Elizabethtown Gas

Mary Patricia Keefe
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Via FedEx & Electronic Mail

September 22, 2017

Irene Kim Asbury, Secretary
State of New Jersey
Board of Public Utilities
44 South Clinton Avenue, 3rd Floor
Suite 314
Post Office Box 350
Trenton, New Jersey 08625-0350

Re: ***In The Matter Of The Petition Of Pivotal Utility Holdings, Inc. d/b/a Elizabethtown Gas To Revise The Remediation Adjustment Clause Component Of Its Societal Benefits Charge Rate***
BPU Docket No. GR_____

Dear Secretary Asbury:

Enclosed for filing are an original and ten copies of the Petition of Pivotal Utility Holdings, Inc. d/b/a Elizabethtown Gas ("Elizabethtown" or "Company") to the Board of Public Utilities ("BPU" or "Board") to revise the Remediation Adjustment Clause ("RAC") component of the Societal Benefits Charge ("SBC") rate. Attached to and made part of the Petition are the testimonies and supporting schedules of Company witnesses Thomas Kaufmann and Steven L. Cook, marked as exhibit numbers P-1 and P-2, respectively.

The RAC Component of the SBC Rate

Elizabethtown's SBC was approved by the Board by an Order dated March 30, 2001 in BPU Docket No. GX99030121, et al. and November 21, 2001 in Docket No. EX00020091, et al. The SBC currently consists of four components: (1) the Remediation Adjustment Clause ("RAC") component, (2) the New Jersey Clean Energy Program ("CEP") component, (3) the Universal Service Fund ("USF") component, and (4) the Lifeline component. Petitioner is not proposing changes to the CEP, USF or Lifeline rates in this filing. The SBC charge is applicable to all customers, with the exception of those exempt from the charge pursuant to the Long-Term Capacity Agreement Pilot Program legislation enacted on January 28, 2011.

Elizabethtown proposes to increase its currently effective RAC credit rate of ($0.0016) per therm to ($0.0128) per therm, effective October 1, 2017. Elizabethtown's current SBC rate for the RAC was approved by the Board's June 29, 2016 Order with an effective date of July 12, 2016 in Docket No. GR15101210. The proposed RAC rate is designed to enable Elizabethtown to refund approximately $5.8 million over a twelve month period.

Total Customer Impact

The proposed adjustment to the RAC rate would decrease the monthly bill of a typical residential heating customer using 100 therms by $1.12, from $87.95 to $86.83, or a decrease of 1.3%, as compared to the Company's September 1, 2017 rates. Please contact the undersigned at (908) 662-8452 or Thomas Kaufmann at (908) 662-8461 if you have questions or require further information.

Yours truly,

/s/ Mary Patricia Keefe

Mary Patricia Keefe

cc: Richard S. Mroz, President
Upendra J. Chivukula, Commissioner
Joseph L. Fiordaliso, Commissioner
Mary-Anna Holden, Commissioner
Dianne Solomon, Commissioner
Paul Flanagan, Executive Director
Kenneth J. Sheehan, Chief of Staff
Thomas Walker, Director, Division of Energy
Stefanie A. Brand, Director, Rate Counsel
Service List

IN THE MATTER OF THE PETITION OF
PIVOTAL UTILITY HOLDINGS, INC. d/b/a ELIZABETHTOWN GAS
TO REVISE THE REMEDIATION ADJUSTMENT CLAUSE COMPONENT
OF ITS SOCIETAL BENEFITS CHARGE RATE
BPU DOCKET NO. GR_____

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STATE OF NEW JERSEY
BOARD OF PUBLIC UTILITIES

In The Matter Of The Petition Of Pivotal Utility	**:**	
Holdings, Inc. d/b/a Elizabethtown Gas To Revise	**:**	**Docket No. GR**
The Remediation Adjustment Clause Component	**:**	
Of Its Societal Benefits Charge Rate	**:**	**SUMMARY SHEET**

This Petition presents the request of Pivotal Utility Holdings, Inc. d/b/a Elizabethtown Gas ("Petitioner") that the Board of Public Utilities ("Board") accept the filing of Petitioner's revised Remediation Adjustment Clause ("RAC") component of the Societal Benefits Charge ("SBC") rate. The Petition proposes that Petitioner's RAC credit rate be increased from ($0.0016) per therm to ($0.0128) per therm effective October 1, 2017. The proposed filing would decrease the monthly bill of a typical residential heating customer using 100 therms by $1.12 or 1.3%.

PIVOTAL UTILITY HOLDINGS, INC. d/b/a ELIZABETHTOWN GAS
REMEDIATION ADJUSTMENT CLAUSE ("RAC") FILING
MINIMUM FILING REQUIREMENTS (MFR) INDEX

Minimum Filing Requirements	Schedule
1. Please provide a vendor listing for the prior RAC period that contains information concerning vendor expenditures by MGP site, also showing a description of the services provided and the amount of each vendor invoice. The vendor list should include the monthly actual expenditures for the twelve month RAC period.	SLC-2
2. Identify the three MGP sites with the highest level of expenditures during the prior RAC period. For each identified site, provide a copy of the latest work plan, remediation report, or major work product submitted to the NJDEP. The copies should include the narrative portion of the report or work plan but need not include the technical supporting workpapers, charts and tables.	SLC-2
3. For each of the same three MGP sites, provide all correspondence between the Company and the NJDEP concerning submissions for the site, reply comments, and other major items which have a material impact on remediation activities and associated costs incurred by the Company. The correspondence should span the twelve months of the most recent RAC period.	SLC-2
4. For each of the same three MGP sites, provide expense documentation for any contractor or supplier whose invoices for the RAC period exceed $250,000 in aggregate. The expense documentation should include descriptions of services rendered, applicable invoices, and any tracking of invoiced charges vs. budgets. The expense detail need not include expense reports or time sheets, but it should include supporting documentation for any subcontractor and third party expenses totaling $100,000 or more for the period.	SLC-2 Confidential
5. For each of the same three MGP sites, provide a narrative description and organization chart for that site, showing the vendors and project control structure for the remediation effort. The response should show what entities supervise all significant contractors and subcontractors and which Company personnel are involved in site and remediation supervision and control.	SLC-2
6. Provide a detailed narrative describing Company activities and any reimbursements related to insurance claims or potentially responsible parties' liabilities for all of the Company's MGP sites. The narrative, with supporting documentation, should cover the prior RAC period. In addition, the Company should provide a listing of all insurance reimbursements received from each insurance company through the end of the year covered by the filing, but need not disclose any insurance company's identity.	SLC-2
7. Provide copies of any RAC audit reports or related materials prepared by the Board's Audit Staff, FERC, or the Company's internal or external auditors during the previous twelve months. To the degree applicable, please also provide any materials prepared in response to the audits or in compliance with any audit findings.	SLC-2 Confidential
8. Provide a narrative concerning all material events, whether related to NJDEP mandates or not, which could have an impact on the Company's ultimate MGP remediation liability, with claimed confidential information	SLC-2

PIVOTAL UTILITY HOLDINGS, INC. d/b/a ELIZABETHTOWN GAS
REMEDIATION ADJUSTMENT CLAUSE ("RAC") FILING
MINIMUM FILING REQUIREMENTS (MFR) INDEX

Minimum Filing Requirements	Schedule
provided pursuant to a confidentiality agreement. The narrative should encompass all sites, whether or not active remediation efforts on the site are under way.	
9. Provide schedules and supporting workpapers and documents, which show the reconciliation of the prior period RAC expenditures and recoveries as well as the derivation of the deferred tax credit and the interest accrual on any unamortized balances.	TK-2
10. Provide the Company's bid evaluation studies, reports, workpapers or other material related to the two largest MGP remediation contracts awarded during the previous RAC period. The response should include the criteria utilized for bid evaluation and the comparisons between the terms and conditions offered by the competitive bidders.	SLC-2 Confidential
11. Provide documentation relating to the two largest supplemental contract amendments authorized by the Company during their previous RAC period. The response should provide the contractor's request for supplemental funding, the reasons cited for the request, and the Company's evaluation and action taken concerning the request.	SLC-2 Confidential
12. Provide documentation relating to any instances during the previous RAC period where the Company sought to modify, change, or eliminate the NJDEP site remediation requirements for any of its MGP sites. The response should provide copies of any such Company requests, the NJDEP responses, and the ultimate outcome concerning the requests.	SLC-2
13. Provide a calculation of the carrying costs that the Company seeks to recover in its filing, including workpapers and supporting documentation.	TK-3
14. The Company currently provides a schedule that summarizes the expenditures incurred by major cost category by site on a quarterly basis. These data will be reported with its annual filing.	SLC-2
15. For each of the Company's MGP sites, provide a schedule showing the status of the remediation effort and estimated dates for the completion of remaining milestones, along with a discussion of major remediation problems. The parties understand that the timeframes to complete the remediation efforts are subject to a great deal of uncertainty due to factors beyond the Company's control.	SLC-2
16. Provide an update concerning the status of discussions with the NJDEP concerning its NRD initiative as well as any other NRD-related activities, with claimed confidential information provided pursuant to a confidentiality agreement. Such update will include information about NRD-related expenditures during the prior RAC period and related documentation, as well as total NRD-related expenses deferred to date.	SLC-2
17. Provide information about unreasonable delays in remediation efforts caused by the inability to obtain requisite approvals, clearances or other rights from the NJDEP, local authorities or property owners, or other circumstances that are unduly impeding remediation efforts. The Company will address issues that are outside of the ordinary experience for these matters.	SLC-2

PIVOTAL UTILITY HOLDINGS, INC. d/b/a ELIZABETHTOWN GAS
REMEDIATION ADJUSTMENT CLAUSE ("RAC") FILING
MINIMUM FILING REQUIREMENTS (MFR) INDEX

Minimum Filing Requirements	Schedule
18. Provide details concerning all remediation related charges to the Company from or through Southern Company Gas and its affiliates for the past RAC period. The response should show amounts by month, by entity, and should describe the nature of services provided.	SLC-2

STATE OF NEW JERSEY
BOARD OF PUBLIC UTILITIES

In The Matter Of The Petition Of Pivotal Utility Holdings, Inc. d/b/a Elizabethtown Gas To Revise The Remediation Adjustment Clause Component Of Its Societal Benefits Charge Rate	**:**	**Docket No. GR** **PETITION**

To The Honorable Board of Public Utilities:

Petitioner, Pivotal Utility Holdings, Inc. d/b/a Elizabethtown Gas ("Petitioner"), a public utility corporation duly organized under the laws of the State of New Jersey subject to the jurisdiction of the Board of Public Utilities ("Board"), respectfully states:

1. Petitioner's principal business office is located at 520 Green Lane, Union, NJ, 07083.

2. Communications and correspondence concerning these proceedings should be sent as follows:

Mary Patricia Keefe, Esq.
Vice President, External Affairs
and Business Support
Pivotal Utility Holdings, Inc.
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3. Petitioner is engaged in the business of transmission and distribution of natural and mixed gas to approximately 288,000 customers within its service territory located principally in Hunterdon, Mercer, Middlesex, Morris, Sussex, Union and Warren Counties.

4. The purpose of this filing is to revise the rate associated with Petitioner's Remediation Adjustment Clause ("RAC") component of the Societal Benefits Charge ("SBC") and to reconcile costs and cost recoveries associated with the clause for the period in which the clause is applicable.

5. Annexed hereto and made a part of this Petition is Exhibit P-1, which Petitioner suggests be marked as indicated. Exhibit P-1 is the testimony and supporting schedules of Thomas Kaufmann, Manager of Rates and Tariffs for Petitioner. The following schedules supporting the tariff sheets and the derivation of the proposed RAC rate are attached and referred to in Exhibit P-1:

(a) Tariff Schedule TK-1, consists of revised tariff sheets in clean and redlined form;

(b) Forecast Schedule TK-1; and

(c) RAC Schedule TK-1 through RAC Schedule TK-7.

6. Also annexed hereto and made a part of this Petition is Exhibit P-2, which Petitioner suggests be marked as indicated. Exhibit P-2 is the testimony of Steven L. Cook, Manager of Environmental Programs for Petitioner. The following schedules are included with Mr. Cook's testimony:

(a) Schedule SLC-1 through Schedule SLC-2.

7. In a September 22, 2011 Board Order in BPU Docket Nos. GR07080645, GR08090836 and GR09080651 concerning the reconciliation of Petitioner's SBC for the 2006-2007, 2007-2008 and 2008-2009 periods, it was agreed that Petitioner would provide information responsive to certain minimum filing requirements ("MFRs") as part of future filings to reconcile its RAC rate. An Index to the MFRs is included with this Petition. As noted in the MFR Index, some of the MFR information being provided by the Company is deemed confidential and as such will be redacted and provided to those parties executing a mutually acceptable confidentiality agreement entered into subsequent to the filing of this Petition.

The RAC Component of the SBC Rate

8. Petitioner's current RAC rate, a component of the SBC, of ($0.0016) per therm was approved by the Board in a June 29, 2016 Order authorizing that rate to become effective July 12, 2016 in Docket No. GR15101210. The Company's 2016 RAC filing is still pending before the Board.

9. Petitioner is proposing to increase its current RAC credit rate of ($0.0016) per therm to a credit of ($0.0128) per therm effective October 1, 2017. Petitioner's accounting for RAC-related costs reflected in the calculation of the RAC factor is based on actual data for the period July 1, 2016 through June 30, 2017 plus prior period true-up amounts. All information for the 2018 Recovery Year, which is the twelve month period ending September 30, 2018, reflects forecast data. In this year's filing, the rate is designed to

refund approximately $5.8 million as reflected on RAC Schedule TK-1 Line 4.

10. In accordance with Petitioner's tariff, the RAC component is determined by first calculating the sum of (a) one seventh of Petitioner's net deferred remediation costs incurred during the twelve months ended June 30th, for the periods ending 2017, 2016, 2015, 2014, 2013, 2012 and 2011, less the deferred tax benefit, as shown on RAC Schedule TK-2 pages 1 through 7. The calculation of the proposed credit rate of ($0.0128) per therm is described and detailed in Mr. Kaufmann's testimony. Interest accrued on RAC-related costs is calculated in the manner approved by the Board in its Order in BPU Docket No. GX99030121 dated March 30, 2001, *et al.*

11. As discussed in the testimony of Mr. Cook, Petitioner owns, owned and/or operated six former MGP sites located at Erie Street in Elizabeth, South Street in Elizabeth, Rahway, Perth Amboy, Flemington and Newton. Petitioner's remediation costs are incurred to enable Petitioner to comply with applicable laws and regulations in a prudent manner.

12. Under the RAC, the total annual charge to Petitioner's customers during any Recovery Year may not exceed five percent (5%) of Petitioner's total revenues from sales, transportation and storage services during the previous annual July 1 through June 30 period. As set forth in Exhibit P-1, the application of this cap calculation does not require a reduction in the remediation costs recoverable during the 2018 Recovery Year.

13. Under the RAC, Petitioner is required to project its anticipated remediation costs for the July 1, 2017 through June 30, 2018 Remediation Year. As discussed by Mr. Cook, Petitioner estimates that it will incur approximately $27 million of net deferred remediation costs during that period. However, this is only an estimate. Petitioner's actual costs will be determined by its need to comply with applicable environmental laws and regulations in a prudent manner.

Overall Impact

14. The overall impact of Petitioner's filing in this proceeding is a proposed decrease in the monthly bill of a typical residential heating customer using 100 therms by $1.12, from $87.95 to $86.83, or a decrease of 1.3%.

Miscellaneous

15. Petitioner is serving notice and a copy of this Petition, together with a copy of the exhibits and schedules annexed hereto upon Stefanie A. Brand, Director, Division of Rate Counsel ("Rate Counsel"), 140 East Front Street, 4th Floor, Trenton, New Jersey, upon the service list, and as outlined in *N.J.A.C.* 14:1-5.12.

WHEREFORE, Petitioner respectfully requests that the Board (1) accept Petitioner's filing, (2) allow the proposed RAC rate and associated proposal to become effective October 1, 2017; (3) grant any waivers of Petitioner's tariff or Board regulations as may be required, and (4) grant such other relief as the Board may deem just and proper.

Respectfully submitted,

By:

Mary Patricia Keefe, Esq.
Vice President, External Affairs
and Business Support
Pivotal Utility Holdings, Inc.
d/b/a Elizabethtown Gas
520 Green Lane
Union, New Jersey 07083
(908) 662-8452

Date: September 22, 2017

STATE OF NEW JERSEY)
)
COUNTY OF UNION)

ss:

I, Thomas Kaufmann, being duly sworn according to law, upon his oath, deposes and says:

1. I am the Manager of Rates and Tariffs of the Petitioner in the foregoing Petition and I am authorized to make this Affidavit on behalf of the Petitioner.

2. The statements made in the foregoing Petition and the exhibits and schedules submitted therewith correctly portray the information set forth therein, to the best of my knowledge, information and belief.

Thomas Kaufmann
Manager, Rates and Tariffs

Sworn to and subscribed to before me this

22nd day of SEPTEMBER, 2017.

Deborah L. Bailey
Notary Public

Deborah Y. Bailey
Notary Public
New Jersey
My Commission Expires 09-08-2020

STATE OF NEW JERSEY)
)
COUNTY OF UNION)

ss:

I, Steven L. Cook, being duly sworn according to law, upon his oath, deposes and says:

1. I am the Manager of Environmental Programs for the Petitioner in the foregoing Petition and I am authorized to make this Affidavit on behalf of the Petitioner.

2. The statements made in the foregoing Petition and the exhibits and schedules submitted therewith correctly portray the information set forth therein, to the best of my knowledge, information and belief.

Steven L. Cook
Manager, Environmental Programs

Sworn to and subscribed to before me this

22nd day of SEPTEMBER, 2017.

Deborah Y. Bailey
Notary Public

Deborah Y. Bailey
Notary Public
New Jersey
My Commission Expires 09-08-2020

EXHIBIT P-1

PIVOTAL UTILITY HOLDINGS, INC.
d/b/a ELIZABETHTOWN GAS
DIRECT TESTIMONY OF
THOMAS KAUFMANN

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Thomas Kaufmann. My business address is 520 Green Lane, Union, New Jersey 07083.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am employed by Pivotal Utility Holdings, Inc. d/b/a Elizabethtown Gas ("Elizabethtown" or "Company") as Manager of Rates and Tariffs.

Q. WHAT IS THE SCOPE OF YOUR DUTIES AT ELIZABETHTOWN?

A. I am responsible for designing and developing rates and rate schedules for regulatory filings with the New Jersey Board of Public Utilities ("Board") and internal management purposes. I also oversee daily rate department functions, including tariff administration, monthly parity pricing, competitive analyses and preparation of management reports.

Q. PLEASE DESCRIBE YOUR PROFESSIONAL QUALIFICATIONS AND BUSINESS EXPERIENCE.

A. In June 1977, I graduated from Rutgers University, Newark, N.J. with a Bachelor of Arts degree in Business Administration, majoring in accounting and economics. In July 1979, I graduated from Fairleigh Dickinson

University, Madison, N.J. with a Masters of Business Administration, majoring in finance.

My professional responsibilities have encompassed financial analysis, accounting, planning, and pricing in manufacturing and energy services companies in both regulated and unregulated industries. In 1977, I was employed by Allied Chemical Corp. as a staff accountant. In 1980, I was employed by Celanese Corp. as a financial analyst. In 1981, I was employed by Suburban Propane as a Strategic Planning Analyst, promoted to Manager of Rates and Pricing in 1986 and to Director of Acquisitions and Business Analysis in 1990. In 1993, I was employed by Concurrent Computer as a Manager, Pricing Administration. In 1996, I joined NUI Corporation ("NUI") as a Rate Analyst, was promoted to Manager of Regulatory Support in August 1997 and Manager of Regulatory Affairs in February 1998, and named Manager of Rates and Tariffs in July 1998. NUI Corporation was acquired by AGL Resources Inc. ("AGL") in November 2004. AGL was acquired by Southern Company in July 2016.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. I will discuss the derivation of the Remediation Adjustment Clause ("RAC") component of the Societal Benefits Charge ("SBC") rate to be assessed to the

Company's customer classes subject to the RAC for the 2018 Recovery Year, which is the twelve month period ending September 30, 2018.

Q. WHAT EFFECTIVE DATE IS THE COMPANY PROPOSING FOR THE RAC RATE?

A. The Company is proposing that the proposed RAC rate take effect on October 1, 2017.

Q. WHEN WAS THE COMPANY'S RAC RATE LAST REVISED?

A. This rate was last revised by a June 29, 2016 Order ("June 29 Order") with an effective date of July 12, 2016 in Docket No. GR15101210. The June 29 Order resolved the Company's then-pending 2015 annual RAC reconciliation filing and approved the Company's current RAC rate of ($0.0016) per therm. The Company's 2016 annual RAC reconciliation filing is currently pending before the Board.

Q. DOES YOUR TESTIMONY INCLUDE ANY ILLUSTRATIVE SCHEDULES?

A. Yes. My testimony includes schedules and proposed tariff sheets that were prepared under my direction and supervision. As explained in the Petition some of these schedules contain information responsive to the Minimum Filing Requirements agreed to in a Board Order involving the Company's 2007, 2008 and 2009 SBC filings. An Index

to the MFRs is included with the Petition. The schedules are as follows:

(1) Tariff Schedule TK-1 consists of revised tariff sheets in redlined and clean form which reflect the proposed RAC rate.

(2) Forecast Schedule TK-1 provides the level of forecast sales and services for the 2018 Recovery Year, which was utilized in the calculation of the proposed RAC rate.

(3) RAC Schedule TK-1 sets forth the calculation of the proposed RAC rate for the 2018 Recovery Year.

(4) RAC Schedule TK-2 consists of seven pages and presents the calculation of the recoverable portion of remediation costs for the twelve months ended June 30, 2017, 2016, 2015, 2014, 2013, 2012 and 2011, respectively, to be recovered through the proposed RAC rate.

(5) RAC Schedule TK-3 sets forth the calculation of carrying costs applied to the RAC consistent with the Board's Order dated March 30, 2001 in Docket No. GX99030121, *et al*.

(6) RAC Schedule TK-4 sets forth the prior year reconciliation of 2017 Recovery Year recoverable costs versus actual recoveries for the twelve month

period ended June 30, 2017, which is included in the calculation of the proposed RAC rate.

(7) RAC Schedule TK-5 sets forth the calculation to determine whether Elizabethtown's proposed recovery of remediation costs exceeds 5% of the Company's total revenues from sales, transportation and storage services during the twelve months ended June 30, 2017.

(8) RAC Schedule TK-6 sets forth the RAC recoveries for the twelve months ended June 30, 2017.

(9) RAC Schedule TK-7 sets forth the derivation of the proposed credit to the RAC of the net proceeds from the sale of the Rahway property.

REVENUE FORECAST

Q. WHAT IS THE METHODOLOGY USED TO PROJECT FIRM SALES AND SERVICES FOR THE RECOVERY YEAR IN ORDER TO DERIVE THE COMPANY'S PROPOSED RAC RATE?

A. The methodology used is the same as that used in the demand forecast which supports Elizabethtown's Basic Gas Supply Service ("BGSS") rates. A summary of the forecast of normalized sales and services is set forth on Forecast Schedule TK-1.

Q. WHAT PERIOD IS COVERED BY THE DEMAND FORECAST?

A. The gas sales demand forecast as set forth on Forecast Schedule TK-1 for the RAC is for the twelve month period ended September 30, 2018, a period of 12 months, also referred to as the 2018 Recovery Year.

Q. WERE THE COMPANY'S FIRM AND NON-FIRM SALES AND TRANSPORTATION REVENUE FORECASTS PREPARED USING THE SAME METHODOLOGY USED BY THE COMPANY IN PREPARING LAST YEAR'S REVENUE FORECASTS?

A. Yes. The Company continues to use regression equations based on actual historical sales demand data as well as any known customer changes to develop the forecast demand.

THE RAC COMPONENT OF THE SBC RATE

Q. PLEASE DESCRIBE THE SBC.

A. The SBC currently consists of the following components: (1) the RAC, (2) the New Jersey Clean Energy Program (“CEP”), (3) the Universal Service Fund (“USF”) charge, and (4) the Lifeline charge.

Q. WHAT CUSTOMERS ARE ASSESSED THE SBC?

A. The SBC charge is applicable to all customers, with the exception of those exempt from the charge pursuant to the Long-Term Capacity Agreement Pilot Program legislation enacted on January 28, 2011.

Q. IS THE COMPANY PROPOSING ANY CHANGES TO THE CEP, USF OR LIFELINE RATES IN THIS FILING?

A. No, the reconciliations of those rates are addressed in separate filings.

Q. WHAT RAC RATE IS THE COMPANY PROPOSING BY THIS FILING?

A. Elizabethtown is proposing a RAC credit rate of ($0.0128) per therm, which is an increase in the credit of ($0.0112) per therm from its currently effective RAC rate of ($0.0016) per therm.

Q. PLEASE EXPLAIN HOW THIS PROPOSED RAC RATE WAS CALCULATED.

A. The proposed RAC rate is calculated by determining the sum of one seventh of the Company's net deferred remediation costs, less the deferred tax benefit associated with the unamortized balances of these costs during each of the Remediation Years ended June 30, 2017, 2016, 2015, 2014, 2013, 2012 and 2011 respectively, as shown on Pages 1-7 of RAC Schedule TK-2, as adjusted for applicable carrying costs as shown on RAC Schedule TK-3, and the prior year's projected over or under-recovery balance shown on RAC Schedule TK-4. In addition, the RAC includes a credit of $496,388 to reflect the net proceeds associated with the sale of the Rahway property. All of these items are as shown on RAC Schedule TK-1. The net total represents the amount to be recovered in the 2018

Recovery Year through the RAC component, as shown on RAC Schedule TK-1. This total is then divided by the volumes projected for the Recovery Year for the service classifications and customers subject to the SBC as shown on Forecast Schedule TK-1, with the resulting quotient adjusted for applicable taxes to arrive at a RAC credit rate of ($0.0128) per therm.

Q. PLEASE EXPLAIN THE CALCULATION OF THE COMPANY'S PROPOSAL TO CREDIT THE RAC WITH THE NET PROCEEDS ASSOCIATED WITH THE SALE OF THE RAHWAY PROPERTY.

A. RAC Rider D, Section II.A.8. of the Company's tariff describes how to calculate the net proceeds associated with the sale of a former manufactured gas plant site and sets forth the formula for sharing such proceeds, as follows: The sale price of $724,927 was reduced by the property's net book value at October 31, 2016 of $202,016, by costs associated with the sale of $22,188 and by city property taxes of $4,672 to arrive at the net proceeds of $496,051 as shown on RAC Schedule TK-7. However, the Company's total remediation expenditures related to this site of $8,287,798 exceed the net proceeds so there is no 50%/50% sharing per Rider D. The full amount of net proceeds of $496,051, plus an additional $337 for a return of escrow money, is being

credited to the RAC as set forth on RAC Schedule TK-1 and RAC Schedule TK-3.

Q. WHAT IS THE LEVEL OF DEFERRED REMEDIATION COSTS ELIGIBLE FOR RECOVERY FOR THE REMEDIATION YEAR ENDED JUNE 30, 2017?

A. The level of total deferred remediation costs for the twelve month period ended June 30, 2017 is $15,959,849 as discussed in the testimony and supporting schedules of Company witness Steven L. Cook. The amount is then adjusted for third party recoveries and deferred insurance litigation costs as shown on RAC Schedule TK-2, page 1 of 7. The resulting net amortizable recoverable cost of $15,223,708, divided by seven and adjusted for the deferred tax benefit as set forth on RAC Schedule TK-2, page one of seven, line 5, yields $2,174,815 before adjusting for a deferred tax benefit described below.

Q. WHAT ARE THE CURRENT REMEDIATION COSTS ELIGIBLE FOR RECOVERY?

A. The table below presents the eligible recoverable costs after adjusting for a deferred tax benefit by year as shown on RAC Schedule TK-2 pages 1 through 7 as well as each year’s filing status:

Year	Eligible Amount	Filing Status / Date Approved:
2017	$2,047,328	
2016	($3,158,292)	pending in Docket No. GR16080794
2015	($3,568,906)	July 12, 2016 in Docket No. GR15101210
2014	$527,609	June 18, 2015 in Docket No. GR14101135
2013	$625,768	February 11, 2015 in Docket No. GR13090839
2012	$1,058,650	December 18, 2013 in Docket No. GR12100936
2011	$1,401,113	April 29, 2013 in Docket No. GR11080485
Total	($1,066,733)	

Q. HOW IS THE DEFERRED TAX BENEFIT CALCULATED?

A. The deferred tax benefit is calculated by multiplying the unamortized portion of the Company's net deferred remediation costs by the effective statutory income tax rate and the RAC Interest Rate. In accordance with the Board's Order dated July 8, 1999 in Docket No. GR98080535, *et al.,* the statutory tax rate used in the calculation of the deferred tax benefit is 40.85% and includes Corporate Business Tax. This calculation results in a deferred tax benefit of $127,487 for the twelve months ended June 30, 2017. This calculation is presented in RAC Schedule TK-2, page one of seven which is the same methodology applied to the prior years being amortized.

Q. WHAT ARE THE RESULTS OF THE PRIOR YEAR'S RECOVERY RECONCILIATION?

A. RAC Schedule TK-4 provides a reconciliation of the 2017 Recovery Year which shows an over-recovery balance of ($3,586,519) as of June 30, 2017.

Q. WHAT LEVEL OF COSTS IS THE PROPOSED RAC RATE DESIGNED TO REFUND?

A. The proposed RAC rate is designed to refund an amount of ($5,814,118) as set forth on RAC Schedule TK-1, Line 4.

Q. PLEASE DESCRIBE THE ANNUAL CAP CALCULATION.

A. Under the RAC, total annual remediation costs charged to the Company's customers during any recovery year may not exceed five percent (5%) of the Company's total revenues from sales, transportation and storage services during the preceding July 1 through June 30 period. For the twelve month period ended June 30, 2017, total revenues were $298,946,412. RAC Schedule TK-5 illustrates that the total remediation costs do not exceed the five percent cap.

Q. ARE CARRYING COSTS INCLUDED IN THE RAC CALCULATION?

A. Yes. In accordance with the Board's Order dated March 30, 2001 in Docket No. GX99030121 *et al.,* the Company is permitted to recover carrying costs.

Q. HOW ARE THE CARRYING COSTS CALCULATED?

A. Carrying cost rates are applied to each year's net prior year balance and current year expenditures and recoveries. The interest rate is based on the rate available from seven year constant maturity Treasury securities established closest to August 31st of each year plus 60 basis points. This interest rate, currently 2.05%, is applied to monthly net RAC balances as shown on RAC Schedule TK-3. Interest on monthly balances is not compounded.

Q. PLEASE SUMMARIZE THE PROPOSED CHANGE TO THE RAC RATE.

A. The current RAC credit rate is ($0.0016) per therm and the proposed RAC credit rate is ($0.0128) per therm, which the Company proposes to take effect October 1, 2017.

Q. WHAT IS THE IMPACT OF THE PROPOSED RAC RATE CHANGE ON TYPICAL RESIDENTIAL CUSTOMERS?

A. The total impact of the proposed adjustment to the RAC rate on a typical residential heating customer using 100 therms is to decrease the customer's typical monthly bill by $1.12 from $87.95 to $86.83, a decrease of 1.3%, as compared to the Company's September 1, 2017 rates.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

ELIZABETHTOWN GAS
B. P. U. NO. 15 – GAS ~~1st~~ REVISED SHEET NO. 117

RIDER "D"

SOCIETAL BENEFITS CHARGE ("SBC")

Applicable to all tariff Service Classifications except those Customers under special contracts that explicitly do not permit the Company to apply increased charges as filed and approved by the BPU and those customers exempted pursuant to the Long-Term Capacity Agreement Pilot Program ("LCAPP"), P.L. 2011, c.9, codified as N.J.S.A. 48:3-60.1. See the LCAPP Exemption Procedures at the end of this Rider.

The SBC is designed to recover the t components listed below and any other new programs which the Board determines should be recovered through the Societal Benefits Charge.

	SBC Rate Components:	Per Therm
I.	New Jersey Clean Energy Program ("CEP")	$0.0252
II.	Remediation Adjustment Charge ("RAC")	($0.0128)~~($0.0016)~~
III.	Universal Service Fund and Lifeline:	
	1. Universal Service Fund ("USF")	$0.0076
	2. Lifeline	$0.0051
	TOTAL	$0.0251~~$0.0363~~

The charges applicable under this Rider include provision for the New Jersey Sales and Use Tax, and when billed to customers exempt from this tax shall be reduced by the amount of such tax included therein.

I. New Jersey Clean Energy Program Component ("CEP")

The Comprehensive Resource Analysis ("CRA") name was changed to the Clean Energy Program - CEP per Board Order dated January 22, 2003 in Docket No. EX99050347 *et.al*. The CEP is a mechanism that will (1) establish a rate to recover the costs of the Core and Standard Offer Programs in the Company's CEP Plan which was approved by the BPU" in Docket No. GE92020104, and (2) compensate the Company for the revenue erosion resulting from conservation savings created by the Standard Offer Program. The annual recovery period for the CEP is from October 1 through September 30. The CEP recovers program costs and revenue erosion incurred during the previous CEP year ended June 30.

1. CEP program costs include the costs of core programs, standard offer payments and any administrative costs not recovered directly from standard offer providers.

CLEAN

ELIZABETHTOWN GAS
B. P. U. NO. 15 – GAS _____REVISED SHEET NO. 117

RIDER "D"

SOCIETAL BENEFITS CHARGE ("SBC")

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	2. Lifeline	$0.0051
	TOTAL	$0.0251

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1. CEP program costs include the costs of core programs, standard offer payments and any administrative costs not recovered directly from standard offer providers.

PIVOTAL UTILITY HOLDINGS, INC. d/b/a ELIZABETHTOWN GAS

FORECASTED SALES VOLUME - THERMS

RECOVERY YEAR - 2018

	SBC (RAC) *
Residential	223,883,700
Commercial	71,308,514
Industrial	967,550
Interruptible	1,917,340
Total Sales	298,077,104
Residential, *included above*	-
Commercial	74,655,700
Industrial	43,733,700
Interruptible	68,091,210
Total Transportation	186,480,610
Total Sales and Transportation	484,557,714

* Excludes LCAPP therms used for wholesale electric generation.

PIVOTAL UTILITY HOLDINGS, INC. d/b/a ELIZABETHTOWN GAS
SOCIETAL BENEFITS CHARGE (SBC)
REMEDIATION ADJUSTMENT CLAUSE (RAC)

CALCULATION OF THE RAC RATE BASED ON VOLUMES FROM
October 1, 2017 through September 30, 2018
RECOVERY YEAR - 2018

1a	Recovery Year Amortization Costs (Sch. TK-2, L5, pgs 1+2+3+4+5+6+7)		($1,198,016)	
1b	Recovery Year Deferred Tax Adjustments (Sch. TK-2, L16, pgs 1+2+3+4+5+6+7)		$131,286	
1	Recovery Year Recoverable Costs (L1a +L1b)		($1,066,730)	
2	Accrued Carrying Costs (Sch. TK-3 + TK-3a)		($664,481)	
3	Prior Year RAC Overrecovery (Sch. TK-4)	($3,586,519)		
	Proceeds Sale of Rahway (Sch. TK-7)	($496,388)	($4,082,907)	
4	Total Recovery Year Recoverable / (Refund) Costs (L1+L2+L3)		($5,814,118)	
5	Projected Normalized Sales and Services (Forecast Sch. TK-1)		484,557,714	therms
6	RAC COMPONENT, before taxes (L4/L5)		($0.0120)	/therm
7	Sales & Use Tax @ 6.875%		($0.0008)	
8	RAC COMPONENT (L6+L7)		**($0.0128)**	/therm

PIVOTAL UTILITY HOLDINGS, INC. d/b/a ELIZABETHTOWN GAS
REMEDIATION ADJUSTMENT CLAUSE

AMORTIZATION RECOVERY YEAR 2018

			Y/E 6/30/17	
1	Total Recoverable Costs		$15,959,849	
2	Adjustments to Recoverable Costs		$0	
2A	A. 100% of Third Party Recoveries		($2,400)	
2B	B. 50% Deferred Ins. Litigation - Opening Balance		$200,416	
2C	C. 50% Deferred Ins. Litigation - Ending Balance		($437,769)	
3	Less Miscellaneous Adjustments TK-3, ex interest adjustment		($496,388)	
4	Amortizable Recoverable Costs		$15,223,708	
5	Amortization Recoverable Cost (L4/7)			$2,174,815
6	Deferred Tax Calculation			
7	Unamortized Recoverable Costs:			
8	Upcoming Recovery Year	2018		
9	Remediation Year	2017		
10	Difference (L8-L9)	1		
11	Unamortized Factor (7-(difference-1))/7	1		
12	Unamortized Recoverable Costs (L4*L11)		$15,223,708	
13	Tax Rate		40.85%	
14	Deferred Taxes on Net Deferred Remediation Cost (L12*L13)		$6,218,885	
15	Interest on Deferred Taxes at the RAC interest rate set August 31st equal to the seven year constant maturity Treasuries plus 60 basis points.		2.05%	
16	Deferred Tax Benefit (L14*L15)			($127,487)
17	2017 Remediation Year 2016-17 (L5+L16)			$2,047,328

PIVOTAL UTILITY HOLDINGS, INC. d/b/a ELIZABETHTOWN GAS
REMEDIATION ADJUSTMENT CLAUSE

AMORTIZATION RECOVERY YEAR 2018

			Y/E 6/30/16	
1	Total Recoverable Costs		$7,305,684	
2	Adjustments to Recoverable Costs			
2A	A. 100% of Third Party Recoveries		($30,400,000)	
2B	B. 50% Deferred Ins. Litigation - Opening Balance		$17,090	
2C	C. 50% Deferred Ins. Litigation - Ending Balance		($200,416)	
3	Less Miscellaneous Adjustments		$0	
4	Amortizable Recoverable Costs		($23,277,642)	
5	Amortization Recoverable Cost (L4/7)			($3,325,377)
6	Deferred Tax Calculation			
7	Unamortized Recoverable Costs:			
8	Upcoming Recovery Year	2018		
9	Remediation Year	2016		
10	Difference (L8-L9)	2		
11	Unamortized Factor (7-(difference-1))/7	0.857143		
12	Unamortized Recoverable Costs (L4*L11)		($19,952,265)	
13	Tax Rate		40.85%	
14	Deferred Taxes on Net Deferred Remediation Cost (L12*L13)		($8,150,500)	
15	Interest on Deferred Taxes at the RAC interest rate set August 31st equal to the seven year constant maturity Treasuries plus 60 basis points.		2.05%	
16	Deferred Tax Benefit (L14*L15)			$167,085
17	2017 Remediation Year 2015-16 (L5+L16)			($3,158,292)

PIVOTAL UTILITY HOLDINGS, INC. d/b/a ELIZABETHTOWN GAS
REMEDIATION ADJUSTMENT CLAUSE

AMORTIZATION RECOVERY YEAR 2018

			Y/E 6/30/15	
1	Total Recoverable Costs		$16,287,242	
2	Adjustments to Recoverable Costs			
2A	A. 100% of Third Party Recoveries		($42,750,000)	
2B	B. 50% Deferred Ins. Litigation - Opening Balance		$405,751	
2C	C. 50% Deferred Ins. Litigation - Ending Balance		($17,090)	
3	Less Miscellaneous Adjustments		$0	
4	Amortizable Recoverable Costs		($26,074,097)	
5	Amortization Recoverable Cost (L4/7)			($3,724,871)
6	Deferred Tax Calculation			
7	Unamortized Recoverable Costs:			
8	Upcoming Recovery Year	2018		
9	Remediation Year	2015		
10	Difference (L8-L9)	3		
11	Unamortized Factor (7-(difference-1))/7	0.714286		
12	Unamortized Recoverable Costs (L4*L11)		($18,624,355)	
13	Tax Rate		40.85%	
14	Deferred Taxes on Net Deferred Remediation Cost (L12*L13)		($7,608,049)	
15	Interest on Deferred Taxes at the RAC interest rate set August 31st equal to the seven year constant maturity Treasuries plus 60 basis points.		2.05%	
16	Deferred Tax Benefit (L14*L15)			$155,965
17	2017 Remediation Year 2014-15 (L5+L16)			($3,568,906)

PIVOTAL UTILITY HOLDINGS, INC. d/b/a ELIZABETHTOWN GAS
REMEDIATION ADJUSTMENT CLAUSE

AMORTIZATION RECOVERY YEAR 2018

			Y/E 6/30/14	
1	Total Recoverable Costs		$3,984,044	
2	Adjustments to Recoverable Costs			
2A	A. 100% of Third Party Recoveries		($4,500)	
2B	B. 50% Deferred Ins. Litigation - Opening Balance		$247,470	
2C	C. 50% Deferred Ins. Litigation - Ending Balance		($405,751)	
3	Less Miscellaneous Adjustments		$0	
4	Amortizable Recoverable Costs		$3,821,263	
5	Amortization Recoverable Cost (L4/7)			$545,895
6	Deferred Tax Calculation			
7	Unamortized Recoverable Costs:			
8	Upcoming Recovery Year	2018		
9	Remediation Year	2014		
10	Difference (L8-L9)	4		
11	Unamortized Factor (7-(difference-1))/7	0.571429		
12	Unamortized Recoverable Costs (L4*L11)		$2,183,579	
13	Tax Rate		40.85%	
14	Deferred Taxes on Net Deferred Remediation Cost (L12*L13)		$891,992	
15	Interest on Deferred Taxes at the RAC interest rate set August 31st equal to the seven year constant maturity Treasuries plus 60 basis points.		2.05%	
16	Deferred Tax Benefit (L14*L15)			($18,286)
17	2017 Remediation Year 2013-14 (L5+L16)			$527,609

PIVOTAL UTILITY HOLDINGS, INC. d/b/a ELIZABETHTOWN GAS
REMEDIATION ADJUSTMENT CLAUSE

AMORTIZATION RECOVERY YEAR 2018

			Y/E 6/30/13	
1	Total Recoverable Costs		$4,677,399	
2	Adjustments to Recoverable Costs			
2A	A. 100% of Third Party Recoveries		($7,843)	
2B	B. 50% Deferred Ins. Litigation - Opening Balance		$71,171	
2C	C. 50% Deferred Ins. Litigation - Ending Balance		($247,470)	
3	Less Miscellaneous Adjustments		$0	
4	Amortizable Recoverable Costs		$4,493,257	
5	Amortization Recoverable Cost (L4/7)			$641,894
6	Deferred Tax Calculation			
7	Unamortized Recoverable Costs:			
8	Upcoming Recovery Year	2018		
9	Remediation Year	2013		
10	Difference (L8-L9)	5		
11	Unamortized Factor (7-(difference-1))/7	0.428571		
12	Unamortized Recoverable Costs (L4*L11)		$1,925,682	
13	Tax Rate		40.85%	
14	Deferred Taxes on Net Deferred Remediation Cost (L12*L13)		$786,641	
15	Interest on Deferred Taxes at the RAC interest rate set August 31st equal to the seven year constant maturity Treasuries plus 60 basis points.		2.05%	
16	Deferred Tax Benefit (L14*L15)			($16,126)
17	2017 Remediation Year 2012-13 (L5+L16)			$625,768

