance to Section 280-70 of the Radnor Township Zoning Code, which, among other things, limits the maximum length or depth of a building to 160 feet. Cabrini desires to expand its existing Dixon Athletic Center ("Dixon Center") to offer a more comprehensive athletic and wellness program to its students, faculty and staff. The proposed expansion would increase the dimensions of the building to 306 feet by 262.5 feet.

Description of previous decisions by the Zoning Hearing Board pertinent to the property, or attach copies of decisions: (*attach additional pages if necessary)*

Cabrini's Engineer met with Suzan Jones under a right-to-know request and found two zoning decisions related to the Dixon Athletic Center. Radnor Township requested an extension of time to produce the copies of the decision. Once received by the applicant, we will provide.

Brief narrative of improvements: ***(attach additional pages if necessary)***

The Dixon Center is an existing 90,000 sf athletics complex at Cabrini College. The Center is in need of an addition to create a more comprehensive athletics and wellness program for Cabrini students. The 28,000 sf addition will provide a range of much needed spaces including: Lobby, Fitness Center, Fitness Classroom, Offices, Locker Rooms and Storage. The addition will be located along the east and north sides of the existing athletics center. To accommodate the existing basketball court, swimming pool and related facilities, the maximum overall length of the existing building is 253'. The proposed improvements are designed to enhance the existing facility and need to be in close proximity to the existing spaces within the building. These proximity requirements require an addition and overall maximum building length of 306'.

ATTACHMENTS: Ten (10) copies of each of the following must be provided:

1. **Engineered plan or survey of the property drawn to scale, prepared by a registered architect, engineer or surveyor licensed in Pennsylvania, containing the following information:**
   - **a) lot lines and lot dimensions described in metes and bounds (in feet);**
   - **b) total lot area;**
   - **c) location of easements and rights of way, including ultimate rights of way;**
   - **d) location of all setback lines for existing and proposed structures;**
   - **e) location of steep slopes, floodplains, riparian buffers, wetlands, and other pertinent features;**
   - **f) location of existing and proposed improvements;**
   - **g) table of zoning data including zoning district, required setbacks, existing and proposed building coverage, impervious coverage, height, and other pertinent zoning restrictions, and any degree of compliance or noncompliance; and**
   - **h) all other features or matters pertinent to the application.**

   PLANS SHALL NOT EXCEED 24" X 36" , AND MUST BE NEATLY FOLDED TO NO GREATER DIMENSION THAN 8 ½" X 11" AT FILING

2. **List of witnesses and summary of their testimony attached.**

3. **Photographs of the property at issue and all adjoining properties.**

4. **Copies of any written professional reports, including traffic studies, land planning studies,**

appraisals, floodplain analyses, economic forecasts or other written reports, which the applicant wishes to present at the hearing *(note: the author of the study or a qualified representative of the entity who prepared the study must appear at the meeting and be available for cross-examination).*

5. Copy of deed, lease, agreement of sale, or other authorization to file the appeal. *(note: leases or agreements of sale either must expressly permit the tenant or buyer to file an appeal, or must be accompanied by a by a letter from the owner clearly authorizing tenant or buyer to file the appeal).*

ADDITIONAL REQUIREMENTS

1. Will this application involve the subdivision of land? Applications that involve the subdivision of land are referred to the Planning Commission for review and recommendation. *Applicants will be notified of the date and time of the Planning Commission meeting* No

2. Will briefs or memoranda of law be filed in accordance with requirements of the Zoning Hearing Board? (*note – 10 copies of any brief or memorandum of law to be submitted by the applicant must be received by the Community Development Department no later than 14 days before the hearing*). Yes

3. Will the applicant (or duly authorized officer of the applicant, if applicant is not a natural person) be present at the hearing. If not, then power of attorney, notarized and in recordable form, authorizing the person who will testify on behalf of the applicant, and to bind the applicant in any proceedings of the Board must be presented at or before commencement of the hearing. Attorneys, agents, or other representatives of the applicant may not appear and testify on behalf of the applicant without power of attorney. Forms of power of attorney are available in the Community Development Department. *(note: failure to provide power of attorney will result either in the appeal being discontinued, or being dismissed, at the discretion of the Board)* Yes

Joanne Semeister

SIGNATURE OF APPLICANT

Joanne Semeister, Counsel for Applicant Cabrini College

AN ADDITIONAL FEE F $150 SHALL BE CHARGED FOR ANY CONTINUANCE REQUESTED BY THE APPLICANT. THIS FEE SHALL BE PAID PRIOR TO THE RESCHEDULING OF THE HEARING.

APPLICANT RESERVES THE RIGHT TO SUPPLEMENT/AMEND THE APPLICATION PRIOR TO THE ZONING HEARING.

ATTACHMENT 1

ENGINEERED PLAN OR SURVEY OF PROPERTY

Attached.

ATTACHMENT 2

LIST OF WITNESSES AND SUMMARY OF TESTIMONY

CABRINI COLLEGE

Howard Holden, Capital Projects Coordinator, Facilities Department

Mr. Holden will provide testimony of the College's need for the Dixon Center expansion and the school's historical background with respect to development of the Center.

WALLACE ROBERTS & TODD (WRT) ARCHITECTS

WRT will provide design concepts as relate to the school's athletic and wellness program, detailing the building's design and the necessity for the expansion of the Center's footprint.

SITE ENGINEERING CONCEPTS, LLC

Robert Lambert will detail the engineering aspects of the project, the siting of the proposed improvements and related matters.

ATTACHMENT 3

PHOTOGRAPHS OF PROPERTY


FGN-2852

ATTACHMENT 4

COPIES OF WRITTEN PROFESSIONAL REPORTS
(Traffic Studies, Land Planning Studies)

N/A

ATTACHMENT 5

DEED, LEASE OR OTHER AUTHORIZATION TO FILE APPEAL

AMENDED AND RESTATED MEMORANDUM OF LEASE

THIS AMENDED AND RESTATED MEMORANDUM OF LEASE is dated April 30, 2010, and is effective as of January 1, 2006 by and between **MISSIONARY SISTERS OF THE SACRED HEART**, an Illinois not-for-profit corporation ("Lessor") and **CABRINI COLLEGE**, a Pennsylvania nonprofit corporation ("Lessee").

WITNESSETH:

WHEREAS, the Lessor and Lessee are parties to a certain Master Ground Lease Agreement dated June 30, 1988. A Memorandum of Lease ("Memorandum") dated June 30, 1988 and recorded March 7, 1989 at Volume 0651, page 1415 in the Records of Deeds of Delaware County, Pennsylvania, and recorded on March 7, 1989 at Book 1532, page 306 in Chester County, Pennsylvania memorialized certain provisions of the Master Ground Lease Agreement. A copy of the Memorandum is attached hereto as Exhibit "A."

The Master Ground Lease Agreement has been amended several times since June 30, 1988, with the most recent and current amendment being dated January 1, 2006 and denominated the Second Amended and Restated Master Ground Lease ("Restated Master Ground Lease").

The parties wish to memorialize certain provisions of the Restated Master Ground Lease by entering into this Amended and Restated Memorandum of Lease ("Amended Memorandum").

The Lessor and Lessee hereby agree as follows:

1. The name and address of the Lessor is: Missionary Sisters of the Sacred Heart, an Illinois not-for-profit corporation, 434 W. Deming Place, Chicago, Illinois 60614.

2. The name and address of the Lessee is: Cabrini College, a Pennsylvania nonprofit corporation, King of Prussia and Eagle Roads, Radnor, Pennsylvania 19087.

3. The date of the Restated Master Ground Lease is January 1, 2006.

4. The description of the Premises is set forth on Exhibit "B" attached hereto and made a part hereof.

5. The Commencement Date of the term under the Restated Master Ground Lease is January 1, 2000.

6. The Term of the Restated Master Ground Lease is sixty (60) years, ending on December 31, 2059.

7. Lessee has no right to extend or renew the Term under the Restated Master Ground Lease.

8. Subject to the terms and conditions of the Restated Master Ground Lease, Lessor has granted Lessee a purchase option.

9. Subject to the terms and conditions of the Restated Master Ground Lease, Lessor has granted Lessee a right of first refusal.

10. Subject to the terms and conditions of the Restated Master Ground Lease, Lessor has granted Lessee a right of first offer.

11. Lessor has granted to Lessee certain easements for vehicular and pedestrian access over and upon all other land owned by Landlord adjacent or contiguous to the Premises ("Additional Land") and Lessor has reserved unto itself an easement over and upon the Premises for pedestrian and vehicular access to and from the Additional Land all as more particularly described in the Restated Master Ground Lease.

12. This Amended Memorandum may be executed in counterpart, each of which shall be deemed an original and all of which together shall constitute one and the same instrument.

IN WITNESS WHEREOF, Lessor and Lessee have executed this Amended Memorandum of Ground Lease as of the date first hereinabove written.

LESSOR:

MISSIONARY SISTERS OF THE SACRED HEART

By: Sr. Joan McGlinchey, MSC
Name: Sr. JOAN McGLINCHEY
Title: First Vice-President

LESSEE:

CABRINI COLLEGE

By: [signature], Ph.D.
Name: MARIE RUSSELLA George
Title: PRESIDENT

COMMONWEALTH OF PENNSYLVANIA :
: SS
COUNTY OF Delaware :

On this, the 30th day of April, 2010, before me a Notary Public in and for the Commonwealth of Pennsylvania, the undersigned officer, personally appeared Marie A. George, who acknowledged himself/herself to be the President of **CABRINI COLLEGE**, a Pennsylvania nonprofit corporation, and that he/she as such officer, being authorized to do so, executed the foregoing instrument for the purposes therein contained by signing the name of the corporation by himself/herself as such officer.

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

Nancy L. Ollinger [SEAL]
Notary Public in and for the
Commonwealth of Pennsylvania

My Commission Expires:

Dec 7, 2011

Commonwealth of Pennsylvania
NOTARIAL SEAL
Nancy L. Ollinger, Notary Public
Radnor, Delaware County
My Commission expires Dec. 7, 2011

STATE OF ILLINOIS :
: SS
COUNTY OF COOK :

On this, the 29th day of March, 2010, before me a Notary Public in and for the State of Illinois, the undersigned officer, personally appeared Sr. Joan McGlinchey, MSC, who acknowledged herself to be the First Vice-President of **MISSIONARY SISTERS OF THE SACRED HEART**, an Illinois not-for-profit corporation, and that she as such officer, being authorized to do so, executed the foregoing instrument for the purposes therein contained by signing the name of the corporation by herself as such officer.

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

Stephen L Ruff [SEAL]
Notary Public

"OFFICIAL SEAL"
STEPHEN L RUFF JR
Notary Public, State of Illinois
My Commission Expires Jan. 23, 2012

My Commission Expires:

January 23, 2012

EXHIBIT A

(3)
1-Def
2-Chester

MEMORANDUM OF LEASE

MEMORANDUM OF LEASE entered into by and between MISSIONARY SISTERS OF THE SACRED HEART, an Illinois not-for-profit corporation ("Lessor") and CABRINI COLLEGE, a Pennsylvania not-for-profit corporation ("Lessee").

The parties hereto have entered into a Lease (the "Lease") in connection with which this Memorandum of Lease is executed.

Lessor and Lessee hereby agree as follows:

1. The name and address of the Lessor in the Lease (referred to therein as "Landlord") is:

MISSIONARY SISTERS OF THE SACRED HEART, an Illinois not-for-profit corporation
434 W. Deming Place
Chicago, Illinois 60614

RECORDED IN DEEDS DELAWARE CO., PA
89 MAR 17 PM 1:47

2. The name and address of the Lessee in the Lease (referred to therein as "Tenant") is:

CABRINI COLLEGE, a Pennsylvania not-for-profit corporation
Xing of Prussia and Eagle Roads
Radnor, Pennsylvania

3. The date of the Lease is the 30th day of June, 1988.

4. The description of the demised premises is set forth in Exhibit A attached hereto and made a part hereof.

5. The date of commencement of the term of the Lease is July 1, 1988

6. The term of the Lease is 60 years, ending at 12:01 A.M. on the 30th of June, 2048.

7. Lessee has no right to extend or renew the term of the Lease.

8. Lessee has no right of the purchase of or refusal of the demised premises.

9. Lessor has granted to Lessee certain easements for vehicular and pedestrian access over and upon all other land owned by Landlord adjacent or contiguous to the Premises ("Additional Land") and Landlord has reserved unto itself an easement over and upon the Premises for pedestrian and vehicular access to and from the Additional Land all as more particularly described in the Lease.

VOL 0651 PG 415

BK 1532 PG 306

Description #2
Cabrini College Entire Tract
excluding
"College Parcel"

Beginning at a point in the bed of Eagle Road (30 ft wide) extending along said Eagle Road north sixty six degrees zero minutes thirty seconds west one hundred and seventeen ft and two tenths of a foot to a point; thence extending north seventy nine degrees three minutes twenty seconds east one thousand seven hundred and seventy six ft and two tenths of a foot to a point; thence extending north seventy five degrees forty two minutes east three hundred and eleven ft and fifteen one hundredths of a foot to a point; thence extending north fifty seven degrees twenty eight minutes and thirty seconds east fifty five ft and sixteen one hundredths of a foot to a point; thence extending north thirty nine degrees thirty seven minutes west two hundred and thirty seven ft and twenty three one hundredths of a foot to a point; thence extending north fifty two degrees twenty seven minutes east fifty two ft and eight one hundredths of a foot to a point; thence extending north seventy three degrees eight minutes east four hundred and eight ft and eighty five one hundredths of a foot to a point; thence extending north seventy four degrees twenty nine minutes east two hundred and nineteen ft and forty six one hundredths of a foot to a point; thence extending north seventy three degrees fifty nine minutes east five hundred and eighteen ft and fourteen one hundredths of a foot to a point. Such named point is located in the middle of the intersection of Eagle Road and King of Prussia Road; thence extending along King of Prussia Road north twenty five degrees eighteen minutes forty seconds west four hundred and eighty five ft and sixty eight one hundredths of a foot to a point; thence leaving aforesaid King of Prussia Road and extending south sixty eight degrees two minutes and thirty seconds west twenty eight ft to an iron pin; thence extending along the same course four hundred and twenty nine ft and sixty five one hundredths of a foot to a point; thence extending north sixty four degrees thirty nine minutes and thirty seconds west one thousand five hundred and twelve ft and sixteen one hundredths of a foot to an iron pin; thence extending south fifty seven degrees fifty seven minutes fifty eight seconds west one hundred and seventy six ft and eighteen one hundredths of a foot to a point; thence extending north thirty three degrees forty three minutes and two seconds west eight hundred and fifty two ft and eighty five one hundredths of a foot to a point; thence extending north fourteen degrees fifty eight minutes twenty seven seconds west four hundred and fifty one ft and eighty nine one hundredths of a foot to a point; thence extending along the same course forty two ft and thirty five one hundredths of a foot to a point in the bed of Upper Gulph Road; thence extending along aforesaid Upper Golf Road south eighty five degrees fifty six minutes forty seven seconds west two hundred and eighty seven ft and one tenth of a foot to a point, thence extending along the same course seventy six ft and forty one hundredths of a foot to a point; thence leaving aforesaid Upper Gulph Road and

Description #2
Cabrini College Entire Tract
excluding
"College Parcel"
(continuation)

extending south fourteen degrees thirty five minutes and four seconds east twenty eight ft and eight tenths of a foot to an iron pin; thence extending along the same course six hundred and forty eight ft to an iron pin; thence extending south fifty seven degrees thirty five minutes forty-five seconds west two hundred and three ft and three hundredths of a foot to a point; thence extending along the same course three hundred and thirty five ft to a monument; thence extending north sixty nine degrees forty four minutes west one hundred and ninety nine ft and twenty five one hundredths of a foot to an iron pin; thence extending south five degrees fifty minutes and fifteen seconds east one hundred and seventy seven ft and seven one hundredths of a foot to a monument; thence extending north fifty seven degrees thirty five minutes forty-five seconds east ninety six ft and forty seven one hundredths of a foot to an iron pin; thence extending south thirty degrees twenty eight minutes and five seconds east five hundred and forty five ft and eighty six one hundredths of a foot to an iron pin; thence extending south seventeen degrees twenty four minutes and forty two seconds west eight hundred and fifty two ft and twenty two one hundredths of a foot to an iron pin; thence extending south eleven minutes forty one seconds west five hundred and eighty nine ft and forty three one hundredths of a foot to an iron pin; thence extending along the same course twenty three ft and eighty one one hundredths of a foot to the point and place of beginning in the bed of Eagle Road. Said parcel lying partly in Chester County and partly in Delaware County excluding the parcel described as follows: Beginning at an interior point marked by a spike set in the title line in the bed of a driveway extending through "Cabrini College" from Eagle Road to King of Prussia Road said spike is at the distance of two thousand and seventy ft and forty three one hundredths of a foot measured by the following various courses and distances North eastwardly along the said title line in the bed of said driveway from its intersection with the title line in the bed of Eagle Road, said point being measured the two following courses and distances along the same from a nail in the line of land of Valley Forge Military Academy viz: North seventy nine degrees three minutes twenty seconds east one hundred and sixty six ft and eighteen one hundredths of a ft to a point; thence from said point extending the following sixteen courses and distances along the title line in the bed of the aforesaid driveway viz: (1) north twelve degrees fifty nine minutes east one hundred and ninety nine ft and ninety seven one hundredths of a foot to a spike; (2) north two degrees forty eight minutes east one hundred and seventeen ft and eighty three one hundredths of a foot to a spike; (3) north eight degrees twelve minutes thirty seconds west ninety nine ft and eighty one hundreds of a foot to a spike; 4) north five degrees thirteen minutes thirty seconds west one

Description #2
Cabrini College Entire Tract
excluding
"College Parcel"
(continuation)

hundred ft to a spike; (5) north zero degrees thirty six minutes thirty seconds east one hundred ft to a spike; (6) north twenty four degrees fifty five minutes thirty seconds east one hundred ft to a spike; (7) north forty six degrees forty two minutes thirty seconds east one hundred ft to a spike; (8) north fifty six degrees forty four minutes thirty seconds east one hundred ft to a spike; (9) north sixty three degrees twenty eight minutes thirty seconds east one hundred ft to a spike; (10) north sixty eight degrees fifty eight minutes thirty seconds east one hundred ft to a spike; (11) north seventy two degrees fifty seven minutes east one hundred ft to a spike; (12) north seventy four degrees forty two minutes east one hundred ft to a spike; (13) north seventy six degrees zero minutes thirty seconds east four hundred and seventy four ft and sixty eight one hundredths of a foot to a spike; (15) north seventy six degrees forty minutes east one hundred twenty five ft and ninety four one hundredths of a foot to a spike; (16) north seventy four degrees three minutes east sixty two ft and eighty one one hundredths of a foot to an iron pin, the point of beginning; thence extending from said beginning point along the title line in the bed of the driveway the four following courses and distances: (1) north seventy four degrees three minutes east sixty seven ft and forty one one hundredths of a foot to a spike; (2) north sixty eight degrees forty five minutes thirty seconds east one hundred ft and zero hundredths of a foot to a spike; (3) north sixty two degrees nineteen minutes thirty seconds east one hundred ft and zero one hundredths of a foot to a spike; (4) north fifty five degrees fifty eight minutes thirty seconds east forty three ft and tuenty three one hundredths of a foot ft to a spike; thence leaving aforesaid driveway three following courses and distances: (1) south ten degrees five minutes east three hundred and seventy four ft and one one hundredths of a foot to an iron pin; (2) south seventy nine degrees fifty five minutes west three hundred ft and zero one hundredths of a foot to an iron pin; (3) north ten degrees five minutes west three hundred ft and zero one hundredths of a foot to an iron spike to the point and place of the beginning of the college partial; thence following the courses (16) to (1) returning to the point in the title line bed of the driveway.

Radnor Twp 36-02-00477-00

BK 1532 PG 309

VOL 0651 PG 141 R

10. This Memorandum of Lease has been executed merely to give notice of the Lease pursuant to the provisions of the Act of June 30, 1959, P.L. 454; 21 P.S. 405, and as agreed by the parties. All of the terms, conditions and covenants of the Lease are incorporated herein by reference. The parties hereto do not intend this Memorandum of Lease to modify, amend or supersede the Lease or any of the rights or obligations created thereunder. In the event of any variance or discrepancy between the Lease and this Memorandum of Lease, the terms and provisions of the Lease shall govern.

IN WITNESS WHEREOF, the parties to the Lease have duly executed this Memorandum of Lease, under seal this 30th day of June, 1988.

LESSOR
MISSIONARY SISTERS OF THE SACRED HEART

By: _____ (SEAL)

ATTEST: _____

LESSEE
CABRINI COLLEGE

By: _____ (SEAL)

ATTEST: _____

STATE OF ILLINOIS)
) SS
COUNTY OF DUPAGE)

On the 10th day of June, 1988, before me, the subscriber, a Notary Public in and for the Commonwealth and County aforesaid, personally appeared Sister Antonia Luzione, M.S.C. who acknowledged herself to be the Treasurer of the Missionary Sisters of the Sacred Heart, an Illinois not for profit corporation, and that she, as such President being authorized to do so, executed the foregoing instruments for the purposes therein contained by signing the name of the corporation by herself as such President, and desired that the same might be recorded as such.

WITNESS my hand and seal the day and year aforesaid.

OFFICIAL SEAL
STEPHEN L. RUFF, Jr.
Notary Public, State of Illinois
My Commission Expires Dec. 22, 1991

Notary Public

My Commission expires:

CONGRESS ABSTRACT CORPORATION
200 S. 12th STREET
PHILADELPHIA, PA 19102
735-2858

KINDLY RECORD & RETURN TO:

CONGRESS ABSTRACT CORPORATION
200 South Broad Street
Philadelphia, Pennsylvania 19102
PA # 88-5674

RETURN TO

NE
1550
RW

Missionary Sister of The
Sacred Heart

TO

Cabrini College

VOL 0651 PG 1421

BK 1532 PG 312

EXHIBIT B

CABRINI COLLEGE ENTIRE TRACT

Beginning at a point in the bed of Eagle Road (30 ft wide) extending along said Eagle Road north sixty six degrees zero minutes thirty seconds west one hundred and seventeen ft and two tenths of a foot to a point; thence extending north seventy nine degrees three minutes twenty seconds east one thousand seven hundred and seventy six ft and two tenths of a foot to a point; thence extending north seventy five degrees forty two minutes east three hundred and eleven ft and fifteen one hundredths of a foot to a point; thence extending north fifty seven degrees twenty eight minutes and thirty seconds east fifty five ft and sixteen one hundredths of a foot to a point; thence extending north thirty nine degrees thirty seven minutes east two hundred and thirty seven ft and twenty three one hundredths of afoot to a point; thence extending north fifty two degrees twenty seven minutes east fifty two ft and eight one hundredths of a foot to a point; thence extending north seventy three degrees eight minutes east four hundred and eight ft and eighty five one hundredths of a foot to a point; thence extending north seventy four degrees twenty nine minutes east two hundred and nineteen ft and forty six one hundredths of a foot to a point; thence extending north seventy three degrees fifty nine minutes east five hundred and eighteen ft and fourteen one hundredths of a foot to a point. Such named point is located in the middle of the intersection of Eagle Road and King of Prussia Road; thence extending along King of Prussia Road north twenty five degrees eighteen minutes forty seconds west four hundred and eighty five ft and sixty eight one hundredths of a foot to a point; thence leaving aforesaid King of Prussia Road and extending south sixty eight degrees two minutes and thirty seconds west twenty eight ft to an iron pin; thence extending along the same courses four hundred and twenty nine ft and sixty five one hundredths of a foot to a point; thence extending north sixty four degrees thirty

nine minutes and thirty seconds west one thousand five hundred and twelve ft and sixteen one hundredths of a foot to an iron pin; thence extending south fifty seven degrees fifty seven minutes fifty eight seconds west one hundred and seventy six ft and eighteen one hundredths of a foot to a point; thence extending north thirty three degrees forty three minutes and two seconds west eight hundred and fifty two ft and eighty five one hundredths of a foot to a point; thence extending north fourteen degrees fifty eight minutes twenty seven seconds west four hundred and fifty one ft and eighty nine one hundredths of a foot to a point; thence extending along the same course forty two ft and thirty five one hundredths of a foot to a point in the bed of Upper Golf Road; thence extending along aforesaid Upper Gulph Road south eighty five degrees fifty six minutes forty seven seconds west two hundred and eighty seven ft and one tenth of a foot to a point, thence extending along the same course seventy six ft and forty one hundredths of a foot to a point; thence leaving aforesaid Upper Gulph Road and extending south fourteen degrees thirty five minutes and four seconds east twenty eight ft and eight tenths of a foot to an iron pin; thence extending along the same course six hundred and forty eight ft to an iron pin; thence extending south fifty seven degrees thirty five minutes forty five seconds west two hundred and three ft and three hundredths of a foot to a point; thence extending along the same course three hundred and thirty five ft to a monument; thence extending north sixty nine degrees forty four minutes west one hundred and ninety nine ft and twenty five one hundredths of a foot to an iron pin; thence extending south five degrees fifty minutes and fifteen seconds east one hundred and seventy seven ft and seven one hundredths of a foot to a monument; thence extending north fifty seven degrees thirty five minutes forty five seconds east ninety six ft and forty seven one hundredths of a foot to an iron pin; thence extending south thirty degrees twenty eight minutes and five seconds east five hundred and forty five ft and eighty six one hundredth, of a foot to an iron pin; thence

extending south seventeen degrees twenty four minutes and forty two seconds west eight hundred and fifty two ft and twenty two one hundredths of a foot to an iron pin; thence extending south eleven minutes forty one seconds west five hundred and eighty nine ft and forty three one hundredths of a foot to an iron pin; thence extending along the same course twenty three ft and eighty one one hundredths of a foot to the point and place of beginning in the bed of Eagle Road.

GRACE HALL PARCEL

All those certain Premises situate in the Township of Radnor, County of Delaware, Commonwealth of Pennsylvania and more particularly described in a Lease Line Plan for Cabrini College prepared by Site Engineers, Inc. dated June 15, 1988 and last revised on September 8, 1988, Drawing C 2A.

Starting from a point in the bed of Upper Gulph Road (30' wide), extending South fourteen degrees thirty five minutes four seconds east six hundred and forty eight feet to an iron pin: thence South fifty seven degrees thirty-five minutes forty five seconds West two hundred and sixty eight feet and three one hundredths of a foot to a point: thence South sixteen degrees thirty five minutes eighteen seconds East four hundred and twenty feet to the beginning point: thence continuing from the beginning point along the same course five hundred and fifty nine feet and eight hundredths of a foot: thence North seventy three degrees twenty four minutes and forty two seconds East six hundred and thirty five feet to a point: thence North sixteen degrees thirty five minutes and eighteen seconds West three hundred and sixty feet to a point; thence South seventy three degrees twenty four minutes forty two seconds West one hundred feet to a point; thence North sixteen degrees thirty five minutes and eighteen seconds West one hundred and ninety nine feet and eight one hundredths of afoot to a point: thence south seventy three degrees twenty four minutes and forty two seconds West five hundred and thirty feet to a point and place of the beginning.

CONTAINING 7.7 acres more or less.

Delaware County Planning Department
and the
Delaware County Regional Water
Quality Control Authority

Delaware County Act 537 Sewage Facilities Plan Update

Eastern Service Area

DOCUMENT FOR MUNICIPAL REVIEW AND ADOPTION

June 2013

Prepared by

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1400 Weston Way
P.O. Box 2653
West Chester, PA 19380

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PLAN SUMMARY

This plan is an update of the existing Delaware County Act 537 Sewerage Facilities Plan Update: Eastern Plan of Study that was approved by PADEP on May 5, 2003. This is a multi-municipal plan for the DELCORA Eastern Service Area, which is currently serviced by in part by DELCORA's Western Regional Treatment Plant (WRTP) and by the Philadelphia Water Department's (PWD) Philadelphia Southwest Water Pollution Control Plant (SWWPCP). The Eastern Service Area encompasses 31 municipalities the eastern portions of Delaware and Chester Counties. These municipalities are served by the Central Delaware County Authority, Muckinipates Authority, Darby Creek Joint Authority, and Radnor-Haverford-Marple Sewer Authority. An additional 11.5 square miles of Delaware County is served by PWD's Cobbs Creek Interceptor, which sends flows directly to SWWPCP. In total, the planning area contains 72.4 square miles in Delaware County.

When this planning effort was initiated, DELCORA was in negotiations with PWD regarding a new contract to treat a portion of the wastewater generated in the Eastern Service Area. The purpose of this plan was to examine reasonably feasible sewage disposal alternatives that are both environmentally and economically sound. The alternatives considered during the sewage facilities planning process were:

1. Diverting flow to the DELCORA's WRTP,
2. Constructing a new treatment facility,
3. Continued use of existing facilities and sending flow to PWD's SWWPCP for treatment,
4. Constructing equalization tanks.

Included in all four alternatives is continued aggressive elimination of inflow and infiltration (I&I) to the collection systems in the Eastern Service Area.

The evaluation of these alternatives led to the selection of Alternative 3, continuing to send wastewater to Philadelphia for treatment, as the most implementable and economically advantageous to the residents of the Eastern Service Area. This alternative includes either the adoption and implementation of a Lateral Inspection and Repair/Replacement Time of Sale Ordinance or development of a written, municipality-specific I&I reduction plan.

A detailed cost evaluation of all the alternatives was performed for this Act 537 Plan Update. The major cost components for Alternative 3 include the following payments to PWD over the 15 year life of the agreement:

1. An average of approximately $11.4 million per year for wastewater treatment,
2. An average of $4.3 million per year for DELCORA's portion of PWD's compliance with their Long-Term Control Plan,
3. Any exceedance (peak flow) charge due to wet weather I&I.

DELCORA is committed to this course of action and on April 1, 2013, DELCORA executed a new 15-year agreement with PWD for the continued treatment of wastewater at SWWPCP. The implementation schedule and intermediate benchmark dates are noted in the table below.

Implementation Schedule for Alternative 3

Milestone	Date
PADEP approval. the Act 537 Plan	Time Zero
Continued implementation of public sewer I&I elimination and reporting of past and planned activities in the annual Chapter 94 report.	1 month from Time Zero
Municipal development and adoption of a Lateral Inspection and Repair/Replacement Time-of-Sale Ordinance or Develop and initiate implementation of a municipality-specific I&I reduction plan.	12 months from Time Zero

CHAPTER 1
PREVIOUS WASTEWATER PLANNING

1.1 INTRODUCTION

Delaware County is located in the southeastern corner of Pennsylvania. The County is bounded on the east by the City of Philadelphia and Montgomery County, on the southeast by the Delaware River and the State of New Jersey, on the southwest by the State of Delaware and on the northwest by Chester County. Figure 1-1 shows Delaware County in its regional setting. Although the County is the third smallest in the state in terms of land area (184.43 square miles), it has the fifth largest population (558,989) according to the 2010 Census. Of the 49 municipalities comprising the County, 19 have areas of less than one square mile, and eleven others do not exceed two square miles (see Figure 1-2).

Most of the wastewater treatment in Delaware County is performed by the Delaware County Regional Water Quality Control Authority (DELCORA). DELCORA has two primary service areas as shown on Figure 1-2. A more in-depth discussion of DELCORA's service areas and sewage facilities is found in Chapter 3 of this Plan.

1.2 HISTORICAL PLANNING

Considerable wastewater planning has taken place since the approval of the 1971 *Delaware County Sewerage Facilities Plan.* This planning has occurred at all levels of government including federal, regional, county, and local municipal levels. Table 1-1 provides a brief history of wastewater planning affecting the Eastern Service Area (Eastern SA) from 1928 to 2012.

1.2.1 Federal Wastewater Planning

At the federal level, EPA has provided incentives for regional and area-wide planning. The Construction Grants Program (Federal Water Pollution Control Act, P.L. 95-500, and its implementing regulations) provided funds for required area-wide facilities or "201" plans (Step 1) prior to funding wastewater facilities design (Step 2) and construction (Step 3). This program was subsequently delegated to the Pennsylvania Department of Environmental Resources (DER),

Table 1-1

History of Wastewater Planning in Delaware County 1928 - 2012

Year	Event
1928	Delaware County Board of Engineers formed to evaluate the County's sewage facility needs.
1931	Board of Engineers' report recommends construction of six sewage systems: Darby Creek Joint, Muckinipates, Central Delaware County, Eddystone, City of Chester, and Marcus Hook. All recommendations were implemented by 1960.
1931-1967	Planning by individual municipalities leads to construction of the Radnor-Haverford-Marple (RHM), Tinicum, Media, Rose Valley, Brookhaven, and Southwest Delaware County systems.
1967	Passage of Act 537, the Pennsylvania Sewage Facilities Act. Requires all municipalities to prepare a ten-year sewage facilities plan to address their needs. Following a Pennsylvania Department of Health (PDH) recommendation, all 49 municipalities in Delaware County pass resolutions authorizing the Delaware County Planning Commission (DCPC) to prepare a County sewage facilities plan.
1971 (Jul)	Delaware County Sewerage Facilities Plan identifies needs and recommends a regionalized sewer system for as much of the County as possible.
1971 (Oct)	Delaware County Regional Water Quality Control Authority (DELCORA) is created by the Delaware County Commissioners to implement the recommended plan and is given the authority to finance, construct, and operate all interceptor systems, pumping stations, and treatment plants in the County except (1) the Upper Darby-Haverford system (which discharges directly to the City of Philadelphia network) and (2) the Bethel Township Sewer Authority system (which discharges to New Castle County). Municipal agencies retain control of local collection systems except for the Chester City, Parkside, and Upland collection systems operated by DELCORA.
1972 (Nov)	*Delaware County Regional Sewerage Project* report by Albright and Friel, division of Betz Environmental Engineers (analysis performed in 1971).
1972	Federal Water Pollution Control Act Amendments of 1972 (Clean Water Act). Extensive regulatory and grants program for planning, design, and construction of wastewater control facilities. Section 303 of this Act established water quality standards and the calculation of total maximum daily loads (TMDLs) that a water body can receive and still meet water quality standards.
1974	In response to the Pennsylvania Clean Streams Law, the Pennsylvania Department of Environmental Resources (DER) begins to develop the Comprehensive Water Quality Management Plan for Southeastern Pennsylvania (COWAMP).
1975	Governor designates the Pennsylvania portion of the Philadelphia SMSA as a 208 study area, making the region eligible for a federal area-wide waste treatment management planning grant. With receipt of federal funds, the COWAMP and 208 programs are merged to become the COWAMP/208 Plan, with a goal of comprehensive evaluation of water quality. Existing plans already being implemented for the Regional Sewerage Project were accepted as part of the COWAMP program.
1977	Clean Water Act: 1977 Amendments to the Federal Water Pollution Control Act. Provides additional funding authorization, institutional changes, and a shift in technical emphasis to favor new waste treatment technology and control of toxic pollutants.
1978	Draft *COWAMP/208 Water Quality Management Plan* completed. Suggests alternatives for addressing sewerage needs of the upper Ridley Creek and Crum Creek watersheds and the Chester Creek watershed, but no single alternative is selected.
1979	*Supplement No. 1 to COWAMP/208 Water Quality Management Plan for Southeastern Pennsylvania*. Contains post-publication additions and corrections to the COWAMP/208 plan, including several major changes in recommendations for Delaware County.
1985	EPA issued regulations that implemented Section 303(d) of the Clean Water Act.

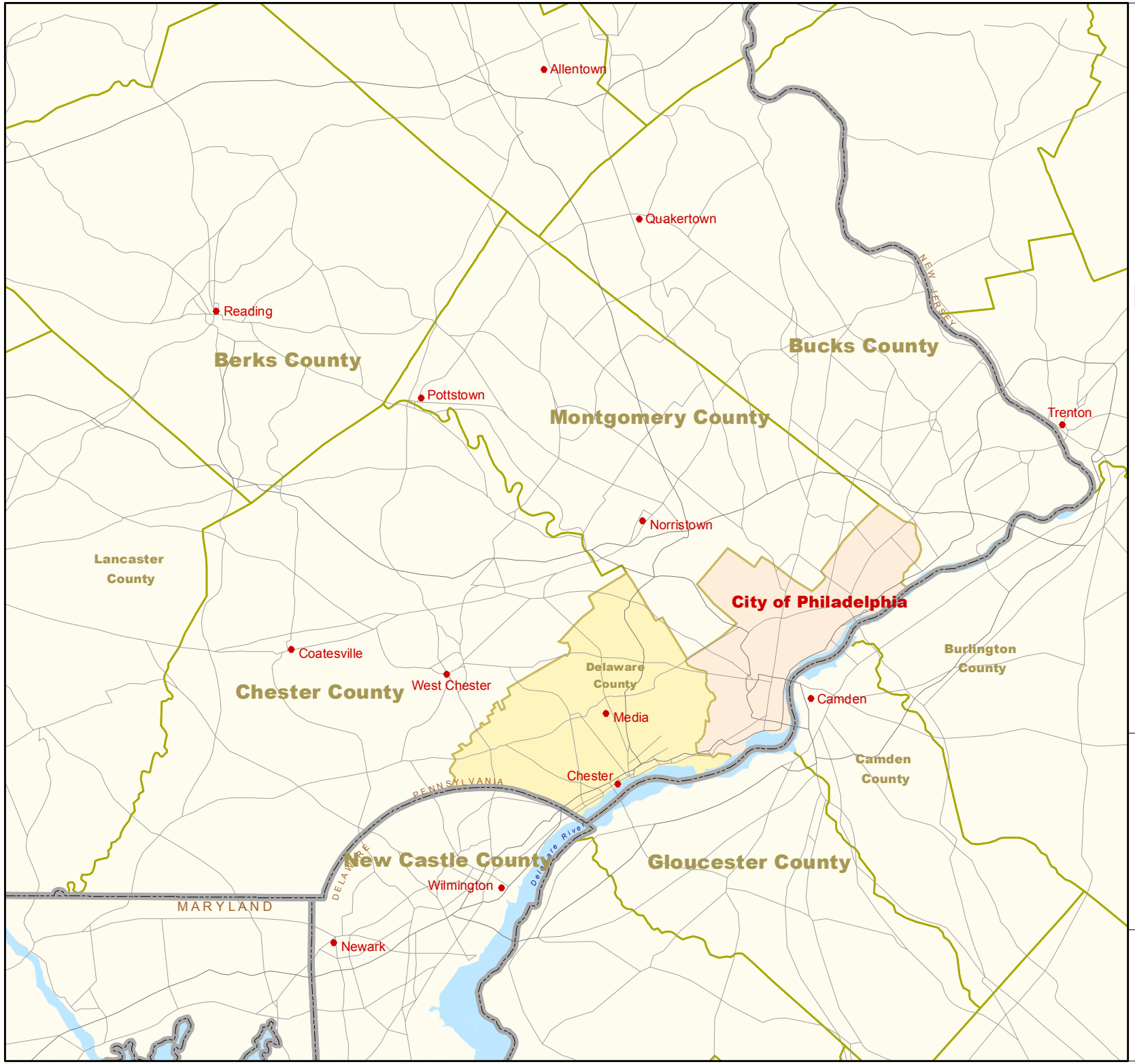
Table 1–1 (cont.)

History of Wastewater Planning in Delaware County 1928 – 2010

Year	Event
1987	Water Quality Act of 1987: amends Federal Water Pollution Control Act. For Delaware County, some of the more significant provisions include creation of (1) a program providing grants to states for establishing water pollution control revolving funds, and 2) the National Estuary Program, with Delaware Bay given priority consideration.
1988	PENNVEST. State legislation creating a revolving fund to provide loans and grants for water and wastewater facilities. Referendum approved to provide funding.
1990	EPA Phase I of the NPDES Stormwater Program addressed the negative impact of stormwater runoff on water quality. Municipal separate storm sewer systems that serve populations of 100,000 or more, eleven categories of industrial activities and construction activities disturbing 5 acres or more were required to obtain NPDES permit coverage.
1992	EPA issues current TMDL regulations that included a 2-year listing cycle for states to list impaired and threatened waters, a TMDL must include point and nonpoint sources, TMDLs are subject to public review, etc.
1999	Phase II of the NPDES Stormwater Program was published by EPA requiring permit coverage for certain small municipal separate storm sewer systems and construction activities between 1 and 5 acres.
2000	EPA published revised regulations for the implementation of TMDLs. In 2001, began to reexamine the published rule and after consulting with stakeholders, began to redraft the rule. On March 19, 2003, EPA withdrew "Revisions to the Water Quality Planning and Management Regulation and Revisions to the National Pollutant Discharge Elimination System Program in Support of Revisions to the Water Quality Planning and Management Regulation" or what was referred to as the "July 2000" rule.
2002	Municipalities adopted the updated Act 537 Plan for the Eastern Region
2009	PADEP approved Act 537 Sewage Facilities Plan Revision for Rerate of the Western Regional Treatment Plant.
1971-2013	Municipalities within the Eastern SA continue to update individual Act 537 as required.

Source: Adapted from DCPD, 2002; Weston Solutions, Inc., 2003

now Department of Environmental Protection (PADEP). The program, with its related planning requirements, continued through amendments contained in the Clean Water Act (1977) and the Water Quality Act of 1987, although at lower funding levels than in previous years. The 1987 Act cut construction grant funding back even further, but at the same time added a new Section 601, "Grants to States for Establishment of Revolving Funds," which provides for loans to finance facility planning (and design and construction) and limited funds for area-wide planning. Today this state-level program is known as the Pennsylvania Infrastructure Investment Authority (PENNVEST). Table 1-2 lists recent PENNVEST loans and grants in the Eastern SA.



Legend

- State Boundary
- County Boundary

N
W E
S

0 2 4 8 12 16
Miles

Figure 1-1
Regional Setting

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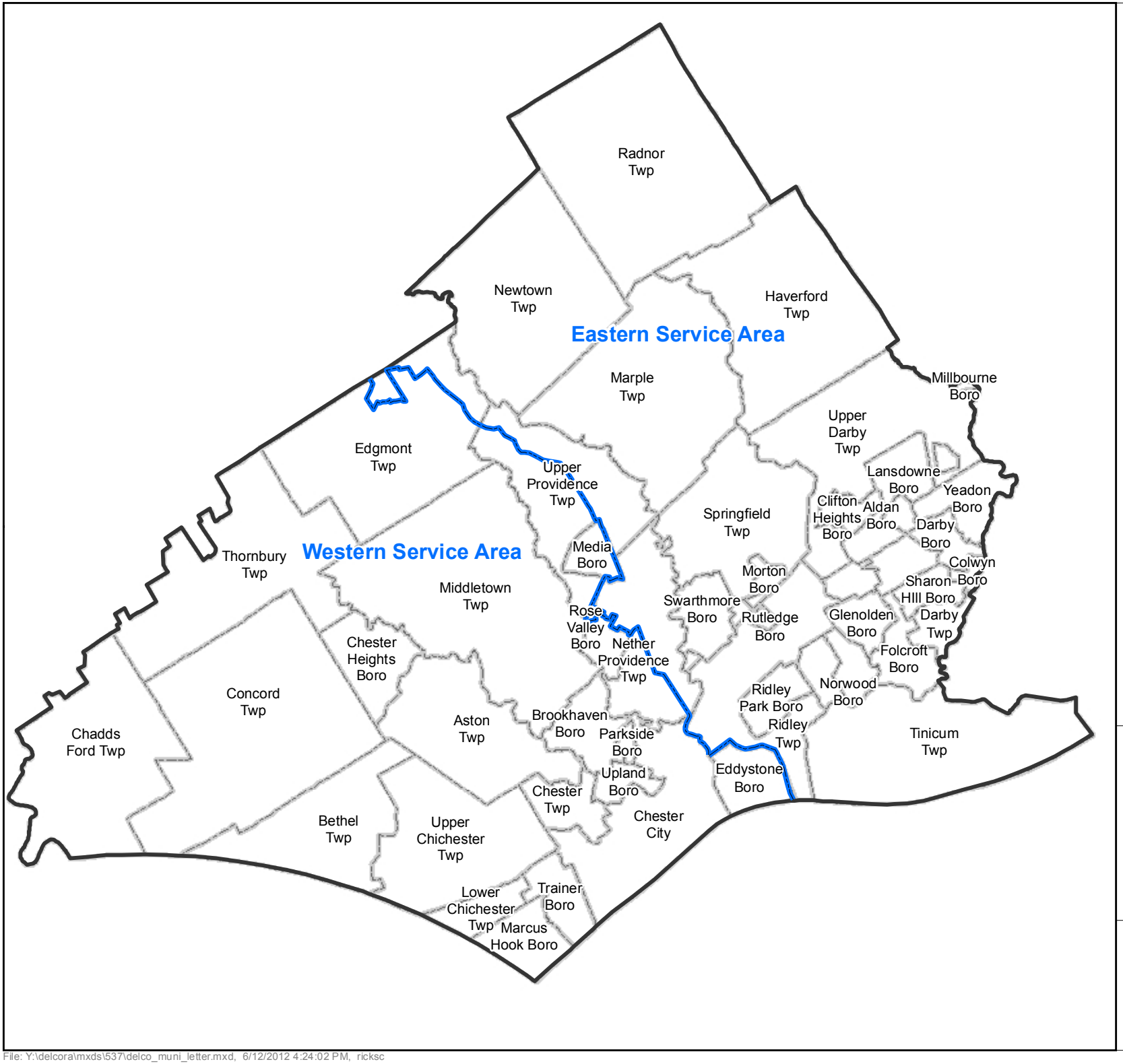

Figure 1-2
Delaware County Municipalities

Table 1-2

PENNVEST Loans in the Eastern Service Area

Municipality/ Authority	Project Description	Project Type	Date of Approval	Amount
Prospect Park Borough	repair sewer trunk line & manholes	Wastewater	4/4/1990	$70,370
Ridley Township	manhole repairs to reduce I&I	Wastewater	9/26/1990	$138,407
Brookhaven Borough	storm water inlets & piping	Stormwater	3/23/1994	$195,460
Eddystone Borough	storm sewers	Stormwater	3/23/1994	$1,402,625
Prospect Park Borough	new storm water drainage system	Stormwater	11/30/1994	$128,374
Ridley Park Borough	stormwater dam project	Stormwater	11/30/1994	$650,000
Ridley Park Borough	stormwater improvement project	Stormwater	11/30/1994	$650,000
Ridley Township	upgrade & extend stormwater drainage system	Stormwater	11/30/1994	$1,242,500
Ridley Township	stormwater drainage improvements in 12 areas	Stormwater	7/16/1997	$1,250,000
DELCORA	upgrade CDCA pump station & new force main	Wastewater	11/17/1999	$5,009,000
Lansdowne Borough	replace sewer lines	Wastewater	7/12/2000	$1,827,781
Lansdowne Borough	storm sewer improvements	Stormwater	7/12/2000	$1,538,741
Morton Borough	replace sewer lines in 4 areas	Wastewater	3/20/2002	$407,675
Aqua PA	Crum Water Treatment	Drinking Water	11/20/2002	$9,785,463
Aqua PA	Crum Filtration Improvements	Drinking Water	4/14/2008	$1,493,848
DELCORA	Collection System Improvement Project	Wastewater	7/21/2009	$10,038,785
Villanova University	Down Spout Disconnection Program	Stormwater	7/21/2009	$55,912

Source: PENNVEST website, https://www.pvportal.state.pa.us/projectsearch/projectsearch.aspx (6/1/2012)

In 1974, DER (now PADEP) began work on a Comprehensive Water Quality Management Plan for Southeast Pennsylvania (COWAMP) under Pennsylvania's Clean Streams Law. This work and federally initiated planning under Section 208 of the Water Pollution Control Act were merged, and the combined COWAMP/208 Plan was published in draft form in 1978 and supplemented in 1979. The plan was intended to serve as a guide to wastewater planning in southeastern Pennsylvania. While the plan was unable to reach consensus on recommended actions for specific geographic areas in Delaware County, other than to recommend additional "201" facilities planning studies, it did provide policy guidance. Although the plan recognized that public sewers would continue to be a viable solution for wastewater problems in many areas, its emphasis was also focused on alternative "non-sewer" methods of wastewater disposal. Land application and the maintenance and management of on-lot sewage disposal systems (OLDS) were stressed as considerations for future planning.

Section 303 of P. L. 92-500 provided for planning for an even larger area, and the *Delaware River Basin Comprehensive Study* was partially funded by that program. With the

1987 amendments to the Act, the Delaware Estuary was given special attention, and planning efforts began to identify the full spectrum of needs related to this major water resource.

1.2.2 State/County Wastewater Planning

On January 24, 1966, the Pennsylvania Sewage Facilities Act (Act 537, as amended) was enacted to correct existing sewage disposal problems and prevent future problems. Act 537 requires municipalities to prepare 10-year plans to address their sewage facility needs. As recommended by the Pennsylvania Department of Health (PDH), all 49 municipalities in Delaware County passed resolutions authorizing DCPC to prepare a County sewage facilities plan on their behalf. The resulting 1971 *Delaware County Sewerage Facilities Plan* identified needs and recommended a regionalized sewer system for as much of the County as possible.

1.2.3 Delaware County Regional Sewerage Project

As a follow-up to the 1971 *Delaware County Sewerage Facilities Plan*, detailed engineering studies were undertaken for the County by Albright and Friel, a division of Betz Environmental Engineers, resulting in the 1972 report, *Delaware County Regional Sewerage Project*. The report divides the County into two service areas: the predominantly skewered area east of Crum Creek and the western area that includes the Chester and Ridley Creek watersheds and the upper Crum Creek watershed above the Geist (Springtown) Reservoir. While the lower portions of the watersheds were largely skewered and included major wastewater producing industries, the upper portions were largely answered, with high growth potential.