PIVOTAL UTILITY HOLDINGS, INC. d/b/a ELIZABETHTOWN GAS
REMEDIATION ADJUSTMENT CLAUSE

AMORTIZATION RECOVERY YEAR 2018

			Y/E 6/30/12	
1	Total Recoverable Costs		$7,605,951	
2	Adjustments to Recoverable Costs			
2A	A. 100% of Third Party Recoveries		($78,199)	
2B	B. 50% Deferred Ins. Litigation - Opening Balance		$80,202	
2C	C. 50% Deferred Ins. Litigation - Ending Balance		($71,171)	
3	Less Miscellaneous Adjustments		$0	
4	Amortizable Recoverable Costs		$7,536,783	
5	Amortization Recoverable Cost (L4/7)			$1,076,683
6	Deferred Tax Calculation			
7	Unamortized Recoverable Costs:			
8	Upcoming Recovery Year	2018		
9	Remediation Year	2012		
10	Difference (L8-L9)	6		
11	Unamortized Factor (7-(difference-1))/7	0.285714		
12	Unamortized Recoverable Costs (L4*L11)		$2,153,367	
13	Tax Rate		40.85%	
14	Deferred Taxes on Net Deferred Remediation Cost (L12*L13)		$879,650	
15	Interest on Deferred Taxes at the RAC interest rate set August 31st equal to the seven year constant maturity Treasuries plus 60 basis points.		2.05%	
16	Deferred Tax Benefit (L14*L15)			($18,033)
17	2017 Remediation Year 2011-12 (L5+L16)			$1,058,650

PIVOTAL UTILITY HOLDINGS, INC. d/b/a ELIZABETHTOWN GAS
REMEDIATION ADJUSTMENT CLAUSE

AMORTIZATION RECOVERY YEAR 2018

			Y/E 6/30/11	
1	Total Recoverable Costs		$9,991,455	
2	Adjustments to Recoverable Costs			
2A	A. 100% of Third Party Recoveries		($26,501)	
2B	B. 50% Deferred Ins. Litigation - Opening Balance		$5,865	
2C	C. 50% Deferred Ins. Litigation - Ending Balance		($80,202)	
3	Less Miscellaneous Adjustments TK-3		$0	
4	Amortizable Recoverable Costs		$9,890,617	
5	Amortization Recoverable Cost (L4/7)			$1,412,945
6	Deferred Tax Calculation			
7	Unamortized Recoverable Costs:			
8	Upcoming Recovery Year	2018		
9	Remediation Year	2011		
10	Difference (L8-L9)	7		
11	Unamortized Factor (7-(difference-1))/7	0.142857		
12	Unamortized Recoverable Costs (L4*L11)		$1,412,945	
13	Tax Rate		40.85%	
14	Deferred Taxes on Net Deferred Remediation Cost (L12*L13)		$577,188	
15	Interest on Deferred Taxes at the RAC interest rate set August 31st equal to the seven year constant maturity Treasuries plus 60 basis points.		2.05%	
16	Deferred Tax Benefit (L14*L15)			($11,832)
17	2017 Remediation Year 2010-11 (L5+L16)			$1,401,113

PIVOTAL UTILITY HOLDINGS, INC. d/b/a ELIZABETHTOWN GAS
SOCIETAL BENEFITS CHARGE (SBC)
REMEDIATION ADJUSTMENT CLAUSE (RAC)

RAC Schedule
TK-3

Carrying Costs

	Beginning Balance	Total Remediation Costs (2)	Third Party Recoveries at 100% (3)	Adjustments (see below)	(Recoveries) / Disbursement TK-6	Credit for Deferred Tax Benefit (4)	Ending Balance	Average Balance	Interest Rate *	Carrying Costs	Ending Balance plus Cumulative Interest **
a	b	c	d	d1	e	f	g=b+c+d+d1+e+f	h=(b+g)/2	i	j=h*i/12	m=g+ cum of j
Beginning Balance (1)											(Over) / Under
Jul-16	**($35,022,035)**	$129,890	$0	$0	$10,785	$29,244	($34,852,116)	($34,937,076)	2.54%	($73,950)	($34,926,066)
Aug-16	($34,852,116)	$88,230	$0	$0	$23,748	$29,244	($34,710,894)	($34,781,505)	2.54%	($73,621)	($34,858,465)
Sep-16	($34,710,894)	$414,926	$0	$0	$24,625	$29,244	($34,242,099)	($34,476,497)	2.05%	($58,897)	($34,448,567)
Oct-16	($34,242,099)	$89,923	$0	$0	$85,574	$29,244	($34,037,358)	($34,139,729)	2.05%	($58,322)	($34,302,148)
Nov-16	($34,037,358)	$126,023	$0	($496,051)	$51,802	$29,244	($34,326,340)	($34,181,849)	2.05%	($58,394)	($34,649,524)
Dec-16	($34,326,340)	$710,900	($2,400)	($24)	$84,582	$29,244	($33,504,038)	($33,915,189)	2.05%	($57,938)	($33,885,160)
Jan-17	($33,504,038)	$72,220	$0	$0	$112,076	$29,244	($33,290,498)	($33,397,268)	2.05%	($57,054)	($33,728,674)
Feb-17	($33,290,498)	$3,517,122	$0	$0	$101,817	$29,244	($29,642,315)	($31,466,407)	2.05%	($53,755)	($30,134,246)
Mar-17	($29,642,315)	$204,443	$0	$0	$93,611	$29,244	($29,315,017)	($29,478,666)	2.05%	($50,359)	($29,857,307)
Apr-17	($29,315,017)	$4,011,479	$0	$0	$77,205	$29,244	($25,197,089)	($27,256,053)	2.05%	($46,562)	($25,785,941)
May-17	($25,197,089)	$2,703,256	$0	$0	$41,874	$29,244	($22,422,715)	($23,809,902)	2.05%	($40,675)	($23,052,242)
Jun-17	($22,422,715)	$3,891,437	$0	($337)	$31,162	$29,243	($18,471,210)	($20,446,963)	2.05%	($34,930)	($19,135,667)
Total		$15,959,849	($2,400)	($496,412)	$738,861	$350,927				($664,457)	
			Less Interest adj.	($24)					Plus Interest adj.	($24)	
			Sch TK-2-17 line 3	($496,388)					Sch TK-1 line 2	($664,481)	

Notes:

(1) Beginning Balance is the ending balance from 2016.

(2) These costs include 100% of all expenses as such, they may vary from the amortizable recoverable costs on RAC Schedule TK-2. The primary difference would be the deferral of all NRD expenses and fifty percent of the costs incurred in pursuit of third party claims which are deferred pending a Third Party recovery.

(3) Recovery credit at 100%, as all expenses have been included, for purposes of deriving Carrying costs.

(4) Reduction of the Remediation Costs to reflect a Deferred Tax Benefit on a monthly basis sourced from last year's RAC TK-2 Schedules 1-7.

* Interest Rate seven year constant maturity Treasuries closest to August 31 of each year plus 60 basis points per the Board's Order in Docket No. GX99030121 et al. www.federalreserve.gov/releases/h15/

** Net (Over) / Under Recovery Position

Adjustments

November and June adjustments - see Schedule TK-7 for details
December adjustment - see Schedule TK-3a for details

PIVOTAL UTILITY HOLDINGS, INC. d/b/a ELIZABETHTOWN GAS
SOCIETAL BENEFITS CHARGE (SBC)
REMEDIATION ADJUSTMENT CLAUSE (RAC)

RAC Schedule
TK-3a

Carrying Costs - GEI Invoice correction

	Beginning Balance	Total Remediation Costs (1)	Third Party Recoveries at 100%	Adjustments	(Recoveries) / Disbursement	Credit for Deferred Tax Benefit	Ending Balance	Average Balance	Interest Rate *	Carrying Costs	Ending Balance plus Cumulative Interest **
a	b	c	d	d1	e	f	g=b+c+d+d1+e+f	h=(b+g)/2	i	j=h*i/12	m=g+ cum of j
Beginning Balance											(Over) / Under
Jul-14	**$0**	$0					$0	$0	2.84%	$0	$0
Aug-14	$0	$0					$0	$0	2.84%	$0	$0
Sep-14	$0	$0					$0	$0	2.65%	$0	$0
Oct-14	$0	$0					$0	$0	2.65%	$0	$0
Nov-14	$0	$0					$0	$0	2.65%	$0	$0
Dec-14	$0	($340)					($340)	($170)	2.65%	$0	($340)
Jan-15	($340)	$0					($340)	($340)	2.65%	($1)	($341)
Feb-15	($340)	$0					($340)	($340)	2.65%	($1)	($342)
Mar-15	($340)	$0					($340)	($340)	2.65%	($1)	($343)
Apr-15	($340)	$0					($340)	($340)	2.65%	($1)	($344)
May-15	($340)	$0					($340)	($340)	2.65%	($1)	($345)
Jun-15	($340)	$0					($340)	($340)	2.65%	($1)	($346)
Jul-15	**($346)**	$0					($346)	($346)	2.65%	($1)	($347)
Aug-15	($346)	$0					($346)	($346)	2.65%	($1)	($348)
Sep-15	($346)	$0					($346)	($346)	2.54%	($1)	($349)
Oct-15	($346)	$0					($346)	($346)	2.54%	($1)	($350)
Nov-15	($346)	$0					($346)	($346)	2.54%	($1)	($351)
Dec-15	($346)	$0					($346)	($346)	2.54%	($1)	($352)
Jan-16	($346)	$0					($346)	($346)	2.54%	($1)	($353)
Feb-16	($346)	$0					($346)	($346)	2.54%	($1)	($354)
Mar-16	($346)	$0					($346)	($346)	2.54%	($1)	($355)
Apr-16	($346)	$0					($346)	($346)	2.54%	($1)	($356)
May-16	($346)	$0					($346)	($346)	2.54%	($1)	($357)
Jun-16	($346)	$0					($346)	($346)	2.54%	($1)	($358)
Jul-16	**($358)**	$0					($358)	($358)	2.54%	($1)	($359)
Aug-16	($358)	$0					($358)	($358)	2.54%	($1)	($360)
Sep-16	($358)	$0					($358)	($358)	2.05%	($1)	($361)
Oct-16	($358)	$0					($358)	($358)	2.05%	($1)	($362)
Nov-16	($358)	$0					($358)	($358)	2.05%	($1)	($363)
Dec-16	($358)	$0					($358)	($358)	2.05%	($1)	($364)
Total		($340)								($24)	

Notes:
(1) Reflects correction of GEI Invoice #10371 to reduce amount charged to the RAC by $340.

* Interest Rate seven year constant maturity Treasuries closest to August 31 of each year plus 60 basis points per the Board's Order in Docket No. GX99030121 et al. www.federalreserve.gov/releases/h15/
** Net (Over) / Under Recovery Position

PIVOTAL UTILITY HOLDINGS, INC. d/b/a ELIZABETHTOWN GAS
SOCIETAL BENEFITS CHARGE (SBC)
REMEDIATION ADJUSTMENT CLAUSE (RAC)
AMORTIZATION RECOVERY YEAR

Prior Year's Reconciliation

FOR RECOVERY YEAR **2017**

1	Total to be Recovered / (Refunded), (prior year Sch TK-1)	($4,325,356)
2	Other *	($24)
3	Adjusted Prior Year Balance (L1+L2)	($4,325,380)
4	Actual Recoveries / (Refunds) (Sch TK-6)	($738,861)
5	Prior Year Over Recovery, (L3-L4)	($3,586,519)

* See Schedule TK-3a

PIVOTAL UTILITY HOLDINGS, INC. d/b/a ELIZABETHTOWN GAS
SOCIETAL BENEFITS CHARGE (SBC)
REMEDIATION ADJUSTMENT CLAUSE (RAC)
Annual Cap Calculation
RECOVERY YEAR -
2018

1	Total Revenues 12 months ended June 30, 2017	$298,946,412
2	5% of Line 1	$14,947,321
3	Total Remediation Costs to be Recovered this Year, (Sch TK-1)	($5,814,118)
4	Excess Remediation Costs to be Deferred (L4 = If L3 < L2 then zero, else L3 - L2)	$0

PIVOTAL UTILITY HOLDINGS, INC. d/b/a ELIZABETHTOWN
SOCIETAL BENEFITS CHARGE (SBC)
REMEDIATION ADJUSTMENT CLAUSE (RAC)

Cost Recoveries
12 Months Ended
June-17

	Therms	Rate w/o tax *	Recovery / (Disbursement)
Jul-16	17,570,626	($0.0006)	($10,785)
Aug-16	16,842,054	($0.0014)	($23,748)
Sep-16	16,622,361	($0.0015)	($24,625)
Oct-16	14,920,635	($0.0057)	($85,574)
Nov-16	34,538,401	($0.0015)	($51,802)
Dec-16	56,798,522	($0.0015)	($84,582)
Jan-17	75,040,788	($0.0015)	($112,076)
Feb-17	68,135,183	($0.0015)	($101,817)
Mar-17	62,853,770	($0.0015)	($93,611)
Apr-17	51,550,921	($0.0015)	($77,205)
May-17	28,141,034	($0.0015)	($41,874)
Jun-17	20,886,285	($0.0015)	($31,162)
Total	463,900,580		($738,861)

* Billing at the tariff rate yields the dollars recovered, inclusive of rate proration or cancel/rebills, if any. The rate presented is derived from dividing that amount by the therms, as such rounding differences to the tariff / billing rate may result.

PIVOTAL UTILITY HOLDINGS, INC. d/b/a ELIZABETHTOWN GAS
SOCIETAL BENEFITS CHARGE (SBC)
REMEDIATION ADJUSTMENT CLAUSE (RAC)

Rahway Land Sale

November 2016
Distribution of Proceeds

1	Initial Sale Proceeds		$724,927
2	Adjustments per Rider D of the Company's Tariff:		
	Net Book Value October 31, 2016	$202,016	
	Selling / Transaction Costs	$22,188	
	City Property Taxes	$4,672	$228,876
3	Net Proceeds (L1-L2)		$496,051
4	Clean-Up Costs at the Site through June 2017		$8,289,113
5	Amount available for sharing (L3 - L4 if > 0, else 0)		$0
6	Sharing 50 / 50 per Rider D of the Company's Tariff (L5/2)		$0
7	TK-3 Amount Credited to the RAC November 2016		($496,051)
8	Post Sale return of escrow water bill June 2017, TK-3 credit adjustment June 2017		($337)

Exhibit P-2

PIVOTAL UTILITY HOLDINGS, INC.
d/b/a ELIZABETHTOWN GAS
DIRECT TESTIMONY
OF STEVEN L. COOK

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Steven Cook. My business address is 520 Green Lane, Union, New Jersey 07083.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am employed by Southern Company Gas as Manager, Environmental Programs. As such, I am responsible for the efforts of Pivotal Utility Holdings, Inc. d/b/a Elizabethtown Gas (“Elizabethtown” or “Company”) to investigate, contain, and remediate its former Manufactured Gas Plant ("MGP") sites.

Q. WHAT IS YOUR PROFESSIONAL AND EDUCATIONAL BACKGROUND?

A. I am a graduate of East Texas State University where I received my BA Degree in political science and of Seton Hall University School of Law where I earned a Juris Doctorate degree. I am also a member of the New Jersey Bar. I have over twenty-six years of experience in the environmental field.

I have been employed by AGL Resources Inc. (“AGL”), which is now Southern Company Gas, since December 2004. Prior to AGL’s acquisition of NUI Corporation in 2004, I

worked for more than nine years in the environmental department of NUI Utilities, Inc. (“NUI Utilities”), a subsidiary of NUI Corporation. In this position, I managed environmental compliance and liability issues associated with the operations of NUI Utilities, including its New Jersey Division, Elizabethtown Gas. In this position, I participated in managing specific issues associated with the investigation and remediation of Elizabethtown’s MGP sites. From 1990 to 1995, I was employed by Foster Wheeler Environmental Corporation. There, I held the title of Regulatory Affairs Specialist where I was responsible for assessing the impacts of federal, state and local environmental laws and regulations on various environmental projects. My particular responsibilities included site remediation, permitting and compliance, and environmental liability management.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to support Elizabethtown's Petition in this proceeding to review the Remediation Adjustment Clause ("RAC") component of the Societal Benefits Charge (“SBC”). I will discuss Elizabethtown's efforts to investigate, contain and remediate its former MGP sites in a prudent manner and

will discuss the costs incurred by the Company during the period July 1, 2016 through June 30, 2017. I will also discuss the Company's treatment of costs incurred to obtain third party and/or insurance recoveries of MGP-related costs and briefly describe the MGP-related rate and third party recovery that the Company has obtained during the period July 1, 2016 through June 30, 2017. Finally, I will provide a projection of the MGP-related costs that the Company is likely to incur during the period July 1, 2017 through June 30, 2018.

Q. DOES YOUR TESTIMONY INCLUDE ANY ILLUSTRATIVE SCHEDULES?

A. Yes. My testimony includes the schedules listed below that were prepared under my direction and supervision. As explained in the Petition, these schedules contain information responsive to the Minimum Filing Requirements ("MFRs") reflected in a Stipulation that was approved in the proceedings involving the Company's 2007, 2008 and 2009 SBC filings. An Index to the MFRs is included with the Petition. The schedules are as follows:

(1) Schedule SLC-1 consists of a summary of MGP-related expenses incurred by the Company from July 1, 2016 through June 30, 2017. This schedule also provides information concerning insurance, third

party and rate recoveries of MGP-related expenses associated with this period.

(2) Schedule SLC-2 contains information responsive to MFRs 1 through 8, MFRs 10 through 12 and MFRs 14 through 18.

Q. HOW MANY FORMER MGP SITES HAS ELIZABETHTOWN OWNED OR OPERATED?

A. Elizabethtown owns, owned and/or operated MGPs at six sites located within the State of New Jersey. These six sites will be referred to as (1) Erie Street, Elizabeth; (2) South Street, Elizabeth; (3) Rahway; (4) Perth Amboy; (5) Flemington; and (6) Newton. Four of these six sites (Erie Street, South Street, Rahway, and Perth Amboy) were owned and/or operated solely by Elizabethtown and/or its predecessor companies. The remaining sites (Newton and Flemington) were also owned and operated by a predecessor of Jersey Central Power & Light Company, which is now owned by First Energy, herein referred to as ("JCP&L"). Elizabethtown also has responsible party liability for a site that I will refer to as the Renora Landfill.

Q. HAVE ELIZABETHTOWN'S MGP-RELATED COSTS AT ITS VARIOUS SITES BEEN INCURRED TO COMPLY WITH APPLICABLE LAWS AND REGULATIONS?

A. Yes. In all instances, Elizabethtown's efforts to test, contain, and remediate its former MGP sites have been directed toward complying with applicable laws and regulations in a reasonable, cost prudent manner.

Q. PLEASE UPDATE THE STATUS OF EACH OF ELIZABETHTOWN'S FORMER MGP SITES AND THE COSTS INCURRED FROM JULY 1, 2016 THROUGH JUNE 30, 2017.

A. Set forth below is a discussion of the activities that were either ongoing or completed during the period July 1, 2016 through June 30, 2017 at each of the Company's MGP sites:

Erie Street

In accordance with applicable laws and regulations, including mandatory remediation deadlines, the Company has completed the remedial investigation at the Erie Street site. In addition, the Company continues to perform work related to the implementation of remedial measures at the site.

Erie Street is comprised of eight (8) Areas of Concern ("AOC"), Areas A through H. The remediation of Area A was completed in the prior RAC period. During the current RAC period, the Company performed design, permitting, and procurement activities associated with the implementation of a remedial action for Areas B&G at

the site. The remedy for Area B is excavation with in situ stabilization ("ISS") and the remedy for Area G is engineering controls in the form of a stone cap. The ISS component of this remedial action will significantly reduce the volume of MGP impacted material that will require excavation for offsite treatment and disposal and importation of clean fill for site restoration. The remedial action began in the late second quarter of this RAC period and is expected to be completed in the late second quarter of the subsequent RAC period.

During the 2017 RAC period the Company also completed delineation of MGP impacts that have migrated off site into a City of Elizabeth public right of way ("ROW") and toward several adjacent residential properties. The Company has determined that MGP have migrated onto one adjacent residential property. The Company is currently assessing strategies for addressing these off site impacts.

Renora Landfill

Remediation of the Renora site was completed by the Renora RD/RA trust in early 1996. On September 27, 1999 the United States Environmental Protection Agency ("USEPA") issued a letter constituting a Certificate of Completion of the Remedial Action for the Renora site.

Effective March 20, 2000, the Renora site was deleted from the National Priorities List. Elizabethtown anticipates future costs, if any, for the Renora site will be limited to reimbursement of a portion of site inspection and maintenance fees.

Costs Incurred for Erie Street, Including the Renora Landfill

During the current remediation period, July 1, 2016 through June 30, 2017, the Company incurred costs of $13,385,875 in connection with the Erie Street site, including the Renora Landfill. A breakdown of those expenses is included in Schedule SLC-1.

South Street

In accordance with applicable laws and regulations, including mandatory remediation deadlines, the Company has completed the remedial investigation at the South Street site. Further, in accordance with applicable laws and regulations and an Administrative Consent Order with the NJDEP dated April 9, 1991, Elizabethtown is continuing to conduct environmental investigations and evaluate further remediation at the South Street site.

During the prior RAC period, the Company completed groundwater sampling and prepared a groundwater remedial investigation report and a remedial alternative analysis

report. The remedial alternative analysis report addresses groundwater and MGP impacts remaining beneath the Route 1 viaduct that could not be excavated during the soil interim remedial measure ("IRM") due to safety concerns of the New Jersey Department of Transportation. During the current RAC period, the Company initiated permitting efforts to implement further groundwater investigations in order to assess the feasibility of groundwater remedial alternatives. The Company also submitted a Remedial Funding Source in accordance with the AOC.

Future work will include negotiation with the City of Elizabeth to obtain a deed restriction for City-owned property located on the opposite side of the Route 1 viaduct to limit excavation and disposal of MGP impacts on the property.

Costs Incurred for South Street

During the current remediation period, July 1, 2016 through June 30, 2017, Elizabethtown incurred remediation costs of $44,975 in connection with the South Street site. A breakdown of those costs is included in Schedule SLC-1.

Rahway

In accordance with applicable laws and regulations, the Company has completed the remediation of the Rahway site, including the remediation of MGP impacted sediments within the Robinson's Branch of the Rahway River which is adjacent to the site. The Company recorded a deed notice with environmental restrictions for this property for residual MGP impacts in soil and a Classification Exemption Area ("CEA") for naturally occurring constituents in groundwater has been issued by NJDEP. A A Response Action Outcome ("RAO") has been issued by the site registered LSRP and a Remedial Action permit ("RAP") has been issued by the NJDEP.

During this RAC period, the Company closed on the sale of the property to the Rahway Redevelopment Authority.

Costs Incurred for Rahway

During the current remediation period, July 1, 2016 through June 30, 2017, Elizabethtown obtained remediation credits of ($495,072) in connection with the Rahway site. A breakdown of those costs is included in Schedule SLC-1.

Perth Amboy

In accordance with applicable laws and regulations, including mandatory remediation deadlines, the Company

has completed the remedial investigation at the Perth Amboy site.

During this RAC period, the Company continued design, permitting and procurement activities in support of a remedial action at the site. The remedial action will consist of excavation and off site treatment and disposal of MGP impacts at the property to an unrestricted use standard. The majority of the remedial activities will be performed under a tent-like movable structure to control dust and odors to be protective of the many receptors surrounding the site including a children's playground, a water front park, residential properties and a church. The remedial action will begin in July of 2017 and require approximately one year to complete.

Costs Incurred for Perth Amboy

During the current remediation period, July 1, 2016 through June 30, 2017, Elizabethtown incurred remediation costs of $505,790 in connection with the Perth Amboy site. These costs include a payment to the Church for compensation for the demolition of the existing structure on the property. A breakdown of those costs is included in Schedule SLC-1.

Flemington

In accordance with applicable laws and regulations,

including mandatory remediation deadlines, the Company has completed the remedial investigation at the Flemington site. The Company completed a Remedial Investigation Report which was approved by the site LSRP.

Also during this RAC period, in coordination with JCP&L, the Company conducted design, permitting and procurement activities in support of a Phase III and final soil remedial action at the site. This remedial action, which included the excavation and off site treatment and disposal of MGP impacted soil, wetlands soil and stream sediment and the restoration of the stream and wetlands, began in the winter of 2016 and was completed in the spring of 2017.

Subsequent to this remedial action, the Company and JCP&L are assessing strategies for groundwater remediation at the site. Groundwater investigation will continue into the next RAC period.

Costs Incurred for Flemington

During the current remediation period, July 1, 2016 through June 30, 2017, Elizabethtown incurred net remediation costs of $1,037,781 in connection with the Flemington site. A breakdown of those costs is included in Schedule SLC-1.

Newton

During this period, in accordance with applicable laws and regulations, including mandatory remediation deadlines, the Company and JCP&L has completed the remedial investigation at the Newton site.

Also during this period, the Company and JCP&L continued negotiations with the adjacent property owner in an attempt to reduce the extent of required wetland remediation.

The Company and JCP&L also completed an ecological risk assessment and held technical consultations with the NJDEP concerning ecological risk issues. The Company and JCP&L and the NJDEP are currently not in agreement with the results of the ecological risk assessment and the extent of offsite wetlands and stream sediments that will require remediation. The Company and JCP&L continue attempts to resolve ecological risk issues with the NJDEP.

The Company anticipates the development and implementation of an IRM to address impacts associated with a subsurface gas holder and to remove free and residual product during the 2018 RAC period.

Costs Incurred for Newton

During the current remediation period, July 1, 2016 through June 30, 2017, the Company incurred net remediation costs of $115,575 in connection with the Newton site. A breakdown of those costs is included in Schedule SLC-1.

Q. HAS ELIZABETHTOWN INCURRED ANY MGP-RELATED COSTS THAT ARE NOT SPECIFICALLY RELATED TO PARTICULAR MGP SITES?

A. Yes. In addition to the costs specifically allocated to the individual Elizabethtown MGP sites, the Company has incurred additional costs of $389,032 related to the overall investigation and remediation of the Company's MGP sites. These unallocated costs are included in Schedule SLC-1, Lines 8 and 9. These unallocated costs include internal labor costs in accordance with the Stipulation approved by the Board in the Company’s base rate case proceeding in BPU Docket No. GR09030195 and costs associated with liability cost estimating in accordance with the Stipulation approved by the Board in BPU Docket Nos. GR07080645, GR08090836 and GR09080651.

Q. HAS ELIZABETHTOWN OBTAINED BASE RATE RECOVERY OF ANY MGP-RELATED EXPENSES?

A. No. As a result of the Board’s March 30, 2001 Order in Docket No. GX99030121 et al, Elizabethtown has, since

June 1, 2001, deferred all MGP-related costs for recovery through the RAC component of the SBC.

Q. DO ELIZABETHTOWN'S NET DEFERRED MGP-RELATED COSTS INCLUDE ANY COSTS ASSOCIATED WITH INSURANCE LITIGATION AND PURSUING THIRD PARTY CLAIMS?

A. Yes. Elizabethtown has incurred $479,506 of such costs during the period July 1, 2016 through June 30, 2017 associated with third party claims. Fifty percent of these costs were initially deferred pending receipt of third party recoveries. In the period ending June 30, 2017 third party recoveries amounted to $2,400, allowing for a like amount of the deferred balance to be recovered. As a result, $239,753 is currently being deferred pending receipt of future third party recoveries. This third party recovery amount represents payment in a settlement with an insurance carrier.

Q. ARE THERE ANY SALE OF PROPERTY ALLOCATIONS REFLECTED IN THE DETERMINATION OF THE RAC COMPONENT OF THE SBC?

A. Yes. As shown on RAC Schedule TK-7, an allocation from the sale of the Rahway property is reflected in the RAC component of the SBC for this reporting year.

Q. PLEASE SUMMARIZE THE TOTAL MGP-RELATED EXPENDITURES THAT ELIZABETHTOWN SEEKS TO BEGIN TO RECOVER IN THIS PROCEEDING.

A. As set forth on Schedule SLC-1, Elizabethtown incurred remediation costs of $15,463,461. In this proceeding, after adjusting for the receipt of Third Party Recoveries and deferred litigation costs, the Company is seeking to recover $15,223,708. The net costs are used to calculate the proposed RAC factor in this proceeding.

Q. PLEASE PROVIDE AN ESTIMATE OF THE REMEDIATION COSTS THAT ELIZABETHTOWN IS LIKELY TO INCUR DURING THE PERIOD JULY 1, 2017 THROUGH JUNE 30, 2018.

A. Based on the scope of work planned during this period, I estimate that the Company may incur approximately $27 million of remediation costs during the year ending June 30, 2018. However, this is only a rough estimate. The Company's costs will continue to be driven by its need to comply with applicable laws and regulations and access to third party owned property.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

Pivotal Utility Holdings, Inc. d/b/a Elizabethtown Gas
Manufactured Gas Plant Remediation Program

Summary Statement of Site Expenses
Annual Report
July 1, 2016 through June 30, 2017

Line No.	Description	Consulting/ Remediation	Legal	NJDEP Oversight	Natural Resource Damages (NRD)	Other	(1) **Total Remediation Expenses**	(2) NRD Deferral 100%	(3) Ins. Lit/ Third Party Deferral 50%	(4) Recovery of Prior Deferred Expenses	(5) Third Party Recoveries	**Net Remediation Cost This Period**
1	Elizabeth (Erie Street)	13,350,533	2,002	33,340			**$13,385,875**					**$13,385,875**
2	Elizabeth (South Street)	41,200		3,775			**$44,975**					**$44,975**
3	Rahway	(495,102)		30			**($495,072)**					**($495,072)**
4	Perth Amboy	485,311	12,929	7,550			**$505,790**					**$505,790**
5	Flemington	1,037,781					**$1,037,781**					**$1,037,781**
6	Newton	115,575					**$115,575**					**$115,575**
7	Renora (Erie Street)						**$0**					**$0**
8	Internal					50,233	**$50,233**					**$50,233**
9	Misc.	326,340				12,459	**$338,799**					**$338,799**
10	Insurance Litigation/ Third Party Claims		479,506				**$479,506**		($239,753)	$2,400	($2,400)	**$239,753**
11		$14,861,638	$494,437	$44,695	$0	$62,692	**$15,463,461**	$0	($239,753)	$2,400	($2,400)	**$15,223,708**

Notes:

1 Line 10 - Pursuit of Third Party Claims at 100% of expenses incurred, 50% of which is deferred pending a Third Party recovery.
2 100% of Natural Resource Damages deferred pending BPU resolution.
3 50% of the expenses incurred in the pursuit of Insurance and/or Third Party Claims.
4 Allowable recovery of the deferred expenses incurred in pursuit of Insurance and/or Third Party recoveries.
5 Credit of 100% of amounts received from Third Parties.

Schedule SLC-2

MFR-1 **Please provide a vendor listing for the prior RAC period that contains information concerning vendor expenditures by MGP site, also showing a description of the services provided and the amount of each vendor invoice. The vendor list should include the monthly actual expenditures for the twelve month RAC period.**

Please see attachment MFR-1.1 for vendor expenditures by site and MFR-1.2 for a description of the services provided by each vendor.

Elizabethtown Gas
MGP Vendor Expenditures
July 2016 through June 2017

Vendor Name	Erie St	South St	Rahway	Flemington	Perth Amboy	Newton	Misc.	Ins Litigation/ Ins Recovery	Internal	Total
AECOM, Inc							54,308.05			$54,308.05
Charter Contracting Company LLC	11,321,404.15									$11,321,404.15
Covington & Burling								479,505.81		$479,505.81
Creamer Environmental	126,535.86									$126,535.86
Environmental Cost Management, Inc							7,573.94			$7,573.94
Expense Journal							12,459.27			$12,459.27
GEI Consultants, Inc	1,251,725.46						53,319.50			$1,305,044.96
H&G Public Affairs, LLC	56,536.95				31,121.11					$87,658.06
Henkels & McCoy Inc	261,682.82									$261,682.82
Insurance Recovery (checks)								(2,400.00)		($2,400.00)
JCP&L				1,037,781.35		115,574.60				$1,153,355.95
Kazmarek, Mowrey, Cloud, Laseter, LLP	2,002.00									$2,002.00
Langan Engineering & Environmental		38,328.21			354,189.91		14,797.71			$407,315.83
Larry's Landscaping		2,095.73	1,166.30							$3,262.03
NJ Division of Revenue	33,340.00	3,775.00	30.00		7,550.00					$44,695.00
O'Brien & Gere Inc of North America							196,340.86			$196,340.86
Payroll									50,232.51	$50,232.51
Rahway sale			(518,238.06)							($518,238.06)
Rahway sale - legal cost offset			22,187.47							$22,187.47
Riker, Danzig, Scherer, Hyland					12,928.87					$12,928.87
St. Demetrios Greek Orthodox Church *					100,000.00					$100,000.00
Shelby Mechanical, Inc.	6,974.30									$6,974.30
Surety Abstract Ventures **			(337.12)							($337.12)
TRC	167,137.73									$167,137.73
Triad Security Systems, Inc.			118.93							$118.93
Veolia Environmental Services	158,535.93	776.25								$159,312.18
	$13,385,875.20	**$44,975.19**	**($495,072.48)**	**$1,037,781.35**	**$505,789.89**	**$115,574.60**	**$338,799.33**	**$477,105.81**	**$50,232.51**	**$15,461,061.40**

Note: Charter Contracting, GEI Consultants, Henkels & McCoy, JCP&L and Langan Engineering represent the contractors or suppliers whose invoices exceeded $250,000 in aggregate for the period for the top three sites.

* Related to reimbursement of costs and compensation during the remediation at St. Demetrios Greek Orthodox Church; does not represent a contractor or supplier.

** Related to sale of Rahway property; does not represent a contractor or supplier.

Elizabethtown Gas

MGP Remediation Vendor Services*

July 2016 through June 2017

AECOM

All MGP Sites

- Consulting for Elizabethtown Gas' liability cost estimating

Charter Contracting Company LLC

Erie Street MGP

- Remedial construction

Covington & Burling

All MGP Sites

- Legal services relating to insurance recovery and insurance recovery litigation

Creamer Environmental

Erie Street MGP

- Remedial construction

Environmental Cost Management

All MGP Sites

- Assist in the development of environmental liability cost estimates for ETG's MGP sites

GEI Consultants

Erie Street MGP

- Engineering consulting for the design and implementation of remedial investigation and remedial action activities

All MGP Sites

- Assist in the development of environmental liability cost estimates for ETG's MGP sites

H&G Public Affairs

Erie Street and Perth Amboy MGP

- Public relations and community outreach services

Henkels & McCoy Inc.

Erie Street MGP

- Utility abandonment and relocation

JCP&L

Flemington and Newton MGP

- Responsible party for remedial investigation and remedial action

Kazmarek, Mowrey, Cloud and Laseter

Erie Street MGP

- General legal services relating to remediation issues, i.e., contracts, access agreements, financial reporting

Langan Engineering and Environmental Services

South Street MGP

- Engineering consulting for the design and implementation of remedial investigation activities
- Remedial investigation and remedial action permitting

Perth Amboy MGP

- Engineering consulting for the design and implementation of remedial investigation and remedial action
- Remedial investigation and remedial action permitting
- Preparation of specification and bid documents and analysis of bids received
- Engineering oversight of the remediation construction contractor

All MGP Sites

- Assist in the development of environmental liability cost estimates for ETG's MGP sites

Larry's Landscaping

South Street and Rahway MGP

- Property maintenance at MGP remediation site

New Jersey Dept. of Treasury / Div. of Revenue

All MGP Sites

- NJDEP regulatory oversight

O'Brien & Gere Inc. of North America

All MGP Sites

- ETG MGP program management assistance

Riker, Danzig, Scherer and Hyland

Perth Amboy MGP

- Legal services associated with the negotiation for site access for the Perth Amboy MGP site

St. Demetrios Greek Orthodox Church

Perth Amboy MGP

- Lost Use Compensation

Shelby Mechanical

Erie Street MGP

- Site preparation for remedial action

Surety Abstract Ventures

Rahway MGP

- Return of escrow money related to Rahway property sale

TRC

Erie Street MGP

- Perimeter Air Monitoring and reporting for remedial construction

Triad Security Systems, Inc.

Rahway MGP

- Fire and security alarm systems

Veolia ES

Erie Street and South Street MGP

- Regulated waste disposal services primarily for IDW

*** For a detailed description of specific services provided by a given vendor under the general categories listed above, please see description of services included with individual vendor invoices.**

MFR-2 **Identify the three MGP sites with the highest level of expenditures during the prior RAC period. For each identified site, provide a copy of the latest work plan, remediation report, or major work product submitted to the NJDEP. The copies should include the narrative portion of the report or work plan but need not include the technical supporting workpapers, charts and tables.**

The three MGP sites with the highest level of expenditure during the prior RAC period are the Erie Street former MGP site, the Flemington former MGP site and the Perth Amboy former MGP site. Please see attachment MFR-2.1 for the Remedial Action Workplan for Erie Street; tables, figures and charts have been excluded due to their voluminous nature but will be provided upon request. No work plans or reports for the Flemington and Perth Amboy MGP sites were submitted to the NJDEP during the 2016-2017 RAC period. The majority of costs incurred were associated with negotiating an access agreement with the Church property owner and reimbursement to the Church for the demolition of the existing structure as part of the future remediation.

GEI Consultants

Consulting
Engineers and
Scientists

Remedial Action Workplan

Erie Street Former MGP Site
Remediation Areas B and G

Third Avenue and Florida Street
Elizabeth, New Jersey 07206
NJDEP PI #030684

Prepared for:
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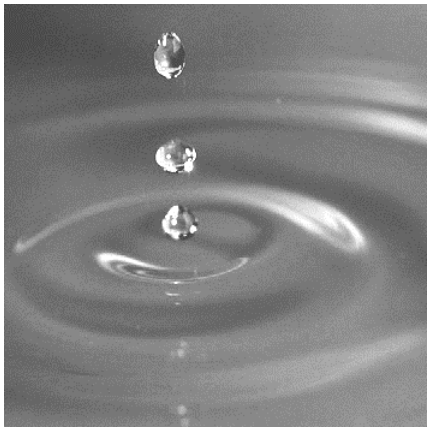
October 2016
Project #1507890



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List of Acronyms and Abbreviations

AHA	activity hazard analysis
AMSL	above mean sea level
AOC	Area of Concern
ARRCS	Administrative Requirements for the Remediation of Contaminated Sites
Bayshore	Bayshore Soil Management, LLC of Keasbey, NJ
BTEX	benzene, toluene, ethylbenzene, and xylenes
CEA/WRA	Classification Exception Area/Well Restriction Area
CFR	Code of Federal Regulations
Clean Earth	Clean Earth, Inc. of Morrisville, PA
CM/SEC	centimeters per second
COCs	contaminants of concern
CQAP	construction quality assurance plan
Creamer	Creamer Environmental, Inc. of Cedar Grove, NJ
CSM	conceptual site model
DGA	dense-graded aggregate
DNAPL	dense non-aqueous phase liquid
EPH	extractable petroleum hydrocarbons
ETG	Elizabethtown Gas Company
EPRI	Electric Power Research Institute
FRP	free and residual product
FSPM	Field Sampling Procedures Manual
GEI	GEI Consultants Inc.
GGBFS	ground granulated blast furnace slag cement
GWQS	Groundwater Quality Standards
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HDPE	high-density polyethylene
IAL	Integrated Analytical Laboratories, LLC in Randolph, New Jersey
IGWSSL	Impact to Groundwater Soil Screening Levels
IRM	Interim Remedial Measures
ISS	in-situ solidification/stabilization
ITRC	Interstate Technology Regulatory Council (ITRC)
JMEUC	Joint Meeting of Essex and Union Counties
LEAF	Leaching Environmental Assessment Framework
LFPS	low-flow purge and sampling
LNG	liquefied natural gas
LSRP	Licensed Site Remediation Professional

MGP	manufactured gas plant
NAPL	non-aqueous phase liquids
NAVD 88	North American Vertical Datum of 1988
NJDEP	New Jersey Department of Environmental Protection
NJDOT	New Jersey Department of Transportation
NJPDES	New Jersey Pollutant Discharge Elimination System
NJTP	New Jersey Turnpike
NRDCSRS	Non-Residential Direct Contact Soil Remediation Standards
PAC	powdered activated carbon
PAH	polycyclic aromatic hydrocarbons
PAMP	Perimeter Air Monitoring Plan
PBR	permit-by-rule
PDI	pre-design investigation
PID	photoionization detector
Pivotal	Pivotal Utility Holdings, Inc.
PSE&G	Public Service Electric and Gas Company
PSI	pounds per square inch
PULS	PULS Inc. of Bethlehem, Pennsylvania
RA	Remedial Action
RAO	Response Action Outcome
RAP	Remedial Action Permit
RAR	Remedial Action Report
RAWP	Remedial Action Workplan
RDCSRS	Residential Direct Contact Soil Remediation Standards
RIR	Remedial Investigation Report
RIWP	Phase II Remedial Investigation Work Plan
SESC	Soil Erosion and Sediment Control
SPLP	Synthetic Precipitation Leaching Procedure
SPPP	Stormwater Pollution Prevention Plan
SRP	Spill Response Plan
Summit	Summit Drilling Company of Bridgewater, NJ
SVOCs	semi-volatile organic compounds
TAL	target analyte list
TCL	target compound list
TCLP	Toxicity Characteristic Leaching Procedure
Tech Regs	Technical Requirements for Site Remediation
The Site	Erie Street Former Manufactured Gas Plant
United	United Construction Services LLC of Montvale, NJ
VI	vapor intrusion
VOCs	volatile organic compounds
WTS	water treatment system

Executive Summary

GEI Consultants, Inc. prepared this Remedial Action Workplan on behalf of Pivotal Utility Holdings, Inc. d/b/a Elizabethtown Gas Company. The purpose of this document is to report the results of pre-design investigation activities and to describe a proposed remedial action to address soil and groundwater impacts at the Erie Street Former Manufactured Gas Plant Site. The remedial action described in this document is for Remediation Area B, Remediation Area G, and a portion of Remediation Area A.

GEI performed pre-design investigation work to delineate the horizontal and vertical extents of MGP impacts in order to establish the limits of the remedial action proposed in this work plan. The pre-design work included a solidification treatability study that measured strength, hydraulic conductivity, and leachability of soil-cement mixes, and identified a target reagent mix of 8 percent total cement with up to 0.5 percent bentonite.