The Plan recommended conveying wastewater from Radnor-Haverford-Marple Sewer Authority (RHM), Darby Creek Joint Authority (DCJA), Muckinipates, Tinicum, and Central Delaware County Authorities (CDCA) to an expanded and upgraded Philadelphia Southwest Water Pollution Control Plant (SWWPCP) for treatment. For the remaining portions of the County, it recommended conveying all wastewater to an existing, upgraded and expanded plant in Chester City for treatment, as well as gradual phase out of all other treatment facilities, including nineteen institutional plants. Implementation was to occur by 2020, in four stages. It recommended creation of a County-level sewer authority in Phase I to implement the recommended plan and to assume responsibility for its continued operation. The resulting County-level authority was the Delaware County Regional Water Quality Control Authority

(DELCORA). Following approval by the Delaware County Commissioners at a public hearing, the PA DER (now PADEP) accepted this report as a guide to the design of wastewater facilities in the study area.

Since 1972, municipalities in the eastern portion of the County have prepared, adopted, and received PADEP approval for complete updates or major revisions to their Act 537 Plans. The single most significant County-wide sewage facility planning effort has been the *Delaware County Act 537 Sewage Facilities Plan, Eastern Plan of Study*, which was approved in 2002 by the following municipalities:

- Aldan Borough
- Clifton Heights Borough
- Collingdale Borough
- Colwyn Borough
- Darby Borough
- Darby Township
- East Lansdowne Borough[(1)]
- Edgmont Township
- Folcroft Borough
- Glenolden Borough
- Haverford Township
- Lansdowne Borough
- Marple Township
- Millbourne Borough[(1)]
- Morton Borough
- Newtown Township
- Nether Providence Township
- Norwood Borough
- Prospect Park Borough
- Radnor Township
- Ridley Township
- Ridley Park Borough
- Rutledge Borough
- Sharon Hill Borough
- Springfield Township
- Swarthmore Borough
- Upper Providence Township
- Upper Darby Township
- Yeadon Borough
- Tredyffrin Township, Chester County
- Easttown Township, Chester County

[(1)]Flow directly to SWWPCP

The 2002 Eastern Plan of Study included I&I studies of the collection systems in each municipality. Since large portions of the Eastern SA are sewered, the plan recommendations focused on actions to manage or reduce I&I. Specifically, it was recommended that the municipalities and eastern authorities implement the corrective action plan (CAP) in the individual I&I studies, install flow meters to measure the effectiveness of the CAP, and to identify/monitor existing on-lot disposal systems. DELCORA, while having no operational or maintenance control over the individual municipal collection systems, agreed to provide technical assistance for CAP implementation, institute a cooperative purchase program, provide a forum for an area-wide metering program, and evaluate a funding assistance program.

In 2002, DELCORA implemented a cooperative purchase program for the procurement of manhole lid inserts to prevent inflow. In 2006, an area-wide flow metering program was

initiated after over a year of discussions with the municipalities and an evaluation of sewer flow metering technology. This program is ongoing today with 109 meters deployed in the Eastern SA and 10 meters deployed in the Western SA.

1.2.4 Municipal Wastewater Planning

Since the preparation of the 1971 *Delaware County Sewerage Facilities Plan*, numerous municipal sewerage feasibility studies and facilities plans have been prepared. The recommendations of these studies and plans and the responses of various local regional, state, and even federal agencies to those recommendations have shaped the specific components of the County's sewage facilities network over the past thirty years.

The following section summarizes local planning efforts in the Eastern SA municipalities in the context of County and regional plans and in accordance with state and federal regulatory requirements.

1.2.5 Other Related Planning

In the last few decades, government and public organizations in the planning area prepared numerous reports that directly or collaterally address wastewater issues in the last several decades. Some reports were prepared pursuant to state regulations while others were dedicated to specific projects.

Stormwater management planning under Pennsylvania Act 167 has been completed for all of Delaware County's watersheds with the exception of the Brandywine Creek and areas that are directly tributary to the Delaware River. Act 167 Stormwater Management Plan (SWMP) approval dates are as follows:

- Ridley Creek (1998)
- Chester Creek (2003)
- Darby-Cobbs Creek (2005)
- Crum Creek (2012)

With the exception of Ridley Creek, which was prepared before stormwater quality requirements took effect, all of the SWMPs, require municipal adoption of a model ordinance that includes criteria for determining pre- and post-development runoff rates, performance

standards for managing stormwater runoff, criteria for stormwater management system design, water quality control criteria, and groundwater recharge requirements. The model ordinance also prohibits the discharge of stormwater to a sanitary sewer. Article VIII, Section 803.A of the model ordinance states "Roof drain and sump pumps shall not be connected to sanitary sewers."

1.3 OTHER ENVIRONMENTAL PLANS

1.3.1 Water Quality Requirements

Pennsylvania regulations specifically address water quality standards in 25 Pa. Code § 93. Chapter 93 sets statewide water uses for all surface waters. The lower main stem portions of Chester Creek and Ridley Creeks are designated as Warm Water Fisheries. Headwater tributaries are designated as Trout Stocking Fisheries. Ridley Creek above the Aqua (Media) Waterworks is designated High Quality, and portions of Crum Creek are designated as Exceptional Value.

Chapter 93 water quality criteria are associated with the statewide water uses listed previously and apply to all surface waters unless otherwise indicated. The criteria specify such parameters as pH, temperature, dissolved oxygen (DO), color, bacteria count, nutrients, priority pollutants, and others.

Clean Water Act Section 305(b) requires a report on all impaired waters of the Commonwealth. Section 303(d) further evaluates these findings to determine which waters still would not support specified uses even after the appropriate required water pollution technology has been applied. Section 303(d) also establishes the total maximum daily load (TMDL) program. In Pennsylvania, the 305 (b) report is now known as the Integrated Water Quality Monitoring and Assessment Report. The 303 (d) category is now referred to as Category 5 Water bodies. Category 5 Water bodies are impaired due to pollutants and require a TMDL. The 2010 Category 5 list includes portions of Chester Creek. Causes of impairment include municipal point sources and organic enrichment/low DO, nutrients, and suspended solids from package sewage treatment plants. A majority of the streams in the Eastern SA are listed as not attaining their designated use with the source cause being typically reported as "Urban Runoff/Storm Sewers - Cause Unknown; Urban Runoff/Storm Sewers - Water/Flow Variability; Urban Runoff/Storm Sewers - Siltation; Habitat Modification - Other Habitat Alterations".

Figure 1-3 depicts these streams in the service area that are listed in the 2010 Pennsylvania Integrated Water Quality Monitoring and Assessment Report.

1.3.2 State Water Plan

The Pennsylvania State Water Plan was originally developed in the 1970s and divided the state's major river basins into twenty smaller units (sub basins) for planning purposes. Most of these sub basins were further divided into watershed areas that range in size from 100 to 1000 square miles. Delaware County is located in Sub basin 3 (Lower Delaware River). Watershed Area G (Darby-Crum Creeks) covers all of the study area.

The State Water Plan was updated in March, 2009. It addressed a general understanding of water resources and examined problems and viable solutions. The plan consists of inventories of water availability, an assessment of current and future water use demands and trends, assessments of resource management alternatives and proposed methods of implementing recommended actions. The plan includes an interactive map on-line, enabling display of watershed characteristics including impaired streams, special protection waters, public water supply areas, and impervious land cover.

Watershed G, known as the Darby-Crum Creeks watershed, has an approximate drainage area of 231 square miles and also includes Ridley Creek, Chester Creek, and other tributaries flowing directly into the Delaware River Estuary from Tinicum to Marcus Hook. The watershed is characterized by a combination of point and nonpoint pollution sources, including urban runoff, stormwater management, stream bank erosion, hydromodification, combined sewer overflows (CSOs), heavy industry, and commercial development. Many developments in this watershed are encroaching on floodplains, creating a flooding hazard during storm events. For example, severe flooding occurred in the lower portions of the watershed during record rainfall from Hurricane Floyd in 1999.

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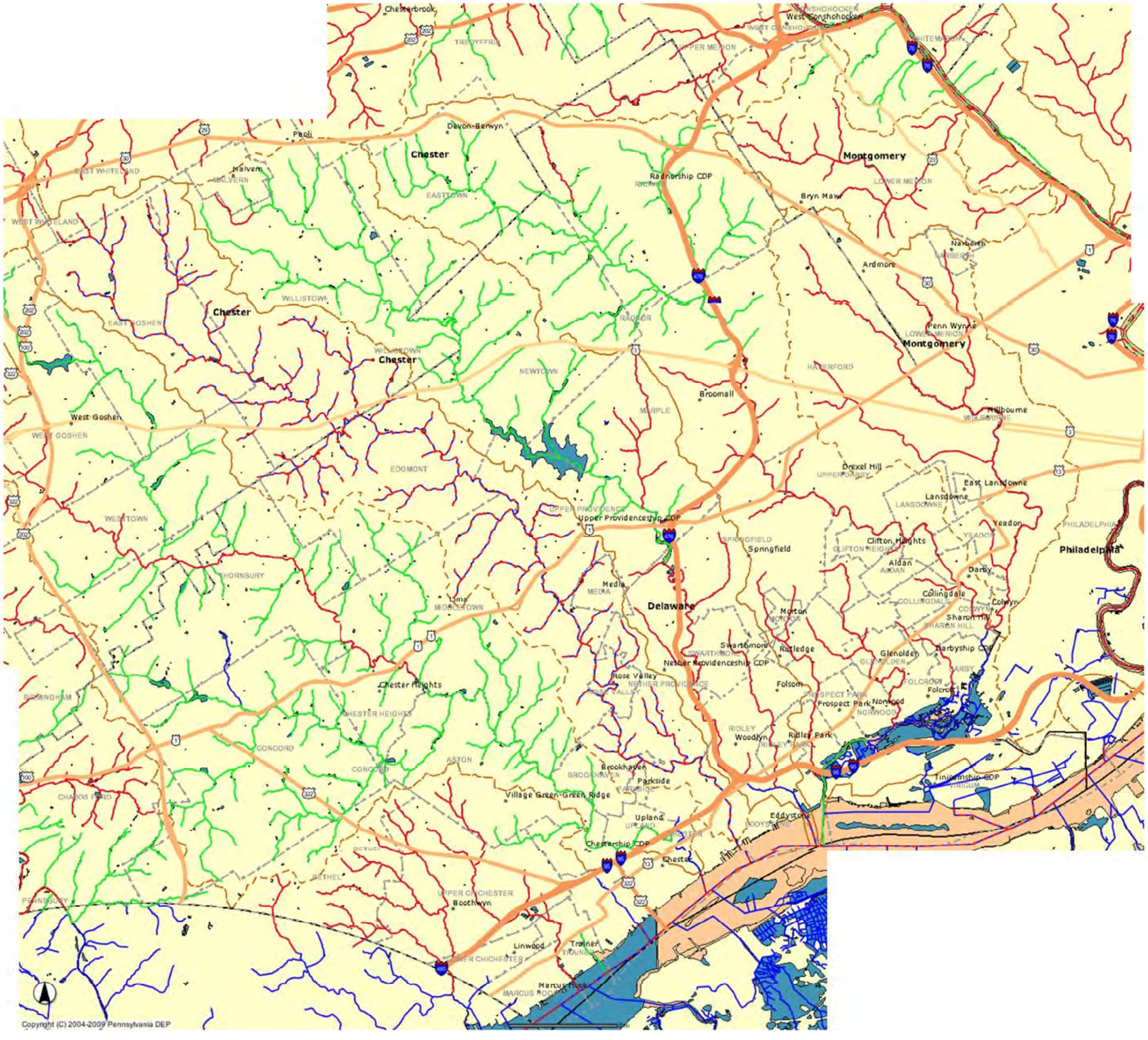

Legend

- Streams
- Not Attaining Designated Use
  - Approved
  - Tentative
- Attaining Designated Use
  - Approved
  - Tentative

Figure 1-3
Stream Attainment in
Delaware County

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CHAPTER 2
PHYSICAL AND DEMOGRAPHIC ANALYSIS

2.1 IDENTIFICATION OF STUDY AREA

The wastewater flows generated in the DELCORA Eastern SA have been treated at the City of Philadelphia's Southwest Water pollution Control Plant (SWWPCP) for over 30 years. The previous long-term agreement with the Philadelphia Water Department (PWD) that allowed this treatment expired in 2007. In 2011, DELCORA negotiated an interim 2-year agreement with the PWD while it dealt with issues related to Philadelphia's CSO Long-Term Control Plan and the cost of implementing the plan over 25 years. DELCORA is commencing planning efforts to evaluate all options for treating wastewater in the study area. Preliminary studies for wastewater treatment indicate there are currently three viable options for treating wastewater from eastern Delaware County: (1) continued treatment at the SWWPCP, (2) treatment at an expanded Western Regional Treatment Plant (WRTP) in Chester, or (3) construct a new Eastern Regional Treatment Plant (ERTP) with discharge to the Delaware River.

DELCORA manages wastewater from 29 municipalities in eastern Delaware County and portions of Chester County. The sources in the Eastern SA currently flow through DELCORA collection systems and pump stations to the SWWPCP. Two additional municipalities (Millbourne and East Lansdowne) flow directly to the SWWPCP. The area flowing directly to the SWWPCP has been designated as the Cobbs Creek SA. Additionally, Tredyffrin and Easttown Townships, located in Chester County, contribute some flow to the collection system, and are included in this plan. The areas under evaluation for this plan are Central Delaware County Authority (CDCA), Muckinipates Authority (MA), Darby Creek Joint Authority (DCJA), Radnor-Haverford-Marple (RHM) Sewer Authority, and the Cobbs Creek SA. Flows from these areas arrive via gravity flow at three DELCORA owned and operated pump stations: Central Delaware Pumping Station (CDPS), Muckinipates Pumping Station (MPS), and Darby Creek Pumping Station (DCPS). All flow from the Cobbs Creek SA drains to the Cobbs Creek Pumping Station and is conveyed to the SWWPCP for treatment. The study area for this Plan Update is shown in Figure 2-1, and includes the following municipalities:

- Aldan Borough
- Clifton Heights Borough
- Collingdale Borough
- Colwyn Borough
- Darby Borough
- Darby Township
- East Lansdowne Borough[(1)]
- Edgmont Township
- Folcroft Borough
- Glenolden Borough
- Haverford Township
- Lansdowne Borough
- Marple Township
- Millbourne Borough[(1)]
- Morton Borough
- Newtown Township
- Nether Providence Township
- Norwood Borough
- Prospect Park Borough
- Radnor Township
- Ridley Township
- Ridley Park Borough
- Rutledge Borough
- Sharon Hill Borough
- Springfield Township
- Swarthmore Borough
- Upper Providence Township
- Upper Darby Township
- Yeadon Borough
- Tredyffrin Township, Chester County
- Easttown Township, Chester County

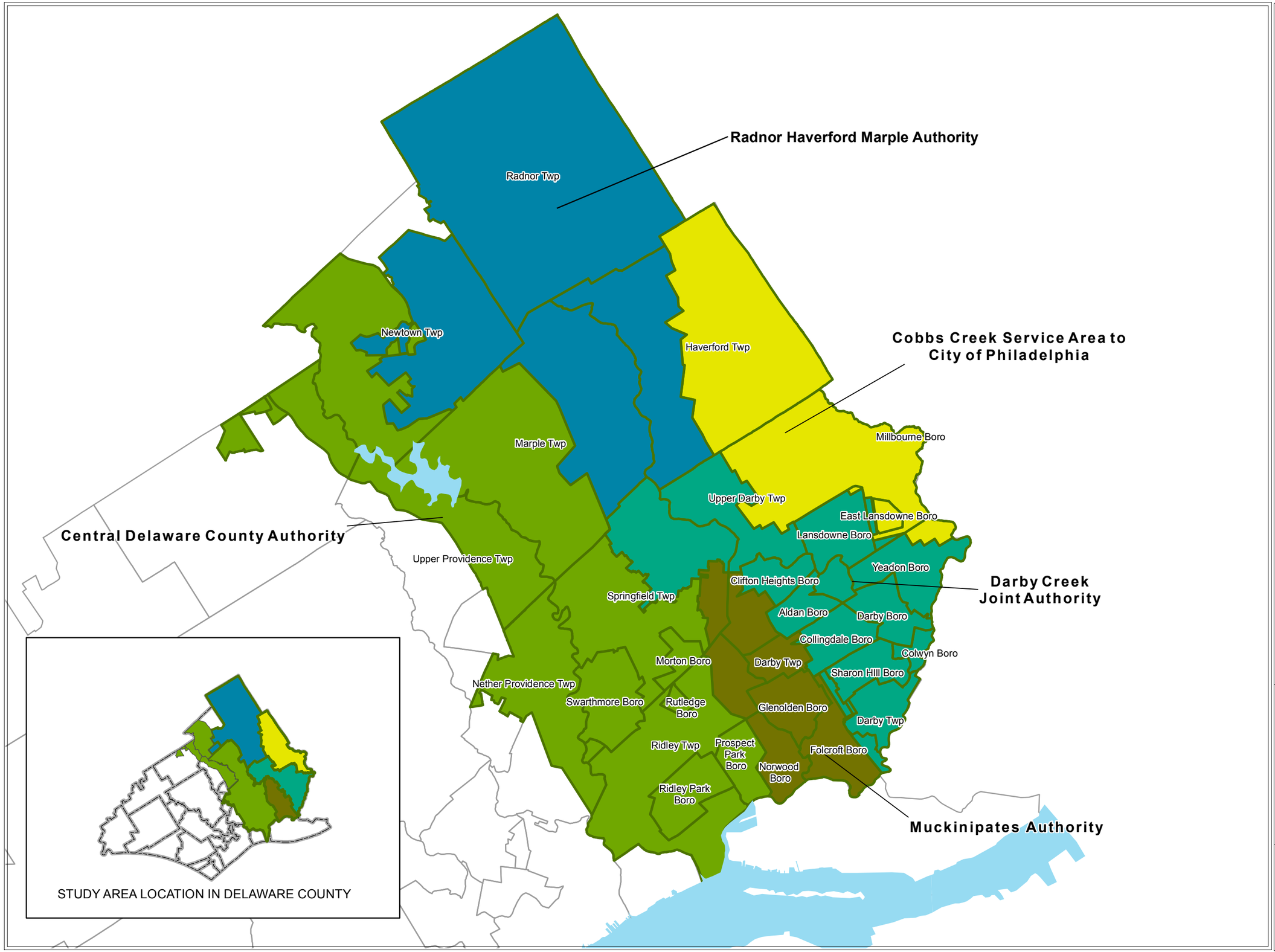
[(1)]Flow directly to SWWPCP

Figure 2-1 also shows the service areas for the five municipal authorities that serve the planning area, as well as the location of the WRTP and pump stations within DELCORA's service area. Tredyffrin and Easttown Townships in Chester County contribute some flow to the RHM, and are included in the plan, as well.

2.2 IDENTIFICATION OF THE PHYSICAL CHARACTERISTICS

Two major topographical areas run through the County. The eastern section of Delaware County is quite level and lies in the Atlantic Coastal Plain. This is an area of low, flat, poorly drained land which extends from the Marcus Hook area northeastward on a line almost paralleling Route 13 between MacDade Boulevard and Chester Pike into the Yeadon area and south to the Delaware River. Much of this land has been improved for industrial and commercial use because of its proximity to the Delaware River.

The western portion of the County is extremely hilly. This area lies north and west of the Coastal Plain and covers the remaining area of the County. It is the beginning of the Piedmont Province, which extends sixty to eighty miles inland from the Coastal Plain. This area includes rolling or undulating uplands, low hills, and well-drained soils. These features give the County its rolling surface, which ranges from a height of 480 feet (in Marple Township) to sea level (at the Delaware River).



Legend

- Authority Boundaries
- Municipal Boundaries
- Cobbs Creak Service Area
- Central Delaware County Authority
- Darby Creek Joint Authority
- Muckinipates Authority
- Radnor Haverford Marple Authority

N

0 1 2 Miles

Figure 2-1
Act 537 Plan Update
Study Area

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Legend

- State Boundary
- County Boundary
- Watershed Boundary

N
W E
S

0 0.25 0.5 0.75 1

Miles

Figure 2-2
Major Watersheds of
Delaware County

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Although all of the land in Delaware County is part of the Delaware River watershed, the County is also divided into eight major subwatersheds which correspond to the County's major streams (see Figure 2-2). The County has many small lakes and farm ponds, as well as the much larger Springton Reservoir, which is located between Marple and Upper Providence Townships.

2.3 SOILS

As per the meeting with PADEP as the Southeast Regional Office on May 23, 2011, and the Plan of Study on November 7, 2011, analysis of soils is not applicable for this plan.

2.4 GEOLOGIC FEATURES

As per the meeting with PADEP as the Southeast Regional Office on May 23, 2011, and the Plan of Study on November 7, 2011, analysis of geologic features is not applicable for this plan.

2.5 TOPOGRAPHY

As per the meeting with PADEP as the Southeast Regional Office on May 23, 2011, and the Plan of Study on November 7, 2011, analysis of topography is not applicable for this plan.

2.6 POTABLE WATER SUPPLIES

As per the meeting with PADEP as the Southeast Regional Office on May 23, 2011, and the Plan of Study on November 7, 2011, analysis of potable water supplies is not applicable for this plan.

2.7 WETLANDS

Wetlands are generally low-lying areas with high water tables that are temporarily or intermittently filled with shallow water. The density of the soil particles in wetland soils results in low percolation rates, causing sewage to seep to the surface and producing wet, smelly, and unsanitary conditions. A high seasonal water table is generally indicative of lateral movement of water to adjacent water bodies, and any alteration of the water movement or water quality in these areas will have a direct impact on neighboring waters. Areas where the water table is at the surface are highly vulnerable to pollution. Therefore, wetlands can be considered areas unsuitable for on-site systems. For more information on the location of wetlands, consult the Soil

Survey of Chester and Delaware Counties for the presence of hydric soils or refer to the National Wetlands Inventory Maps prepared by the U.S. Department of the Interior.

CHAPTER 3
EXISTING SEWAGE FACILITIES IN THE EASTERN SERVICE AREA

3.1 INTRODUCTION

Most of Delaware County's domestic sewage is currently conveyed and/or treated by one or more of the public entities charged with these tasks. Homes and businesses in portions of the County not served by these entities still use individual on-site or community treatment systems constructed to serve their respective homes or businesses. The following is a discussion of those municipal and non-municipal wastewater treatment and conveyance systems operating in the Eastern SA. Note that many of these entities are responsible for the sewage collection and conveyance systems only. DELCORA and the City of Philadelphia are responsible for wastewater treatment as well as portions of the wastewater conveyance system.

Public organizations currently providing sewage treatment or conveyance service within the Eastern SA:

- Delaware County Regional Water Quality Control Authority (DELCORA) (T,C)
- Muckinipates Authority (C)
- Central Delaware County Authority (C)
- Darby Creek Joint Authority (C)
- Radnor-Haverford-Marple Sewer Authority (C)
- City of Philadelphia (T,C)

T – treatment authority
C – conveyance authority

It should be noted that while Tinicum Township is located in eastern Delaware County, they own and operate their own wastewater collection system and treatment plant outside of the Eastern SA.

3.2 WASTEWATER TREATMENT AUTHORITIES

3.2.1 Delaware County Regional Water Quality Control Authority (DELCORA)

3.2.1.1 Organizational Description

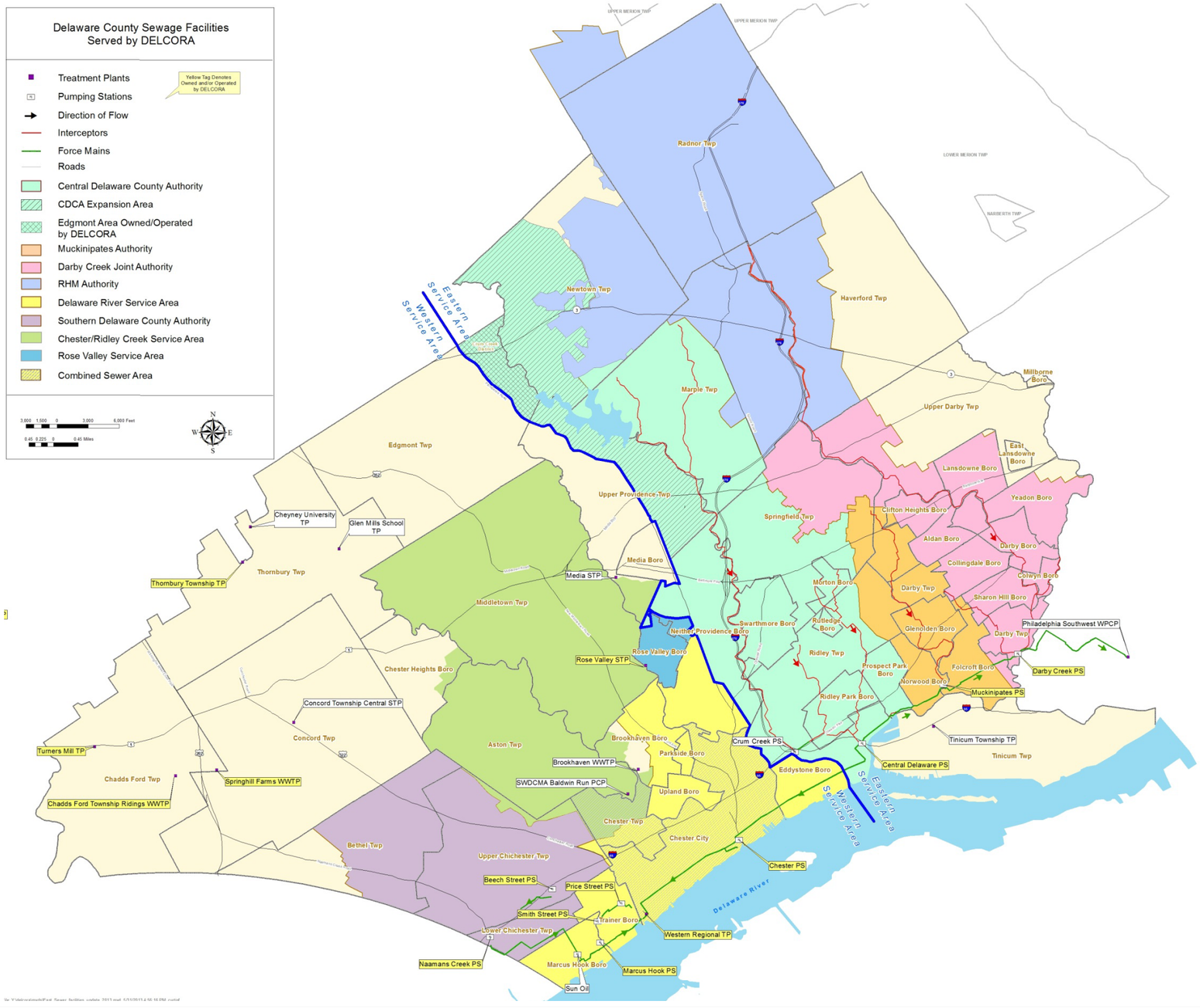
On November 3, 1971, the Delaware County Board of County Commissioners authorized the formation of the Delaware County Regional Water Quality Control Authority (DELCORA)

under the provisions of the Municipalities Act of 1945, as amended and supplemented. DELCORA was incorporated by the Commonwealth of Pennsylvania on November 17, 1971. Under the Articles of Incorporation, DELCORA "shall be organized for the purpose only to acquire, hold, construct, improve, maintain, operate, own and lease, either in the capacity of lessor or lessee, projects of the following kind and character, sewers, sewer systems, or parts thereof, sewerage treatment works, including works for the treating and disposing of industrial waste, in and for the County of Delaware and such other territory, corporations, municipal corporations, authorities, and other governmental bodies or regulatory agencies both within and without the County of Delaware ….." On April 16, 2002, the Delaware County Council adopted Ordinance No. 2002-1, which extended DELCORA's term of existence until January 15, 2052.

DELCORA is governed by a nine-member Board of Directors appointed by the Delaware County Council. DELCORA is managed by a full-time executive director and operated by professional engineering, operational, and financial staff and a workforce of approximately 110 people. DELCORA is financially self-sufficient; capital funds are raised through bond issues, grants, loans, and user charges while operation and maintenance (O&M) expenses and debt service are covered by user charges.

3.2.1.2 Service Areas

DELCORA's facilities serve over 100,000 residential, commercial, institutional, and industrial customers in Delaware and Chester Counties. DELCORA is responsible for the safe collection, transmission, treatment and disposal of approximately 65 million gallons per day (MGD) of wastewater generated in southeastern Pennsylvania (see Figure 3-1). To support this service area, DELCORA owns and operates over 137 miles of gravity sewers and over 14 miles of large-diameter (>24-inch) force mains. Historically, DELCORA has characterized its service areas as "Eastern" and "Western" as established in the 1974 Albreit and Friel plan. The Western Service Area (Western SA) discharges to the Western Regional Treatment Plant (WRTP) and services approximately 84,000 people. The Crum Creek Watershed portion of the Eastern SA (CDCA) discharges a maximum 13.3 MGD of dry weather flow to the WRTP. The Darby Creek Watershed portion of the Eastern SA (MA and DCJA) is conveyed to the Philadelphia Southwest Water Pollution Control Plant (SWWPCP). The Eastern SA services approximately 275,000 residents. Figure 3-2 presents a schematic representation of DELCORA's conveyance system.



Eastern Region Act 537 Plan Update

Delaware County Regional Water Quality Control Authority

FIGURE 3-1

DELCORA SEWAGE FACILITIES IN DELAWARE COUNTY

Figure 1-1.ppt

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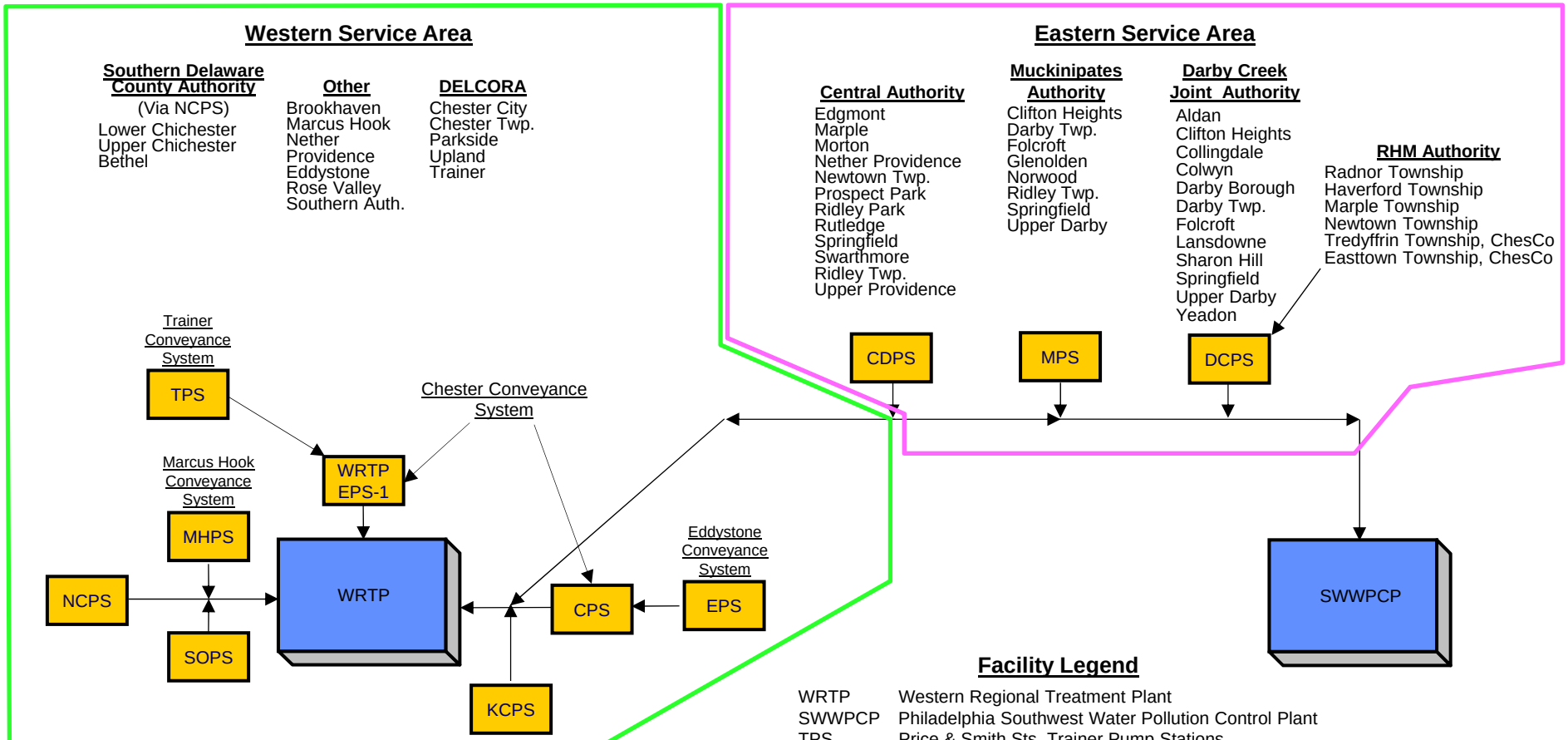

Eastern Region Act 537 Plan Update

Delaware County Regional Water Quality Control Authority

FIGURE 3-2

DELCORA's CONVEYANCE SYSTEM

EASTERN SERVICE AREA

The Eastern SA is composed of four subareas that are served by conveyance authorities. These areas are the Radnor Haverford Marple (RHM) Authority, Darby Creek Joint Authority (DCJA), Muckinipates Authority (MA), and Central Delaware County Authority (CDCA) and are delineated in Figure 2-1 and Figure 3-1. Each of these authorities has a legal agreement with their member municipalities to dispose of their wastewater. In turn, DELCORA has legal agreements with each of the authorities, except RHM, to receive and dispose of the collected wastewater. RHM discharges to the DCJA.

DELCORA owns and operates three large pump stations that serve DELCORA's Eastern SA; they are the Central Delaware County Pump Station, the Muckinipates Pump Station, and the Darby Creek Pump Station. These pump stations are designed to pump the wastewater from DELCORA's Eastern SA to the Philadelphia Southwest Water Pollution Control Plant for treatment. The Central Delaware County Pump Station is also capable of directing flow to the WRTP. Originally constructed in the 1970s, the Central Delaware Pump Station (serving CDCA) is rated for 40 MGD. The pump station discharges though a 1.9-mile, 36-inch-diameter prestressed concrete cylinder pipe (PCCP) force main that runs northeast toward the Muckinipates Pump Station. The next pump station is the 24-MGD Muckinipates Pump Station (serving MA). Here the force main increases to 48 inches in diameter and continues approximately 1.65 miles northeast to the Darby Creek Pump Station. Upon reaching the 60-MGD Darby Creek Pump Station (serving DCJA and RHM), the force main increases in diameter to 66 inches and continues approximately 2.5 miles on to SWWPCP.

WESTERN SERVICE AREA

DELCORA's Western SA is shown in yellow and purple in Figure 3-1. DELCORA owns and operates the collection system in the following communities in the Western SA:

- Chester City
- Chester Township
- Marcus Hook Borough
- Parkside Borough
- Rose Valley Borough *
- Upland Borough
- Trainer Borough

*Note: Rose Valley Borough collection system discharges to its own treatment plant and a portion is discharged to the WRTP.

DELCORA does not own or operate the collection system in the following communities in the Western SA:

- Brookhaven Borough
- Lower Chichester Township
- Nether Providence Township
- Eddystone Borough

In 2014, the Western SA is expanding to include part of all of the following municipalities in the Chester and Ridley Creek Watersheds. DELCORA will provide wastewater treatment services but they will not own or operate the collection system with the exception of the pump station and force main from the Chester-Ridley Creek Service Area to the WRTP.

- Aston Township
- Chester Heights Borough
- Middletown Township
- Upper Chichester Township

3.2.1.3 Treatment Facility Description

The DELCORA WRTP is located at the foot of Booth Street in the City of Chester and serves the Western SA. The plant, which has a rated treatment capacity of 50 MGD (92.3 MGD maximum with 30 MGD recycled to aeration basins), discharges to the Delaware River under NPDES permit number PA 0027103. In 2011, DELCORA averaged 37.71 MGD of flow through the WRTP. The maximum flow occurred on August 28, 2011 (71.27 MGD). As noted in the Chapter 94 Report, organic capacity is not applicable since the NPDES permit for the plant addresses effluent. The design organic loading for the plant influent is 108,000 lbs. of BOD5 per day. During 2011, the WRTP averaged 67,099 lbs. of BOD5 per day in the influent with a 95.8% removal that discharged 2,818 lbs. per day.

The plant employs an aerated waste activated sludge process that provides primary and secondary treatment levels. The treatment processes include primary clarification, aeration, secondary clarification, post-aeration, and disinfection by chlorination. Sludge is thickened, dewatered, and incinerated. The ash is stored and transported to the Tullytown Landfill and GROWS North Landfill for disposal. During 2011, DELCORA landfilled 3,585 tons of ash.

Wastewater flow to the WRTP is first treated in a pre-aeration basin. Next, solids are settled and removed during primary clarification. Flow is then directed to the aeration tanks where biological action takes place to remove organics. From the aeration tanks, flow is transferred to final clarifiers where more solids are settled and removed. The final step is the chlorine contact tanks, where disinfection to eliminate pathogens and bacteria takes place prior to discharge to the Delaware River.

Approximately 60% of DELCORA's WRTP flow is categorized as industrial wastewater (industrial reserve capacity of 29 MGD). All industrial waste discharging to the WRTP must have a DELCORA issued Industrial Waste Permit in accordance with the EPA approved treatment program. Pretreated industrial wastewater must comply with limits established by DELCORA and approved by the EPA.

SLUDGE/BIOSOLIDS GENERATION

Activated sludge is removed from the system based on flow and solids concentration. The sludge is processed in an air flotation system prior to dewatering. The treated waste is then pumped to the filtration building at about 3-5% solids. The sludge can be directed to one or all three filter belt presses. Sludge cake from the belt presses is conveyed to one or two multiple hearth incinerators. The ash is collected at the bottom of the incinerator and transported by air to two storage silos. One incinerator is normally operated 24 hours a day, seven days a week. The operation is permitted for 96 dry tons, 48 dry tons per incinerator. Sludge reduction by incineration is about 75%. The ash is permitted for disposal in the State of Delaware and all ash generated is disposed of there.

PREVIOUS UPGRADES

DELCORA is in a continuous process of implementing contract improvements to maintain and upgrade the treatment at the WRTP. Upgrades that have been completed or in progress at the WRTP are shown in Table 3-1.

Table 3-1
WRTP Improvement Projects

Start	Project	Project Cost	Completion
2000	Key Card System at WRTP	$18,785	2000
2000	Repairs to Incinerator No. 2	$322,100	2002
2001	Repairs to Clarifier T-16	$18,816	2002
2001	Grit Removal System Rehabilitation	$873,370	2004
2001	Trench Duct Installation	$540,000	2002
2002	WRTP SCADA	$1,093,000	2003
2002	Process Control System, Phase 1	$791,877	2004
2003	Architectural Upgrade B2, B3 & B5	$2,266,464	2004
2003	Incinerator #1 Repairs	$463,600	2003
2003	Control Room Upgrade	$130,900	2003
2003	Aeration System Upgrade	$6,702,309	2005
2003	Belt Filter Press Odor Control in B3	$474,845	2003
2003	Return Activated Sludge Line Replacement	$1,102,245	2003
2004	Process Control System Phase 2 and RAS Line Replacement	$5,182,921	2006
2005	Ash Scrubber Line Replacement	$257,400	2006
2005	Induced Draft Fan Installation	$129,730	2006
2005	Incinerator Platform Improvement	$94,000	2006
2005	Installation of Induced Draft Fan #2 and Scrubber #2	$155,500	2006
2005	Redundant Continuous Emissions Monitor and Data Acquisition System	$389,800	2007
2006	Ash Scrubber Pumping System Upgrade	$411,422	2007
2006	Belt Filter Press #1, #2, & #3	$339,900	2007
2006	EPS-1 Discharge Line Replacement	$862,000	2007
2007	Automation of Solids Handling Equipment	$253,109	2008
2007	Pre-Fabricated Metal Building	$94,800	2007
2007	Installation of Mixing Manifold for ET-1 & ET-3	73,690	2007
2007	HVAC BFP Control Room	$19,817	2007
2008	Chlorine Scrubbing System Modifications	$67,200	2008
2008	Installation of Primary Sludge Monitoring Level Detectors	$95,076	2009
2008	Installation of a Shaftless Conveyor and Screen for Grease Unloading	$157,200	2009
2008	Sludge and Grease Handling Systems Piping Modifications	$218,100	2009
2008	Sludge Receiving Screen Installation	$154,300	2009
2009	EPS-1 Pump Upgrade	$148,197	2009
2009	Installation of Effluent Flow Totalizers	$126,700	2010
2009	Primary Scum & Grease Transfer Piping	$126,375	2010
2010	Belt Filter Press Controls Optimization	$94,456	In progress
2010	Energy Conservation – Lighting Improvements At WRTP and Pump Sta.	$235,000	2011
2010	EPS-1 Rag Conveyor System	$166,850	2011
2010	SCADA Integration of CSO Sites Phase 2	$47,615	2010
2011	Building B-4 Structural Rehabilitation	$1,242,745	2012
2011	Incinerator Natural Gas Conversion & PLC Instrumentation Conversion	$2,315,000	In progress
2011	Lining of Final Clarifier Inlet Piping	$986,000	In progress
2011	Replacement of 480v Underground Cable from Substation #1 to EPS-1	$126,890	2011
2011	Installation of Gravity Belt Thickeners	$1,747,000	In progress
2012	SCADA Integration of CSO Sites Phase 3	$151,579	In progress

OTHER ISSUES

DELCORA has a long-term service contract with the PWD which provides DELCORA 50 MGD of reserve capacity in the 210 MGD capacity SWWPCP. DELCORA and the City of Philadelphia are in negotiations to update the agreement. The reserve 50 MGD capacity includes the flows generated in the Eastern SA including the Muckinipates Authority, Darby Creek Joint Authority, Radnor Haverford Marple Sewer Authority, and the Central Delaware County Authority conveyance systems. In 2002, DELCORA completed a force main that connects the Central Delaware Pump Station (CDPS) via a 3.4-mile, 24-inch pipe. This connection allows DELCORA to send up to 27 MGD of flow from the CDPS to the WRTP; however, DELCORA's operating policy limits this flow to 13.3 MGD, with flows above this point directed to the SWWPCP.

SCHEDULED UPGRADES

DELCORA continues to implement its Capital Improvement Plan for the WRTP. It is DELCORA's intention to maximize the utilization of the WRTP. Upgrades currently underway or in progress at the WRTP include:

- Enhanced automation controls for the belt filter press process.
- Outfall extension.
- Conversion to natural gas fuel for the multiple hearth incinerators and update of the control system.
- Replacement of the Dissolved Air Floatation System with gravity belt thickeners.
- Return Activated Sludge System pipe lining under the final clarifiers.

CURRENT PLANT STATUS

The WRTP is currently operating within both hydraulic and organic load design parameters. In 2011, operations at the WRTP were very consistent. On August 29, 2011, there was a violation of the 1.0 mg/L chlorine limit at 1.05 mg/L. There was a violation of the weekly BOD5 limit in September and there were several days of high flow due to rain. On October 31, 2011, there was a missed sample for BOD_5. Analysis was performed for $cBOD_5$, as the laboratory transitioned to the new NPDES permit requirements one day too early. (The NPDES permit modification was effective November 1, 2011.)

3.2.1.4 Conveyance Facilities Description

As noted previously, DELCORA has two major service areas. Conveyance facilities serving the Eastern SA include a network of interceptors and pump stations, most of which are referenced in the following section covering the conveyance authorities which include Central Delaware County Authority, Darby Creek Joint Authority, and the Muckinipates Authority.

3.2.2 City of Philadelphia Water Department (PWD)

All flows from the Eastern SA in excess of 13.3 MGD dry weather flow is directed to the Philadelphia Southwest Pollution Control Plant. An average of 29.36 MGD is directed to this plant, which averaged 181.8 MGD with an average 96.8 percent removal of $CBOD_5$ in 2011. The SWWPCP operates under NPDES permit PA0026671, and discharges to the Delaware River.

3.3 EXISTING COLLECTION SYSTEMS SERVING THE EASTERN SA

There are four conveyance authorities that serve to transport sewage from the municipalities to the treatment authorities. The service areas associated with these conveyance authorities are shown on Figure 2-1 and Figure 3-1.

3.3.1 Conveyance Authorities

3.3.1.1 Central Delaware County Authority (CDCA)

CDCA's service area spans the Crum Creek watershed and a portion of the Ridley Creek watershed. It has twelve member municipalities that include Marple, Nether Providence, Ridley, Springfield, Newtown, Upper Providence, and Edgmont Townships, and Morton, Prospect Park, Ridley Park, Rutledge, and Swarthmore Boroughs. A nine-member board was originally formed in 1938 to serve the treatment authority. However, as part of the implementation of the 1972 Delaware County Regional Sewerage Project, the Authority was one of three authorities whose treatment plant was phased out of operation and whose flows are conveyed to SWWPCP by DELCORA's pump stations and force mains. Edgmont, Newtown, and Upper Providence Townships joined the CDCA in 2009, with service agreements to contribute approximately 1.8 MGD additional flow to the system by 2017.

CDCA maintains approximately 22.5 miles of sewer lines, four interceptors, and one pump station. The DELCORA 2011 Chapter 94 Report notes that a second pump station owned and operated by DELCORA serves as the terminus of all sewage flowing from CDCA. The major interceptors owned by CDCA include the Crum Creek Interceptor, the Little Crum Creek Interceptor, the Stony Creek Interceptor, and the Prospect Park Interceptor. Collectively, they comprise approximately 118,640 linear feet of pipe of various sizes as follows:

Diameter	Length (ft)
8-inch	3,700
10-inch	5,700
12-inch	6,600
14-inch	4,600
15-inch	9,700
18-inch	3,400
20-inch	2,200
21-inch	1,200
24-inch	13,540
27-inch	4,330
30-inch	18,920
33-inch	12,650
36-inch	16,800
42-inch	11,100
54-inch	4,200

The Crum Creek Pump Station (CCPS) is owned by CDCA. CCPS has four 100-HP variable speed raw sewage pumps each rated at 5,000 GPM. Emergency stand-by power is provided to the Pump Station via a diesel generator. One pump motor failed in 2009 and was replaced with a high-efficiency motor and also a new shaft assembly and pump with the existing pump to be available as a spare. The design capacity of the pump station is 16 MGD. Average monthly flow for 2011 was 6.42 MGD. The CCPS pumps wastewater via a 24-inch cast force main along Chester Pike a distance of 1,700 feet. From this point the wastewater flows via gravity into the Little Crum Creek Interceptor.

Currently, there are no plans to increase pumping capacity at the Crum Creek Pump Station before 2013. Flows to the station will increase, however, as tie-ins from Newtown and Upper Providence Townships reach their Service Agreements allocated combined flow of 267,000 gallons per day (GPD) and beyond. With these 2 townships and Edgmont Township becoming CDCA members in 2009, up to an additional 1.8 MGD average daily flow (ADF) will require pumping around 2017 or later. A draft study of the pump station and force main upgrade/replacement recommends capacity increase to 24 MGD.

The Central Delaware Pump Station (CDPS) is owned and operated by DELCORA and serves the entire CDCA service area. Built in 1979 and upgraded in 2002, the CDPS has four 450-horsepower variable speed pumps designed to match the incoming flow. Each pump has a capacity of 9,266 GPM at 150 feet total dynamic head with a combined capacity of 53.4 MGD and a permitted combined capacity of 40 MGD. The CDPS pumps wastewater via a 36-inch ductile iron pipe force main runs from the CDPS to the Chester Force Main for the diversion of up to 13.3 MGD of flow daily to the WRTP. The remaining flow is pumped through a 36-inch prestressed concrete cylinder pipe along Darby Creek a distance of approximately 10,000 feet to the Muckinipates Pump Station and ultimately ending at the SWWPCP.

Contract forces are used for inspection, troubleshooting, and routine maintenance. CDCA embarked on an accelerated Infiltration & Inflow Video Inspection Program in 2003. Review of the program is ongoing with I&I maintenance activities being developed from the videos. CDCA adopted a 12-year Interceptor Maintenance Assessment Program, continued the I&I abatement activities in 2011. The interceptor line and manholes are inspected annually and after each major storm event to monitor any irregularities with the system such as manhole damage, exposed pipe, or sinkholes over the sewer line. Emergency repair work is performed when and as required.

Based upon the video inspection program, the system is in fair to good condition. There are no known areas of capacity exceedance presently nor expected in the next five years. In 2006, the Comprehensive Trunkline Assessment and Capital Improvement Plan prepared in 2005 for the Crum Creek Interceptor portion of the system was updated for interceptor current capacity and future needs to include Edgmont Township, as well as Upper Providence and Newtown Townships who became CDCA members in 2009.

In September 2011, a Sanitary Sewer Overflow (SSO) occurred caused by damages from Hurricane Irene. These damages allowed an excessive amount of I&I into the sanitary sewer system and discharged at Manhole #17. Upon its detection, emergency repairs were made to fix the hurricane damages which caused the flows to return to normal.

Recent improvements to the CDCA system include the Crum Creek Interceptor Capital Improvements and Increased Capacity project completed in 2012 involved the following upgrades:

- 23,200 feet of parallel pipe installed for increased capacity
- 9,200 feet of pipe relined
- 7,400 feet of pipe enlarged

3.3.1.2 Muckinipates Authority (MA)

The MA service area covers the Muckinipates Creek watershed (approximately 4.2 square miles) that includes, in whole or in part, eight municipalities as shown in Figure 2-1. The eight member municipalities are Darby, Ridley, Springfield, and Upper Darby Townships and Clifton Heights, Folcroft, Glenolden, and Norwood Boroughs. Each municipality has representation on MA's eight-member board. The MA is one of the three authorities that were converted from a treatment authority to a conveyance authority upon implementation of the 1972 Regional Sewerage Project.