The objectives of the remedial action described in this document are to:

1. Improve groundwater quality by removing soils that exceed the default impact to groundwater soil screening levels above the groundwater table to the extent practicable and treating or removing soils below the groundwater table that have the potential to continue to leach into groundwater, so that the groundwater quality standards can eventually be achieved via monitored natural attenuation.
2. Remove former MGP infrastructure including product lines and gas holder foundations that may be impacted with free and residual product.
3. Remove or remediate free and residual product that may remain in Areas A, B, or G above the bedrock interface, to the extent practicable.
4. Use a combination of institutional and engineering controls to prevent worker contact with soils left in place that may contain contamination above the non-residential direct contact soil remediation standards.

To achieve the objectives listed above, GEI designed a remedial action with these components:

1. Excavation of impacted soil across 4.76 acres with a maximum depth of approximately 10 feet below existing grades, which will generate approximately 65,000 cubic yards of soil to dispose offsite by thermal desorption.
2. In-situ solidification (ISS) of impacted soil across 3.65 acres with an approximate thickness of 15 feet below the bottom of the excavation, which is approximately 95,000 cubic yards.

3. Engineering controls in the form of a cap.
4. Institutional controls in the form of deed notices to define the nature and location of impacts left in place, the use restrictions associated with these impacts, and the engineering controls that were established in response to these impacts.

To predict the effectiveness of the remedial action, GEI performed an ISS treatability study using soil collected from the target ISS treatment volume at the Site. The goal of the study was to identify one or more ISS mix designs that could satisfy the ISS performance criteria for strength, hydraulic conductivity, and leaching. ISS remedies reduce the leaching of COCs to groundwater so that GWQS can be achieved via monitored natural attenuation downgradient of the ISS monolith.

The ISS treatability study evaluated a total of 26 mix designs, and five of the candidate mix designs that satisfied the physical criteria for strength and hydraulic conductivity were evaluated for leach performance. Three of the five candidate mixes achieved the GWQS, and GEI and the LSRP recommended that the full-scale remedial action be performed with a mix design of 8% total cement plus 0.25-0.5% bentonite.

In addition to the ISS treatability study, the effectiveness of the remedial action will be evaluated by a combination of construction quality assurance sampling during the remedial action and groundwater monitoring after completing the remedial action. GEI will implement a groundwater monitoring plan to evaluate conditions in the shallow and deep overburden soils both up-gradient and downgradient of the ISS monolith.

Impacted soils outside of the Project Limits of this remedial action will be addressed in future remedial actions. Groundwater both inside and outside the Project Limits of this remedial action will be addressed in a separate, site-wide, future Remedial Action Permit for groundwater once remediation at the Site is substantially complete. The ISS component of this remedial action will be included in the site-wide groundwater Remedial Action Permit.

The remedial action is planned to begin in October 2016 and be completed in September 2017. Upon completion and reporting of this remedial action, and the recording of a deed notice(s), Remediation Areas A, B, and G will be eligible for a Remedial Action Permit for soil. Then a soils-only restricted use Response Action Outcome can be issued for these Remediation Areas.

1. Introduction

GEI Consultants, Inc. (GEI) prepared this Remedial Action Workplan (RAWP) in accordance with the New Jersey Department of Environmental Protection (NJDEP) *Technical Requirements for Site Remediation* (*Tech Regs*) (N.J.A.C. 7:26E) on behalf of Pivotal Utility Holdings, Inc. (Pivotal) d/b/a Elizabethtown Gas Company (ETG).

The Erie Street Former Manufactured Gas Plant Site (the Site) occupies 24.19 acres of land at addresses 200 through 334 Third Avenue (near its intersection with Erie Street) in the City of Elizabeth, Union County, New Jersey. Figure 1 shows the Site location on a 7.5-minute topographic quadrangle map. Figure 2 shows the Site location on a City of Elizabeth tax map (Block 5, Lot 1381). The center of the Site is located at New Jersey state plane coordinates northing 660425 and easting 575347. The Site is located in a mixed commercial, residential, and light industrial area.

Figure 3 identifies significant features of the Site, which was the location of a manufactured gas plant (MGP). The Site is currently occupied by ETG, who uses the Site for storage, transfer, and distribution of liquefied natural gas (LNG). A chain link fence encircles the perimeter of the Site. Most of the Site is covered by gravel, but there is a paved driveway near the main entrance at Florida Street. A gas regulator building, warehouse buildings, and a maintenance shop are present in the northern corner of the Site. An operations control room building and a security office / locker room building are located near the current main entrance to the Site at Florida Street. A portion of the Site is currently under construction by contractors to ETG to install a new operations control room, security office, maintenance shop / locker room, fire pump, and equipment to liquefy natural gas for storage and distribution. A 75-foot diameter LNG cryogenic storage tank and the containment berm for this tank occupy the central portion of the Site. The remainder of the Site is vacant land.

The Site is divided into eight Remediation Areas as shown on Figure 3. This RAWP addresses Remediation Area B, Remediation Area G, and a portion of Remediation Area A that was inaccessible during a prior remedial action (RA). The RA described in this RAWP will occur within the 7.89-acre portion of the Site that is identified as the "Project Limits" on Figure 3. The Remediation Areas (or "Areas") are described later in this section.

Rather than using the term Area of Concern (AOC), this document substitutes "Remediation Area" and, more simply, "Area." For example, "Remediation Area B" is identical to "Area B." This usage is not in strict accordance with the Tech Regs. However, due to the nature, extent, and age/history of contamination across the Site, and the large number of AOCs (as defined in the Tech Regs) within each Remediation Area that were demolished and are not currently present at the Site, it is not practical to approach the remediation of the Site using AOCs as defined by

the Tech Regs. For this RAWP, the terms "Remediation Area," "Area," and "AOC" are used interchangeably.

1.1 Site History and Areas of Concern / Remediation Areas

Prior to its current use as a natural gas distribution and maintenance facility, the Site operated as a water gas manufacturing plant from approximately 1895 to 1952. In 1952, the plant was retrofitted to manufacture oil gas. The oil gas manufacturing process ceased around 1974, after which the facility was, and still is, used as a storage and transfer facility for LNG, and as an administrative control center for gas distribution. More details on the Site history are available in the *Remedial Investigation Report* (GEI, 2014) (RIR) and other previous reports.

Various environmental consultants have performed remedial investigation work at the Site since the mid-1980s. Based upon the results of historic remedial investigations, GEI organized the Site into the eight Remediation Areas shown on Figure 3. This was done to facilitate review of data and Area-specific conditions and to develop a phased approach to remedial investigations and remedial actions. GEI established the borders of the Areas based on the historic MGP-related operations and the contaminants and impacted media within each Area. The Areas are summarized below, and the outlines of some of the historic structures mentioned below are shown on Figure 3.

The lines separating the Remediation Areas on Figure 3 are approximate. Remedial actions at the Site must fit into the footprints allowed by ETG's operations infrastructure, which includes security fences, active utilities, and occupied buildings. The Area A remedial action footprint shown on Figure 3 does not exactly overlap the Area A outline. Similarly, the Project Limits for this RAWP overlap slightly into Area F and Area E. The entire footprint of the Site will be remediated, but the margins of each Remediation Area may shift slightly from what is shown on Figure 3. Surveys of each as-completed Remediation Area will be included in the Response Action Outcome (RAO) documentation and Remedial Action Permit (RAP) applications.

The *Preliminary Assessment* (GEI, 2015) (PA) identified sub-areas within the larger Remediation Areas/AOCs based on historic and current uses. Appendix A contains a tabulated list of these sub-areas that are within the Project Limits of this RAWP. Appendix A also contains two figures that show where these sub-areas are located with respect to the footprint of the RA. One of the figures shows the locations of the currently existing sub-areas, and the other figure shows the locations of the historic sub-areas. Below are the descriptions of the Remediation Areas/AOCs, which encompass the sub-areas identified during the PA.

Remediation Area A – Gas Storage Area

The primary operations in Area A were storage and management of manufactured gas. Relevant historic features included three gas holders, purifier media boxes, a tar pump house, and a coke

pile. Most of Area A was remediated between October 2014 and June 2015 by excavation and off-site disposal of soils containing free and residual product (FRP), but a portion of Area A containing FRP was inaccessible at that time due to a combination of active subsurface utilities and the active fire pump house. Demolition of the fire pump house and remediation of the FRP impacts remaining in Area A is included in the scope of this RAWP. After these remaining impacts are addressed, GEI will finalize a Remedial Action Report (RAR) for Area A.

The footprint of the portion of Area A remaining to be remediated is approximately 0.93 acres. But a total of approximately 1.87 acres of Area A is included in the Project Limits for this RAWP. A portion of the previously remediated footprint of Area A will be used as the support zone and equipment laydown for this RA.

Remediation Area B – Northern Production Area

Remediation Area B was the primary gas production area. Relevant historic features included the gas retorts (generator house), boiler house, engine rooms, compressor house, gas holders, tar separator, tar storage tanks, and purifier media boxes. This area of the Site exhibits the greatest degree of MGP impacts from past operations and is the primary focus area of this RAWP.

Remediation Area C – Liquid Fuel Storage Area

Remediation Area C contained two former gas oil tank areas, with a combined capacity of 1,650,000 gallons. Remediation Area C is not included in this RAWP.

Remediation Area D – Material Storage Area

Remediation Area D was used primarily for temporary storage/management of oxides (purifier bed media). No significant structures were present in this area during the MGP operations. Remediation Area D is not included in this RAWP.

Remediation Area E – LNG Storage Area

Remediation Area E is the current LNG storage and distribution area. Historic features in Remediation Area E include a drip oil area and a coal and coke pile area. Remediation Area E is not included in this RAWP, although the Project Limits do include a small portion of the Area E footprint as shown on Figure 3. Refer to the prior discussion regarding as-drawn versus as-completed Remediation Areas. The remedy for Area E is likely to be a perimeter containment wall, since the active LNG tank and its associated infrastructure and piping precludes excavation for most of Area E. The solidification remedy for Area B described in this RAWP is intended to serve as one side of the Area E containment wall. This is discussed further in Section 5.

Remediation Area F – Central Production Area

Remediation Area F was the central gas production area. Historic features in Area F include a clarifying pit and gas oil tanks. Area F is not included in this RAWP, although the Project Limits do include a small portion of the Area F footprint as shown on Figure 3. Refer to the discussion above regarding approximate delineations versus as-completed Remediation Areas.

Remediation Area G - Northwestern Production Area

Remediation Area G was the northwest gas production area. Historic features in Area G are former storage tanks containing gasoline and diesel, although no observed contamination has been attributed to these tanks. Figure 3 identifies the footprint of an interim remedial measure (IRM) performed in the northern corner of Area G in 2009 to facilitate the construction of a new metering building for the Transcontinental Gas Pipe Line Company, LLC (Transco) Pipeline. This IRM is described in Section 3.4. Subsequent to this IRM, a consultant retained by Transco performed additional remedial investigation and a remedial action, which is described in Section 3.5.

Remediation Area G contains the Transco metering building, an active gate station and regulator/meter house, gas-fired heaters associated with for the regulator/meter equipment, and several buildings used for equipment storage and maintenance. Remediation Area G is included in this RAWP.

Remediation Area H – Elizabeth River Berm

Remediation Area H consists of the Elizabeth River flood-control berm constructed by the United States Army Corps of Engineers in the 1970s, which is located along the southwest side of the Site. Remediation Area H also includes sediment in the Elizabeth River. The flood-control berm contains a subsurface sheet pile barrier and low-permeability clay core. Remediation Area H is not included in this RAWP.

1.2 Purpose and Organization of this Document

Section 1 summarizes the Site location and history, and explains how the Site is divided into Remediation Areas. This section identifies and provides more detail on the subset of Remediation Areas where the RA will be performed.

Section 2 summarizes the physical setting of the Site and provides details on topography and drainage, regional/local geology, hydrogeology, and migratory pathways, and local and adjacent property use.

Section 3 summarizes the RIR findings and recommendations for the AOCs that are the target of this RA and identifies the remedial technologies that will be used for this RA. It describes the conceptual site model (CSM) and how the proposed RA addresses potential receptors. It explains how in situ solidification/stabilization (ISS) was selected as one of the remedial

technologies for this RA. It also summarizes previous IRMs and RAs completed at the Site, and how the proposed RA integrates with them.

Section 4 summarizes the results of the pre-design investigation (PDI) and identifies the horizontal and vertical extent of the areas to be remediated, and the volume of contamination to be treated or removed. This section also describes sampling for waste classification for offsite disposal, and identifies the contaminants of concern (COCs) and remedial standards for the RA.

Section 5 provides a detailed description of the RA including the work sequence and schedule, a list of required permits, the plan for perimeter air monitoring and strategies for dust/vapor/odor control, and the fill use plan. It lists health and safety and resiliency considerations for the performance of the RA and describes how the Site will be restored to conclude the RA.

Section 6 describes how the effectiveness of the RA will be evaluated. It summarizes the results of a bench-scale ISS treatability study, describes the construction quality assurance plan, presents the post-remediation groundwater monitoring plan, and addresses data quality assurance.

1.3 Objectives

The objectives of this RAWP are to:

1. Summarize the historic MGP operations, physical setting, and conceptual site model for the three Remediation Areas within the Project Limits.
2. Summarize previous interim remedial measures and remedial actions that are relevant to these Remediation Areas.
3. Review the receptor evaluation for the Site.
4. Report the results of recent PDI observations and soil samples and identify the vertical and horizontal extents of impacts to be remediated.
5. Identify the COCs, cleanup goals, and remedial standards.
6. Describe the proposed RA to be performed in pursuit of a soil-only restricted use Response Action Outcome (RAO) for each of the three Remediation Areas within the Project Limits.
7. Present treatability testing results that confirm the ISS mix design will meet the performance criteria for strength, hydraulic conductivity, and leaching of COCs.
8. Describe how the effectiveness of the RA will be evaluated.
9. Summarize the construction quality assurance and data quality procedures that will be employed to maximize project oversight and reporting efficiency.
10. Summarize health and safety precautions for the remedial actions.
11. Establish a schedule for implementation of the RA.

2. Physical Setting

Section 2 summarizes the physical setting of the Site and provides details on topography and drainage, regional/local geology, hydrogeology, and migratory pathways, and local and adjacent property use.

2.1 Topography and Regional Drainage

Figure 1 shows the location of the Site adjacent to the Elizabeth River and just upstream of the Arthur Kill. This area is generally flat, and elevations within the Project Limits range from approximately seven to 10 feet above mean sea level (AMSL) referenced to the North American Vertical Datum of 1988 (NAVD 88). Topography and surficial features are primarily the result of Quaternary glacial events, which both scoured the existing bedrock surfaces and deposited a mantle of lacustrine deposits.

The Site is drained by the Elizabeth River, which borders the Site and is located approximately 800 feet southwest of Project Limits. The Elizabeth River drains to the Arthur Kill/Newark Bay approximately 0.5 miles east of the Site.

2.2 Overburden Soils

A review of the *Web Soil Survey* published by the United States Department of Agriculture National Resources Conservation Service revealed that the soils within the Project Limits are classified as UR: Urban Land. According to the NJDEP's *Historic Fill Map #HFM-02* (Elizabeth Quadrangle), none of the area within the Project Limits is included in the footprint of historic fill that is mapped by the NJDEP (see Figure 4). However, historic fill is present within the Project Limits and is considered a site-wide AOC as defined by the NJDEP.

Based on subsurface explorations performed by GEI, shallow soil stratigraphy within the Project Limits is generally:

- Approximately five to ten feet of historic fill material (brick, wood, concrete, glass, ash, coal fines) spanning from the current ground surface at approximately nine feet AMSL to as deep as zero feet AMSL. Peat soils (meadow mat) are not present within the Project Limits for this RA, but they are present on the Site closer to the Elizabeth River.
- Approximately 15 to 20 feet of red-brown silty clay with varying amounts and interbedded sand and gravel. NJDEP soil maps classify this material as glacial Rahway Till (abbreviation: Qr). Per NJDEP, Rahway Till consists of reddish-brown to light-reddish brown silty sand and sandy clayey silt containing some to many sub-rounded and sub-angular pebbles and cobbles and a few sub-rounded boulders. The till is poorly

sorted, non-stratified, and generally compact below the soil zone. It may include thin, discontinuous beds and lenses of sorted sand and gravel. The maximum thickness is 90 feet, but it is generally less than 20 feet thick. Within the Project Limits, this material spans the range from approximately zero feet AMSL to approximately -15 to -20 feet AMSL.

- Between approximately -15 feet and -25 feet AMSL, the glacial till transitions into weathered siltstone bedrock. Refusal of drilling equipment at bedrock is generally shallower than -20 feet AMSL.

GEI contracted Underwood Engineering Company of Bellmawr, NJ to perform grain size and Proctor density tests on a soil sample composited from soils collected within the Project Limits and spanning from approximately zero to -20 feet AMSL. GEI removed the coarse gravel fraction (estimated at 13 percent by volume) from this sample prior to testing. The sample had 55 percent by weight passing the #200 sieve and was classified a silty clay with some coarse-to-fine sand and little medium-to-fine gravel. The sample had a maximum dry unit weight of 123.0 pounds per cubic foot at an optimum water content of 10.1 percent as measured by the modified-effort Proctor compaction test.

2.3 Underlying Bedrock Formation

The Site is located within the Piedmont Physiographic Province (New Jersey GeoWeb). According to the New Jersey Geologic Survey *Information Circular: Physiographic Provinces of New Jersey* (2006), the Piedmont Physiographic Province is mainly underlain by slightly folded and faulted sedimentary rocks of Triassic and Jurassic age (240 to 140 million years old) and igneous rock of Jurassic age. The land surface in the region is generally characterized as a low rolling plain which slopes gently southeastward.

The regional bedrock consists of red clastic sedimentary rocks interbedded with basalt lava flows and intrusions of Triassic age. The lithological and structural formation associated with the Piedmont Lowlands Physiographic Province is known as the Newark Super Group. The sedimentary rocks of the Newark Group generally strike northeast and dip from 4 to 20 degrees towards the northwest. These rocks in Union County range in thickness from 2,000 to 12,000 feet and have undergone structural deformation resulting in primary and secondary faulting.

Subsurface explorations within the Project Limits encountered bedrock as shallow as -4 feet AMSL and as deep as -27 feet AMSL, but more typically from -15 to -25 feet AMSL.

2.4 Groundwater

GEI evaluated groundwater conditions at the Site via a 42-well monitoring well network and delineated groundwater impacts in the RIR. Groundwater is present in two overburden zones (A and B) and within the shallow bedrock beneath the Site. The overburden A zone is situated

above the peat layer (where present) and in the shallow fill soils and is not confined. Depth to groundwater in the overburden A zone is approximately five feet AMSL (about three to four feet below the existing ground surface elevation). The overburden B zone is situated below the peat layer (where present) and is under semi-confined conditions. Groundwater elevations are consistently 1 to 2 feet higher in the A zone than the B zone.

Groundwater in the A zone flows primarily to the south towards a gap in the flood control berm to the Elizabeth River located at the South Second Street Pump Station. Groundwater in the B zone flows southeast towards the Elizabeth River in the southern two-thirds of the Site and has a relatively flat gradient in the northern one-third of the Site where the Project Limits are located. Based on groundwater and surface water elevation measurements, groundwater in the overburden A and B zones appears to be connected to the Elizabeth River. Local discharge to the river may be impeded by the presence of steel sheet pile and a low-permeability clay core in the flood control berm along the river adjacent to the Site (in Remediation Area H).

Groundwater in the shallow bedrock is under confined conditions and flows east with localized components to the north and south. Groundwater elevation in the shallow bedrock is generally lower than groundwater elevation in the overburden. The degree of connection between the overburden and shallow bedrock is based on the permeability of the intervening deposits and varies widely across the Site. Overburden B groundwater likely flows downward preferentially in areas along the fracture alignment. Tidal influence on groundwater levels is most prevalent in the shallow bedrock in Area D but is not of sufficient magnitude to affect groundwater flow direction in the overburden or shallow bedrock.

Sixteen wells currently exist within the Project Limits, and fourteen of these wells are part of the groundwater monitoring well network at the Site. The other two are former production wells FW-1 and FW-2, which well installed while the MGP was operating, and were intended to produce water for use by the MGP. Some of these existing wells will be abandoned during the RA, and others will be protected. Additional wells will be installed to monitor the RA after it is completed. This is discussed in Section 6.3. Although we expect the soil RA described in this RAWP to improve groundwater conditions after it is completed, site-wide groundwater remedial actions will be considered later, in a separate RAWP.

2.5 Adjacent Property Usage

The Site is located in a mixed commercial, industrial, and residential area. The four sides of the property have boundaries roughly in the northeast, southeast, northwest, and southwest directions. Section 3 discusses a receptor evaluation that was performed for properties in the vicinity of the Site, and the expected effects of the RA on these receptors.

- **Northeast** – Residential properties and some commercial properties are located immediately adjacent to the Site across Third Avenue.

- **Southeast** – Industrial and commercial property is immediately adjacent to the Site across South Second Street and Third Avenue. Across South Second Street is a trucking warehouse. Directly east of the Site across Third Avenue is a treatment, storage, and disposal facility owned by Cycle Chem, Inc., which accepts drum and bulk containers of hazardous and non-hazardous waste. Continuing southeast, a tank farm and the Port of Elizabeth cargo facilities are present on the Arthur Kill. Staten Island, New York is located approximately 3,000 feet southeast of the Site, across the Arthur Kill.
- **Northwest** – An easement for Central Railroad of New Jersey borders the Site along the entire northwest boundary. West and parallel to the railroad is the New Jersey Turnpike (NJTP). The combined width of the railroad easement and NJTP is approximately 350 feet. To the west of the railroad and NJTP is the City of Elizabeth Public Works Department property used for waste management and maintenance of municipal service vehicles.
- **Southwest** – The flood-control berm, on property owned by the City of Elizabeth, borders the Site to the southwest. The Elizabeth River runs adjacent to the berm. Across the Elizabeth River, approximately 200 feet from the Site, is the Edward P. Decher Secondary Wastewater Treatment Facility, a municipal sewage treatment plant owned and operated by the Joint Meeting of Essex and Union Counties (JMEUC).

3. Site Historical Context for the Remedial Action

This section summarizes the RIR findings for the AOCs that are the target of this RA and identifies the remedial technologies that will be used in this RA. It describes the conceptual site model and how the proposed RA addresses potential migratory and exposure pathways and receptors. It explains how ISS was selected as one of the remedial technologies for this RA. It also summarizes previous IRMs and RAs completed at the Site, and how this RAWP integrates with them. This section also provides an update to the previously-performed receptor evaluation.

3.1 Summary of Remedial Investigation Report Findings

The RIR summarized the scopes of work for remedial investigation efforts performed by various environmental consultants at the Site between 1984 and 2009. Section 4 of the RIR lists the documents in which the detailed results of those scopes of work are reported. The primary focus of the RIR was to present and interpret the results of remedial investigation field work performed by GEI between December 2009 and January 2014. This scope of work was described in the *Phase II Remedial Investigation Work Plan* (RIWP) (GEI, 2009), and the 2009 addendum to the RIWP. The objectives stated in the RIWP were to:

- Delineate the extent of COCs and non-aqueous phase liquids (NAPL) in soil and groundwater for consideration of future remedial actions.
- Conduct a bedrock groundwater investigation to evaluate impacts to the deeper groundwater regime.
- Characterize groundwater flow at the Site and evaluate the hydraulic effects of the flood protection berm sheet pile barrier on groundwater flow to the Elizabeth River and other off-site areas.
- Investigate potential preferential pathways.

Subsurface exploration locations installed prior to 2014 are shown on Figure 5. GEI gathered the logs from these subsurface exploration locations from various prior reports into a single group that is included as Appendix B to this RAWP.

Soil Analytical Data

- In Area A, soil concentrations above either the residential direct contact soil remediation standards (RDCSRS) or the non-residential direct contact soil remediation standards (NRDCSRS) were measured for nine semi-volatile organic compounds (SVOCs), one volatile organic compound (VOC) (benzene), and two metals (arsenic and thallium). Concentrations above the regulatory standards were generally measured in soil borings

advanced in the portion of Area A located west-southwest of former gas holders 6 and 7. These data were tabulated in Table 1 of the *Remedial Action Workplan – Remediation Area A* (GEI, 2014) and are not reproduced here.

- In Area B, soil concentrations above either the RDCSRS or the NRDCSRS were measured for eight SVOCs, one VOC (benzene), and one metal (arsenic). Concentrations above the regulatory standards were measured across much of the footprint of Area B, but especially in the corner with the former gas holder foundation near the Florida Street entrance. These data were tabulated in Table 10-2 of the RIR and are reproduced as Table 1 of this RAWP.
- The RIR presented no soil data for Area G other than those associated with the Transco IRM in the far northern corner of Area G, described in Section 3.4 below. These data were tabulated in Table 10-4 of the RIR and are reproduced as Table 2 of this RAWP. (The PDI described in Section 4 of this RAWP includes delineation soil samples collected in Area G near its border with Area B.)
- In the right-of-way of Third Avenue, soil concentrations above either the RDCSRS or the NRDCSRS were measured for four SVOCs and one VOC (benzene). TWP-6 was the most impacted location, with NAPL noted in that soil boring.

Presence of NAPL in Soil and Bedrock

- In Area A, the shallow Overburden A soils (above the meadow mat layer) contain more NAPL than the Overburden B soils. The three locations with FRP noted at depth in Area A were outside of the meadow mat footprint. No dense non-aqueous phase liquid (DNAPL) was noted in the bedrock in Area A. However, during the excavation RA for Area A, FRP impacts likely associated with a former subsurface drip/separator tank west of gas holders 6 and 7 were found to extend to the weathered bedrock interface at approximately -10 feet AMSL. The RA for Area A is described in more detail later in this section.
- In Area B, releases from the main MGP production area have impacted the Overburden A, Overburden B, and the bedrock aquifers. FRP is widely distributed in soils in Area B from the shallow fill to the bedrock contact. Free product is present from the area of the former gas holder at Third Avenue and Florida Street to the former tar separator on the western side of Area B near Areas F and G. DNAPL was observed in bedrock fractures at a maximum depth of approximately -200 feet AMSL. The maximum probable vertical extent of DNAPL at the Site is -250 to -275 feet AMSL. DNAPL has been observed in two former production wells installed for the MGP in the 1920s (FW-1 and FW-2).
- In Area G shallow soils there was one observation of oil sheen in TP-12 performed in 1992 by Dames and Moore in the vicinity of a former gasoline tank. Additional investigation in this area will be conducted as part of the RA, and if necessary soil

excavation work will be conducted. No indication of FRP was observed in other Overburden A or Overburden B subsurface explorations. Sheens and blebs were noted in bedrock at a depth of approximately 117 feet in MW-21(110-120).

- In Third Avenue, FRP was observed in two soil borings: in the Overburden A aquifer at TWP-6, and in the Overburden B aquifer in B-15. Impacts were also noted in shallow soil excavated for the replacement of a sewer line running in the middle of Third Avenue during 2013. The PDI described in Section 4 of this RAWP encountered more widespread and deeper FRP in portions of Third Ave between Delaware and Florida Street.

Groundwater Impacts

- In Remediation Areas A, B, and G, Overburden A groundwater concentrations of benzene, toluene, ethylbenzene, and xylenes (BTEX) and PAHs exceed the NJDEP groundwater quality standards (GWQS). The locations of these groundwater exceedances are coincident with observations of MGP impacts in Overburden A soil.
- In Remediation Areas A, B, and G, Overburden B groundwater concentrations of BTEX and PAHs exceed the GWQS. The locations of these groundwater exceedances are coincident with observations of MGP impacts in Overburden B soil. The GWQS exceedances in Areas B and G coincide with locations of observed impacts in soil, and the occurrences are likely to be related.
- In Third Avenue, benzene concentrations detected in samples collected from TWP-5, TWP-6, TWP-10(2009), and TWP-11(2009) were orders of magnitude above GWQS (maximum concentration of 32,000 μg/L at TWP-6). In TWP-6, PAH concentrations also exceed GWQS. These results were used in selecting locations for final delineation wells MW-23A/B, MW-24A/B, and MW-25A/B.
- In bedrock, dissolved BTEX/PAH concentrations in the bedrock aquifer zone exceed GWQS in central and eastern portions of the Site. The highest BTEX/PAH concentrations were detected in Area B and Area F, in samples collected from MW-2(36-61) and MW-8(31-56). The concentrations are attributed to migration of coal tar DNAPL and groundwater from overburden into bedrock fractures. Concentrations in bedrock decrease moving outward from Area B toward either Area A or Area G, and also decrease with increasing depth.

Ecological Impacts

- The RIR ecological evaluation and conclusions are focused on the Elizabeth River and do not directly pertain to the Project Limits of the RAWP.

3.2 Conceptual Site Model Summary

The CSM is described in Section 15 of the RIR. Below is a summary of the CSM elements that pertain to this RA.

Nature of Release

The releases consisted of products and byproducts of the gas manufacturing processes. Coal tar and lighter phase oils likely entered the subsurface soils from incidental spills and process upsets from tar and oil storage and handling facilities. Leakage from subsurface structures and piping was likely the primary mechanism of release for impacts within the Project Limits of the RAWP.

Free and Residual Product Migration

In the overburden, FRP tends to migrate downward. Presence of meadow mat impedes this downward migration. Within the Project Limits of this RA, the meadow mat layer is absent. In this area, downward migration of coal tar DNAPL occurred from Overburden A to Overburden B and bedrock via more conductive seams and lenses in the soil, and in bedrock fractures. Horizontal migration of NAPL occurred via capillary forces. The RIR concluded that NAPL at the Site is likely not mobile.

Groundwater Impacts Plume/Migration

BTEX and PAHs concentrations exceed GWQS in areas where free and residual product is observed. Site-related groundwater impacts extend offsite into Third Avenue, based on samples collected from test well points. A benzene plume appears to be migrating southward from an area of impacted soil in southern Area A, and this plume includes an off-site non-MGP-related source on the adjacent parcel. (Impacted soil in the southern portion of Area A extending to the edge of the asphalt in South Second Street was removed as part of the RA for Area A, described later in this section.)

Potential Migratory and Exposure Pathways

Potentially complete migratory pathways identified in the RIR that are relevant to this RAWP are listed below. The expected benefits of the proposed RA to potential receptors via these migratory and exposure pathways are described later in this section.

- Soil to groundwater from precipitation inflow, groundwater table fluctuations, or groundwater flow across the Site
- NAPL or impacted groundwater to surface water via sewer infiltration
- Surface soil erosion and migration to surface water and sediments

Potentially complete exposure pathways identified in the RIR that are relevant to this RAWP are:

- Inhalation of vapors from soil and groundwater during excavation by construction workers
- Groundwater accidental ingestion and dermal contact by construction workers in excavations at or below the water table
- Soil dermal contact by human receptors
- Soil ingestion and inhalation by human receptors from fugitive dust

3.3 Receptor Evaluation Update

GEI submitted a Receptor Evaluation Form for the Site on October 15, 2012, and updated the form on May 7, 2014, concurrent with the submittal of the RIR. GEI again updated the form on August 31, 2016. The four primary receptor types are:

1. Land use (focused on sensitive populations like schools and day care facilities)
2. Groundwater (focused on drinking water/potable wells)
3. Vapor/indoor air, and
4. Ecological

Receptors in the vicinity of the Project Limits are residential properties across Third Avenue. The *Site Investigation: VI Report* and addendum (GEI, 2009) demonstrated that indoor air has not been impacted by the Site. Groundwater in the vicinity of the Site is not used for potable purposes. Therefore, indoor air/VI and potable well/drinking water are not receptors of concern.

During the RA the selected remediation contractor (Contractor) will implement engineering controls to minimize fugitive emissions that could affect the residential properties across Third Avenue. Pivotal will implement a perimeter air monitoring plan (PAMP) to document concentrations of dust and volatile contaminants, including benzene, at the fence line. More information on fugitive emissions engineering controls and the PAMP are included in Section 6.

3.4 Previous Interim Remedial Measures

Each of the IRMs summarized below is described in greater detail in the RIR, which also provides references to the primary documents that report these IRMs. The IRMs discussed below are located in or adjacent to the Project Limits for this RAWP.

Transco Excavation

This IRM was performed in the northern corner of Area G in 2009 to facilitate the construction of a new metering building for the Transco Pipeline. Figure 3 shows the Transco IRM footprint.

Soil contamination in this area consisted of PAHs and metals at concentrations above the NJDEP residential direct contact health-based criteria and soil remediation standards, which were the standards in place at that time. A limited soil excavation of approximately 550 cubic yards to a depth of 5.5 to 6.5 below ground surface was performed, with off-site thermal treatment and recycling of excavated soils. Excavated areas were backfilled with certified clean fill. Post-excavation soil samples collected from the sidewalls and bottom of the excavation confirmed regulatory compliance for soils. The Transco IRM is documented in the *Transco Interim Remedial Measure Completion Report* (GEI, 2010).

Third Avenue Sewer Replacement

From November 19, 2012 to May 15, 2013, GEI performed worker-protection air monitoring and environmental oversight on an as-needed basis for the Third Avenue Flood Control Project between South Second Street and Delaware Street. Hatch Mott MacDonald was the engineer of record and provided construction management on behalf of the City of Elizabeth. The project upgraded and replaced the combined sanitary/storm sewer and catch basins on this portion of Third Avenue and connections to sewers on several of the intersecting streets.

Excavations in Third Avenue varied in size from three to 13 feet deep, and were up to 15 feet wide. The contractor encountered MGP-related impacts in excavated soils in Third Avenue for approximately 450 linear feet, from the intersection with Florida Street to the approximate midpoint of the block between Erie Street and Delaware Street. Approximately 1,500 cubic yards of soil with MGP-related impacts were segregated from the excavation and disposed offsite by thermal desorption. The contractor backfilled the excavations with clean fill. A more detailed summary of this IRM is in the RIR, and field observations from this work are included as an appendix to the RIR.

Florida Street Entrance Storm Sewer Replacement

Between July 11 and August 1, 1997, GEI oversaw the installation of 443 linear feet of butt fusion-welded 24-inch diameter high-density polyethylene (HDPE) pipe, two 2.5-foot diameter epoxy coated concrete catch basins, and one 2-foot diameter epoxy coated concrete manhole. The storm sewer is oriented from northeast to southwest, connecting the Third Avenue municipal sewer main to a catch basin located between the operations control building and the LNG fence line. GEI designed this IRM to minimize the possibility of infiltration of contaminated groundwater into this portion of the storm sewer system, which would mitigate the potential for direct contact exposure and offsite migration of contaminated groundwater. The construction of this IRM was documented in the *Storm Sewer Installation Documentation Report* (GEI, 1998).

J. Fletcher Creamer and Son, Inc. of Hackensack, NJ was the contractor that installed this IRM. The trench work encountered numerous active and inactive utility lines. GEI noted visual impacts in the trench sidewalls and groundwater at two locations: 21 feet inside the entrance gate, and 98 feet inside the entrance gate.

This storm sewer and these catch basins are located mostly within the Project Limits for this RAWP and will be protected or replaced by the Contractor during the RA.

Former Production Well Redevelopment and NAPL Removal

Former production wells FW-1 and FW-2 are located within the Project Limits for this RA and their locations are shown on Figure 3. These are not monitoring wells, they were installed while the MGP was operating to produce water for MGP operations. The RIWP called for an investigation of former production wells FW-1 and FW-2. GEI located these wells on July 28, 2010 and determined that the two wells both have 8-inch steel casings. GEI noted strong naphthalene like odors, sheens, and tar blebs in groundwater pumped from the wells. GEI contracted Summit Drilling Company of Bridgewater, NJ (Summit) to clean out and redevelop the wells using an air-rotary drill rig. Summit welded stick-up protectors with locking caps to the wells. NAPL and groundwater recovered from the wells was contained in a 20,000 gallon tank for disposal. Summit developed the wells until no further NAPL was observed in the produced water.

DNAPL Recovery Evaluation

From April to September, 2015, GEI performed an evaluation of DNAPL recovery from three bedrock wells: monitoring wells MW-40(165-175) and MW-40(184-194), and one former production well FW-1(183-193). The objectives of the investigations were to evaluate DNAPL steady-state conditions and accumulation, assess DNAPL recharge rates for each well into each well, and to evaluate equipment performance to identify the optimum tools to recover DNAPL from the wells. The overall goal was to determine whether an on-going DNAPL recovery program is justified for the Site.

The evaluation determined that the average DNAPL recovery rates from deep bedrock wells were 1.7E-2 gallons per day (gal/day) for MW-40(165-175), 5.4E-3 gal/day for MW-40(184-194), and 2.6E-4 gal/day for FW-1(183-193).

FW-1(183-193) is located within the footprint of the RA described in this RAWP. This well, and the other bedrock wells within the Project Limits, will be protected during the RA if the licensed site remediation professional (LSRP) determines that they may be needed in the future.

3.5 Previous Remedial Actions

Area A

In 2014 GEI designed a soil excavation and offsite disposal RA for Remediation Area A. This RA is described in the RAWP for Remediation Area A (GEI, 2014). Pivotal contracted with Creamer Environmental, Inc. of Cedar Grove, NJ (Creamer) to perform the RA, which was implemented under GEI oversight from October 8, 2014 to June 17, 2015. The excavation spanned approximately 4.6 acres of Area A and the bottom of the excavation ranged from approximately 2 feet AMSL to approximately -10 feet AMSL (6 to 24 feet below the existing ground surface). The total weight of soil disposed offsite by thermal desorption was 140,636.53 tons. This RA will be documented in the ***Remedial Action Report – Area A***, which is currently under review by the LSRP and will be produced final by GEI in 2016.

This excavation RA targeted soils impacted with FRP, which were encountered above the meadow mat layer in the southwest portion of Area A. Pivotal and GEI extended the excavation area to the south and east to capture MGP impacts adjacent to the Public Service Electric and Gas Company (PSE&G) 30-inch diameter high-pressure gas line where it crosses a portion of the Site. The shallow sloped excavation in this area extended into the right-of-way with South Second Street, and terminated at the edge of the asphalt pavement.

Deeper impacts in Overburden B soils were encountered in the central portion of Area A where the meadow mat is not present. The Area A PDI subsurface exploration results failed to predict the depth and extent of these impacts, mainly because the direct-push soil borings advanced in this footprint were refused above the impacted depths.

These impacts likely originated from a former subsurface drip/separation structure encountered west of gas holder 7, associated with the former gas purifier media beds. These impacts extended to the contact with weathered bedrock in an area spanning approximately one acre of Area A. Creamer chased the impacts until reaching either clean margins, weathered bedrock, or utility obstructions. At the direction of GEI and the LSRP, Creamer placed a 6-inch compacted layer of clay above the weathered bedrock to separate the inaccessible impacts from the clean backfill.

Approximately 0.93 acres of the original footprint of Area A were inaccessible during the RA for Area A due to ETG operations and the presence of active utilities, such as the fire pump house and LNG boil-off line, but only approximately 0.3 acres of this total have impacts that need to be remediated from the former drip/separation structure. The 0.93 acres of Area A that were previously inaccessible are included in the scope of the RA described in this RAWP.

Transco Remedial Actions – Northern Corner of Area G

A portion of Area G was historically and is currently operated by Transco. As previously noted, a new metering building was constructed by Transco in this portion of Area G. A Preliminary Assessment was conducted by an environmental consultant retained by Transco for this area separate from the former MGP and related only to the Transco-operated portion. The Former Metering Building Doorway No. 1 and No. 2, sump area, and building footing soils were identified as AOCs and were investigated by soil sampling. Elevated concentrations of PCBs, PAHs, and metals (arsenic, mercury, and lead) were identified during site investigation activities. Because PAHs, arsenic, and lead are considered MGP-related contaminants, only the PCBs and mercury were delineated for the Transco operations. After delineation, soils were excavated to a total depth of 12 to 36 inches below the ground surface. Post-excavation samples were collected to verify horizontal and vertical delineation of PCBs. PCB concentrations exceeded the soil cleanup standards in five locations, but the soils could not be removed due to the high water table, proximity to high pressure lines and underground wiring, and proximity to the railroad retaining wall. The excavation was backfilled and capped with certified clean fill. A deed notice for this area has not yet been recorded but is in progress and a RAP and RAO are being pursued for the Doorway No. 1 and Doorway No. 2 AOCs. A RAO was issued in May 2015 for the sump area and footing area AOCs by Richard Calogero (LSRP License No. 576770) of Cornerstone Environmental Group, LLC.

4. Pre-Design Investigation Activities

This section summarizes the results of the pre-design investigation and identifies the horizontal and vertical extent of the areas to be remediated, and the volume of contamination to be treated or removed. This section also describes sampling performed for waste classification for offsite disposal, and identifies the COCs and the remedial standards for the RA.

4.1 Pre-Design Investigation

In 2015, GEI performed PDI subsurface exploration work in and adjacent to the Project Limits for this RA, primarily to delineate the horizontal and vertical extents of MGP impacts in order to establish the horizontal and vertical extents of the RA. The PDI scope of work and results are summarized below.

Goals of the PDI

Although the primary goal of the PDI was to delineate MGP impacts, there were several secondary goals to support the design and implementation of the RA. The goals of the PDI were:

- Delineate horizontal and vertical extents of impacts between the ground surface and the top of bedrock in Area B, Area G, and the portion of Area A still requiring remediation.
- Delineate the horizontal and vertical extent of impacts in areas that will be capped or are above the groundwater table.
- Locate active subsurface utilities in and adjacent to the Project Limits.
- Survey features within the Project Limits that will be relevant to the RA, like the depth, thickness, and location of the gas holder foundations.
- Collect and analyze waste classification soil samples to pre-characterize impacted soil for offsite disposal by thermal desorption.
- Collect bulk soil samples for the bench-scale ISS treatability study.

Schedule of the PDI

The field work occurred in four blocks of time:

- **June 17 to 26, 2015:** Utility mark-out and survey
- **July 13 to September 22, 2015:** Soft-dig utility clearance, waste classification soil sample collection, and sonic drilling to advance soil borings

- **November 10 to 16, 2015:** Utility mark-out, soft-dig utility clearance, and test pitting to clear locations for step-out delineation soil boring locations requested by the LSRP
- **December 7-15, 2015:** Direct-push drilling to advance soil borings at step-out locations cleared between November 10-16, 2015

Subsurface Utility Locate

GEI contracted PULS Inc. of Bethlehem, Pennsylvania (PULS) to perform subsurface utility locating. PULS used a combination of electromagnetic, video, and physical observation methods to identify and trace subsurface utilities. Electromagnetic methods were most effective, and ground-penetrating radar methods were not effective due to the shallow water table.

PULS located numerous subsurface utilities within the Project Limits and traced the locations on the ground surface. PULS also located lines inside the LNG fence line in Remediation Area E to provide a continuous trace of some of the most important active utility lines entering the Project Limits. GEI surveyed the traced locations using a Leica SmartPole and digitized these locations into the electronic base map for the Site.