The Authority is responsible for approximately 5.04 miles of the Muckinipates Creek Interceptor Sewer was constructed in 1949 and consists of reinforced concrete pipe with 120 brick masonry manholes. The following tabulates the lengths of the interceptor:

Diameter	Length (mi)
12-inch	0.42
15-inch	0.75
18-inch	0.78
20-inch	0.08
24-inch	0.51
30-inch	0.35
33-inch	0.17
36-inch	0.72
42-inch	0.28
48-inch	0.92

There are no pump stations owned or operated by MA.

Flows from MA are conveyed to and pumped through a DELCORA-owned pump station to the SWWPCP for treatment. The Muckinipates Pump Station (MPS), built in 1979 and upgraded in 2009, the MPS has three 100-horsepower variable speed vertical centrifugal pumps that allow operations to match incoming flow. Each pump has a capacity of 4,200 GPM with a combined capacity of approximately 18 MGD and a permitted combined capacity of 15 MGD. The MPS

pumps wastewater into a 48-inch prestressed concrete cylinder pipe force main where it joins flows from CDPS and transports it along Darby Creek a distance of approximately 8,800 feet to the Darby Creek Pump Station, ultimately ending at the SWWPCP.

The Authority monitors the Interceptor with scheduled annual inspections and maintenance programs. A contract with A.J. Jurich, Inc was entered into in October, 2010 to repair manholes along the Interceptor. This work was performed in 2011.

The concrete pipe has been observed to be in good condition. There have been no pipe failures to date. Repairs have been made to remortar joints for the larger diameter sections of the Interceptor. The condition of the manholes has been observed to be good. Repairs have been made to covers and frames. There have been no failures of the manholes.

There have been no reported SSO events and there are no sections of the Interceptor with capacity problems.

3.3.1.3 Darby Creek Joint Authority (DCJA)

DCJA was established in the mid-1930s as a treatment authority. It is one of three authorities that were converted from treatment to a conveyance authority. Its service area, as shown in Figure 2-1, encompasses most of the Darby Creek watershed and a portion of the Crum Creek watershed. The twelve member municipalities served by DCJA include Darby, Springfield, and Upper Darby Townships and Aldan, Clifton Heights, Collingdale, Colwyn, Darby, Folcroft, Lansdowne, Sharon Hill, and Yeadon Boroughs. The Radnor-Haverford-Marple Authority sends flow to DCJA.

The DCJA owns and/or maintains approximately 48,850 linear feet of sewer line, two DCJA-owned interceptors, and three non-DCJA-owned interceptors with the following sizes:

Diameter	Length (ft)
8-inch	900
10-inch	300
12-inch	1,350
15-inch	1,900
18-inch	1,000
24-inch	6,200
30-inch	5,400
36-inch	8,150
42-inch	5,300
48-inch	4,500

54-inch	7,350
60-inch	6,500

The three primary interceptor lines owned by DCJA include the Darby Creek Interceptor, the Cobbs Creek Interceptor, and the Hermesprota Creek Interceptor. The one pump station serving DCJA, which is owned and operated by DELCORA, pumps all sewage flows to the SWWPCP for treatment.

The Darby Creek Pump Station (DCPS) is owned and operated by DELCORA and serves the entire DCJA service area. Built in 1976 and upgraded in 2007, the DCPS has three 700-horsepower variable speed vertical centrifugal pumps. Each pump has a capacity of 25,000 GPM with a combined capacity of approximately 70 MGD and a permitted combined capacity of 60 MGD. The DCPS pumps wastewater into a 66-inch prestressed concrete cylinder pipe, where it joins flows from the CDPS and the MPS and transports it a distance of approximately 14,000 feet to the SWWPCP.

Contract forces are used for inspection, troubleshooting, and routine maintenance. DCJA's Line Cleaning and Inspection Program was recently placed on an accelerated schedule. The interceptor line and manholes are inspected annually and after each major storm event to monitor any irregularities with the system such as manhole damage, exposed pipe, or sinkholes over the sewer line.

Based upon the video inspection program, the system is in fair to good condition. There are no known areas of capacity limitations presently nor expected in the next five years. DCJA has adopted a seven-year plan to correct deficiencies in the system found by the video inspection program and to address abatement of excessive I&I. Abatement efforts in 2009 and 2010, have reduced I&I in its service area by a total of 734,150 GPD. This amount is based on I&I reduction in the approved capacity management plan of Darby Creek Interceptor. It is estimated that another 194,473 GPD of I&I were removed in 2011. No SSOs were reported in 2011.

3.3.1.4 Radnor-Haverford-Marple Sewer Authority (RHM)

RHM receives sanitary sewage flow from the separate collection systems of its five (5) member townships (Radnor, Haverford, Marple, Newtown and Tredyffrin) and routes the sewage through its own interceptor system. This interceptor system consists of approximately 4 miles of

24-inch and 30-inch RCP parallel interceptors that flow into a single 1.6 mile long 36-inch RCP interceptor. The latter interceptor connects the RHM system with the Upper Darby-Springfield Trunk Sewer and the downstream Darby Creek Joint Authority (DCJA) interceptor systems. The RHM interceptor system was designed to have a peak hydraulic capacity estimated at approximately 20 MGD. The original RHM interceptor was constructed in the late 1940s and the parallel interceptor and 36-inch RCP line were both constructed in the 1970s.

RHM inspects its facilities on a routine basis. RHM employees inspect the RHM interceptor right-of-way (ROW) on a monthly basis. The interceptor manholes are opened and visually inspected to assess the interior condition of the manhole and whether there is evidence of obstructions or surcharging. RHM also assists in the maintenance and repairs the sewage collection system for its five member townships in the areas of those townships it serves. Specific maintenance and repair tasks involving RHM work crews include the following:

- Vaporooting of sewage collection pipes.
- Cleaning of sewage collection pipes
- Television inspection and evaluation of sewage collection pipes.
- Grouting of defective joints in sewage collection pipes.
- Manhole repairs/rehabilitation.

A summary of all RHM maintenance and repair activities is provided on an annual basis with its I&I Flow Reduction Progress Report. These reports document the amount of measured I&I removed annually by the efforts of RHM and township work crews. The reports are then submitted on an annual basis to Springfield Township, PADEP, and the Darby Creek Joint Authority (DCJA) for review. RHM's report submitted in 2011 documented total I&I removal of 122,243 GPD for the prior year (2010). Besides its on-going I&I Flow Reduction Program, RHM has initiated a Wet Weather Inflow Abatement Program. The objective of the program, started in 2005, focused on performing flow monitoring within township collector systems in order to identify areas exhibiting the greatest amounts of wet weather inflow. Portable flow meters are installed at strategic manhole locations and flows are monitored over dry and wet weather periods. A dry weather average flow is obtained and then compared with wet weather flows from the largest rainfall events to estimate inflow. Flow Monitoring and Inflow Summary Reports, quantifying wet weather inflow amounts and identifying the most problematic inflow areas, are then prepared and submitted.

During inspections of the RHM interceptor system, leakage points were found at several locations. RHM engaged a contractor to make point repairs at these locations in the summer of 2011. Due to several periods of heavy rainfall, this repair work had to be done on an intermittent basis during the latter part of the year. It is anticipated that all repair work will be completed by the end of the first quarter of 2012.

There are no conveyance capacity issues in the RHM interceptor system during dry weather periods and modest rainfalls. However, during heavy rain events SSOs sometimes occur. In 2011, SSOs in the RHM interceptor system occurred on April 16th, August 28th, September 6th, and September 8th following heavy rainfalls and flooding on those dates. The SSOs in late August and early September resulted from Hurricane Irene and the remnants of Tropical Storm Lee. The SSOs have occurred in Merry Place Park, located in Haverford Township. In order to alleviate the health problem, RHM is in the final engineering phase to construct an off-line sanitary sewage equalization tank at that location that will accept diverted excess flow during heavy wet weather conditions. RHM will proceed with the construction as soon as PADEP approval is received.

3.3.2 Municipalities

The information below was provided by each municipality.

3.3.2.1 Aldan Borough

Aldan Borough's sanitary sewer collection system is a gravity system containing a total of 68,750 +/- feet of pipe, the majority of which is 8-inch and 12-inch vitrified clay pipe (VCP). Aldan Borough has a 3,000 feet 20-inch VCP interceptor along Lobbs Run, which discharges to the DCJA 48-inch RCP interceptor along Darby Creek. As a result of two Community Development Block Grant projects in 2008 and 2010, the upper 760 feet contains a 12-inch HDPE slip lining and the lower 2,240 feet contains a 16-inch HDPE slip lining and CIPP lining. The system also includes approximately 250 brick manholes and 4 pre-cast concrete manholes. All sewers are sanitary sewers only (no combined sewers). Aldan Borough contains no pump stations. The total system consists of approximately 254 manholes, and associated gravity sewer main, all ranging in age from 70-100 years old.

Aldan Borough cleaned lines as necessary in 2011 and is preparing a new sewer cleaning contract to ensure complete coverage of the Borough's system over the next 4 years.

Aldan Borough currently has a procedure for inspecting properties to determine whether a sump pump or illegal connection (i.e. floor drains or roof drains), discharges into the sanitary sewer system. By requiring the issuance of a Use & Occupancy (U & O) certificate, Borough Officials inspect both rental and owner-occupied units at the time of rental or sale.

The system is in good working condition and is structurally sound with no known capacity problems. No known surcharges occurred within the system and no SSOs were reported within the last 5 years.

In 2011, Aldan Borough completed lining 3,000 feet of the Lobb's Run Sanitary Sewer Interceptor which was identified as a problem area. Additionally, television inspections and night-time surveys in 2011 have lead Aldan Borough to target the areas tributary to Meters #2 and #3 for rehabilitation in coming years to address I&I.

Since 2002, Aldan Borough has implemented an aggressive I&I Abatement Program, involving systematic rehabilitation and repairs of manholes and sewer mains. This program also includes periodic cleaning and televising. The majority of Aldan's sewer system has been cleaned, televised, documented, and prioritized for rehabilitation within the last 5 years. Aldan will continue to implement an aggressive I&I Abatement Program each year. For 2013, Aldan is applying for a CDBG Grant to install cured-in-place liner and rehabilitate manholes for approximately 13 sewer sections including approximately 1,800 linear feet of 8-inch VCP sewer main and 14 brick manholes, that were identified in the televising program as the highest priority for repairs.

The Aldan Borough Engineer monitors and reviews DELCORA metering data on a monthly basis to analyze flow trends, effects of rainfall, assess effectiveness of I&I rehabilitation work, and isolate problem areas.

3.3.2.2 Clifton Heights Borough

Clifton Heights Sewer System is a gravity collection sanitary system. The total system consists of 254 manholes and 62,709 feet of sewer main. Most of the manholes (248) and 61,969 feet of sewer main are tributary to the DCJA Interceptor. (The remaining 6 brick manholes and 740 feet of pipe are tributary to the Muckinipates Interceptor.) The majority of the DCJA system consists of approximately 57,807 feet of 8-inch VCP and approximately 1,874 feet of 10-inch VCP all ranging in age from 70-100 years old. The balance of the system includes 2,221 feet of 8-inch plastic pipe and 67 feet of 8-inch cast iron pipe ranging in age from 1-30 years old. There are no combined sewers and no pump stations within the system.

The Clifton Heights Borough is utilizing TV inspection reports and flow meter data as a means to identify areas in need of repair, giving high priority to structural deficiencies and areas susceptible to I&I. Cured-in-place pipe re-lining has been the rehabilitation method of choice, effectively addressing both infiltration and structural concerns. Clifton Heights continues to utilize a database of the sanitary system in order to analyze the recorded conditions and prioritize repairs. In addition, the available flow meter data is reviewed regularly to monitor I&I. The Clifton Heights Borough Engineer monitors and reviews DELCORA meter data to analyze flow trends and effects of rainfall, assess effectiveness of I&I rehab work and isolate problem areas.

Using these resources, the Borough has continued an aggressive repair and rehabilitation program. During 2011, the Borough contracted for relining approximately 200 feet of 8-inch sanitary sewer main. The Borough owns a tow-behind jet-vac machine and the highway department continues to clean the sanitary mains on an as-needed basis.

No known surcharges occur within the system and no SSOs occurred within Clifton Heights during the last permit year.

3.3.2.3 Collingdale Borough

Collingdale Borough has three (3) main collection and conveyance systems that discharge to Darby Creek Joint Sewer Authority's system. There are no combined sewers.

The pipe lengths, diameters, materials and age are as follows:

Diameter	Length (mi)	Material	Age
8-inch	0.24	PVC Pipe- SDR 35	1997,2006
12-inch	0.07	PVC Pipe- SDR 35	2006
6-inch	0.01	terra cotta	Unknown
8-inch	9.77	terra cotta	Unknown
8-inch	0.16	CIPP	2009-2010
10-inch	0.24	terra cotta	Unknown
10-inch	0.16	CIPP	2009-2010
12-inch	0.32	terra cotta	Unknown
12-inch	0.05	CIPP	2010
15-inch	0.69	terra cotta	Unknown
15-inch	0.16	CIPP	2010
18-inch	0.28	terra cotta	Unknown

Collingdale Borough personnel are responsible for routine monitoring, maintenance, and repair of the sewer systems. This includes periodic flushing and cleaning with a Jet-Pac cleaner. During the past year the Borough cleaned and videoed approximately 2.19 miles of terra cotta pipe including 1.50 miles of 8-inch, 0.16 miles of 10-inch and 0.53 miles of 12-inch piping. When a sewer back- up occurs, the Borough contracts with a camera crew to record video of the mains and lateral connections. If a problem is detected, the system is analyzed and a method to rehabilitate the system is developed and a contractor is hired to correct the problem.

The gravity mains are generally in good condition. There were no SSOs reported in 2011.

There are numerous sinkholes that have developed throughout Collingdale Borough at the lateral tie-in locations which the Borough has repaired in recent years. In an effort to alleviate this condition, Collingdale Borough regularly inspects and cleans these sections of main and the manholes. In 2011, portions of terra cotta main piping and lateral connections where sink holes developed were repaired using SDR 35 poly-vinyl chloride (PVC) piping in three locations. The work completed includes replacement of a total of 40 feet of sewer and 4 lateral connections.

In the fall of 2011, DELCORA's consultant advised of a large spike in sewage flows in Meter MH-3 near the intersection of MacDade Blvd. and Springfield Roads. An investigation found that the extended periods of excessive flow are related to storm events. Collingdale Borough is arranging to televise the system first from the manhole and then moving upstream in sections. The results will be analyzed and Collingdale Borough will plan a course of action to address deficiencies encountered.

3.3.2.4 Colwyn Borough

Colwyn Borough's collection system is a separate sanitary sewer collection system comprised of approximately 18,725 feet of sanitary sewer main, with pipe sizes ranging from 6-inch through 16-lnch. The pipe sizes, materials and quantities are as follows:

Diameter	Length (feet)	Material
6-inch	340	VCP
8-inch	15,980	VCP
8-inch	320	HDPE
10-inch	485	VCP
12-inch	1,450	VCP
16-inch	150	CIP

The system is in excess of 80 years old with some sections approaching 100 years in age. There are no force mains and no pump stations. There are no known locations where combined sewers exist.

In 2011, 200 feet of 6-inch VCP and 121 feet of 8-inch VCP were replaced with SDR 26 PE. Installations of manhole inserts are planned for 2012. The community is built out and there are no areas for new development to occur. Redevelopment could occur. The Borough has a policy of requiring I&I offset equivalents to proposed increases such that the net increase in flow to the system is zero. During property transfers or rental unit inspections, sumps and roof drains are inspected for connection to the sanitary sewer system. If either connection is discovered, the owners are told to disconnect. Where an existing building may undergo modification, sumps and roof drains are inspected and if found, the applicant is required to disconnect as part of the land development approval process.

The general condition of the sewer system is satisfactory. I&I was reported as a problem that affects capacity. There are known trouble spots where grease build-up tends to be a problem. The Health Inspector has been instructed to inspect each food establishment to ensure that satisfactory grease trap maintenance is performed. During 2011, three blockages and one SSO were caused by grease.

3.3.2.5 Darby Borough

Darby Borough's sewer collection system is comprised of approximately 87,950 feet of sanitary sewer main, with pipe sizes ranging from 8-inch through 24-inch concrete/terracotta. The pipe sizes/quantities are as follows:

Diameter	Length (feet)	Material
8-inch	69,110	terra cotta
10-inch	3,950	terra cotta
12-inch	11,250	terra cotta
15-inch	2,390	terra cotta
24-inch	1,250	terra cotta

The system is in excess of 80 years old with some sections approaching 100 years in age. There are no force mains and no pump stations.

In 2011, 161 feet of 8-inch sewer was replaced and 12 manholes were rehabilitated. Grease traps are inspected annually by the Health Inspector.

The general condition of the sewer system is satisfactory. Due to its age, the system has I&I issues. As a result of the televising accomplished the prior year, there are known problem areas within the Borough system. These will be addressed as budget monies permit. Three sewer blockages occurred in 2011 and two of the blockages resulted in an SSO. Additionally, one lateral blockage occurred resulting in an SSO.

Darby Borough passed an ordinance prohibiting connection of sump pumps and roof drains from the sanitary sewer collection system. During property transfers, or rental unit inspections, both of these items are inspected and owners are told to disconnect. During land development process where an existing building may be undergoing modification, these items would be inspected and if found, the applicant would be required to disconnect as part of the approval process.

3.3.2.6 Darby Township

No description of the collection has been provided. Darby Township has no areas that are serviced by on-lot systems or small flow treatment systems. There are no pumping stations in Darby Township. Darby Township’s sewer system is in fair to good condition, but has inflow and infiltration that enters the system during rain events. The area monitored by flow meter #4

records flows that are over double the anticipated flow, and is currently being investigated to discover and remediate the source of the flows.

Darby Township personnel and equipment perform sewer system operation and maintenance on an "as-needed" basis. Darby Township workers responded to a number of complaint calls in 2011. Whenever an SSO is reported (none have been reported recently) an inspection is immediately conducted by the Township Engineer and proper clean up and repairs are completed to restore the sewer and affected areas to normal conditions. The Township Contractor is programmed for bi-annual cleaning on the entire system. Implementing the Action Plan submitted to PADEP was continued in 2011.

No capacity problems are evident presently or expected. Darby Township anticipates only minimal additional connections from new businesses or residences. The detailed study of the Stratford Road, Ashland Avenue, Garfield Road Watershed Area has been completed and a relief sewer for this area was constructed in 2010. There are no additional upgrades planned.

3.3.2.7 East Lansdowne Borough

East Lansdowne Borough located in the Cobbs Creek Service Area and discharges to the City of Philadelphia's Cobbs Creek Interceptor.

East Lansdowne reports that its collection system is subject to I&I but that SSOs are uncommon. The most recent overflow was related to roots in a line. The line section was excavated and replaced.

During property transfers, or rental unit inspections, both of these items are inspected and owners are told to disconnect. During land development process where an existing building may be undergoing modification, these items would be inspected and if found, the applicant would be required to disconnect as part of the approval process.

No additional information was submitted.

3.3.2.8 Easttown Township, Chester County

A small portion of Easttown Township, along the western borders of Radnor and Tredyffrin Townships, flows into the RHM service areas through these townships. This area of Easttown Township encompasses approximately 70 sewer connections.

3.3.2.9 Edgmont Township

There is no municipal collection and conveyance system in Edgmont. There is currently no discharge to the CDCA system from properties in Edgmont Township. Edgmont anticipates completion of the collection system servicing 1,265 EDUs by 2015.

3.3.2.10 Folcroft Borough

The Borough of Folcroft's sanitary sewer collection System is approximately eleven (11) miles in length. Pipe sizes vary from 8-inch to 20-inch diameter. Additionally, the system contains approximately 250 manholes and one (1) pump station that is owned by Folcroft but operated and maintained by DELCORA.

Folcroft Borough does not have a designated Sewer Department. All sewer complaints/issues are identified by Highway Department staff that monitors the system as well as notification by residents. All problems are handled by DELCORA staff under agreement with Folcroft Borough. Folcroft has implemented a regimented inspection system. Repairs are completed as needed and with funding available.

The last borough-wide I&I study was performed in 2003. Results from the 2003 study indicated moderate I&I problems associated with rainfall, runoff, and groundwater that effect the sewer system. Substantial amounts of I&I appear to be introduced to the collection system along the Sharon Hill and Ashland/Shallcross Basin.

Folcroft Borough formally adopted a 5-year I&I Abatement Plan in January of 2003. This planning is still ongoing. The proposed measures of this plan aim to reduce or eliminate future hydraulic overloads in the Borough's collection system. Measures include the implementation of a cleaning program that will clean all sewers and remove blockages and the examination and rehabilitation of all of the manholes located within the Borough. The cleaning program initially prioritizes areas that have a history of overflow conditions. Folcroft Borough

has completed lining of 1,145 feet of 8-inch sewer and 5 manholes within the Llanwellyn Park area on King and Folcroft Avenues in the DCJA watershed.

Folcroft Borough's collection system is in moderate condition. The ongoing video inspections indicate problem areas such as small cracks and leaking joints, items to be expected for a system of this age. Folcroft will address issues in the remaining years of the I&I Abatement Plan.

3.3.2.11 Glenolden Borough

Glenolden Borough's sanitary sewer system has approximately 16.4 miles of sewers ranging in size from 8-inch to 15-inch in diameter. There are no combined sewers in Glenolden and the sewers are as follows:

Diameter	Length (mi)	Material
8-inch	0.15	SDR-35 PVC
8-inch	14.45	Terra Cotta
10-inch	0.29	Terra Cotta
12-inch	0.76	Terra Cotta
15-inch	0.72	Terra Cotta

There are no municipally-owned pump stations and the Borough cleans approximately 25% of the system each year. In addition, Glenolden Borough has implemented a thirteen (13) years corrective plan to maintain the integrity of the system through select rehabilitation to prevent overflows and I&I. The Borough uses occupancy inspections to ensure disconnection of illicit connections. No surcharges or SSOs were encountered by the Borough in 2011.

3.3.2.12 Haverford Township

Haverford Township's Darby Creek Drainage Basin consists of collector sewers and no Haverford-owned interceptors exist. The collector sewers are predominantly composed of 8-inch diameter pipe with some 10- and 12-inch diameter sewers.

Diameter	Length (feet)
8-inch	250,800
10-inch	7,920
12-inch	5,280

There are no municipally-owned pump stations in the Darby Creek Drainage Basin. There is, however, one (l) privately owned pump station located in the basin which discharges into Haverford's gravity sewer system.

Haverford Township inspects for illegal connections to the sanitary sewers (sump pumps, basement drains, foundation drains, etc.) and has an I&I Abatement Program in place. This program also includes a public education prograll1 to further educate residents regarding illegal connections. During 2011, one illegal sump pump connections was removed in the Darby Creek Drainage Basin.

Haverford Township sewer forces typically complete 8 to 10 relatively small sewer repairs each year. Routine maintenance such as video inspection and cleaning was the only work performed in 2011. Haverford includes sewer repair and/or rehabilitation in its annual capital improvement program. Work is performed on an as needed basis, either by the Township forces or private contractors. In 2011, approximately 6 feet of collapsed sewer was replaced.

Haverford Township repairs sources of I&I as they are discovered. Haverford operates their own video inspection system and this system is used daily to televise the mains and laterals. In addition, the RHM Sewer Authority also works with Haverford to identify and repair high I&I areas.

The overall condition of the sewer collection system is good. Approximately 75% of the Haverford Township Sanitary Sewer System was constructed between 1950 and 1970, aged at approximately 38 to 58 years. Most of the remaining system was constructed between 1970 and 1990, aged at approximately 18 to 39 years.

The overall capacity of the Haverford's sanitary sewer collection system is adequate for present and projected flows. No projects to increase sewer capacity are scheduled at this time. Also, the Township's maintenance program to identify problem areas and minimize I&I will also serve to help offset increases in future flows.

There were no SSOs within the Township system during 2011.

3.3.2.13 Lansdowne Borough

Lansdowne Borough has a separate storm and waste water sewer system with 136,900 feet of mains in their wastewater collection system with the following sizes:

Diameter	Length (feet)
6-inch	11,000

8-inch	103,600
10-inch	9,400
12-inch	5,500
18-inch	4,600

The sanitary system is comprised of VCP, PVC, DIP, RCP, and HDPE. There are no force mains, pump stations or combined sewers. The age of the borough's sewer system varies but the majority is over 50 years in age.

A 3-year CCTV monitoring and cleaning program of the entire sanitary sewer system was initiated in 2004. This work was completed in 2006. Lansdowne has used the data to prioritize areas for repair and maintenance activities. Lansdowne also owns a sewer jet truck used to clean lines in-house. Since 2008, Lansdowne has also started to use degreasing agents when cleaning sewer lines. In 2010 the Lansdowne began a cycle of root treatments with an outside contractor; and plan on continuing this treatment as a yearly maintenance item.

Lansdowne Borough has reported that its collection system is subject to I&I but had no SSOs during 2011. Over the last fifteen years, Lansdowne has expended approximately $4,886,195.00 in sanitary and storm sewer reconstruction. While some of this work included the remediation recommended by the study, a considerable amount of the reconstruction resulted from areas later identified as requiring immediate correction. In addition to the projects referenced above, Lansdowne has installed hundreds of manhole inserts for all manholes in a sump condition, eliminating gutter line inflow and reducing debris migration into the sewer.

During property transfers, or rental unit inspections, both of these items are inspected and owners are told to disconnect. During land development process where an existing building may be undergoing modification, these items would be inspected and if found, the applicant would be required to disconnect as part of the approval process.

3.3.2.14 Marple Township

There are approximately 100 miles of sanitary sewer within the Township; the sewer lines range in size from 4-inch to as large as 18-inch and consist mainly of 8-inch lines. Only a very small section (l% of system) is 18-inch sewer, which is located where the RHM line reaches the eastern Township boundary with Haverford Township. The vast majority of piping is VCP with an average age of 30 to 40 years. The approximate size/material breakdown is as follows:

Diameter	Length (mi)	Material
8-inch	4	SDR-35 PVC
8-inch	86	VCP
10-inch	5	VCP
12-inch	4	VCP

There is one (1) pumping station within the Township, located at the Cedar Grove Farms development. The station consists of two (2) submersible pumps, each with a 100 GPM capacity. Some individual houses utilize grinder pumps that are located and operated on the homeowners' properties. Low and high pressure force mains are located in the areas where the grinder pumps and the Cedar Grove Farms pump station discharge.

The Township has a full staff that does periodic monitoring of the sewer system in addition to the long-term maintenance of all of the lines. Specifically, the Township's public works department performs scheduled services including monitoring, maintenance and repairs.

The existing system is in good working order with no current problems. No extensive development is projected for the future; no significant additional demands are currently anticipated for the system. Marple Township currently has an in-house public works staff that does periodic maintenance of the system, as required. Furthermore, portions of the line are periodically videotaped for the purpose of maintaining the system and preventative maintenance.

At the present time, any portions of the system that appear to be experiencing I&I problems are addressed and repaired on a case-by-case basis.

With the exception of the Arden Road sewer, there were no problematic sewer sections in need of repair or rehabilitated in 2011. The Township includes sewer repair and/or rehabilitation in its annual capital improvement program. Work is performed on an as-needed basis, either by the Township Public Works Department or private contractors.

There was one portion of the sewer collection system in 2011 that was identified as requiring repair, replacement, or rehabilitation. Marple Township notified PADEP on January 10, 2011 of a SSO that took place within the Township's sewer collection system near Arden Road. The SSO began when a tree fell on an aboveground concrete pipe encasement, causing the pipe to break. Sewage was unable to pass through the pipe, and flow was backed up and

discharged out of a nearby manhole upstream to the environment. The pipe was repaired and environmental conditions stabilized and restored by the Township.

There were no other SSOs within Marple Township during 2011.

3.3.2.15 Millbourne Borough

Millbourne Borough located in the Cobbs Creek Service Area and discharges to the City of Philadelphia's Cobbs Creek Interceptor. No additional information was submitted.

3.3.2.16 Morton Borough

The Morton Borough Sanitary Sewer Collection System consists of approximately 42,000 feet (7.95 miles) of pipe as follows:

Diameter	Length (ft)
8-inch	40,000
10-inch	500
12-inch	1,500

The sewers are mainly terracotta pipe, there are no combined sewers, pump stations, or force mains. No known problems with capacity at this time.

Morton Borough cleans and inspects the sanitary sewer periodically as funding permits. From the inspection, repairs are made to reduce I&I and to improve the structural integrity of the system.

Morton Borough's sanitary sewer system is in fair to good condition, but has I&I that enters the system during rain events. Specifically flow meter area #5 records flows that are over double the anticipated flow. This area is currently being investigated to discover the cause and to remedy the situation.

No SSOs have occurred recently. Whenever an SSO is reported, an inspection is conducted by the engineer of the Borough immediately, and proper clean up and repairs are completed to restore the sewer and affected areas to normal conditions.

3.3.2.17 Nether Providence Township

There is one pumping station within the Nether Providence Township sewerage system. It is located at the Mills of Rose Valley development, just off Brookhaven Road. It has two (2) pumps (rated 1,150 GPM each).

Nether Providence is currently working to formalize the sewer system monitoring, maintenance, repair, rehabilitation procedures currently used to ensure adequate system performance. During the current year maintenance and repairs were made resulting from blockages/overflows. In 2009, Nether Providence procured a new self-contained TV truck/jet and dedicated significant resources towards locating all system components as well as identifying crossings with storm sewers and creeks. Areas that are prone to root problems have been identified and chemical root treatment will be performed.

The general condition of the sewer system is good. An I&I study of the CDCA portion of the sewer system was completed during 1997. In addition, Nether Providence is currently working on an I&I reduction program. It is anticipated that Nether Providence will make a 10% reduction in I&I over the next 3 years. The program will consist of the following: grouting; replacing manhole inserts; having homeowners repair curb vents and traps; and repairing damaged street mains at lateral connections at targeted locations. Several manhole benches and channels will be repaired during the three year period.

3.3.2.18 Newtown Township

The sewered areas in Newtown Township are managed by the Newtown Township Sewer Authority (NTSA) and divided into two (2) drainage basins, Crum Creek Basin and Darby Creek Basin. The overall Township system consists of approximately 42.5 miles of eight inch (8") diameter sewer pipe with the following general breakdown on age of system:

Diameter	Length (ft)	Construction Date	Receiving Authority
8-inch	157,080	1960-1970	RHM
8-inch	33,600	1970-1990	RHM/CDCA
8-inch	33,600	1990-present	CDCA

The remainder of the Township is served by individual on-lot disposal systems.

The Darby Creek Basin is situated along the eastern portion of Newtown Township and contains approximately 80% of the existing sewer collection system with a gravity sewer connection through Marple Township to RHM. There is one (1) pump station owned by the NTSA and operated by the Township that serves a small townhouse development and 5 single family dwellings. The lines within the Darby Creek Basin are 8-inch diameter pipe made of mostly PVC SDR-35 with some vitrified clay and asbestos-cement. There are four (4) separate metered connections from Newtown Township into the RHM Interceptor. With respect to future connections, there are approximately 75 "in-fill" and new connections projected over the next 5 years and are considered to be within the capacity of the existing system.

The Crum Creek Basin currently accounts for approximately 20% of the total collection system, situated in the south-central portion of the Township. Within the Crum Creek Basin, the Township owns the Springton Pointe Estates Wastewater Treatment Plant (SPE WWTP), with an Average Annual Flow of 35,000 GPD and Sequencing Batch Reactor Treatment process with land disposal of the treated effluent. This system serves only the immediate development and consists of the treatment works and three pump stations for subsurface effluent disposal. The remainder of the system in this basin is served by two (2) pump stations, namely Camelot and Hickory Lane, that direct flow to the CDCA Interceptor in Marple Township. All sewers within the Crum Creek Basin are 8-inch diameter pipe. The Township contracts operation and maintenance services for the SPE WWTP and all pump stations. The Township has recently completed an update to their individual ACT 537 Plan (April 2013) to address expansion of the public system in Crum Creek Basin.

The Township Public Works Department performs periodic monitoring and maintenance of the system. The Township includes sewer repair and rehabilitation work in its annual capital improvement program. The work is performed on an as-needed basis. The existing system is in good working condition. The RHM assists Newtown Township with identifying and affecting repairs to the system as well as televised inspections of sewers, manhole rehabilitation, root cutting and grouting. No major repairs to the system have been undertaken in the past 5 years. In February of 2012 an SSO was reported to PADEP , resulting from a section of 8-inch diameter Transite pipe with an offset joint and root mass that caused a back-up and overflow of the sewer main. Twenty-three feet (23') of sewer line was replaced.

3.3.2.19 Norwood Borough

Norwood Borough cleans, inspects and repairs the sewer systems as necessary. From the inspection, repairs are made to reduce I&I and to improve the structural integrity of the system.

Residents of the 100 Block of Garfield Avenue have complained of back-ups in their basements over the past years. The Borough has completed a project to investigate the issues in the 100 and 200 block of Garfield, Duffee, and Leon Avenues. A project is substantially complete to replace all lines, relocate manhole at Leon and Willows and parge the remaining manholes to alleviate issues.

Pump Station at Martin Lane has been updated by installing a Muffin Monster to alleviate clogs. The collection system in Norwood Borough is 50+ years old and I & I is a growing concern. Residents have been advised to disconnect sump pumps. Occupancy permit inspections include sump pump tie ins and removal from the service lateral if found in accordance with the Borough Ordinance. Borough has an annual contract to clean and video lines throughout the Borough.

No information has submitted for Norwood Borough that provides a comprehensive description of the collection system.

3.3.2.20 Prospect Park Borough

The sanitary sewer collection system in Prospect Park is mostly 50-year-old, terra cotta pipe and one small section containing PVC pipe that is approximately 3 years old with sizes as follows:

Diameter	Length (mi)
6-inch	0.04
8-inch	0.09
8-inch	10.73
10-inch	0.54
12-inch	0.44
15-inch	0.30
18-inch	0.41
27-inch	0.90

Prospect Park Borough has undertaken a program to clean all lines annually with the maintenance staff. This program will reduce the probability of a surcharge or blockage in the line. Prospect Park continues to reduce I&I through rehabilitation of mains. Prospect Park

Inspectors are requiring removal of all sump pumps from the system. This practice is solely for new certificates of occupancy and a program for all residents and businesses is proposed.

No SSOs were reported in 2011.

3.3.2.21 Radnor Township

No information has submitted for Radnor Township on a description of the collection system, operation and maintenance programs, identified problems, and scheduled upgrades.

3.3.2.22 Ridley Park Borough

The Ridley Park Borough Sanitary Sewer Collection System consists of 99,000 linear feet (~18.15 miles) of 8-inch and 10-inch sewer, comprised mainly of terracotta pipe. There are no combined sewers, pump stations, or force mains in Ridley Park Borough.

Ridley Park Borough personnel are used for inspection of the sanitary sewer system. Contract forces are used for troubleshooting and routine maintenance. Each year a portion of the system is cleaned and video inspected as part of the Ridley Park's preventative maintenance program. In 2012, sections of East Rodgers Street from Tome Street to Thayer Street were cleaned and inspected, and repairs will be made as necessary.

Based on an I&I Study the system is in fair to good conditions. Ridley Park Borough has implemented an Infiltration & Inflow Abatement Program. In 2011, Ridley Park Borough replaced one manhole frame/cover and 35 feet of sewer removing an estimated 1,810 GPD of I&I.

No SSOs were reported in 2011.

3.3.2.23 Ridley Township

Ridley Township's sanitary sewer collection system consists of 367,000 linear feet (~69.5 Miles) of sewer comprised mainly of 8-inch terracotta pipe. There is one (1) pump station (2 small compressed air operated pumps) located on Chester Pike at Crum Creek, which conveys flow across the creek to the CDCA Crum Creek Interceptor. Ridley Township also

maintains 2,800 linear feet of 8-inch force main serving the Boeing southern complex via a Boeing-owned pump station.

Ridley Township personnel are used for inspection, troubleshooting and routine maintenance of the sanitary sewer system. Each year, a portion of the system is cleaned and video inspected as part of the Ridley Township's Preventative Maintenance Program. The Line Cleaning Program is completed by Ridley Township personnel and is set as a 4-year program to address the entire system. The Video Inspection Program is an ongoing 9-year program. Phases 8-9 of the video inspections are underway.

Based upon a periodic video inspection, the system is in fair to good condition. Over the past year, this system has not had any SSOs. There is no indication that the system is experiencing any capacity issues, and no large developments are scheduled that could potentially compromise the capacity of the system. Ridley Township continues to implement the I&I Abatement Program. In 2011, Ridley Township replaced 50 feet of sewer removing an estimated 2,500 GPD of I&I. Localized problems with the system occur during heavy storm events. These occurrences are investigated and remedied appropriately based on the investigations findings. Areas such as Braxton Road, Morris Avenue, and Leedom Estates have been studied when reoccurring incidents are reported to remedy the situation.

3.3.2.24 Rutledge Borough

The Rutledge Borough Sanitary Sewer Collection System consists of approximately 13,450 linear feet (~2.55 miles) of 8-inch terracotta pipe. There are no combined sewers, pump stations or force mains in the Borough.

Contractors are used for troubleshooting and routine maintenance. A bi-annual cleaning of the entire system is the Rutledge Borough preventative maintenance program. Video inspection is conducted periodically and on an as needed in conjunction with required emergency repairs.

Based upon video inspection in 2000, the system is in fair to good condition. In 2011, Rutledge Borough raised and resealed three manholes removing an estimated 180 GPD of I&I.

Overall, Rutledge Borough's sanitary sewer system is in fair to good condition, but has I&I that enters the system during rain events. Specifically flow Meter MH-2 service area records flows that are over double the anticipated flow. This area is currently being investigated to discover the cause and to remedy the situation.

3.3.2.25 Sharon Hill Borough

The Borough of Sharon Hill operates and maintains 12.18 miles of sanitary sewer covering the 0.77 square mile area with sizes as follows:

Diameter	Length (ft)	Material	Age (years)
8-inch	51,211	VCP	50 to 105
10-inch	1,208	VCP	105
12-inch	3,114	VCP	105
15-inch	1,094	VCP	105
18-inch	2,948	VCP	105
24-inch	3,236	RCP & VCP	55 to 105

Most of the sanitary sewers are old, having been constructed between 1905 and 1950. The sewers are primarily vitrified clay or reinforced concrete construction and are all gravity. There are no sewage pump stations within the Borough system. There are no combined sewers in the Borough system.

Sharon Hill Borough continues to monitor their sanitary sewer system with closed circuit TV inspections and cleaning maintenance performed on portions of the Sharon Hill system annually. Inflow connections are ordered removed when found during certificate of occupancy inspections. Sharon Hill personnel provide system operation and maintenance on an as needed basis. Approximately 100 feet of 8-inch diameter vitrified clay sewer was replaced on Burnside Avenue in July of 2011. TV inspection had identified several open joints and abandoned laterals.

Sharon Hill Borough is not aware of any areas in their sanitary sewer system where conveyance capacity is being exceeded. There have been no reports of surcharging or SSOs in 2011. Corrective measures have been instituted to reduce pipeline infiltration by relining 6,710 feet of sewer lines in 2005 and 6,920 feet in 2007. In 2011, 100 feet of sewer was replaced. Sharon Hill inspects for illegal sump pumps and roof drain connections to the sanitary sewer system on all certificates of occupancy.

The problems with the Sharon Hill Borough Sewer System are primarily maintenance issues especially with the areas with older piping. One known problem is a portion of the 8-inch sewer on Academy Terrace. This portion of sewer is scheduled to be replaced in 2012.

3.3.2.26 Springfield Township

Springfield Township owns and maintains 46.28 miles of sanitary sewer pipe throughout the CDCA service area and 39.637 miles of sanitary sewer pipe throughout the DCJA service area. The mains range in size from 8 inches to 36 inches in diameter and are constructed of a wide variety of materials including vitrified clay, ductile iron, asbestos cement, reinforced concrete and cast iron pipe. The entire system flows via gravity, therefore, no pump stations or force mains are present in the system.

Monitoring maintenance and rehabilitation programs have been established in accordance with the Water Environment Federation's (WEF) Existing Sewer Evaluation and Rehabilitation (WEF MOP FD-6; ASCE MREP-62) and WEF's MOP 7. The Public Works Department conducts inspection and evaluation activities according to the schedule prescribed by the Township Engineer. Inspection and evaluation are facilitated through a jet cleaning truck and a closed circuit television sewer inspection truck operated by a three man crew from the Public Works Department. Public Works inspects between 10 and 20 miles of sewer line annually. The lines are evaluated for defects (breaks, roots, I&I, grease, etc.) by the field crew and also by the Public Works Superintendent and Township Engineer. Any defects discovered during evaluation are assessed, rated and prioritized for repair or further evaluation as necessary.

The majority of Springfield's system is operating adequately with occasional blockages due to root intrusion, grease accumulation or collapsed pipe. Connections to DCJA are currently being managed as part of a Corrective Action Plan required as a result of SSOs. The system has not experienced SSOs in the past year.

In 2011, Springfield Township completed the following repairs to the sanitary sewer system:

- In February, D. Keller Excavating completed an emergency repair at 449 Woodland Avenue. The repair included replacing 20 feet of an 8-inch main that was collapsed and blocked causing an overflow.

- In March, Springfield Township had a contractor completely replace the 8-inch sanitary sewer pipe at 449 Woodland Avenue.
- In November, Springfield Township had a contractor complete an emergency repair on Evans Road of a partially collapsed 8-inch sanitary sewer pipe near East Leamy Avenue.

3.3.2.27 Swarthmore Borough

The Borough Sanitary Sewer Collection System consists of 95,670 feet of sewer pipe broken down by size as follows:

Diameter	Length (ft)
6-inch	14,800
8-inch	71,250
10-inch	9,000
12-inch	160
15-inch	460

The sewers are comprised mainly of terracotta c1ay pipe, with some cast iron, the majority of which was installed in the 1950's. PVC has been used for the newer replacements. There are no combined sewers, pump stations, or force mains.

Swarthmore Borough's Public Works Department provides routine maintenance and emergency line cleaning on a daily basis and has developed a Seven Year Plan which serves as a basis for ongoing Sewer Maintenance and Inspection programs as follows:

a. The Borough contracts with an outside contractor nearly every year to clean, root cut and video inspect a portion of the sewer system as part of an ongoing preventative maintenance program.

b. The Borough has completed an I&I study based on the DELCORA metering program to identify problematic sewer lines in need of repair or replacement. The report identified approximately 320,000 gallons of inflow that could potentially be removed from the sanitary sewer collection system by a pipe and manhole lining and repair program. A contract was awarded in September 2009 to line 8-inch diameter sewer pipe and the repairs were completed in 2010.

c. The Borough Contract SB-09-01 was awarded in 2009 to authorize the installation of a cured-in-place PVC liner for 7,435 feet of 6- and 8-inch sanitary sewer pipe. The project was completed by a qualified contractor in October 2010.

d. During the course of a typical year, the Public Works Department responds to fourteen sewer blockages and in some cases repair work is completed.

e. As part of the routine preventive maintenance program, every year the Swarthmore Borough contracts with a private company to apply chemical root control within identified sewer line segments. In 2011, Swarthmore Borough

treated approximately 7,840 feet of sanitary sewer. Swarthmore Borough has allocated $20,000 for root control in 2012.

Based upon a Sewer System Evaluation completed by Pennoni Associates in 1994, the system is in fair to good condition. Work identified in the study to correct I&I and other structural problems has been completed. In 2002, Swarthmore Borough approved a new sanitary sewer plan that includes dedicated funding for the maintenance program as well as for capital improvements to rectify problems identified in the inspection program.

The 2004 CCTV internal sewer inspections of 46 line segments have been reviewed and a list of potential rehabilitation segments has been identified. Approximately 22 line segments were partially televised and require additional investigation. Based on the analysis of the televised lines and results of the I&I study, Swarthmore Borough has compiled a comprehensive list of sanitary sewer rehabilitation work.

3.3.2.28 Tredyffrin Township, Chester County

Approximately 1.1 square miles of Tredyffrin Township, along the northern border of Radnor Township flows into the RHM trunk sewers. This area of Tredyffrin Township encompasses approximately 2100 EDUs and contributes approximately 550,000 GPD to the Eastern SA flow to PWD.

3.3.2.29 Upper Darby Township

The drainage area to DCJA is 2.20 square miles and is primarily a dense suburban, residential district with moderate commercial usage. This area contains approximately 51 miles of sewer pipe and over 1,050 manholes. The collection systems have been in existence for over 83 years and the trunk lines are as old as 50+ years and contain the following pipe sizes:

Diameter	Length (ft)
8-inch	222,297
10-inch	25,436
12-inch	7,440
15-inch	1,998
18-inch	844
20-inch	2,190
36-inch	8,387

There are no pumping stations that provide flow to the DCJA system.

The Upper Darby Township Sewer Division is responsible for the maintenance of the sewer system. The sewer crew has a routine plan to monitor and maintain the system, which includes the replacement of deteriorated sections of pipe, the cleaning of grease, built up, removal of roots and jet sewer lines at known problem locations. The tasks of the TV camera crew along with the surveyor crew are to video the sewer lines, locate manholes, and obtain elevations of the manhole's rims and inverts. Sanitary sewer flow monitoring will continue at selected sites in order to compile flow information for unmeasured sections of Upper Darby Township's sewers. The data collected will be used for I&I studies, and other reports.

The sanitary sewer interceptor along the Darby Creek owned and operated by Upper Darby and Springfield Townships, and which ties into the DCJA's trunk line, has had capacity issues in the past where the interceptor became surcharged during a heavy rain storm event. The PADEP had placed a moratorium on the interceptor due to limited capacity issues.

The sanitary sewer main on Township Line Road between Lynn Boulevard and the Cobbs Creeks Interceptor, which is owned by Haverford Township and receives Upper Darby Township's Kirklyn area sewer flows, has limited capacity issues. The sanitary sewer manhole on Lynn Boulevard near the S. Bayberry Lane intersection becomes surcharged during heavy rain events. Upper Darby has been in the design phase to re-direct the service area's sewer flows. Upper Darby Township has consented with the PADEP to address the Lynn Blvd surcharges by making improvements to the capacity of the Cobbs Creek Interceptor. As a result, Upper Darby Township has already lined over 5200 LF of sanitary sewer pipe and replaced over 800 LF of sewer pipe within the Cobbs Creek Interceptor service area. Additional trenchless pipe lining work has already been programmed for the upcoming year.

Historically, Upper Darby has had occasional sewer main breaks along the Cobbs Creek drainage areas due to the natural environment of the location of the sewers (in the woods and along stream banks) and the fragile age and material of the pipe.

Upper Darby Township has completed CIPP lining of various sections of major sanitary sewer lines, installed manhole inserts, sanitary sewer pipe replacement, and implemented its own sewer flow metering program for the Cobbs Creek Interceptor in addition to DELCORA's sewer flow metering program. Upper Darby complies with the wastewater conveyance treatment

regulations of DELCORA and the City of Philadelphia which prohibits sump pump and roof drain connection to the sanitary sewer.

One SSO occurred on August 9, 2011 due to a line break at Fernwood Cemetery. The section of line was immediately replaced using an outside contractor.

3.3.2.30 Upper Providence Township

The collection system which conveys from Upper Providence Township into the CDCA system is comprised of an 8-inch PVC gravity main which follows Farnum Road and enters the Crum Creek Interceptor. Low pressure lines (2-inch SDR11 HDPE) from two tributary streets, Dyanna Lane and Dogwood Road, connect to that gravity line. In addition, two separate 8-inch PVC sanitary sewer mains on Crum Creek Road connect to CDCA through the Farnum Road line and the Nether Providence Township sanitary system.

There is no apparent gravity main or low pressure sanitary sewer main which currently exceeds capacity and no known surcharges or SSOs occurred in this district. However, the Authority has taken measures to maintain the integrity of the system and reduce I&I problems. As stated above, the Authority continues to implement the sewer cleaning program in order to maintain the integrity of the system. In addition, the Authority is planning to institute a service lateral inspection/rehabilitation program designed to eliminate potential sources of I&I such as failing laterals and illegal connections.

The Farnum Road sewer district is essentially built out with all properties connected to public sewers and no sewer extensions were conducted within the last year. However the Sewer Authority recently awarded a bid for the construction of the Low Pressure Sanitary Sewer Mains for Sewer Districts 8 & 9. During 2012, the Authority plans to construct the Low Pressure Sewer Mains for Sewer Districts 5, 6 and 7.

3.3.2.31 Yeadon Borough

The Borough of Yeadon Sanitary Sewer Collection System consists of approximately:

Diameter	Length (ft)	Material
8-inch	4,000	HDPE, PVC
8-inch	76,000	terra cotta
10-inch	12,300	terra cotta
12-inch	8,100	terra cotta

15-inch	5,900	terra cotta
18-inch	650	terra cotta
24-inch	2,000	terra cotta

There are no combined sewers, pump stations or force mains in the Borough. Most of the system is over 75 years old and terra cotta material. Yeadon Borough reports that the collection system is subject to I&I.

During 2011, approximately 48,000 feet of sewer main was cleaned in part due to preventative maintenance to avoid back-ups in known trouble spots and in response to reported back-up complaints.

The general condition of the sewer system is satisfactory and a copy of the collection system plan is enclosed. There are known trouble spots where grease build-up tends to be a problem. The Health Inspector has been instructed to inspect each food establishment to ensure that satisfactory grease trap maintenance is performed.

During 2011, a blockage was reported in the Hillside Circle/Lansdowne Ave. intersection manhole. No overflow occurred. The line continues to have a partial obstruction and will be addressed in 2012. Also during 2011, 24 feet of 8-inch terra cotta pipe was replaced with SDR 35 PE, two house laterals were replaced, and eight curb vents are replaced.

During property transfers, or rental unit inspections, both of these items are inspected and owners are told to disconnect. During land development process where an existing building may be undergoing modification, these items would be inspected and if found, the applicant would be required to disconnect as part of the approval process.

3.3.3 Existing Treatment Systems Serving the Eastern SA

The eastern service area is services by two treatment facilities: DELCORA's WRTP located in the City of Chester (described in detail in 3.2.1.3) and PWD's SWWPCP located in Philadelphia.