There are numerous active and derelict utilities within and adjacent to the Project Limits. Safely exposing, identifying, and either protecting or abandoning subsurface utilities will be a key task for the Contractor during the implementation of the RA. Figure 6 shows known and suspected locations of active gas, water, sewer, and electric lines within and adjacent to the Project Limits. The LNG boil-off line, the LNG vaporizer line, the cathodic protection anodes, and the fire suppression water lines are critical infrastructure to work around during the RA.

For clarity, Figure 6 only shows a subset of the traced utility lines that are on the base map for the Site. The lines shown on this figure are some of the most important because they are known to be active and must either be protected or decommissioned during the RA. More utility line traces are included on the design drawings for the RA, and as-yet unknown active and derelict utility lines may be encountered during the RA. The perimeter soft dig effort to expose known and unknown utilities is discussed in Section 6.

Soft-Dig Utility Clearance

After PULS completed the subsurface utility locate scope of work, GEI contracted United Construction Services LLC of Montvale, NJ (United) to provide soft-dig hydro-excavation services to clear proposed soil boring locations to a target elevation of zero feet AMSL (approximately 8 to 10 feet below the existing ground surface). Utility pre-clearance is necessary to drill safely around the numerous active and derelict utilities and other subsurface obstructions either known or suspected to exist at the Site.

United provided a hydro-excavation vacuum truck and operator, and Creamer (contracted to Pivotal) provided a laborer to assist the soft-dig operator. Soft-dig spoils were temporarily stockpiled in a lined, bermed, spoils wash-out area located in Remediation Area C, and periodically loaded and hauled for offsite disposal by thermal desorption.

GEI established the 50-foot-square grid system shown on Figure 7 to cover the target delineation area. The grid spanned an area approximately 850 feet by 450 feet and included a portion of Area G, all of Area B, the un-remediated portion of Area A, and Third Avenue between Florida Street and Delaware Street. The field team planned to advance at least one soil boring in each grid square until the horizontal and vertical limits of MGP impacts were established in soils above bedrock for this target area. Soil boring locations were named alpha-numerically according to the grid system. Each of the PDI locations identified on Figure 7 was cleared by hydro-excavation to the target depth of zero feet AMSL, and 125 of these locations subsequently had soil borings advanced.

Waste Classification Soil Samples

The proposed RA will excavate impacted soils between the ground surface and approximately zero feet AMSL and dispose these soils offsite by thermal desorption. Thermal desorption facilities require sampling for waste classification before they will accept waste for disposal. GEI used the soft-dig utility pre-clearance as an opportunity to collect these waste classification soil samples by combining hydro-excavation and manual hand auger clearance methods.

At each location, the top three feet of fill and debris was cleared with hydro-excavation, then GEI personnel used a hand auger to collect a soil sample from 3 to 3.5 feet below the ground surface. Then the clearance was advanced with hydro-excavation to 4.5 feet, and another hand auger sample was collected from 4.5 to 5 feet. These two hand augers were composited to yield a soil sample representing the first five feet below the ground surface. Then the process was repeated with hand augers from 7 to 7.5 and 9 to 10 feet below the ground surface. The deeper two hand augers were composited to yield a soil sample representing 5-10 feet below the ground surface. More details on the results of waste classification soil sampling are provided later in this section.

GEI also logged the hand auger samples for soil types and impacts, and screened them with a photoionization detector (PID) to measure relative concentrations of VOCs. GEI also observed the sidewalls of the cleared locations for evidence of impacts. The hydro-excavated cleared locations had diameters of approximately 16 inches to a depth of approximately 10 feet below the ground surface. Cleared locations were backfilled with flowable fill within a few days after completion and prior to the advancement of soil borings. GEI recorded and digitized the cleared locations to the electronic base map. Soil logs of the soft-dig cleared locations are included in Appendix B. If a soil boring was later advanced within a cleared location, GEI combined the logs for the soft-dig interval and the soil boring interval into a single continuous soil log.

Delineation Soil Borings

GEI contracted with Summit to provide drilling services for advancement of soil borings. Most of the PDI soil boring locations highlighted on Figure 7 were advanced using sonic drilling methods, using a RS4 rig with 2-inch diameter cores. In areas that the sonic rig could not access due to low mast clearance (e.g. overhead utilities), Summit advanced soil borings using a track-mounted direct-push rig and collected either 1.25-inch or 3-inch diameter cores. Both technologies collected continuous soil cores from the bottom of the pre-cleared depth to the depth of refusal.

GEI elected to use sonic drilling methods for the majority of the PDI subsurface explorations in order to achieve deeper depths of refusal compared to direct-push methods. This decision was triggered by the RA excavation performed in Area A, in which visual impacts were observed at the weathered bedrock contact below the refusal depth of most of the direct-push delineation soil borings that had been advanced during the Area A PDI.

Summit advanced 110 soil borings using sonic methods from August 10 to September 22, 2015. Summit and GEI remobilized from December 7-15, 2015, with a direct-push rig to advance 15 additional soil borings that were requested by the LSRP for step-out delineation. These borings were located inside the maintenance shop, in and adjacent to the large gas holder foundation, and in the sidewalk on the far side of Third Avenue. The locations in the maintenance shop and sidewalk had overhead obstructions that made them accessible only to a low-clearance direct push rig, rather than a sonic rig. The locations in and around the large gas holder were focused on delineation of shallower rather than deep impacts. Each location was pre-cleared by a combination of hydro-excavation and hand augers. Locations on the gas holder foundation were pre-cleared by Creamer with a backhoe to penetrate the holder foundation.

Within the Project Limits, sonic methods typically encountered bedrock from -17 to -22 feet AMSL (25 to 30 feet below the ground surface). Direct-push methods typically encountered refusal from -12 to -17 feet AMSL (20 to 25 feet below the ground surface). GEI environmental geologists logged the soil cores as they were produced, classifying the soil types and the MGP-related impact types and intervals. The field team screened the soil cores with a PID and photographed them. The soil logs are compiled into Appendix B.

GEI personnel identified free product mainly by observation of the soil cores. Soils with only staining and odor were judged not to contain free product. Soils with impacts heavier than a sheen were judged to contain free product. GEI personnel further classified the intensity of MGP-related impacts as blebs and stringers, coated soil grains, and product-saturated soil. These classifications are reflected on the soil logs.

At some of the soil boring locations, where GEI personnel were unable to visually identify free product, but there was evidence of residual product, GEI collected soil samples to provide data to

support a determination of either presence or absence of residual product. Samples collected near the edges of the delineated area to help establish and justify the limits of the RA to meet the objective for the removal of FRP were analyzed for extractable petroleum hydrocarbons (EPH) and, depending on EPH results, for BTEX and PAHs. The results of these analyses are included in Tables 3 and 4. Samples were analyzed by Integrated Analytical Laboratories, LLC in Randolph, New Jersey (IAL).

ISS Treatability Study Soil Samples

During the PDI, GEI field personnel collected approximately 400 pounds of bulk composite soil from a total of 14 soil borings within the anticipated remediation footprint. The composite soil samples spanned the depth of each boring from approximately zero feet AMSL to the termination depth of the boring. This is the approximate depth range for which ISS will be performed. GEI packed the composite soil into 12 clean, sealed 5-gallon buckets and shipped it to the treatability lab of Geosystems Consultants, Inc. in Fort Washington, PA for use in the ISS treatability study. The fourteen soil boring locations that contributed soil to these composite samples are noted on Figure 7. The locations are widely spaced across the target remediation area and are representative of the soils to be treated using ISS. Sections 5 and 6 include more details on the ISS treatability study.

Summary of PDI Findings

These are the significant findings of the PDI:

- Several active utilities that are critical infrastructure for the operation of the LNG facility are located either within or directly adjacent to Project Limits for the RA. These active utilities include gas lines, water lines, electrical and communication lines, and sewer lines. The LNG boil-off line, the LNG vaporizer line, and water lines for the LNG facility fire suppression system are especially important to protect and work around. Many utilities supporting the control room and guard house are currently active but will be decommissioned by Pivotal as part of the transition of operations to the new structures currently under construction in Remediation Area A.
- Five aboveground structures require demolition to complete this RA. The structures are the control room, the guard house, the fire pump hose, the gym, and the former guard shack.
- The 340,000 cubic foot former gas holder foundation is at approximately -2 feet AMSL and is of unknown thickness and construction. No information is available on whether the foundation is pile-supported. The walls of this holder were encountered at 6 feet AMSL. This holder is filled with soil and debris that is not highly impacted. The native soil below this holder is highly impacted, and impacts related to this holder extend offsite to the north into the right-of-way of Third Avenue.

- FRP impacts extend offsite into the right-of-way of Third Avenue between Delaware Street and Florida Street. The most distant soil borings from the Site that contained FRP are Y22, Y23, Y28, and Y30. PDI soil samples collected from soil intervals with FRP in soil borings in Third Avenue exceed NRDCSRS for benzene and some PAHs (refer to Table 3). Additional step-out delineation borings are planned in this area and the impacts in Third Avenue will be addressed in a separate, future RA.
- The 1,000,000 cubic foot former gas holder foundation is at approximately 4 feet AMSL and consists of six to 12 inches of unreinforced concrete overlain by 0.25-inch riveted steel plate. FRP impacts are present in soil above and at the surface of this holder, and in soils immediately below the western edge of the holder foundation. Impacts were not observed more than a few feet below the edge of the holder foundation, so no deep excavation or ISS is planned for this area.
- Deep soil impacts in Remediation Area A extend beneath the fire pump house but do not connect with deep soil impacts in Remediation Area B. The impacts in Area A seem to be associated with the former drip/separation structure identified during the RA for Area A, while the impacts in Area B seem to be associated with former structures in Area B.
- Shallow soil impacts are present in Remediation Area G at its border with Remediation Area B, which likely originated from former structures within Remediation Area B. But PDI soil samples collected below the water table from the most visually impacted intervals of delineation soil borings in this vicinity do not exceed the RDCSRS or the NRDCSRS for BTEX or PAHs (refer to Table 3 and Figure 8).
- Shallow soil impacts are more extensive than deep soil impacts within the Project Limits. Shallow soil impacts also have generally higher PID screening measurements than deeper impacts, which suggests that shallow soils have both a higher concentration of VOCs and a higher concentration of EPH than deeper soils.
- The depth of deeper soil impacts within the Project Limits is variable, but impacts were observed to extend to the interface with weathered bedrock in many of the soil borings. We know from prior subsurface exploration work, including bedrock wells, that NAPL is also present in bedrock fractures within the Project Limits.
- Shallow impacts more uniformly distributed/smeared across the soil interval from approximately five feet AMSL to zero feet AMSL, which consists of a combination of historic fill and the top layer of native soil, and coincides with the typical depth range for the shallow groundwater table. Deeper intervals of native soil tend to contain discrete intervals of FRP, concentrated in the more conductive sand or gravel lenses.
- The maximum depth at which bedrock was encountered for the sonic borings was approximately -31 feet AMSL (39 feet below grade) in boring MN1112. The average depth at which bedrock was encountered was approximately -17 feet AMSL (25 feet below grade). Weathered bedrock is typically present several feet above bedrock.

- Below the historic fill layer, the predominant native soil type within the Project Limits is a lean clay with a poorly-sorted sand fraction and increasing gravel fraction with depth.
- Visual observations of "sheen" in soil samples correlate with EPH concentrations of less than 1,000 mg/kg and therefore do not indicate the presence of residual product.

4.2 Remediation Target Areas and Volumes

GEI used the visual and analytical results from soil explorations during the PDI and prior remedial investigations within the Project Limits to establish the target areas and volumes for the RA described in this RAWP. The Project Limits include Area G, Area B, and a portion of Area A that was not part of the RA for Area A completed in June 2015. Soil analytical results for Area A were tabulated in the RAWP for Area A and are not reproduced here. Soil analytical results for Area B and Area G were tabulated in the RIR and those tables are reproduced as **Tables 1 and 2** of this RAWP. Soil analytical results for samples collected during the PDI are included as **Tables 3 and 4** of this RAWP.

Figure 8 shows the visual impacts identified during the PDI and previous investigations and also shows the RA target areas, including the excavation-only areas and the ISS monolith areas. The vertical limits of the RA are illustrated on **Figures 9, 10, and 11**, which show three cross-sections through the remediation target volumes, with color-coded impacts. The locations of these cross-sections are identified on **Figure 8.** The target excavation and solidification depths and horizontal extents are shown on these figures, along with the approximate depths of surface fill, native soil, and bedrock.

The total soil excavation footprint is 4.76 acres and will generate an estimated volume of approximately 65,000 cubic yards of soil to dispose offsite by thermal desorption. Approximately the top half of this soil volume is non-native fill material, and the bottom half of this volume is native soil. The average wet unit weight of the excavated soil volume is estimated to be 1.7 tons per cubic yard, so the total weight of soil to be excavated is approximately 110,500 tons. This estimate contains no contingency for over-excavation, heavier-than-expected soil, or cutting of swell volume from the ISS remedy.

Within the soil volume to be excavated, the Contractor will encounter substantial volumes of subsurface piping, foundations, and former MGP process structures. Up to half of the excavation footprint may be obstructed by derelict structures, which we estimate could generate up to 12,000 tons of rubble to be disposed offsite. The RA does not plan to make beneficial reuse of un-impacted soil or concrete, because we do not expect to encounter sufficient volume of un-impacted material to justify the sampling, stockpiling, and handling that is necessary for reuse.

The total solidification footprint is 3.65 acres. The smaller monolith area is 0.28 acres and the larger monolith area is 3.37 acres. Solidification will be performed from approximately zero feet AMSL until the solidification equipment is refused at bedrock. The depth of refusal will vary

across the solidification footprint and is difficult to predict in advance, but we estimate the average elevation of refusal will be -15 feet AMSL. On this basis, the total solidification target volume is estimated to be 95,000 cubic yards. This estimate contains no contingency.

The solidification target area may be adjusted during the RA based on observations from additional delineation soil borings advanced during the RA. Section 6 contains more discussion of the areas where additional delineation soil borings are planned. Access to these areas is currently limited by obstructions that will be removed during the RA.

In the direction of Remediation Area G and Remediation Area A, the soil excavation and ISS remedies will be performed until the limits of FRP are reached. Figure 8 shows the limits of the proposed ISS and soil excavation activities.

The RA for Area E likely will be containment with a low-permeability perimeter wall due to the inaccessibility of soils directly beneath the active LNG tanks and supporting infrastructure. The edge of the Area B ISS monolith is intended to serve as a portion of that perimeter containment wall. But the edge of the Area B monolith shown on Figure 8 and on the design drawings is intentionally offset to the northeast (away from the LNG tank) at least 10 feet horizontally from the utility obstructions that lie between Area B and Area E. This offset will provide space for the designer of the RA for Area E to install a low-permeability wall directly adjacent to the Area B monolith between the edge of the monolith and these utility obstructions, if that is deemed necessary.

4.3 Waste Classification Soil Samples

The two thermal desorption facilities that will be used for offsite disposal of excavated soils containing MGP impacts are Bayshore Soil Management, LLC of Keasbey, NJ (Bayshore) and Clean Earth, Inc. of Morrisville, PA (Clean Earth). These facilities received impacted soil excavated during the RA for Area A.

The two facilities have different analyte lists and sampling frequencies to pre-characterize soil for disposal. During the soft-dig utility pre-clearance for the PDI, GEI collected waste classification samples to meet the requirements of each facility. Samples were analyzed by IAL.

The waste classification submittal packages to each facility are included as Appendix C. The submittal packages include the cover letters and summary data tables. The full laboratory reports, which were submitted to each facility, are excluded from Appendix C for brevity.

A total of 24 composite samples and 98 grab samples were collected and analyzed for Clean Earth. GEI compiled, summarized, and reported the results of these samples to Clean Earth in a submittal dated July 13, 2016. The samples should be sufficient to pre-characterize up to 36,000 tons of soil for disposal at Clean Earth.

A total of 161 composite samples were collected and analyzed for Bayshore. GEI compiled, summarized, and reported the results of these samples to Bayshore in two submittals, the first dated November 3, 2015, and the second dated July 13, 2016. The samples should be sufficient to pre-characterize up to 120,750 tons of soil for disposal at Bayshore.

The estimated (no-contingency) soil disposal tonnage for this RA is 110,500 tons. It is likely that the actual tonnage disposed will be higher due to over-excavation and disposal of swell from ISS. If characterization for additional tonnage becomes necessary for one or both disposal facilities during the course of the RA, GEI will collect and analyze additional samples.

4.4 Constituents of Concern and Applicable Remedial Standards

The COCs for this RAWP are presented in the list below. The excavation and capping remedial technologies in this RA are specific to soil, but the ISS remedial technology is both a soil and a groundwater RA. The COCs in the list below apply to both soil and groundwater. COCs on this list are based on one of the following criteria:

- Multiple detections exceeding the lesser of either the NRDCSRS or RDCSRS in the 2014 RI, 2015 PDI, or 2015 waste classification efforts. These contaminants pose a potential risk to direct contact with impacted soils and are addressed by the RA, which is designed to prevent direct contact with these contaminants.
- Multiple detections in soil exceeding the default impact to groundwater soil screening levels (IGWSSL). The RA is designed to remove IGW impacts in soil via excavation and/or ISS, except in cases where the impacts are either inaccessible or resulting from historic fill.
- Multiple detections exceeding the GWQS in groundwater samples collected from monitoring wells within or closely adjacent to the Project Limits and screened either in Overburden A or Overburden B. The RA is designed to improve groundwater quality in order to attain the GWQS for these contaminants following remediation.

Vapor intrusion is not a concern at the Site, so contaminants related to VI are not included on this list. Compounds and analytes that were detected infrequently and at concentrations barely above the GWQS or soil screening levels are also not included on this list. Of the 17 typically analyzed PAHs, only anthracene, fluoranthene, and pyrene did not meet the criteria listed above and are excluded from this list.

COC	NRDCSRS (mg/kg)	RDCSRS (mg/kg)	IGWSSL (mg/kg)	GWQS (µg/L)
VOCs				
Benzene	5	2	0.005	1
Toluene	91,000	6,300	7	600
Ethylbenzene	110,000	7,800	13	700
Xylenes	170,000	12,000	19	1,000
Isopropyl benzene	NS	NS	NS	NS
Styrene	260	90	3	100
SVOCs				
2-Methylnaphthalene	2,400	230	8	30
Acenaphthene	37,000	3,400	110	400
Acenaphthylene	300,000	NS	NS	100
Benzo[a]anthracene	2	0.6	0.8	0.1
Benzo[a]pyrene	0.2	0.2	0.2	0.1
Benzo[b]fluoranthene	2	0.6	2	0.2
Benzo[g,h,i]perylene	30,000	380,000	NS	NS
Benzo[k]fluoranthene	23	6	25	0.5
Chrysene	230	62	80	5
Dibenz[a,h]anthracene	0.2	0.2	0.8	0.3
Fluorene	24,000	2,300	170	NS
Indeno[1,2,3-cd]pyrene	2	0.6	7	0.2
Naphthalene	17	6	25	300
Phenanthrene	300,000	NS	NS	NS
Metals/Metalloids				
Antimony	450	31	6	6
Arsenic	19	19	19	3
Beryllium	140	16	0.7	1
Cadmium	78	78	2	4
Lead	800	400	90	5
Mercury	65	23	0.1	2
Other				
Cyanide (total)	23000	1600	20	100

NRDCSRS – Non-Residential Direct Contact Soil Remediation Standard
RDCSRS – Residential Direct Contact Soil Remediation Standard
IGWSSL – Impact to Groundwater Soil Screening Level (default)
GWQS – Groundwater Quality Standard
NS – no standard

5. Detailed Description of the Remedial Action

This section provides a detailed description of the RA including the work sequence and schedule, a list of required permits, the plan for perimeter air monitoring and strategies for dust/vapor/odor control, and the fill use plan. It lists health and safety and resiliency considerations for the performance of the RA and describes how the Site will be restored after the RA.

5.1 Objectives of the Remedial Action

The objectives of the RA described in this RAWP are to:

1. Improve groundwater quality by removing soils that exceed the default IGW soil screening levels above the groundwater table to the extent practicable and treating or removing soils below the groundwater table that have the potential to continue to leach into groundwater, so that GWQS can eventually be achieved via monitored natural attenuation.
2. Remove former MGP infrastructure including product lines and gas holder foundations that may be impacted by FRP.
3. Remove or remediate FRP that may remain in Areas A, B or G to the extent practicable above the bedrock interface.
4. Use a combination of institutional and engineering controls (i.e. deed notice and cap) to prevent worker contact with soils left in place that may contain COCs above the NRDCSRS.

After completing the RA and recording the deed notice(s), ETG will apply for a Remedial Action Permit (RAP) for soils for Area A, Area B, and Area G. After the RAP is issued by NJDEP, the LSRP should be able to issue soils-only restricted use RAOs for Area A, Area B, and Area G. This will include individual AOCs that were identified in the case inventory document, but were specifically investigated during the PDI or identified in this RAWP.

Impacted soils outside of the Project Limits of this RA will be addressed in future RAs. Groundwater will be addressed in a separate, site-wide, future RAP after site-wide remediation is substantially complete. The ISS component of this RA is a groundwater remedy and will be included in the site-wide groundwater RAP.

5.2 Selected Remedial Technologies

The Project Limits include Area G, Area B, and the un-remediated portion of Area A. As described in the RIR summary sections above, the depth and degree of impacts varies widely across these areas, so a combination of remedial technologies is warranted.

GEI and Pivotal selected three remedial technologies to use within the Project Limits of this RAWP: excavation, ISS, and capping. The subsections below briefly describe each technology and the conditions to which it applies.

Restricted Site Use – Engineering Control (Cap)

Within the 7.89-acre Project Limits, approximately 3.13 acres are not impacted by FRP in overburden soils, but soils with COCs at concentrations above the RDCSRS and NRDCSRS may still exist within these areas, due to the presence of either historic fill or MGP-related impacts other than FRP. A cap will be installed as an engineering control to restrict Site use and to mitigate exposure and prohibit unauthorized contact with impacted soils left in place.

Excavation and Offsite Thermal Desorption

Excavation and offsite disposal via thermal desorption will be used for impacted soils within the Project Limits that are located shallower than approximately zero feet AMSL. After treatment, the soils will be recycled by the disposal facility for offsite use. None of the desorbed soils will be returned to the Site as fill. The excavation footprint within the Project Limits is approximately 4.76 acres. Impacts in overburden soil deeper than zero feet AMSL are present across approximately 3.65 acres of this footprint, and will be addressed with ISS as described in the next subsection. The remaining approximately 1.1 acres of the excavation footprint do not have deeper FRP impacts in overburden soil, so this area will be remediated by excavation alone. Excavation will proceed until either the horizontal and vertical limits of FRP are reached – based on visual observations made in the field – or until the Project Limits or some impassable obstruction is reached.

In Situ Solidification/Stabilization

In situ solidification/stabilization will be used for soils with FRP within the Project Limits that are located deeper than approximately zero feet AMSL. The ISS footprint within the Project Limits is approximately 3.6 acres, consisting of two discrete footprints of approximately 3.3 and 0.3 acres. Section 4.2 contains more details on the ISS target areas and volumes. Excavation will be performed for soils shallower than zero feet AMSL within the ISS footprint prior to the performance of ISS as noted above. ISS will be installed to refusal, which is likely to be at the overburden contact with weathered bedrock.

As described previously, the RA for Area A was a large-scale soil excavation with offsite disposal via thermal desorption. The RA encountered previously-unknown FRP impacts at the top of weathered bedrock across almost an acre, and this substantially increased the excavation quantities. Despite the deeper excavation, not all of the impacts at the weathered bedrock interface in Area A could be removed. Within the Project Limits for the RA described in this

RAWP, we already know that FRP extends to the bedrock interface and beyond, into bedrock fractures.

Because an excavation-only RA could not remove all of the FRP known to be present within the Project Limits, GEI recommended a combination of excavation and ISS to remediate FRP-impacted overburden soils and prevent continued downward migration of FRP into bedrock. ISS has been demonstrated to be effective at stabilizing FRP and reducing leachability of organic contaminants related to MGP operations at the Camden Coke Works site. Camden Coke Works was completed in 2013 and was the initial demonstration project for using ISS for the remediation of former MGP sites in New Jersey. Since that time remediation of MGP sites using ISS has spread to other utilities with former MGP sites in New Jersey and is now considered an accepted alternative to excavation, especially at sites where removal of FRP is difficult due to geologic conditions and site infrastructure.

The Electric Power Research Institute (EPRI) conducted a study in 2009 on leachability testing of ISS material from MGP sites. This study recommended a new approach to assessing leachability compared to traditional approaches that relied on Toxicity Characteristic Leaching Procedure (TCLP) and Synthetic Precipitation Leaching Procedure (SPLP) to model leaching of contaminants at MGP sites being remediated using ISS. The new approach used the Leaching Environmental Assessment Framework (LEAF) tests as a basis for assessing leachability from the ISS mass (EPRI, 2009). The Technical Guidance used to develop performance specifications for using ISS was prepared by the Interstate Technology Regulatory Council (ITRC) in cooperation with several experts in the field and regulatory agencies including the New Jersey Department of Environmental Protection. The guidance document *Development of Performance Specifications for Solidification/Stabilization* (ITRC, 2011) provides the framework for using ISS and was used in conjunction with the EPRI study as the basis for the ISS RA documented in this RAWP.

A technical consultation meeting was held July 14, 2015, between GEI, Pivotal, the LSRP, and NJDEP. The purpose of this meeting was to establish the regulatory basis for using ISS at the Site. A memo summarizing this meeting is included as Appendix D. The primary outcome of this meeting was that the attendees agreed that ISS was an appropriate technology to use in Remediation Area B.

Another outcome of the technical consultation meeting was confirmation from NJDEP that a permit-by-rule (PBR) is no longer required to implement ISS, so long as standard admixtures such as bentonite, blast furnace slag cement, and portland cement are used. Since a PBR is not required, a post-remediation groundwater monitoring plan is included as part of the RAWP. The proposed post-remediation groundwater monitoring plan is described in Section 6.3.

The justifications for including ISS as a remedial technology are numerous:

- Complete removal of FRP within the Project Limits via excavation is impossible because it extends into weathered bedrock and bedrock.
- Deep excavation would require a low-permeability layer to be placed on top of impacted bedrock to minimize the potential for recontamination of clean fill. ISS creates a low-permeability monolith to the contact between overburden soils and weathered bedrock.
- ISS has been successfully implemented at former MGP sites in New Jersey, including for soils containing FRP.
- ISS minimizes the need for deep excavation, which would be logistically challenging around the Site infrastructure and nearby roadways, and potentially disruptive to neighbors.
- There are no plans to transfer the property – it will remain under control of ETG, as part of the active LNG facility.
- Even when ISS is implemented, it still requires substantial excavation first. The subsurface former MGP infrastructure will be removed and disposed offsite, including gas holder foundations and tar separators. However, portions of foundations and structures may not be removed if field observations indicate limited impacts below the structures.
- Shallow soils above approximately zero feet AMSL, which are highly impacted across much of the target area, will be excavated and disposed offsite in order to create sufficient freeboard volume for the ISS to be installed.
- ISS will have either a neutral or positive effect on bedrock DNAPL. If DNAPL currently in overburden soil is still capable of migrating to bedrock, then ISS will eliminate this potential migratory pathway.
- The ISS monolith may be useful as a component of other RAs at the Site.

5.3 Expected Effects of the Remedial Action

On Regulatory Cleanup Goals

This subsection lists the regulatory cleanup goals identified in the RIR and how the proposed RA aligns with these goals:

Cleanup of soils on site to NRDCSCS with capping and restricted site use. In areas where excavation cannot fully remove direct contact contaminants, in areas where contaminants remain as part of the ISS mass, and in other areas with low level impacts (including historic fill), an engineered cap, deed restriction and RAP for soil will be required to prevent direct contact with underlying soils because soils in these areas may still contain concentrations of COCs above the RDCSRS and NRDCSCS.

Removal of free and residual product from soil. Where FRP is present shallower than zero feet AMSL, it will be excavated and disposed offsite by thermal desorption. Shallow impacts will be over-excavated until visually clean margins are established, or the Project Limits are reached. Where FRP is present in soil deeper than zero feet AMSL, it will be treated by ISS that will extend to the contact between overburden soils and bedrock.

Removal of free and residual product from bedrock where practicable. This RA will not directly address FRP in bedrock. To the extent that FRP currently in overburden soils could migrate to bedrock, the RA will eliminate this migration pathway by either removing via excavation or treating via ISS the FRP in overburden soils. This RA will protect the existing bedrock wells that may be needed for future groundwater monitoring or DNAPL collection.

Treatment and containment of free and residual product in Area E. The ISS remedial technology will create a low-permeability soil-cement monolith along a portion of the border between Area B and Area E. This portion of the monolith for Area B is intended to function as one side of the Area E perimeter containment wall.

Hydraulic control and treatment of groundwater in isolated areas. Hydraulic control and treatment of groundwater is likely to be necessary within the Area E perimeter containment wall, once it is installed. As described in the previous point, the ISS monolith for Area B described in this RAWP will form a portion of the perimeter containment wall for Area E.

Monitored natural attenuation of dissolved-phase impacts in groundwater. The excavation and solidification technologies to be used in this RA will remove impacted soil within the excavated or treated volume from contact with groundwater at the Site. Soil above the ISS monolith and groundwater table that is above NJDEP's default IGWSSL will be excavated and disposed offsite by thermal desorption. The excavated soil, and soil within the ISS monolith, will no longer be a continuing source of dissolved-phase impacts in groundwater. Dissolved-phase impacts can leach from the ISS monolith, as discussed further in Section 6. New and existing monitoring wells will be used to assess the effectiveness of the RA, as discussed in Section 6.3.

On Potential Receptors

This subsection lists the primary types of receptors and how the proposed RA will address these receptors:

Land use – Residential properties are closely adjacent to Project Limits, across Third Avenue from the Site. The updated receptor evaluation did not discover any sensitive populations like schools or day cares in close proximity to the Site. Residents may notice odors from the Site when impacted soils are exposed during the excavation and solidification remedies. Proposed engineering controls for limiting fugitive emissions of noise, dust, odors, and VOCs are listed

and described in Section 5.10, along with details on the community-protection PAMP that Pivotal will implement during the RA.

Vapor/indoor air – Prior work determined that Site-related impacts in soil and groundwater are not affecting indoor air quality for the residential properties across Third Avenue. But, as noted above, residents may notice increased odors from the Site while the RA is underway. By removing the FRP impacts for the Site, or isolating them from contact with groundwater, the RA eliminates FRP within the excavated/treated volume from potentially contributing to vapor/indoor air quality problems in the future.

Groundwater – The updated receptor evaluation did not discover any potable groundwater wells in close proximity to the Site. Nevertheless, by removing the impacted soil from the Site, or isolating them from contact with groundwater, the RA eliminates these impacts as a continuing source to groundwater. New and existing monitoring wells will be used to assess the effectiveness of the RA, as discussed in Section 6.3.

Ecological – The ecological receptors identified at the Site are in Remediation Area H, adjacent to the Elizabeth River, which is over 700 feet distant from the nearest edge of the Project Limits for this RA. The RA is not likely to have much effect on these receptors. But the sewer system in Third Avenue, to which the storm sewer within the Project Limits connects, is a combined storm/sanitary system that can discharge directly to surface water during heavy precipitation events. Infiltration of NAPL and contaminated groundwater to the storm sewer was a potential migratory pathway identified in the RIR. The RA will eliminate this potential migratory pathway for impacts within the remediated soil volume.

5.4 Remediation Sequence, Coordination, and Schedule

The fact that the Site houses an active LNG facility and is an operations hub for ETG personnel poses significant constraints on the coordination, sequencing, and implementation of the RA. ETG is currently constructing new facilities on the remediated portion of Area A and plans to transition equipment and personnel to these new facilities in the fourth quarter of 2016. ETG also plans to decommission the fire pump house and many of its associated utilities as part of this move of operations to Area A, where a new fire pump will be installed.

The Project Limits encompass several buildings that are currently occupied by ETG and it is likely that these buildings will still be occupied when the Contractor mobilizes to the Site. This means the Contractor will share space with ETG personnel inside the Project Limits for an as-yet-undetermined length of time, and remediation will yield to the requirements of the operating facility.

A table of tasks/milestones with estimated start and end dates is included below. The period of most intense coordination with ETG will be during the first few months when several of the

buildings scheduled for demolition during this RA are still occupied by ETG. During this time the Contractor will be able to install temporary facilities and controls such as perimeter erosion controls, construction entrances, jobsite trailers, temporary utilities, and the water treatment system. Then the Contractor can proceed with utility mark-out, demolition of unoccupied structures, and the start of the perimeter soft-dig hydro excavation to expose and protect/abandon utilities within the excavation limits.

The excavation and ISS footprint is large enough that the Contractor should be able to start mass excavation in the northwest, away from the occupied ETG buildings, and proceed toward the southeast. It is possible that several months of work could be performed before the Contractor begins to be obstructed by the occupied buildings and the utilities serving them. By that time, in late 2016 or very early in 2017, ETG plans to have vacated the buildings and moved into Area A. If that schedule holds, then the Contractor will continue to move southeast across the remediation footprint and conclude the work in the vicinity of the fire pump house, which must be demolished and its footprint remediated.

Perimeter soft dig will be the first ground penetrating activity. Once a sub-area is cleared of utilities, mass excavation and removal of abandoned subsurface structures can proceed. ISS will start after a sufficiently large work area is cleared of obstructions by mass excavation. ISS will follow the excavation across the remediation footprint. Backfill will follow the ISS operation after the swell is cured and trimmed to the target elevation approximately four feet below the final restoration grade. Fine grading and installation of the surface demarcation geotextile and gravel cover will follow the placement and compaction of backfill. Restoration will be the final step, and it will consist of installing permanent fences and gates, restoring gravel and asphalt driveways, mending and extending monitoring well protective casings, and trenching new storm sewer lines and catch basins. More details on the implementation of each remedial technology are provided later in this section.

Task / Milestone	Estimated Task/Milestone Start Date	Estimated Task/Milestone Completion Date
Pre-Design Investigation	June 2015	December 2015
Waste Classification Soil Sampling	July 2015	August 2015
Prepare Plans and Specifications	March 2016	June 2016
Prepare and Submit Permit Applications	May 2016	September 2016
Solicit Remediation Contractor Bids	June 2016	August 2016
Soil Acceptance for Thermal Desorption	July 2016	September 2016
Retain Remediation Contractor	August 2016	September 2016
Submit Public Notification Letters	September 2016	October 2016
Mobilization and Site Preparation	October 2016	November 2016
Demolish Aboveground Structures	November 2016	February 2017
Remediation: Excavation and ISS	December 2016	July 2017

Task / Milestone	Estimated Task/Milestone Start Date	Estimated Task/Milestone Completion Date
Site Restoration/Cap Construction	June 2017	August 2017
Demobilize Equipment and Materials	August 2017	September 2017
Deed Notice	January 2018	February 2018
RAR and RAP Application	October 2017	March 2018
Issue RAO	September 2018	September 2018

5.5 List of Required Permits

These permits are the responsibility of GEI to procure prior to the start of the RA:

Soil Erosion and Sediment Control Plan

Because the planned area of disturbance is greater than 5,000 square feet, a soil erosion and sediment control (SESC) plan must be approved by the Somerset-Union Soil Conservation District. GEI prepared the SESC Plan application package and the SESC permit for the project was issued on August 30, 2016.

Construction General Permit for Stormwater Discharge

During the RA, stormwater discharged from the Project Limits must be authorized under the New Jersey Pollutant Discharge Elimination System (NJPDES) Stormwater Phase II Construction General Permit (also called a 5G3 Permit). This authorization requires the development and submittal of a Request for Authorization form as well as a Stormwater Pollution Prevention Plan (SPPP). The SPPP consists of the certified SESC plan and a construction site waste control component that is set forth in Attachment B of the 5G3 permit document. A certified Soil Erosion and Sediment Control Plan is a prerequisite to the issuance of a 5G3 permit. GEI will procure this permit, and Pivotal and the Contractor will be jointly covered as co-permittees.

Permit to Discharge Pre-treated Effluent

Contact water generated during the RA by storm water run-on and groundwater infiltration to the excavation/ISS footprint will be collected and pre-treated in the onsite water treatment system supplied and operated by the Contractor. Pre-treated effluent will be sampled and discharged to the City of Elizabeth combined sewer system via an onsite catch basin. The sewer flows to a secondary wastewater treatment plant operated by the Joint Meeting of Essex and Union Counties (JMEUC) secondary wastewater treatment plant.

GEI originally procured a permit to discharge pretreated effluent to JMEUC during the RA for Area A. That permit, JM0194, has been modified to cover discharge of pretreated effluent for the RA described in this RAWP. JMEUC approved the permit modification in a letter dated July 7, 2016. The permit specifies sampling of pre-treated effluent that is required prior to initial discharge, then quarterly during the period of discharge. Continuous flow monitoring is required, and pH will be measured and reported for each 20,000-gallon batch of pretreated effluent, since contact with ISS reagents has the potential to increase pH.

Approval for Waste Disposal to Thermal Desorption Facilities

As described in Section 4, the thermal desorption facilities require pre-characterization of impacted soils before they will approve the soils for disposal at their facilities. GEI collected the necessary waste classification soil samples and submitted requests for authorization to dispose impacted soils at Bayshore and at Clean Earth.

Contractor-Procured Construction and Demolition Permits

These permits are the responsibility of the Contractor to procure either prior to or during the RA, as needed:

- Permits for temporary placement of jobsite trailers and temporary utility connections to the jobsite trailers
- Local construction and demolition permits, including proof of termination of utility services for structures to be demolished
- Permits for temporary lane or road closures, if necessary.

5.6 Public Notification

The NJDEP Administrative Requirements for the Remediation of Contaminated Sites (ARRCS) (N.J.A.C 7:26C-1.7), requires persons responsible for conducting remediation to notify the public of upcoming and ongoing remedial investigations and actions. Pivotal met the initial public notification requirements for ongoing remedial investigations in August 2009 with the publication of "Notification of Environmental Investigation and Cleanup" in the local newspaper *The Star Ledger*, and Pivotal also sent public notification letters and fact sheets to owners and tenants within 200 feet of the Site.

Pivotal sent updated fact sheets and public notification letters to property owners and tenants within 200 feet of the Site on August 9, 2014, in compliance with the public notification requirements for submittal of the Classification Exception Area/Well Restriction Area (CEA/WRA) Fact Sheet Form. The updated fact sheet included a description of the RA planned for Area A, and served as formal notification to local residents of the RA for Area A. Pivotal

held a community information session on September 29, 2014, to give local residents the opportunity to review remedial plans for Area A and ask questions from the project team.

On September 28, 2016, Pivotal sent updated fact sheets and public notification letters to property owners and tenants within 200 feet of the Site, notifying them of the planned RA that is described in this RAWP. Copies of the updated fact sheet and notification letter are included in Appendix E.

5.7 Implementation of the Remedial Action

This RAWP identified and described the selected remedial technologies of excavation, ISS, and capping in Section 3.6, and then in Section 5.2 explained how the installation of these technologies would be sequenced and coordinated with ongoing ETG facility operations within the Project Limits. Appendix A contains a tabulated list and two figures showing the locations of the AOC sub-areas identified in the Preliminary Assessment that will be remediated during the planned RA.

This subsection provides more details on how the components of the RA will be safely implemented to ensure that the limits of FRP impacts in overburden soil within the Project Limits are remediated.

Utility Clearance and Protection

After completing the installation of temporary facilities and controls, the Contractor will begin ground-intrusive work with soft-dig hydro-excavation around the perimeter of the excavation footprint to locate known and suspected utilities. The primary goal of this effort will be to confirm the locations of known active critical utilities like the LNG boil-off line, the cluster of gas lines along the western perimeter, the storm/sanitary sewer lines, and the fire-suppression water lines. The secondary goal of this effort will be to locate unknown utilities that enter the excavation footprint. ETG's designated utility contractor, Henkels and McCoy, will be used to perform safe taps of unknown utilities to determine whether they are active or derelict. Derelict utilities will be cut and capped at the perimeter of the excavation and removed from the interior of the excavation footprint. This combination of perimeter soft-dig, identification by tapping, and cut/cap/remove was used during the RA for Area A. Virtually all of the unknown utilities encountered in Area A were derelict, and we expect that will also be the case during Area B. Whenever a utility is exposed, electromagnetic signal tracing and soft-dig potholing will be used to confirm its alignment within and adjacent to the excavation footprint. The location of encountered utilities will be surveyed: full alignments for active utilities, and point-of-cap for derelict utilities.

The soft-dig effort will proceed to a target depth of zero feet AMSL and is intended to completely encircle the approximately 2,000-linear foot excavation perimeter. It is not practical

to complete the entire perimeter soft dig before starting the excavation, so the Contractor likely will clear sub-areas of the excavation footprint and tie-in the soft dig trench to edges of subsurface foundations and structures that require demolition, in order to begin mass excavation and then ISS before the entire perimeter is cleared.

Some active utilities may be temporarily or permanently bypassed by the Contractor to facilitate the performance of the RA. These include the LNG boil-off line, the fire-suppression water lines, and the storm sewer beneath the Florida Street driveway. Alternately, these utilities will be protected and supported in place while impacted soil is excavated around them and ISS is installed beneath them, for at least part of their alignments. Utility relocation, protection, and support will be performed by the Contractor and by Henkels and McCoy. Utility support and protection plans will be submitted to GEI for review by ETG and the Engineer of Record, and the work will be closely coordinated with ETG operations for the LNG facility.

Demolition

Five aboveground structures require demolition to complete the RA. The structures are the operations control room, the guard house, the fire pump hose, the gym, and the former guard shack. Some of these aboveground structures may still be occupied by ETG personnel at the start of the RA, so their demolition may be delayed. A pre-demolition hazardous materials survey identified asbestos, lead-based paint, and universal waste in several of the buildings to be demolished. The asbestos and universal waste will be abated and removed prior to demolition, and rubble with lead-based paint will be disposed properly.

The two subsurface gas holder foundations that require either partial or complete demolition are adjacent to Third Avenue in Area B and are shown in plan view on Figure 5 and in cross-section A-A' on Figure 9. The small "relief holder" foundation shown on Figure 5 may not be present, based on soil borings HB-1 and HB-1A, which did not encounter a foundation. The larger of the two confirmed holder foundations is shallower and flat, without walls. The smaller holder foundation is deeper, with brick walls capped by concrete. The holder foundations and associated structures will be removed to the extent required to complete the RA. Impacted soil may be present immediately below a portion of the larger foundation, but no deep impacts have been observed beneath the larger holder. The native soil beneath the smaller holder foundation is some of the most contaminated at the Site, and this holder is likely the source of FRP impacts that extend into Third Avenue adjacent to the holder location.