3.3.4 Small Flow Treatment Systems

There are no small flow treatment systems within the Eastern SA.

3.3.5 Disposal Areas

All wastewater generated within the Eastern SA is treated at either the WRTP of the SWWPCP. There are no spray fields, subsurface discharges, or other type of discharge locations other than the sewage treatment plants.

3.4 EXISTING ON-LOT SEWAGE DISPOSAL SYSTEMS

As per the meeting with PADEP at the Southeast Regional Office on May 23, 2011, and the Plan of Study dated November 7, 2011, analysis of on-lot sewage disposal systems is not applicable for this plan.

3.5 WASTEWATER SLUDGE AND SEPTAGE GENERATION, TRANSPORT AND DISPOSAL

As per the meeting with PADEP at the Southeast Regional Office on May 23, 2011, and the Plan of Study dated November 7, 2011, analysis of wastewater sludge and septage generation, transport and disposal is not applicable for this plan.

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CHAPTER 4
FUTURE GROWTH AND LAND DEVELOPMENT

4.1 INTRODUCTION

One of the key components of a sewage facilities plan is an analysis of sewage treatment needs. The Eastern SA is served by an existing network of sewage collection and conveyance lines that direct flow to regional sewage treatment facilities. However, there are still several unsewered "pockets" with in the Eastern SA.

4.2 MUNICIPAL AND COUNTY PLANNING DOCUMENTS PER ACT 247

4.2.1 Land Use Plans and Zoning Maps

As per the meeting with PADEP at the Southeast Regional Office on May 23, 2011, and the Plan of Study dated November 7, 2011, analysis of land use plans and zoning maps is not applicable for this plan.

4.2.2 Zoning and Subdivision Regulations

As per the meeting with PADEP at the Southeast Regional Office on May 23, 2011, and the Plan of Study dated November 7, 2011, analysis of zoning and subdivision regulations is not applicable for this plan.

4.2.3 Floodplain and Stormwater Management Plans

As per the meeting with PADEP at the Southeast Regional Office on May 23, 2011, and the Plan of Study dated November 7, 2011, analysis of floodplain and stormwater management plans is not applicable for this plan.

4.3 EASTERN SERVICE AREA SEWAGE FACILITY NEEDS

4.3.1 Existing Development or Plotted Subdivisions

As per the meeting with PADEP at the Southeast Regional Office on May 23, 2011, and the Plan of Study dated November 7, 2011, analysis of existing development or plotted subdivisions is not applicable for this plan.

4.3.2 Land Use As Allowed by Zoning

As per the meeting with PADEP at the Southeast Regional Office on May 23, 2011, and the Plan of Study dated November 7, 2011, analysis of land use as allowed by zoning is not applicable for this plan.

4.3.3 Future Population Growth Areas

One of the most important factors in assessing future sewage facilities needs is the service area's population. The number of people living and working in an area determines how much wastewater will be generated. Population and land use are the two primary factors in determining where sewage facilities resources are needed for newer systems in developing areas. The age of the collection system in the Eastern SA and the amount of I&I are contributing to high peak flows that overload the system and are more difficult to predict than population-based wastewater flows.

Planned development has been reported for the following municipalities:

1. Norwood Borough reports an additional 80 units on the Muckinipates Authority property are planned to be serviced by a low pressure sewer system.
2. Possible expansions at Villanova University and Cabrini College in Radnor Township may occur.
3. Commercial development may take place on the former Charles El Ellis school property in Newtown Township.

The U.S. Department of Commerce, Bureau of the Census (Census Bureau) reports indicate that as of 2010, Delaware County had a population of 558,979 residents within the boundaries of its 49 municipalities. The majority (32) of the municipalities had populations under 10,000, and slightly more than half of those populations were under 5,000. There were only seven municipalities with a substantial number of residents. Upper Darby Township had the largest population with 82,795. Upper Darby was followed by Haverford Township (48,491) and Chester City (33,855), with Marple, Radnor, Ridley, and Springfield Townships having populations over 20,000. The remaining municipalities had populations ranging from 784 in Rutledge Borough to 17,231 in Concord Township.

Significant growth and development has taken place in the County since the last census in 2000, particularly in the developing western municipalities. While the County's overall population rose from 551,989 in 2000 to 558,979 in 2010, the most significant population change was in population distribution from east to west. Refer to Table 4-1 for most recent census information.

Table 4-1
Delaware County Census Data

Municipality	1970 Census	1980 Census	1990 Census	2000 Census	2010 Census	Absolute Change 2000-2010
Eastern SA						
Aldan Borough	5,001	4,671	4,549	4,315	4,152	-163
Clifton Heights Borough	8,348	7,320	7,111	6,780	6,652	-128
Collingdale Borough	10,605	9,539	9,175	8,665	8,786	121
Colwyn Borough	3,169	2,851	2,613	2,455	2,546	91
Darby Borough	13,729	11,513	11,140	10,300	10,687	387
Darby Township	13,603	12,264	10,955	9,625	9,264	-361
East Lansdowne Borough	3,186	2,806	2,691	2,585	2,668	83
Edgmont Township	1,368	1,410	2,735	3,915	3,987	72
Folcroft Borough	9,610	8,231	7,506	6,980	6,606	-374
Glenolden Borough	8,697	7,633	7,260	7,475	7,153	-322
Haverford Township	56,873	52,349	49,848	49,608	48,491	-1,117
Lansdowne Borough	14,090	11,891	11,712	11,044	10,620	-424
Marple Township	25,040	23,642	23,123	23,735	23,428	-307
Millbourne Borough	637	652	831	945	1,159	214
Morton Borough	2,602	2,412	2,851	2,715	2,669	-46
Nether Providence Township	13,589	12,730	13,229	13,456	13,706	250
Newtown Township	11,081	11,775	11,366	11,705	12,216	511
Norwood Borough	7,229	6,647	6,162	5,985	5,890	-95
Prospect Park Borough	7,250	6,593	6,764	6,595	6,454	-141
Radnor Township	28,782	27,676	28,703	30,880	31,531	651
Ridley Park Borough	9,025	7,889	7,592	7,195	7,002	-193
Ridley Township	39,085	33,771	31,169	30,790	30,768	-22
Rutledge Borough	1,167	934	843	860	784	-76
Sharon Hill Borough	7,464	6,221	5,771	5,465	5,697	232
Springfield Township	29,006	25,326	24,160	23,675	24,211	536
Swarthmore Borough	6,156	5,950	6,157	6,170	6,194	24
Upper Darby Township	95,910	84,054	81,177	81,821	82,795	974
Upper Providence Township	9,234	9,477	9,727	10,510	10,142	-368
Yeadon Borough	12,136	11,727	11,980	11,762	11,443	-319
Easttown Township, Chester Co.[1]	169	160	169	181	185	4
Tredyffrin Township, Chester Co.[1]	1,286	1,265	5,986	6,207	6,265	58
Eastern SA Total	455,127	411,379	405,055	404,399	404,151	-248

Note: 1) Easttown and Tredyffrin Townships are only partially served by DELCORA. The Easttown 2010 Census data is estimated based on 70 connections and 2.64 persons per household. Tredyffrin 2010 Census data is estimated based on metered flow, 262.5 gal/EDU & 2.99 persons/EDU.

Table 4-1 (cont.)
Delaware County Census Data

Municipality	1970 Census	1980 Census	1990 Census	2000 Census	2010 Census	Absolute Change 2000-2010
Western SA						
Aston Township	13,704	14,530	15,080	16,205	16,592	387
Bethel Township	2,034	2,438	3,330	6,420	8,791	2,371
Brookhaven Borough	7,370	7,912	8,567	7,985	8,006	21
Chadds Ford Township	1,281	2,057	3,118	3,170	3,640	470
Chester City	56,331	45,794	41,856	36,855	33,972	-2,883
Chester Heights Borough	597	1,302	2,273	2,481	2,531	50
Chester Township	5,708	5,687	5,399	4,605	3,940	-665
Concord Township	4,592	6,437	6,933	11,235	17,231	5,996
Eddystone Borough	2,706	2,555	2,446	2,440	2,410	-30
Lower Chichester Township	4,009	3,784	3,660	3,590	3,469	-121
Marcus Hook Borough	3,041	2,638	2,546	2,315	2,397	82
Media Borough	6,444	6,119	5,957	5,530	5,327	-203
Middletown Township	12,878	12,463	14,130	16,065	15,807	-258
Parkside Borough	2,343	2,464	2,369	2,265	2,328	63
Rose Valley Borough	876	1,038	982	945	913	-32
Thornbury Township	3,284	3,653	4,728	5,787	8,028	2,241
Trainer Borough	2,336	2,056	2,271	1,905	1,828	-77
Upland Borough	3,930	3,458	3,334	2,980	3,239	259
Upper Chichester Township	11,414	14,377	15,004	16,845	16,738	-107
Western SA Total	144,878	140,762	143,983	149,623	157,187	7,564
Delaware County	**603,456**	**555,007**	**547,323**	**551,989**	**558,979**	**6,990**

4.3.3.1 Growth Rate History

Through the post-Korean War era (1950s), the eastern portion of the County experienced significant growth as a result of industrial expansion. During this time period, the area prospered, jobs were abundant, and the population grew. During this same period, the western portions of the County remained largely rural/agricultural.

From 1970 to 1990, the total population of Delaware County has exhibited a decline in numbers similar to that of many other manufacturing-dependent urban areas in the United States. Table 4-1, showing the census figures from 1970 through 2010, illustrates that although there had been a gradual yet steady decline in total population for three consecutive census reports, the Census 2000 and 2010 actually showed an increase in population.

The eastern municipalities have consistently exhibited a decrease in population, while the western municipalities have experienced significant growth. This shift is attributable to a

number of factors including the change from a manufacturing to a service economy (1970s) and the migration of people from urban areas like Chester City and Upper Darby to more suburban settings such as Chester Heights Borough and Bethel, Concord, Edgmont, and Thornbury Townships in western Delaware County.

4.3.3.2 Population Distribution

As depicted on Figure 4-1, the "developed" eastern portion of the County is much more densely populated than the "developing" western portion. Table 4-2 provides the accompanying numerical data. The eastern municipalities encompass 89.95 square miles which is 49% of the total land mass whereas the western municipalities encompass 94.48 square miles, accounting for 51%. However, 78.4% of the County's population is in the eastern half.

Density patterns mirror the population distribution in Delaware County. For instance, municipal densities are generally much lower in the developing western/northern portions of the County than in the developed eastern/southern portions of the County. Western municipalities are typically larger and contain smaller populations. Chadds Ford Township, the least dense municipality in the County, has a density of 412 persons/square mile. Chadds Ford Township has the ninth largest land area (8.84 square miles) with a 2010 population of 3,640.

The majority of the County’s population is concentrated in the eastern part of the County. Despite the fact that the eastern portion of the County contains several large municipalities, most of this area is characterized by small, heavily populated boroughs that border West Philadelphia. Millbourne Borough, the densest municipality in the County, has a density of 16,557 persons per square mile. Millbourne Borough has the smallest land area (0.07 square miles) with a population of 1,153.

4.3.3.3 FUTURE POPULATION

The population shift that Delaware County is currently experiencing is expected to continue. Table 4-3 presents the forecasted population for the next thirty years as formulated by Delaware Valley Regional Planning Commission (DVRPC).

Table 4-2
Population Density

Municipality	2010 Census	Size in Square Miles	Persons per Square Mile
Eastern SA			
Aldan Borough	4,152	0.59	7,037
Clifton Heights Borough	6,652	0.62	10,729
Collingdale Borough	8,786	0.87	10,099
Colwyn Borough	2,546	0.25	10,184
Darby Borough	10,687	0.81	13,194
Darby Township	9,264	1.64	5,649
East Lansdowne Borough	2,668	0.21	12,705
Edgmont Township	3,987	9.74	409
Folcroft Borough	6,606	1.38	4,787
Glenolden Borough	7,153	0.86	8,317
Haverford Township	48,491	9.95	4,873
Lansdowne Borough	10,620	1.2	8,850
Marple Township	23,428	10.43	2,246
Millbourne Borough	1,159	0.07	16,557
Morton Borough	2,669	0.36	7,414
Nether Providence Township	13,706	4.64	2,954
Newtown Township	12,216	10.11	1,208
Norwood Borough	5,890	0.81	7,272
Prospect Park Borough	6,454	0.73	8,841
Radnor Township	31,531	13.83	2,280
Ridley Park Borough	7,002	1.04	6,733
Ridley Township	30,768	5.18	5,940
Rutledge Borough	784	0.15	5,227
Sharon Hill Borough	5,697	0.77	7,399
Springfield Township	24,211	6.29	3,849
Swarthmore Borough	6,194	1.38	4,488
Tinicum Township	4,091	5.53	740
Upper Darby Township	82,795	7.62	10,865
Upper Providence Township	10,142	5.93	1,710
Yeadon Borough	11,443	1.6	7,152
Easttown Township, Chester Co.[1]	185	0.11	1,691
Tredyffrin Township, Chester Co.[1]	6,265	1.09	5,728
Eastern SA Total	404,151	100.26	4,031

Note: 1) Easttown and Tredyffrin Townships are only partially served by DELCORA. The Easttown 2010 Census data is estimated based on 70 connections and 2.64 persons per household. Tredyffrin 2010 Census data is estimated based on metered flow, 262.5 gal/EDU & 2.99 persons/EDU.

Table 4-2 (cont.)
Population Density

Municipality	2010 Census	Size in Square Miles	Persons per Square Mile
Western SA			
Aston Township	16,592	5.9	2,812
Bethel Township	8,791	5.44	1,616
Brookhaven Borough	8,006	1.69	4,737
Chadds Ford Township	3,640	8.84	412
Chester City	33,972	4.77	7,122
Chester Heights Borough	2,531	2.17	1,166
Chester Township	3,940	1.38	2,855
Concord Township	17,231	13.78	1,250
Eddystone Borough	2,410	0.96	2,510
Lower Chichester Township	3,469	1.06	3,273
Marcus Hook Borough	2,397	1.14	2,103
Media Borough	5,327	0.75	7,103
Middletown Township	15,807	13.43	1,177
Parkside Borough	2,328	0.19	12,253
Rose Valley Borough	913	0.74	1,234
Thornbury Township	8,028	9.16	876
Trainer Borough	1,828	0.98	1,865
Upland Borough	3,239	0.66	4,908
Upper Chichester Township	16,738	6.8	2,461
Western SA Total	157,187	79.84	1,969
Delaware County	**558,979**	**184.43**	**3,031**

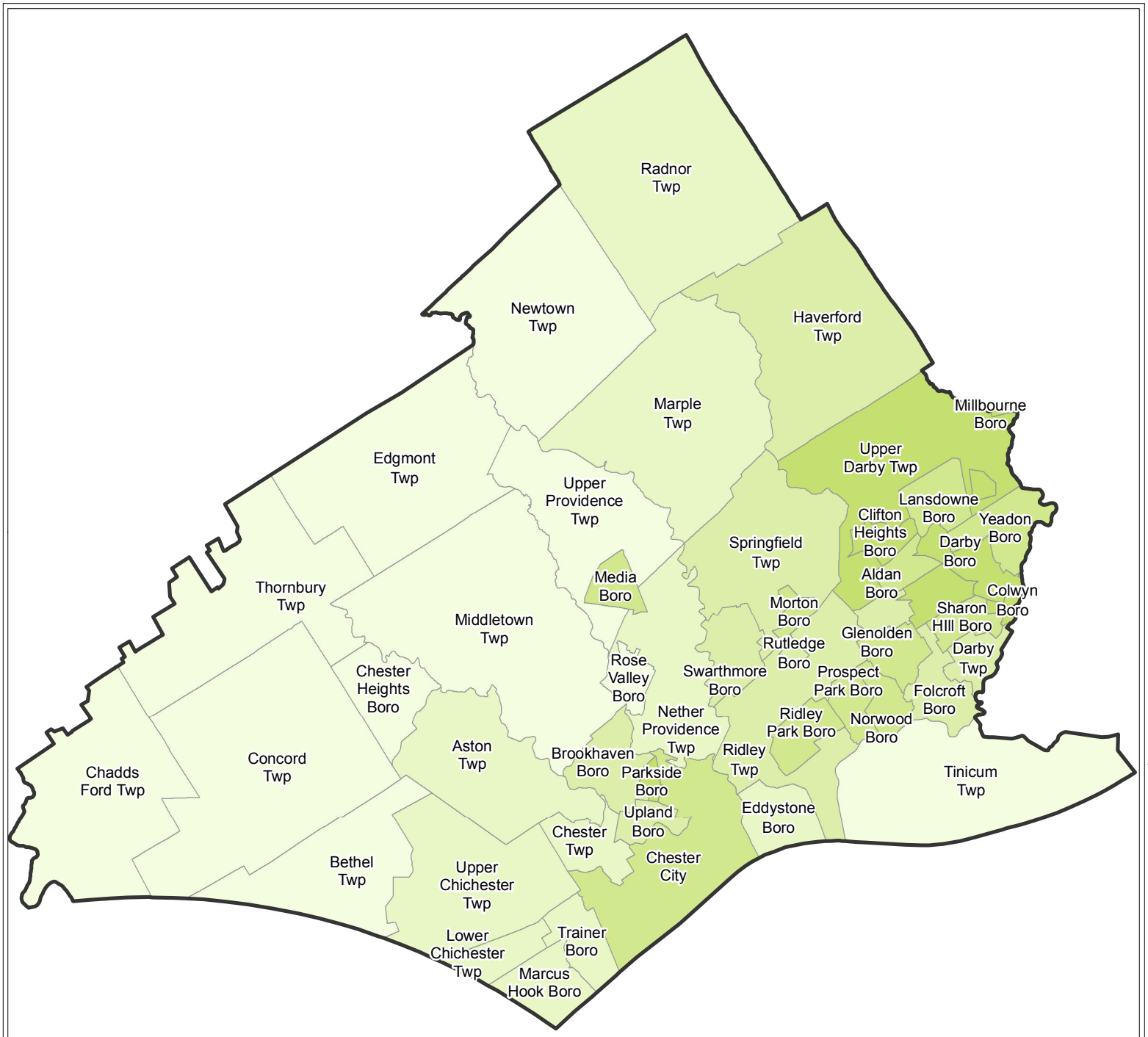

Figure 4-1
Population Density by Municipality, 2010

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Table 4-3
Forecasted Population

Municipality	2010 Census	2015 Forecast	2020 Forecast	2025 Forecast	2030 Forecast	2035 Forecast	2040 Forecast
Eastern SA							
Aldan Borough	4,152	4,153	4,156	4,163	4,170	4,173	4,174
Clifton Heights Borough	6,652	6,651	6,649	6,643	6,638	6,636	6,635
Collingdale Borough	8,786	8,795	8,822	8,886	8,949	8,976	8,985
Colwyn Borough	2,546	2,551	2,566	2,600	2,635	2,649	2,654
Darby Borough	10,687	10,693	10,711	10,753	10,796	10,814	10,820
Darby Township	9,264	9,255	9,230	9,171	9,111	9,086	9,077
East Lansdowne Borough	2,668	2,667	2,665	2,661	2,656	2,654	2,653
Edgmont Township	3,987	4,020	4,112	4,330	4,547	4,640	4,672
Folcroft Borough	6,606	6,598	6,573	6,517	6,460	6,436	6,427
Glenolden Borough	7,153	7,151	7,144	7,130	7,115	7,108	7,106
Haverford Township	48,491	48,495	48,508	48,538	48,568	48,581	48,585
Lansdowne Borough	10,620	10,613	10,593	10,545	10,497	10,477	10,470
Marple Township	23,428	23,416	23,382	23,301	23,221	23,186	23,174
Millbourne Borough	1,159	1,162	1,170	1,189	1,207	1,215	1,218
Morton Borough	2,669	2,669	2,670	2,672	2,674	2,675	2,675
Nether Providence Township	13,706	13,713	13,733	13,780	13,826	13,846	13,853
Newtown Township	12,216	12,227	12,257	12,327	12,398	12,428	12,438
Norwood Borough	5,890	5,888	5,884	5,874	5,864	5,859	5,858
Prospect Park Borough	6,454	6,456	6,461	6,472	6,484	6,489	6,490
Radnor Township	31,531	31,547	31,594	31,703	31,812	31,858	31,875
Ridley Park Borough	7,002	7,004	7,008	7,020	7,031	7,035	7,037
Ridley Township	30,768	30,754	30,716	30,625	30,534	30,495	30,482
Rutledge Borough	784	784	784	783	783	783	783
Sharon Hill Borough	5,697	5,699	5,704	5,717	5,729	5,735	5,736
Springfield Township	24,211	24,239	24,318	24,504	24,690	24,769	24,797
Swarthmore Borough	6,194	6,197	6,206	6,226	6,247	6,256	6,259
Tinicum Township	4,091	4,088	4,078	4,055	4,033	4,023	4,020
Upper Darby Township	82,795	82,916	83,262	84,074	84,887	85,232	85,354
Upper Providence Township	10,142	10,167	10,240	10,411	10,581	10,654	10,679
Yeadon Borough	11,443	11,432	11,401	11,329	11,256	11,225	11,214
Easttown Township, Chester Co.[1]	185	190	196	206	216	223	228
Tredyffrin Township, Chester Co.[1]	6,265	6,415	6,602	6,892	7,182	7,370	7,520
Service Area Total	404,151	404,519	405,316	407,040	408,763	409,563	409,930

Note: 1) Easttown and Tredyffrin Townships are only partially served by DELCORA. The Easttown 2010 Census data is estimated based on 70 connections and 2.64 persons per household. Tredyffrin 2010 Census data is estimated based on metered flow, 262.5 gal/EDU & 2.99 persons/EDU.

Table 4-3 (cont.)
Forecasted Population

Municipality	2010 Census	2015 Forecast	2020 Forecast	2025 Forecast	2030 Forecast	2035 Forecast	2040 Forecast
Western SA							
Aston Township	16,592	16,610	16,663	16,786	16,910	16,962	16,980
Bethel Township	8,791	8,830	8,942	9,204	9,467	9,579	9,618
Brookhaven Borough	8,006	8,013	8,032	8,077	8,122	8,142	8,148
Chadds Ford Township	3,640	3,663	3,730	3,887	4,044	4,111	4,134
Chester City	33,972	33,984	34,018	34,097	34,176	34,210	34,222
Chester Heights Borough	2,531	2,533	2,540	2,556	2,573	2,580	2,582
Chester Township	3,940	3,945	3,960	3,994	4,029	4,043	4,049
Concord Township	17,231	17,336	17,635	18,338	19,041	19,340	19,445
Eddystone Borough	2,410	2,409	2,407	2,401	2,396	2,393	2,392
Lower Chichester Township	3,469	3,468	3,466	3,459	3,453	3,451	3,450
Marcus Hook Borough	2,397	2,399	2,405	2,418	2,431	2,437	2,439
Media Borough	5,327	5,332	5,347	5,383	5,418	5,433	5,438
Middletown Township	15,807	15,838	15,925	16,129	16,334	16,421	16,452
Parkside Borough	2,328	2,329	2,333	2,343	2,352	2,356	2,358
Rose Valley Borough	913	917	930	959	988	1,000	1,004
Thornbury Township	8,028	8,066	8,173	8,427	8,680	8,787	8,825
Trainer Borough	1,828	1,823	1,810	1,777	1,745	1,732	1,727
Upland Borough	3,239	3,239	3,237	3,234	3,231	3,229	3,229
Upper Chichester Township	16,738	16,764	16,839	17,014	17,189	17,264	17,290
Service Area Total	157,187	157,500	158,390	160,484	162,578	163,469	163,781
Delaware County	**558,979**	**559,501**	**560,986**	**564,481**	**567,976**	**569,461**	**569,983**

Forecasted population change through 2040 for the eastern municipalities is mixed. Some municipalities are expected to decrease, some are relatively stable, and some are expected to grow. In contrast, most of the western municipalities are expected to increase. Edgmont Township is included in the Eastern SA because the planned connection to CDCA will introduce new flows to the system. Edgmont Township is projected to grow by 17.2% and is the exception to the population growth trend in Eastern SA municipalities. By contrast, most eastern municipalities such as Folcroft, Glenolden, and Lansdowne Boroughs as well as Darby and Marple Townships are expected to decrease in population.

Table 4-4 presents the projected density figures for both the eastern and western municipalities. In the suburban West, the municipalities are generally projected to experience population (and associated density) increases which may influence the need for sewage treatment alternatives. The reverse is true in the urbanized East where municipal populations and associated densities are expected to decrease or experience only small increases. The projected population change from 2010 to 2040 is shown in Figure 4-2.

Table 4-4
Projected Population Density

Municipality	2010 Census	2040 Forecast	Absolute Change 2010-2040	Percent Change 2010-2040	Persons per Square Mile
Eastern SA					
Aldan Borough	4,152	4,174	22	0.5%	7,075
Clifton Heights Borough	6,652	6,635	-17	-0.3%	10,701
Collingdale Borough	8,786	8,985	199	2.3%	10,328
Colwyn Borough	2,546	2,654	108	4.3%	10,618
Darby Borough	10,687	10,820	133	1.2%	13,358
Darby Township	9,264	9,077	-187	-2.0%	5,535
East Lansdowne Borough	2,668	2,653	-15	-0.6%	12,633
Edgmont Township	3,987	4,672	685	17.2%	480
Folcroft Borough	6,606	6,427	-179	-2.7%	4,657
Glenolden Borough	7,153	7,106	-47	-0.7%	8,263
Haverford Township	48,491	48,585	94	0.2%	4,883
Lansdowne Borough	10,620	10,470	-150	-1.4%	8,725
Marple Township	23,428	23,174	-254	-1.1%	2,222
Millbourne Borough	1,159	1,218	59	5.1%	17,403
Morton Borough	2,669	2,675	6	0.2%	7,431
Nether Providence Township	13,706	13,853	147	1.1%	2,986
Newtown Township	12,216	12,438	222	1.8%	1,230
Norwood Borough	5,890	5,858	-32	-0.5%	7,232
Prospect Park Borough	6,454	6,490	36	0.6%	8,891
Radnor Township	31,531	31,875	344	1.1%	2,305
Ridley Park Borough	7,002	7,037	35	0.5%	6,766
Ridley Township	30,768	30,482	-286	-0.9%	5,885
Rutledge Borough	784	783	-1	-0.1%	5,219
Sharon Hill Borough	5,697	5,736	39	0.7%	7,450
Springfield Township	24,211	24,797	586	2.4%	3,942
Swarthmore Borough	6,194	6,259	65	1.0%	4,535
Tinicum Township	4,091	4,020	-71	-1.7%	727
Upper Darby Township	82,795	85,354	2,559	3.1%	11,201
Upper Providence Township	10,142	10,679	537	5.3%	1,801
Yeadon Borough	11,443	11,214	-229	-2.0%	7,009
Easttown Township, Chester Co.[1]	185	228	43	23.2%	1,691
Tredyffrin Township, Chester Co.[1]	6,265	7,520	1,255	20.0%	5,728
Service Area Total	404,151	409,930	5,779	1.4%	4,031

Note: 1) Easttown and Tredyffrin Townships are only partially served by DELCORA. The Easttown 2010 Census data is estimated based on 70 connections and 2.64 persons per household. Tredyffrin 2010 Census data is estimated based on metered flow, 262.5 gal/EDU & 2.99 persons/EDU.

Table 4-4 (cont.)
Projected Population Density

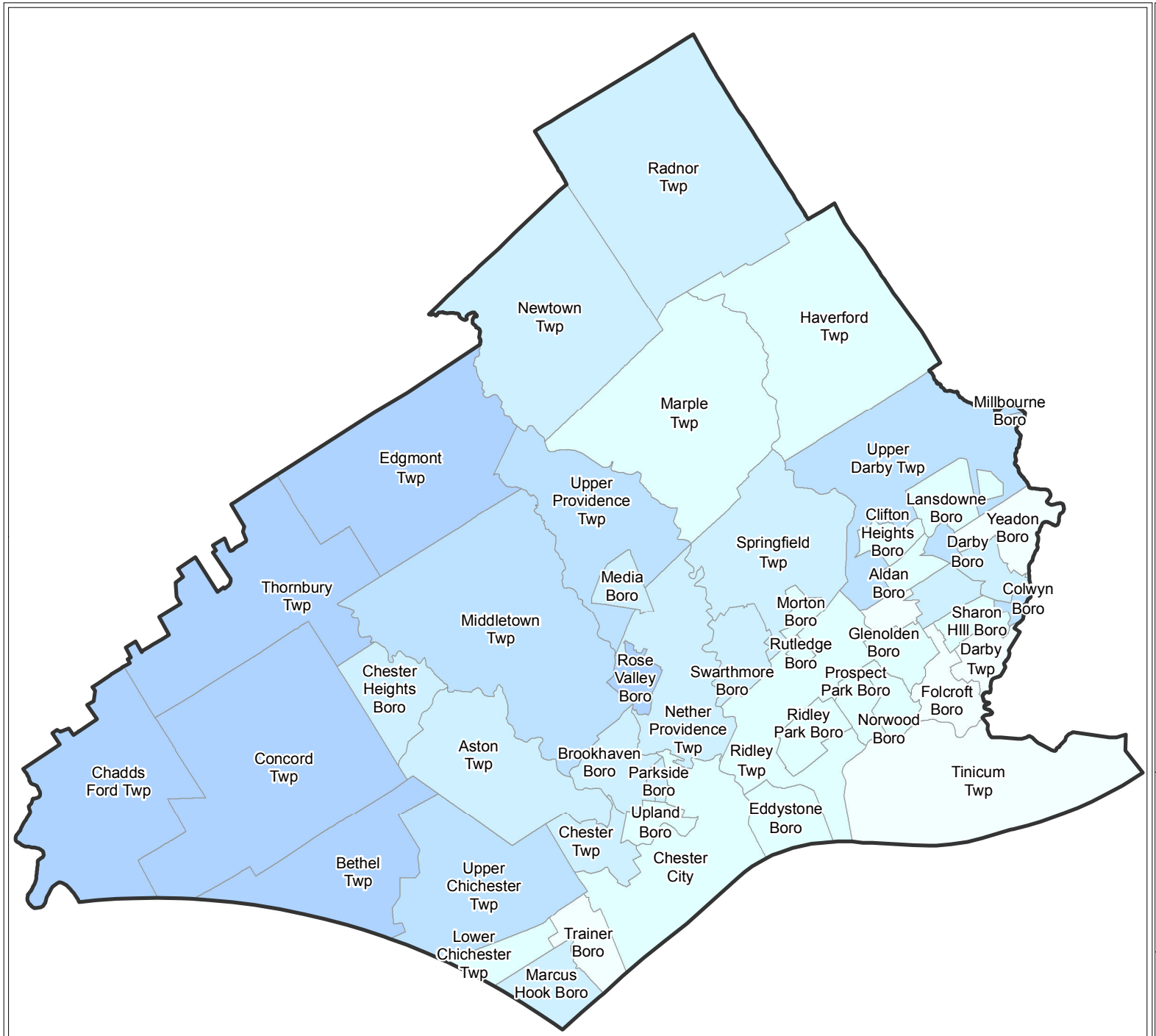
Municipality	2010 Census	2040 Forecast	Absolute Change 2010-2040	Percent Change 2010-2040	Persons per Square Mile
Western SA					
Aston Township	16,592	16,980	388	2.3%	2,878
Bethel Township	8,791	9,618	827	9.4%	1,768
Brookhaven Borough	8,006	8,148	142	1.8%	4,821
Chadds Ford Township	3,640	4,134	494	13.6%	468
Chester City	33,972	34,222	250	0.7%	7,174
Chester Heights Borough	2,531	2,582	51	2.0%	1,190
Chester Township	3,940	4,049	109	2.8%	2,934
Concord Township	17,231	19,445	2,214	12.8%	1,411
Eddystone Borough	2,410	2,392	-18	-0.7%	2,492
Lower Chichester Township	3,469	3,450	-19	-0.5%	3,255
Marcus Hook Borough	2,397	2,439	42	1.7%	2,139
Media Borough	5,327	5,438	111	2.1%	7,251
Middletown Township	15,807	16,452	645	4.1%	1,225
Parkside Borough	2,328	2,358	30	1.3%	12,409
Rose Valley Borough	913	1,004	91	10.0%	1,357
Thornbury Township	8,028	8,825	797	9.9%	963
Trainer Borough	1,828	1,727	-101	-5.5%	1,762
Upland Borough	3,239	3,229	-10	-0.3%	4,892
Upper Chichester Township	16,738	17,290	552	3.3%	2,543
Service Area Total	157,187	163,781	6,594	4.2%	2,051
Delaware County	**558,979**	**569,983**	**11,004**	**2.0%**	**3,091**

4.3.3.4 Impact on the East

In the fully-sewered Eastern SA, the population shift is not expected to have a tremendous effect on sewerage alternatives. Issues relating to adequacy of the existing sewer network to accommodate additional flows, as well as many other issues affecting sewerage alternatives for the Eastern SA will be addressed in subsequent chapters and specifically as an aspect of the I&I study component.

4.3.4 Changes in Zoning and/or Subdivision Regulation Creating Future Growth Areas

With the exception of re-zoning the Haverford Hospital property in Haverford Township, there have been no reported changes to Zoning Ordinances that would provide opportunity for population growth in the Eastern SA. The zoning for approximately 190 acres in Haverford



Legend

- Delaware County

Population change (%)

- 5.30 - 17.20
- 2.80 - 5.30
- 0.70 - 2.80
- -1.69 - 0.70
- -5.50 -1.70

N

0 1 2 4

Miles

Figure 4-2
Projected Population Change, 2010-2040

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Township was changed from Institutional to low density residential. Additional small parcels (0.5 to 1.3 acres were changed from low density to medium density or to office districts.

Many municipalities reported that they are built out, therefore, land subdivision and development in these areas would be rare. Edgmont Township adopted a new Sewage Disposal System Ordinance in 2010 that amended open space provisions of the Township Zoning Ordinance regarding on-lot and community sewage disposal systems permitted by conditional use.

The following municipalities have adopted new comprehensive plans:

- Lansdowne and East Lansdowne Boroughs
- Glenolden and Prospect Park Boroughs – Multi-Municipal Plan
- Morton Borough
- Norwood Borough
- Ridley Township and Eddystone Borough
- Springfield Township/Clifton Heights Borough Joint Comprehensive Plan
- Nether Providence, Rose Valley, Swarthmore, and Rutledge Boroughs Multi-Municipal Comprehensive Plan
- Upper Providence Township

4.3.5 Sewage Facilities Needs

The sewage facilities needs of the Eastern SA center on affordable ways to maintain aging infrastructure and reduce I&I to the collection systems. The potential for fee increases originating from the City of Philadelphia's mandated compliance with their Long Term Control Plan would adversely impact residents and prevent funds from being directed to I&I abatement. Municipal and authority efforts and programs to mitigate I&I and replace aging infrastructure are being implemented to various degrees throughout the service area and are detailed in Section 3.3 of this plan.

The other long-term need for the entire Eastern SA is to identify a long-term treatment facility. Increasing costs due to the City of Philadelphia's Long Term Control Plan make it prudent to evaluate options to manage treatment costs including evaluating alternate treatment facilities.

As presented in 3.3.1.1, CDCA is served by DELCORA's CDPS with a hydraulic capacity of 53.4 MGD and a permitted capacity of 40 MGD. Table 4-5 shows the historical flows reported in the Chapter 94 2011 Annual Report. Flow can be diverted for treatment to either DELCORA's WRTP, or PWD's SWWPCP.

Table 4-5
CDCA Historical Flows (MGD)

	2007	2008	2009	2010	2011
January	12.56	8.82	9.09	11.80	8.63
February	10.47	10.55	8.43	13.16	10.95
March	13.83	11.18	8.04	16.59	12.54
April	15.69	9.63	10.17	12.89	12.28
May	12.05	9.92	10.53	9.96	10.27
June	10.08	9.01	10.20	8.33	8.57
July	8.77	7.75	8.14	8.58	7.79
August	8.25	6.97	10.05	7.34	12.10
September	7.51	7.69	9.66	7.14	15.38
October	8.02	7.23	10.33	8.82	11.35
November	7.83	7.96	10.30	8.05	11.51
December	9.17	10.00	14.27	8.21	13.04
Average	10.35	8.89	9.93	10.07	11.20
Max 3-Month Avg.	13.86	10.45	11.63	14.21	12.94
5-Year Average					10.09

MA is served by DELCORA MPS with a hydraulic capacity of 18 MGD and a permitted capacity of 15 MGD (see 3.3.1.2). Table 4-6 shows the historical flows reported in the Chapter 94 2011 Annual Report.

DCJA and RHM are served by DELCORA DCPS with a hydraulic capacity of 70 MGD and a permitted capacity of 30 MGD (see 3.3.1.3). Table 4-7 shows the historical flows reported in the Chapter 94 2011 Annual Report.

Table 4-8 shows the historical flows for the Eastern SA as reported in the Chapter 94 2011 Annual Report as split between the two treatment plants servicing the area. Table 4-9 shows the projected flows for the Eastern SA are reported in the Chapter 94 2011 Annual Report. The flows to the WRTP reflect an increase in flow in 2015 and 2016 due to a new service area in Edgmont Township.

Table 4-6
MA Historical Flows (MGD)

	2007	2008	2009	2010	2011
January	5.34	4.03	4.35	5.49	4.28
February	4.50	4.85	3.99	6.32	5.41
March	5.93	4.99	3.74	7.35	5.82
April	6.58	4.29	4.82	5.68	5.67
May	4.88	4.51	4.85	4.64	4.80
June	4.33	4.12	5.01	3.96	4.15
July	3.89	3.67	3.94	4.30	3.85
August	3.66	3.29	4.94	3.60	6.18
September	3.34	3.56	4.65	3.46	6.87
October	3.63	3.43	4.99	4.16	5.30
November	3.53	3.81	4.86	3.76	5.20
December	4.31	4.83	6.70	3.92	5.82
Average	4.50	4.12	4.74	4.72	5.28
Max 3-Month Avg.	5.80	4.71	5.52	6.45	6.12
5-Year Average					4.67

Table 4-7
DCJA Historical Flows (MGD)

	2007	2008	2009	2010	2011
January	26.82	20.10	19.70	25.17	18.18
February	24.48	23.30	18.50	27.68	21.82
March	29.47	24.40	17.80	32.53	25.03
April	33.26	21.40	20.30	26.84	24.52
May	29.10	20.50	21.10	21.54	21.08
June	26.01	19.10	20.20	18.67	18.26
July	21.61	17.40	18.30	19.85	17.13
August	19.81	15.80	22.20	16.91	24.07
September	17.63	17.30	20.70	16.07	30.40
October	18.75	16.60	21.80	20.28	23.22
November	19.52	17.60	21.20	17.53	22.99
December	22.15	21.00	27.40	17.99	25.50
Average	24.05	19.54	20.77	21.75	22.68
Max 3-Month Avg.	30.61	23.03	23.47	29.02	25.89
5-Year Average					21.76

Table 4-8
Eastern SA Historical Flows (MGD)

	To DELCORA's WRTP					To PWD's SWWPCP				
	2007	**2008**	**2009**	**2010**	**2011**	**2007**	**2008**	**2009**	**2010**	**2011**
January	11.17	8.70	8.74	11.13	8.49	33.54	24.25	24.46	31.57	22.68
February	10.06	9.62	8.41	11.47	10.15	29.40	29.08	22.59	35.75	28.09
March	11.37	10.23	8.01	11.50	11.13	37.87	30.34	21.63	45.01	32.33
April	11.29	9.35	9.59	11.19	11.20	44.24	25.97	25.64	34.28	31.37
May	11.21	9.40	9.85	9.82	10.19	34.82	25.53	26.56	26.45	26.06
June	9.80	8.67	9.73	8.28	8.51	30.62	23.56	25.68	22.79	22.56
July	8.32	7.57	8.14	8.11	7.68	25.96	21.25	22.38	24.73	21.18
August	7.79	6.84	9.53	7.32	9.32	23.93	19.22	27.91	20.65	33.08
September	7.40	7.31	9.51	7.05	9.14	21.08	21.24	25.78	19.76	43.51
October	7.61	6.98	9.50	8.29	11.00	22.80	20.28	27.76	25.06	28.98
November	7.70	7.61	10.16	7.89	10.32	23.19	21.76	26.29	21.55	29.47
December	8.85	9.18	11.33	8.03	11.19	26.79	26.65	37.12	22.20	33.25
Average	9.38	8.46	9.38	9.17	9.86	29.52	24.09	26.15	27.48	29.38
Max 3-Mo. Avg.	11.29	9.73	10.33	11.39	10.84	38.98	28.46	30.39	38.34	35.19
5-Year Avg					9.25					27.33

Table 4-9
Projected Hydraulic Loading – Eastern SA

	To DELCORA's WRTP		To PWD's SWWPCP	
	Projected Average Month Flow	**Projected Maximum Month Flow**	**Projected Average Month Flow**	**Projected Maximum Month Flow**
2012	9.26	10.73	27.4	34.2
2013	9.27	10.74	27.5	34.4
2014	9.28	10.74	27.6	34.5
2015	9.54	11.05	27.7	34.6
2016	9.55	11.06	27.8	34.7

Notes:
Projected Max Month =Projected Annual Avg. Flow x 5-year average hydraulic ratio.

4.3.6 Municipality-Specific Sewage Facilities Needs

Capacity limitations and SSOs are generally caused by stormwater I&I. I&I during heavy rainfall events is the most common and predictable cause of SSOs in the Eastern SA. In addition, SSOs have been caused by failing pipes or blockages and not by ADF capacity limitations. Programs to identify failing components of the aging infrastructure are needed where they're not already in place. Table 4-10 lists specific needs that were reported by individual municipalities. Most municipalities are struggling to allocate adequate budget to address all identified problems within their systems. Institutional measures such as inspections

during real estate sale or rental transfers to disconnect sump pumps and roof drains from the sanitary collection system are in place in most communities. Addressing I&I in residential lateral connections is believed to have great potential to reduce I&I to the system, but is difficult to implement. Homeowners own the lateral pipes and they are expensive to repair. Lateral connection repairs are usually only performed in response to a failure.

Table 4-10
Municipal Sewage Facilities Status

Municipality	Identified Sewage Facilities Needs	Sewer Survey Program in Place	Program to Disconnect Roof Drains & Sump Pumps	Lateral Inspection/ Repair Program
Aldan Borough	Perform work on an ongoing basis per I&I Abatement Program to systematically reduce I&I.	yes	yes	
Clifton Heights Borough	No known problems.	yes		
Collingdale Borough	Performing study to evaluate MacDade Blvd and Springfield Road area. Problems with sink holes developing at lateral tie-in locations.	yes		
Colwyn Borough	Known areas where grease build-up causes problems.	yes	yes	
Darby Borough	I&I problems due to age of collection system.	yes	yes	
Darby Township	Currently performing an Action Plan as directed by PADEP.	yes	yes	yes
East Lansdowne Borough	System subject to I&I.		yes	
Edgmont Township	Planned connection to CDCA - 1,265 EDUs			
Folcroft Borough	Identified I&I problems along the Sharon Hill and Ashland/Shallcross Basin. Has I&I Abatement Plan.	yes		
Glenolden Borough	No information submitted.			
Haverford Township	Perform work on as-needed basis. Works with RHM to identify and repair I&I problems.	yes		
Lansdowne Borough	System subject to I&I.	yes	yes	
Marple Township	System subject to I&I. Problems are repaired on a case-by-case basis.	yes		
Millbourne Borough	No information submitted.			
Morton Borough	System subject to I&I. A problem has been identified in the area of flow meter #5.			
Nether Providence Township	Subject to I&I and blockages due to roots.	yes		
Newtown Township	No information submitted.			
Norwood Borough	System prone to I&I.			
Prospect Park Borough	System prone to I&I.	yes	yes	
Radnor Township	No information submitted.			
Ridley Park Borough	Implemented and I&I Abatement Program.	yes		
Ridley Township	Implemented and I&I Abatement Program. Areas near Braxton Road, Morris Avenue, and Leedom Estates were studies due to recurring incidents.	yes		
Rutledge Borough	I&I problems, especially at MH-2 meter.	yes		

Table 4-10 (cont.)
Municipal Sewage Facilities Status

Municipality	Identified Sewage Facilities Needs	Sewer Survey Program in Place	Program to Disconnect Roof Drains & Sump Pumps	Lateral Inspection/ Repair Program
Sharon Hill Borough	On-going I&I Abatement.	yes	yes	
Springfield Township	Implementing I&I Abatement Program. Occasional failures due to system age.	yes		
Swarthmore Borough	Has identified list of rehabilitation work based on I&I Study results.	yes	yes	
Upper Darby Township	Trunk line has capacity issues during rainfall events. PADEP moratorium on interceptor. Line Road Interceptor and Cobbs Creek Interceptor also have capacity issues.	yes	yes	
Upper Providence Township	I&I Abatement and construction of low-pressure lines is ongoing.	yes		
Yeadon Borough	System subject to I&I and blockages.		yes	

CHAPTER 5
IDENTIFICATION OF ALTERNATIVES

INTRODUCTION

This chapter presents feasible alternatives for addressing long-term sewage disposal needs in the Eastern SA. The purpose of this evaluation is to assure that DELCORA customers in the Eastern SA continue to receive wastewater treatment for affordable rates and the collection and conveyance system is maintained or upgraded to prevent SSOs. The two main drivers for the evaluation are to mitigate on-going SSOs caused by I&I and reduce treatment costs resulting from discharge of large peaks to the treatment facilities during storm events. Mitigation of SSOs is necessary to protect the public health and avoid regulatory fines and penalties, as well as maintain capacity for new connections.

The City of Philadelphia's Long Term Control Plan (LTCP) addresses combined sewer overflows at a total estimated cost of $2 Billion over a 25-year planning period. Philadelphia has a new 15-year contract with DELCORA that includes paying a proportionate share of the LTCP costs fixed at 9.44% over the life of the contract. The total charges for wastewater treatment paid to Philadelphia cannot be controlled without reduction in peak flows from the Eastern SA.

5.1 TREATMENT AND CONVEYANCE ALTERNATIVES

5.1.1 Diverting Flow to the WRTP

One option for treatment of the wastewater from the Eastern SA is to construct a connecting force main to DELCORA's WRTP in Chester. The existing 54-in ductile iron (DI) force main across the City of Chester is insufficient to accommodate the additional flow from the Eastern SA and would require, at least, a new twin of the force main that was constructed in 2012. Additionally, the existing 36-in DI force main between the Central Delaware Pump Station (CDPS) and Chester would need to be increased in size to a twin 48-in DI force main for a distance of 2.5 miles.

In addition to constructing the force mains, the WRTP would need to be expanded. A 2007 study commissioned by DELCORA included an evaluation of the changes necessary at the

WRTP to increase the treatment capacity by adding a new 30-MGD treatment train, to operate in parallel with the existing 50-MGD activated sludge system. Final effluent (after disinfection) from the two trains would be combined for discharge through the existing outfall. Tertiary filtration would be added to the existing 50-MGD treatment system. The evaluation for expansion of the WRTP considered the wastewater characteristics summarized in Table 5-1, with a daily peaking factor of 2.0 (a peak flow capacity of 60 MGD). Figure 5-1 lays out the components that were included in this evaluation.

Table 5-1
Treatment Plant Basis of Design

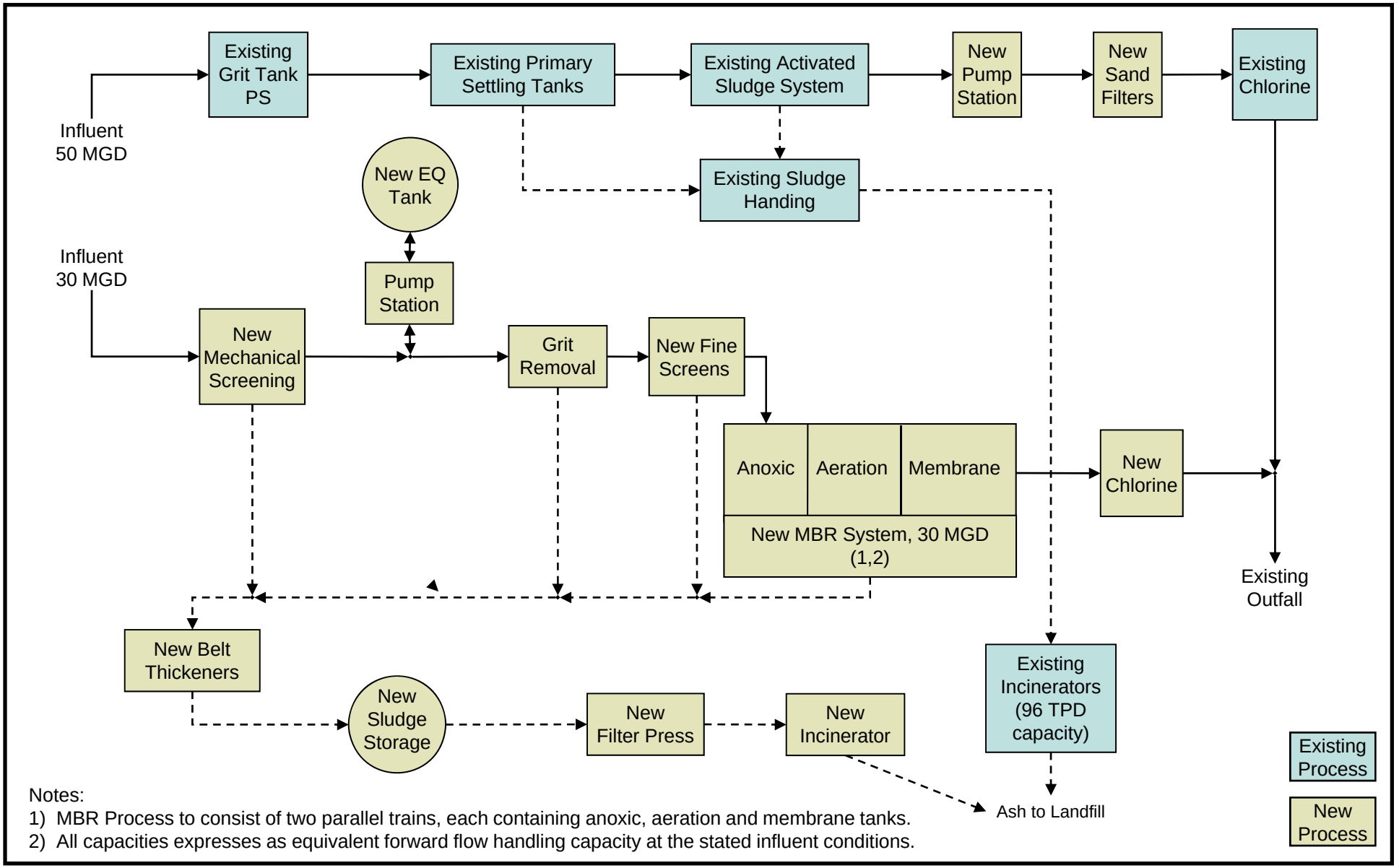
Parameter	Assumed Value	
	Influent	Secondary Treatment (no BNR/ENR)
BOD_5 (mg/L)	250	25
TSS (mg/L)	250	30
Ammonia Nitrogen (mg/L)	25	Monitor only
Total Kjeldahl Nitrogen (mg/L)	40	Monitor only
Total Phosphorus (mg/L)	8	Monitor only
Residual Chlorine or CPO	NA	0.5

Expanding use of the existing sewage treatment is a viable alternative. However, to manage the cost of this alternative, an aggressive and tangible effort to reduce I&I are required.

5.1.1.1 Influent Flow Split

Influent currently enters the treatment process through existing lines, and proceeds to the existing grit tanks via a 5-foot diameter vertical riser pipe, with flow split evenly between the two grit tanks by weirs.

Under the proposed scenario for this alternative, the new Cross-Chester Force Main will enter the WRTP from the north after crossing under the railroad tracks at Highland Avenue. After passing the flow splitter, located near the front gate, a portion of the flow in the Cross-Chester Force Main would go to the new treatment train on the northern side of the WRTP site.



Delaware County Act 537 Sewage Facilities Plan Update

Eastern Service Area

FIGURE 5-1

WRTP PRELIMINARY BLOCK FLOW DIAGRAM 30 MGD EXPANSION

Figure 5-1.ppt

5.1.1.2 Equalization

A 2-MG equalization tank would be necessary to reduce short-term (i.e., hourly) peaks to match peak membrane flux rate requirements. The equalization tank dimensions would be 90-ft diameter and 24-ft wall height. A coarse bubble diffused air system would be used to provide mixing and control odor.

The membrane bio-reactor (MBR) system would be required to accommodate a 2.0 wet day peak for a 24-hour period. Wet day peak flow in excess of a 2.1 peaking factor will be routed to the existing activated sludge system.

5.1.1.3 Headworks

Flow for the expansion would be directed from the new flow splitter to a new headworks building located at the western end of the area formerly occupied by the ash lagoon.

The new headworks building would include mechanical screening (for large solids), grit removal, and fine screening. Fine screens are provided to meet manufacturers' requirements for protection of the membrane units. Flow would proceed from the new headworks to the MBR system.

5.1.1.4 MBR System

The MBR technology uses a complete mix suspended growth bioreactor operated at high mixed liquor suspended solids (MLSS) concentration, followed by membrane filters for solids removal. Treated effluent passes the membrane as permeate for discharge. Similar to conventional activated sludge systems, recycle of concentrated solids to the bioreactor would be used. Sludge is wasted from the bioreactor to control mean cell retention time (MCRT). The fine pore size of the membrane results in very low effluent TSS levels, and the high resulting MCRT of the system provides a high degree of BOD_5 removal and significant nitrification. Anoxic process tanks can be incorporated, if necessary, for denitrification. Factors to be evaluated in using this technology include the capital cost of the membrane components, maintenance required to control fouling of the membranes, and the long-term life of the membranes. Process-specific operating costs include both the operating pressure of the

membrane, and, for some systems, the internal recycle flow rates used to control fouling. For the purposes of this evaluation, the Kubota MBR and Zenon MBR systems were considered.

The MBR system would consist of two parallel treatment trains each comprising anoxic, pre-aeration, and membrane tanks. Parallel trains are used for operational flexibility.

5.1.1.5 Disinfection System

MBR effluent would be directed to a new chlorine contact chamber sized for 30 MGD (60 MGD peak). This design provides a minimum 15-minute retention time at peak daily flow and a design chlorine dosage of 8 mg/L (PADEP Document 362-0300-001) in accordance with PADEP requirements. Channel dimensions and side water depth meet conventional design criteria and match the existing chamber.

5.1.1.6 Effluent Discharge

Following disinfection the effluent from the new chlorine contact tank would be routed to a junction with the existing outfall system. A new magnetic flow meter would be installed on the second (currently unused) 60-in gravity outfall line.

5.1.1.7 Pumping

Return Activated Sludge (RAS)/Waste Activated Sludge (WAS) pumping is provided with the MBR system.

5.1.1.8 Sludge Handling

The following components would be required to be added for sludge handling:

- One, 2-meter belt thickener.
- One, 2-meter belt filter press.
- One, 40 dry tons/day sludge incinerator system.

5.1.2 Constructing a New Treatment Facility

A new Eastern Regional Treatment Plant is being considered to treat wastewater from the RHM, CDCA, MA, DCJA, and Cobbs Creek Service Areas. The new regional treatment plant is being considered as an alternative to potential increases in treatment and surcharge costs for flow that is diverted to the SWWPCP.

A 2007 study commissioned by DELCORA included an option for a new Eastern Regional Treatment Plant (ERTP) located on portions of the former Boeing Facility in Ridley Township. The facility evaluated was a MBR treatment plant with a submerged outfall into the Delaware River. The new ERTP would be designed to treat 30 MGD daily average flow with the wastewater characteristics summarized in Table 5-1. The same wastewater characteristics were used as a basis of design for the WRTP expansion, and similarly, a daily peaking factor of 2.0 was used for the ERTP design to provide a peak flow capacity of 60 MGD. Figure 5-2 lays out the components that were included in the ERTP evaluation.

5.1.2.1 Influent Flow

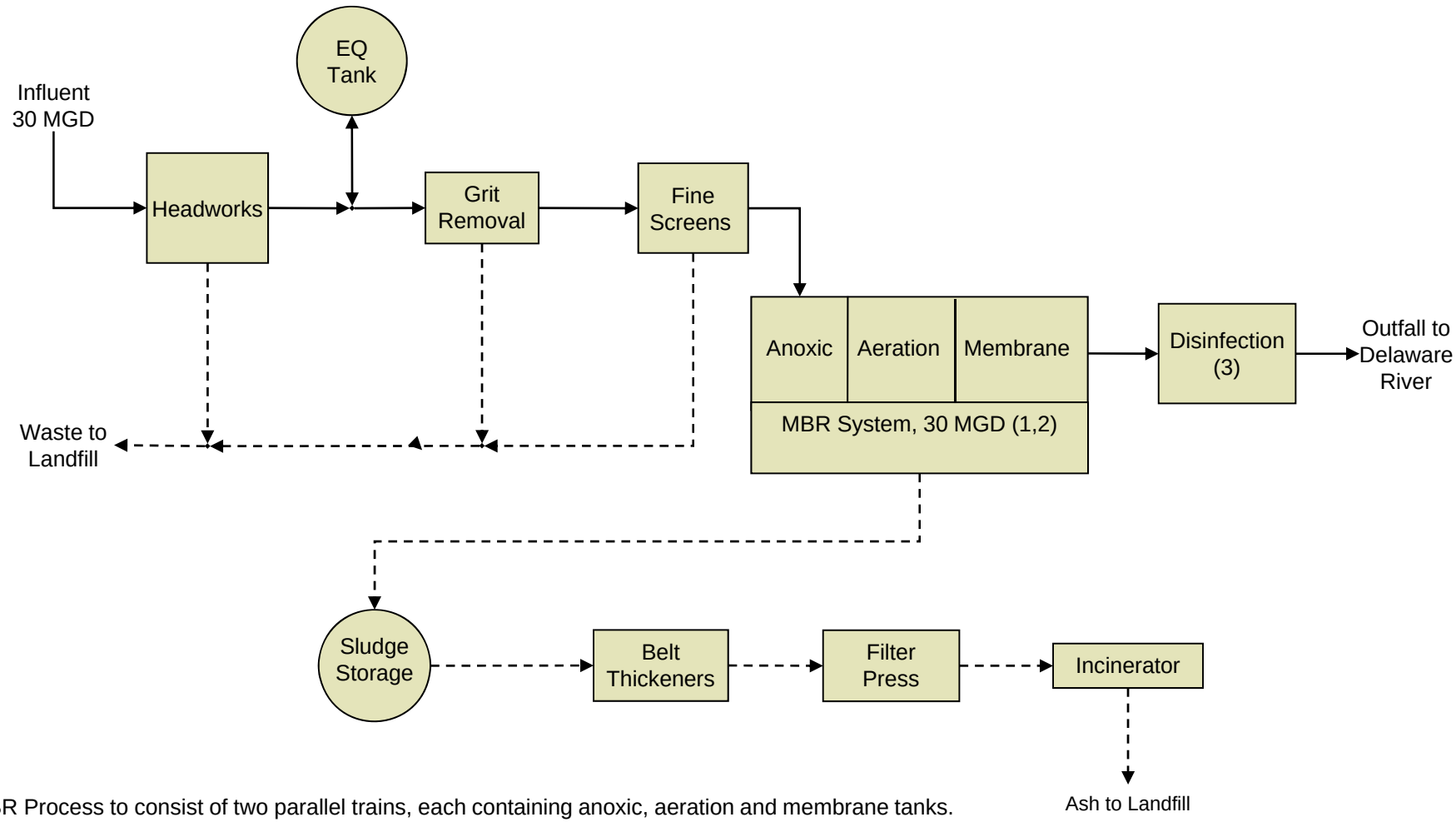
Influent would enter the treatment process through a new force main. The new headworks building would include mechanical screening (for large solids), grit removal, and fine screening. Fine screens are provided to meet manufacturers' requirements for protection of the membrane units. Flow will proceed from the new headworks to the MBR system.

5.1.2.2 Equalization

A new 2-MG equalization tank would be designed to reduce short term (i.e., hourly) peaks to match peak membrane flux rate requirements. As with Alternative 1, the equalization tank dimensions are 90-ft diameter and 22-ft side wall height. A coarse bubble diffused air system would be used to provide mixing and control odor. The MBR system is specified to accommodate a 2.0 wet day peak for a 24-hour period.

5.1.2.3 MBR System

The MBR technology was described in Section 5.1.1.4. It should be noted that although nitrification and denitrification are not strictly required under this scenario, the MBR configuration typically provides nitrification as a result of its long sludge age and the denitrification components (tank and mixer) are generally provided with the system.



Notes:
1) MBR Process to consist of two parallel trains, each containing anoxic, aeration and membrane tanks.
2) All capacities expressed as equivalent forward flow handling capacity at the stated influent conditions.
3) uV disinfection or chlorination can be used. Capital cost estimated is based upon uV disinfection.

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FIGURE 5-2

ERTP PRELIMINARY BLOCK FLOW DIAGRAM
30 MGD TREATMENT FACILITY

Figure 5-2.ppt

5.1.2.1 Disinfection System

MBR effluent would be directed to a new disinfection system sized for 30 MGD (60 MGD peak). For the purposes of this evaluation an ultraviolet light (uV) disinfection system is provided. The conceptual approach is based on the Infilco Degremont Aquaray lamp system. The design provides a uV dosage of 30,000 uVsec/cm^2 at peak flow, with allowances for uV lamp tube fouling, and lamp output reduction over time. Channel dimensions and side water depth must meet the manufacturer's specifications.

5.1.2.2 Effluent Discharge

Following disinfection the effluent from the uV channel will be routed to an effluent discharge chamber constructed of concrete from which three 42-in diameter HDPE lines will discharge. The discharge lines, which are proposed to extend approximately 1,000 ft. into the Delaware River, would be equipped with multi-port diffusers to assist in dispersing the treated effluent into the river.

5.1.2.3 Pumping

WAS pumping is provided with the MBR system.

5.1.2.4 Sludge Handling

The following components would be required for sludge handling:

- One, 2-meter belt thickener.
- One, 2-meter belt filter press.
- One, 40 dry tons per day sludge incinerator system, including all associated equipment, wiring, piping, ducts, air pollution control system, ash handling system, blowers, and pumps and control system.

A sludge handling building would be necessary for thickening and dewatering and a separate building would be required for the incinerator.

5.1.3 Continued Use of Existing Facilities

The City of Philadelphia's LTCP for combined sewers prescribes measures to reduce CSOs. The City of Philadelphia potentially passing on these costs through increased costs for surcharges and lowered thresholds for peak and average daily flows was of concern to

DELCORA. DELCORA negotiated a two-year contract extension with Philadelphia where the flow thresholds (the allowable peak flow before an additional fee is applied for discharges in excess of the permitted flow rate) were held at existing levels, and is currently completing negotiations for a long-term (15 year) contract.

The long-term contract contains provisions that hold the thresholds for flow exceedences (Average Daily Flow on a monthly basis = 50 MGD, Maximum Daily Flow = 75 MGD, and Instantaneous Maximum over 5-minute duration flow = 100 MGD) at existing levels. Surcharge rates for exceeding the flow thresholds are:

1. Annual Daily Average = $1,000 per each MGD in excess of 50 MGD on a monthly basis. This limit has not been exceeded to date.
2. Instantaneous Maximum = $10,000 per each MGD in excess of 100 MGD. An advantageous revision to previous contract terms is that the Instantaneous Maximum Flow is defined as having duration of 5 minutes instead of the previous definition of any instant that the flow meter exceeds the threshold.
3. Daily Average Flow = $15,000 per each MGD.

The surcharge calculation in the draft long-term contract has better terms for the costs of flow exceedences than the previous contract. Instead of additive penalties, it contains a provision that only the increment of additional flow is charged on a monthly basis, instead of new charges for the total flow for subsequent flow exceedences within each month. An example to illustrate these terms is as follows:

DELCORA would be billed $50,000 if an occurrence of instantaneous maximum flow to Philadelphia was 105 MGD (5 MGD over the threshold). If, on a later date in the same month, an occurrence of instantaneous maximum flow to Philadelphia was 104 MGD, DELCORA would not be billed the 4 MGD over the threshold because 105 MGD is the new threshold for that month. If on a later date during that same month, an instantaneous maximum flow rate of 106 MGD were recorded, DELCORA would only be billed for the 1 MGD increment ($10,000) instead of the entire 6 MGD over the baseline 100 MGD threshold. DELCORA would have been assessed a $150,000 fee for this example month under the previous terms of paying a surcharge every time the instantaneous maximum was exceeded, significantly more than the $60,000 total for the month under the terms of the new contract. The baseline threshold of 100 MGD is re-established at the beginning of each new month. Additionally, there will be fewer

cases where fees are assessed for exceeding the instantaneous maximum threshold since the flow rate must exceed 100 MGD for a duration of five minutes instead of just momentarily.

Continued conveyance of flow to the SWWPCP and use of the existing sewage treatment is being evaluated as an alternative. Aggressive and tangible efforts to reduce I&I are required under this alternative to minimize payment to the City of Philadelphia for flow exceedences.

5.2 REPAIR OR REPLACEMENT OF EXISTING CONVEYANCE FACILITIES

5.2.1 Regional Assets

As with all conveyance systems, rehabilitation or replacement of the asset is required for use beyond the original design life. The DELCORA-owned pump stations have been rebuilt in the last ten years to accommodate flow, more efficient technology, and replacement of worn items. The PCCP force mains are approaching the end of their design life (40-50 years) and will need to be replaced in the near future.

Due to the force main's alignment adjacent to the Heinz Refuge, replacement adjacent to the existing force main may not be feasible. Alternate routes under roads and streets will increase conflicts with other utilities thus increase construction costs.

5.2.2 Authority and Local Municipal Assets

Rehabilitation of gravity sewers and interceptors is a continual and on-going task. As these assets age, a systematic approach is needed to address long-term maintenance and capital expenditures. A good capital plan coupled with an asset management program will ensure that municipalities have the resources necessary to maintain their assets while avoiding sharp jumps in service fees.

Appropriate long-term solutions may include complete replacement, selective replacement of severely deteriorated sections, grouting of joints, slip-lining of sewers/interceptors and manhole lining to name a few corrective actions that will reduce and eliminate I&I from public assets.

5.2.3 Private Property Assets

Aggressive and tangible efforts to reduce I&I are required under all of the alternatives presented in this plan. PADEP has stated that an Ordinance requiring actions for reducing I&I must be included in this Sewage Facilities Plan Update for the Eastern SA. Repair or replacement of existing conveyance facilities to reduce I&I is a focus of this Act 537 Plan Update because it benefits all proposed alternatives by reducing fees paid to the City of Philadelphia for exceedences, reducing DELCORA treatment costs to users, and maintaining availability of connections to the system; therefore, it is being presented here and applies to all alternatives.

All communities acknowledge that correcting the condition of public assets cannot always eliminate sufficient I&I to prevent excessive flows and SSOs. One alternative to combating the continuing problem of I&I is to implement a private property I&I control program. In June 2010, DELCORA published a summary report that presents the techniques to investigate private property I&I and various programmatic options to systematically control I&I. There are numerous program options and variants that can be used to craft a program that meets local needs. At minimum, the program needs to assess I&I sources within the community and establish a framework and timetable for implementing corrective actions.

The service area- wide I&I abatement program needs include promulgating requirements in all municipalities to require and track I&I abatement measures. Adoption of a sewer lateral inspection and repair ordinance containing minimum standards to ensure I&I is being mitigated by each municipality in the Eastern SA is recommended under this alternative. Alternatively, a written plan detailing an I&I reduction strategy that better meets their municipal I&I flow situation may be prepared.

Section 202 (A)(9) of the DELCORA Standards, Rules and Regulations of 2011 prohibits the discharge of unpolluted waters such as stormwater, surface water, groundwater, roof runoff, subsurface drainage, non-contact cooling water, or other unpolluted waters unless a variance has been granted. The lateral inspection and repair ordinance is a vehicle to transmit this requirement to private residences and businesses and track compliance. Article V, Sewage Quality Restrictions, Section 5.02, Compelling Compliance by Users, of the CDCA agreement

with DELCORA states that: *"CDCA will require its Members and all other municipalities and authorities from which it accepts Sewage into its facilities to enact and keep in full force and effect at all times, ordinances and resolutions prohibiting and providing penalties for the discharge into their respective systems and restrictions, which ordinances and resolutions will also prohibit connection of municipal stormwater systems, roof or storm drains, cellar drains, or any other sources of underground, surface, or storm waters to Sewage collection systems."* A selected alternative for Eastern SA Municipalities that includes instituting a private lateral inspection and repair ordinance is consistent with the goals, objectives, and requirements of the current DELCORA agreements with DCJA, MA, and CDCA. There are multiple requirements already in place that prohibit discharge of clean water to the sanitary collection system. In addition to the agreements with DELCORA, the municipal Act 167 Stormwater Management Ordinances contain the following language in Section 803, Roof Drains and Sump Pumps:

a. Roof drains and sump pumps shall not be connected to sanitary sewers.
b. Roof drains and sump pumps shall not be connected to streets, storm sewers, or roadside ditches except on a case by case basis as determined by the municipality.
c. Roof drains and sump pumps shall discharge to infiltration areas or vegetative BMPs to the maximum extent practicable where advantageous to do so.

A sample Lateral Inspection and Repair/Replacement Time-of-Sale Ordinance is contained in Appendix B and examples lateral inspection and repair ordinances from other Delaware County municipalities are contained in Appendix C of this Plan Update is required for adoption by all municipalities that do not already have one in place. These are provided to assist the local municipal solicitors in drafting an ordinance for their municipality. The lateral inspection and repair ordinance contains standards that would address sources of I&I on private property such as the recommended standards found in Appendix D.

5.2.4 New Community Treatment Systems and the Potential for Re-Use

New community treatment systems are not applicable in the Eastern SA because much of the area is built-out and extensive existing collection and conveyance systems are in place to connect the area to regional treatment facilities.

5.2.5 Innovative/Alternative Methods of Collection/Conveyance

New collection/conveyance systems are not being considered in the Eastern SA because much of the area is built-out and extensive existing collection and conveyance systems are in place to connect the area to regional treatment facilities. A recommendation to upgrade materials, especially in areas that are served by terra-cotta, is included in Section 5.2 of this plan. Lateral connection repairs and system repairs in areas of known collection system failures will be performed under I&I Abatement Programs.

5.3 INDIVIDUAL SEWAGE DISPOSAL SYSTEMS

As per the meeting with PADEP at the Southeast Regional Office on May 23, 2011, and the Plan of Study dated November 7, 2011, identification of individual sewage disposal systems alternatives is not applicable for this plan.

5.4 SMALL FLOW SEWAGE TREATMENT FACILITIES

As per the meeting with PADEP at the Southeast Regional Office on May 23, 2011, and the Plan of Study dated November 7, 2011, identification of small flow sewage treatment facilities alternatives is not applicable for this plan.

5.5 COMMUNITY LAND DISPOSAL SYSTEMS

Any type of land disposal system requires open space for either surface irrigation, subsurface irrigation (drip), or subsurface infiltration. The level of treatment drives the size and rate of disposal. It is acknowledged that on-lot treatment/disposal systems are not feasible given the level of development in the Eastern SA. Use of a community land disposal system would require the siting of small treatment facilities across the Eastern SA or construction of an effluent pipeline to distribute treated water for reuse. This would require an industrial user with a water demand or large tracts of open space. Neither of these exists in the Eastern SA.

5.6 EQUALIZATION TANKS

As per the meeting with PADEP at the Southeast Regional Office on May 23, 2011, and the Plan of Study dated November 7, 2011, identification of retaining tank alternatives is not appropriate as a long-term sewage facilities option in this plan. RHM has completed the design of an equalization holding tank to be located in Haverford Township, in order to significantly

reduce the frequency of SSOs occurring on its interceptor caused by inflow during and after heavy rainfalls. The tank would reduce the health hazards associated with the SSOs and improve water quality in Darby Creek. As of this writing, RHM has received zoning approval for the project from Haverford Township. PADEP has not yet granted a formal approval and has stated that the tank, if approved, must be a temporary facility and that RHM and its member municipalities must continue with a program to aggressively address I&I problems.

In a 2007 study, DELCORA evaluated using equalization tanks to reduce the exceedence of contract peaks with PWD for disposal at SWWPCP. The evaluation was based on flow records between 1996 and 2006. The equalization tank conceptual design assumed siting at the former DCJA treatment plant, constructing a new pump station to feed the tanks, tanks were constructed of pre-stressed concrete with a roof and a 32-ft side water depth, and an odor control system would be required. The 2007 study was completed prior to knowledge of the contract terms that are now being offered by the City of Philadelphia, so the required storage volume is much larger than the volume that would be required under the current exceedence thresholds. Even if the projected costs of storage tanks are 50 percent of the costs calculated in 2007, the project would still cost approximately $65 Million. Considering that equalization tanks would not be an investment in a long-term asset prevents DELCORA from advancing this alternative.

5.7 SEWAGE MANAGEMENT PROGRAMS

As per the meeting with PADEP at the Southeast Regional Office on May 23, 2011, and the Plan of Study dated November 7, 2011, identification of sewage management program alternatives is not applicable for this plan.

5.8 NON-STRUCTURAL COMPREHENSIVE PLANNING

Except for the re-zoning of the Haverford Hospital property in Haverford Township, there have been no reported changes to Zoning Ordinances that would provide opportunity for population growth in the Eastern SA. The Eastern SA is largely built out; therefore, planned land use designations that would result in additional flow are not anticipated.

5.9 NO-ACTION ALTERNATIVE

The No Action alternative is being considered as part of this evaluation, although many critical components of the necessary I&I abatement and collection and conveyance system maintenance are already being performed under existing mandates or voluntary programs. Ongoing I&I Abatement programs are established throughout the Eastern SA and would continue regardless of the selected sewage facilities alternative.

5.9.1 Water Quality and Public Health

The No Action alternative would not address SSOs resulting from failures in the aging collection and conveyance system. SSOs constitute a significant public health hazard and damage the environment.

5.9.2 Growth Potential (Residential, Commercial, Industrial)

Although increased flows due to growth and development are not projected to occur, no action could result in increased SSOs throughout the service area. Increased SSOs and failure to address I&I could result in Chapter 94 connection moratoriums issued by PADEP, which would stifle redevelopment potential and economic growth potential within the service area.

5.9.3 Recreational Opportunities

No Action would likely result in increased SSOs which could, in turn, degrade surface water quality and produce a negative impact on wildlife habitat and park settings throughout the service area.

5.9.4 Drinking Water Sources

The Eastern Service SA does not drain to the Geist Reservoir, located in Upper Providence Township. There are no drinking water intakes from surface waters within the service area.

5.9.5 Other Environmental Concerns

Meeting stream use designations and maintaining the quality of life for residents within the service area would be negatively affected by adopting a “No Action” policy for the Eastern SA. Abandoning the responsibility of maintaining the collection and conveyance systems to

save money in the short term would likely result in a more reactive system of addressing failures in the future. Additionally, controlling peak flows from I&I is essential to managing the costs of treatment from the City of Philadelphia.

CHAPTER 6
EVALUATION OF ALTERNATIVES

6.1 INTRODUCTION

This chapter evaluates feasible alternatives for addressing long-term sewage disposal needs in the Eastern SA. Feasible alternatives for sewage treatment within the Eastern SA identified in Chapter 5 include:

1. Diverting flow to the WRTP
2. Constructing a new treatment facility
3. Continued use of existing facilities
4. Equalization Tanks

6.2 ALTERNATIVE 1 – DIVERTING FLOW TO THE WRTP

The first identified alternative for sewage treatment in the Eastern SA is to construct a 54-inch diameter connecting force main to DELCORA's WRTP in Chester. Additionally, the existing 36-in DI force main between CDPS and the Chester Force Main would need to be increased in size to a twin 48-in DI force main for a distance of 2.5 miles. The WRTP would also require expansion to provide treatment for the additional flow. The process expansion at the WRTP is outlined in Section 5.1.1 of this report.

6.2.1 Treatment Facility Cost Opinion

The estimated cost to construct conveyance to and expand the capacity of the WRTP includes the following major elements:

- Force main design and permitting
- Right-of-way acquisition
- Force main construction costs
- Pump station upgrade
- Treatment plant re-rate planning and design
- Treatment plant upgrade construction cost

The following assumptions were made for the WRTP expansion improvements:

- The new flow will be treated in a train independent of the existing system.
- The existing WRTP site has insufficient space to accommodate all the new treatment facilities. Additional property must be obtained for some of the new facilities.
- The daily peak flow of 2.0 times the average (30 MGD) will be treated through the proposed forward flow treatment units.
- The maximum hourly flow (3.5 times average) above the maximum daily flow will be diverted to an equalization tank and returned to the system as incoming flow allows.
- No additional waste load allocation will be given for the flow treated. Therefore, a sand filter system has been added for the existing plant's 50 MGD.
- A membrane bioreactor is proposed for the new flow treatment train. This eliminated the need for additional final clarifiers and sand filters.
- New sludge handling (thickening, dewatering, storage, and incineration) is required for the new flow treatment train.

The estimated construction cost, including force mains from DCPS to the WRTP, an MBR, and a new incinerator is:

• Conveyance/Transmission System	$308,336,000
• Treatment System Upgrade/Expansion	$207,097,000
• Total Estimated Construction Cost	$515,433,000

The original costs were developed for a previous study and are in May 2007 dollars. They were projected to December 2012 using the ENR Construction Cost Index. The scale of this expansion would require an extended period of time to design, permit, and construct. Accordingly, the project cost can expect to increase by approximately 3.5% per year.

6.3 ALTERNATIVE 2 – CONSTRUCTING A NEW TREATMENT FACILITY

A new Eastern Regional Treatment Plant is the second alternative being considered to treat wastewater from the RHM, CDCA, MA, DCJA, and Cobbs Creek Service Areas. The new regional treatment plant is being considered as an alternative to potential increases in treatment and surcharge costs for flow that is diverted to the SWWPCP.

6.3.1 Treatment Facility Cost Opinion

The estimated cost to construct a new treatment and the associated conveyance system in eastern Delaware County includes the following major elements:

- Force main design and permitting
- Right-of-way acquisition
- Force main construction costs
- Pump station upgrade
- Treatment plant planning and design
- Treatment plant construction cost

The following assumptions were made specific to the design, permitting, and construction of a new eastern regional treatment plant:

- The new flow will be treated in a MBR process on a new site.
- The daily peak flow of 2.0 times the average (30 MGD) will be treated through the proposed forward flow treatment units.
- The maximum hourly flow (3.5 times average) above the maximum daily flow will be diverted to an equalization tank and returned to the system as incoming flow allows.
- As a new facility is it assumed that a new BOD Waste Load Allocation (WLA) will be established by DRBC.
- A membrane bioreactor is proposed for the new ERTP. This eliminates the need for final clarifiers and reduces land requirements.
- New sludge handling (thickening, dewatering, storage, and incineration) is required for the ERTP.
- The cost of the treatment system does not include procurement of the land necessary for the facility.

The estimated construction cost, including force mains from DCPS to the ERTP, an MBR process treatment plant, and a new incinerator is:

• Conveyance/Transmission System	$180,965,000
• Treatment System	$215,180,000
• Total Estimated Construction Cost	$396,145,000

The original costs were estimated in May 2007 dollars, and have been projected to December 2012 using the ENR Construction Cost Index. The extensive nature of constructing a new treatment plant would require a significant period of time to design, permit, and construct, as well as additional training and start-up costs. Accordingly, the project cost can expect to increase by approximately 3.5% per year. Table 6-1 included the component costs of constructing a new ERTP.

An alternate to sludge incineration at the new ERTP was evaluated and estimated. The alternate includes sludge storage facilities at the ERTP as well as a 12-in. diameter ductile iron force main to the WRTP. Sludge handling and incinerator costs will be required at either the ERTP or the WRTP. Accordingly, pumping the sludge to the WRTP for disposal increases the ERTP project cost by nearly $26 million.

6.4 ALTERNATIVE 3 – CONTINUED USE OF EXISTING TREATMENT FACILITIES

Continuing to pump wastewater to the City of Philadelphia's SWWPCP is the third alternative for sewage treatment for the Eastern SA that is being evaluated for this Act 537 Plan Update. The cost of this alternative will include payments to the City of Philadelphia for treatment of wastewater and will also include a proportionate share of the cost of implementing the City of Philadelphia's Long-term CSO Control Plan.

This alternative will require a long-term agreement with the City of Philadelphia. As indicated in Section 5.1.3, aggressive and tangible efforts for I&I reduction is required to minimize flow exceedance charges under the contract with the City of Philadelphia. Section 5.2 details the items that are included in this approach to generate I&I reduction and peak flow management.

Table 6-1
Annual Alternative 2 – New ERTP Costs

Year	Annual LTCP Cost	Annual PWD Treatment Cost	Exceedance Charges	Engineering, Legal, Land Acquisition	Construction Costs	Annual Debt Service on Construction Costs	Annual ERTP Treatment Cost	Total Annual Cost	Cumulative Cost	
1	$230,995	$9,500,000	$259,260	$10,963,070		$2,210,672		$12,200,927	$12,200,927	New PWD Contract
2	$687,359	$9,737,500	$261,853	$10,963,070		$2,210,672		$12,897,383	$25,098,310	
3	$1,188,556	$9,980,938	$264,471	$10,963,070		$2,210,672		$13,644,636	$38,742,946	
4	$1,726,102	$10,230,461	$267,116		$88,800,870	$14,148,298		$26,371,977	$65,114,923	
5	$2,337,680	$10,486,222	$269,787		$88,800,870	$14,148,298		$27,241,988	$92,356,911	
6	$2,912,908	$10,748,378	$272,485		Start-up	$14,148,298	$9,616,970	$37,699,039	$130,055,949	
7	$3,548,720					$14,148,298	$9,857,394	$27,554,412	$157,610,362	
8	$4,184,531					$14,148,298	$10,103,829	$28,436,658	$186,047,020	
9	$4,820,343					$14,148,298	$10,356,425	$29,325,066	$215,372,085	
10	$5,456,154					$14,148,298	$10,615,335	$30,219,787	$245,591,873	
11	$6,091,966					$14,148,298	$10,880,719	$31,120,983	$276,712,856	
12	$6,727,777					$14,148,298	$11,152,737	$32,028,812	$308,741,667	
13	$7,363,589					$14,148,298	$11,431,555	$32,943,442	$341,685,109	
14	$7,999,401					$14,148,298	$11,717,344	$33,865,043	$375,550,152	
15	$8,635,212					$14,148,298	$12,010,277	$34,793,788	$410,343,940	
16						$14,148,298	$12,310,534	$26,458,833	$436,802,773	Future PWD Contract
17						$14,148,298	$12,618,298	$26,766,596	$463,569,369	
18						$14,148,298	$12,933,755	$27,082,053	$490,651,422	
19						$14,148,298	$13,257,099	$27,405,397	$518,056,819	
20						$14,148,298	$13,588,527	$27,736,825	$545,793,644	
21						$11,937,627	$13,928,240	$25,865,866	$571,659,510	
22						$11,937,627	$14,276,446	$26,214,072	$597,873,583	
23						$11,937,627	$14,633,357	$26,570,983	$624,444,566	
24							$14,999,191	$14,999,191	$639,443,757	
25							$15,374,171	$15,374,171	$654,817,927	

6.4.1 Treatment Costs at SWWPCP

The costs of continuing to send flow from the Eastern SA to the SWWPCP for treatment include the normal costs of treatment plus surcharges for flows in excess of values specified in the agreement with the City of Philadelphia. DELCORA signed a temporary two-year agreement with the City of Philadelphia in July 2011 and executed a long-term (15 year) contract on April 1, 2013. Table 6-2 includes the flow thresholds contained in the agreement and treatment costs for flows that DELCORA sent to the SWWPCP during 2011.

Table 6-2
Annual Costs for Flow Exceedances to the SWWPCP

Flow Category	Agreement with Philadelphia	2011 Surcharges for Exceedances
Annual Daily Average Flow	50 MGD	none
Average Daily Flow	75 MG	$105,000
Instantaneous Peak Flow	100 MG	$154,260

DELCORA has executed a long-term agreement for wastewater treatment service with the City of Philadelphia because the terms for exceedance surcharges are reasonable. Surcharge rates in the contract with Philadelphia are:

- $1,000 per each MGD exceeding the Annual Daily Average
- $15,000 per each MG for exceeding the Daily Average Flow Rate
- $10,000 per each MG for exceeding the Instantaneous Maximum Flow Rate for a duration of 5 minutes.

6.4.2 Philadelphia LTCP Cost Impact

In addition to obtaining acceptable surcharge rates for flow exceedances, reasonable levels of participation have been offered for contributing to the necessary measures for compliance with the City of Philadelphia's EPA mandated Long Term Control Plan (LTCP) for CSO discharges. The costs for treatment from the City of Philadelphia were $9.5 Million in 2011, a typical year. In addition to these usual fees for wastewater treatment and any exceedance surcharges that result from excessive peak discharges, DELCORA must participate in supporting efforts to be undertaken by the City of Philadelphia to comply with their Long Term Control Plan. The City of Philadelphia contract requires DELCORA to contribute 9.44% of the annual capital costs of complying with their LTCP.

The City of Philadelphia has estimated that complying with the LTCP will cost approximately $1.74 Billion over 25 years, assuming a 3.87% inflation rate and 1.7% annual increases for operation and maintenance. DELCORA's contribution to the LTCP compliance effort is based on the Eastern SA's contribution of 9.44% to the peak wet weather flow. The calculated present worth contribution from DELCORA is approximately $178 Million over 25 years. These costs have been distributed so that they are low in the first years and grow with successive years. This cost was used in this analysis as a conservative cost for Alternative 3 – Continued Treatment at the SWWPCP. Table 6-3 presents the annual present-worth charges to DELCORA for compliance with the LTCP as calculated by the City of Philadelphia. This table presents the annual cash flow associated with this alternative as well as the cumulative cost of the alternative. DELCORA has executed a 15-year contract, so year 15 is highlighted as a point where different terms could be negotiated based on the percentage of wet weather flow contributed by DELCORA. This point of negotiation emphasizes the need to reduce I&I, as documented lower contributions could be the basis of lower payments to the City of Philadelphia during the current PWD contract and extending beyond year 15.

The total annual present worth cost of this alternative is based on the DELCORA share of the Philadelphia LTCP costs averaged over the 15-year term of the planning agreement. The 15-year agreement is advantageous because it offers a "pay as you go" scenario, where DELCORA can choose a different alternative at the end of the agreement if the contract terms change or if it becomes preferable for any reason. Contract terms will be renegotiated in 15 years. At this time, the percentage of wet weather flow contributed by DELCORA can be redefined. DELCORA's proportional share of the costs associated with complying with Philadelphia's LTCP could increase or decrease, depending on how quickly I&I is reduced by each party.

Table 6-3
Annual Alternative 3 – Continued Discharge to SWWPCP Costs

Year	Annual LTCP Cost	Annual Treatment Cost	Exceedance Charges	Total Annual Cost	Cumulative Cost	
1	$230,995	$9,500,000	$259,260	$9,990,255	$9,990,255	New PWD Contract
2	$687,359	$9,737,500	$261,853	$10,686,712	$20,676,967	
3	$1,188,556	$9,980,938	$264,471	$11,433,965	$32,110,931	
4	$1,726,102	$10,230,461	$267,116	$12,223,679	$44,334,610	
5	$2,337,680	$10,486,222	$269,787	$13,093,689	$57,428,299	
6	$2,912,908	$10,748,378	$272,485	$13,933,771	$71,362,070	
7	$3,548,720	$11,017,087	$275,210	$14,841,017	$86,203,088	
8	$4,184,531	$11,292,515	$277,962	$15,755,007	$101,958,095	
9	$4,820,343	$11,574,828	$280,741	$16,675,912	$118,634,007	
10	$5,456,154	$11,864,198	$283,549	$17,603,901	$136,237,908	
11	$6,091,966	$12,160,803	$286,384	$18,539,154	$154,777,062	
12	$6,727,777	$12,464,823	$289,248	$19,481,848	$174,258,910	
13	$7,363,589	$12,776,444	$292,141	$20,432,173	$194,691,083	
14	$7,999,401	$13,095,855	$295,062	$21,390,318	$216,081,401	
15	$8,635,212	$13,423,251	$298,013	$22,356,476	$238,437,877	
16	$9,271,024	$13,758,833	$300,993	$23,330,849	$261,768,727	Future PWD Contract
17	$9,906,835	$14,102,803	$304,003	$24,313,641	$286,082,368	
18	$10,542,647	$14,455,373	$307,043	$25,305,063	$311,387,431	
19	$11,178,458	$14,816,758	$310,113	$26,305,329	$337,692,760	
20	$11,687,358	$15,187,177	$313,214	$27,187,749	$364,880,509	
21	$11,893,341	$15,566,856	$316,346	$27,776,544	$392,657,053	
22	$12,099,324	$15,956,028	$319,510	$28,374,862	$421,031,914	
23	$12,305,307	$16,354,928	$322,705	$28,982,940	$450,014,855	
24	$12,511,290	$16,763,801	$325,932	$29,601,024	$479,615,878	
25	$12,717,273	$17,182,897	$329,191	$30,229,361	$509,845,239	

The LTCP costs in Table 6-3 can be further broken down by the split between the three authorities serving the Eastern SA. Since the Philadelphia LTCP costs and exceedance charges are based on peak flows, it is reasonable to use a method for dividing these costs that is based on contributions above dry weather flows. This method uses two statistics: 1) the average daily flow recorded at each of the three DELCORA pump stations (CDPS, MPS, and DCPS) and 2) the dry-weather flow (minimum 7-day rolling average). Subtracting the annual minimum 7-day average value from the average daily flow recorded that year creates a differential number that reflects both the size of the authority service areas as well as the contribution of clear water with respect to the dry-weather flow. The fraction assigned to each authority is calculated by dividing each individual differential by the sum of the differentials. For 2012, Table 6-4 contains the flow information used to calculate each fraction.

Table 6-4
Splitting Philadelphia LTCP and Exceedance Costs

2008-2012 Flows in MGD	CDPS	MPS	DCPS
Average Daily Flow	9.89	4.65	20.56
Instantaneous (5-Min) Maximum Flow	35.00	19.40	59.40
Average of Annual Minimum 7-day Base Flow	7.21	3.33	15.64
Average of ADF - Base Flow	2.68	1.32	4.92
ADF - Base Flow Fraction	30.05%	14.78%	55.17%

Applying the fractions (shown in Table 6-4) to the costs shown in Table 6-3, allows a long-term estimate of the Philadelphia LTCP charges assigned to each authority to be made (presented in Table 6-5).

Table 6-5
Estimated Annual Philadelphia LTCP Costs by Authority

Year	Annual Cost	CDCA	MA	DCJA	
1	$230,995	$69,418	$34,139	$127,438	New PWD Contract
2	$687,359	$206,562	$101,585	$379,211	
3	$1,188,556	$357,180	$175,658	$655,718	
4	$1,726,102	$518,721	$255,102	$952,279	
5	$2,337,680	$702,510	$345,488	$1,289,682	
6	$2,912,908	$875,375	$430,502	$1,607,032	
7	$3,548,720	$1,066,446	$524,469	$1,957,805	
8	$4,184,531	$1,257,518	$618,436	$2,308,577	
9	$4,820,343	$1,448,589	$712,403	$2,659,350	
10	$5,456,154	$1,639,661	$806,370	$3,010,123	
11	$6,091,966	$1,830,732	$900,338	$3,360,896	
12	$6,727,777	$2,021,803	$994,305	$3,711,669	
13	$7,363,589	$2,212,875	$1,088,272	$4,062,442	
14	$7,999,401	$2,403,946	$1,182,239	$4,413,215	
15	$8,635,212	$2,595,018	$1,276,206	$4,763,988	
16	$9,271,024	$2,786,089	$1,370,174	$5,114,761	Future PWD Contract
17	$9,906,835	$2,977,161	$1,464,141	$5,465,534	
18	$10,542,647	$3,168,232	$1,558,108	$5,816,307	
19	$11,178,458	$3,359,303	$1,652,075	$6,167,079	
20	$11,687,358	$3,512,236	$1,727,286	$6,447,836	
21	$11,893,341	$3,574,137	$1,757,729	$6,561,475	
22	$12,099,324	$3,636,038	$1,788,171	$6,675,115	
23	$12,305,307	$3,697,939	$1,818,613	$6,788,754	
24	$12,511,290	$3,759,840	$1,849,056	$6,902,394	
25	$12,717,273	$3,821,742	$1,879,498	$7,016,033	

6.5 ALTERNATIVE 4 – EQUALIZATION TANKS

The draft 2007 study included significantly more restrictive discharge criteria and higher exceedance charges than the negotiated values in the recently executed contract with Philadelphia. Costs were evaluated for storage facilities ranging in size from 34 to 65 million gallons. In 2007, the costs were approximately $2 million per million gallons of storage constructed ($2.37 million in December 2012 dollars). Given the current discharge criteria and exceedance charges, there is no financial advantage to constructing and operating a storage facility at the base of the system to manage flows being sent to SWWPCP for treatment.

6.6 CONSISTENCY WITH EXISTING ENVIRONMENTAL REGULATIONS AND POLICIES

Selected alternatives to treat wastewater from the Eastern SA have been evaluated for consistency with respect to the following plans and policies:

- Section 208 of the Clean Water Act Comprehensive Water Quality Management Plan (COWAMP) – Consistency with this plan could not be verified because it is out of print. It is unlikely that the proposed alternatives are inconsistent with the COWAMP Plan.
- Annual Chapter 94 Report – The 2011 Wasteload Management (Chapter 94) Reports for the three authorities in the Eastern SA were examined to establish projected flows. The projected hydraulic loading for the WRTP and SWWPCP is included as Table 4-9. The flows to the WRTP reflect an increase in flow in 2015 and 2016 due to a new service area in Edgmont Township.

  All reports indicate I&I repairs are being conducted by some municipalities in efforts to reduce flows. All the alternatives under evaluation can manage the projected flows.
- Previous plans developed under Title II of the CWA or Titles II and VI of the Water Quality Act of 1987 – Title II of the Clean Water Act contains provisions for federal construction grants for treatment works. The Water Quality Act of 1987 authorized the stormwater NPDES program and encouraged states to implement non-point source pollution controls (under Section 319). Municipal wastewater construction is addressed under Titles II and VI of this Act. Title II is the federal construction grants program that was replaced by Title VI, the state revolving funds loan program. DELCORA received a Penn Vest loan for the Central Delaware County Pump Station (CDPS) force main diversion project and for a group of projects including replacement of the Chester Force Main, bulkhead stabilization at the Chester Pump Station, harmonic filters at the Central Delaware Pump Station, and rehabilitation of three CSO regulators in the City of Chester. The WRTP was funded by a federal construction grant in the 1970's.

- Comprehensive Plans – This Act 537 Plan Update is consistent with municipal comprehensive plans within the Eastern SA.
- Anti-degradation Requirements in PA Code, Title 25, Chapters 93, 95, and 102. Contractors constructing a system improvement described in any of the alternatives will be required to obtain a Chapter 102 Erosion and Sedimentation Control Permit for the construction activity and a NPDES Permit to Discharge Stormwater Associated with Construction Activity.
- State Water Plan – The improvements to the collection system that are proposed in this Act 537 Plan Update will not affect flooding problems identified in the 1983 State Water Plan. The State Water Plan is currently being re-written, however conflicts due to the proposed upgrades are not anticipated.
- Pennsylvania Prime Agricultural Land Policy – There is no opportunity for agricultural use of the urban and suburban land locations of the proposed force main corridors.
- County Stormwater Management Plans – There are approved Act 167 Stormwater Management Plans for Darby, Crum, Ridley, and Chester Creek watersheds, all of which include that cover portions of the Eastern SA. Alternatives 1 and 2 would involve land development for a new treatment plant or plant expansion located in an existing heavy industrial area. Alternative 4 would require development at a former wastewater treatment plant site.
- Wetland Protection – The proposed system improvements in any alternatives will not involve any significant impacts to wetlands identified on the National Wetland Inventory (NWI) map of the service area. System improvements will be designed and constructed to minimize wetland impacts.
- Protection of rare, endangered, or threatened plant and animal species. If the selected alternative requires significant disturbance activities, a Pennsylvania Natural Diversity Index (PNDI) request will be prepared and submitted. Alternatives 1, 2, and 4 would require development in existing, disturbed industrial areas.
- Historical and Archaeological resources protection – If the selected alternative requires significant disturbance activities, Cultural Resources Notices will be submitted to the Bureau of Historic Preservation for the proposed activity. Alternatives 1, 2 and 4 would require development in existing, disturbed industrial areas.

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CHAPTER 7
INSTITUTIONAL EVALUATION

7.1 INTRODUCTION

Sewage facilities planning requires analyses of all of the agreements, contracts, and the legal interrelationships between sewer authorities and municipalities. These agreements provide the framework for support of the various components of the physical sewer infrastructure. The legal interrelationships are particularly important in Delaware County because the area is served by a network of sewer authorities and municipally owned collection systems. The purpose of this section is to present the current legal framework within which these entities operate and document DELCORA's ability to implement the selected alternative that is presented in Chapter 8.

7.2 DELCORA EVALUATION

DELCORA's charter authorizes the acquisition, construction, improvement, maintenance, operation, owning, and leasing of the sewer systems and sewer treatment facilities within the DELCORA Eastern and Western Service Areas. DELCORA is directed by a nine-member Board of Directors appointed by the Delaware County Council.

7.2.1 Financial and Debt Status

DELCORA has a year 2013 annual budget of over $41.3 million in expenses which includes $6.8 million budgeted for debt service. Moody's Investors Service affirmed an A1 rating of DELCORA's $41.8 million of sewer revenue debt and assigned a positive outlook on 21 September 2012. In 2011, the net asset value was approximately $133.0 million. DELCORA has spent over $150 million in construction since it began operating in 1971. Moody's evaluation was based on a large and stable Delaware County service area, long-term service contracts that insulate DELCORA from fluctuations in collections, and reduced uncertainty related to the long-term treatment contract with the PWD.

7.2.2 Available Staff and Administrative Resources

Day-to-day operations are handled by DELCORA's Executive Director and staff of approximately 114 employees: 49 salaried and 65 hourly/union. DELCORA employs 23 Class A certified operators, 19 Class E-4 collection system operators and 6 staff members who are licensed engineers or have extensive engineering training and background.

7.2.3 DELCORA's Existing Legal Authority

DELCORA is a municipal authority, originally incorporated under the Municipal Authorities Act of 1945. Delaware County Ordinance No. 2002-1, adopted by the County in April 2002, extends DELCORA's term of existence until January 15, 2052. The Articles of Incorporation give DELCORA the authority to acquire, hold, construct, improve, maintain, operate, own, and lease projects including sewers, sewer systems or parts thereof, and sewerage treatment works. DELCORA is authorized to serve and to contract with individuals, municipal corporations, authorities, and other governmental bodies or regulatory agencies. DELCORA's legal authority includes the ability address items in the following subsections at their facilities.

7.2.3.1 Implement Wastewater Planning Recommendations

DCPD and DELCORA have developed Act 537 Plans and Updates for the Eastern and Western Service Areas in Delaware County. The *Act 537 Plan Update* for the Eastern Service Area (2002) addressed maximizing the capacity of the existing collection system and recommended construction of the diversion from CDPS to CPS, which has been completed. The project aided in maximizing the existing capacity of the Eastern Service Area.