The Preliminary Assessment (GEI, 2015) noted a number of historical tar storage locations among other features related to storage, separation, and other processes for the tar. If unknown features, such as pits identified on maps but not encountered during investigations, are encountered during the RA, the features will be removed as needed to complete the RA. Historical tar storage in the bottom of the smaller holder foundation is consistent with the FRP impacts observed in soils below the holder and adjacent in Third Avenue.

Numerous other subsurface foundations, structures, and derelict utilities are either known or suspected to be present within the Project Limits. Structures encountered during the excavation will be removed as needed, even if they extend deeper than target excavation depth. Pile-supported structures were encountered in Area A, but no pile supports were encountered in test pits for the larger of the two gas holders in Area B. The pile-supported status of the other foundations within the Project Limits is unknown. Deep pile supports within the ISS footprint will be removed as needed by excavation to facilitate the ISS installation. Pile supports in the excavation-only portion of the remediation footprint may be broken off and left in place at the limits of the excavation if no impacts are observed.

Derelict utilities within the Project Limits include pipes up to several feet in diameter. Derelict utilities encountered will be removed from the excavation footprints. The maximum expected depth of utility lines is approximately zero feet AMSL, based on observations made during the RA for Area A and during the replacement of the storm sewer in the Florida Street driveway, as described in Section 3.4.

Wells within the Project Limits are shown on Figure 3 (and several other figures), and the wells to be protected and remain after the completion of the RA are shown on Figure 12. The well characteristics are also tabulated in the groundwater monitoring subsection of Section 6.3. Wells to be abandoned are either screened within the ISS target volume, or were determined by GEI and the LSRP not to be needed any longer.

Excavation and Test Pitting

The excavation extents shown on Figure 8 and in the cross-sections (the "design extents") are approximate. Excavation will proceed until either the Project Limits are reached, the extents of FRP are reached, or an impassable obstruction or utility is encountered. Within the ISS footprint, excavation will terminate at approximately zero feet AMSL and ISS will be performed from zero feet AMSL to bedrock. The elevation of the groundwater table is approximately five feet AMSL (about three to four feet below current Site grade).

The design limits of the excavation avoid the gas line cluster on the western edge of the remediation area at the approximate barriers between Area B and Area G, and between Area B and Area E/F. PDI soil borings indicate that impacts terminate near the design extents between Area B and Area G, which means that chasing impacts around and under the gas line cluster may not be necessary in that area. But if encountered, impacts will be chased until they terminate in Area G.

Also in Area G, GEI will ask the Contractor to perform a test pit in the vicinity of TP-12 shown on Figure 5. The log for this test pit, performed by Dames and Moore in 1992, indicated oil sheen in the top 3 feet. The June 1950 site plan drawing shows a 1,000-gallon gasoline tank

(identified as sub-area G1a in Appendix A) between this test pit location and the warehouse building to the north. If impacted soils are observed in this area they will be removed.

Impacts are known to be present at the border of Area B with Area E/F near the gas line cluster and continuing into Area E/F. Along this border the excavation will terminate at the design extents and maintain a safe offset from the nearest gas line. Impacts beyond the design extents will be addressed in the future RAs for Area E and Area F.

Along the border with Third Avenue, the excavation will terminate at the perimeter fence line, which is approximately the Site property line. Impacts in Third Avenue will be addressed in a future RA.

From within Area B toward Area A, the excavation will proceed until impacts terminate. The intent of the design is to address the remaining accessible impacts within Area A.

Outside of the ISS footprint, FRP impacts will be chased both vertically and horizontally until they terminate. If deeper FRP impacts are widespread, then the ISS perimeter will be extended as described below. If they are isolated, then limited deeper over-excavation will be performed to capture them.

Delineation Soil Borings

The excavation and ISS design extents are based on observations of impacts in soil borings advanced during the PDI described in Section 4 and previous remedial investigations described in Section 3. NJDEP guidance is for delineation soil borings to be spaced no further apart than 30 feet-on-center for open excavations. The set of soil borings used to establish the limits of the excavation and ISS footprints do not satisfy this guidance in some portions of the perimeter. This is due to the presence of obstructions including the large gas holder foundation, the operations control room, and areas with high concentrations of active utilities. These areas will need further investigation to satisfy this guidance. The remainder of this subsection describes how the FRP delineation to finalize the extents of the ISS will be completed during the implementation of the RA.

During the implementation of the RA, the obstructions that constrained prior soil borings will either be removed or carefully delineated and exposed, which will allow for additional delineation soil borings to be advanced. As part of the RA, the Contractor will be required to provide a drill rig and drill crew to advance soil borings and collect continuous soil cores as necessary. The LSRP and the Engineer of Record will identify the soil borings locations and GEI environmental geologists will screen and log the soil cores, and collect samples, if warranted.

Most of these delineation soil borings will likely be advanced after the preliminary excavation work is complete. In that case the subsurface foundations and structures will have been

removed, derelict utilities cut and capped, and active utilities exposed and protected. This will allow for rapid advancement of soil borings at target and step-out locations. Observations from these borings will quickly be used by the LSRP and Engineer of Record to adjust the ISS footprint, because the Contractor is likely to perform ISS shortly after the excavation limits are reached. So there may only be a brief window of time when each sub-area is cleared of utilities and excavated but ISS has not yet been performed. This is when the additional delineation soil borings will have to be advanced and the ISS footprint adjusted, if needed. It is likely that several mobilizations of the drill rig will be needed over the course of the project as different areas become accessible. GEI will coordinate this work with the Contractor.

In Situ Solidification/Stabilization

The horizontal and vertical extents of ISS (the "design extents") are described in Section 4.2 and are shown in Figures 8 through 10. The design extents of ISS are approximate and may be adjusted based on observations from additional delineation soil borings as described above.

ISS will be performed either with a rig-mounted auger or a hydraulic excavator to create columns or cells of soil-cement by mixing a water-based cement grout with the native soil. The fluid of the grout and the energy of the auger or excavator combine to homogenize the target soil volume into a fluidized mixture. The volume of the grout that is injected results in the phenomenon of swell: the final volume of the fluidized soil-cement is approximately equal to the target volume of the impacted soil plus the volume of injected grout. The result of this phenomenon is that the completed volume of the ISS monolith is larger than the in-place volume of the impacted soil targeted for treatment by ISS. Swell ranges from about 20 to 50 percent, depending on how much water is required to fluidize the soil. So a 10-foot deep target of impacted soil can result in a monolith that is 12 to 15 feet deep.

Excavation must be performed either prior to or following ISS (or both) to manage the volume of swell. For this RA, pre-excavation will be performed to remove subsurface obstructions, which are likely to be concentrated mainly in the top five feet of depth. The design extents of excavation are to remove soil within the ISS footprint to approximately zero feet AMSL, which is approximately eight to 10 feet below existing grade. This is the depth target for four reasons:

1. The most impacted soils are found above zero feet AMSL across much of the excavation footprint, especially in the shallow fill.
2. The target elevation of the as-constructed top of the ISS monolith (including swell) is approximately five feet AMSL. This target allows for four feet of cover between the top of the ISS monolith and final grade, to provide frost protection and volume for future utility installations.
3. The estimated swell volume is approximately 33 percent, or one third of the target depth of the ISS soil column. The average depth of the target ISS volume is estimated to be 15

feet, so the swell will be five feet. That would fill the pre-excavation depth from zero feet AMSL to five feet AMSL.

4. The excavation of impacted soils with concentrations of contaminants above the default IGW.

The actual swell volume may be different from the estimated quantity. The actual percentage of swell volume will become clear early in the ISS effort. The intent of the design is to minimize the volume of swell that is excavated and disposed offsite as impacted soil. If the swell volume is higher than expected, then additional pre-excavation, deeper than zero feet AMSL, may be performed. GEI will work with the Contractor during the implementation of ISS to identify the optimum balance of excavation versus disposal of swell.

Swell will be "wet-cured" in its final location. The intent of the design is for swell to be cured in place so that only minimal fine grading is necessary to achieve the post-cured top of ISS target elevation of approximately five feet AMSL. Sometimes it is necessary to disturb swell after its initial curing and move it to another location on top of the monolith. In that case swell will be reconditioned by mechanically homogenizing it with fresh grout prior to final placement.

The performance criteria for ISS are:

1. Solidified soils have an average unconfined compressive strength of greater than or equal to 50 pounds per square inch (psi), with no sample below 40 psi. No more than 20 percent of samples can be below 50 psi.
2. Samples tested for hydraulic conductivity produce an average of less than or equal to 1x10-6 centimeters per second (cm/sec) with no sample above 1x10-5 cm/sec. No more than 20 percent of samples can be above 1x10-6 cm/sec.
3. Solidified soils leach COCs at a rate such that the groundwater quality standards are not exceeded at the established point of compliance.

Appendix F contains the ISS treatability study report, which provides more detail on how these performance criteria were evaluated in bench-scale samples. The treatability study report identifies mix designs that GEI and the LSRP expect will satisfy the strength and permeability performance criteria, and decrease the leaching of COCs to a level that the GWQS will be attained. The recommended solidification reagents for the ISS grout are ground granulated blast furnace slag cement (GGBFS), portland cement, and bentonite. The recommended mix design is: 8 percent total cement (at a 60:40 ratio of GGBFS to portland cement), and 0.25-0.5 percent bentonite (by wet weight of soil basis).

Bedrock wells to be protected within the footprint of the ISS will require an offset of approximately three feet around each well where solidification will not be performed. This will leave a cylinder of untreated overburden soil from approximately zero feet AMSL to bedrock around each of the wells to be protected within the ISS footprint. These offsets are a very small

percentage of the total ISS target soil volume, and will be totally surrounded by the ISS monolith, so impacts remaining within them will be contained.

After the ISS is completed and the monolith has cured, a low-permeability layer of either compacted clay soil or a geo-composite liner will be placed on top of the ISS monolith prior to mass backfill to final grade. This low-permeability layer is necessary to minimize leaching of COCs from the top of the monolith to groundwater recharging from precipitation infiltration, to help attain the GWQS. More details on the calculations that drive this decision are included in Appendix F.

Dewatering and Water Treatment

The shallow water table is encountered at an elevation of approximately five feet AMSL (three or four feet below existing grade) within the Project Limits, so the target excavation depth of zero feet AMSL is below the water table. But since the fine-grained native soil below the surface fill is not very conductive, and no deep or mechanically-supported excavations are planned for the RA, well point dewatering is not required. Instead, the excavation will be dewatered with sumps and pumps placed at the low points of the working footprint. This is the strategy that was used for the Area A excavation, and it was successful for shallow sloped excavations to zero feet AMSL and even in deeper sloped excavations to -10 feet AMSL.

Stormwater run-on and groundwater infiltration will contribute contact water volume that will be pumped from the excavation to storage tanks and then treated. The Contractor will install and operate a temporary onsite water treatment system (WTS) for contact water. The WTS unit process treatment train is:

1. Influent storage tanks
2. Fine particle filtration with bag filters
3. Organo-clay filtration media to adsorb oil and gross levels of organic COCs
4. Granular activated carbon media to adsorb organic COCs (polishing filters)
5. Ultra-fine particle filtration (cartridge filters) to protect ion exchange resin bed
6. Ion-exchange resin bed to adsorb arsenic and cyanide ions
7. Effluent storage tanks

Influent contact water likely will contain some NAPL/DNAPL. The influent tanks will have over-under weirs to trap and contain these separate-phase liquids. The influent water also likely will have a high concentration of total suspended solids, which will be at least partially removed by gravity settling within the quiescent influent storage tanks.

Contact water from the ISS treatment footprint may have elevated pH due to the alkalinity of the cements used as solidification reagents. The Contractor will adjust the pH of the influent water to near-neutral values by mixing muriatic acid (hydrochloric acid) into the influent tanks. JMEUC requires each batch of pre-treated effluent that will be discharged to the sanitary sewer to be sampled for pH.

Pre-treated water will either be discharged to JMEUC or re-used as grout make-up water for the ISS process. It is possible that the volume of water needed for making ISS grout will be greater than the total volume of contact water treated during the RA. The ISS grout volume could require three or four million gallons of water. The difference will be made up of potable water from connections to hydrants at the Site.

Potential fugitive emissions from influent contact water tanks will be minimized either by using closed-top tanks, covering the tanks, or placing the tanks inside a temporary enclosure. The Contractor will implement freeze protection for the WTS, including influent and effluent tanks and piping.

Backfill and Capping

Backfill and surface capping may proceed after excavation and ISS are completed. The entire footprint of the excavation and ISS remedies does not need to be completed for backfill to start. It is likely that backfill and surface capping will lag the completion of ISS by at least several weeks so that swell can cure in place, be trimmed to final grades, and then be capped with clay or geo-composite as described in the ISS subsection above. The fill use plan is described in detail in Section 5.9.

In the direction of Area E and Area F, and at the edge of the Project Limits with Third Avenue, FRP may still be present on the excavation sidewalls at the maximum limits of excavation. Impacts that extend in these directions will be addressed in future RAs, as explained in the excavation subsection above. To minimize the potential for re-contamination of clean fill, and to provide a visual demarcation of the limits of prior excavation, a geo-synthetic membrane will be placed on these sidewalls.

The final eight to 12 inches of backfill to reach the restoration surface grades shown on Figure 12 will be a base course of at least six inches of compacted dense-grade aggregate (DGA) topped by a surface wearing course of crushed stone aggregate. This surface layer will be applied across the entire Project Limits, with the exception of the driveways and access roads to be restored. Areas within the Project Limits but outside of the excavation/ISS footprint will receive a geotextile demarcation layer beneath the DGA course. The surface cap layer and other restoration components are described in more detail in the next subsection.

5.8 Site Restoration and Restricted Site Use

Figure 12 shows the restoration plan for the Project Limits. There are three main components of restoration at the end of the RA after excavation and ISS are completed:

1. Final grading of compacted backfill, followed by installation of a crushed stone aggregate top course across the 4.76-acre excavation/ISS footprint
2. Installation of the geotextile demarcation layer and crushed stone aggregate layer across the 3.13-acre portion of the Project Limits that is outside of the excavation/ISS footprint
3. Restoration of permanent features like driveways, fences, gates, and catch basins

The majority of the area within the Project Limits is currently covered with crushed stone on top of dense-graded aggregate, which is what will be replaced as the final ground cover at the conclusion of the RA. Currently existing driveways and access roads will be replaced to match their existing alignment and surface materials. The Florida Street entrance pen with its automatic gate and vehicle barriers will be reconstructed equal or better to current conditions. The Site perimeter fence will be unchanged after the RA, but the interior fence alignment will be altered (per ETG's request) to match what is shown on Figure 12. Existing wells to be protected will be extended up to grade as needed to account for the new surface cap layer thickness, and the protective casings of stick-up wells will be rehabilitated or re-installed as needed. New Overburden A and B well cluster locations shown on Figure 12 will be installed after the RA is completed, as described in more detail in Section 6.

Engineering Control (Cap)

Within the excavation/ISS footprint of the RA, the cap will consist of the clean fill that will be used to backfill the excavation and cover the ISS monolith. For the approximately 3 acres outside of the excavation/ISS footprint, the cap will be a combination of a geosynthetic demarcation layer topped with a layer of crushed stone aggregate.

Portions of the reconstructed driveways and access roads will also cover some of the area outside of the excavation/ISS footprint. The footprint of the reconstructed driveways and access roads will receive a geogrid layer topped with dense-graded aggregate and then either a crushed stone aggregate wearing course or a hot-mix asphalt base and wearing course, to match existing surface conditions. The geogrid beneath the driveways and access roads will serve double-duty as both structural support and a visual demarcation layer to indicate the bottom of the cap.

A portion of the Project Limits on Area A was previously capped with a demarcation layer and crushed stone aggregate as part of the RA for Area A. This area is shown on Figure 3 and will be used for laydown, jobsite trailers, and parking during the RA. The cap in this area will be replaced if it is disturbed during the course of this RA.

The net elevation inside the Project Limits will be approximately the same before and after the RA. In Area G, the ground surface elevation will increase by the thickness of the cap: approximately 8 inches. This is why flush-mounted wells in Area G may need to be raised and their concrete pads re-poured as part of the restoration work. Within the remainder of the Project Limits the net elevation change will be zero, and the ground surface will be fine-graded to shed water toward the perimeter of the Project Limits. The existing onsite storm drain system will be protected, but if a portion of it must be temporarily removed to perform the RA, it will be replaced in-kind during the restoration work.

Routine monitoring of the cap will be required, and repairs will be made if damage is observed. Routine monitoring likely will consist of periodic visual inspections for evidence of erosion, ground disturbing activity, or exposure of the demarcation layer. A monitoring and maintenance plan will be incorporated into the permit application described below.

Institutional Controls (Deed Notice)

GEI and the LSRP will prepare deed notices for Area A, Area B, and Area G after this RA is completed. As part of the deed notices, the as-constructed limits of remediation for each of these three Remediation Areas will be surveyed.

For each of these three Remediation Areas, the deed notices will define the nature and location of impacts left in place, the use restrictions associated with these impacts, and the engineering controls that were established in response to these impacts. The deed notices will include maps, figures, and tables as necessary to define the use-restricted areas and engineering controls.

After review, approval, and execution by Pivotal, GEI will file the deed notices with the Union County Clerk. A final, filed copy of the deed notice will be provided to NJDEP in the RAR for this RA.

Remedial Action Permit

GEI and the LSRP will submit an application for a Remedial Action Permit for soils after the engineering control (cap) is constructed, the deed notices are in place, and the RAR has been completed. The RAP application will summarize the details of the institutional and engineering controls and associated monitoring and maintenance activities, and will include demonstration of financial assurance for the maintenance of the engineering controls.

5.9 Fill Use Plan

Common fill for general use will meet the requirements of soil aggregate I-10 per NJDOT material specification 917.11. Other backfill materials used in smaller quantities will be crushed stone aggregate (DGA as well as coarse aggregates), and low-permeability clay (to be placed and compacted on top of the cured ISS monolith).

GEI has requested backfill that is Licensed Quarry/Mine Material as described in the document *Fill Material Guidance for SRP Sites* (NJDEP, 2015). The Contractor will be required to provide sufficient documentation, meeting the requirements of that guidance document, from each proposed borrow site to permit the Engineer and the Owner to approve the use of the proposed fill material prior to its import and placement. The required documentation is:

- Name and location of commercial quarry, mine, or other type of supplier from which the donor material will be purchased.
- Certification or statement from the facility operator that the material is from an undisturbed geologic formation or manufacturing process that has not been impacted by contaminant sources.
- A Site Review Report that describes the environmental setting of the donor site and includes an electronic data base check summarizing the regulatory compliance history of the facility.
- Results of at least one Target Analyte List (TAL)/Target Compound List (TCL) and EPH analysis of the material, by a NJDEP-certified laboratory and collected within the last 12 months, with comparison of the analytical results to soil remediation standards and default IGWSSL.

The RA will not use alternate fill material or make beneficial reuse of either onsite soils or concrete rubble. We do not expect to encounter sufficient volume of un-impacted material to justify the sampling, stockpiling, and handling that is necessary for reuse.

The quantity of backfill required to complete this RA will be substantially less than the quantity of soil excavated. This is because ISS generates swell that will fill approximately half of the excavated soil volume. The estimated quantity of backfill soil is 60,000 tons.

5.10 Health and Safety

GEI has updated the Site-Specific Health and Safety Plan (HASP) in preparation for this RA. The GEI HASP applies to GEI personnel at the Site. Copies of the GEI HASP will be kept at the Site by the Construction Manager during the implementation of the RA, as well as at GEI's Mt. Laurel, NJ office. An Activity Hazard Analysis (AHA) will be completed for each major category of task that GEI employees perform at the Site during the RA. AHAs will be completed by the employees that will perform the task, and reviewed with the Construction Manager.

The Contractor will prepare a site-specific HASP in accordance with Title 29 of the Code of Federal Regulations (CFR) 1910.120 and 1926. The Contractor's HASP will apply to Contractor employees and their subcontractors.

Some of the key health and safety aspects for this RA are:

- Site-specific protocols/training related to ETG active operations for the LNG facility
- Site workers who might reasonably come into contact with impacted soils must be 40-hour trained for Hazardous Waste Operations and Emergency Response (HAZWOPER)
- The community-protection PAMP described later in this section, and worker-protection air monitoring to be performed by the Contractor
- Soft-dig requirement to expose and identify known and unknown active and derelict utilities
- Decontamination of vehicles departing the Site, including washing of truck tires to avoid tracking soils onto City streets, and periodic street sweeping to contain

Community-Protective Perimeter Air Monitoring

While the RA is performed, Pivotal will implement a PAMP to document concentrations of dust and volatile contaminants, including benzene, at the Project Limits fence line. The purpose of this PAMP is to demonstrate that the RA is protective of the community outside the Site with respect to fugitive emissions of vapors, odors, and dust. The PAMP is not for the protection of workers within the Project Limits; both GEI and the Contractor will perform their own worker-protection air monitoring as needed. The PAMP will be similar to the one that was implemented during the RA for Area A.

The PAMP will be written and implemented by a third-party consultant on behalf of Pivotal. The PAMP will be reviewed by the LSRP prior to implementation. The PAMP will establish action levels for particulates, VOCs, and odors. Action levels will also be established for BTEX compounds and naphthalene. Approximately five air monitoring stations will be placed along the perimeter of the Project Limits to measure ambient air concentrations and to allow for comparison of upwind and downwind concentrations.

The PAMP will specify background, periodic, and continuous monitoring and analysis methods that will be used to measure and document the concentrations of fugitive emissions from the RA. These methods include real-time screening of total VOCs and particulates smaller than 10 microns, on-site as-needed screening of grab samples for BTEX and naphthalene, regular periodic assessments of odor intensity, and regular periodic collection of composite time-weighted-average samples for off-site laboratory analysis of VOCs and SVOCs. An on-site meteorological station will record atmospheric factors including wind direction, speed, relative humidity, temperature, and rainfall.

Engineering Controls for Fugitive Emissions

Fugitive emissions, especially from benzene, will be controlled during the RA by a combination of engineering controls that are regularly deployed to control fugitive emissions of VOCs, dust,

and odors during excavation and ISS remedies at former MGP sites. These measures will be implemented regularly to prevent fugitive emissions and as a control measure if the action levels established as part of the PAMP are exceeded. By employing the engineering controls described below, and monitoring fugitive emissions as described above, GEI is confident that the RA can be implemented in a manner that is protective of site workers and the community.

With specific regards to benzene, measurement of benzene concentrations in air grab samples is an element of the PAMP described above, and the equipment to perform those measurements will be onsite and capable of generating data approximately 30 minutes after sample collection.

The fugitive emissions controls that will be employed during this RA are:

Odor- and dust-suppressing foam spray – Water-based latex foam spray will be used on a daily basis to cover impacted working excavation faces and active ISS areas. Short-duration foam will be used for up to 12-hour coverage, and long-duration foam will be used for areas that are not planned to be disturbed again for multiple days or weeks.

Odor-neutralizing mist/fogger fans – A mobile, odor-suppressing mist system may be used on an as-needed basis to fog the active excavation area with ultra-fine droplets of a dilute solution designed to neutralize odors and adsorb VOCs. The mist droplets can aid in removing dust and odors by adhering to particles and adsorbing VOCs and then falling out of suspension in the air by gravity.

Dust-suppressing water spray – Water trucks and sprays will be used to apply water to disturbed soil surfaces, haul roads, and working faces in order to minimize dust generation.

Temporary soil covers – Excavated soil with lower levels of impacts may be temporarily placed as a "skim coat" of several inches thickness on top of more impacted working faces. This may be particularly useful in areas that are pre-excavated prior to ISS. The temporary soil covers would be incorporated into the ISS volume when it is installed. Long-term foam may be used in addition to, or in substitution of, temporary soil covers.

Temporary stockpile covers – Direct-loading of excavated soils to haul trucks for offsite disposal will be performed to the maximum extent possible, but temporary stockpiles within the excavation may occasionally be necessary. In that case stockpiles would be covered with polymer sheeting or short-duration foam when not being actively worked.

Planning for and Response to Catastrophic Events

In June 2016, NJDEP issued the guidance document *Planning for and Response to Catastrophic Events at Contaminated Sites.* In particular, this low-lying Site is vulnerable to flooding from the Arthur Kill, as was seen when the Site flooded during Superstorm Sandy. In response to the NJDEP guidance GEI will require the Contractor to develop and submit a "Contingency and

Flood Preparedness Plan" for review and approval by Pivotal and GEI. The required components of this plan are:

- How the Site will be prepared in advance of inclement weather that could lead to flooding, including resiliency or evacuation for storage equipment for hazardous substances, fuel, ISS reagents, and contact water.
- How excavations, stockpiles, and ISS areas will be minimized, stabilized, and protected from exposure to flood waters.
- A spill response plan (SRP) for addressing spills that occur on site during remedial construction activities. The SRP will describe the methods, means, and facilities required to prevent soil, water, structure, equipment, and material impacts caused by spills.
- Designation of an emergency coordinator, and a communication plan for getting information to the project team and the proper authorities prior to and during an emergency.
- A listing of contact personnel with phone numbers that, at a minimum, includes fire officials, ambulance service, local, county, and state police, local hospitals, and a spill response team
- Procedures that Contractor's personnel will take in response to an emergency, an evacuation plan for personnel and equipment, and designated routes for emergency vehicular access/egress
- Procedures for monitoring weather emergencies and discussion of how weather conditions and notifications will impact Site operations

6. Evaluating the Effectiveness of the Remedial Action

This section describes how the effectiveness of the RA will be evaluated. It summarizes the results of a bench-scale ISS treatability study, describes the construction quality assurance plan, presents the post-remediation groundwater monitoring plan, and addresses data quality assurance.

6.1 Bench-Scale ISS Treatability Study

The first step for evaluating the potential effectiveness of ISS was to perform a bench-scale treatability study using impacted soils collected from the Site. GEI performed an ISS treatability study using soil collected from within the target ISS treatment volume from the Site. The collection of these soil samples is described in Section 4 and the locations of the borings from which the samples were collected are shown on Figure 7. GEI personnel from the Exton, PA and Mt Laurel, NJ offices performed the study in laboratory space in Fort Washington, PA. The results of the study are reported in the *In Situ Solidification Treatability Study Report*, included as Appendix F to this RAWP, and summarized below.

The goal of the study was to identify one or more grout mix designs that efficiently satisfy the ISS performance criteria listed in Section 5.5. ISS remedies reduce the flux of COCs to groundwater from the target treatment volume in order to achieve site-specific remediation goals. In this case the goals of ISS are to remediate FRP within the target ISS volume, and to reduce the flux of COCs to groundwater so that GWQS can be achieved via monitored natural attenuation downgradient of the ISS monolith.

The study evaluated a total of 26 mix designs with a range of concentrations of the solidification reagents GGBFS, portland cement, and bentonite. The study also measured the effect of the stabilization additives PAC and organo-clay. The physical parameters of unconfined compressive strength and hydraulic conductivity were measured for cured test cylinders of soil-cement from each mix design.

Five of the mix designs that satisfied the physical criteria of strength and conductivity were further evaluated for leach performance using EPA Method 1315, modified for use with organic COCs. This is a semi-dynamic leach method in which a soil-cement cylinder is immersed in sequential water baths for varying lengths of time and then eluate of each bath (plus an organic COC trap in each bath) is analyzed for the mass of COCs released during that leach interval. The results from the leach testing show how COC mass flux changes over time, and were used to predict leach behavior of the field-scale monolith.

The COC flux rates calculated from the leach tests for each of the five candidate mixes were used to model the groundwater concentration of COCs at the downgradient edge of the ISS monolith. The model used for these calculations is in the document *Development of Performance Specifications for Solidification/Stabilization* (ITRC, 2011). Appendix F provides more detail on these calculations.

By using the measured COC fluxes as input to the ITRC model and then applying a dilution-attenuation factor of 3.0, the GWQS were achieved for the COCs in three of the five candidate mixes. On a wet weight of soil basis, the successful mixes used 6%, 8%, and 10% total cement, respectively. Each used a 60:40 ratio of GGBFS to portland cement. Only the 6% mix contained bentonite, at 0.5%.

Based on the results of the physical and chemical analyses performed during the ISS treatability study, GEI and the LSRP recommended a mix design of 8% total cement (at a 60:40 ratio of GGBFS to portland cement), and 0.25-0.5% bentonite (by wet weight of soil basis).

GEI will perform quality assurance monitoring during the ISS implementation to ensure that the target concentrations of reagents are delivered, and that the monolith behaves at field-scale at least as well as predicted by the bench-scale tests. Part of this evaluation will be to analyze field samples of cured soil-cement for leach performance by EPA Method 1315M. As 1315M can take up to 90 days to receive a full set of analytical results, it will not be relied on to demonstrate compliance. Instead, the treatability study results will be used for that purpose. The field-scale 1315M tests will be compared to the leachability results from the treatability study, and will provide additional data that can be used to help model the leaching behavior of the monolith.

6.2 Construction Quality Assurance

GEI will implement and oversee a construction quality assurance program during the performance of the RA to measure and document compliance with the performance criteria for the excavation and ISS. GEI will prepare a Construction Quality Assurance Plan prior to the start of the RA, which will address the following elements:

In Situ Solidification/Stabilization

Samples will be collected from ISS columns with a frequency of at least one sample of newly solidified soil per 500 in-place cubic yards of soil that is solidified, with a minimum of one sample collected per active mixing rig per day and a minimum of one sample per 50 linear feet from perimeter columns. Bulk samples representing individual columns will be composited from multiple depth-discrete grab samples to demonstrate complete vertical mixing throughout each soil column. Discrete grab samples will be evaluated for homogeneity, pH above 10.5 standard units, and absence of free liquids.

Composite samples will be cured in cylindrical molds and tested for unconfined compressive strength and hydraulic conductivity by a qualified third-party laboratory. Up to two of the cured samples collected early in the ISS process will be selected by GEI for analysis of leach behavior by EPA Method 1315M at a qualified third-party laboratory.

GEI will also require the Contractor to measure and report the weight of each solidification reagent added to each batch of grout, the density of select grout batches, the weight and volume of grout delivered to each soil column, and the as-constructed top and bottom elevations of each soil column or cell.

The performance criteria for ISS are:

1. Solidified soils have an average unconfined compressive strength of greater than or equal to 50 pounds per square inch (psi), with no sample below 40 psi. No more than 20 percent of samples can be below 50 psi.
2. Samples tested for hydraulic conductivity produce an average of less than or equal to 1x10-6 centimeters per second (cm/sec) with no sample above 1x10-5 cm/sec. No more than 20 percent of samples can be above 1x10-6 cm/sec.
3. Solidified soils leach COCs at a rate such that the groundwater quality standards are not exceeded at the established point of compliance.

Excavation and Backfill

GEI personnel will inspect the sidewalls and bottom of the excavation extents in the excavation-only areas. This visual inspection is to determine whether over-excavation is necessary to chase impacts, or whether the limits of impacts have been reached and the area is ready to be backfilled. The LSRP has requested sidewall/bottom post-excavation soil samples from the excavation-only areas at a frequency of one per 5,000 square feet. These samples are not to determine whether additional excavation is needed, but rather to document the concentrations of COCs that remain in place outside of the excavation limits. GEI will divide the excavation-only area into a grid with cells each approximately 5,000 square feet and collect soil samples for analysis of the COCs tabulated in Section 4.4.

Backfill borrow sources must satisfy the criteria for Licensed Quarry/Mine Material as explained in the Fill Use Plan described in Section 5.9. In addition to the chemical analysis described in that section, GEI also requires particle-size analysis and Proctor tests on a regular basis for imported fill material, and whenever the fill source changes, and whenever the Engineer judges that the fill characteristics have changed. These same requirements apply to the low-permeability clay to be placed atop the cured ISS monolith. A hydraulic conductivity test is also required for the clay, to demonstrate its low-permeability behavior.

Compaction testing will be performed using the nuclear density method by a third-party firm contracted to the Contractor to determine field density and moisture content for the compacted fill. If early test results are good, then a "method spec" may be employed and the frequency of in-situ testing may be reduced.

Contact Water Treatment and Reuse

Contact water will be containerized and pre-treated either for discharge to the sanitary sewer or for reuse as grout make-up water. The JMEUC permit describes the nature and frequency of sampling and analysis for pre-treated water to be discharged to the sanitary sewer. The frequency of the sampling is: once prior to the start of discharge, and quarterly thereafter. The analyte list is pH, biochemical oxygen demand, total suspended solids, arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc, total cyanide, hexane-extractable oil and grease, hexane-extractable hydrocarbons, BTEX, and total toxic organics (VOCs, SVOCs, polychlorinated biphenyls, and pesticides).

This sampling is the responsibility of the Contractor, but GEI will provide oversight. Adjustment of pH to near-neutral values and measurement of pH on a per-20,000-gallon batch basis is also a required element of that permit.

6.3 Post-Remediation Groundwater Monitoring Plan

GEI developed the groundwater sampling plan described in this subsection to monitor groundwater quality after the completion of the RA. Sampling parameters are based on groundwater sample results reported in the RIR. The concentration of MGP-related COCs in groundwater should begin a decreasing trend after the completion of the RA.

Previous Groundwater Investigation and Delineation

Concentrations of COCs above the GWQS have been detected in groundwater samples collected from wells screened in Overburden A, Overburden B, and the bedrock aquifer. The RA described in this RAWP targets impacted soil in Overburden A and Overburden B, and therefore should improve groundwater quality in those layers. Although the bedrock aquifer is not directly targeted by this RA, long-term improvement of bedrock groundwater quality is expected due to the remediation of impacts in overburden soils that could be contributing to contamination in bedrock.

Groundwater samples collected at the Site and reported in the RIR were analyzed for TCL VOC+15, TCL PAH, TAL metals, free and total cyanide, and ammonia. TCL VOC+15 compounds detected at concentrations above the GWQS consisted of BTEX compounds and chlorinated VOCs. The highest BTEX compound concentrations were detected in Overburden A monitoring wells, typically in the presence of tar-saturated soil and NAPL. The highest detected

concentrations of PAH compounds were in groundwater samples collected from the Overburden A zone.

The RIR determined that exceedances of the GWQS for metals were either naturally occurring or related to fill material, since these exceedances were not centered on former MGP process areas. Total cyanide was detected in samples collected from both off-site and on-site monitoring wells, with the highest total cyanide concentrations reported in Area A, off-site adjacent to Area A, and southwest Area D. No exceedances of the GWQS for free cyanide were reported. Based on a comparison of the free and total cyanide concentrations, the RIR determined that cyanide detected in the groundwater is not bio-available. Ammonia was detected in groundwater samples collected from the majority of monitoring wells on-site and off-site. The highest ammonia concentrations were detected in samples collected from the Overburden B and bedrock zones. These highest detections were at opposite ends of the study area. No discernable trends were identified to indicate an on-site source of ammonia.

Proposed Groundwater Monitoring Activities

Upon the completion of the RA, GEI will implement a groundwater monitoring plan to evaluate groundwater conditions in Overburden A and Overburden B for locations both up-gradient and downgradient of the excavation/ISS footprint for this RA. Observations documented in the RIR show an easterly direction of groundwater flow in both Overburden A and Overburden B near Third Avenue. A component of flow to the northeast is also possible in the Overburden A aquifer, due to the potential for preferential pathways caused by the presence of underground utility lines in the Third Avenue right of way.

Shown within the Project Limits on Figure 12 are the locations of existing groundwater wells that will remain at the completion of the RA. The table below identifies the wells to be protected and abandoned during the RA. Each of the currently existing wells in Area G will remain: three overburden and four bedrock. Five wells will remain in Area B, all screened in bedrock.

Although these wells to be protected in Area G and Area B may be used for future monitoring and remediation efforts, they are either screened in the wrong formation or located either too distant or in the wrong groundwater flow direction to be used for the post-remediation monitoring of this RA.

Well ID	Location	Screened Formation	Screened Interval (feet below grade)	Protect	Abandon
MW-2	Area B	Overburden A+B	5-25		X
MW-2 (36-61)	Area B	Shallow bedrock	36-61		X
MW-9 (33-44)	Area B	Shallow bedrock	33-44		X
MW-22A	Area B	Overburden A	2-12		X

MW-22B	Area B	Overburden B	25-30		X
MW-27 (180-190)	Area B	Deep bedrock	180-190		X
MW-32 (150-160)	Area B	Deep bedrock	150-160	X	
MW-32 (235-245)	Area B	Deep bedrock	235-245	X	
MW-43	Area B	Deep bedrock	287-307	X	
FW-1 (183-193)	Area B	Deep bedrock	183-193	X	
FW-2 (240-250)	Area B	Deep bedrock	240-250	X	
MW-1	Area G	Overburden A+B	2-20	X	
MW-1 (24-40)	Area G	Shallow bedrock	24-40	X	
MW-21A	Area G	Overburden A	3-13	X	
MW-21B	Area G	Overburden B	20-30	X	
MW-21 (85-95)	Area G	Deep bedrock	85-95	X	
MW-21 (110-120)	Area G	Deep bedrock	110-120	X	
MW-21 (190-200)	Area G	Deep bedrock	190-200	X	

Figure 12 also shows the proposed locations of four new well pairs to be installed after the RA is completed. At each location, one well will be screened in Overburden A and the other will be screened in Overburden B. Each well pair will be located 15 to 20 feet distant from the edge of the ISS monolith, which is the model-predicted approximate distance that groundwater moves downgradient in three months in the Overburden B soil. Each of these eight new wells will be included in the groundwater monitoring program.

Shown at the very top of Figure 12 on the cross-streets northeast of Third Avenue, there are six off-site existing well locations: MW-23A, MW-23B, MW-24A, MW-24B, MW-25A, and MW-26A. These wells are screened either in Overburden A or Overburden B and will be included in the groundwater monitoring program. There are 14 total wells proposed for the groundwater monitoring program for this RA: eight new wells to be installed in four nested clusters as shown on **Figure 12**, plus the six existing wells listed at the top of this paragraph.

We will divide the groundwater monitoring program into a short-term and a long-term component. After the eight new wells are installed and developed, all 14 of the wells in the program will be sampled for the parameters and analytes listed in the two paragraphs below. This will be the first of eight quarterly sampling events in the long-term sampling plan. For the short-term sampling plan, only the eight newly-installed wells will be additionally sampled on a weekly basis for one month (total of three events) and then on a biweekly basis for two additional months (total of three events). The weekly and biweekly sampling events will only be for field parameters, not laboratory analytes. After the third biweekly event it will be time for the second quarterly long-term sampling event, which will be for all 14 wells. The quarterly sampling events will be for field parameters and laboratory analytes.

The long-term groundwater monitoring plan will consist of eight rounds of quarterly groundwater sampling after the completion of the RA. Sampling will be conducting using low

flow purge and sampling (LFPS) techniques. GEI is certified by the NJDEP for analysis of field parameters associated with LFPS (NJDEP Lab Number 07086), and will use a multi-parameter meter certified for groundwater quality parameter analysis. Field equipment will be calibrated in accordance with NJDEP guidance for LFPS. GEI will record the field parameters of pH, dissolved oxygen, oxidation-reduction potential, conductivity, temperature, depth to water, and presence or absence of free product. Purge water will be containerized pending waste classification, for off-site treatment and disposal.

Grab groundwater samples from each sampling event will be collected and submitted to a New Jersey-certified laboratory for TCL VOC+15 and TCL PAH analysis. GEI also proposes to analyze the samples for antimony, arsenic, beryllium, cadmium, lead, mercury, and cyanide (total). This list encompasses all of the COCs identified in Section 4.4.

Potential modifications to the CEA/WRA established for the Site will not be requested until the completion of proposed soil remediation activities at the Site. At that time a determination will be made regarding the frequency of groundwater sampling and the monitoring wells to be included in the sampling program.

6.4 Data Quality Assurance

Samples for chemical laboratory analysis will be collected, analyzed, and evaluated for data quality in accordance with the NJDEP *Field Sampling Procedures Manual* (FSPM), the NJDEP Tech Regs, and the NJDEP *Quality Assurance Project Plan Technical Guidance*.

The samples that are subject to this guidance are post-excavation sidewall/bottom soil samples and post-remediation groundwater samples.

Samples will be collected with dedicated sampling equipment to the extent possible. Sampling equipment will be decontaminated in accordance with Section 2.4 of the FSPM prior to use. Equipment will be calibrated prior to use and at the recommended interval for the equipment, and whenever a calibration error is suspected. The results of calibrations will be recorded and maintained.

Field blanks will be performed with a minimum frequency of 10 percent of the total samples to be collected. A field blank is made by using organic-free distilled water to rinse the properly decontaminated field sampling apparatus (bailer, split-spoons, hand auger, etc.). The water is then sealed in the same type of sample bottle as the other samples, preserved in the same manner, transported to the laboratory with other samples and analyzed for the same parameters as the samples.

Trip blanks will be analyzed for aqueous sampling events only, at a minimum frequency of one per cooler, and will be analyzed for TCL VOC+15.

Duplicate samples will be submitted with a minimum frequency of one per 20 samples. The laboratory will perform one matrix spike and one matrix spike duplicate sample (MS/MSD) with a minimum frequency of one per 20 samples analyzed.

Laboratory data will be reviewed in accordance with NJDEP data validation protocols and method-specific guidelines to determine usability of data. Data reduction, management, and validation will be performed by GEI's in-house data management group, who will import electronic data deliverables from the laboratory into a database and then summarize the data into formats that facilitate interpretation, analysis, and evaluation. The data management group will review the laboratory reports and ensure that data packages are complete, hold times were met, blanks are reviewed, and that the laboratory quality control data are included. The LSRP will work with the data management group to qualify laboratory data in the case of quality control non-conformance, and to determine the usability of the data.

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MFR-3 **For each of the same three MGP sites, provide all correspondence between the Company and the NJDEP concerning submissions for the site, reply comments, and other major items which have a material impact on remediation activities and associated costs incurred by the Company. The correspondence should span the twelve months of the most recent RAC period.**

During this RAC period, the remediation at these sites was under the oversight of LSRPs pursuant to SRRA. Nevertheless, the Company and JCP&L did conduct technical consultations with the NJDEP regarding Flemington and Newton ecological risk assessments. Please see attachments MFR-3.1 and MFR-3.2 for correspondence related to these consultations. The NJDEP position required additional remediation in the Flemington wetlands area which has been completed. Regarding Newton, the Company and JCP&L are still negotiating with the NJDEP on the results of the ecological risk assessment.

Potanovich, Susan L.