Inflow and infiltration (I&I) was identified as a problem for the aging system and a recommendation to implement a metering program was included in the 2002 Act 537 Plan. The metering program was initiated in 2006. The municipalities now use metering data to identify I&I problem areas and to recommend collection system maintenance activities.

7.2.3.2 Implement System-wide Operation and Maintenance Activities

As a single regional authority, DELCORA is able to operate and maintain its own facilities (i.e., lines, pump stations, treatment plant) and make improvements as needs arise. It has a full-time Executive Director, trained professional staff, and a single Board of Directors

providing oversight. However, it should be noted that issues still exist regarding implementation of some needed improvements in some local sewer systems. The authorities have switched from a billing system based on equivalent dwelling units (EDUs) to a meter-based system in order to incentivize the reduction of flows in the local collection systems.

Since DELCORA owns and operates the WRTP, it has legal responsibilities to the Commonwealth of Pennsylvania for the safe and effective operation of its system through its NPDES permit. The permit allows the state and federal government to hold DELCORA accountable for its system and operations. This, coupled with DELCORA's desire to manage treatment costs, it provides strong incentives to maintain its facilities and eliminate I&I.

The Eastern SA is composed of four subareas that are served by conveyance authorities. These areas (RHM, DCJA, MA, and CDCA) were introduced in Chapter 2 of this report. DELCORA has legal agreements with each of these authorities, except RHM, to receive and dispose of the collected wastewater. RHM discharges to the DCJA.

7.2.3.3 Set Fees and Implement Purchasing Actions

Municipalities within the Eastern SA are billed by DELCORA for wastewater treatment by the applicable collection authority. Costs associated with treatment of these flows are a prorated share of the blended costs for treatment at the SWWPCP and the WRTP. Pumping and conveyance system costs are billed in accordance to service area served. The municipal authorities in the Eastern SA are billed wholesale rates for wastewater treatment by DELCORA. These rates are based on their pro-rated share of treatment costs from the City of Philadelphia plus DELCORA operation and maintenance costs for the conveyance and pumping systems.

7.2.3.4 Take Enforcement Actions Against Ordinance Violators

Various municipal, conveyance authority, and DELCORA agreements, include provisions that strictly prohibit the connection of any source of water other than sanitary sewers (i.e., downspouts, sump pumps). Enforcement of these requirements through inspection programs is the responsibility of the municipalities. DELCORA operates and maintains an industrial user pretreatment program for both the areas served by the WRTP and SWWPCP and can take enforcement action if the situation warrants.

7.2.3.5 Negotiate Agreements with Other Parties

DELCORA maintains an agreement with the City of Philadelphia for disposal of a portion of the wastewater conveyed in DELCORA-owned interceptors and force mains. DELCORA also maintains agreements with the collection authorities that discharge wastewater to DELCORA's system.

7.2.3.6 Raise Capital for Construction and Maintenance of Facilities

DELCORA has the ability to obtain bonds for construction and maintenance projects. DELCORA can also apply for grants available from PADEP (Growing Greener, CZM) or low-interest loans from PENNVEST.

7.3 INSTITUTIONAL ALTERNATIVES

DELCORA and the Eastern SA conveyance authorities are in place and have established agreements and relationships. Each of the municipalities in the Eastern SA is serviced by one or more of the municipal authorities and DELCORA.

7.3.1 Need for New Municipal Authorities

Currently, DELCORA is actively planning for future conditions and currently successfully managing waste water collection and treatment in Delaware County. There is no anticipated need for new municipal departments or authorities to implement the technical alternative proposed in Chapter 8. DELCORA has a demonstrated history of completing system upgrades and negotiating the agreements necessary to meet increasing demands.

As an option for regionalization of collection and treatment of wastewater as opposed to smaller decentralized treatment facilities, DELCORA provides an example of an efficient, self-sufficient organization that specializes in wastewater treatment and systems management. The advantages and disadvantages of the existing regionalized sewage conveyance and treatment system are as follows:

- Advantages
  - Single layer of management.
  - Trained staff and employees specializing in wastewater management and treatment.

  - Ability to view projects and their benefits to the County as a whole.
  - Accountability for their facilities through the NPDES permit for the WRTP.
  - Increased financial stability since costs are spread over a larger area that is less susceptible to economic limitations at the neighborhood level.

- Disadvantages
  - Local municipal service, priorities, and concerns can potentially become secondary to those of the Regional Authority.

7.3.2 Functions of Existing and Proposed Organizations

DELCORA would own and operate any recommended new or replacement facilities under Alternatives 1 or 2. DELCORA and the Eastern SA conveyance authorities would continue to operate in their existing capacities under Alternative 3.

7.3.3 Cost of Administration and Future Needs

The 2013 budgeted cost of administration, IT, and engineering is $5.67 Million. DELCORA continually plans for future conditions and works closely with the Delaware County Planning Department to monitor development trends and anticipate future sewage facility needs. Currently, DELCORA and the contributing municipal authorities in the Eastern SA are successfully managing waste water collection and treatment in Delaware County. The Lateral Inspection and Repair/Replacement Time-of-Sale Ordinance that has been developed as part of this Act 537 Plan Update is the latest initiative undertaken to reduce I&I and eliminate SSOs in the Eastern SA.

In 2013, DELCORA is financing approximately $15 million to fund construction of a new pump station and force main in 2013 to convey wastewater from the Chester-Ridley SA to the WRTP. An additional $13 million is planned to construct a municipal wastewater collection system.

7.4 ADMINISTRATIVE AND LEGAL ACTIONS

No incorporation of authorities or agencies will be required to ensure the implementation of the selected alternatives. Implementation of the alternative to continue to send wastewater to the City of Philadelphia will not require adoption of ordinances, regulations, standards, or inter-

municipal agreements. In order to meet the goals of this Plan, either a Lateral Inspection and Repair/Replacement Time-of-Sale Ordinance needs be adopted by each municipality in the Eastern SA or a municipality-specific I&I reduction plan is included as part of the selected alternative. This ordinance will provide a mechanism to systematically address the issue of I&I from private sewer laterals at their source and has been developed to address high peak flows while minimizing SSOs. The benefit to all customers of the system from implementation of the ordinance will be reduced I&I resulting in stabilized costs for wastewater treatment.

7.4.1 Rights-of-way, Easements, and Land transfers

There are no required rights-of-way or easements associated with the alternative to continue sending wastewater from the Eastern SA to the SWWPCP for treatment. The provision in the Lateral Inspection and Repair/Replacement Time-of-Sale Ordinance specifying inspections for illicit connections to the sanitary collection system requires permission to access private property. Most occurrences requiring access to the private property would occur as part of the home inspection during a property transfer.

7.4.2 Adoption of Other Municipal Sewage Facilities Plans

Adoption of other municipal sewage facility plans will not be necessary to implement the alternative to continue sending wastewater from the Eastern SA to the SWWPCP for treatment, although municipalities can undertake their own planning as needed. .

7.4.3 Administrative and Legal Requirements

The necessary administrative and legal activities to be completed and adopted to ensure the implementation of the selected alternative were reviewed. As the preliminary step in completing most administrative and legal requirements, this *Act 537 Plan Update* should be adopted by all municipalities within the planning area. Additionally, all municipalities need to either adopt a version of the Lateral Inspection and Repair/Replacement Time-of-Sale Ordinance or develop/initiate a municipality-specific I&I reduction plan.

7.4.4 Implementation Schedule

Table 7-1 includes milestone dates for the major elements required to implement the selected alternative of continuing to send flow to the SWWPCP for treatment including adoption

of a Lateral Inspection and Repair/Replacement Time-of-Sale Ordinance or develop/initiate a municipality-specific I&I reduction plan.

Table 7-1
Implementation Schedule

Milestone	Date
PADEP approval. the Act 537 Plan	Time Zero
Continued implementation of public sewer I&I elimination and reporting of past and planned activities in the annual Chapter 94 report.	1 month from Time Zero
Municipal development and adoption of a Lateral Inspection and Repair/Replacement Time-of-Sale Ordinance or Develop and initiate implementation of a municipality-specific I&I reduction plan.	12 months from Time Zero

7.5 PROPOSED INSTITUTIONAL ALTERNATIVE

The proposed institutional alternative is for DELCORA and the existing conveyance authorities to continue to administer and provide wastewater treatment to the Eastern SA.

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CHAPTER 8
SELECTED ALTERNATIVES

8.1 INTRODUCTION

This Act 537 Plan for the Eastern SA is being updated to present, analyze, and select the optimal sewage facilities alternative for existing and future wastewater disposal. Given that the Eastern SA is mostly built out, this plan focuses on I&I issues in the older collection system, private lateral I&I, as well as the complex relationship between the municipalities, the municipal authorities, DELCORA, and the City of Philadelphia. The evaluation of alternatives in this Act 537 Plan Update sought the most cost-effective alternative, in order to continue wastewater treatment using the management and administrative systems in place at the municipal and county level.

In previous chapters, feasible alternatives for addressing long-term sewage disposal needs in the Eastern SA have been evaluated. The alternatives evaluated for sewage treatment within the Eastern SA included:

1. Diverting flow to the WRTP
2. Constructing a new treatment facility
3. Continued use of existing facilities
4. Equalization tanks

Inherent to all four alternatives is continuation of aggressive elimination of I&I in the Eastern Service Area.

8.2 SELECTED SEWAGE FACILITIES ALTERNATIVES

To better understand the alternative selection it is useful to compare total costs to construct and operate Alternative 2 and Alternative 3 side by side. This does not include the cost to reconstruct the eastern force mains that are nearing the end of their useful life and will need to be replaced regardless of the treatment alternative selected. Table 8-1 shows the life of debt service for the combined engineering and construction of the new treatment plant. It also shows the life of the new 15-year contract with PWD.

Table 8-1
Comparison of Cost to Own and Operate

Year	Annual Comparison		Cumulative Comparison		
	Alternative 2 (ERTP) Total Annual Cost	Alternative 3 (PWD) Total Annual Cost	Alternative 2 (ERTP) Cumulative Cost	Alternative 3 (PWD) Cumulative Cost	
2013	$12,200,927	$9,990,255	$12,200,927	$9,990,255	ERTP Debt Service
2014	$12,897,383	$10,686,712	$25,098,310	$20,676,967	
2015	$13,644,636	$11,433,965	$38,742,946	$32,110,931	
2016	$26,371,977	$12,223,679	$65,114,923	$44,334,610	
2017	$27,241,988	$13,093,689	$92,356,911	$57,428,299	
2018	$37,699,039	$13,933,771	$130,055,949	$71,362,070	
2019	$27,554,412	$14,841,017	$157,610,362	$86,203,088	
2020	$28,436,658	$15,755,007	$186,047,020	$101,958,095	
2021	$29,325,066	$16,675,912	$215,372,085	$118,634,007	
2022	$30,219,787	$17,603,901	$245,591,873	$136,237,908	
2023	$31,120,983	$18,539,154	$276,712,856	$154,777,062	
2024	$32,028,812	$19,481,848	$308,741,667	$174,258,910	
2025	$32,943,442	$20,432,173	$341,685,109	$194,691,083	
2026	$33,865,043	$21,390,318	$375,550,152	$216,081,401	
2027	$34,793,788	$22,356,476	$410,343,940	$238,437,877	New PWD Contract
2028	$26,458,833	$23,330,849	$436,802,773	$261,768,727	
2029	$26,766,596	$24,313,641	$463,569,369	$286,082,368	
2030	$27,082,053	$25,305,063	$490,651,422	$311,387,431	
2031	$27,405,397	$26,305,329	$518,056,819	$337,692,760	
2032	$27,736,825	$27,187,749	$545,793,644	$364,880,509	
2033	$25,865,866	$27,776,544	$571,659,510	$392,657,053	
2034	$26,214,072	$28,374,862	$597,873,583	$421,031,914	
2035	$26,570,983	$28,982,940	$624,444,566	$450,014,855	Future PWD Contract
2036	$14,999,191	$29,601,024	$639,443,757	$479,615,878	
2037	$15,374,171	$30,229,361	$654,817,927	$509,845,239	

Based on the total cost of implementing the various alternatives, the selected alternative is that the Eastern SA adopt Alternative 3 - Continued use of existing facilities and treatment of Eastern SA wastewater at SWWPCP, operated by PWD.

Enhancing environmental protection in the region by addressing I&I to reduce peak flows and eliminate sewage overflows was factored into choice of the selected alternative. Reducing peak flows to the SWWPCP will provide more capacity for Philadelphia to treat combined sewage/stormwater flows from their system. Reduction in the CSO discharge from Philadelphia will preserve and enhance existing natural resources.

Since the selected alternative is not immediately capital intensive, budgeting for the cost associated with DELCORA's share of Philadelphia's Long Term Control Plan for CSOs is an important component. The costs for the Philadelphia LTCP are projected for each year but they may increase or decrease annually depending on the pace of the LTCP projects. This variability is evidenced in Table 6-3 by the differing annual costs. To reduce the impact of this variability, DELCORA has initiated rate increases to cover costs and created a fund to place revenue collected beyond the immediate needs to offset future larger LTCP costs.

8.3 SELECTED PLANNING ALTERNATIVES

Future revised municipal comprehensive plans and Subdivision and Land Development Ordinances should be consistent with current municipal Act 537 Plans. Municipal regulations should include restrictions on connecting roof leaders or foundation drains to the sanitary collection system.

The selected alternative requires that each municipality implement ordinances for the inspection of sump pumps and downspouts to ensure that there are no illegal connections. These connections are prohibited for new development and redevelopment under existing ordinances (Act 167 stormwater ordinance). Additionally, these illegal connections are prohibited under DELCORA's Rules and Regulations that were adopted by all municipalities either when DELCORA was originally formed or when that municipality joined a system served by DELCORA.

Additionally, the selected alternative includes a provision that each municipality aggressively pursue I&I reduction. I&I from private property sources is acknowledged by U.S. EPA and other experts as a significant potential contributor to excess flows in sanitary sewers. The severity of the problem can vary between municipalities. Therefore this plan recommends one of the following:

1). Adopt and implement a Lateral Inspection and Repair/Replacement Time-of-Sale Ordinance. A sample of this ordinance to aid local municipal solicitors in developing their specific ordinance is attached in Appendix B.

or

2). Develop a detailed alternate plan to identify and remove I&I from the system. This written plan can include addressing both public and private sources of I&I.

8.4 SELECTED INSTITUTIONAL ALTERNATIVES

The selected institutional alternative is the continuation of current organizations and activities. DELCORA has previously prepared documents and brochures that support the removal of private property I&I and will continue to make these materials available as requested. The design standards attached to this plan as Appendix D contain standardized requirements for lateral connection repairs to provide consistency across DELCORA's service areas.

CHAPTER 9
PUBLIC PARTICIPATION

9.1 BACKGROUND

On June 1, 2011, a public meeting was held at Springfield Township Municipal Building. At this meeting DELCORA presented the status of negotiations with PWD regarding a new contract. Since the notice of termination of the previous contract in 2005, PWD indicated that they were willing to consider continuing to receive flow from DELCORA provided an agreement could be reached on terms including flow thresholds and charges for exceedances. The initial terms offered by PWD were stringent and necessitated DELCORA to consider all options for treatment of wastewater from the Eastern SA. After a review of the Act 537 process by DCPD, all municipalities were asked to provide a signed resolution authorizing DCPD and DELCORA to prepare this plan on their behalf.

9.2 AUTHORIZATION RESOLUTIONS

To date, 28 of 31 municipalities in the Eastern SA have provided a "sign-on" resolution.

9.3 SUMMARY OF PUBLIC PARTICIPATION ACTIVITIES

During the planning process, three public meetings were held. The first meeting, as discussed above, was held on June 1, 2011 after which all municipalities were asked to pass a resolution authorizing DCPD and DELCORA to prepare this plan on their behalf. The second meeting was held in January 24, 2012 to update the municipalities on the progress of negotiations with PWD, review what components comprise the wastewater charges in the Eastern SA, and the role of the municipalities in the planning process. The third public meeting was held on March 14, 2013. This meeting served to inform the municipalities of the final contract terms with PWD, present information on the cost share of Philadelphia's LTCP that would be apportioned to DELCORA, review private property I&I reduction options, and present the findings of the Act 537 Plan sewage disposal alternatives analysis. Copies of the public meeting presentations and a recent news article are attached in Appendix E.

During the course of the planning process, DCPD and DELCORA involved members of the municipalities and municipal authorities from the Eastern SA in the drafting and review of

plan content. All municipalities and municipal authorities within the Eastern SA were invited to send representatives, including managers, engineers, and public works officials, among others, to planning team meetings. A total of nine planning team meetings have been held to present draft documents and discuss the direction and final content of the selected alternative. Representatives from PADEP were also invited to participate and did attend some of the meetings.

9.4 PUBLIC NOTICE

The release of the draft plan for municipal and public comment was advertised in the Delaware County Times on _____. The public was encouraged to provide comments that would be addressed prior to submission to PADEP for approval. A copy of the public notice is attached in Appendix F.

9.5 COMMENTS FROM LOCAL PLANNING AGENCIES

To be completed after review period. A copy of the comments and responses received from local planning agencies is attached in Appendix G.

9.6 COMMENTS FROM THE PUBLIC

To be completed after review period.

9.7 SAMPLE RESOLUTION FOR PLAN ADOPTION

The following is a model resolution for municipal adoption of this Act 537 Sewage Facilities Plan Update. Signed and sealed copies of the .municipal adoption resolutions are attached in Appendix H.

RESOLUTION ADOPTING THE DELAWARE COUNTY SEWAGE FACILITIES PLAN UPDATE – EASTERN SERVICE AREA

RESOLUTION OF THE (Superv./Comm./Council) OF _____

(City/Township/Borough), DELAWARE COUNTY, PENNSYLVANIA (hereinafter "the municipality").

WHEREAS, Section 5 of the Act of January 24, 1966, P.L. 1535, No 537, known as the "Pennsylvania Sewage Facilities Act," as amended, and the Rules and Regulations of the Department of Environmental Protection (Department) adopted thereunder, Chapter 71 of Title 25 of the Pennsylvania Code, require the municipality to adopt an Official Sewage Facilities Plan providing for sewage services adequate to prevent contamination of waters and/or environmental health hazards with sewage wastes, and to revise said plan whenever it is necessary to meet the sewage disposal needs of the municipality; and

WHEREAS the Delaware County Planning Department, acting upon authorization from the Pennsylvania Department of Environmental Protection, did offer assistance to the municipalities in meeting their Act 537 requirements on a sub-County basis; and

WHEREAS, the (City/Township/Borough) of _____ did by formal resolution dated _____, authorize the County of Delaware to prepare the sewage facilities plan on its behalf; and

WHEREAS, The Delaware County Act 537 Sewage Facilities Plan Update: Eastern Service Area recommends implementation of the selected alternative to continue to send wastewater to SWWPCP for treatment and continue to pursue I&I removal from the collection systems in the Eastern Service Area. This includes either adopting and implementing a Lateral Inspection and Repair/Replacement Time of Sale ordinance or developing a written municipality-specific I&I reduction plan.

WHEREAS, the appropriate municipal officials, including the planning commission, of the (City/Township/Borough) have reviewed the findings and recommendations of that plan and find it to conform to applicable zoning, subdivision, other municipal ordinances and plans, and to a comprehensive program of pollution control and water quality management.

NOW, THEREFORE, BE IT RESOLVED THAT THE (Super./Comm./Council) of (City/Township/Borough) hereby accepts and adopts the "Delaware County Act 537 Sewage Facilities Plan Update: Eastern Service Area" prepared by the Delaware County Planning Department, April, 2013, as an amendment to the official plan for sewage facilities in compliance with the Pennsylvania Sewage Facilities Act of 1966. The (City/Township/Borough) hereby assures the Department that it will implement the said plan within the time limits established in the implementation schedule found on page 7-7 of the plan, as required by law. (Section 5, Pennsylvania Sewage Facilities Act, as amended).

I, _____, Secretary, _____

(City/Township/Borough) (Super./Comm./Council) hereby certify that the foregoing is a true copy of the (Township's/Borough's) Resolution No. _____, adopted _____, 2013.

AUTHORIZED SIGNATURE CITY/TOWNSHIP/BOROUGH SEAL

_____

Appendix A

Environmental Report

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Delaware County Planning Department
and the
Delaware County Regional Water
Quality Control Authority

Uniform Environmental Review Process Environmental Report for the Eastern Service Area

DOCUMENT FOR MUNICIPAL REVIEW AND ADOPTION

June 2013

Prepared by

Weston Solutions, Inc.
1400 Weston Way
P.O. Box 2653
West Chester, PA 19380

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1. INTRODUCTION

This Environmental Report has been prepared as a requirement of the Sewage Facilities Act (Act 537) Planning process to evaluate wastewater treatment options for the Eastern Service Area in Delaware County, PA. This report appears as Appendix A to the Delaware County Act 537 Sewage Facilities Plan Update for the Eastern Service Area and incorporates references to text and figures presented in the Act 537 Plan. This Environmental Report is being submitted to PADEP to demonstrate conformance with environmental regulations administered by the following agencies:

- PA Department of Environmental Protection
- PA Department of Community and Economic Development
- USDA Rural Development, Rural Utilities Service
- U.S. Environmental Protection Agency, Region III

2. PROJECT DESCRIPTION

The purpose of the plan was to review options for wastewater disposal for the Eastern Service Area.

3. PROJECT PURPOSE AND NEED

Wastewater treatment for the Eastern Service Area has been provided by the City of Philadelphia at the Southwest Water Pollution Control Plant (SWWPCP) since the 1970's construction of the pump stations and force mains. The contract signed with Philadelphia in 1973 provided for termination with 5 years notice. In July 2006, Philadelphia provided DELCORA with a notice to terminate. Initial negotiations with Philadelphia for a new contract indicated that Philadelphia was considering much more restrictive flow limits and higher exceedance charges. This led DELCORA to initiate the Act 537 planning process to evaluate treatment options.

4. SUMMARY OF REASONABLE ALTERNATIVES CONSIDERED

The alternatives considered during the sewage facilities planning process were:

1. Diverting flow to the DELCORA's Western Regional Treatment Plant (WRTP)

2. Constructing a new treatment facility
3. Continued use of existing facilities (SWWPCP)
4. Equalization tanks

Inherent in all four alternatives is continued aggressive elimination of inflow and infiltration (I&I) to the collection systems in the Eastern Service Area.

4.1 COMPARISON OF ALTERNATIVES

Based on both immediate and long-term costs, Alternative 3 (continued use of existing facilities) was selected. Alternatives 1 and 2 would require permitting new treatment plant or significantly expanding the existing permit for the WRTP. This would be very challenging and the cost of construction of both the treatment works as well as new collection components to transport the wastewater to the facility would exceed the cost of Alternative 3. The new contract with Philadelphia has the same exceedance threshold limits as the previous contract but with higher penalties. Implementing Alternative 4 alone could not replace one of the three other alternatives for treatment. Equalization tanks would only eliminate a small cost for penalties while incurring a large cost to construct and operate equalization tanks.

4.1 ENVIRONMENTAL CONSEQUENCES OF THE SELECTED ALTERNATIVE

The selected alternative is to continue to send wastewater to SWWPCP for treatment and aggressively continue to pursue I&I removal from the collection systems in the Eastern Service Area. The selected alternative includes a provision requiring municipalities to either adopt and implement a Lateral Inspection and Repair/Replacement Time of Sale Ordinance or develop a written plan detailing an I&I reduction strategy that better meets their municipal I&I situation.

4.1.1 Land Use/Important Farmland/Formally Classified Lands

There are no impacts to important farmlands, state or national parks, or national monuments or landmarks associated with the actions of the selected alternative.

4.1.2 Floodplains

Since the actions of the selected alternative do not necessitate construction there will be no impacts to floodplains.

4.1.2 Wetlands

There are no actions of the selected alternative that will impact wetlands.

4.1.3 Historic Resources

Since the actions of the selected alternative do not necessitate construction there will be no impacts to historic or cultural resources.

4.1.4 Biological Resources

Since the actions of the selected alternative do not necessitate construction there will be no impacts to sensitive biological resources.

4.1.5 Water Quality Issues

The purpose of this plan is to evaluate the sewage facilities treatment options for the Eastern Service Area. The selected sewage facilities alternative will continue to send the wastewater to SWWPCP for treatment and discharge to the Delaware River. The continued aggressive elimination of I&I will reduce peak flow to the SWWPCP which will allow Philadelphia to treat more combined wastewater/stormwater thereby reducing the discharge of the combined sewer overflows to waters of the Commonwealth.

4.1.6 Coastal Resources

Philadelphia's Southwest Water Pollution Control Plant is located within the federally designated Coastal Zone Management Area. However, the actions of the selected alternative will not impact these operations.

4.1.7 Socio-Economic Issues

The actions of the selected alternative do not impose any disproportionate impacts on minority and disadvantaged populations. Economic considerations were evaluated to choose the most affordable option for sewage treatment for residents of the Eastern Service Area.

4.1.8 Air Quality

There are no actions of the selected alternative that will impact air quality.

4.1.9 Transportation

There are no actions of the selected alternative that will affect transportation patterns in the surrounding communities.

4.1.10 Noise Abatement and Control

There are no actions of the selected alternative that will generate additional noise as a result of this project, aside from temporary impacts from construction activities.

4.1.11 Wild and Scenic Rivers

There are no actions of the selected alternative that will affect any wild and scenic rivers.

5. SUMMARY OF MITIGATION

The selected alternative is to continue to send wastewater to SWWPCP for treatment and to aggressively pursue I&I reduction from the collection systems in the Eastern Service Area. None of the actions of this alternative will require mitigation of an impact.

6. PUBLIC PARTICIPATION

During the planning process, three public meetings were held. The first meeting, as discussed above, was held on June 1, 2011 after which all municipalities were asked to pass a resolution authorizing DCPD and DELCORA to prepare this plan on their behalf. The second meeting was held in January 24, 2012 to update the municipalities on the progress of negotiations with PWD, review what components comprise the wastewater charges in the Eastern SA, and the role of the municipalities in the planning process. The third public meeting was held on March 14, 2013. This meeting served to inform the municipalities of the final contract terms with PWD, present information on the cost share of Philadelphia's LTCP that would be apportioned to DELCORA, review private property I&I reduction options, and present the findings of the Act 537 Plan sewage disposal alternatives analysis. Copies of the public meeting presentations are attached in Appendix E.

During the course of the planning process, DCPD and DELCORA involved members of the municipalities and municipal authorities from the Eastern SA in the drafting and review of

plan content. All municipalities and municipal authorities within the Eastern SA were invited to send representatives, including managers, engineers, and public works officials, among others, to planning team meetings. A total of nine planning team meetings have been held to present draft documents and discuss the direction and final content of the selected alternative. Representatives from PADEP were also invited to participate and did attend some of the meetings.

The release of the draft plan for municipal and public comment was advertised in the Delaware County Times on _____. The public was encouraged to provide comments that would be addressed prior to submission to PADEP for approval.

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Appendix B

Lateral Inspection and Repair/Replacement Time-of-Sale Ordinance Sample

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ORDINANCE NO. _____

Lateral Inspection and Repair/Replacement Time of Sale sample ordinance

AN ORDINANCE OF THE TOWNSHIP/BOROUGH OF _____ TO AMEND THE ZONING ORDINANCE AS HERETOFORE AMENDED, TO REQUIRE PRIVATE SEWER LATERAL INSPECTIONS UPON THE RESALE OF A PROPERTY WITHIN _____ TOWNSHIP/BOROUGH.

The Board of Supervisors/Mayor of _____ Township/Borough, Delaware County, Pennsylvania does hereby ENACT and ORDAIN that the Code to the Township enacted XXXX XX, XXXX, as heretofore amended, is further amended as follows:

SECTION 1. The Township/Borough Code, Chapter xxx, Certificates of Use and Occupancy, as heretofore amended, is hereby amended to add a new subsection, xxx. to Section xxx, to read in its entirety as follows:

A. Prior to the transfer of any property within _____ Township/Borough, the sewer lateral for that property shall be inspected and/or televised by the property owner in conformance with the Minimum Testing, Evaluation, and Repair Standards published by the Delaware County Regional Water Quality Authority (DELCORA).

Under this Ordinance, property transfer includes transfer to or vesting in any other person or entity by deed or other instrument of writing by which any lands are sold, granted, assigned, transferred, or otherwise conveyed to, or vested in, a purchaser or purchases thereof, or to any other person or persons, and the property includes any buildings or structures constructed more than ten (10) years prior to the sale of the property. The property owner shall make all areas of the property to be inspected and/or televised available to the Township/Borough upon the Township's/Borough's request.

This Section shall not apply to all buildings where the Township/Borough official, or said Township/Borough official's authorized representative, determines that testing and/or repairs have been performed to Township/Borough standards within the last ten (10) years.

1. If the inspection determines that the sewer lateral is in an unacceptable condition, the property owner shall be so notified in writing and the sewer and the sewer lateral shall be repaired or replaced by the property owner, in accordance with the notice and the applicable Lateral Inspection and Repair/Replacement Design Standards as adopted by the

Township/Borough. All costs of repair and/or replacement shall be borne by the property owner. The Township/Borough shall confirm by inspection and/or televising that the sewer lateral has been satisfactorily repaired or replaced once notified of the repairs or replacement by the property owner.

2. The Township/Borough shall use best efforts to conduct the inspection and/or televising by the least invasive and intrusive means possible. However, in the event of any damage to the property caused by the Township's/Borough's inspection, the Township/Borough shall promptly repair or restore the property to the reasonable condition in which the property existed prior to the entry of the Township/Borough onto the property, circumstances permitting.

3. The cost of the lateral inspection shall be determined and established by the Board of Supervisors/Borough Council from time to time, by resolution.

SECTION 2. This Ordinance shall become effective five (5) days after adoption.

ENACTED and ORDAINED this ____ day of _____, 2013

_____ Township/Borough
Board of Supervisors/Borough Council

_____

_____

_____

_____

_____

Attest: _____
Secretary

Appendix C

Example Inspection and Repair/Replacement Ordinances From Delaware County Municipalities

Chester Township

Concord Township

Darby Township

Rose Valley Borough

Upland Borough

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TOWNSHIP OF CHESTER
DELAWARE COUNTY, PENNSYLVANIA
ORDINANCE NO. 4 OF 2012

AN ORDINANCE OF THE TOWNSHIP OF CHESTER, DELAWARE COUNTY, PENNSYLVANIA, CREATING PART 2 – "PRIVATE SANITARY SEWER LATERAL CONNECTIONS" IN CHAPTER 18 – "SEWERS AND SEWAGE DISPOSAL" OF THE CODIFIED ORDINANCES OF THE TOWNSHIP OF CHESTER, PENNSYLVANIA, 1993, AS SUPPLEMENTED AND AMENDED, SETTING REGULATIONS FOR ALL SANITARY SEWER LATERAL CONNECTIONS IN THE TOWNSHIP OF CHESTER; AND ESTABLISHING REQUIREMENTS AND TIMING FOR AUTHORIZED INSPECTIONS AND PROPER MAINTENANCE OF SAID SEWER LATERALS AND CONNECTIONS; AND SETTING STANDARDS AND CONDITIONS FOR SEWER LATERAL CERTIFICATION; SETTING FEES AND SETTING PENALTIES FOR FAILURE TO COMPLY; AND REPEALING ALL ORDINANCES OR PARTS OF ORDINANCES INCONSISTENT HEREWITH.

BE IT ENACTED and it is hereby enacted and ordained by the Council of the Township of Chester, Delaware County, Pennsylvania, as follows:

Chapter 18 – SEWERS AND SEWAGE DISPOSAL

PART 2 – Private Sanitary Sewer Lateral Connections

§201. Definitions

The following terms apply to this Chapter and augment definitions found in the International Plumbing Code:

1. ***"Backwater Valve"*** shall mean a device or valve installed in the building drain or sewer pipe where a sewer is subject to backflow, and which prevents drainage or waste from backing up into a lower level or fixtures and causing a flooding condition.

2. ***"Township authorized representative"*** shall mean the Township Engineer or a Township employee designated in writing by the Township Engineer to sign certificates of inspection for the purpose of lateral inspections and to issue Certificates of Lateral Compliance.

3. ***"Township's fee and rate schedule"*** shall mean a list of all Township service, penalty, interest, permit fees, and hourly personnel and equipment rates, as adopted by resolution of the Township Council from time to time.

4. ***"Building sewer"*** shall mean that part of the drainage system that extends from the end of the *building drain* and conveys the discharge (sewage) to a *public sewer, private sewer,* individual sewage disposal system or other point of disposal.

5. ***"Commercial Multi-Family building"*** shall mean any building containing more than one rental unit located in any area in the Township.

6. ***"Cleanout"*** shall mean an *access* opening in the drainage system utilized for removing obstructions. Types of cleanouts include removable plug or cap, and a removable fixture or fixture trap.

7. ***"DELCORA"*** shall mean the Delaware County Regional Water Quality Control Authority.

8. ***"Maintenance"*** shall mean routine flushing or rodding of a sewer to maintain a free flowing condition.

9. ***"Overflow device"*** shall mean a device that is specifically designed to relieve the pressure created when a gravity sewer is flowing full. All overflow devices require the approval of the Township Engineer for proper application before their installation.

10. ***"Private sewer system"*** shall mean a sewer or system of sewers serving more than one building that is not owned by DELCORA or SDCMSA.

11. ***"Repair"*** shall mean physical exposure of a section of pipe and or appurtenances and for the purpose of resuming proper operating condition.

12. ***"Replacement"*** shall mean removal and replacement of existing pipe and/or appurtenances.

13. ***"Sanitary sewer"*** shall mean a pipe or conduit which carries sanitary sewage and to which stormwater and ground waters are not admitted.

14. ***"Sewage"*** shall mean all water or combination of liquid and water-carried solid, bio-solids or solid waste conducted away from any dwellings, residences,

business buildings, institutions, unit, firm, association, organization, public corporation, political subdivision (including the Township of Chester), county, or district; or the State of Pennsylvania; or the United States of America, or any department or agency thereof and other sources, which is known as domestic sewage, together with liquid or water-carried solid or semi-solid wastes resulting from a manufacturing process employed in industrial establishments, including the washing, cleaning or drain water from such process, which is known as industrial waste.

15. ***"Sewer facilities"*** shall mean and include the sanitary collection system owned and operated by DELCORA or SDCMSA in the Township of Chester, all appurtenances thereto, and all portions thereof.

16. ***"Sewer lateral" or "lateral"*** shall mean a sewer pipe that conveys sewage from plumbing of a building or structure to a DELCORA or SDCMSA maintained sewer main, also referred to as "building sewer" in the International Plumbing Code.

17. ***"Sewer" or "sewer main,"*** when used herein, shall mean any Township -owned and/or DELCORA or SDCMSA owned sewer pipe within a street or public right-of-way receiving or intended to receive the discharges of more than one sewer lateral. No sewer main constructed henceforth shall be less than eight inches in diameter nor be laid or constructed in any Township street, easement or right-of-way or street, easement or right-of-way under the control of the Township and/or DELCORA or SDCMSA, except to the lines, grades, and specifications approved by the Township Engineer.

18. ***'SDCMSA"*** shall mean Southwest Delaware County Municipal Sewer Authority.

19. ***"Storm sewer" or "storm drain"*** shall mean a pipe or conduit which carries storm and surface waters and drainage, but excludes sewage and polluted industrial wastes.

20. ***"Sub-divider"*** shall mean a person, firm, corporation, partnership or association which causes land to be divided into a subdivision for person, firm, corporation, partnership or association, or for others.

21. ***"User"*** shall mean and include any dwelling, unit, firm, association, organization, public corporation, political subdivision (including the Township of Chester), county, district, the State of Pennsylvania, or the United States of America, or any department or agency thereof.

§ 202. Sewer connections required

1. All property owners, owning or controlling property facing upon any of the streets of the Township of Chester shall lay or cause to be laid all necessary sewer connections with the DELCORA or SDCMSA sewer mains.

§203. Property owner's responsibility for lateral repairs and maintenance

1. General:

A. It shall be the responsibility of the property owner to perform all required maintenance and to keep the lateral(s) in good condition as defined by this Chapter. For the purpose of this requirement any sewer lateral on private property (e.g.; rear yards and side yards) shall be considered as a lateral and is to be connected to DELCORA'S or SDCMSA's sewer main.

B. A building's sewer must be maintained to meet the following minimum requirements:

(1) The sanitary sewer lateral and vent cleanouts shall be kept free from roots, grease deposits, and other solids which may impede the flow or obstruct the transmission of waste.

(2) All joints shall be tight and all pipes shall be sound to prevent ex-filtration by waste or infiltration by ground water or storm water.

(3) The sanitary sewer lateral shall be free of any structural defects, cracks, breaks, or missing portions and the grade shall be uniform without sags or offsets.

(4) The sanitary sewer lateral shall have a two (2) way cleanout located at the property line or at the sewer main easement. All cleanouts shall be securely capped with a proper cap at all times.

2. Compliance:

A. The property owner's compliance with required repairs and maintenance of laterals shall be as set forth herein and/or by any implementing policy established by the Township Engineer, or said Township Engineer's designee, and/or by the Township's ***"Sanitary Sewer Lateral Compliance Plan"*** adopted by resolution of the Township Council pursuant to this Chapter.

B. The property owner shall obtain a Certificate of Lateral Compliance from the Township Engineer, or said Township Engineer's designee, prior to the sale of any property from which a sewer lateral is connected to the DELCORA or SDCMSA maintained sanitary sewer system.

C. As a condition of the issuance of a building permit for construction, the property owner shall obtain a Certification of Lateral Compliance from the Township Engineer, or said Township Engineer's designee, prior to final building Use and Occupancy inspection.

D. The property owner shall obtain a Certification of Lateral Compliance from the Township Engineer, or said Township Engineer's designee, which verifies that the property owner has installed, or upgraded to, a two (2) way approved cleanout for testing purposes.

E. The Township Engineer, or said Township Engineer's designee, shall determine the criteria and acceptable methods of evaluating building sewers to ensure compliance with the above requirements.

§204. Connections required for every separate lot

Every separate lot of twenty-five (25) feet or more, or any two (2) lots adjoining shall be connected with DELCORA'S or SDCMSA'S sewer main.

1. Every building or structure with plumbing fixtures requiring drainage on a property must have its own lateral connected to the DELCORA'S or SDCMSA's main. When any repairs or replacements are done to those laterals that are jointly shared by more than one building or structure from different properties, each shall require a discrete connection to the DELCORA'S or SDCMSA's sanitary sewer main as part of the repair. If a property with two buildings or structures with

plumbing fixtures requiring drainage is subdivided, each building or structure shall be required to have a discrete connection to the DELCORA'S or SDCMSA's sanitary sewer main as a condition of subdividing.

§205. Backwater valve required

1. The International Plumbing Code of the Township of Chester requires a backwater valve be installed whenever plumbing facilities exist and are below the manhole cover elevation.

2. In any system where a backwater valve is required, the property owner shall install the appropriate approved valve. It shall be the responsibility of the property owner to maintain said backwater valve in a proper operating condition.

3. In the event that the condition of any installed backwater valve becomes irreparable, the said valve shall be immediately replaced by the property owner.

4. Connections of any backwater valve shall be made only after the issuance of a Township plumbing permit.

§206. Illegal sewer connections

1. All sewer laterals or sewer clean-outs which contain leaks or breaks, uncapped sewer clean-outs, sump pumps, down spouts or yard drains which discharge into the sewer system, and all other sources of accidental, negligent or intended introduction of stormwater run-off or similar waters into the sanitary sewer system are hereby declared to be a public nuisance. If such a condition exists, it shall be abated by the owner of the property, who is hereby required to remove or correct such improper sewer connections.

§207. Right of entry

1. The Township Engineer, or said Township Engineer's designee, may enter, inspect, collect wastewater samples, and test any buildings, structures, or premises to secure compliance or prevent a violation of any portion of this Chapter. The Township Engineer, or said Township Engineer's designee, shall also be

authorized to review repair/maintenance records. No premises shall be entered until a ten (10) business day written notice is given to the property owner or said owner's agent, except to protect life or public safety.

§208. Notices to make connections

1. It shall be the duty of the Township Engineer, or said Township Engineer's designee, to give written notice to property owners, or their agents if known, and to the occupant(s) of the property, if any, specifying that the sewer connection repair shall be made by means of the initial installation or repair of the illegal lateral. If the owners or their agents are not known and if there are no occupants, the Township Engineer, or said Township Engineer's designee shall post said notice conspicuously on said property. Said notice shall briefly describe the work required, referring to this Chapter, and shall contain a notification to the effect that, unless said work is done within ten (10) days, the Township Engineer, or said Township Engineer's designee will do the same, and that the costs and expenses will be charged against, and made a lien upon, the said property. If said work is not done within ten (10) days after the service and posting of said notice, it shall be the duty of the Township Engineer, or said Township Engineer's designee, forthwith to proceed to do the same.

2. The Township Engineer, or said Township Engineer's designee, shall keep a record of said notices. He shall also keep a separate record of the work done upon each piece, parcel or lot of land, and the costs and expenses of the same. After the completion of the work, said Township Engineer, or said Township Engineer's designee shall cause an itemized bill of the expenses to be mailed to the property owner.

§209. Payment of assessments, annual installments, interest

1. On a periodic basis as determined by the Township Engineer, or said Township Engineer's designee, said Township Engineer, or said Township Engineer's designee shall prepare and file with the Township Manager a report and assessment list which identifies all real property at which sewer lateral work was done by the Township pursuant to this Chapter and for which the owner has not fully reimbursed the Township within thirty (30) days of the date of billing. The report and assessment list shall provide a description of the real property at which

the work was performed, the expenses incurred by the Township, and the names and addresses of the persons entitled to notice.

2. Upon receipt of the report, the Township Manager shall post a notice of filing of the report in a conspicuous place in Township Municipal Building, with said notice specifying the filing date of the report and assessment list and the time and place when and where the report and assessment list will be submitted to the Township Council for hearing and confirmation.

3. The Township Manager shall also mail by first class mail a notice to each property owner identified in the report and assessment. Said notice shall provide a description of the real property at which the work was performed, and the expenses incurred by the Township in performing the work and shall notify the owner that said costs shall be assessed against the owner of the property unless objection is made by the owner in writing and submitted to the Township Manager at least two days before the hearing. Said notice shall also specify the time and place when and where the proposed assessment will be presented to the Township Council for hearing and confirmation. The notice shall be mailed at least ten (10) days prior to the date of said hearing.

4. Any owner who objects to the proposed assessment and who desires to challenge the proposed assessment at the Township Council hearing must submit any and all objections in writing to the Township Manager at least two days prior to the date of said hearing. The failure of any owner to submit objections to the Township Manager shall constitute a waiver of any such objection.

5. At the time and place fixed for hearing and confirming the proposed assessments, the Township Council shall hear the same. At such hearing, only those persons who have submitted written objections to the Township Manager will be heard by the Council. At said hearing, the Township Council may correct, modify or eliminate any proposed assessment which it may deem excessive or otherwise incorrect. Thereafter, by vote and resolution, the Council shall confirm each assessment and the amount thereof, as proposed or as corrected and modified, and order that an assessment be made a personal obligation of the owner or, alternatively, assess it against the property. If the Council orders that an assessment be charged as a personal obligation of the property owner, it shall direct appropriate Township personnel to collect the same by use of all appropriate legal remedies. If the Council orders that an assessment be assessed

against the property, it shall direct that the same be recorded on the tax assessment roll and, if necessary, in the Office of Judicial Support, and thereafter said assessment shall constitute a special assessment and lien against the property. The special assessment and lien shall be subject to the same penalties as are provided for other delinquent taxes or assessments of the Township.

6. The payment of any assessments of Four Hundred Dollars ($400.00) or more upon a single family residence may be made in annual installments, not to exceed five (5); the payment of assessments so deferred shall bear interest on the unpaid balance at the statutory rate of interest as prescribed by the State. Said interest shall begin to accrue on the 31st day after the confirmation of the assessments.

§210. Connections to be made without damage to streets

1. All sewers and sewer connections shall be laid so that house connections can be made without damaging the surface of any improved street. Thereafter, before any person shall be given a permit by the Township Engineer, or said Township Engineer's designee to alter or remove the surface dressing of any improved street, a bond with sufficient surety in an amount as reasonably determined by the Township and based upon the scope of the work shall be given to the Township Manager. The bond shall guarantee that the condition of the altered street will be replaced in as good a condition as before the removal of the surface and the property owner shall be held responsible for a period of one year to keep the part of the street so removed in good condition and good repair.

§211. General requirement for lateral testing

1. Within ten (10) years of the final passage of this Part , all private sewer laterals constructed in the Township of Chester prior to October 1, 1996, shall be tested by the property owner, and shall be tested at least every twenty-five (25) years thereafter in conjunction with the requirements of this Chapter. If the property owner does not meet the timeline of this requirement, the procedures for a notice to conduct lateral testing will be the same as set forth in this Part.

§212. Conversions from Single Family to Multi-Family Dwellings

1. Whenever any single family use, located in any zoning district within the Township of Chester, is being converted to accommodate a multi-family use, the

following must be accomplished in order to be awarded a Township of Chester Use and Occupancy Certificate:

A. An analysis of the existing wastewater drainage system(s) and planned additional fixtures shall be completed by an appropriate competent practitioner to certify that the wastewater drainage systems of the building will be capable of meeting the sanitary needs of the planned multi-family use.

B. A Certificate of Lateral Compliance for the said property shall have been issued.

C. Documentation shall be obtained from the Township Plumbing Inspector affirming the ability of the affected DELCORA or SDCMSA sewer main piping to handle the additional loads associated with the intended Multi-Family use associated with the said property, and associated fees paid.

§213. Lateral testing upon sale

1. Whenever any property located in the Township of Chester is to be transferred to or vested in any other person or entity by deed, instrument or writing, by which any lands are sold, granted, assigned, transferred or otherwise conveyed to, or vested in, a purchaser or purchasers thereof, or to any other person or persons, and the property includes any buildings or structures constructed more than fifteen (15) years prior to the sale of the property, the sewer lateral(s) to the property shall be tested for infiltration and all necessary repairs or replacements shall be performed to prevent all infiltration. All testing procedures must be approved by the Township Engineer, or said Township Engineer's authorized representative, and all repair or replacement work shall be completed and approved by the Township prior to transfer of title. The property owner shall retain the inspection card, signed by a Township authorized representative as approved, as proof of compliance.

2. Exceptions. This section shall not apply to:

A. Condominium or cooperative apartment buildings

B. To all buildings where the Township Engineer, or said Township Engineer's authorized representative, determines that testing and/or repairs have been performed to Township standards within the last five (5) years.

§214. Private sewer lateral testing procedure and requirements

1. The property owner or his/her appointed contractor shall obtain a ***lateral inspection form*** in addition to a plumbing permit for sewer lateral testing prior to commencing with the testing procedure. The test procedure shall be performed as follows:

2. Each lateral is to have a two-way cleanout made of material approved by the Township Engineer, or said Township Engineer's authorized representative, located in the Township right-of-way, on private property adjacent to the Township right-of-way, or on a public utility easement inside of the curb line. If one does not exist, an approved clean-out shall be installed prior to performing any testing. Installation of the clean-out, if necessary, shall require a plumbing permit; shall be run to grade and covered/capped by a meter box and lid as approved by the Township Engineer, or said Township Engineer's designee. A clean-out located adjacent to (within 30" inches of) the building is required by the International Plumbing Code for any new construction and is required by this Chapter.

3. Lateral testing shall be accomplished, where applicable, by a closed-circuit video recording observation and evaluation grading test, and if appropriate, a water ex-filtration test, an air test, or by a smoke test.

A. Closed circuit video recordings shall be used as the primary testing/inspection method for all laterals that have been in service for ten (10) years or more, for an initial observation and evaluation grading test conducted according to the standard specifications on record with the Township Engineer, or said Township Engineer's designee.

B. A water ex-filtration test shall only be appropriate for laterals that are new or exposed, and will be conducted according to standard specifications as per the pertinent plumbing code of the Township of Chester.

C. Air testing shall only be appropriate for laterals that are new or exposed, and will be conducted according to standard specifications as per the pertinent plumbing code of the Township of Chester.

D. Smoke testing shall only be appropriate for laterals that are new or exposed, and will be conducted according to standard specifications as per the pertinent plumbing code of the Township of Chester.

§215 Failure of test

1. Should the lateral fail the test, the lateral shall be either repaired or replaced, and retested. A plumbing permit shall be required in order to perform the necessary repairs or replacement. This process shall continue until the lateral passes the required test. *

2. For the purposes of retesting any system, fees that are in effect for the lateral compliance inspection shall apply for each and every testing event.

** The "PACP Condition Grading System" Standards are used to evaluate all test results. These documents are on file in the Chester Township Plumbing Inspector's office. These standards are adopted and or amended by resolution of the Chester Township Council from time to time.*

§216. Lateral Certification

1. Once the lateral has successfully passed the testing procedure, the Township Engineer, or said Township Engineer's designee, shall issue a signed Certificate of Lateral Compliance.

§217. Inspection and Certification Fees

1. Fees associated with this Chapter and Part can be found in the Township's fee and rate schedule, a list of all Township service, penalty, interest, permit fees, and

hourly personnel and equipment rates, as adopted by resolution of the Township Council from time to time

§218. Person Authorized to perform work

1. Plumbers, licensed by the Township of Chester, "Third Party Inspection Agencies" and certain trained and qualified individuals may be approved to provide lateral piping inspection services to property owners within the said Township by being in compliance with 218.2 and 218.3. below.

2. The qualifications and equipment of any plumber, third party inspector, or other person(s), having been trained as a piping system tester, shall be evaluated and approved by the Plumbing Inspector of the Township of Chester prior to providing lateral testing, under §214.3. of this Part, within the Township of Chester.