From: Stynchula, Jamey <jstynchula@geiconsultants.com>
Sent: Tuesday, November 29, 2016 4:08 PM
To: nancy.hamill@dep.nj.gov
Cc: Kevin.Schick@dep.nj.gov; alan.mott@dep.nj.gov; ecomings@firstenergycorp.com; Cook, Steven L.; Pernick, Steven; Raus, Barry; Bjorkman, Bjorn; Waterhouse, Tara; Gensemer, Bob; Schott, Tyler; Gorges, Aaron; 972600
Subject: 972600 Flemington MGP Site PI# 001038
Attachments: Fig 3-2 Proposed Limits of Excavation - Wetlands and Wetlands Buffer Zone.pdf; Fig 3-1 Proposed Limits of Excavation - All.pdf; 4B - Excavation - For Land Use Permit Application.pdf; 4A - Excavation - Wetland and Wetland Transition Area.pdf; Plate 2-1 Surface and Shallow Subsurface Soil Analytical Summary.pdf; Response to NJDEP Comments Letter_2016.11_FINAL 1.pdf

Dear Ms. Hamill,

Bob Blauvelt, the LSRP for this site, is on vacation this week and asked that we transmit our revised response to the Department's comment letter to the Ecological Risk Assessment for the Flemington former manufactured gas plant site. We have recalculated a High Molecular Weight (HMW) PAH Proposed Remediation Goal (PRG) based on your feedback from our November 15, 2016 conference call. We have also recalculated a background concentration from additional data presented in the Remedial Investigation Report. Our approach is discussed in more detail in the attached letter.

Due to the time-sensitive nature of this project, we respectfully request that the Department review the attached letter as soon as practical to provide concurrence with the approach and/or to provide any final guidance. We have a narrow window in which to conduct the Remedial Action due to restrictions for Trout Maintenance Stream, General Game Fish, and Indiana Bat habitat (March 15th to September 30th). We are currently submitting a major modification to the LURP/FHA permit to expand the excavation area so that several hot spots can be removed to meet the proposed PRG. We have a selected remediation contractor and we will need to mobilize in the next week in order to complete the Remedial Action before March 15th.

When reviewing the response we ask that you consider the following:

- Our proposed Remedial Action will be removing a majority of the wetland buffer zone soil and all of the stream sediment. We have attached some relevant figures from the Remedial Action Workplan (RAW) to support your review. We can also provide copies of the RAW text and figures, if requested.
- The area surrounding the site consists of Historic Fill. We have confirmed that our soil samples selected to support a background concentration calculation were collected from fill placed between 1940 and 1991, following MGP operation. We have attached some relevant figures from the RIR for your review and can provide aerial photographs via a sharefile site, if requested.
- Bushkill Brook and the associated floodplain receive stormwater and overflow stormwater from the Flemington Borough/Rartian Township combined sewer system which can deposit PAHs in the wetland buffer soil and stream sediments.
- While we have used the TRV values accepted in the Passaic River ROD, we do not feel that the Passaic River site is an acceptable analogue to the Flemington site. The Passaic River site is a sediment site while the site-specific ERA for Flemington addresses wetland buffer soils.

If necessary, we'd like to schedule a meeting at the site so that you can have an opportunity to evaluate site conditions. Thank you for your time and consideration on this matter.

Regards,

Jamey A. Stynchula
Senior Project Manager

GEI Consultants, Inc.
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Sample Name:	TP-32A
Sample Interval (ft bgs):	1.5-2.0
Sample Date:	5/5/1993
Carcinogenic PAHs (mg/kg)	
Benz[a]anthracene	**32**
Benzo[a]pyrene	**54**
Benzo[b]fluoranthene	**70**
Benzo[k]fluoranthene	**24**
Dibenz[a,h]anthracene	**12**
Indeno[1,2,3-cd]pyrene	**52**
Metals (mg/kg)	
Arsenic	**24**

Sample Name:	SS-10
Sample Interval (ft bgs):	0-2
Sample Date:	5/6/1997
Carcinogenic PAHs (mg/kg)	
Benzo[a]pyrene	**0.32 J**

Sample Name:	SS-16
Sample Interval (ft bgs):	0-2
Sample Date:	5/5/1997
Carcinogenic PAHs (mg/kg)	
Benz[a]anthracene	**0.7**
Benzo[a]pyrene	**1.6**
Benzo[b]fluoranthene	**1.6**
Metals (mg/kg)	
Lead	**424 J**

Sample Name:	SS-15
Sample Interval (ft bgs):	0-2
Sample Date:	5/5/1997
Non-carcinogenic PAHs (mg/kg)	
Methylnaphthalene,2-	**19 J**
Naphthalene	**15 J**
Carcinogenic PAHs (mg/kg)	
Benz[a]anthracene	**190**
Benzo[a]pyrene	**300**
Benzo[b]fluoranthene	**150**
Benzo[k]fluoranthene	**130**
Chrysene	**240**
Indeno[1,2,3-cd]pyrene	**93**

Sample Name:	SS-11
Sample Interval (ft bgs):	0-2
Sample Date:	5/5/1997
No Exceedances	

Sample Name:	TP1-1	Duplicate of TP1-1
Sample Interval (ft bgs):	1.0-1.5	1.0-1.5
Sample Date:	11/6/1985	11/6/1985
Carcinogenic PAHs (mg/kg)		
Benz[a]anthracene	**12**	**7**
Benzo[a]pyrene	**19**	**13**
Benzo[k]fluoranthene	**28**	**16**
Dibenz[a,h]anthracene	**20 J**	*ND*
Indeno[1,2,3-cd]pyrene	**20 J**	**20 J**
Metals (mg/kg)		
Arsenic	**46.9**	NA

Sample Name:	SS-24	Duplicate of SS-24
Sample Interval (ft bgs):	1-2.5	1-2.5
Sample Date:	6/1/2007	6/1/2007
Other SVOCs (mg/kg)		
Trichlorobenzene,1,2,4-	0.045 U	**8 J**

Sample Name:	TP-66
Sample Interval (ft bgs):	1.5
Sample Date:	5/1/1997
BTEX (mg/kg)	
Benzene	**0.008 J**
Non-carcinogenic PAHs (mg/kg)	
Methylnaphthalene,2-	**5.9 J**
Naphthalene	**7.2 J**
Carcinogenic PAHs (mg/kg)	
Benz[a]anthracene	**110**
Benzo[a]pyrene	**33 J**
Benzo[b]fluoranthene	**69**
Benzo[k]fluoranthene	**87**
Chrysene	**140**
Indeno[1,2,3-cd]pyrene	**49**
Metals (mg/kg)	
Arsenic	**111**
Lead	**975 J**

Sample Name:	SS-30
Sample Interval (feet):	1.5-2.0
Sample Date:	11/25/2009
Carcinogenic PAHs (mg/kg)	
Benz[a]anthracene	**12.2**
Benzo[a]pyrene	**12.3**
Benzo[b]fluoranthene	**10.1**
Benzo[k]fluoranthene	**8.68**
Dibenz[a,h]anthracene	**3.31**
Indeno[1,2,3-cd]pyrene	**7.42**

Sample Name:	SS-31
Sample Interval (feet):	0.5-1.0
Sample Date:	11/25/2009
Carcinogenic PAHs (mg/kg)	
Benz[a]anthracene	**13.8**
Benzo[a]pyrene	**15.9**
Benzo[b]fluoranthene	**16.1**
Benzo[k]fluoranthene	**10.2**
Dibenz[a,h]anthracene	**3.15**
Indeno[1,2,3-cd]pyrene	**7.53**

Sample Name:	SS-23
Sample Interval (ft bgs):	0.6-1.1
Sample Date:	6/1/2007
Carcinogenic PAHs (mg/kg)	
Benz[a]anthracene	**2**
Benzo[a]pyrene	**2.3 J**
Benzo[b]fluoranthene	**2.9 J**
Indeno[1,2,3-cd]pyrene	**0.79 J**

Sample Name:	SS-38
Sample Interval (feet):	1.5-2.0
Sample Date:	11/25/2009
Carcinogenic PAHs (mg/kg)	
Benz[a]anthracene	**14**
Benzo[a]pyrene	**16**
Benzo[b]fluoranthene	**15.7**
Benzo[k]fluoranthene	**9.92**
Dibenz[a,h]anthracene	**3.22**
Indeno[1,2,3-cd]pyrene	**7.65**

Sample Name:	SS-32
Sample Interval (feet):	1.5-2.0
Sample Date:	10/5/2009
Carcinogenic PAHs (mg/kg)	
Benz[a]anthracene	**2.45**
Benzo[a]pyrene	**2.48**
Benzo[b]fluoranthene	**2.73**
Dibenz[a,h]anthracene	**0.658**
Indeno[1,2,3-cd]pyrene	**1.69**

Sample Name:	SS-17
Sample Interval (ft bgs):	0-2
Sample Date:	5/14/1997
Carcinogenic PAHs (mg/kg)	
Benz[a]anthracene	**30**
Benzo[a]pyrene	**29**
Benzo[b]fluoranthene	**24**
Benzo[k]fluoranthene	**21**
Indeno[1,2,3-cd]pyrene	**19 J**

Sample Name:	SS-37
Sample Interval (ft bgs):	1-1.5
Sample Date:	11/25/2009
No Exceedances	

Sample Name:	SS-33
Sample Interval (feet):	1.5-2.0
Sample Date:	10/5/2009
Carcinogenic PAHs (mg/kg)	
Benzo[a]pyrene	**0.452**

Sample Name:	SS-03
Sample Interval (ft bgs):	0-0.5
Sample Date:	10/26/1993
Other VOCs (mg/kg)	
Methylene chloride	**0.008 JB**
Carcinogenic PAHs (mg/kg)	
Benz[a]anthracene	**5 J**
Benzo[a]pyrene	**5.5**
Benzo[b]fluoranthene	**6.8**
Dibenz[a,h]anthracene	**0.86 J**
Indeno[1,2,3-cd]pyrene	**2.5 J**

Sample Name:	SS-04	SS-04A
Sample Interval (ft bgs):	0-2	0-2
Sample Date:	5/1/1997	5/7/1997
BTEX (mg/kg)		
Benzene	**20**	*ND*
Toluene	**74**	ND
Ethylbenzene	**12 J**	ND
Xylene, Total	**160**	ND
Non-carcinogenic PAHs (mg/kg)		
Acenaphthene	**740 J**	ND
Fluoranthene	**3800**	**0.85**
Fluorene	**4600**	ND
Methylnaphthalene,2-	**13000**	**0.058 J**
Naphthalene	**17000**	**0.014 J**
Pyrene	**5300**	**1.7**
Carcinogenic PAHs (mg/kg)		
Benz[a]anthracene	**1700 J**	**0.7**
Benzo[a]pyrene	**1300 J**	**0.54**
Benzo[b]fluoranthene	**590 J**	**0.34 J**
Benzo[k]fluoranthene	**910 J**	**0.51**
Chrysene	**1400 J**	**0.76**
Indeno[1,2,3-cd]pyrene	**1600 J**	**0.44 J**
Metals (mg/kg)		
Arsenic	**16.7**	**138**

Sample Name:	SS-22
Sample Interval (ft bgs):	1-2
Sample Date:	6/1/2007
Carcinogenic PAHs (mg/kg)	
Benzo[a]pyrene	**0.3**

Sample Name:	SS-05
Sample Interval (ft bgs):	0-2
Sample Date:	5/7/1997
Carcinogenic PAHs (mg/kg)	
Benz[a]anthracene	**6.7**
Benzo[a]pyrene	**5.9 J**
Benzo[b]fluoranthene	**4.6**
Indeno[1,2,3-cd]pyrene	**5.5**

Sample Name:	SS-06
Sample Interval (ft bgs):	0-2
Sample Date:	5/7/1997
No Exceedances	

Sample Name:	TP-36A
Sample Interval (ft bgs):	1.5-2.0
Sample Date:	5/5/1993
BTEX (mg/kg)	
Benzene	**24**
Toluene	**74**
Ethylbenzene	**86**
Xylene, Total	**180**
Other VOCs (mg/kg)	
Styrene	**32**
Non-carcinogenic PAHs (mg/kg)	
Fluoranthene	**3800**
Fluorene	**3700**
Methylnaphthalene,2-	**7500**
Naphthalene	**10000**
Pyrene	**4700**
Carcinogenic PAHs (mg/kg)	
Benz[a]anthracene	**1600**
Benzo[a]pyrene	**1300**
Benzo[b]fluoranthene	**1100**
Benzo[k]fluoranthene	**450 J**
Chrysene	**76 J**
Dibenz[a,h]anthracene	**110 J**
Indeno[1,2,3-cd]pyrene	**540 J**

Sample Name:	SS-34
Sample Interval (feet):	1.0-1.5
Sample Date:	10/5/2009
Carcinogenic PAHs (mg/kg)	
Benz[a]anthracene	**8.82**
Benzo[a]pyrene	**8.16**
Benzo[b]fluoranthene	**8.95**
Dibenz[a,h]anthracene	**2.08**
Indeno[1,2,3-cd]pyrene	**4.97**

Sample Name:	SS-35
Sample Interval (ft bgs):	1-1.5
Sample Date:	10/5/2009
No Exceedances	

Sample Name:	SS-21
Sample Interval (ft bgs):	1.5-2
Sample Date:	6/1/2007
BTEX (mg/kg)	
Benzene	**1.4 J**
Toluene	**200**
Ethylbenzene	**41**
Xylene, Total	**850**
Non-carcinogenic PAHs (mg/kg)	
Fluorene	**570**
Methylnaphthalene,2-	**2200**
Naphthalene	**4500**
Carcinogenic PAHs (mg/kg)	
Benz[a]anthracene	**270**
Benzo[a]pyrene	**190**
Benzo[b]fluoranthene	**92**
Benzo[k]fluoranthene	**190 J**
Chrysene	**240**
Dibenz[a,h]anthracene	**22**
Indeno[1,2,3-cd]pyrene	**76**

Sample Name:	TP-16
Sample Interval (ft bgs):	1.5-2.0
Sample Date:	3/22/1991
BTEX (mg/kg)	
Benzene	**43**
Toluene	**230**
Ethylbenzene	**15**
Xylene, Total	**239**
Other VOCs (mg/kg)	
Methylene chloride	**7.3 BJ**
Styrene	**180**
Non-carcinogenic PAHs (mg/kg)	
Methylnaphthalene,2-	**170 J**
Naphthalene	**310 J**
Carcinogenic PAHs (mg/kg)	
Benz[a]anthracene	**40 J**
Benzo[a]pyrene	**12 J**
Benzo[b]fluoranthene	**21 J**
Benzo[k]fluoranthene	**21 J**
Dibenz[a,h]anthracene	**2.9**
Indeno[1,2,3-cd]pyrene	**6.1**

Sample Name:	SS-07
Sample Interval (ft bgs):	0-2
Sample Date:	5/14/1997
No Exceedances	

Sample Name:	SS-08
Sample Interval (ft bgs):	0-2
Sample Date:	5/6/1997
Carcinogenic PAHs (mg/kg)	
Benz[a]anthracene	**7.2**
Benzo[a]pyrene	**7**
Benzo[b]fluoranthene	**5.7**
Benzo[k]fluoranthene	**6.6**
Indeno[1,2,3-cd]pyrene	**3.4 J**

Sample Name:	SS-28
Sample Interval (ft bgs):	1.5-2
Sample Date:	10/5/2009
No Exceedances	

Sample Name:	SS-18
Sample Interval (ft bgs):	1-2
Sample Date:	5/31/2007
Carcinogenic PAHs (mg/kg)	
Benz[a]anthracene	**1.2**
Benzo[a]pyrene	**2 J**
Benzo[b]fluoranthene	**1.5 J**
Dibenz[a,h]anthracene	**0.28 J**
Indeno[1,2,3-cd]pyrene	**0.74 J**
Metals (mg/kg)	
Lead	**8960 J**

Sample Name:	SS-19
Sample Interval (ft bgs):	0.5-2
Sample Date:	5/31/2007
Carcinogenic PAHs (mg/kg)	
Benz[a]anthracene	**2.8**
Benzo[a]pyrene	**4.1 J**
Benzo[b]fluoranthene	**4.5 J**
Dibenz[a,h]anthracene	**0.72 J**
Indeno[1,2,3-cd]pyrene	**1.4 J**

Sample Name:	SS-12
Sample Interval (ft bgs):	0-2
Sample Date:	5/6/1997
Carcinogenic PAHs (mg/kg)	
Benz[a]anthracene	**51**
Benzo[a]pyrene	**69**
Benzo[b]fluoranthene	**49**
Benzo[k]fluoranthene	**33 J**
Indeno[1,2,3-cd]pyrene	**25**
Metals (mg/kg)	
Lead	**1010 J**

Sample Name:	SB-9
Sample Interval (ft bgs):	0.5-1
Sample Date:	5/31/2007
Carcinogenic PAHs (mg/kg)	
Benzo[a]pyrene	**0.39**

Sample Name:	SS-27
Sample Interval (ft bgs):	0.5-1
Sample Date:	10/5/2009
No Exceedances	

Sample Name:	SS-20
Sample Interval (ft bgs):	1-2.5
Sample Date:	5/31/2007
Carcinogenic PAHs (mg/kg)	
Benz[a]anthracene	**3.3**
Benzo[a]pyrene	**4.7 J**
Benzo[b]fluoranthene	**3.7 J**
Dibenz[a,h]anthracene	**0.52 J**
Indeno[1,2,3-cd]pyrene	**1.6 J**

Sample Name:	SB-10
Sample Interval (ft bgs):	1-2
Sample Date:	5/31/2007
No Exceedances	

Sample Name:	SS-14
Sample Interval (ft bgs):	0-2
Sample Date:	5/15/1997
Non-carcinogenic PAHs (mg/kg)	
Methylnaphthalene,2-	**7.4 J**
Naphthalene	**8.6 J**
Carcinogenic PAHs (mg/kg)	
Benz[a]anthracene	**42 J**
Benzo[a]pyrene	**42**
Benzo[b]fluoranthene	**31 J**
Benzo[k]fluoranthene	**22 J**
Indeno[1,2,3-cd]pyrene	**24 J**
Metals (mg/kg)	
Lead	**736 J**

Sample Name:	SS-36
Sample Interval (feet):	1.0-1.5
Sample Date:	10/5/2009
Carcinogenic PAHs (mg/kg)	
Benz[a]anthracene	**19.5**
Benzo[a]pyrene	**22.1**
Benzo[b]fluoranthene	**17.2**
Benzo[k]fluoranthene	**13.4**
Dibenz[a,h]anthracene	**3.81**
Indeno[1,2,3-cd]pyrene	**8.72**

Sample Name:	SS-09
Sample Interval (ft bgs):	0-2
Sample Date:	5/14/1997
Carcinogenic PAHs (mg/kg)	
Benz[a]anthracene	**16**
Benzo[a]pyrene	**18 J**
Benzo[b]fluoranthene	**8.9**
Benzo[k]fluoranthene	**11 J**
Indeno[1,2,3-cd]pyrene	**5.7**

LEGEND

- SITE PROPERTY BOUNDARY
- PROPERTY BOUNDARY
- PHASE 3 RA PROJECT BOUNDARY
- UTILITY EASEMENT
- SS-107 — 2015 ERA SAMPLE LOCATIONS (SEE APPENDIX D FOR DETAILS)
- SS-29 — SURFACE SOIL SAMPLE LOCATION (COLLECTED IN 2009)
- SS-20 — SURFACE SOIL SAMPLING LOCATION (CONDUCTED IN 2007)
- SS-01 — EPA SURFACE SOIL SAMPLE (COLLECTED IN 1993)
- MW-10D (SS-12) — DEEP BEDROCK MONITORING WELL SURFACE SOIL SAMPLE LOCATION
- MW-12S (SS-17) — SHALLOW MONITORING WELL LOCATION SURFACE SOIL SAMPLE LOCATION
- MW-19S — MONITORING WELL LOCATION (INSTALLED IN 2007)
- SB-15 — SOIL BORING LOCATION (CONDUCTED IN 2009)
- SB-9 — SOIL BORING LOCATION (CONDUCTED IN 2007)
- SB-5 (SS-14) — SOIL BORING LOCATION SURFACE SOIL SAMPLE LOCATION
- TP-66 — TEST PIT LOCATION (EXCAVATED IN 1997)
- TP-100 — TEST PIT LOCATION (EXCAVATED IN 2013, NO SAMPLES TAKEN))
- TP-1 — TEST PIT (TP-1 THROUGH TP-8 CONDUCTED IN 1987) (TP-9 THROUGH TP-23 CONDUCTED IN 1991) (TP-24 THROUGH TP-53 CONDUCTED IN 1993)
- ft bgs — FEET BELOW GROUND SURFACE
- NA — NOT ANALYZED
- ND — NOT DETECTED; TOTAL CONCENTRATION IS LISTED AS ND BECAUSE NO COMPOUNDS WERE DETECTED IN THE GROUP
- NE — NOT ESTABLISHED
- J — POSITIVELY IDENTIFIED; THE ASSOCIATED NUMERICAL VALUE IS AN APPROXIMATE CONCENTRATION
- N — ANALYTE IS PRESUMPTIVELY PRESENT
- UJ — NOT DETECTED ABOVE THE REPORTED SAMPLE QUANTITATION LIMIT AND THE REPORTED QUANTITATION LIMIT IS AN APPROXIMATE CONCENTRATION
- B — DETECTED IN THE SAMPLE AT A LEVEL LESS THAT THREE TIMES THAT OF THE BLANK
- BJ — DETECTED IN A SAMPLE AT A LEVEL BETWEEN THREE AND FIVE TIMES THAT OF THE BLANK AND ESTIMATED RESULT
- mg/kg — MILLIGRAMS/KILOGRAM OR PARTS PER MILLION (ppm)
- BTEX — BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES
- VOCs — VOLATILE ORGANIC COMPOUNDS
- PAHs — POLYCYCLIC AROMATIC HYDROCARBONS
- SVOCs — SEMIVOLATILE ORGANIC COMPOUNDS
- *ITALIC* — INDICATES A NON-DETECTED RESULT REPORTING LIMIT EXCEEDS AT LEAST ONE REMEDIATION STANDARD
- **BOLD** — INDICATES A DETECTED RESULT VALUE
- BOLD — INDICATES THAT THE DETECTED RESULT VALUE EXCEEDS ESTABLISHED IGW-SOIL
- BOLD — INDICATES THAT THE DETECTED RESULT VALUE EXCEEDS ESTABLISHED RDCSRS
- BOLD — INDICATES THAT THE DETECTED RESULT VALUE EXCEEDS ESTABLISHED NRDCSRS
- IGW-Soil — DEFAULT IMPACT TO GROUND WATER SOIL REMEDIATION STANDARDS FOR MOBILE ORGANIC CONTAMINANTS
- RDCSRS — RESIDENTIAL DIRECT CONTACT SOIL REMEDIATION STANDARD AS DESCRIBED IN TITLE 7 OF THE NEW JERSEY ADMINISTRATIVE CODE: N.J.A.C. 7:26D
- NRDCSRS — NON-RESIDENTIAL DIRECT CONTACT SOIL REMEDIATION STANDARD AS DESCRIBED IN TITLE 7 OF THE NEW JERSEY ADMINISTRATIVE CODE: N.J.A.C. 7:26D

	IGW-Soil	RDCSRS	NRDCSRS
BTEX (mg/kg)			
Benzene	0.005	2	5
Toluene	4	6,300	91,000
Ethylbenzene	8	7,800	110,000
Xylene, Total	12	12,000	170,000
Other VOCs (mg/kg)			
Acetone	12	70,000	NA
Methylene chloride	0.007	34	97
Tetrachloroethene	0.005	2	5
Non-carcinogenic PAHs (mg/kg)			
Acenaphthene	74	3,400	37,000
Acenaphthylene	NA	NA	300,000
Anthracene	NE	17,000	30,000
Benzo(g,h,i)perylene	NE	380,000	30,000
Fluoranthene	NE	2,300	24,000
Fluorene	110	2,300	24,000
Methylnaphthalene,2-	5	230	2400
Naphthalene	16	6	17
Phenanthrene	NE	NE	300,000
Pyrene	NE	1,700	18,000
Carcinogenic PAHs (mg/kg)			
Benz[a]anthracene	NE	0.6	2
Benzo[a]pyrene	NE	0.2	0.2
Benzo[b]fluoranthene	NE	0.6	2
Benzo[k]fluoranthene	NE	6	23
Chrysene	NE	62	230
Dibenz[a,h]anthracene	NE	0.2	0.2
Indeno[1,2,3-cd]pyrene	NE	0.6	2
Other SVOCs (mg/kg)			
Bis(2-ethylhexyl)phthalate	NE	35	140
Carbazole	NA	24	96
Diethyl phthalate	57	49,000	550,000
Di-n-butyl phthalate	NE	6,100	68,000
Trichlorobenzene,1,2,4-	0.4	73	820
Metals (mg/kg)			
Aluminum	NE	78,000	NA
Antimony	NE	31	450
Arsenic	NE	19*	19*
Barium	NE	16,000	59,000
Beryllium	NE	16	140
Cadmium	NE	78	78
Cobalt	NE	1,600	590
Copper	NE	3,100	45,000
Iron	NE	NE	NE
Lead	NE	400	800
Manganese	NE	11,000	5,900
Mercury	NE	23	65
Nickel	NE	1,600	23,000
Selenium	NE	390	5,700
Silver	NE	390	5,700
Sodium	NE	NE	NE
Vanadium	NE	78	1,100
Zinc	NE	23,000	110,000
Total Cyanide (mg/kg)			
Cyanide, Total	NE	1,600	23,000

SOURCE:
TAX LOTS 14 & 12.03 BLOCK 18, TOWNSHIP OF RARITAN, TAX LOTS 14 &15 BLOCK 5, BOROUGH OF FLEMINGTON, HUNTERDON COUNTY, NEW JERSEY, PREPARED BY GERALD G. DEGROAT, L.S., SCHOOLEY'S MOUNTAIN, NEW JERSEY, SCALE: 1" = 50', REVISED DATED JUNE 15, 2005.

PHASE 3 SOIL REMEDIAL ACTION WORKPLAN
FLEMINGTON FORMER MGP SITE
FLEMINGTON, NEW JERSEY

JERSEY CENTRAL POWER & LIGHT COMPANY
AND ELIZABETHTOWN GAS COMPANY

PROJECT 972600

GEI Consultants
18000 HORIZON WAY, SUITE 200
MOUNT LAUREL, NJ 08054

SURFACE AND SHALLOW SUBSURFACE SOIL ANALYTICAL SUMMARY

March 2016 — Plate 2-1

H:\TECH\project\JCP&L\flemington\Phase 3 Soil RAWP\Figures\CAD - Xu\ Flemington-Phase 3 Soil Analytical Results Summary.dwg \Mar 11, 2016

PHASE 2
RA AREA

PHASE 1
RA AREA

ETG SERVICE
CENTER PARKING

GRASS AREA

ONE-STORY
OFFICE BUILDING

10" SANITARY SEWER

TAX LOT 16
BLOCK 18.01

TAX LOT 14
BLOCK 18

TAX LOT 14
BLOCK 18.01

TAX LOT 14
BLOCK 5

TAX LOT 13.01
BLOCK 5

TAX LOT 13
BLOCK 5

TAX LOT 4.03

TAX LOT 4
BLOCK 5

TAX LOT 6
BLOCK 5

TAX LOT 5
BLOCK 5

TAX LOT 12
BLOCK 5

TAX LOT 11
BLOCK 5

TAX LOT 3
BLOCK 5

BLOCK 5

EXCAVATION BOUNDARY
NOT TO EXCEED CURB
AND COUNTY RIGHT OF WAY,
WHICHEVER COMES FIRST

0 60 120
SCALE: 1:60

EXCAVATION AREA LEGEND			
	DESCRIPTION	AREA (S.F.)	VOLUME (C.Y.)
	SHALLOW EXCAVATION - 1'	1,050	39
	SHALLOW EXCAVATION - 2'	18,600	1,380
	DEEP EXCAVATION - TO BEDROCK	81,420	24,125
	BUSHKILL CREEK SEDIMENT REMOVAL	12000	225

LEGEND:

- PHASE 3 IRM PROJECT LIMITS
- EXCAVATION BOUNDARY
- SITE PROPERTY BOUNDARY
- PROPERTY BOUNDARY
- WETLANDS BOUNDARY
- WETLANDS BUFFER ZONE BOUNDARY
- 100 GROUND SURFACE CONTOUR (FEET)
- OHW OVERHEAD ELECTRIC LINE
- S SANITARY SEWER
- STORM SEWER
- WATER MAIN
- -WM- INFERRED WATER MAIN
- GAS MAIN
- UNDERGROUND ELECTRIC CABLE
- ⊕ MW-14S MONITORING WELLS

Phase 3 Remedial Action Workplan
Flemington Former MGP Site
Flemington, New Jersey
SRP ID: 001038

Jersey Central Power & Light Company
And Elizabethtown Gas Company

GEI Consultants

Project 972600

PROPOSED LIMITS OF
EXCAVATION - TOTAL
REMEDIAL ACTION

April 2016 Fig. 3-1

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PHASE 2
RA AREA

PHASE 1
RA AREA

ETG SERVICE
CENTER PARKING

GRASS AREA

ONE-STORY
OFFICE BUILDING

10" SANITARY SEWER

TAX LOT 14
BLOCK 18.01

TAX LOT 16
BLOCK 18.01

TAX LOT 14
BLOCK 18

TAX LOT 14
BLOCK 5

TAX LOT 13.01
BLOCK 5

TAX LOT 13
BLOCK 5

TAX LOT 4.04

TAX LOT 4.03

TAX LOT 4
BLOCK 5

TAX LOT 6
BLOCK 5

TAX LOT 5
BLOCK 5

TAX LOT 12
BLOCK 5

TAX LOT 3
BLOCK 5

TAX LOT 11
BLOCK 5

BLOCK 5

REMEDIAL ACTION LEGENG			
	DESCRIPTION	AREA (S.F.)	VOLUME (C.Y.)
	ENVIRONMENTAL RISK ASSESSMENT	51,193	NOT APPLICABLE
	SHALLOW EXCAVATION - 1'	1,050	39
	DEEP EXCAVATION	54,120	16,035
	BUSHKILL CREEK SEDIMENT REMOVAL	12,000	225

LEGEND:

- PHASE 3 IRM PROJECT LIMITS
- EXCAVATION BOUNDARY
- SITE PROPERTY BOUNDARY
- PROPERTY BOUNDARY
- WETLANDS BOUNDARY
- WETLANDS BUFFER ZONE BOUNDARY
- GROUND SURFACE CONTOUR (FEET)
- OVERHEAD ELECTRIC LINE
- SANITARY SEWER
- STORM SEWER
- WATER MAIN
- INFERRED WATER MAIN
- GAS MAIN
- UNDERGROUND ELECTRIC CABLE
- MW-14S MONITORING WELLS

0 60 120

SCALE: 1:60

Phase 3 Remedial Action Workplan
Flemington Former MGP Site
Flemington, New Jersey
SRP ID: 001038

Jersey Central Power & Light Company
And Elizabethtown Gas Company

GEI Consultants

Project 972600

PROPOSED LIMITS OF EXCAVATION - WETLAND/WETLAND BUFFER ZONE

April 2016 Fig. 3-2

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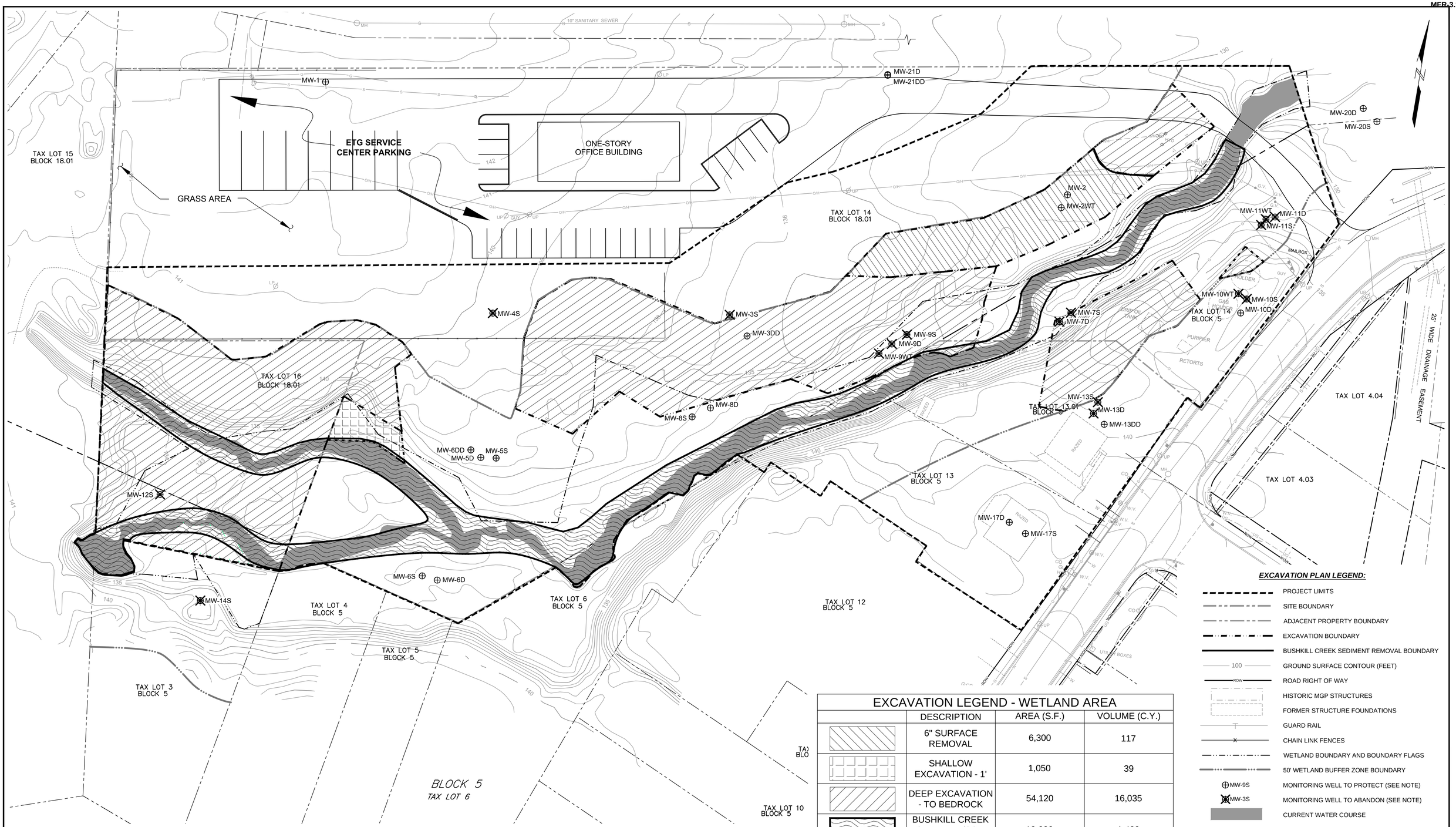

EXCAVATION NOTE:

1. EXCAVATE TO THE TOP OF COMPETENT BEDROCK IN THE AREA NOTED. SEE EXCAVATION AREA LEGEND.
2. MAINTAIN MINIMUM 2H-1V SLOPE ANGLE DURING EXCAVATION WORK. ADJUST THE SLOPE ANGLE AS NEEDED BASED ON CONDITIONS OBSERVED IN THE FIELD TO COMPLY WITH OSHA REQUIREMENTS.
3. PROVIDE EXCAVATION SUPPORT(E.G. SHEET PILE, TRENCH BOX, SLIDE RAIL, ETC) AS NECESSARY ON BUSHKILL CREEK SEDIMENT REMOVAL TO COMPLY WITH OSHA EXCAVATION SAFETY REQUIREMENT.
4. PROTECT THE FOLLOWING MONITORING WELL: MW-2, MW-2WT, MW-3DD, MW-5S, MW-5D, MW-6S, MW-6D, MW-6DD, MW-8S, MW-8D, MW-10D, MW-13DD, MW-17S, MW-17D, MW-20S, MW-20D, MW-21D, AND MW-21DD.
5. CLOSE AND REMOVE FOLLOWING MONITORING WELLS: MW-3S, MW-4S, MW-7S, MW-7D, MW-9S, MW-9D, MW-9WT, MW-10WT, MW-10S, MW-11WT, MW-11S, MW-11D, MW-12S,MW-13S, MW-13D, AND MW-14S.

EXCAVATION LEGEND - WETLAND AREA

	DESCRIPTION	AREA (S.F.)	VOLUME (C.Y.)
	6" SURFACE REMOVAL	6,300	117
	SHALLOW EXCAVATION - 1'	1,050	39
	DEEP EXCAVATION - TO BEDROCK	54,120	16,035
	BUSHKILL CREEK SEDIMENT/SOIL REMOVAL	19,000	1,400

EXCAVATION PLAN LEGEND:

- PROJECT LIMITS
- SITE BOUNDARY
- ADJACENT PROPERTY BOUNDARY
- EXCAVATION BOUNDARY
- BUSHKILL CREEK SEDIMENT REMOVAL BOUNDARY
- 100 GROUND SURFACE CONTOUR (FEET)
- ROW ROAD RIGHT OF WAY
- HISTORIC MGP STRUCTURES
- FORMER STRUCTURE FOUNDATIONS
- GUARD RAIL
- CHAIN LINK FENCES
- WETLAND BOUNDARY AND BOUNDARY FLAGS
- 50' WETLAND BUFFER ZONE BOUNDARY
- ⊕MW-9S MONITORING WELL TO PROTECT (SEE NOTE)
- ⊗MW-3S MONITORING WELL TO ABANDON (SEE NOTE)
- CURRENT WATER COURSE

FOR BIDDING

Attention: 0 1" — If this scale bar does not measure 1" then drawing is not original scale.	NO.	DATE	ISSUE/REVISION	APP
	2	7/26/2016	FOR BIDDING	TS
	1	5/25/2016	FOR REVIEW	TS

7/26/2016

Designed:	TS/SX
Checked:	JS
Drawn:	SX
Submitted By:	TS
NJ P.E. No.:	24GE04794800
Submittal Date:	7/26/2016

GEI
18000 HORIZON WAY
SUITE 200
MOUNT LAUREL, NJ 08054
(856)608-6860

Jersey Central Power & Light
A FirstEnergy Company

GEI Project 972600

Phase 3 Soil Remedial Action
Flemington Former MGP Site
Flemington, New Jersey

DWG. NO. 4A

EXCAVATION PLAN -WETLAND AND WETLAND BUFFER AREAS

REV 1

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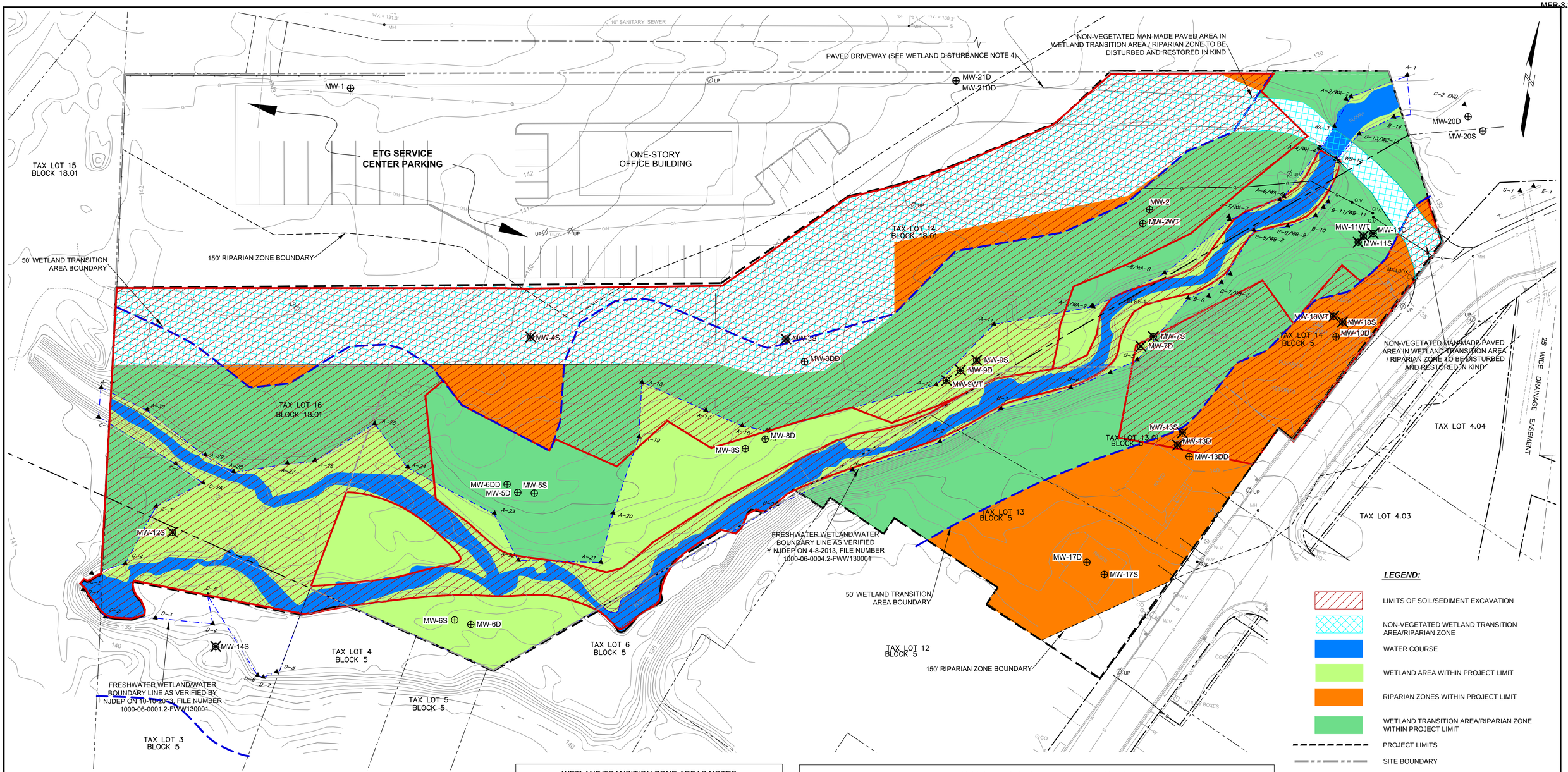

0 30 60

SCALE: 1:30

WETLAND/TRANSITION ZONE AREAS NOTES

MAP LEGEND	DESCRIPTION	WITHIN EXCAVATION AREA (sq. ft / acre)	WITHIN PROJECT AREA (sq. ft/acre)
	NON-VEGETATED WETLAND TRANSITION AREA / RIPARIAN ZONE	~40,104 / ~0.921	~41,766 / ~0.959
	BUSHKILL CREEK	~ 12,180 / ~ 0.280	~12,815 / ~0.294
	WETLAND AREAS	~ 20,050 / ~0.460	~37,633 / ~0.864
	WETLAND TRANSITION AREA/RIPARIAN ZONE	~37,480 / ~0.860	~64,653 / ~1.484
	RIPARIAN ZONE	~ 13,290 / ~0.305	~27,346 / ~0.628

TEMPORARY AND PERMANENT IMPACTS NOTE

Description	Map Legend	AREA OF VEGETATION TO BE REMOVED /DISTURBED TEMPORARY IMPACTS	AREA OF VEGETATION TO BE REMOVED /DISTURBED PERMANENT IMPACTS
BUSHKILL CREEK		N/A	N/A
DELINEATED WETLAND		PALUSTRINE FORESTED (VARIANT) = 0.460 ACRE	N/A
WETLAND TRANSITION AREA/RIPARIAN ZONE		MOWED LAWN/GRASS COVER = 250 SF OR 0.006 ACRE UPLAND FORESTED (DISTURBED) = 0.854 ACRE	N/A
RIPARIAN ZONE		UPLAND FORESTED (DISTURBED) = 0.305 ACRE	N/A

WETLAND DISTURBANCE NOTE:

1. THE EXCAVATION BOUNDARY AS SHOWN IS THE LIMIT OF WETLAND AND WETLAND TRANSITION AREA DISTURBANCE. EXCAVATION AREA IS A SUBSET OF PROJECT LIMIT.
2. ALL WORK IMPACTING WETLANDS AND WETLAND TRANSITION ZONE TO BE PERFORMED IN ACCORDANCE WITH NJDEP FRESHWATER WETLANDS GP-4 PERMIT TO BE OBTAINED BY OWNER'S REPRESENTATIVE, AS WELL AS APPLICABLE FEDERAL AND STATE REGULATIONS.
3. CONTRACTOR NOT PERMITTED TO STAGE EQUIPMENT IN WETLANDS OR WETLAND TRANSITION AREAS THAT ARE NOT WITHIN THE EXCAVATION BOUNDARY, EXCEPT FOR DESIGNATED LAYDOWN AREA ON TAX BLOCK 5, LOT 13 AND TAX BLOCK 5, LOT 13.01. ANY POTENTIAL DISTURBANCE AS RESULTS OF CONTRACTOR ACTIVITY ON THE DESIGNATED LAYDOWN AREA WILL BE RESTORED IN KIND.
4. PAVED DRIVEWAY WITHIN THE WETLAND TRANSITION ZONE TO BE RESTORED IN KIND. THE REST OF NON-NEGETATED WETLAND TRANSITION ZONES WILL BE RESTORED IN ACCORDANCE WITH THE WETLAND RESTORATION PLAN.