3. In order to gain approval to provide lateral testing services, under §214.3. of this Part, the following requirements shall be satisfied:

A. The closed circuit video equipment system(s), or other technologies to be used for said testing shall be approved by the Plumbing Inspector of the Township of Chester; and

B. Said equipment must meet or exceed the minimum technical equipment specifications on file with the Township Plumbing Inspector, and

C. Video disk image samples shall be provided for evaluation by the Township Plumbing Inspector; and

D. The required evaluation fee has been paid to the Township.

§219. Plumbing Elevation

1. In all buildings in which there are plumbing fixtures at an elevation too low to permit drainage by gravity from the fixtures to the sewer main, the sewage from the buildings shall be lifted and discharged to the DELCORA's or SDCMSA's

sewer system by pumps or other appropriate wastewater facilities, which shall be the responsibility of the property owner.

§220. Application of Standard Specifications

1. The Township's standard specifications shall control in any case where they apply except as follows:

A. The standard specifications are in conflict with the provisions of this Code of Ordinances of the Township of Chester in which case the provisions of the Code of Ordinances shall control; and

B. For good cause, the Township Engineer has authorized deviation from the standard specifications. If the action required by the standard specifications in a particular case is unclear, the Township Engineer shall make the determination.

§221. Condominiums, Coop Apartment Buildings, Multi-Unit Apartment Complexes

1. This section is intended to apply to, but is not necessarily limited to application to, the following facilities that exist(ed) on the date of passage of this Part; (a) Delaware County Housing; and (b) Bridgewater Apartments.

2. Condominiums, cooperative apartment buildings and multi-unit apartment complexes constructed prior to August 1, 1996, shall be tested as follows:

A. Within one (1) year of the final passage of this Part, all condominium or cooperative apartment buildings or multi-unit apartment complexes shall be certified. Thereafter, retesting and certification of the lateral(s) shall occur at ten (10) year intervals, or at the discretion of the Township Engineer, or said Township Engineer's designee.

B. Exception: This paragraph shall not apply to condominium or cooperative apartment buildings or multi-unit apartment complexes where the Township Engineer, or said Township Engineer's designee, determines that testing and replacement of lateral(s) has been performed to Township standards within the last ten (10) years.

C. Testing Procedure and Requirements. All condominiums and cooperative apartment buildings shall be required to comply with §214.and §218. of this Part.

§222. Other regulatory considerations

1. Plumbing codes and other applicable regulations adopted or amended by the Township of Chester shall govern the construction of private lateral repair.

§223. Violations and Penalties

1. Any person who shall violate any provision of this Part shall, upon conviction thereof, in a summary proceeding before a Magisterial District Judge, be sentenced to pay a fine of not more than One Thousand Dollars ($1,000.00), plus costs of prosecution, and, in default of payment thereof, to a term of imprisonment for a period not exceeding thirty (30) days. Each day that a violation of this Part continues shall constitute a separate offense.

2. In addition to, or in lieu of, the remedies set forth above, any violation of this Part may result in the issuance of an administrative citation.

§224. Severability.

1. If any section, subsection, subdivision, paragraph, sentence, clause or phrase of this Part is, for any reason, held to be unconstitutional or invalid, such a decision shall not affect the validity of the remaining portions of this Part. The Township Council hereby declares that it would have passed each section, subsection, subdivision, paragraph, sentence, clause or phrase of this Part irrespective of the unconstitutionality or invalidity of any section, subsection, subdivision, paragraph sentence clause or phrase.

§225. Effective Date.

1. This ordinance shall take effect five (5) days after the date of its enactment.

ENACTED AND ORDAINED this 5th day of April, 2012.

TOWNSHIP OF CHESTER

Stanley R. Kester, Chairman

Nathaniel Ellis, Vice Chairman

Robert J. May, Jr., Councilman

Calvin J. Bernard, Councilman

Attest: William P. Pisarek, Secretary
(Municipality Seal)

Robert J. Willert
Township Manager

Pennoni Associates Inc.
Township Engineer

Hugh A. Donaghue
Township Solicitor

Township of Concord

DELAWARE COUNTY

CONCORD TOWNSHIP

ORDINANCE NO. 338

AN ORDINANCE OF THE TOWNSHIP OF CONCORD TO AMEND THE ZONING CODE AS HERETOFORE AMENDED, TO REQUIRE PRIVATE SEWER LATERAL INSPECTIONS UPON THE RESALE OF A PROPERTY WITHIN CONCORD TOWNSHIP.

The Board of Supervisors of Concord Township, Delaware County, Pennsylvania does hereby ENACT and ORDAIN that the Code of the Township enacted January 5, 1998, as heretofore amended, is further amended as follows:

SECTION 1. The Township Code, Chapter 90, Certificates of Use and Occupancy, as heretofore amended, is hereby amended to add a new subsection G. to Section 90-3, to read in its entirety as follows.

G. Prior to the resale of any property within Concord Township, the sewer lateral for that property shall be inspected and/or televised by the Township. The property owner shall make all areas of the property to be inspected and/or televised available to the Township upon the Township's request.

1. If the inspection determines that the sewer lateral is in an unacceptable condition, the property owner shall be so notified in writing and the sewer lateral shall be repaired or replaced by the property owner, in accordance with the notice and the applicable Rules and Regulations of the Concord Township Sewer Department. All costs of repair and replacement shall be borne by the property owner. The Township shall confirm by inspection and/or televising that the sewer lateral has been satisfactorily repaired or replaced once notified of the repairs or replacement by the property owner.

2. The Township shall use best efforts to conduct the inspection and/or televising by the least invasive and intrusive means possible. However, in the event of any damage to the property caused by the Township's inspection, the Township shall promptly repair or restore the property to the reasonable condition in which the property existed prior to the entry of the Township onto the property, circumstances permitting.

3. The cost of the lateral inspection shall be determined and established by the Board of Supervisors from time to time, by resolution.

SECTION 2. This Ordinance shall become effective five (5) days after adoption.

ENACTED and ORDAINED this 1ST day of November, 2011.

CONCORD TOWNSHIP
BOARD OF SUPERVISORS

Attest: Brenda L. Lamanna
Secretary

TOWNSHIP OF DARBY

DELAWARE COUNTY, PENNSYLVANIA

ORDINANCE #691

SANITARY SEWER LATERAL INSPECTIONS

AN ORDINANCE OF THE TOWNSHIP OF DARBY, DELAWARE COUNTY, PENNSYLVANIA PROHIBITING CERTAIN DISCHARGES INTO THE SANITARY SEWER SYSTEM WITHIN THE TOWNSHIP OF DARBY MANDATING INSPECTION OF SANITARY SEWER LATERALS AND THE REPAIR OF ANY DEFECT IN SUCH LATERALS PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY, EMPOWERING THE TOWNSHIP OF DARBY TO INSPECT SANITARY SEWER LATERALS WITHIN THE TOWNSHIP, AND REPEALING ALL ORDINANCES, RESOLUTIONS, OR PARTS OF ORDINANCES AND RESOLUTIONS INCONSISTENT HEREWITH.

WHEREAS, this discharge, inflow and infiltration of certain unpolluted waters into the sanitary sewer system unnecessarily increases the cost of wastewater treatment; and

WHEREAS, the Township of Darby deems it desirous to prohibit the discharge, and take measures to reduce the inflow and infiltration, or unpolluted waters into the sanitary sewer system.

NOW, THEREFORE, the Township of Darby hereby ordains that:

1. **Definitions.** When used in this ordinance and capitalized the following terms shall have the following meanings:

   a. **Applicant** shall mean any Person applying for a Certificate of Occupancy.
   b. **Certificate of Occupancy** shall mean the certificate required pursuant to Chapter 11, Section 102 of the Code of Ordinance of the Township of Darby.
   c. **Person** shall include any individual, entity, partnership, business, corporation, company or other such similar entity.
   d. **Property** shall mean any real property located within the Township of Darby.
   e. **Sanitary Sewer System** shall include piping, lines, sewers and connection thereto transporting wastewater within the Township of Darby to a destination for sanitization and treatment.
   f. **Sewer Lateral** shall mean any pipe, line or sewer running across or through any Property and connecting to a pipe, line or sewer owned by any municipality or municipal authority for the purpose of transporting wastewater for treatment.
   g. **Storm Water** shall include all storm water, rain water, surface water, ground water, roof run-off or subsurface drainage.

2. **Prohibition of Storm water discharges into the Sanitary Sewer System.**

   a. It shall be unlawful for any Person to discharge any Storm Water into the Sanitary Sewer System, or permit the discharge of Storm Water from any Property owned b y any such person into the Sanitary Sewer System. For the purpose of this Paragraph, any discharge of Storm Water into the Sanitary Sewer System shall be deemed to have been permitted by the owner of the Property upon or within such Storm Water enters the Sanitary Sewer System.

   b. No Person who owns any Property serviced by the Sanitary Sewer System shall connect any roof drain or foundation drain or foundation drain thereto or permit any such drains to remain connected thereto.

   c. Each violation of the terms of any provision of this Paragraph 2 of this Ordinance shall be punishable by a fine of not less than Three Hundred Dollars ($300.00) nor more than One Thousand Dollars ($1,000.00). For the purpose of this provision, each day on which a discharge or connection that violates this Paragraph 2 occurs shall constitute a separate violation.

3. **Inspection by Township.** The Township of Darby and/or its agents, employees, designees, or assigns, may upon ten (10) days notes, undertake such inspection or test at it may deem appropriate to determine the condition of any Sewer Lateral. Any such inspection or test may only take place during the hours of 8:00 A.M. and 8:00 P.M., Monday through Friday. The owner of the affected Property shall make all areas to be inspected or tested available to the Township or its designee, upon request. If, in its sole discretion, the Township determines that the Sewer Lateral is in an unacceptable condition unless said terms are extended by the owner, the Sewer Lateral shall be repaired or replaced by the owner of the Property at such owner's expense within thirty (30) days or at the expiration of any such extension is outlined above of the date Township notifies such owner that the Sewer Lateral is in an unacceptable condition.

4. **Mandatory Inspection Prior to the Issuance of a Certificate of Occupancy.**

   a. As a pre-condition to the issuance by the Township of Darby of any Certificate of Occupancy, the Applicant shall contract a plumber to perform a dye test, smoke test or air test of the Sewer Lateral on the affected Property and provide the results of same to the Township, any smoke test shall involve the use of non-toxin, non-staining smoke, forced through the Sewer Lateral by way of forced air. The

plumber performing such test shall notify the Township at least seven (7) business days in advance of same, so that Township may have the opportunity to witness the test. The Township shall have the right to approve the test as performed or required additional testing. The plumber performing such test shall certify the results to the Township of Darby. Should there be any connection to the Sewer Lateral in violation of Paragraph 2 of this Ordinance, or should the Sewer Lateral be in a condition that Township, in its sole discretion, deems unsatisfactory, then, except as otherwise provided herein, the Applicant shall not receive a Certificate of Occupancy until such connection is removed or such condition is remedied to the satisfaction of The Township of Darby.

b. In the event a Sewer Lateral is in an unsatisfactory condition, the Township of Darby may, in its discretion, issue a temporary Certificate of Occupancy upon the Applicant placing an amount of money that the Township of Darby, in its sole discretion, deems sufficient to remedy such unsatisfactory condition. In the event that the Applicant fails to remedy such unsatisfactory condition within thirty (30) days, the Township may, in its discretion: (1) revoke the temporary Certificate of Occupancy; or (2) undertake such repairs or replacement of the Sewer Lateral as may be necessary to remedy the unsatisfactory situation, applying the escrowed monies toward such repairs or replacement. Should Township of Darby undertake the repair or replacement of any Sewer Lateral in accordance with this Paragraph 4.b, the amount by which the costs of such repairs or replacement may exceed the amount of money placed in escrow, such difference shall be a liability of both the property and the Applicant, and may be assessed against the property in accordance with Pennsylvania's Municipal Claims Act, in which case it shall constitute a lien against the property until paid. Any money remaining in escrow after the Sewer Lateral is repaired to a satisfactory condition or replaced in accordance with this Paragraph 4.b shall be returned to the Applicant.

c. Except as provided in this Paragraph 4 of this Ordinance, nothing herein is intended to amend, reduce or remove any existing prerequisite to an Applicant obtaining a Certificate of Occupancy pursuant to Chapter 11, Section 102, Code of Ordinances of the Township of Darby.

5. **Severability.** Should any clause, paragraph or provision of this Ordinance be deemed illegal or unconstitutional by an appropriate court of law, it is the intention of the Township of Darby that the remainder of this Ordinance continue in effect.

6. **Repealer.** Any ordinance, resolution, or any severable part of any ordinance or resolution directly conflicting with the provisions of this Ordinance is hereby repealed.

7. **Effective Date.** The Ordinance shall be effective as of January 1, 2011.

ORDAINED AND ENACTED into law as of this 8th day of December, 2010.

TOWNSHIP OF DARBY

BY: Lawrence F. Patterson
Lawrence F. Patterson,
President

ATTEST:

Thomas J. Judge, Sr.,
Secretary

BOROUGH OF ROSE VALLEY

ORDINANCE NUMBER 337

AN ORDINANCE PROHIBITING CERTAIN DISCHARGES INTO THE SANITARY SEWER SYSTEM LOCATED IN THE BOROUGH OF ROSE VALLEY, MANDATING THE INSPECTION OF SANITARY SEWER LATERALS AND THE REPAIR OF ANY DEFECTS AND/OR REMOVAL OF ANY ILLEGAL INFLOW CONNECTIONS TO SUCH LATERALS PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY; EMPOWERING THE BOROUGH OFFICIALS TO INSPECT THE SANITARY SEWER LATERALS, REPEALING ALL ORDINANCES INCONSISTENT HEREWITH AND IMPOSING PENALTIES FOR VIOLATIONS.

WHEREAS, the discharge, inflow and infiltration of Storm Water into the sanitary sewer system unnecessarily increases the cost of wastewater treatment to Borough residents; and

WHEREAS, the Council of the Borough of Rose Valley desires to prohibit the inflow of Storm Water into the Sanitary Sewer System and seeks to take all necessary and appropriate measures to reduce infiltration into the Sanitary Sewer System.

NOW, THEREFORE, the Council of the Borough of Rose Valley hereby ordains:

SECTION 1. Definitions. When used in this ordinance, the following terms shall have the following meanings:

A. **Applicant** shall mean any person applying for a Certificate of Occupancy.

B. **Certificate of Occupancy** shall mean the official certificate issued by the proper officers of the Borough of Rose Valley stating that the Sewer Lateral is in satisfactory condition and there are no known illegal Storm Water inflow connections into the Sewer Lateral on the specific property which is being sold or transferred to a different Person.

C. **Person** shall include any individual, legal entity, partnership, business, corporation or company.

D. **Property** shall mean any real property located within the boundaries of the Borough of Rose Valley.

E. **Sanitary Sewer System** shall include piping, lines, sewers, laterals and connections thereto, which transport wastewater within the Borough of Rose Valley to a destination for wastewater treatment.

F. **Sewer Lateral** shall mean any pipe, line or sewer running across or through
any real property and connecting to a pipe, line or sewer owned by any municipality or municipal authority, which has as its purpose the transport of wastewater for treatment.

G. **Storm Water** shall include all storm water, rain water, surface water, ground
water, roof run-off or subsurface drainage.

SECTION 2. Prohibition of Storm Water discharges into the Sanitary Sewer System.

A. It shall be unlawful for any Person to discharge any Storm Water into the Sanitary Sewer System, or permit the inflow of Storm Water from any property owned by such Person into the Sanitary Sewer System. Any discharge or inflow of Storm Water into the Sanitary Sewer System shall be deemed to have been permitted by the owner of the Property upon which or within which such Storm Water enters the Sanitary Sewer System.

B. No Person who owns any Property serviced by the Sanitary Sewer System
shall connect any sump pump, roof drain, foundation drain, or other surface water drain, or permit any such drains to remain connected, to the Sanitary Sewer System.

C. Each violation of any of the provisions of this Ordinance shall be punishable
by a fine of no less than one hundred ($100.00) dollars, nor more than the statutory limit applicable to boroughs under the state code. Each day on which such violation occurs or exists, shall constitute a separate violation of this Ordinance.

SECTION 3. **Inspection by Designated Borough or DELCORA Officials.**

A. The Borough of Rose Valley, by its elected or appointed officials, including the Building Inspector, Code Enforcement Officer and/or any DELCORA employee duly appointed by Resolution of Council, may undertake such inspection or tests as it deems necessary and appropriate to determine the condition of any Sewer Lateral. Any such inspection or test may only take place after notice has been given, in writing, hand delivered or mailed to the address of the property in question, at least ten (10) business days in advance. Tests or inspections shall be permitted only on weekdays, between the hours of 9:00 a.m. and 5:00 p.m., or by appointment.

B. The owner of the affected Property shall make all areas to be tested or inspected available to the designated inspectors.

C. If, in the sole opinion of the inspector, any illegal Storm Water inflow connections are found, or the Sewer Lateral is determined to be in unsatisfactory condition, the Sewer Lateral shall be repaired or replaced by the owner of the Property, at the owner's expense. Such repairs or replacement must be commenced within ninety (90) days of the date the Borough notifies the owner of the deficiency, in writing.

D. The Borough shall re-inspect the Property upon notice from the Property owner that the deficiency has been repaired, or one hundred twenty (120) days after the notice of deficiency was first sent by the Borough, whichever first occurs.

E. If the owner of the Property fails to make such repairs or replacement, within the times specified in this Ordinance, the Borough shall be authorized and permitted to make such repairs or replacements and to assess the owner of the Property for the cost thereof, plus ten (10%) for administrative costs. Such assessment shall be made in accordance with the Pennsylvania Municipal Claims Act, and shall constitute a lien against the Property until paid.

SECTION 4. Mandatory Inspection Prior to Issuance of a Certificate of Occupancy.

A. A Certificate of Occupancy shall be required upon the sale, or transfer of ownership, of any Property in the Borough.

B. As a mandatory condition prior to the issuance of a Certificate of Occupancy by the Borough, the Applicant shall contract a plumber or other qualified contractor to inspect and appropriately test for any illegal Storm Water inflow connections into the Sewer Lateral on the affected property and provide the results of the inspection and tests to the Borough. Such tests could include a dye test, smoke test, or air pressure test of the Sewer Lateral. Any smoke test shall use nontoxic, non-staining smoke, forced through the Sewer Lateral by way of forced air. All Sewer Laterals more than thirty (30) years old shall be televised over their entire length, unless the lateral was previously televised within the last five (5) years and found to be in satisfactory condition. The plumber or other contractor performing such tests shall notify the Borough at least three (3) business days in advance of performing the test, to give the Borough the opportunity to have a representative present during testing. The Borough representative/inspector is empowered to approve the test as performed, or to require additional testing.

C. The plumber or other qualified contractor performing the tests shall certify the results in writing to the Borough. If the test results indicate any illegal Storm Water inflow connection to the Sewer Lateral, and/or if the Sewer Lateral is found to be in such condition that the inspector, in his sole discretion, deems it to be unsatisfactory, then the

Applicant shall not be given a Certificate of Occupancy until such illegal connection is removed and/or the unsatisfactory condition has been remedied to the satisfaction of the Borough officials.

D. In the event a Sewer Lateral is found to be in an unsatisfactory condition, the Borough may, in its discretion, issue a temporary Certificate of Occupancy upon the Applicant placing an amount of money in escrow that the Borough, in its sole discretion, deems sufficient to remedy such unsatisfactory condition. In the event the Applicant fails to remedy such unsatisfactory condition within ninety (90) days, the Borough may, in its sole discretion:

(1). Revoke the temporary Certificate of Occupancy; or

(2). Undertake such repairs or replacement of the Sewer Lateral as may be necessary to remedy the unsatisfactory situation, and apply the escrowed money toward such costs. Should the Borough undertake the repairs or replacement of the unsatisfactory Sewer Lateral, any excess money in escrow shall be returned to the property owner. Any shortage of funds shall be a liability of both the Property and the Applicant, and may be assessed against the Property in accordance with Pennsylvania's Municipal Claims Act.

E. Nothing in this Ordinance shall amend, reduce or remove any other Borough requirements for a Certificate of Occupancy pursuant to other Ordinances or laws applicable to the transfer or sale of real property in the Borough.

SECTION 5. Severability.

Should any clause, paragraph or provision of this Ordinance be deemed illegal or unconstitutional by any Court of competent jurisdiction, it is the intention of the Borough that the remainder of this Ordinance continue in full force and effect.

SECTION 6. Repealer.

Any Ordinance, Resolution, or any severable part thereof, in direct conflict with the provisions of this Ordinance is hereby repealed.

7. **Effective Date.**

This Ordinance shall be effective thirty (30) days after passage by Council and Approval by the Mayor.

ORDAINED and ENACTED this 11th day of April , 2012.

BOROUGH OF ROSE VALLEY

Attested this 11th day of April , 2012.

s/ s/

Paula W. Healy, Borough Secretary William C. Hale, President of Council

Approved this 11th day of April, 2012.

s/

Thomas F. Plummer, Jr., Mayor

BOROUGH OF UPLAND
DELAWARE COUNTY, PENNSYLVANIA
ORDINANCE NO. 1 OF 2012

AN ORDINANCE OF THE BOROUGH OF UPLAND, DELAWARE COUNTY, PENNSYLVANIA, CREATING ARTICLE II – "PRIVATE SANITARY SEWER LATERAL CONNECTIONS" IN CHAPTER 150 – "SEWERS" OF THE CODIFIED ORDINANCES OF THE BOROUGH OF UPLAND, PENNSYLVANIA, 1969, AS SUPPLEMENTED AND AMMENDED, SETTING REGULATIONS FOR ALL SANITARY SEWER LATERAL CONNECTIONS IN THE BOROUGH OF UPLAND; AND ESTABLISHING REQUIREMENTS AND TIMING FOR AUTHORIZED INSPECTIONS AND PROPER MAINTENANCE OF SAID SEWER LATERALS AND CONNECTIONS; AND SETTING STANDARDS AND CONDITIONS FOR SEWER LATERAL CERTIFICATION; SETTING FEES AND SETTING VIOLATIONS AND PENALTIES FOR FAILURE TO COMPLY; AND REPEALING ALL ORDINANCES OR PARTS OF ORDINANCES INCONSISTENT HEREWITH.

BE IT ENACTED and it is hereby enacted and ordained by the Council of the Borough of Upland, Delaware County, Pennsylvania, as follows:

Chapter 150 – SEWERS

ARTICLE II – Private Sanitary Sewer Lateral Connections

§ 150-1 Definitions

The following terms apply to this chapter and augment definitions found in the Uniform Plumbing Code:

(a) ***"Backwater Valve"*** shall mean a device or valve installed in the building drain or sewer pipe where a sewer is subject to backflow, and which prevents drainage or waste from backing up into a lower level or fixtures and causing a flooding condition.

(b) ***"Borough authorized representative"*** shall mean the Borough engineer or a borough employee designated in writing by the Borough engineer to sign certificates of inspection for the purpose of lateral inspections and to issue Certificates of Lateral Compliance.

(c) ***"Borough's fee and rate schedule"*** shall mean a list of all borough service, penalty, interest, permit fees, and hourly personnel and equipment rates, as adopted by resolution of the borough council from time to time.

(d) ***"Building sewer"*** shall mean that part of the drainage system that extends from the end of the *building drain* and conveys the discharge (sewage) to a *public sewer, private sewer*, individual sewage disposal system or other point of disposal.

(e) ***"Commercial Multi-Family building"*** shall mean any building containing one or more rental unit(s) located in any area in the Borough.

(f) ***"Cleanout"*** shall mean an *access* opening in the drainage system utilized for removing obstructions. Types of cleanouts include removable plug or cap, and a removable fixture or fixture trap..

(g) ***"DELCORA"*** shall mean the Delaware County Regional Water Quality Control Authority.

(h) ***"Maintenance"*** shall mean routine flushing or rodding of a sewer to maintain a free flowing condition.

(i) ***"Overflow device"*** shall mean a device that is specifically designed to relieve the pressure created when a gravity sewer is flowing full. All overflow devices require the approval of the Borough engineer for proper application before their installation.

(j) ***"Private sewer system"*** shall mean a sewer or system of sewers serving more than one building that is not owned by DELCORA.

(k) ***"Repair"*** shall mean physical exposure of a section of pipe and or appurtenances and for the purpose of resuming proper operating condition.

(l) ***"Replacement"*** shall mean removal and replacement of existing pipe and/or appurtenances.

(m) ***"Sanitary sewer"*** shall mean a pipe or conduit which carries sanitary sewage and to which stormwater and ground waters are not admitted.

(n) ***"Sewage"*** shall mean all water or combination of liquid and water-carried solid, bio-solids or solid waste conducted away from any dwellings, residences, business buildings, institutions, unit, firm, association, organization, public corporation, political subdivision (including the Borough of Upland), county, or district; or the State of Pennsylvania; or the United States of America, or any department or agency thereof and other sources, which is known as domestic sewage, together with liquid or water-carried solid or semi-solid wastes resulting from a manufacturing process employed in industrial establishments, including the washing, cleaning or drain water from such process, which is known as industrial waste.

(o) ***"Sewer facilities"*** shall mean and include the sanitary collection system owned and operated by DELCORA in the Borough of Upland, all appurtenances thereto, and all portions thereof.

(p) ***"Sewer lateral" or "lateral"*** shall mean a sewer pipe that conveys sewage from plumbing of a building or structure to a Borough maintained sewer main, also referred to as "building sewer" in the Uniform Plumbing Code.

(q) ***"Sewer" or "sewer main,"*** when used herein, shall mean any borough-owned and/or DELCORA owned sewer pipe within a street or public right-of-way receiving or intended to receive the discharges of more than one sewer lateral. No sewer main constructed henceforth shall be less than eight inches in diameter nor be laid or constructed in any borough street, easement or right-of-way or street, easement or right-of-way under the control of the borough and/or DELCORA, except to the lines, grades, and specifications approved by the Borough engineer.

(r) ***"Storm sewer" or "storm drain"*** shall mean a pipe or conduit which carries storm and surface waters and drainage, but excludes sewage and polluted industrial wastes.

(s) ***"Sub-divider"*** shall mean a person, firm, corporation, partnership or association which causes land to be divided into a subdivision for person, firm, corporation, partnership or association, or for others.

(t) ***"User"*** shall mean and include any dwelling, unit, firm, association, organization, public corporation, political subdivision (including the Borough of Upland), county, district, the State of Pennsylvania, or the United States of America, or any department or agency thereof.

§ 150-2 Sewer connections required

A. All property owners, owning or controlling property facing upon any of the streets of the Borough of Upland shall lay or cause to be laid all necessary sewer connections with the DELCORA sewer mains.

§ 150-3 Property owner's responsibility for lateral repairs and maintenance

A. General:

(1) It shall be the responsibility of the property owner to perform all required maintenance and to keep the lateral(s) in good condition as defined by this chapter. For the purpose of this requirement any sewer lateral on private property (e.g.; rear yards and side yards) shall be considered as a lateral and is to be connected to DELCORA's sewer main.

(2) A buildings' sewer must be maintained to meet the following minimum requirements:

a) The sanitary sewer lateral and vent cleanouts shall be kept free from roots, grease deposits, and other solids which may impede the flow or obstruct the transmission of waste.

b) All joints shall be tight and all pipes shall be sound to prevent ex-filtration by waste or infiltration by ground water or storm water.

c) The sanitary sewer lateral shall be free of any structural defects, cracks, breaks, or missing portions and the grade shall be uniform without sags or offsets.

d) The sanitary sewer lateral shall have a two (2) way cleanout located at the property line or at the sewer main easement. All cleanouts shall be securely capped with a proper cap at all times.

B. Compliance:

(1) The property owner's compliance with required repairs and maintenance of laterals shall be as set forth herein and by any implementing policy established by the Borough Engineer.

(2) The property owner shall obtain a Certificate of Lateral Compliance from the Borough Engineer, or said Borough Engineer's designee, prior to the sale of any property from which a sewer lateral is connected to the DELCORA maintained sanitary sewer system.

(3) As a condition of the issuance of a building permit for construction which exceeds one percent (1%) of the existing value of the structure(s), based on the building valuation schedule of the Building Codes, the property owner shall obtain a Certification of Lateral Compliance from the Borough Engineer, or said Borough Engineer's designee, prior to final building Use and Occupancy inspection.

(4) The property owner shall obtain a Certification of Lateral Compliance from the Borough Engineer, or said Borough Engineer's designee, which verifies that the property owner has installed, or upgraded to, a two (2) way approved cleanout for testing purposes, if required.

(5) The Borough Engineer, or said Borough Engineer's designee, shall determine the criteria and acceptable methods of evaluating building sewers to ensure compliance with the above requirements.

§ 150-4 Connections required for every separate lot

Every separate lot of twenty-five feet or more, or any two lots adjoining shall be connected with DELCORA's sewer main.

A. Every building or structure with plumbing fixtures requiring drainage on a property must have its own lateral connected to the DELCORA's main. When any repairs or replacements are done to those laterals that are jointly shared by more than one building or structure from different properties, each shall require a discrete connection to the DELCORA's sanitary sewer main as part of the repair. If a property with two buildings or structures with plumbing fixtures requiring drainage is subdivided, each building or structure shall be required to have a discrete connection to the DELCORA's sanitary sewer main as a condition of subdividing.

§ 150-5 Backwater valve required

A. The Plumbing Code of the Borough of Upland requires a backwater valve be installed whenever plumbing facilities exist and are below the manhole cover elevation.

B. In any system where a backwater valve is required, the property owner shall install the appropriate approved valve. It shall be the responsibility of the property owner to maintain said backwater valve in a proper operating condition.

C. In the event that the condition of any installed backwater valve becomes irreparable, the said valve shall be immediately replaced by the property owner.

D. Connections of any backwater valve shall be made only after the issuance of a Borough plumbing permit.

§ 150-6 Illegal sewer connections

A. All sewer laterals or sewer clean-outs which contain leaks or breaks, uncapped sewer clean-outs, sump pumps, down spouts or yard drains which discharge into the sewer system, and all other sources of accidental, negligent or intended introduction of stormwater run-off or similar waters into the sanitary sewer system are hereby declared to be a public nuisance. If such a condition exists, it shall be abated by the owner of the property, who is hereby required to remove or correct such improper sewer connections.

§ 150-7 Notices to make connections

A. It shall be the duty of the Borough Engineer, or said Borough Engineer's designee, to give written notice to property owners, or their agents if known, and to the occupant(s) of the property, if any, specifying that the sewer connection repair shall be made by means of the initial installation or repair of the illegal lateral.
B. If the owners or their agents are not known and if there are no occupants, the Borough Engineer, or said Borough Engineer's designee shall post said notice conspicuously on said property. Said notice shall briefly describe the work required, referring to this or other code chapters, and shall contain a notification to the effect that, unless said work is done within ten (10) days, the Borough Engineer, or said Borough Engineer's designee will take appropriate legal action(s) to have the work accomplished.
C. The Borough Engineer, or said Borough Engineer's designee shall keep a record of said notices and actions.

§ 150-8 Conversions from Single Family to Multi-Family Dwellings

A. Whenever any single family use, located in any zoning district within the Borough of Upland, is being converted to accommodate a multi-family use, the following must be accomplished in order to be awarded a Borough of Upland Use and Occupancy Certificate:

    1. An analysis of the existing wastewater drainage system(s) and planned additional fixtures shall be completed by an appropriate competent practitioner to certify that the wastewater drainage systems of the building will be capable of meeting the sanitary needs of the planned multi-family use.
    2. A Certificate of Lateral Compliance for the said property shall have been issued.
    3. Documentation shall be obtained from the Borough Plumbing Inspector affirming the ability of the affected DELCORA Sewer Main piping to handle the additional loads associated with the intended Multi-Family use associated with the said property, and associated fees paid.

§ 150-9 Lateral testing upon sale

A. Whenever any property located in the Borough of Upland is to be transferred to or vested in any other person or entity by deed, instrument or writing, by which any lands are sold, granted, assigned, transferred or otherwise conveyed to, or vested in, a purchaser or purchasers thereof, or to any other person or persons, and the property includes any buildings or structures constructed more than fifteen (15) years prior to the sale of the property, the sewer lateral(s) to the property shall be tested for infiltration and all necessary repairs or replacements shall be performed to prevent all infiltration. All testing procedures must be approved by the Borough Engineer, or authorized representative, and **all repair or replacement work shall be completed and approved by the Borough prior to transfer of title**. The property owner shall retain the inspection documentation, signed by a Borough authorized representative as approved, as proof of compliance.

B. Exceptions. This section shall not apply to:

1. Condominium or cooperative apartment buildings

2. To all buildings where the Borough engineer, or said Borough engineer's authorized representative, determines that testing and/or repairs have been performed to Borough standards within the last five (5) years.

§ 150-10 Private sewer lateral testing procedure and requirements

A. The property owner or his/her appointed contractor shall obtain a ***lateral inspection form,*** in addition to any required plumbing permit, for sewer lateral testing prior to commencing with the testing procedure. The test procedure shall be performed as follows:

B. Each lateral is to have a two-way cleanout made of material approved by the Borough engineer, or said Borough engineer's authorized representative, located in the Borough right-of-way, on private property adjacent to the Borough right-of-way, or on a Public Utility Easement inside of the curb line. If one does not exist, an approved clean-out shall be installed prior to performing any testing. Installation of the clean-out, if necessary, shall require a plumbing permit; shall be run to grade and covered/capped by a meter box and lid as approved by the Borough Engineer, or said Borough Engineer's designee. A clean-out located adjacent to (within 30" inches of) the building is required by the Uniform Plumbing Code for any new construction and is required by this chapter.

C. Lateral testing shall be accomplished, where applicable, by a Closed-Circuit Video recording observation and evaluation grading test results using the *"PACP Condition Grading System" Standards,* and if appropriate, a water ex-filtration test, an air test, or by a smoke test.

1. Closed Circuit Video recordings shall be used as the primary testing/inspection method for all laterals that have been in service for ten (10) years or more, for an initial observation and evaluation grading test conducted according to the standard specifications on record with the Borough Engineer, or said Borough Engineer's designee.

2. A Water Ex-filtration Test shall only be appropriate for laterals that are new or exposed, and will be conducted according to standard specifications as per the pertinent plumbing codes of the Borough of Upland.

3. Air testing shall only be appropriate for laterals that are new or exposed, and will be conducted according to standard specifications as per the pertinent plumbing codes of the Borough of Upland.

4. Smoke testing shall only be appropriate for laterals that are new or exposed, and will be conducted according to standard specifications as per the pertinent plumbing codes of the Borough of Upland.

§ 150-11 Failure of test

A. Should the lateral fail the test, the lateral shall be either repaired or replaced, and retested. A plumbing permit shall be required in order to perform the necessary repairs or replacement. This process shall continue until the lateral passes the required test. *

B. For the purposes of retesting any system, fees that are in effect for the Lateral Compliance Inspection shall apply for each and every testing event.

** The "PACP Condition Grading System" Standards are used to evaluate all test results. These documents are on file in the Upland Borough Plumbing Inspector's office at the Borough Municipal Building. These standards are adopted and or amended by resolution of the Upland Borough Council from time to time.*

§ 150-12 Lateral Certification

A. Once the lateral has successfully passed the testing procedure, the Borough engineer, or said Borough Engineer's designee, shall issue the appropriate documentation in the form of a signed Certificate of Lateral Compliance.

§ 150-13 Inspection and Certification Fees

A. Fees associated with this Chapter and Article can be found in the ***"Borough's fee and rate schedule",*** a list of all borough service, penalty, interest, permit fees, and hourly personnel and equipment rates, as adopted by resolution of the borough council from time to time.

§ 150-14 Person Authorized to perform work

A. Plumbers, licensed by the Borough of Upland, "Third Party Inspection Agencies" and certain trained and qualified individuals may be approved to provide lateral piping inspection services to property owners within the said Borough by being in compliance with §150-14, B. and C. below.
B. The qualifications and equipment of any plumber, third party inspector, or other person(s), having been trained as a piping system tester, shall be evaluated and approved by the Plumbing Inspector of the Borough of Upland prior to providing lateral testing, under §150-10, C. (1) of this Article, within the Borough of Upland.
C. In order to gain approval to provide lateral testing services, under §150-10, C. (1) of this Article, the following requirements shall be satisfied:

1. The Closed Circuit Video equipment system(s), or other technologies to be used for said testing shall be approved by the Plumbing Inspector of the Borough of Upland; and
2. Said equipment must meet or exceed the minimum technical equipment specifications on file with the Borough Plumbing Inspector, and
3. Video disk image samples shall be provided for evaluation by the Borough Plumbing Inspector; and
4. The required Evaluation Fee, found in the ***"Borough's fee and rate schedule"*** has been paid**.**

§ 150-15 Plumbing Elevation

A. In all buildings in which there are plumbing fixtures at an elevation too low to permit drainage by gravity from the fixtures to the sewer main, the sewage from the buildings shall be lifted and discharged to the Borough's sewer system by pumps or other appropriate wastewater facilities, which shall be the responsibility of the property owner.

§ 150-16 Application of Standard Specifications

A. The Borough's standard specifications shall control in any case where they apply except as follows:

1. The standard specifications are in conflict with the provisions of this code, in which case the provision of this code shall control; and

2. For good cause, the Borough engineer has authorized deviation from the standard specifications. If the action required by the standard specifications in a particular case is unclear, the Borough engineer shall make the determination.

§ 150-17 Condominiums, Co-op Apartment Buildings, Multi-Unit Apartment Complexes

A. This section is intended to apply to, but is not necessarily limited to application to, the following facilities that exist(ed) on the date of passage of this Article; 1) Auburn Village; 2) Delaware County Housing; 3) Vista Village; 4) Saint Peter's Place; 5) Community Corrections Facilities – MINSEC.

B. Condominiums, cooperative apartment buildings and Multi-Unit Apartment Complexes constructed prior to August 1, 1996, shall be tested as follows;

1. Within one (1) year of the final passage of this Article, all condominium or cooperative apartment buildings or Multi-Unit Apartment Complexes shall be certified. Thereafter, retesting and certification of the lateral(s) shall occur at fifteen (15) year intervals, or at the discretion of the Borough engineer, or said Borough engineer's designee.

2. Exception: This paragraph shall not apply to condominium or cooperative apartment buildings or Multi-Unit Apartment Complexes where the Borough engineer, or said Borough engineer's designee, determines that testing and replacement of lateral(s) has been performed to Borough standards within the last fifteen (15) years;

3. Testing Procedure and Requirements. All condominiums and cooperative apartment buildings shall be required to comply with **§ 150-18 and §150-22** of this chapter.

§ 150-18 Other regulatory considerations

A. Plumbing codes and other applicable regulations adopted or amended by the Borough of Upland shall govern the construction of private lateral repair.

§ 150-19 Violations and Penalties

A. Any person who shall violate any provision of this Chapter shall, upon conviction thereof, in a summary proceeding before a District Justice, be sentenced to pay a fine of not more than six hundred dollars ($600.), plus costs of prosecution, and, in default of payment thereof, shall be committed to the county jail for a period not exceeding thirty (30) days; and each day's continuance of a violation of this Article as shall constitute a separate offense

B. In addition to, or in lieu of, the remedies set forth above, any violation of this chapter may result in the issuance of an administrative citation.

§ 150-20 Severability.

A. If any section, subsection, subdivision, paragraph, sentence, clause or phrase of this Chapter is, for any reason, held to be unconstitutional or invalid, such a decision shall not affect the validity of the remaining portions of this Chapter.

§ 150-21 Effective Date.

A. This ordinance shall take effect thirty (30) days following its adoption.

ENACTED AND ORDAINED THIS 10th DAY OF JANUARY, 2012

Upland Borough Council

_____

Edward M. Mitchell, President

ATTEST:_____

Shirley Purcival, Borough Manager

_____

Michael J. Ciach, Mayor

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Appendix D

Lateral Inspection and Repair/Replacement Design Standards

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LATERAL INSPECTION AND REPAIR/REPLACEMENT DESIGN STANDARDS

1. INTRODUCTION AND PURPOSE

These minimum standards include specifications for inspection, repair, and replacement of lateral sanitary sewer connections. Municipalities within the Delaware County Regional Water Quality Control Authority's (DELCORA's) Eastern Service Area have adopted Lateral Inspection and Repair/Replacement Time of Sale ordinances as required by the Pennsylvania Department of Environmental Protection (PADEP) for the reduction of Infiltration and Inflow (I&I) into the sanitary sewage collection system. These minimum standards include the following:

- Lateral Inspection Procedures
- Metrics for Classification of the Condition of Sewer Laterals
- Maintenance Standards
- Replacement and Repair Standards

These Standards include, by reference, the conditions set forth in the Delaware County Regional Water Quality Control Authority's (DELCORA's) Standards, Rules, and Regulations of 2011 (as amended), the Standard Specifications for the Construction of Sanitary Sewers and Appurtenances, October, 2000, as amended, and in the Service Agreements between the Municipal Authorities and the Township or Borough. Additional resources for contractors and information regarding I&I abatement can be found in the Private Lateral Inflow and Infiltration Elimination Project Summary Report, June, 2010, available on the DELCORA web page.

2. DEFINITIONS.

1. **Area Drains** – Conduits or conveyances that direct clear water away from any area within a building or on a property.
2. **Backfill -** Material placed in trench from the top of the bedding to the finish grade, or sub base of pavement.
3. **Bedding Material -** Material placed in trench to support the pipe and conduit.
4. **Building Drain -** The lowest horizontal piping of a building drainage system which receives the discharge from waste, and other pipes inside the walls of the building, and conveys it to a point approximately five feet outside the foundation wall of the building.
5. **Building Permit** – Permission from _____Township/Borough to undertake plumbing repairs and repairs to the Private Lateral connection to the municipal sewage collection system.
6. **Building Sewer Lateral** (see Private Lateral)
7. **Certificate of Occupancy** shall mean the certificate required by the Borough/Township Code of Ordinances.

8. **Clear Water** shall include all stormwater, rain water, surface water, groundwater, roof runoff, snow melt, or subsurface discharge.

9. **Contractor –** A professional person skilled and experienced in repair and replacement of private lateral sewer connections.

10. **Downspouts –** Gutters or similar drains from rooftops that convey clear water away from the structure.

11. **Final Inspection** shall mean the final visual inspection of the private lateral by means acceptable to the Township/Borough of _____.

12. **FOG –** Fats, Oils, and Grease.

13. **Foundation Drains –** French drains, perimeter drains, or similar feature installed for the purpose of draining clear water away from building foundations and slabs.

14. **I&I –** Infiltration and inflow means any source or occurrence of clear water transmission into the sanitary sewage collection system.

15. **Minimum Standards –** Conditions set forth as the minimum actions to demonstrate adequate documentation of I&I reduction measures including maintenance, inspections, and repairs to private lateral connections to the municipal sewage collection system.

16. **Municipal Authority** means the local municipal sewer authority.

17. **Municipal Engineer** means the professional engineer serving the local municipality.

18. **National Association of Sewer Service Companies (NASSCO)** – A professional organization that has developed standardized methods of inspecting and rating deficiencies in sanitary sewer systems.

19. **Notice of Violation –** Official written correspondence from _____Township/Borough notifying a property owner that they are not in compliance with the conditions set forth in this Ordinance.

20. **Pipeline Assessment Certification Program (PACP)/Lateral Assessment and Certification Program (LACP)** – NASSCO certification programs that document adequate training and expertise to perform standardized sewer system inspections.

21. **Private Lateral** means the segment of the sanitary sewer system located on private property and extending into a public right of way or public property that connects a residence or business to the main sanitary sewer collection system. The Private Lateral will include the entire length of the connection from the house to the municipal sewage collection system.

22. **Property Owner** shall include any individual, entity, partnership, business, corporation, company or other such similar entity.

23. **Property** shall mean any real property located in _____ Borough/Township.

24. **Public Works Department** means the local municipal department responsible for the municipal sanitary sewers.

25. **Roof Leaders –** Gutters or similar drains from roof tops that convey clear water away from the structure.

26. **Sanitary Sewer System** shall include piping, lines, sewers, and connection thereto transporting wastewater within the Township/Borough of _____ to a destination for sanitization and treatment.

27. **Stormwater** shall include all rain water, surface water, groundwater, roof runoff, snow melt, or subsurface discharge.

28. **Sump Pump –** A pump installed in a pit or depression to pump clear water out of a basement (most typical) but can apply to pumping clear water away from any part of a structure or area of property.

29. **Two-way clean out** shall mean a triangular-shaped fitting that enables pipe lateral cleanout in both directions.

30. **Vent Cap** means a tight-fitting cap that can be used to seal the necessary vents associated with private lateral plumbing. The vents shall be manufactured to fit on the type of pipe used in the plumbing and shall provide a tight seal against inflow of stormwater under extraordinarily high precipitation conditions. The vent cap should be set at least 6 inches above grade to preclude stormwater flow into the vent. If vent caps are located at the curb line or in the driveway apron or sidewalk, they must be flush with the finished grade and tightly sealed.

31. **Visual Inspection –** Televising or visually tracing the source of a clear water connection to the sanitary sewer.

3. BUILDING SEWER LATERAL MAINTENANCE STANDARDS

1. The building sewer lateral must be maintained to meet the following minimum requirements:

    1. The building sewer lateral shall be kept free from roots, grease deposits, and other solids which may impede the flow or obstruct the transmission of waste.
    2. All joints shall be tight and all pipes shall be sound to prevent exfiltration by waste or infiltration by groundwater or stormwater.
    3. The building sewer lateral pipe shall be free of any structural defects, cracks, breaks, rodent holes, or missing portions and the grade shall be uniform without sags or offsets.
    4. No area drains, foundation drains, roof leaders, sump pumps or other direct connections that allow stormwater or groundwater into the building sewer lateral will be allowed.

5. The building sewer lateral shall have a two-way clean out located approximately at the property line or, in the case where the building sewer is all within private property, in a location approved by the *municipal engineer*. All clean outs shall be securely capped with an approved cap at all times, except during maintenance activities to prevent the inflow of surface water.
6. The building sewer lateral shall be free of any material that obstructs or prevents the effective maintenance or normal operation of the building sewer lateral or the public sewer main.
7. Property owners and food service operators are required to control the discharge of fats, oils, and grease (FOG) into the sanitary sewer system from their properties or food service establishments, and not cause or contribute to FOG related sanitary sewer overflows, blockages, or increased maintenance in the sanitary sewer systems.

4. LATERAL REPAIR AND REPLACEMENT STANDARDS

There are several acceptable methods for repairing or replacing a lateral. These include open cut, slip lining, cured-in-place (CIPP), pipe bursting, etc. The local municipal engineer should be contacted for the method most appropriate for the situation.

1. Replaced portions of private lateral lines within the street right of way shall be constructed of six (6) inch PVC SDR 35 slip joint pipe.
2. Cleanouts shall be not be located in paved areas and shall be flood proofed.
3. Vents shall not be located within paved areas and shall be flood-proofed and elevated above 100-year floodplain and higher than the level of localized stormwater runoff and ponding.
4. Replaced portions of private lateral lines not within the street right of way shall be constructed of four (4) inch PVC SDR 35 slip joint pipe or four (4) inch Schedule 40 PVC pipe.
5. The slope of the private lateral lines being moved to a location other than the original alignment shall not be less than one eighth (1/8) inch per foot. If possible it is recommended that private lateral connection be installed at a slope of one-fourth (1/4) inch per foot.
6. Private lateral lines are to have four (4) to six (6) inches of bedding beneath the pipe. Bedding material is to be No. 8 or No 12 crushed limestone.
7. Private lateral lines are to be backfilled with a minimum of six (6) inches of No. 8 or No. 12 crushed limestone over the top of the pipe.
8. Private lateral connections under road surfaces or other paved surfaces are to be backfilled with No 8 or No 12 crushed limestone to finish grade of the roadway. Backfill under PennDOT maintained roads shall be in accordance to PennDOT specifications. The road surface is to be repaired in accordance with the PennDOT or Township/Borough Specifications.

9. All connections, with the exception of slip lined pipe, to the sanitary sewer mains are to be made with a PVC SDR 35 slip joint “wye” or ”tee”. A flex coupling may be used for the transition from the PVC SDR 35 slip joint “wye” or “tee” fitting to the sewer main.

10. Connections to slip lined pipe can be made using a tapping saddle. The tapping saddle shall be installed in a neatly tapped hole cut into the slip lined pipe.

11. Manhole connections for private lateral lines are to be installed as follows:

    a. Manholes are to be core drilled.

    b. A flexible pipe to manhole connector shall be used in the connection of the sanitary sewer pipe to the manhole. The connector assembly shall be the sole element relied on to assure a flexible watertight seal of the pipe to manhole.

    c. Non shrink grout is to be place on the inside of the manhole, in the area between the pipe and the outside diameter of the bore opening.

    d. A drop pipe is required if the distance from the bottom of the service lateral to the bottom of the manhole is greater than two (2) feet.

    e. The drop pipe is to be installed to direct the flow from the service lateral to the flow of the sanitary sewer main.

    f. If the vertical drop pipe is greater than three (3) feet, the drop pipe is to be anchored to the manhole using stainless steel straps and stainless steel masonry anchors.

    g. If the vertical drop pipe is greater than six (6) feet the drop pipe is to be anchored to the manhole on three (3) foot centers.

12. If the private lateral line is to be installed using a trenchless method to avoid open-cutting the existing pavement, prior approval by the Township/Borough Engineer is required.