EXCAVATION NOTE:

1. EXCAVATE TO THE TOP OF COMPETENT BEDROCK IN THE AREA NOTED. SEE EXCAVATION AREA LEGEND.
2. MAINTAIN MINIMUM 2H-1V SLOPE ANGLE DURING EXCAVATION WORK. ADJUST THE SLOPE ANGLE AS NEEDED BASED ON CONDITIONS OBSERVED IN THE FIELD TO COMPLY WITH OSHA REQUIREMENTS.
3. PROTECT THE FOLLOWING MONITORING WELL: MW-2, MW-2WT, MW-3DD, MW-5S, MW-5D, MW-6S, MW-6D, MW-6DD, MW-8S, MW-8D, MW-10D, MW-13DD, MW-17S, MW-17D.
4. CLOSE AND REMOVE FOLLOWING MONITORING WELLS: MW-3S, MW-4S, MW-7S, MW-7D, MW-9S, MW-9D, MW-9WT, MW-10WT, MW-10S, MW-11WT, MW-11S, MW-11D, MW-12S,MW-13S, MW-13D, AND MW-14S.

LEGEND:

- LIMITS OF SOIL/SEDIMENT EXCAVATION
- NON-VEGETATED WETLAND TRANSITION AREA/RIPARIAN ZONE
- WATER COURSE
- WETLAND AREA WITHIN PROJECT LIMIT
- RIPARIAN ZONES WITHIN PROJECT LIMIT
- WETLAND TRANSITION AREA/RIPARIAN ZONE WITHIN PROJECT LIMIT
- PROJECT LIMITS
- SITE BOUNDARY
- ADJACENT PROPERTY BOUNDARY
- WETLAND DELINEATION (A-1)
- 50 FT. WETLAND TRANSITION AREA
- RIPARIAN ZONE (150 FT FROM CREEK BANK)
- CHAIN LINK FENCES
- GROUND SURFACE CONTOUR (FEET)
- MW-9S — MONITORING WELL TO PROTECT (SEE NOTE)
- MW-3S — MONITORING WELL TO ABANDON (SEE NOTE)

FOR BIDDING

NO.	DATE	ISSUE/REVISION	APP
2	7/26/2016	FOR BIDDING	TS
1	5/25/2016	FOR REVIEW	TS

Attention: 0 1" — If this scale bar does not measure 1" then drawing is not original scale.

7/26/2016

Designed:	TS/SX
Checked:	JS
Drawn:	SX
Submitted By:	TS
NJ P.E. No.:	24GE04794800
Submittal Date:	7/26/2016

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Jersey Central Power & Light
A FirstEnergy Company

GEI Project 972600

Phase 3 Soil Remedial Action
Flemington Former MGP Site
Flemington, New Jersey

DWG. NO. 4B

EXCAVATION PLAN - FOR LAND USE PERMIT APPLICATION

REV 1

GEI Consultants

Consulting Engineers and Scientists

November 29, 2016
Project 972600

Mr. Kevin Schick
Bureau Chief, BEERA
New Jersey Department of Environmental Protection
P.O. Box 420
Mail Code 401-05W
Trenton, NJ 08625-0420

Dear Mr. Schick:

Re: Alternative/New Soil Remediation Standard Application
Response to Comments (Revision 1)
Flemington Former Manufactured Gas Plant Site
PI # 001038
Flemington Borough/Raritan Township, New Jersey

I have reviewed the New Jersey Department of Environmental Protection's (NJDEP) letter dated October 20, 2016, which provided comments from the review of the Ecological Risk Assessment (ERA) for the Flemington Former Manufactured Gas Plant (MGP) site. The ERA was included as an Appendix to the Remedial Action Workplan (RAW), submitted on May 9, 2016, to address soils at the site. The ERA was prepared to develop Proposed Remediation Goals (PRGs) for compound concentrations in soil at the site which would not pose an unacceptable risk to ecological receptors. This would allow a significant portion of the wetlands to not be disturbed. This approach was agreed upon at a Technical Assist meeting with NJDEP in August 2015. A copy of the minutes from that meeting and NJDEP concurrence are attached.

As the Licensed Site Remediation Professional (LSRP) for this site, I have prepared this letter to respond to NJDEP's comments. GEI Consultants, Inc. (GEI) prepared the ERA and has provided technical support for the review and comments presented herein. During the review, GEI did note a few errors in the presentation of the ERA that should be revised; however, these errors do not materially affect the conclusions presented in the ERA. The review also indicated the need to refine the development, presentation and discussion of Preliminary Remediation Goals (PRGs), as also noted in the comments, in order to allow appropriate risk management decisions to be undertaken. A conference call with NJDEP was held on November 15, 2016 to discuss the draft response to the October 20, 2016 letter. These issues and the outcome of the November 15, 2016 meeting are addressed in the following revised response.

Response to Comments:

NJDEP Comment: *In accordance with Ecological Evaluation Technical Guidance (NJDEP 2015), Section 7.0, appropriate preliminary remediation goals (PRGs) should be developed through the use of food chain modeling, soil toxicity test results or apparent effects threshold (AET. Based on the information provided and given that food chain modeling indicated elevated*

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hazard quotients (HQ's), the food chain modeling appears to be the most appropriate method for developing PRGs.

Response: The ERA relied on two distinct lines of evidence (LOE) which are detailed in the document: a food web model and on the results of earthworm toxicity tests. The numeric PRGs presented in the document were based on the food web modeling line of evidence, but the toxicity based LOE should not be ignored in the risk conclusions and risk management, as Section 9.0 of the guidance indicates.

Once a PRG has been developed, then, in accordance with NJDEP 2015, Section 9.0, a risk management decision can be made to move away from the PRG. Section 11 of the Ecological Risk Assessment of the Flemington Former Manufactured Gas Plant (ERA) (GEI Consulting Engineers and Scientists, April 2016) eludes to "an incremental reduction of ecological risk;" however, this determination cannot be made until PRGs are developed (NJDEP 2015, Section 9,0).

Response: The "incremental reduction of ecological risk" was the term used to convey the concept of exposure risk reductions as discussed as a goal for risk management in Section 9.2 of the guidance. The concept conveyed the idea that removal of the area surrounding SS-103 would reduce the resulting concentrations below the PRG. However, we understand that the language was confusing and it will be revised to be consistent with guidance and present PRGs independent of site data.

It should be noted that the removal of the area of sample SS-103 was included in the RAW based on the findings of the ERA. Additional soil samples will be collected in this area, as necessary, to confirm that the PRGs are being met with the proposed removal.

The HQ's for HMW PAHs used a toxicity reference value (TRV) of 18 mg PAHs/ kg bw/ day based on the EcoSSL values; however, as indicated on page 9 of the Ecological Soil Screening Levels for Polycyclic Aromatic Hydrocarbons (PAHs) Interim Final (USEPA 2007), "A geometric mean of the [no observed adverse effect level] NOAEL values for growth and reproduction was calculated at 18 mg PAHs/ Kg bw/ day. However, this value is higher than the lowest bounded [lowest observed adverse effect level] LOAEL for reproduction, growth, or mortality. Therefore, the TRV is equal to the highest bounded NOAEL lower than the lowest bounded LOAEL for reproduction, growth, or survival and is equal to 0.615 mg PAHs/Kg bw/day." Therefore, the appropriate TRV for HMW-PAHs is 0.615 mg PAHs/Kg bw/day, not 18 mg PAHs/Kg bw/ day.

Response: The applicable TRVs was addressed in our previous response and discussed on the call with NJDEP held on November 15, 2016. As noted we continue to have various technical concerns about the use of the NOAEL TRV of 0.615 mg/kg-d from Culp et al. (1988) as a basis for the PRG, and consider it to be overprotective as a basis for remediation goals in view of the preponderance of ecotoxicological data.

To summarize the discussion:

- We concurred that the use of the 18 mg/kg-d as a high value, as applied in the submitted version of the ERA will not be used for the site (although we consider it a better estimate of true toxicity); neither was an alternate low TRV based on excluding the Culp et al. (1988) data (resulting in a NOAEL TRV of 11.8 mg/kg-d) acceptable to NJDEP.

- The use of the Culp et al. (1988) data as the preferred TRV for HMW PAHs has precedent in New Jersey based on the TRV applied in the ERA at the Lower Passaic River CERCLA site (U.S. EPA 2014, *Lower Eight Miles of the Lower Passaic River Focused Feasibility Study Report, Appendix D: Risk Assessment*)
- However, also based on Passaic precedent, it is reasonable to consider a high TRV equal to the LOAEL TRV (3.1 mg/kg-d from Culp et al. 1988) to define a risk range.

Based on further review, we will apply Culp et al. (1988) as the applicable TRV source to calculate LOAEL based TRV risks in addition to showing the NOAEL TRV based risks. We consider the LOAEL TRV as a reasonable basis for the PRG, and consistent with TRVs developed for the Lower Passaic River CERCLA site.

A revised PRG for HMW-PAHs for the shrew ESNR was calculated using the LOAEL TRVs and are presented below. As noted in the introduction to this memo, one error in the original ERA was present in the calculation of the soil-ingestion factor for the shrew, which should, in accordance with the EPA eco-SSL guidelines, be 3 percent of food ingestion, or Ps=0.03. This affects the intake term for incidental soil ingestion. For the recalculated proposed PRG below, this error has been corrected.

In addition, and in accordance with NJDEP and national guidance, the PRG has been calculated on the basis of site specific exposures and risk founded on the 95th percent UCL of the mean for the entire exposure area. The concentration in diet (plant and worms) is calculated from the average bioaccumulation factor observed in site data.

The proposed revised PRG can be calculated as:

- PRG = soil exposure concentration (95% UCL) / HQ based on incidental soil ingestion and food chain ingestion (at the average observed site specific soil to tissue Bioaccumulation factor at the 95% UCL soil concentration).

The 95% UCL of the mean soil concentration for the exposure area including SS-103 is 415.8 mg/kg HMW PAH. The PRG calculation would not consider bioavailability adjustments (see also next comment). The HQs recalculations apply the same exposure assumptions for shrews as in the existing risk assessment except the revised soil ingestion factor. The recalculated risk becomes:

- HQ (NOAEL TRV) = 17.7
- HQ (LOAEL TRV) = 3.5

Therefore, the proposed PRG is:

- PRG (corresponding to a HQ=1 at LOAEL) = 415.8 mg/kg / 3.5 = 117.1 mg/kg

The low-effect level represents the lowest value at which adverse effects were documented in the original study. This value would replace the PRG of 350 mg/kg presented in the risk assessment.

In addition, a bioavailability of 0.5 was used for soil for the site without any bioavailability studies being conducted. Therefore, bioavailability should be 1 for the site.

Response: We note that Section 6.1.3.2 of the guidance states that:

> "*To be consistent with the first two steps of ERAGS, the EE must assume that 100 percent of a particular COPEC that is identified in a particular media is available to the representative receptors being evaluated (N.J.S.A. 58:10B-12). While this is generally considered to be an overestimation of ecological risk, it provides a level of certainty if the conclusion of the EE is that no ecological risks are evident. However, in the ERA, the investigator should consider bioaccumulation when calculating the levels of exposure to be evaluated in the risk assessments, particularly in calculations of impacts to higher trophic level organisms through food chain transfer of a COPEC.*"

NJ guidance clearly anticipates that realistic exposures are necessary to derive reasonable PRGs. Bioaccumulation is an essential part of this process, and it is highly unrealistic to assume that HMWPAHs are absorbed from diet and soil at 100%. The use of a reasonable 0.5 relative bioavailability factor, therefore, is a useful bounding exercise that would result in a doubling of the PRG. We will revise to mention this bounding in the uncertainty section without including it in the final PRG calculation.

The four background samples included SS-111 through SS-114; however, SS-111 and SS-112 are directly adjacent to the site and located near undelineated elevated HMW-PAHs levels.

Response: We note that there were two "reference" locations from areas representing "regional soil quality" (SS-113 and SS-114) and two "background" locations (SS-111 and SS-112) from upgradient of the site which is consistent with the section 6.2.3.1 of the guidance. These locations may be affected by other sources but, as noted in guidance section 6.2.3.1 III, the "background" areas are as representative of what conditions may exist on site regardless of historical activities on site or post-remediation given regional nonpoint sources of contamination such as through runoff or historical fill. All samples from the upgradient "background" area are relevant to the site investigation and usable for purposes of comparing site concentrations to background and region. In addition, based on discussions with NJDEP the background data set for the area west of the site has been augmented with existing, prior data to strengthen the evaluation.

In accordance with the NJDEP 2015, Section 5.3.4, "All background area samples should be collected from areas outside the site's potential influence."

Response: Figure 7 (attached) of the Remedial Investigation Report (RIR) submitted for the site in April, 2014 shows the extent of Historic Fill on and surrounding the site. Per 7:26E-4.7(a)1., the Historic Fill was delineated to the property boundary. The area of the collection of the background samples is not under the "potential influence" of the site. The HMW PAHs are associated with Historic Fill and historic operations of the adjacent property as an industrial facility and from historic operations of the railroad. The PAHs are not associated with a release from site operations associated with the MGP process or a discharge of MGP-related substances.

The placement of the Historic Fill, from which our background samples were collected, can be confirmed through review of historic aerial photographs. Aerial photographs from 1940 through 1991 show that the soils at or near existing site grades on the adjacent property were placed progressively in the years following the operation of the later MGP plant. Based on this, the soils are not under the "potential influence" of the site and the background soil data presented in the RIR and the ERA are representative of background. The "reference" locations are indicative of regional typical concentrations.

In addition, the highest background levels were compared to the average site levels, which is not acceptable.

In accordance with NJDEP 2015, Section 5.5, "Statistics at a minimum should also include mean, maximum, 95 percent Upper Confidence Limit (UCL) (if appropriate based on number of samples), concentration range, and frequency of detection." Like statistics from background locations should be compared to like statistics for site data.

Response: Section 5.3.4 of the EE guidance indicates "*For a relatively small background area sample size, the mean and range of background contaminant concentrations should be used for comparison with individual sample points from site data, based on professional judgment*". While we concur that, when formally determining if a site is above background, a statistical test comparing "like to like" is appropriate.

The incorporation of additional data available for the upgradient area west (see attached Plate 1) of the site results in a background data set sufficient for statistical analysis. The data set is normally distributed resulting in a 95% UCL of the mean for HMW PAH of 104 mg/kg. Calculation of background threshold values (BTVs) based on the 95/95 UTL in accordance with EPA procedures result in values higher than the maximum detected concentration of 158.5 mg/kg, so conservatively defaulting back to the maximum is appropriate. The 95%UCL of the mean for the background is used to compare to the 95% UCL of the mean of soil concentrations. The 95/95 UTL (or maximum detected in this case) is appropriate BTV for comparison of individual samples to a BTV.

Only acute toxicity tests were performed for the earthworm (14-day survival) and ryegrass (c1nergence and root elongation) instead of chronic tests (i.e. reproductive tests for earthworms). Chronic toxicity tests, particularly for the earthworm, may be more appropriate for site contaminants.

Response: In Appendix E of the EE guidance, it states that sublethal and longer duration endpoints are not always appropriate for soil toxicity tests, as they may result in false positives and/or misleading results. The earthworm test used for this study is a standard method commonly applied when considering terrestrial soil toxicity, as true chronic tests are difficult to implement reliably in terrestrial toxicity testing. The acute earthworm remains a valuable line of evidence for the risk assessment. The ryegrass test should be considered an appropriate chromic endpoint for plants.

Figure 7 of the ERA indicates that complete delineation of PAHs, including off-site, has not been achieved in accordance with NJ.AC 7:26E-4.1(a), -4.2(a), -4.2(b) and -4.8(c).

Response: As stated previously, the RIR submitted for the site in April, 2014 documents delineation of impacted environmental media. The site is bound to the west and south by historical fill not associated with the operation of the former MGP. Per 7:26E-4.7(a)1., the Historic Fill was delineated to the property boundary. The ecological evaluation was

not intended as a complete delineation of contaminants in accordance with NJAC 7:26E. It is specifically focused on evaluating potential ecological risk to ESNRs in the "ERA site" based on the available information about the site. We note that additional work has been presented elsewhere on this topic. The figures do show the extent of the "ERA site" relative to other portions of the site where free or residual product has been previously noted and is not addressed under this ERA.

Additionally, GEI also noted during review some curious results related to selenium, where earthworm tissue data were highly elevated relative to the soil matrix in which they were tested. Such a result is not consistent with established biology of earthworms (i.e. earthworms are expected to have tissue burdens more or less in 1:1 equilibrium with their soil matrix, and are not known to accumulate selenium, particularly in the absence of hyper-accumulating vegetation providing selenium enriched detritus). This results in substantially overestimated risk. Based on the observed soil concentrations, and applying standard eco-SSL accumulation factors, the expected reportable selenium-related risk to shrews should be much lower, in the range of HQ=1 to 2 for the maximum detected soil concentrations of around 2 mg/kg. These are HQs in line with the other metals at the site, and would not require consideration for a remedial goal. There appears to be something problematic with the earthworm selenium data that needs to be considered, and suggests that developing a PRG for selenium is premature and possibly unnecessary. A discussion of concerns about these results will be added.

The additional analysis of the data based on NJDEP feedback from the November 15, 2016 conference call has yielded a more conservative PRG of 117.1 mg/kg (corresponding to a HQ=1 at LOAEL). GEI recalculated the background concentrations from additional soil samples from the RIR, which yielded a concentration of 104 mg/kg for HMW PAHs. GEI also verified through historic research that the soil samples used to calculate the background concentration were not under "potential influence" of the site. Based on the additional analysis, we are proposing the use of the background concentration as a conservative PRG for HMW PAHs.

If you have any questions, please feel free to contact me at (973) 873-7127. We would be happy to hold an on-site meeting with you to help develop a better understanding of site conditions to support your further review.

Sincerely,

GEI CONSULTANTS, INC.

Robert Blauvelt, LSRP
Senior Consultant

Jamey A. Stynchula, P.G.
Project Manager

RB:JAS/lsf
Enclosures

c: Ms. Nancy Hamill

Memo

To: Kevin Schick, NJDEP
Nancy Hamill, NJDEP
Mark Davis, NJDEP (LURP Meeting)
Dennis Contois, NJDEP (LURP Meeting)

From: Bob Blauvelt, LSRP

Re: Summary of August 25, 2015 Technical Consultation Meeting

Discussion of institutional and engineering controls necessary to address exposure pathway for human health and ecological receptors for soil containing PAHs and lead above the NRDCSRS and ESC in the wetland and wetland buffer areas of the former Flemington MGP site (PI No. 001038).

Date: September 3, 2015

Attendees: Elaine Comings, JCP&L
Steve Cook, Pivotal Utility Holdings
Steven Pernick, Pivotal Utility Holdings
Jamey Stynchula, GEI
Tara Waterhouse, GEI
Barry Raus, GEI
Bob Blauvelt, LSRP(License No. 575013)

Purpose of Consultation: To discuss the use of Institutional Controls and Engineering Controls related to exposure pathways for potential human health and ecological receptors from soil impacted with low levels of PAHs above Non-Residential Direct Contact Soil Remediation Standards (NRDCSRS) and Ecological Screening Criteria in the wetland and wetland buffer areas at the former Flemington Manufactured Gas Plant (MGP) site, PI No. 001038. This possible approach may be used in conjunction with excavation of soil and sediment impacted with free and residual product (coal tar) as part of the remedial strategy for the site.

The meeting began with personnel introductions and sign in sheet (attached).

Kevin Schick welcomed the group and explained the role of a technical consultation, which is not intended to approve or reject plans presented by the project team. Rather, the NJDEP is acting in an advisory role to assist the LSRP's use of professional judgment in selecting and implementing an appropriate remedial solution for the site.

The site LSRP, Bob Blauvelt led the discussion and began by providing an orientation to the site and site background and stating that there were several remedial options being considered for the wetlands and wetland soil. One alternative actively being considered is to remove the areas of identified

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free and residual product and allow soils with low concentrations of metals (particularly lead) and PAH impacts to remain in place. From a standpoint of preserving a natural resource this was desirable versus complete disturbance and later restoration of the wetland and adjoining areas. Mr. Blauvelt stated that he would need a high level of comfort that the institutional and engineering controls would be protective of human health and local ecology and that an ecological risk assessment (ERA) would be necessary in order to determine that there was no unacceptable risk to ecological receptors before he would approve this approach.

Jamey Stynchula then discussed the site data and Remedial Investigation Report. The following was presented regarding the remedial status of the site:

- The Remedial Investigation Report was submitted in April 2014 and has been accepted by the NJDEP.

- Soil remediation has been completed in two areas (Phase 1 and Phase 2) to facilitate construction of a new building and yard for Elizabethtown Gas (ETG). The footprint of the new facility was selected to be outside of the wetland buffer zone to avoid the need for permitting and to expedite the project. The remediation in these areas consisted of removal of free and residual product (coal tar) to the bedrock surface with removal of soil with adsorbed phase impacts to a depth of two feet, and backfill with clean fill.

- Two applications for Letters of Interpretation (LOI) have been submitted for the site and been accepted by NJDEP. Permits were issued for remedial investigation activities within the wetlands in 2009 and 2013.

- Figure 1 (attached to the proposed meeting agenda) shows the areas of identified free and residual product in relationship to the delineated wetlands and buffer zone.

- The MGP site is surrounded by mapped Historic Fill, which has been documented on adjacent properties and observed during installation of a culvert to the east of the site. Remedial investigation activities by GEI has identified the fill as including, among other things, coal residues, ash, glass, brick fragments, trash, and other debris. In places, the fill can be more than 12 feet thick.

- The Bushkill Brook is fed by two culverts, which are connected upstream, one older culvert to the north and a more recent culver to the south. These culverts provide drainage for a substantial portion of Flemington Borough and Raritan Township.

- Multiple sources of Diffuse Anthropogenic Pollution (DAP) are fed into and surround the Bushkill Brook.

- A conservation easement, which coincides with the 50 feet wetland buffer zone has been established by Raritan Township and is waiting to be recorded.

- A deed restriction will be placed on the properties as concentrations above the RDCSRS will remain on the Site.

Mr. Schick stated that in cases like this, institutional and engineering controls have been used to preserve natural resources including split rail fence and signage. If the LSRP was comfortable that the proposed controls were protective of human health and the ERA found that there was no unacceptable risk to ecological receptors, the NJDEP would not reject this approach.

Further questions were asked by the NJDEP regarding the ERA:

- The NJDEP had concerns that the soil and sediment samples used to determine background were close to the Site and may have been affected by former MGP operations. GEI explained that the Remedial Investigation had delineated on-site impacts and that local topography and land use patterns supported our final determination as to the extent of MGP related soil impacts.

- The NJDEP remarked that concentrations in the wetland soil in the RIR seemed elevated. GEI explained that the data set included samples in the area of free and residual product. GEI reevaluated the data excluding points that were within the area of free and residual product and that concentrations in the resulting data set were much lower overall. GEI's ecological group looked at the revised data set and had a level of comfort that the soils would pass an ERA. Revised figures and tables would be presented in the ERA.

- GEI's meeting agenda had a description of the ERA problem formulation, which was done in accordance with the current NJDEP Ecological Evaluation technical guidance.

- NJDEP stated that toxicity and macro invertebrate samples would be beneficial. GEI confirmed that our ERA work plan which may include the collection of worm and beetle tissue for analysis and toxicity testing.

- NJDEP clarified that sediment will be removed from the Bushkill Brook so no aquatic ERA will be necessary.

The NJDEP concurred with the overall ERA approach and had several suggestions to enhance the usability of the ERA:

- Site-specific standards will be developed for the wetland soils based on the findings of the ERA.

- Some soil samples areas with higher concentrations may need to be excluded (i.e., designated for excavation and disposal).

- The RAWP submittal form will have a box to be checked for ERA which will trigger forwarding and review to the eco group.

- The NJDEP advised that there is a difference between a background location and reference or control location. Our ERA should identify areas that qualify as both. The reference location

should be similar to the site, but be a non-impacted negative control. GEI stated that we may need to be a substantial distance from the site to meet those criteria.

- A tree survey would be beneficial to the decision process if removal of the trees would be detrimental to the ecosystem.

In conclusion, the NJDEP will not object to allowing soil with low-levels of adsorbed-phase PAH and metals (lead) impacts to remain in place if the LSRP confirms that the proposed controls are protective of human health and the ERA demonstrates there are no unacceptable risks to ecological receptors.

A meeting was then held later in the day with the Division of Land Use Regulation to discuss the permitting needs of the Site. Mark C. Davis, Acting Supervisor of the Office of Dredging and Sediment Technology as well as Dennis Contois, who specializes in Flood Hazard Area issues, provided guidance.

The meeting began with personnel introductions and sign in sheet (attached).

Mark Davis welcomed the group and stated that the role of the meeting was to explain the permits that will be needed based upon the determined remedial scope. Mark Davis stated that he and Kevin Schick discussed the outcome of the Technical Assist meeting prior to the permitting meeting.

Jamey Stynchula provided a site background and based upon the discussions at the technical assist meeting, provided the proposed remedial alternative of removing sediment, removing the areas of identified free and residual product and allowing soils with low concentrations of metals (lead) and PAH impacts to remain in place with institutional and engineering controls (deed restrictions, fencing, signage). This approach would be acceptable to the LSRP, and would not be rejected by the NJDEP, if the results of the ERA found that there was no unacceptable risk to ecological receptors.

Mark Davis and Dennis Contois stated that based upon the provided information, a Freshwater Wetlands General Permit 4: Hazardous Site Investigation and Cleanup Permit as well as an Individual Flood Hazard Area Permit would be required to authorize remedial activities within the regulated areas.

Mark Davis stated that the RAWP must be submitted prior to, or concurrent with, the permit applications and permit review may take up to 90 calendar days (then it's deemed approved by regulation), assuming the application is deemed administratively complete (determination must occur within 20 working days).

Rb:lsf

Technical Consultation
Attendance Sheet

Site Name: Flemington MGP/Elizabethtown Gas Co	PI# 001038	Date: August 25, 2015
Meeting Location: NJDEP – 401 E. State Street, Trenton		
LSRP Name/#: Robert Blauvelt / LSRP# 575013		

Attendees

NAME	AFFILIATION	TELEPHONE	EMAIL
Kevin Schick	NJDEP/SRP/BEERA	(609) 984-1825	Kevin.schick@dep.nj.gov
Nancy Hamill	NJDEP/SRP/BEERA	(609) 633-1353	Nancy.hamill@dep.nj.gov
Bob Blauvelt	GEI / LSRP	973-873-7127	RBLAUVELT@GEICONSULTANTS.com
Elaine Comings	JCP&L	973-401-8784	ecomings@firstenergycorp.com
Jamey Stynchula	GET	856-291-5657	jstynchula@geiconsultants.com
STEVEN PERNICK	ETG	(732) 816-2580	spernick@aglresources.com
Steven Cook	ETG	(908) 662-8317	scook@aglresources.com
Barry Raws	GEI	609-614-4893	braws@geiconsultants.com
Tara Waterhouse	GEI	856-797-5511	twaterhouse@geiconsultants

New Jersey Department of Environmental Protection
Site Remediation Program
Office of Dredging and Sediment Technology

P.O. Box 420
Mail Code: 401-06C
401 East State Street, 6th Floor
Trenton, New Jersey 08625-0420
Phone: (609) 292-3801

Date: August 25, 2015

Subject: JCP&L – Pre-application meeting

Attendance

Name	Affiliation	Phone	E-Mail
Mark Davis	NJDEP / ODST	609-633-1357	mark.davis @ dep.nj.gov
Jamey Stynchula	GEI	856-291-5657	jstynchula@geiconsultants.com
Bob Blauvelt	GEI	973-873-7127	RBLAUVELT@GEICONSULTANTS.COM
Elaine Comings	JCP&L	973-401-8784	ecomings@firstenergycorp.com
Tara Waterhouse	(GEI)	856-797-5511	twaterhouse@geiconsultants.com
Barry Raus	GEI	609-694-4893	braus@geiconsultants.com
Steven Cook	ET 6	908.662.8317	scook@aglresources.com
Steven Pernick	ET 6	732-816-9580	spernick@aglresources.com
Dennis Conton	PEP - LUR	(609)633-6563	dennis.conton@dep.nj.gov

From: Schick, Kevin [mailto:Kevin.Schick@dep.nj.gov]
Sent: Monday, September 14, 2015 10:42 AM
To: Waterhouse, Tara
Subject: RE: Flemington (PI#001038) Tech Assist & Pre-App Meeting 8.25.15

Hello Tara,

Sorry for the delay, I was awaiting responses from staff away on vacation. All NJDEP attendees have reviewed the Technical Consultation Summary and found it to be acceptable. The document has been inserted into NJEMS today.

Kevin Schick
NJDEP/Site Remediation Program
Chief - Bureau of Environmental Evaluation & Risk Assessment
P.O. Box 420
Mailcode 401-05W
Trenton, N.J. 08625
(609) 984 – 1825 (Direct Line)
kevin.schick@dep.nj.gov
Please note that my email address has changed.

From: Waterhouse, Tara [mailto:twaterhouse@geiconsultants.com]
Sent: Friday, September 11, 2015 1:52 PM
To: Schick, Kevin
Subject: FW: Flemington (PI#001038) Tech Assist & Pre-App Meeting 8.25.15

Good Afternoon,
I just wanted to follow up on the memo that we sent that summarized our Technical Consult/Pre-App meeting that took place on August 25th. Please let me know if you have and comments or questions.
Thank you again for your assistance with this project.

Tara J. Waterhouse
Staff Scientist
GEI Consultants
Consulting Engineers & Scientists
GEI Consultants, Inc.
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From: Waterhouse, Tara
Sent: Thursday, September 03, 2015 3:38 PM
To: 'kevin.schick@dep.nj.gov'; 'nancy.hamill@dep.nj.gov'; Mark Davis (Mark.Davis@dep.nj.gov);

RESIDENTIAL TOWN HOUSES
AGWAY PROPERTY
WATER COMPANY PROPERTY
RESIDENTIAL HOMES
RESIDENTIAL HOMES
LATER MGP AREA
ORIGINAL MGP AREA
WOODED AREA
formerly LEHIGH VALLEY R.R.
ELEVATED RAILROAD SIDING
CONCRETE LOADING/STORAGE AREA
CONCRETE SUPPORTS FOR FORMER RAILROAD TRESTLE
UNDERGROUND GASOLINE TANK
2-6,000 gallon UNDERGROUND GASOLINE TANKS (REMOVED 1987)
12,000 gallon OIL TANK
HIGH PRESSURE GAS HOLDER
CONCRETE SUPPORTS FOR FORMER NATURAL GAS TANK
APPROXIMATE PROPERTY LINE
DRIVEWAY
PARKING AREA
TRAILER
GAS PUMP
GAS PUMP
LT. PUMPS
STACK
STORAGE SHED
WAREHOUSE
GENERATING PLANT
PULSATION TANK
PROTECTIVE PIPES AROUND PROPANE TANK
COMPRESSOR HOUSE
OFFICE
CANOPY
CONC. PAD
METER ROOM
RELIEF GAS HOLDER
GAS CYLINDER STORAGE BUILDING
TAR PIT
PURIFIERS
SCRUBBER GAS
COOLING COILS
HORIZONTAL TANK DEHYDRATOR
10,000 gallon PROPANE TANK
30,000 gallon PROPANE TANK
chain link fence
PILE
SS-1
DRIP OIL TANK
PURIFIER
RETORTS
GAS HOLDER
GAS HOLDER
MAILBOX
SANITARY SEWER EASEMENT
SANITARY SEWER LINE NOT MARKED IN FIELD APPROXIMATE LOCATION FROM BOROUGH PLANS
25' WIDE DRAINAGE EASEMENT
10' WIDE SIDEWALK & UTILITY EASEMENT
25' WIDE DRAINAGE EASEMENT
25' WIDE SANITARY SEWER EASEMENT
25' WIDE DRAINAGE EASEMENT
GUARD RAIL
CONCRETE SIDEWALK
PAVED DRIVE
GRAVEL DRIVE
CONCRETE CURB
WALL
OLD CHANNEL
RARITAN TOWNSHIP
FLEMINGTON BOROUGH
BUSHKILL BROOK
EAST MAIN STREET
LINCOLN CIRCLE
BLOCK 18
TAX LOT 14
BLOCK 5
TAX LOT 15
TAX LOT 14
TAX LOT 13.01
TAX LOT 13
TAX LOT 12
TAX LOT 11
TAX LOT 10
TAX LOT 9
TAX LOT 8
TAX LOT 6
TAX LOT 5
TAX LOT 4.04
TAX LOT 4.05
TAX LOT 4.03
TAX LOT 4.02
TAX LOT 4.01
TAX LOT 4.07
TAX LOT 4.06
TAX LOT 3
TAX LOT 2
MW-1
MW-2
MW-2WT
MW-3
MW-3DD
MW-4
MW-5S
MW-5D
MW-6DD
MW-6S
MW-6D
MW-7S
MW-7D
MW-8S
MW-8D
MW-9S
MW-9D
MW-9WT
MW-10S
MW-10D
MW-10WT
MW-11S
MW-11D
MW-11WT
MW-12S
MW-13S
MW-13D
MW-13DD
MW-14S
MW-15S
MW-15D
MW-17S
MW-17D
MW-18S
MW-18D
MW-19S
MW-19D
MW-19WT
MW-20S(WT)
MW-20D
MW-21D
MW-21DD
0
80
160
SCALE, FEET

LEGEND

- MW-1 EXISTING MONITORING WELL
  WT = WATER TABLE, S = SHALLOW BEDROCK, D,DD = DEEP BEDROCK
- CONFIRMED HISTORIC FILL BASED ON SUBSURFACE INVESTIGATION OBSERVATIONS AND FIELD OBSERVATIONS
- HISTORIC FILL IDENTIFIED ON 1994 JMZ GEOLOGY REPORT
- NJDEP IDENTIFIED HISTORIC FILL
- PRESUMED HISTORIC FILL BASED ON FIELD OBSERVATIONS AND TOPOGRAPHY
- CURRENT STRUCTURE
- CURRENT FOUNDATION
- FORMER NON-MGP RELATED STRUCTURE
- FORMER MGP RELATED STRUCTURE
- WATERCOURSE
- 100 GROUND SURFACE CONTOUR (FEET)
- GUARD RAIL
- CHAIN LINK FENCE

SOURCES:

1. *TAX LOTS 14 & 12.03 BLOCK 18, TOWNSHIP OF RARITAN, TAX LOTS 14 &15 BLOCK 5, BOROUGH OF FLEMINGTON,* HUNTERDON COUNTY, NEW JERSEY, PREPARED BY GERALD G. DEGROAT, L.S., SCHOOLEY'S MOUNTAIN, NEW JERSEY, SCALE: 1" = 50', REVISED DATED JUNE 15, 2005.
2. *FIGURE 2-1: COMPOSITE OF HISTORICAL STRUCTURES, PHASE III REMEDIAL INVESTIGATION ADDENDUM REPORT* PREPARED BY GEI, DATED MARCH 24, 1998 (DRAFT FINAL).
3. *HISTORIC FILL FOR NEW JERSEY AS OF FEBRUARY 2009,* NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION (NJDEP), NEW JERSEY GEOLOGICAL SURVEY (NJGS).
4. *EXPERT REPORT FOR TRENCHING CONDUCTED AT 54 EAST MAIN STREET, AND HISTORICAL RESEARCH WITHIN FLEMINGTON, NJ,* PREPARED BY JMZ GEOLOGY, FLEMINGTON, NJ DATED DECEMBER 22, 1994.