13. This standard references ASTM test methods which are made a part hereof by reference and shall be the latest edition and revision thereof.

    a. ASTM F1216 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube

    b. ASTM F1743 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in-Place Thermosetting Resin Pipe (CIPP)

    c. ASTM D5813 - Standard Specification for Cured In Place Thermosetting Resin Sewer Piping Systems

    d. ASTM C1208/C1208M-11 - Standard Specification for Vitrified Clay Pipe and Joints for Use in Microtunneling, Sliplining, Pipe Bursting, and Tunnels

    e. ASTM F714 - 12a Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter

5. LATERAL INSPECTION METHODS

1. Prior to inspection, private laterals shall be cleaned by flushing or pressure jetting. A combination of the following methods shall be used to inspect private laterals to evaluate building sewers and ensure compliance with the above standards:

    a. Smoke Testing: Smoke testing of laterals is performed by blowing smoke, mixed with large volumes of air, into the sanitary sewer line and lateral, typically from an entry manhole. The smoke is nontoxic, odorless, and non-staining. Because the area of interest is temporarily sealed off, the smoke follows the path of least resistance and quickly appears at sites that allow surface water to enter the sanitary sewer system. The only places where smoke should be seen escaping are the sewer vents on the roofs of the houses (if there is no house trap). Any other plumes of smoke indicate a source of inflow.

or

    b. Dye Testing: During this process, a fluorescent, non-toxic, non-staining, biodegradable dye is inserted into locations around a house or lateral alignment that are suspected to be sites of lateral inflow, This includes area drains, downspouts, and the earth near the foundation of the house. After the fluorescent dye is inserted, a downstream manhole is opened and observed. If dye is observed in the manhole, it has penetrated the sewer collection system, which indicates breaks in or illegal connections to the sewer lateral.

and

    c. Visual Inspection. This technique consists of video inspection using a lighted camera designed for inspection of sanitary sewers on the end of a cable "push rod." The camera can be pushed into a lateral using the cable or it can be lowered into the lateral and transported by a small tractor. The Visual (Video) Inspection shall be performed by certified NASSCO Pipeline Assessment Certification Program (PACP)/Lateral Assessment and Certification Program (LACP) Operator using established PACP/LACP coding and observations. Lateral inspection methods shall conform to NASSCO standards and defects shall be coded in accordance with the Manual of Sewer Condition Classification (most recent edition) as published by NASSCO, Inc.

2. In addition to the inspections described above, all clean outs and vents will be inspected to verify that they are located in an area of ponding or flooding during heavy rain events and that they are sealed to prevent stormwater inflow.

6. CRITERIA FOR REQUIRING REPAIR OR REPLACEMENT

1. A sewer lateral will be considered deficient and require repair or replacement, or disconnection of a clear water inflow source, if the test methods in Section 5 of these Standards document any of the following conditions:

a. Visible smoke is detected during a smoke test from any location other than roof vent. If visible smoke is detected, a visual inspection shall be performed to determine whether a source of clear water inflow must be disconnected, the entire lateral connection must be lined or replaced, or whether there is a break or crack that can be repaired.

b. Dye is observed in a downstream manhole during a dye test. If dye is observed in a downstream manhole, visual inspection shall be performed to determine whether a source of clear water inflow must be disconnected, the entire lateral connection must be lined or replaced, or whether there is a break or crack that can be repaired.

c. Visual Inspection results show twenty-five percent (25%) or greater of the lateral cross-sectional area is blocked by debris. If any tree roots are growing into the pipe, the tree roots must be removed and the damaged section of the lateral pipe must be replaced. If the blockage is grease and debris that have not damaged the pipe, the repair can be accomplished by cleaning the pipe.

d. Visual Inspection results show breaks, cracks, or missing sections that contribute observable clear flow or sediment to the sewage collection system. If inflow is observed to weep, drip, run, or gush into the lateral, the lateral will require lining, if appropriate, or complete replacement of the failing section of pipe. Any defect with a NASSCO rating greater than 3 must be replaced or repaired to a condition that abates the source of inflow to the line.

e. Visual Inspection results reveal a connection between roof leaders, area drains, foundation drains, sump pumps, or other source of clear water and the private lateral. All connections between sources of clear water and the sanitary sewage collection system must be disconnected.

2. If the lateral line is found to be in good condition, but the vent or clean out is found to be a source of inflow, the vent must be elevated and flood proofed, without requirement to repair the lateral.

7. LATERAL CLEANING STANDARDS

1. Sewers will be cleaned by removing grit, loose solids, grease, and any debris that are present.

2. Cleaning shall be completed by the Contractor within 72 hours and no less than one hour prior to inspection to reduce the impact of the natural flow within the pipeline during inspection.

3. The Contractor shall trap all debris in the clean-out or at the end manhole and properly dispose and haul away debris.

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Appendix E

Public Meeting Presentations

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Act 537 Plan Update For The Eastern Service Area

June 1, 2011

Agenda

- Welcome and Introduction of Planning Team
  - Karen Holm, Delaware County Planning Department
- Purpose - The Need for Act 537 Planning Update
  - Joseph Salvucci – Executive Director DELCORA
- Presentation
  - Karen Holm, DCPD
  - John Pileggi, CPA, DELCORA
  - Chris Volkay-Hilditch, P.E., DELCORA

Philadelphia Contract Extension

1. Original contract began in 1974 with a term of 30 years. Contract extensions were added.
2. Philadelphia gave DELCORA a 5 year termination notice. Current contract expires July 25, 2011
3. DELCORA has been trying to negotiate with Philadelphia in good faith over a number of years.
4. Philadelphia has been occupied negotiating its Long Term Control Plan with US EPA over the last 5 years. Because of this negotiations between Philadelphia and DELCORA have not progressed.
5. Philadelphia would like to initiate a revised contract beginning July 25, 2011 for a term of two years.

Exceedance Limits

- In proposed Philadelphia two year contract extension, flow limits stay the same
  - 50 MG average annual flow
  - 75 MG average daily flow
  - 100 MG instantaneous flow
- **Philadelphia proposes a future 10 year contract with the following limits**
  - **30 MG average annual flow**
  - **45 MG average daily flow**
  - **60 MG instantaneous flow**
- Any flow exceedance must be eliminated to avoid significant penalties

Proposed Philadelphia Surcharge Rates

- Annual Daily Average - $1,000 per each MGD
  - Has not been exceeded to date
- Instantaneous - $18,000 per each MG
  - Approximately twice the current contract rate
- Daily Average - $27,000 per each MG
  - Approximately three times the current contract rate

Proposed Philadelphia Two-Year Contract Terms

- The Eastern service area has high peaks. Excessive surcharges will be levied under contract.
- LTCP control costs - Unknown
- Increase in management fee (12 % of bill)
- Cost of improvements at Philadelphia – Unknown
- **Total Additional Future Charges: Still cannot be determined but they will increase substantially**

Philadelphia's Long Term Control Plan (LTCP)

- A Long Term Control Plan addresses combined sewer overflows
- Total estimated cost at **$2 BILLION** over 25 years
- Philadelphia's proposed contract would have Delaware County share in the costs of the LTCP
  - Proportionate share of Future LTCP is yet unknown
- These costs, dictated by proposed contract terms, would add to the overall bill for wastewater treatment.
- Costs cannot be controlled without reduction in peak flows by Delaware County

Flow Exceedance

- Under the proposed Philadelphia contract, flow exceedances will cost significantly more money.
- Delaware County flow exceedances caused by:
  - Rainfall/snow melt
  - Inflow and Infiltration
    - Leaking sewers and manholes
    - Leaking building/house laterals
    - Sump pumps tied into the sanitary sewer
    - Roof downspouts tied into the sanitary sewer

Who Pays the BILL?

- DELCORA pays The City of Philadelphia
- The Interceptor Authority pays DELCORA
- The municipality pays their Interceptor Authority (DCJA, RHM, MA, and CDCA)
- Delaware County residents pay their municipality

Components of the Philadelphia Bill to DELCORA

- Operations and Maintenance Costs (O&M)
  - Includes Flow, BOD and TSS components
- Capital Costs for improvement, repair and upgrade
- Management Fee
- Excess Flow Surcharges
- Long Term Control Plan Costs (Future)
- Philadelphia bill is currently approximately $10.0 million/year

Components of DELCORA Bill to Eastern Authorities

- Charge for treatment of the wastewater
- Operation and maintenance costs for DELCORA's Eastern pump stations and force mains
- Capital costs for improvement, repair, and upgrade of DELCORA's System
- Engineering, administration, etc. of DELCORA

Components of Eastern Authorities Bill to Member Municipalities

- DELCORA Bill
- Operation and maintenance costs for interceptors and pump stations
- Capital costs for improvement, repair, and upgrade of Eastern Authorities' systems
- Engineering, administration, etc. of the Eastern Authorities

Components of Municipal Billing to Residents

- Eastern Authority billing
- Operation and maintenance costs for the local collection system
- Capital costs for improvement, repair and upgrade costs of the municipal system
- Administration, engineering, etc. of municipality

Next Steps

- Initiate Act 537 Planning Study which will explore alternatives
- Investigate alternatives such as:
  - Do nothing – stay with Philadelphia and pay higher costs
  - Continue with Philadelphia and construct tanks to store wet weather flows and pump later for treatment during dry weather
  - Build a new treatment plant
  - Expand existing WRTP
  - Others ??

Planning Process (Act 537)

- Pennsylvania Sewage Facilities Act 537 was enacted in 1966 to correct existing sewage disposal problems and prevent future problems. PADEP enforces the Act.
- Municipalities are required to develop and implement a comprehensive official plan to provide sewage disposal.
- The Delaware County Planning Department (DCPD) works with DELCORA and the PADEP to maintain approved Act 537 Plans for municipalities.
- Building permits and land development approvals are contingent upon a current Sewage Facilities Plan.

Delaware County Eastern Service Area Act 537 Plan

- DCPD prepared the Delaware County Act 537 Sewage Facilities Plan Update – Eastern Plan of Study in 2002.
- The situation with Philadelphia makes the required update a very high priority.
- DCPD, DELCORA and its consultant Weston Solutions, Inc. will work with the Municipalities to prepare a revised Act 537 Plan
- Eastern Service Area contains 31 municipalities.
- Coordination and consensus will require municipal support.

Eastern Authorities' Role in Planning Process

- Appoint representatives to steering committee by July 1, 2011
- Representatives will participate in steering committee meetings
  - Serve as liaison between planning team and municipalities/authorities
  - Provide input during plan development
- Continue to eliminate I&I

Municipal Role in the Planning Process

- **Provide authorization for the DCPD to prepare an Act 537 Plan on their behalf by passing a resolution**;
- Designate contact person to provide information during plan preparation and review the draft plan;
- Municipal review comments will be incorporated into the final plan;
- Pass a resolution adopting the Eastern Plan of Study Update as their official Act 537 Sewage Facilities Plan.
- Implement sewage treatment measures described in the plan.
- Continue to eliminate I&I

Questions and Comments

Contact Info

- Karen Holm – Delaware County Planning Department
  - Phone: 610-891-5213
  - Email: Holmk@co.delaware.pa.us

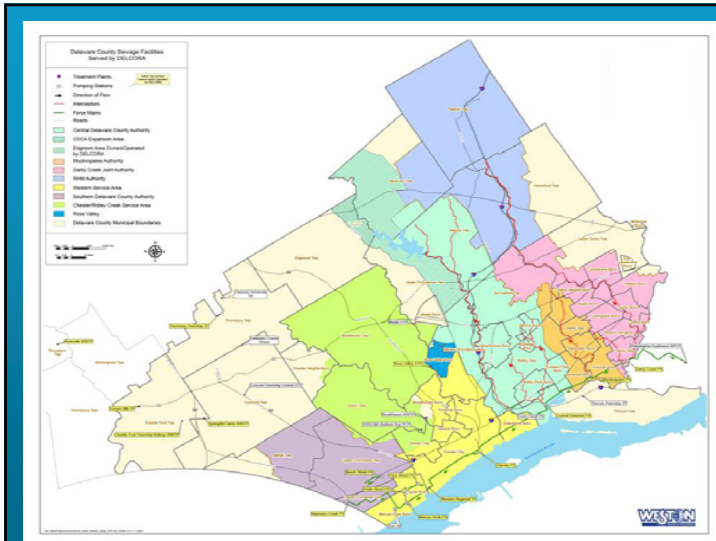
THANK YOU FOR COMING!

Act 537 Plan Update For The Eastern Service Area

January 24, 2012

Agenda

- Welcome and Introduction of Planning Team
  - John Pickett, Delaware County Planning Department
- Purpose - The Need for Act 537 Planning Update
  - Joseph Salvucci, Executive Director DELCORA
- Presentation
  - Karen Holm, DCPD
  - John Pileggi, CPA, DELCORA
  - Chris Volkay-Hilditch, P.E., DELCORA



2-Year Interim Agreement and Future Philadelphia 10-Year Contract

1. Original contract began in 1974 with a term of 30 years. Contract extensions were added.
2. Philadelphia and DELCORA entered into a 2-Year Interim Agreement on July 25, 2011.
3. 2-year Interim Agreement provides a bridge during which a future 10-year contract will be negotiated.

Exceedance Limits

- In two-year Interim Agreement with Philadelphia, flow limits stay the same
  - 50 MG average annual flow - $1,000 per MGD
  - 75 MG average daily flow - $15,000 per MGD
  - 100 MG instantaneous flow - $10,000 per MGD
- Philadelphia proposes a future 10 year contract with lower flow limits with higher penalties for exceedances
- Any flow exceedance must be reduced to avoid significant penalties

Philadelphia 2-Year Interim Agreement Terms

- Increase in management fee (12 % of bill)
- LTCP control costs - Unknown
- Cost of improvements at Philadelphia – Unknown
- **Total additional future charges still cannot be determined, but they will increase substantially**

Philadelphia's Long Term Control Plan (LTCP)

- A Long Term Control Plan addresses combined sewer overflows
- Total estimated cost at **$2 BILLION** over 25 years
- Philadelphia's contract has Delaware County sharing in the costs of the LTCP
  - Proportionate share of Philadelphia's LTCP is yet unknown
- These costs will add to the overall bill for wastewater treatment.
- Costs cannot be controlled without reduction in peak flows by Delaware County

Flow Exceedance

- Delaware County flow exceedances caused by:
  - Rainfall/snow melt
  - Inflow and Infiltration
    - Leaking sewers and manholes
    - Leaking building/house laterals
    - Sump pumps tied into the sanitary sewer
    - Roof downspouts tied into the sanitary sewer

Importance of Municipal Participation

- Existing Act 537 Plan is over 5 years old.
- Risk losing control of choosing remedial measures via regulatory mandate.
- Risk losing ability to evaluate and implement less expensive alternative measures and have to pay Philadelphia.
- Improves position to negotiate with Philadelphia when 2-year Interim Agreement Term expires.
- Local concerns documented, but not evaluated as part of the regional plan.

Who Pays the Bill?

- DELCORA pays the City of Philadelphia
- The Interceptor Authority pays DELCORA
- The municipality pays their Interceptor Authority (DCJA, RHM, MA, and CDCA)
- Municipal residents pay their municipality/sewer authority

Components of the Philadelphia Bill to DELCORA

- Operations and Maintenance Costs (O&M)
  - Includes Flow, BOD and TSS components
- Capital Costs for improvement, repair and upgrade
- Management Fee
- Excess Flow Surcharges
- Long Term Control Plan Costs (Future)
- Philadelphia bill is currently approximately $10.0 million/year

Components of DELCORA Bill to Eastern Authorities

- Charge for treatment of the wastewater
- Operation and maintenance costs for DELCORA's Eastern pump stations and force mains
- Capital costs for improvement, repair, and upgrade of DELCORA's System
- Engineering, administration, etc. of DELCORA

Components of Eastern Authorities Bill to Member Municipalities

- DELCORA bill
- Operation and maintenance costs for interceptors and pump stations
- Capital costs for improvement, repair, and upgrade of Eastern Authorities' systems
- Engineering, administration, etc. of the Eastern Authorities

Components of Municipal Billing to Residents

- Eastern Authority billing
- Operation and maintenance costs for the local collection system
- Capital costs for improvement, repair and upgrade costs of the municipal system
- Administration, engineering, etc. of municipality

Next Steps

- Regional Act 537 Planning Study
- Investigate alternatives such as:
  - Do nothing – stay with Philadelphia and pay higher costs
  - Continue with Philadelphia and construct tanks to store wet weather flows and pump later for treatment during dry weather
  - Aggressively reduce I&I (laterals/lines, sump pumps, downspouts, etc)
  - Build a new treatment plant
  - Expand existing WRTP
  - Others ??
- Replacement of aging infrastructure including cost:benefit analysis to identify projects and schedule.

Planning Process (Act 537)

- Pennsylvania Sewage Facilities Act (Act 537) was enacted in 1966 to correct existing sewage disposal problems and prevent future problems. PADEP enforces the Act.
- Municipalities are required to develop and implement a comprehensive official plan to provide sewage disposal.
- The Delaware County Planning Department (DCPD) works with DELCORA and the PADEP to maintain approved Act 537 Plans for municipalities.
- Building permits and land development approvals are contingent upon a current Sewage Facilities Plan.

Delaware County Act 537 Plan Update for the Eastern Service Area

- DCPD prepared the Delaware County Act 537 Sewage Facilities Plan Update – Eastern Plan of Study in 2002.
- The situation with Philadelphia makes the required update a very high priority.
- DCPD, DELCORA and its consultant Weston Solutions, Inc. will work with the Municipalities to prepare a revised Act 537 Plan
- Eastern Service Area contains 31 municipalities.
- A good outcome will require municipal cooperation and support.

Municipal Role in the Planning Process

- **Provide authorization for the DCPD to prepare an Act 537 Plan on their behalf by passing a resolution**
- **Designate contact person to provide information during plan preparation and review the draft plan**
- **Municipal planning commission review comments will be incorporated into the final plan**
- **Pass a resolution adopting the Delaware County Act 537 Sewage Facilities Plan Update for the Eastern Service Area as their official Act 537 Sewage Facilities Plan**
- **Implement sewage treatment measures described in the plan**
- **Continue to aggressively eliminate I&I**

Municipal Input

A Regional Plan requires municipal adoption, therefore, Municipal Input is essential.

- **Identify municipal concerns early in process.**
- **Municipal concerns will be identified as contributing to the regional plan, or as a local issue to be addressed in independent municipal planning.**
- **PADEP process has changed and they do not review drafts. All municipalities must adopt plan prior to submission to PADEP.**

Municipal Review

- **This plan will only address issues related to regional alternatives.**
- **Draft chapters will be available for municipal review.**
- **A three-week review period will be available for all draft chapters. A thirty-day review period will be available for finished Draft Plan.**

Interceptor Authorities' Role in Planning Process

- Appoint representatives to steering committee
- Representatives to participate in steering committee meetings
  - Serve as liaison between planning team and municipalities/authorities
  - Provide input and operational data to support plan development
  - Project maintenance projections for 5 and 10-year planning periods
  - Review and provide comments on draft chapters and overall draft Plan.
- Continue to eliminate I&I

Requested Information

- Municipal – Data on planned or potential development or redevelopment
- Municipal – Act 537 Planning since 2002 Eastern Regional Plan
- Municipal and Interceptor Authorities – Consent Decrees or Agreements, Notices of Violation of Clean Water Act or NPDES
- Municipal and Interceptor Authorities – Existing and planned programs and budget allocations to eliminate I&I
- Interceptor Authorities - Planned or projected maintenance or system expansion projects

Questions and Comments

Contact Info

- Karen Holm – Delaware County Planning Department
  - Phone: 610-891-5213
  - Email: Holmk@co.delaware.pa.us

THANK YOU FOR COMING!

Eastern 537 Plan

Private Property I & I Reduction Seminar

March 14, 2013

Mission Statement

" Provide Environmentally Responsible and Cost Effective Waste Water Management Services to the Citizens, Businesses and Industries of Delaware County"

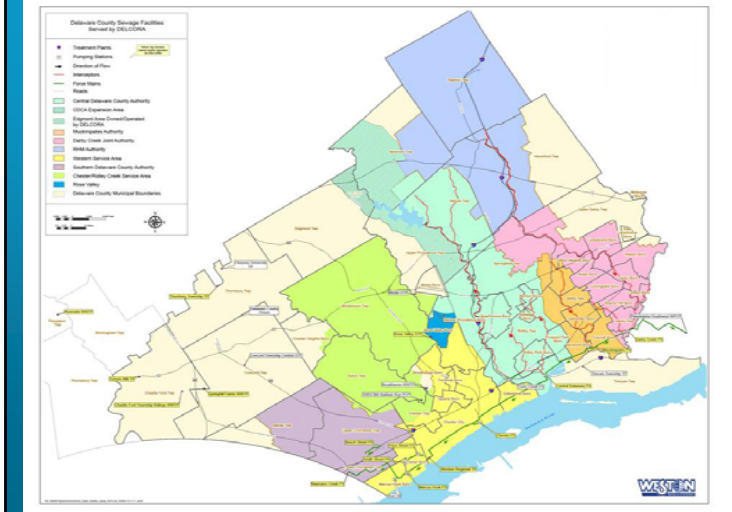
Agenda

- **Welcome, Logistics, and Introductions**
  - Joseph Salvucci, Executive Director DELCORA
- **Purpose of the Meeting**
  - Robert Powell, DELCORA
- **Presentations**
  - John Pileggi, CPA, DELCORA
  - Roger Lehman, P.E., WESTON
  - Tony Dill, P.E., Arcadis

Why Are We Here?

- **Eastern Act 537 Plan**
  - Purpose of the plan is to access options and determine the most economical solution to long-term wastewater treatment for Eastern Delaware County.
  - Alternatives
    - Expand the Western Regional Treatment Plant
    - Construct a new Eastern Regional Treatment Plant
- **New contract with Philadelphia**
- **I & I Reduction Seminar**
  - All 537 alternatives require reduction of peak flows

Eastern Act 537 Plan — Update



Why do a 537 Plan Update in the first place?

Regulatory Concerns

- **Sanitary Sewer Overflows (SSOs)**
- **Chapter 94 reviews**
- **Connection Management Plans (sewer bans)**
- **Consent orders**
  - Old Lycoming
  - East Norriton
  - Allentown/Lehigh County Authority
  - SWDCMA (Delaware County)
- Fines
- Current plan was over 11 years old (renewal is usually every 5 years)

Financial/Operational Concerns

- Agreement with Philadelphia had come to an end (operating under 2 year interim agreement)
- Philadelphia long term control plan costs
- Concerns about exceedance charges from Philadelphia
- Concerns about Philadelphia treatment capacity allocation to us

Alternatives Considered

- Expand WRTP & divert flow
- Construct new 30 MGD facility in Eastern area
- Continue to send flow to Philadelphia
- Construct equalization tanks

Underlying assumption in all cases is to reduce I&I flows

Costs for Alternatives Considered

- Expand WRTP & divert flow
  - $515 million
- Construct new 30 MGD facility in Eastern area
  - $396 million
- Continue to send flow to Philadelphia
  - $64 million
- Construct equalization tanks & send to Philadelphia
  - $154 million plus PWD costs

Philadelphia Contract Update

Philadelphia Contract History

- Original contract was signed in 1973 for 31 years with an “Evergreen” clause
- Philadelphia Water Department (PWD) gave DELCORA a 5 year termination notice in July 2006
- PWD and DELCORA signed a contract extension on July 2011 for a two year term
- Due to EPA/PWD delays over the Long Term Control Plan (LTCP), negotiations did not resume until late 2012

New Philadelphia Contract

The DELCORA Board of Directors approved a new 15 year contract with PWD on February 19, 2013

Wet Weather Flow

- DELCORA dry weather flow to PWD Southwest Plant is well within the agreement’s allocated capacity
- Wet weather flow to PWD is a challenge
  - PWD imposes exceedance charges to serve as a deterrent
  - Our goal is to minimize I & I in Eastern Delaware County to reduce peak flows

Typical Flows to Philadelphia

- Darby Creek Pump Station - 2012
  - Average Flow —18.0 MGD
  - Dry Weather Flow — 14.1 MGD
  - Typical Wet Weather Peak Flow — 50-57 MGD
- Muckinipates Pump Station - 2012
  - Average Flow — 4.0 MGD
  - Dry Weather Flow — 3.1 MGD
  - Typical Wet Weather Peak Flow — 14-18 MGD
- Central Delco Pump Station - 2012
  - Average Flow — 9.2 MGD
  - Dry Weather Flow — 6.6 MGD
  - Typical Wet Weather Peak Flow — 34-39 MGD
  - Diversion capacity to WRTP ~ 17 MGD

Exceedances & Contract Limits

The new 15 year contract has not changed the surcharge thresholds:

50 MGD average annual flow
75 MGD average daily flow
100 MGD instantaneous flow

Philadelphia Surcharge Rates

Annual Daily Average Flow — $1,000 per each MG

Instantaneous — $10,000 per each MGD

Daily Average — $15,000 per each MG

Philadelphia Capital Cost In General

- Based on depreciation and ROI (return on investment) method
  - "Pay as you go method"
  - In a 15 year contract, DELCORA only pays for 15 years of an asset's life
- More uniform annual capital cost
- Costs are lower in the first 5-7 years and higher in the latter years of the contract
  - DELCORA has established a rate stabilization fund to smooth out the cost

Allocation Methods For PWD Costs

- Treatment costs based on average flow and blended costs for PWD treatment and WRTP treatment
- Exceedance charges based on percentage of wet weather flow for the day
- LTCP charges based on average flow less minimum flow for the year
- Allocation of member municipality costs would be determined by the authority

PWD's LTCP Costs

- Long Term Control Plan costs
  - PWD's 25 year estimate is over $2 Billion
  - DELCORA's proportionate share is approximately $143 Million over 25 years
- Although high, the PWD option is the lowest cost alternative for treatment of Eastern Delaware County Flow

Example of Costs - DCJA

- PWD Option
  - Treatment costs for 15 years ~ $190 million
  - LTCP costs for 15 years ~ $28 million
- New Eastern Plant Option
  - Assume treatment cost are the same as the PWD option ~ $190 million
  - DCJA share of debt service on $396,145,000 to construct plant over 15 years is $250.5 Million

Example of Costs - MA

- PWD Option
  - Treatment costs for 15 years ~ $43 million
  - LTCP costs for 15 years ~ $7.5 million
- New Eastern Plant Option
  - Assume treatment cost are the same as the PWD option ~$43 million
  - Muck share of debt service on $396,145,000 to construct plant over 15 years is $56.4 million

Example of Costs - CDCA

- PWD Option
  - Treatment costs for 15 years ~ $91 million
  - LTCP costs for 15 years ~ $15.3 million
- New Eastern Plant Option
  - Assume treatment cost are the same as the PWD option ~$91 million
  - CDCA share of debt service on $396,145,000 to construct plant plant over 15 years is $120.5 million

Planning Ahead

- In 2018 DELCORA will analyze the PWD costs from 2013-2018 and forward to determine if staying with PWD is still the best option
  - If after the analysis it is decided that PWD is not the best option, DELCORA will begin evaluating other options

Break

I & I Reduction

Sources of I&I

- **Public Sources – mains, manholes, cross connections**
- **Private Source – leaking laterals, sump pumps, area drains, roof downspouts**

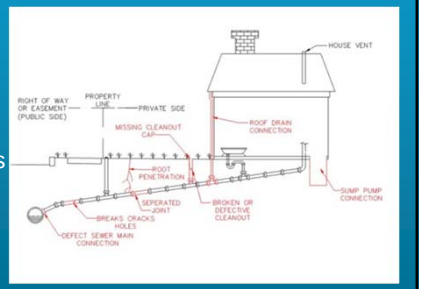
Each municipality needs a holistic approach to fully address the problem.

Why Eliminate I&I?

- **Excessive treatment costs – the Eastern Service Area paid $11.4 million to treat clearwater in 2011 and 2012.**
- **Reduce our share of the Philadelphia LTCP costs and excess flow charges**
- **Eliminate SSOs**
- **Prevent sewer bans**
- **Prevent consent decrees**

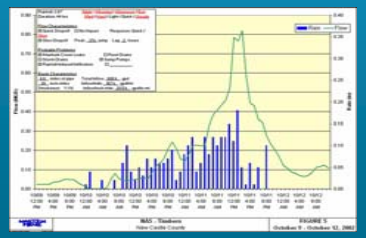
Private I&I Sources

- **Illegal Connections**
  - Sump Pumps
  - Roof Drains
  - Area/Yard Drains
  - Basement/French Drains
- **Defective Lateral**
  - Broken Cleanout Cap
  - Separated Joints
  - Broken Pipe
  - Defective Connection



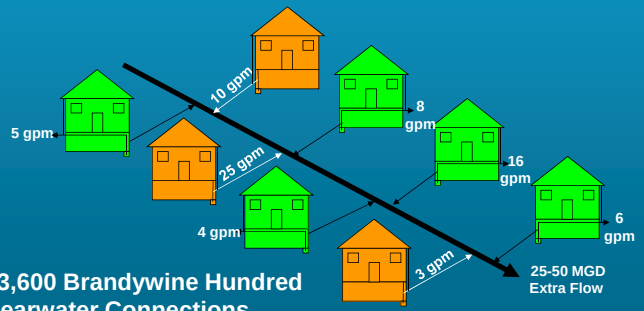
Significance of Private I/I

- **Private I/I may account for 50% of total I/I (laterals + illegal connections).**



Impact of Clearwater on Peak Flow

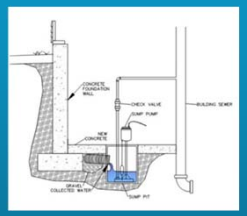
- **1/3 of Peak Flow from Brandywine Hundred (Wilmington, DE) comes from Residential Clearwater Connections**

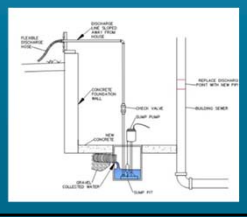


~ 3,600 Brandywine Hundred Clearwater Connections

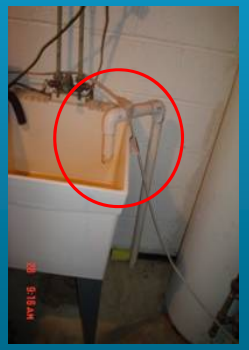
Sump Pumps

- **Can be one of the largest contributors of clear water to the system.**
  - 1 sump pump can contribute as much as 50,000 GPD
- **Sometimes it can be difficult to trace the discharge line.**
- **Reroute discharge line with hard piping in the interior and flexible piping outside.**

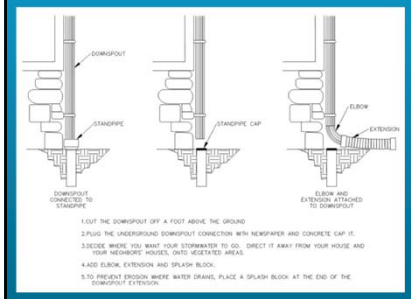




Illegal Sump Pumps



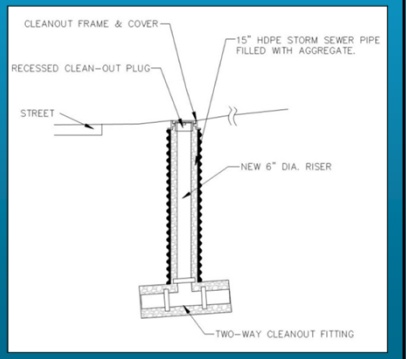
Downspouts



- **Another large contributor of clear water.**
- **Typically repaired inexpensively by capping and sealing the standpipe.**
- **Can be difficult to isolate in large commercial and industrial buildings.**

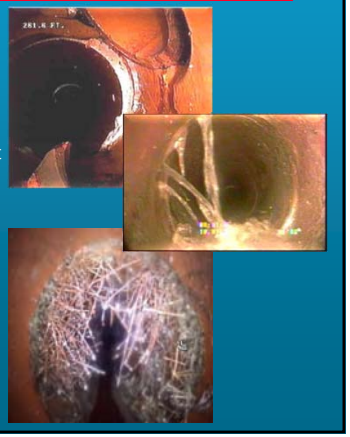
Cleanouts

- **Notorious for breaking at the cap and lateral fitting because of lawn mowers.**
- **Replace with a stable structure.**
  - Encase riser in stone filled stormwater pipe.
  - Recess cap
  - Use cast iron frame and cover at grade



Defective Laterals

- **Contribute as much as 40 percent of the clear water in the sewer system.**
- **Main causes of defects:**
  - Soil movements, ground settlement over time
  - Corrosion or encrustation
  - Tree root intrusion into pipe
  - Poor material of construction (VCP, Orangeburg, ACP)
  - Improper lateral construction practices (“break-ins”)
  - Improper excavation of other utilities (open cut, HDD installations)
  - Lack of maintenance



Lateral Repairs

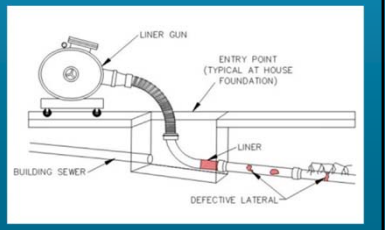
- **Typically the most expensive repair.**
- **Many different options exist.**
  - Dig and Replace
  - Lining
  - Pipe Bursting
  - Grouting
- **Is disruptive to the property owner, no matter which option is chosen.**
- **It is NOT a do-it-yourself weekend project.**

Dig and Replace

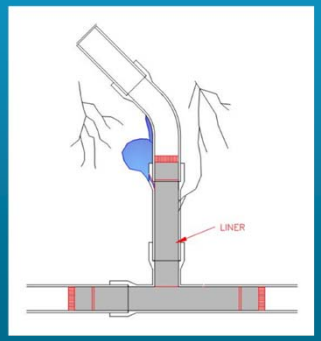
- **Most common repair method.**
- **Highest successful installation rate.**
- **Most disruptive repair method.**
- **Typically, one of the more less expensive repair methods; unless:**
  - Significant landscaping
  - Sidewalks and curbing
  - Required to go to the main

Lining

- **Becoming more common.**
- **Moderate installation rate.**
- **Minimizes disruption.**
  - Typically requires only a single excavation at the house.
  - Can be completed in less than a day.
- **Typically more expensive than other repair methods.**



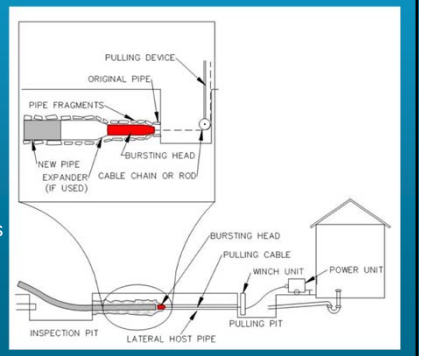
Lining



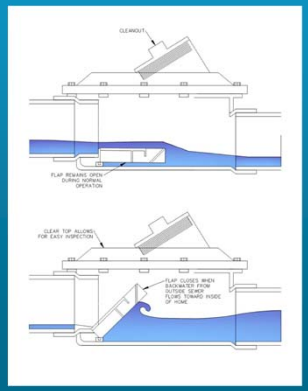
- **Must address the lateral connection or infiltration will travel along the liner and enter the system at the sewer main.**
  - Dig and Replace connection
  - Lateral Connection Liner

Pipe Bursting

- **Relatively new.**
- **Good installation rate.**
- **Minimizes disruption.**
  - Typically requires two excavations, one at the house and one at the sewer main.
  - Can be completed in less than a day.
- **Moderate repair cost.**



Other Possible Needs



- **Utilize backwater valves where sewer mains are subject to surcharging.**
- **Require contractors:**
  - to be bonded
  - to registered with state
  - provide a 1 yr warranty
- **Provide a Thank You to customers after work has been completed.**

Typical Cost of Repair

FOR THE AVERAGE RESIDENTIAL HOME

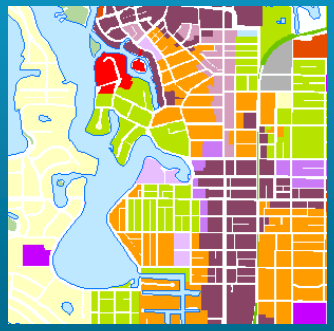
Sump Pump	**$200 - $400**
Downspouts	**Less than $100 each**
Cleanouts	**$500 - $1,000**
Laterals	
◆ Dig and Replace	$70 per foot ($4,500)
◆ Lateral Lining	$100 per foot ($6,500)
◆ Lateral Connection	$2,500 each
◆ Pipe Bursting	$85 per foot ($5,500)
Restoration	**Variable**

Developing Your Approach

Step 1: Define the Problem

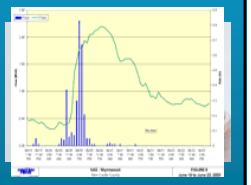
I/I Problem Widespread or Localized?

- Evaluate your metering data
- Prioritize you municipal area flows
- Identify major sources and areas



Step 2: Define Your Goals

- Reduce Peak Flow Rate by ?? Gallons
- Meet Consent Order Deadline
- Minimize Cost to Utility
- Minimize Cost to Property Owners

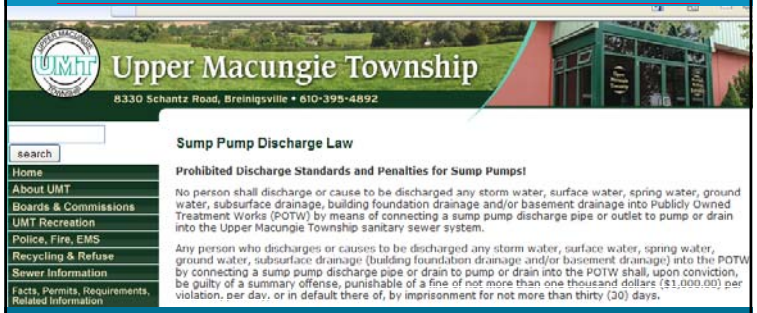


DEFINE WHAT IS IMPORTANT

Step 3: Solicitor Review

- Who Owns Lateral?
- What Connections are Illegal?
- Enforcement/Penalties Defined?
- Is Code Amendment Needed to Support Program?
- Ordinance Preparation/Review

Example Sump Pump Law



$1,000 per day fine for illegal connection

I&I Ordinance (Old Lycoming Twp, PA)

"…each property owner [shall]… maintain, clean, and repair the building sewer serving the improved property at his own expense as necessary to keep such building sewer free and clear of obstructions and in good working order... **All leaks shall be repaired immediately**.

No connections that will allow inflow to enter the Township's sewer system shall be permitted. Such prohibited connections … include …connection of roof downspouts, exterior foundation drains, or other sources of stormwater …

…**Township [may] enter any property to perform inspections** … to determine the type of connections that exist to the building sewer…

A surcharge equal to three times the sewer rate… is hereby imposed and added to every sewer billing to property owners who are not in compliance with this Part, thirty (30) days after non-compliance is identified. "

Excerpts from Ordinance No. 238, Old Lycoming Twp, PA

I&I Inspections Ordinance (Lower Paxton Twp, PA)

"Every building sewer…, shall be maintained in a sanitary and safe operating condition and kept in good repair by the owner of such improved property.

The Board…appoints the Manager of the Lower Paxton Township Authority as the ***Infiltration and Inflow Inspector***... His duties shall be to ***conduct inspections for inflow and infiltration*** from prohibited sources into the …sanitary sewer system. "Prohibited sources" shall include the following:

1. Inflow into the sanitary sewer system from sump pumps, floor drains, rain conductors and other sources of surface water, stormwater or groundwater.
2. Infiltration into the sanitary sewer system of surface water, stormwater or groundwater caused by broken, cracked or otherwise damaged pipes, pipe fittings or connections to the sanitary sewer system."

Excerpts from Codified Ordinances of Lower Paxton Township, Chapter 159

Time-of-Sale Inspection Program (Borough of Fox Chapel, PA)

"…it shall be unlawful for any person to sell real estate within the Borough of Fox Chapel on which a building or improvement exists, without first delivering unto the purchaser a Document of Certification…

Any person selling real estate… [shall] have a plumber…perform a dye test, smoke test or air test of the sewer drainage system on the property to be sold, … The plumber shall…certify that the property has been dye tested, smoke tested or air tested and certify the results of such test…***When an illegal storm or surface water connection or malfunctioning drainage system is discovered…, no Document of certification will be issued until the illegal connections/malfunctioning drainage system are removed/repaired, the system retested and certification of such removal/repair by a registered, licensed plumber is received***."

Excerpts from Ordinance No. 510, Borough of Fox Chapel

Township of Butler, PA and Upper Macungie Twp, PA have similar time of sale inspection requirements.

Lateral Inspection Ordinance (York, PA)

"No person shall discharge…any storm water, surface water, ground water, roof run-off or subsurface drainage except around basement walls into any sanitary sewer...

The…***City… shall be permitted to enter upon all properties for the purposes of inspection***, observation, measurement, sampling and testing, and to examine and copy records of operation required by the City, Federal or State agencies in accordance with the provisions of this article."

Excerpts from Codified Ordinances of York, Part Nine, Art. 931

Delaware County Lateral I&I Ordinances

- Delaware County – Time-of-Sale, Sump Pump, & Downspout Ordinances
  - Upland Borough
  - Concord Township
  - Rose Valley Borough
  - Chester Township
  - Darby Township

What about your community?

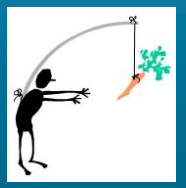
- Have you had discussions in your community about ordinances that specifically address repair of leaking laterals and disconnection of illegal clearwater sources?

Ordinance Options

- **Voluntary Lateral Maintenance**
- **Sewer Lateral Insurance**
- **Mandatory Inspection/Repair**
- **Time-of-Sale Inspection/Repair**
- **Sump Pump Inspection**
- **Downspout/Area Drain Inspection**

Incentives

- Low-income / senior citizen special programs
  - Full or partial support
  - Need to establish eligibility guidelines
- Waived municipal connection inspection fees
- Rebate if repairs are made quickly



Penalties

- Monthly surcharge for non-compliance
  - Williamsport Area – Triple the sewer rate
- Use code enforcement officer to ensure compliance
- Use and Occupancy Permit withheld
- Liens
- Water shutoff

Step 4: Public Outreach

- Public Meetings
- Notifications/Brochures
- Informational Websites & Videos
- Citizen/Business/Civic Organizations
- Advise the residents of the problem and show the solution

CLEARLY DEMONSTRATE PROBLEM

Video

Removing Private Property Infiltration and Inflow

Williamsport Area Case Study

History

- Eight municipalities are tributary to this treatment system and conveyance
- Excessive flow problems going back for decades
- Various PADEP Consent Orders and fines over many years
- Required to prepare and implement Wet Weather Management plan

Estimated Cost to Implement their Wet Weather Plan

For under 50,000 people

TOTAL EXPENDITURE WILL EXCEED

$150 MILLION PUBLIC FUNDS

$50 MILLION PRIVATE FUNDS

Program Types

- **5 Communities implementing very different property inspection programs.**
- **Each program was developed based on the needs and wants of each municipality.**
  - Involvement
  - Political Implications
  - Timeframe

South Williamsport Borough

- **Highlights:**
  - Required inspection
  - Ownership from building to main
  - Instituted a 3X sewer rate for non-compliance
  - Permit required
  - Work performed by local contractors
  - Require minimum of one cleanout
  - Provided up to two extensions for compliance
  - Developed a grant program
    - 100% for poverty to low income
    - 50% for low to moderate income

Loyalsock Township

- **Highlights:**
  - Required building inspection
  - Ownership from building to main
  - Instituted a 3X sewer rate for non-compliance
  - Permit required
  - Work performed by local contractors
  - Require minimum of two cleanouts and replacement of wye at main
  - Provided up to two extensions for compliance
  - Developed a grant program
    - Up to $2,000 for poverty to low income
- **Program Completed in 2011**

Old Lycoming Township

- **Highlights:**
  - Required inspection, collect GPS data points on lateral
  - Ownership from building to edge of pave
  - Instituted a 3X sewer rate for non-compliance
  - Permit required
  - Work performed by local contractors
  - Require minimum of one cleanout
  - Provided up to one extension for compliance
  - Developed a grant program
    - 100% for poverty to low income

Duboistown Borough

- **Just Started in 2011**
- **Not very organized at this *point*.**

Williamsport Sanitary Authority

- **Highlights:**
  - Owns from building to the edge of pavement.
  - Required to obtain permit
  - Lateral work performed by local excavation companies
  - Require minimum of one exterior cleanout.
  - No grant program

Next Steps

Role of Municipalities

- **Review by your municipal planning commission — comments, if any, will be incorporated into the final plan**
- **Pass a resolution adopting this Act 537 Sewage Facilities Plan Update for the Eastern Service Area as your official Act 537 Sewage Facilities Plan**
- **Adopt a Time-of-Sale Lateral Inspection/Repair/Replacement Ordinance**
- **Adopt Sump Pump and Downspout Ordinances**
- **Continue to aggressively eliminate I&I**

Questions and Comments

Thanks

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Roger Lehman, PE, Technical Director, Weston Solutions, Inc.
Roger.Lehman@westonsolutions.com

John Hess, President, Infratech Industries, Inc.
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Matt Peleschak, PE, Project Manager, Larson Design Group
mjp@larsondesigngroup.com

Final Step

Contact Info

- Karen Holm – Delaware County Planning Department
  - Phone: 610-891-5213
  - Email: Holmk@co.delaware.pa.us

THANK YOU FOR COMING!

'Clean water' is cleaning out Yeadon budget; homeowners may be hit

By DesireGrover
dgrover@chesterspirit.com

When you flush your toilet, you may be flushing more than just wastewater. You just might be flushing your municipality's dollars down the drain. Yeadon Borough is trying to stop its budget from going down the drain any further as it tries to fix its aging infrastructure.

Last Thursday, Eileen Mulvena, the borough engineer, reported the need to address a growing problem with the borough's sewer laterals. She underlined that too many Yeadon homes had damaged sewer laterals, costing hundreds of thousands of dollars. In response, Borough Council has been working on an ordinance, making it the responsibility of homeowners to fix their sewer laterals.

A sewer lateral is the pipeline running from a toilet to the main sewer line in the street. Each home has one or more. When this pipeline is damaged, it is usually cracked by years of usage or ruptured by an aggressive tree root.

Yeadon Borough Councilwoman Rosalind Jones-Johnson makes an impassioned request for Council to move quickly on the issue of damaged sewer laterals that are costing the borough hundreds of thousands of dollars.

"We're asking to have an ordinance passed that requires the owner of the property to inspect their (sewer lateral) prior to selling their home," informed Mulvena, "and if it is found to be defective, they are to repair it or replace it. It can get every expensive."

"The old laterals are made out of clay," explained Mulvena, "If you have a tree that is hungry for water, the roots will come out and go right through your pipe."

Sewer problems for homeowners become a problem for the entire borough because rainwater tends to get into the pipe, which increases how much sewer water is being sent to Philadelphia for treatment. Currently, about 3,000 houses have damaged laterals

Continued on Page 11

Homeowners may foot bill for sewer pipe repair

Continued from Page 1

in Yeadon and that has caused Delcora some problems.

"It's been running about $350,000 per ward," explained Yeadon Councilwoman Rosalind Jones-Johnson. "We're *paying to* clean water and they're charging us *for* that (water). So what we have to do is stop the clean rainwater from infiltrating our sanitary sewers; it should not be there."

Adding to the problem is the limit on how much the Philadelphia treatment plant can process when rainwater gets to them so they, in turn, dump the untreated excess into the Delaware River which leads to them getting fined by state environmental officials. Because Delcora holds the contract with Philadelphia, the fine is passed onto them and Delcora passes the cost onto the 31 municipalities in Delaware County that are serviced by Philadelphia.

Jones-Johnson says the Philadelphia treatment plant has told the borough that excess water is wearing out their system so they must do something to prevent further fines. She says it is a big problem that everyone will have to pitch in and solve because the infrastructural problems are only getting worse. Fixing a lateral pipe can become expensive, especially if it involves digging through asphalt in the street. But Jones-Johnson says there are ways to bring down costs; insurance for the pipes is one way.

"A lot of homeowners can get insurance on their pipes," said Jones-Johnson. "The insurance can be as little as $9 a month. It won't cover all of the fees, but it can contribute at least $2,500; but not fixing it just means that you're going to pay for it when your bill comes in."

CHESTER/COMMUNITY SPIRIT

Proudly Serving:
City of Chester; the Townships of Aston, Chester, Darby, and Upper and Lower Chichester; the Boroughs of Brookhaven, Darby, Yeadon, Media, Upland, Parkside, Sharon Hill, Woodlyn, Colwyn, Eddystone, Swarthmore, Marcus Hook, Collingdale, Trainer, Lansdowne and Claymont, DE.

Vol. 5 No. 47 April 24-30, 2013 25 cents

Appendix F

Public Notice

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The Delaware County Planning Department and the Delaware County Regional Water Quality Control Authority (DELCORA) have prepared an update to the Act 537 Sewage Facilities Plan addressing Sewage Facilities needs for the Eastern Service Area which includes the following municipalities in whole or in part:

- Aldan Borough
- Clifton Heights Borough
- Collingdale Borough
- Colwyn Borough
- Darby Borough
- Darby Township
- East Lansdowne Borough[(1)]
- Edgmont Township
- Folcroft Borough
- Glenolden Borough
- Haverford Township
- Lansdowne Borough
- Marple Township
- Millbourne Borough[(1)]
- Morton Borough
- Newtown Township
- Nether Providence Township
- Norwood Borough
- Prospect Park Borough
- Radnor Township
- Ridley Township
- Ridley Park Borough
- Rutledge Borough
- Sharon Hill Borough
- Springfield Township
- Swarthmore Borough
- Upper Providence Township
- Upper Darby Township
- Yeadon Borough
- Tredyffrin Township, Chester County
- Easttown Township, Chester County

The alternatives considered during the sewage facilities planning process were:

1. Diverting flow to the DELCORA's Western Regional Treatment Plant
2. Constructing a new treatment facility
3. Continued use of existing facilities and sending flow to Philadelphia's Southwest Water Pollution Control Plant
4. Equalization tanks

Included in all four alternatives is continued elimination of inflow and infiltration (I&I) to the collection systems in the Eastern Service Area.

Alternative 3 was selected, continuing to send wastewater to Philadelphia for treatment. This alternative includes either adoption and implementation of a Lateral Inspection and Repair/Replacement Time of Sale ordinance or development of a written, municipality-specific I&I reduction plan.

The Plan Update Report is available for review at DELCORA's office at 100 East Fifth Street, Chester, PA 19016 (610-876-5523). DELCORA's office is open Monday through Friday from 8:30 to 4:30. Written comments on this plan should be directed to the individual municipalities

and received within 30 days of this notification. A copy of the written comments should also be directed to DELCORA at the above address.

Appendix G

Local Planning Agencies Comments and Responses

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Appendix H

Municipal Adoption Resolutions

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