SUPPLEMENTAL PHASE IV REMEDIAL INVESTIGATION REPORT
FLEMINGTON FORMER MGP SITE
FLEMINGTON, NEW JERSEY

JERSEY CENTRAL POWER & LIGHT COMPANY
AND ELIZABETHTOWN GAS COMPANY

GEI Consultants

Project 972600-1-1107

IDENTIFIED HISTORICAL FILL MAP

April 2011 Figure 7

I:\Project\JCP&L\Flemington\972600\Supp Phase IV RI Report\Figures\Flemington-Historic Fill Map.DWG

Sample Name:	SS-30	SS-30
Sample Interval (feet):	1.5-2	1.5-2
Sample Date:	11/25/2009	11/25/2009
PAHs (mg/kg)		
Total HPAH (10 of 17)	118.51	117.96

Sample Name:	SS-102	SS-102
Sample Interval (feet):	0-0.5	0.5-1
Sample Date:	10/13/2015	10/13/2015
PAHs (mg/kg)		
Total HPAH (10 of 17)	149.1	120.5

Sample Name:	SS-04	SS-04A
Sample Interval (feet):	0-2	0-2
Sample Date:	5/1/1997	5/7/1997
PAHs (mg/kg)		
Total HPAH (10 of 17)	20600	6.64

Sample Name:	TP-65A
Sample Interval (feet):	1.5-2
Sample Date:	4/29/1997
PAHs (mg/kg)	
Total HPAH (10 of 17)	6.4

Sample Name:	SS-108	SS-108
Sample Interval (feet):	0-0.5	0.5-1
Sample Date:	10/13/2015	10/13/2015
PAHs (mg/kg)		
Total HPAH (10 of 17)	237.6	196.3

Sample Name:	SD-3	SD-3
Sample Interval (feet):		
Sample Date:	10/26/1993	11/11/2009
PAHs (mg/kg)		
Total HPAH (10 of 17)	94.9	44.087

Sample Name:	SS-111	SS-111
Sample Interval (feet):	0-0.5	0.5-1
Sample Date:	10/14/2015	10/14/2015
PAHs (mg/kg)		
Total HPAH (10 of 17)	27.26	56.27

Sample Name:	SS-103	SS-103
Sample Interval (feet):	0-0.5	0.5-1
Sample Date:	10/13/2015	10/13/2015
PAHs (mg/kg)		
Total HPAH (10 of 17)	550.7	1394

Sample Name:	SS-21
Sample Interval (feet):	1.5-2
Sample Date:	6/1/2007
PAHs (mg/kg)	
Total HPAH (10 of 17)	2576

Sample Name:	SS-107	SS-107
Sample Interval (feet):	0-0.5	0.5-1
Sample Date:	10/13/2015	10/13/2015
PAHs (mg/kg)		
Total HPAH (10 of 17)	48.5	107.6

Sample Name:	SD-8
Sample Interval (feet):	
Sample Date:	11/11/2009
PAHs (mg/kg)	
Total HPAH (10 of 17)	28.44

Sample Name:	SS-28
Sample Interval (feet):	
Sample Date:	10/5/2009
PAHs (mg/kg)	
Total HPAH (10 of 17)	0.998

Sample Name:	SD-02
Sample Interval (feet):	
Sample Date:	5/7/1997
PAHs (mg/kg)	
Total HPAH (10 of 17)	47.8

Sample Name:	SS-06
Sample Interval (feet):	0-2
Sample Date:	5/7/1997
PAHs (mg/kg)	
Total HPAH (10 of 17)	44.32

Sample Name:	SS-07
Sample Interval (feet):	0-2
Sample Date:	5/14/1997
PAHs (mg/kg)	
Total HPAH (10 of 17)	1.8

Sample Name:	SS-11
Sample Interval (feet):	0-2
Sample Date:	5/5/1997
PAHs (mg/kg)	
Total HPAH (10 of 17)	2.24

Sample Name:	SS-31
Sample Interval (feet):	0.5-1
Sample Date:	11/25/2009
PAHs (mg/kg)	
Total HPAH (10 of 17)	136.31

Sample Name:	TP-58
Sample Interval (feet):	4-5
Sample Date:	4/29/1997
PAHs (mg/kg)	
Total HPAH (10 of 17)	91.1

Sample Name:	SS-23
Sample Interval (feet):	0.6-1.1
Sample Date:	6/1/2007
PAHs (mg/kg)	
Total HPAH (10 of 17)	22.647

Sample Name:	SS-110	SS-110
Sample Interval (feet):	0-0.5	0.5-1
Sample Date:	10/14/2015	10/14/2015
PAHs (mg/kg)		
Total HPAH (10 of 17)	98.79	98.48

Sample Name:	SS-16
Sample Interval (feet):	0-2
Sample Date:	5/5/1997
PAHs (mg/kg)	
Total HPAH (10 of 17)	9.55

Sample Name:	SS-101	SS-101
Sample Interval (feet):	0-0.5	0.5-1
Sample Date:	10/13/2015	10/13/2015
PAHs (mg/kg)		
Total HPAH (10 of 17)	176.7	291.2

Sample Name:	TP-69	TP-69
Sample Interval (feet):	4-5	5.5-6
Sample Date:	4/29/1997	4/29/1997
PAHs (mg/kg)		
Total HPAH (10 of 17)	3.43	2.67

Sample Name:	SS-32
Sample Interval (feet):	1.5-2
Sample Date:	10/5/2009
PAHs (mg/kg)	
Total HPAH (10 of 17)	26.918

Sample Name:	SS-109	SS-109
Sample Interval (feet):	0-0.5	0.5-1
Sample Date:	10/14/2015	10/14/2015
PAHs (mg/kg)		
Total HPAH (10 of 17)	115.9	123.4

Sample Name:	SD-1	Duplicate of SD-1
Sample Interval (feet):		
Sample Date:	5/7/1997	5/7/1997
PAHs (mg/kg)		
Total HPAH (10 of 17)	77.6	89.1

Sample Name:	SS-35
Sample Interval (feet):	1-1.5
Sample Date:	10/5/2009
PAHs (mg/kg)	
Total HPAH (10 of 17)	0.67

Sample Name:	SS-106	SS-106
Sample Interval (feet):	0-0.5	0.5-1
Sample Date:	10/13/2015	10/13/2015
PAHs (mg/kg)		
Total HPAH (10 of 17)	14.2	6.563

Sample Name:	SD-4
Sample Interval (feet):	
Sample Date:	11/11/2009
PAHs (mg/kg)	
Total HPAH (10 of 17)	67.324

Sample Name:	SD-3	SD-3
Sample Interval (feet):		
Sample Date:	10/26/1993	11/11/2009
PAHs (mg/kg)		
Total HPAH (10 of 17)	94.9	44.087

Sample Name:	SS-33
Sample Interval (feet):	1-1.5
Sample Date:	10/5/2009
PAHs (mg/kg)	
Total HPAH (10 of 17)	5.067

Sample Name:	SS-105	SS-105
Sample Interval (feet):	0-0.5	0.5-1
Sample Date:	10/13/2015	10/13/2015
PAHs (mg/kg)		
Total HPAH (10 of 17)	7.3	2.37

Sample Name:	SS-34
Sample Interval (feet):	1-1.5
Sample Date:	00/5/2007
PAHs (mg/kg)	
Total HPAH (10 of 17)	91.54

Sample Name:	SS-112	SS-112
Sample Interval (feet):	0-0.5	0.5-1
Sample Date:	10/14/2015	10/14/2015
PAHs (mg/kg)		
Total HPAH (10 of 17)	158.5	130.3

Sample Name:	SS-37
Sample Interval (feet):	1-1.5
Sample Date:	11/25/2009
PAHs (mg/kg)	
Total HPAH (10 of 17)	2.549

Sample Name:	SS-05
Sample Interval (feet):	0-2
Sample Date:	5/7/1997
PAHs (mg/kg)	
Total HPAH (10 of 17)	75.6

Sample Name:	SS-104	SS-104
Sample Interval (feet):	0-0.5	0.5-1
Sample Date:	10/13/2015	10/13/2015
PAHs (mg/kg)		
Total HPAH (10 of 17)	301.9	335.6

Sample Name:	SS-37
Sample Interval (feet):	1-1.5
Sample Date:	11/25/2009
PAHs (mg/kg)	
Total HPAH (10 of 17)	2.549

Sample Name:	SS-38
Sample Interval (feet):	1.5-2
Sample Date:	11/25/2009
PAHs (mg/kg)	
Total HPAH (10 of 17)	129.53

Sample Name:	SD-1
Sample Interval (feet):	
Sample Date:	10/26/1993
PAHs (mg/kg)	
Total HPAH (10 of 17)	27.27

Sample Name:	SD-5
Sample Interval (feet):	
Sample Date:	11/11/2009
PAHs (mg/kg)	
Total HPAH (10 of 17)	57.78

PHASE 1 IRM AREA

PHASE 2 IRM AREA

PARKING AREA

ORIGINAL MGP AREA

DRIP OIL TANK

GAS HOLDER

PURIFIER

RETORTS

BLOCK 18

TAX LOT 14

TAX LOT 13

TAX LOT 12

TAX LOT 11

TAX LOT 10

TAX LOT 9

TAX LOT 8

TAX LOT 7

TAX LOT 6.01

TAX LOT 4.04

TAX LOT 4.03

TAX LOT 4.05

TAX LOT 4.02

TAX LOT 4.01

TAX LOT 4.07

TAX LOT 4.06

TAX LOT 5

BLOCK 7

RESIDENTIAL TOWNHOUSES

RESIDENTIAL HOMES

BUSINESSES

WATER COMPANY PROPERTY

AGWAY PROPERTY

OLD CHANNEL

APPROXIMATE PROPERTY LINE

WOODED VALLEY WAY

WALTER E FORAN BLVD

LINCOLN CIRCLE

MAIN AVENUE

RARITAN TOWNSHIP / FLEMINGTON BOROUGH

SOUTH BRANCH RARITAN RIVER

LEGEND

- SITE PROPERTY BOUNDARY
- PROPERTY BOUNDARY
- PHASE 3 RA PROJECT BOUNDARY
- UTILITY EASEMENT
- SS-107 — 2015 ERA SAMPLE LOCATIONS (SEE APPENDIX D FOR DETAILS)
- SS-29 — SURFACE SOIL SAMPLE LOCATION (COLLECTED IN 2009)
- SS-20 — SURFACE SOIL SAMPLING LOCATION (CONDUCTED IN 2007)
- SS-01 — EPA SURFACE SOIL SAMPLE (COLLECTED IN 1993)
- MW-10D (SS-12) — DEEP BEDROCK MONITORING WELL SURFACE SOIL SAMPLE LOCATION
- MW-12S (SS-17) — SHALLOW MONITORING WELL LOCATION SURFACE SOIL SAMPLE LOCATION
- MW-19S — MONITORING WELL LOCATION (INSTALLED IN 2007)
- SB-15 — SOIL BORING LOCATION (CONDUCTED IN 2009)
- SB-9 — SOIL BORING LOCATION (CONDUCTED IN 2007)
- SB-5 (SS-14) — SOIL BORING LOCATION SURFACE SOIL SAMPLE LOCATION
- TP-66 — TEST PIT LOCATION (EXCAVATED IN 1997)
- TP-100 — TEST PIT LOCATION (EXCAVATED IN 2013, NO SAMPLES TAKEN))
- TP-1 — TEST PIT (TP-1 THROUGH TP-8 CONDUCTED IN 1987) (TP-9 THROUGH TP-23 CONDUCTED IN 1991) (TP-24 THROUGH TP-53 CONDUCTED IN 1993)
- LEADER INDICATES SAMPLES USED FOR BACKGROUND CONCENTRATION CALCULATION
- PROPOSED EXCAVATION AREA
- PROPOSED EXCAVATION TO ADDRESS ENVIRONMENTAL RISK
- ENVIRONMENT RISK ASSESSMENT AREA

N

0 50 100

SCALE, FEET

SOURCE:

TAX LOTS 14 & 12.03 BLOCK 18, TOWNSHIP OF RARITAN, TAX LOTS 14 &15 BLOCK 5, BOROUGH OF FLEMINGTON, HUNTERDON COUNTY, NEW JERSEY, PREPARED BY GERALD G. DEGROAT, L.S., SCHOOLEY'S MOUNTAIN, NEW JERSEY, SCALE: 1" = 50', REVISED DATED JUNE 15, 2005.

PHASE 3 SOIL REMEDIAL ACTION WORK PLAN
FLEMINGTON FORMER MGP SITE
FLEMINGTON, NEW JERSEY

JERSEY CENTRAL POWER & LIGHT COMPANY
AND ELIZABETHTOWN GAS COMPANY

PROJECT 972600

GEI Consultants
18000 HORIZON WAY, SUITE 200
MOUNT LAUREL, NJ 08054

SURFACE AND SHALLOW SUBSURFACE SOIL ANALYTICAL SUMMARY

November 2016 Plate 1

H:\TECH\project\JCP&L\flemington\Phase 3 Soil RAWP\Figures\CAD - Xu\ Flemington-Phase 3 Soil Analytical Results Summary.dwg \Nov 21, 2016

Matt,

GEI has reviewed the comments that the NJDEP has provided and offers the following response to your comments in red. If you would like to discuss these issues in more detail, I would suggest that we schedule a meeting to discuss them in person so that we can more effectively communicate.

Regards,

Chris

Christopher

The NJDEP has completed an inspection and review of the RIR submitted for the above subject site. In the review of the ecological aspects of the case, the NJDEP has identified the below listed issues that should be addressed. Please review the issues and provide a response within the next two weeks if possible.

1. Sec. 11.2 (p. 96) *Chemical Migration Pathways* - Contaminants migration pathways must be fully evaluated in accordance with N.J.A.C.7:26E-4.8 and the EETG's Section 5.2.3. In addition to soil runoff and the discharge of contaminated ground water to the Elizabeth River, the LSRP should revise this section to address the potential for the migration (e.g., via seepage) of MGP-related product into wetlands and the Elizabeth River, and potential for free and residual MGP product to persist. Deep subsurface product is pervasive throughout Area C (Plate 7-4), with subsurface near-river tar like material (TLM) and residual product specifically at sample locations ES-H-02, ES-H-04, ES-H-22, ES-H-29 in Area H1 on the western side as well as in Area D near monitoring well MW-7 on the eastern side near Area H1. The large data gap between H1 soil locations ES-H-17, ES-H-18, & ES-H-18 and ES-H-4-1 and ES-H-4-2 and the two transects # 4 and #5 which are approximately 300 feet apart, require additional sampling of sediments at depth within the proposed ERA. Ground water contamination areas on-site and on the banks between the site and the ESNR (Plate 4-1 & Plate 10-8) show a lack of depth delineation sampling. For example, naphthalene was detected up to 210 mg/kg as deep as 28 feet bgs that requires vertically delineation.

As stated in Section 11.2 (p.96), the construction of the flood control berm has likely eliminated many of the transport pathways of MGP related impacts from the Site to the Elizabeth River and associate "Wetlands". Indeed, the purpose of GEI's investigation of the flood control berm along the Elizabeth River in Area H was to determine the competency of the impervious core in the flood control berm to prevent migration of MGP contaminants into the Elizabeth River. The United States Army Corps of Engineers (USACE) plans for the construction of the flood control berm from 1978 show a steel sheet pile wall constructed through the middle of the berm from above site grade to bedrock and low porosity material installed around the sheet pile wall to prevent migration of flood waters onto the property. This same "impervious core" has been demonstrated to have prevented migration of MGP product or groundwater impacts from the site into the Elizabeth River or local wetlands. Geologic Cross Section E-E' (see Plate 7-2) in the RI Report depicts the location of the flood control berm in reference to impacts from the site and the Elizabeth River.

Section 2.5 of the February 2009 Phase II Remedial Investigation Work Plan (RIWP) discusses the construction of the flood control berm and the proposed plan to investigate whether the flood control berm as a barrier to prevent migration of MGP impacts from the site to the Elizabeth River were

presented in Section 4.1 of the Phase II RIWP. The NJDEP approved the proposed investigative approach then and I concur and approved it for the RI report. As is depicted on Plate 10-4, borings were placed on either side of the impervious sheet pile core to determine if MGP impacts were continuing to migrate across the "impervious core". As you indicated in your comment, MGP impacts were found on both sides of the impervious core at only two locations (ES-H-2 and ES-H 4). These impacts were only noted on top of bedrock at a depth of between 25 feet to 28.5 feet below ground surface (bedrock was confirmed at 29 feet bgs). This was far below the bottom of the river sediments or the river elevation itself and seems unlikely that it would migrate upwards into the surface water or river sediments indicating that there is no current migratory pathway into the Elizabeth River or associated sediments. In addition, closer examination of the borings where MGP impacts were observed on the river side of the berm identify the presence of organic material and even meadow mat mixed in with the MGP impacts on top of bedrock. This also is in line with the location of the historic river bed before the USACE realignment based on aerial photographs. Based on my assessment, the MGP impacts that were observed on the top of bedrock were from the historic river channel before the USACE realignment and berm construction and are not mobile. Given the depth of identified impacts it does not seem possible that migration of MGP impacts into the Elizabeth River or local wetlands is even possible.

There are only two known penetrations of the flood control berm adjacent to the site. One is for a 30-inch PSE&G gas main that is located at the top of or keyed into bedrock and the other is an outfall that is at the location of "CONC HW" on Plate 10-4. The 30-inch PSE& G gas main runs below the Elizabeth River, so even if it was allowing MGP impacts to migrate through the flood control berm, it would be at a much deeper elevation than the river itself. In addition, PSE&G is in the process of repairing or replacing the gas main due to an anomaly and will allow for a more detailed assessment of the conditions surrounding the pipe itself in 2017. The 15-inch storm water outfall was identified as a potential migratory pathway early in the assessment process and was permanently closed in 2012 to prevent any migration from the site (see Section 12.2 of the RI Report for further details).

Groundwater migration through the berm was also considered. However, based on groundwater gauging and aquifer test data, communication between the surface water of the Elizabeth River and the unconfined (Overburden A) aquifer[BB1] has not been established. The groundwater tidal study (Section 9.8) supports this conclusion for the unconfined aquifer, where no tidal response was measured on the site side of the berm.

Shallow samples along the flood control berm identified the presence of historic fill (metals & PAHs) that were likely used in the construction of the berm by USACE. These samples did not contain evidence of MGP impacts and therefore are considered to be historic fill related. Any responsibility for the fill would be from USACE which constructed the berm or the City of Elizabeth which currently owns the berm.

Regarding your statement that naphthalene was detected up to 210 mg/kg as deep as 28 feet bgs that requires vertically delineation. This is not an ecological concern as it has already been established that 28 feet bgs is well below, and inaccesible to, any river sediments in an ecologically relevant zone. Because bedrock was encountered at a depth of 28.5 feet in that boring, further vertical delineation is not required into rock.

2. Sec. 11.3.2 (p.99) *Elizabeth River Sediment - Refined COPEC Screening Evaluation* - The 2000 dated sediment data set used for screening is inadequate. Current conditions are uncertain because only 17 year old surface (0-6") sediment data are available, and the presence/extent of free and residual

MGP-related product has not been determined in river sediments, as required in N.J.A.C. 7:26E-2.1(a)14, 3.6 and 4.8. As per the NJDEP's EETG Sec. 5.3.3 (and prior guidance since 1998), sediments should be sampled at a minimum of two intervals and all data screened against Ecological Screening Criteria (ESC). Since deep subsurface MGP product is present on-site based on the 2012 data proximal to the river and elevated concentrations of naphthalene and benzene are present in overburden and bedrock groundwater within 100 feet of the river, a detailed sampling design that includes deep sediment cores, such as a grid/stratified grid approach, is needed to delineate the full horizontal and vertical extent of MGP-related product and associated chemical constituents pursuant to N.J.A.C. 7:26E-4.8(c). Sediment sampling is also specifically required at outfalls, for example, "CONC HW" as shown on Plate 7-[BB2]4. Additionally, it is unclear whether data from emergent wetland as identified on page 95, are available. Therefore, an explanation and identification of the wetlands and berm on appropriate figures (e.g. Plate 4-1 & Plate 7-4), is also required.

Based on the response to question #1, it has been established that the flood control berm with its sheet pile – impervious core has prevented migration of MGP related contaminates including free/residual product into the surface water or river sediments. Any current river sediments were likely deposited before the construction of the flood control berm in 1978 and would currently be present only at depth. Therefore 17 year old samples are more representative of what contribution the site may have had to the river than any samples that would be collected today[BB3].

ETG acknowledges that the site has historically caused impacts to the Elizabeth River and plans to address them. However because the migratory pathway is incomplete, other areas of the site are being actively remediated and were given a higher priority. While we agree that the data in the RIR is not current, in my opinion it does not make sense to collect additional information or to complete an ecological risk assessment until such a time as we are ready to remediate the site's contribution to the Elizabeth River. As far as the RIR is concerned, the data establishes that there are background sources present and the report establishes that residual MGP impacts in the Elizabeth River have been delineated to a background standard[BB4]. Further investigations will be planned when ETG is ready to begin remediation of the Elizabeth River.

Wetlands delineation has been completed along the banks of the river and were identified in close proximity to the river itself. The NJDEP verified the LOI and found that the wetlands are ordinary resource value with no standard transition area or buffer required (NJDEP File No. 2004-10-004.1 FWW 100001 LOIV). The only sign of wetlands is a narrow strip of P~~p~~hragmites located directly along the river bank. We can provide a copy of the wetlands letter of interpretation, however, there are no significant wetlands present along the river bank itself to be concerned with.

3. The LSRP must delineate and remediate MGP-related product present in the Elizabeth River pursuant to N.J.A.C. 7:26E-5.1(e). Since the contaminant migration pathway into the sediments indicates contamination into deep river sediments, additional delineation should be considered. For individual contaminants outside of the product footprint, the LSRP should conduct an ecological risk assessment for constituents exceeding ESCs to determine a site-specific risk-based remediation goal, or conduct the remediation to the higher of background or the ESC.

See response to Comment #1 and #2. We are in agreement that further characterization and remediation of the Elizabeth River sediments ~~is~~ will be required as stated. Because of the planned timing of remedial efforts, which were agreed to by NJDEP, additional characterization of river

sediments and remedial activities are projected to initiate upon completion of the remediation of the other areas of concern.

4. Plate 10-8 notes, "Inferred southwestern extent to edge of the river based on southerly ground water flow direction, and river forming a ground water divide." No monitoring wells are depicted on the southern side of the Elizabeth River to support this note. Therefore, delineation of ground water is clearly required into and beyond the ESNR pursuant to N.J.A.C. 7:26E-4.8 and the LSRP shall specifically complete delineation of the ground water to the northwest, south and southwest where extent of the ground water is inferred near and adjacent to an ESNR.

As was stated in the response to comment #1, it has been established that a migration pathway does not currently exist between the site and the ESNR as required in N.J.A.C. 7:26E-4.8 (a). Based on the lack of a migration pathway further requirements in 7:26E-4.8 (b) and (c) are not necessary including further delineation. It is not necessary to conduct further investigation across the river because the river itself and the sheet pile – impervious core would prevent any further migration of MGP impacts in groundwater across the river in the unconfined aquifer where both the river and other ESNRs exist.

5. Appendix A (NJDEP's 4/6/10 (p. 4 of 7) notes that monitoring well, MW-7, located in the southeastern corner of the site, contains the highest total cyanide**.** It is not clear if cyanide in ground water was adequately delineated as it "was found fairly widespread in ground water" as noted in the NJDEP's NOV. The appendix also notes that due to the ground water contamination, the proposed CEA is indefinite. Based on this, additional cyanide delineation of the ground water migration pathway is required pursuant to N.J.A.C. 7:26E-4.8(c)1.

I refer you to section 10.2.2.3 (page 82) of the RIR for an explanation regarding the difference between total and free/amenable cyanide. Based on this discussion cyanide detected in groundwater is not bio-available and is not considered a concern. NJDEP's September 3, 2008 NOV was responded to in GEI's February 17, 2009 RIWP and April 7, 2010 RIWP Addendum. The specific question regarding cyanide was addressed in the RIWP and RIWP Addendum that was approved by the NJDEP in their August 23, 2010 approval letter and included the discussion stated in Section 10.2.2.3 of the RIR.

6. Based on the Plate 10-6 of the RIR, 1,4-dioxan was detected east off-site within a 100 feet of the ESNR. It is not clear if 1,4-dioxan analyses were conducted in the on-site wells. As of 11/25/15, the NJDEP Interim GWQS for 1,4-dioxan is 0.4 ug/l available at http://www.nj.gov/dep/wms/bears/gwqs_interim_criteria_table.htm and therefore, use of appropriate analytical methods is required in the additional ecological samples required as part of the IRA pursuant to N.J.A.C. 7:26E-3.5, 3,6(b)3, 4.2(b)3, 4.3(b)3 & 4.4(a)4.

1,4-dioxane does not have ecological screening criteria (ESC). It may have a GWQS – which is relevant from a GW quality standpoint – but that is not relevant to ecological exposures in emergent GW to river. The standard referenced was also updated since the report was submitted on 5/7/14 and would not have been required to have been addressed in groundwater at the time.

If you have any questions please feel free to contact me at 609-984-1742.

Thanks

Matt

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GEI Consultants

February 9, 2017
Project 972600

Consulting Engineers and Scientists

Mr. Kevin Schick
Bureau Chief, BEERA
New Jersey Department of Environmental Protection
P.O. Box 420
Mail Code 401-05W
Trenton, NJ 08625-0420

Dear Mr. Schick:

Re: Ecological Risk Assessment Addendum
Flemington Former Manufactured Gas Plant Site
PI # 001038
Flemington Borough/Raritan Township, New Jersey

This letter provides an addendum to GEI's Ecological Risk Assessment (ERA) submitted to the New Jersey Department of Environmental Protection (NJDEP). The ERA was provided as an appendix to the Phase 3 Soil Remedial Action Workplan (RAW), dated May 9, 2016. The purpose of this addendum is to provide revised preliminary remediation goals (PRGs or RGs) for selected regulated compounds present in wetland buffer zone soils at the Flemington former Manufactured Gas Plant (MGP) site (Site). The PRGs require NJDEP approval as Alternative Remediation Standards.

Background

A summary of the significant report submittal dates and correspondences are presented below. Copies of the documents (other than the ERA) are attached for reference.

- May 9, 2016 - ERA submitted with RAW by Mr. Robert Blauvelt, Licensed Site Remediation Professional (LSRP) for the Site.
- October 20, 2016 – NJDEP provided a review and comment letter to the ERA. The PRG for high molecular weight (HMW) polycyclic aromatic hydrocarbons (PAHs) presented in the ERA was not approved. NJDEP requested additional information and supporting data.
- November 15, 2016 – A conference call was held with Nancy Hamill of the NJDEP, GEI, JCP&L and ETG to discuss NJDEP's comments.
- November 29, 2016 – GEI provided a response letter to the NJDEP, which clarified certain items and provided a recalculated PRG for HMW PAHs.
- December 14, 2016 – NJDEP responded to GEI's letter with a draft letter.
- January 5, 2017 – A meeting was held at the Site with NJDEP, GEI, JCP&L, and ETG representatives. Site conditions were discussed and a Site walk was conducted to provide NJDEP with first-hand information.
- January 12, 2017 – GEI provided draft meeting minutes to NJDEP for review.

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- January 17, 2017 – NJDEP provided comments to the draft meeting minutes via e-mail and stated that a No Effects Level (NOAEL) PRG of 23.5 mg/kg for HMW PAHs presented in GEI November 29, 2016 letter would be considered acceptable with appropriate calculations.
- February 1, 2017 – The LSRP provided revised meeting minutes to NJDEP
- February 2, 2017 – Meeting minutes recorded in NJEMS

Soil remediation is currently in progress at the Site in accordance with the RAW. A Freshwater Wetlands and Flood Hazard Area permit modification was submitted to NJDEP LURP for approval to include removal of additional area not included in the RAW. The additional area will require removal to meet the approved PRGs for HMW PAHs.

A Remedial Action Permit (RAP) will be requested for the specific block and lots being remediated to a restricted use, which include Raritan Township Block 18.01 Lot 14 and Flemington Borough Block 5 Lots 13, 13.01, and 14. The Water Company property Raritan Township Block 18.01 Lot 16 and Flemington Borough Block 5 Lot 3 will be remediated to unrestricted use and will not require an RAP. A Response Action Outcome (RAO) will be submitted by the LSRP following cleanup to the approved PRGs, implementation of the institutional and engineering controls and issuance of the RAP. The RAW is not intended to include properties other than those listed above.

The ERA addendum is intended to:

- Summarize the steps followed and calculation used to derive the proposed HMW PAH PRGs for the maximally exposed receptor, the shrew; and

- Provide the estimation of residual concentrations of High Molecular Weight PAHs (HMWPAH) in the remaining ecological exposure area following removal of the most impacted locations, with and without replacement values.

Calculation of the HMW PAH PRG

The response to comments presented the following PRGs for HMWPAH, based on applying the risk model and assumptions for the shrew, identified as the maximally exposed receptor:

PRG (NOAEL) – 23.5 mg/kg
PRG (LOAEL) – 117.1 mg/kg

During the meeting of January 5, the possibility of also considering an intermediate value, equal to the geometric mean of the NOAEL and LOAEL was discussed. This value would be equivalent to the MATC (Maximum Acceptable Threshold Concentration) concept used in aquatic toxicity. Application of the geometric mean to the terrestrial environment, as requested by NJDEP, yields a PRG which is more is about twice the NOAEL based PRG and still can be considered conservative.
The geometric mean of the NOAEL and LOAEL PRGs is 52.5 mg/kg.

To clarify the calculation, the proposed NOAEL and LOAEL PRGs for HMWPAHs were calculated based on the following assumptions. They are derived from the exposure assumptions for shrews described in the ecological evaluation, and using the standard ingested dose model as described in the EETG.

Table 1 - Estimation of Proposed PRGs

TRV NOAEL	TRV-N	0.615	mg/kg-d	Per EcoSSL recommendation				
TRV LOAEL	TRV-L	3.07	mg/kg-d	Corresponding LOAEL to the NOAEL study in EcoSSL				
Exposure Assumptions								
Soil ingestion	Ps	0.03		From EcoSSL value for shrew				
Food ingestion rate	NIRk	0.142	g/g-d	Unchanged from ERA				
Home Range	HR	1.5	ac	Unchanged from ERA				
Body weight	BW	16.9	g	Unchanged from ERA				
Diet fractions	Pworm	0.38		Unchanged from ERA				
	Pinvert	0.46		Unchanged from ERA				
	Pplant	0.16		Unchanged from ERA				
BAF soil-w+inv	BAFi	0.18		Average of measured site data pairs				
BAF soil -plant	BAFp	0.021		Average of measured site data pairs				
Bioavailable fraction	BF	1		Assumes all soil content is bioavailable				
Area Use factor	AUF	1		Present year round, HR<site size				
Soil concentration modeled:			mg/kg	10	20	**23.5**	52.5	**117.1**
						(1)	(2)	(3)
Calculating Dose (forward risk)								
Dose from worms	ADDw		mg/kg-d	0.10	0.19	0.23	0.51	1.14
Dose from inverts	ADDi		mg/kg-d	0.12	0.24	0.28	0.62	1.38
Dose from plants	ADDp		mg/kg-d	0.00	0.01	0.01	0.03	0.06
Dose from soil	ADDs		mg/kg-d	0.04	0.09	0.10	0.22	0.50
Total dose	ADDt		mg/kg-d	0.26	0.52	0.62	1.38	3.07
Risk								
HQ-NOAEL	HQ-N			0.4	0.9	**1.0**	2.2	5.0
HQ-LOAEL	HQ-L			0.1	0.2	0.2	0.4	**1.0**

Highlighting shows the PRG corresponding to a NOAEL TRV at HQ=1. The PRG is the soil concentration where HQ=1 (**red),** shown at both NOAEL and LOAEL for reference

(1) Concentration that yields a HQ=1 at the NOAEL level (the NOAEL PRG)

(2) Concentration corresponding to the geometric mean of the NOAEL and LOAEL PRG

(3) Concentration that yields a HQ=1 at the LOAEL level (The LOAEL PRG)

ADDw = Pw x NIRk x [conc] x BAFs-i

ADDi= Pi x NIRk x [conc] x BAFs-i

ADDp=Pp x NIRk x [conc] x BAFs-p
ADDs - Ps x NIRk x [conc] x BF
ADDt = ADDw+ADDi+ADDp+ADDs

HQ = ADDt/TRV

The assumptions are independent of site data except that the bioaccumulation factors (BAF) through food items (plants and invertebrates) are equal to the average BAF for the actual BAFs observed in paired soil and biota data at the site.

The PRGs are shown as calculated using the LOAEL TRV as well as the NOAEL TRV and also the corresponding results at a soil concentration equal to the geometric mean between the LOAEL and NOAEL PRG.

Recalculation of Residual HMW PAH

In the meeting held with NJDEP in Flemington on January 5, it was suggested that it would be useful to recalculate exposure concentrations for the remaining ecological exposure area assuming replacement of removed hot spot areas with clean fill. The earlier response to comments had calculated the residual concentrations based on the remaining unexcavated values without assuming replacement with clean fill.

Table 2 shows the residual concentrations with replacement of removed areas with clean fill. The replacement fill is conservatively assumed to contain 1 mg/kg HMW PAHs, which is a higher value than the Reporting Limit (RL) of the topsoil analytical data of 0.36 mg/kg. Note that the replacement with a set of known values skews the variance of the data, resulting in increasingly wide confidence limits.

Table 2 – Residual HMW PAH Concentration Calculations (with replacement)

HMWPAH – with replacement at 1 mg/kg	**Residual Concentration (mg/kg)**			**Notes**
	Mean	Median	Min-Max	
SS 103, -102 and -104 removed	59.0	**10.8**	1 – 237.6	UCL of the mean 136.1 mg/kg
SS-108 also removed	35.1	**4.5**	1 – 123.4	Variance due to replacement with 1 mg/kg skews UCL calculation above maximum
SS-109 also removed	**21.9**	**1.0**	1 – 98.6	

Highlighting indicates measures less than NOAEL based PRG of 23.5 mg/kg

As can be seen from the data in Table 2, the sequential removal of elevated concentrations and replacement with clean fill rapidly decreases the mean exposure concentration for a receptor equally exposed to all areas. The median concentration may be more indicative of the exposure of small home range receptors like shrews which do not range freely over the site: half the exposures are likely to be to soils with less than the median concentration, and half above the median.

Calculation of confidence limits around the mean is not an appropriate measure for this situation as there is no uncertainty around the replacement material concentration to model.

For comparison, Table 3 shows the corresponding values without replacement – i.e. it describes only the conditions in the residual, non-remediated areas. The UCL of the mean for this area is what was shown on the previous response to comments.

Table 3 - Residual HMW PAH Concentration Calculations (No Replacement)

HMWPAH – no replacement	Residual Concentration (mg/kg)			Notes
	Mean	Median	Min-Max	
All residual data	217.2	118.2	2.4 – 1394	UCL of the mean 415.8 mg/kg
SS-103 removed	122.8	111.8	2.4 – 335.9	UCL of the mean 167.6 mg/kg
SS102 and -104 also removed	88.1	88.4	2.4 – 237.6	UCL of the mean 127.7 mg/kg
SS-108 also removed	62.3	73.5	2.4 – 123.4	UCL of the mean 92.0 mg/kg
Also SS-109	48.0	44.2	2.4 – 107.6	Sample size too low for reliable UCL

The proposed excavation areas under the RAW have been modified to include removal of all areas that result in an average residual concentration of 21.9 mg/kg or greater. Only two locations with residual concentrations greater than the NOAEL-PRG of 23.5 mg/kg then remain: SS-107 and SS-110. . Demonstration of attainment of the NOAEL-PRG of 23.5 mg/kg will be completed in accordance with the *Technical Guidance for the Attainment of Remediation Standards and Site-Specific Criteria*, dated September 2012, Version 1.0. Additional samples may be collected for the recalculation of the mean to support the demonstration of attainment.

Conclusions

Based on our calculations, PRGs which would not pose unacceptable risk to ecological receptors include:

- NOAEL-based – 23.5 mg/kg
- LOAEL-based – 117.1 mg/kg
- Geometric mean of the LOAEL and NOAEL-based - 52.5 mg/kg

While we feel the application of the LOAEL and geometric mean would be protective for risks to the ecological receptors at the Site, we understand that NJDEP prefers a more conservative approach. The NOAEL HMW PRG of 23.5 mg/kg represents a very conservative value that does not pose a risk to the identified ecological receptors. We request approval of this value as the Alternative Remediation Standard. Remediation of the Site will proceed under the RAW in areas covered by the LURP/FHA permit modification to the PRG for HMW PAHs of 23.5 mg/kg under the scenario presented in Table 2. Additional soil sampling and analysis may be completed, as necessary, to support demonstration of cleanup to the PRG.

If you have any questions, please feel free to contact me at (973) 873-7127.

Sincerely,

GEI CONSULTANTS, INC.

Bjorn Bjorkman
Senior Consultant

Jamey A. Stynchula, P.G.
Project Manager

BB:JAS/ah
Enclosures

c: Ms. Nancy Hamill - NJDEP
Mr. Allen Motter - NJDEP
Ms Elaine Comings – JCP&L
Mr. Steven L, Cook - SCG
Mr. Steve Pernick – SCG
Mr. Bob Blauvelt, LSRP - GEI

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GEI Consultants

Consulting Engineers and Scientists

November 29, 2016
Project 972600

Mr. Kevin Schick
Bureau Chief, BEERA
New Jersey Department of Environmental Protection
P.O. Box 420
Mail Code 401-05W
Trenton, NJ 08625-0420

Dear Mr. Schick:

Re: Alternative/New Soil Remediation Standard Application
Response to Comments (Revision 1)
Flemington Former Manufactured Gas Plant Site
PI # 001038
Flemington Borough/Raritan Township, New Jersey

I have reviewed the New Jersey Department of Environmental Protection's (NJDEP) letter dated October 20, 2016, which provided comments from the review of the Ecological Risk Assessment (ERA) for the Flemington Former Manufactured Gas Plant (MGP) site. The ERA was included as an Appendix to the Remedial Action Workplan (RAW), submitted on May 9, 2016, to address soils at the site. The ERA was prepared to develop Proposed Remediation Goals (PRGs) for compound concentrations in soil at the site which would not pose an unacceptable risk to ecological receptors. This would allow a significant portion of the wetlands to not be disturbed. This approach was agreed upon at a Technical Assist meeting with NJDEP in August 2015. A copy of the minutes from that meeting and NJDEP concurrence are attached.

As the Licensed Site Remediation Professional (LSRP) for this site, I have prepared this letter to respond to NJDEP's comments. GEI Consultants, Inc. (GEI) prepared the ERA and has provided technical support for the review and comments presented herein. During the review, GEI did note a few errors in the presentation of the ERA that should be revised; however, these errors do not materially affect the conclusions presented in the ERA. The review also indicated the need to refine the development, presentation and discussion of Preliminary Remediation Goals (PRGs), as also noted in the comments, in order to allow appropriate risk management decisions to be undertaken. A conference call with NJDEP was held on November 15, 2016 to discuss the draft response to the October 20, 2016 letter. These issues and the outcome of the November 15, 2016 meeting are addressed in the following revised response.

Response to Comments:

NJDEP Comment: *In accordance with Ecological Evaluation Technical Guidance (NJDEP 2015), Section 7.0, appropriate preliminary remediation goals (PRGs) should be developed through the use of food chain modeling, soil toxicity test results or apparent effects threshold (AET. Based on the information provided and given that food chain modeling indicated elevated*

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hazard quotients (HQ's), the food chain modeling appears to be the most appropriate method for developing PRGs.

Response: The ERA relied on two distinct lines of evidence (LOE) which are detailed in the document: a food web model and on the results of earthworm toxicity tests. The numeric PRGs presented in the document were based on the food web modeling line of evidence, but the toxicity based LOE should not be ignored in the risk conclusions and risk management, as Section 9.0 of the guidance indicates.

Once a PRG has been developed, then, in accordance with NJDEP 2015, Section 9.0, a risk management decision can be made to move away from the PRG. Section 11 of the Ecological Risk Assessment of the Flemington Former Manufactured Gas Plant (ERA) (GEI Consulting Engineers and Scientists, April 2016) eludes to "an incremental reduction of ecological risk;" however, this determination cannot be made until PRGs are developed (NJDEP 2015, Section 9,0).

Response: The "incremental reduction of ecological risk" was the term used to convey the concept of exposure risk reductions as discussed as a goal for risk management in Section 9.2 of the guidance. The concept conveyed the idea that removal of the area surrounding SS-103 would reduce the resulting concentrations below the PRG. However, we understand that the language was confusing and it will be revised to be consistent with guidance and present PRGs independent of site data.

It should be noted that the removal of the area of sample SS-103 was included in the RAW based on the findings of the ERA. Additional soil samples will be collected in this area, as necessary, to confirm that the PRGs are being met with the proposed removal.

The HQ's for HMW PAHs used a toxicity reference value (TRV) of 18 mg PAHs/ kg bw/ day based on the EcoSSL values; however, as indicated on page 9 of the Ecological Soil Screening Levels for Polycyclic Aromatic Hydrocarbons (PAHs) Interim Final (USEPA 2007), "A geometric mean of the [no observed adverse effect level] NOAEL values for growth and reproduction was calculated at 18 mg PAHs/ Kg bw/ day. However, this value is higher than the lowest bounded [lowest observed adverse effect level] LOAEL for reproduction, growth, or mortality. Therefore, the TRV is equal to the highest bounded NOAEL lower than the lowest bounded LOAEL for reproduction, growth, or survival and is equal to 0.615 mg PAHs/Kg bw/day." Therefore, the appropriate TRV for HMW-PAHs is 0.615 mg PAHs/Kg bw/day, not 18 mg PAHs/Kg bw/ day.

Response: The applicable TRVs was addressed in our previous response and discussed on the call with NJDEP held on November 15, 2016. As noted we continue to have various technical concerns about the use of the NOAEL TRV of 0.615 mg/kg-d from Culp et al. (1988) as a basis for the PRG, and consider it to be overprotective as a basis for remediation goals in view of the preponderance of ecotoxicological data.

To summarize the discussion:

- We concurred that the use of the 18 mg/kg-d as a high value, as applied in the submitted version of the ERA will not be used for the site (although we consider it a better estimate of true toxicity); neither was an alternate low TRV based on excluding the Culp et al. (1988) data (resulting in a NOAEL TRV of 11.8 mg/kg-d) acceptable to NJDEP.

- The use of the Culp et al. (1988) data as the preferred TRV for HMW PAHs has precedent in New Jersey based on the TRV applied in the ERA at the Lower Passaic River CERCLA site (U.S. EPA 2014, *Lower Eight Miles of the Lower Passaic River Focused Feasibility Study Report, Appendix D: Risk Assessment*)
- However, also based on Passaic precedent, it is reasonable to consider a high TRV equal to the LOAEL TRV (3.1 mg/kg-d from Culp et al. 1988) to define a risk range.

Based on further review, we will apply Culp et al. (1988) as the applicable TRV source to calculate LOAEL based TRV risks in addition to showing the NOAEL TRV based risks. We consider the LOAEL TRV as a reasonable basis for the PRG, and consistent with TRVs developed for the Lower Passaic River CERCLA site.

A revised PRG for HMW-PAHs for the shrew ESNR was calculated using the LOAEL TRVs and are presented below. As noted in the introduction to this memo, one error in the original ERA was present in the calculation of the soil-ingestion factor for the shrew, which should, in accordance with the EPA eco-SSL guidelines, be 3 percent of food ingestion, or Ps=0.03. This affects the intake term for incidental soil ingestion. For the recalculated proposed PRG below, this error has been corrected.

In addition, and in accordance with NJDEP and national guidance, the PRG has been calculated on the basis of site specific exposures and risk founded on the 95th percent UCL of the mean for the entire exposure area. The concentration in diet (plant and worms) is calculated from the average bioaccumulation factor observed in site data.

The proposed revised PRG can be calculated as:

- PRG = soil exposure concentration (95% UCL) / HQ based on incidental soil ingestion and food chain ingestion (at the average observed site specific soil to tissue Bioaccumulation factor at the 95% UCL soil concentration).

The 95% UCL of the mean soil concentration for the exposure area including SS-103 is 415.8 mg/kg HMW PAH. The PRG calculation would not consider bioavailability adjustments (see also next comment). The HQs recalculations apply the same exposure assumptions for shrews as in the existing risk assessment except the revised soil ingestion factor. The recalculated risk becomes:

- HQ (NOAEL TRV) = 17.7
- HQ (LOAEL TRV) = 3.5

Therefore, the proposed PRG is:

- PRG (corresponding to a HQ=1 at LOAEL) = 415.8 mg/kg / 3.5 = 117.1 mg/kg

The low-effect level represents the lowest value at which adverse effects were documented in the original study. This value would replace the PRG of 350 mg/kg presented in the risk assessment.

In addition, a bioavailability of 0.5 was used for soil for the site without any bioavailability studies being conducted. Therefore, bioavailability should be 1 for the site.

Response: We note that Section 6.1.3.2 of the guidance states that:

> "*To be consistent with the first two steps of ERAGS, the EE must assume that 100 percent of a particular COPEC that is identified in a particular media is available to the representative receptors being evaluated (N.J.S.A. 58:10B-12). While this is generally considered to be an overestimation of ecological risk, it provides a level of certainty if the conclusion of the EE is that no ecological risks are evident. However, in the ERA, the investigator should consider bioaccumulation when calculating the levels of exposure to be evaluated in the risk assessments, particularly in calculations of impacts to higher trophic level organisms through food chain transfer of a COPEC.*"

NJ guidance clearly anticipates that realistic exposures are necessary to derive reasonable PRGs. Bioaccumulation is an essential part of this process, and it is highly unrealistic to assume that HMWPAHs are absorbed from diet and soil at 100%. The use of a reasonable 0.5 relative bioavailability factor, therefore, is a useful bounding exercise that would result in a doubling of the PRG. We will revise to mention this bounding in the uncertainty section without including it in the final PRG calculation.

The four background samples included SS-111 through SS-114; however, SS-111 and SS-112 are directly adjacent to the site and located near undelineated elevated HMW-PAHs levels.

Response: We note that there were two "reference" locations from areas representing "regional soil quality" (SS-113 and SS-114) and two "background" locations (SS-111 and SS-112) from upgradient of the site which is consistent with the section 6.2.3.1 of the guidance. These locations may be affected by other sources but, as noted in guidance section 6.2.3.1 III, the "background" areas are as representative of what conditions may exist on site regardless of historical activities on site or post-remediation given regional nonpoint sources of contamination such as through runoff or historical fill. All samples from the upgradient "background" area are relevant to the site investigation and usable for purposes of comparing site concentrations to background and region. In addition, based on discussions with NJDEP the background data set for the area west of the site has been augmented with existing, prior data to strengthen the evaluation.

In accordance with the NJDEP 2015, Section 5.3.4, "All background area samples should be collected from areas outside the site's potential influence."

Response: Figure 7 (attached) of the Remedial Investigation Report (RIR) submitted for the site in April, 2014 shows the extent of Historic Fill on and surrounding the site. Per 7:26E-4.7(a)1., the Historic Fill was delineated to the property boundary. The area of the collection of the background samples is not under the "potential influence" of the site. The HMW PAHs are associated with Historic Fill and historic operations of the adjacent property as an industrial facility and from historic operations of the railroad. The PAHs are not associated with a release from site operations associated with the MGP process or a discharge of MGP-related substances.

The placement of the Historic Fill, from which our background samples were collected, can be confirmed through review of historic aerial photographs. Aerial photographs from 1940 through 1991 show that the soils at or near existing site grades on the adjacent property were placed progressively in the years following the operation of the later MGP plant. Based on this, the soils are not under the "potential influence" of the site and the background soil data presented in the RIR and the ERA are representative of background. The "reference" locations are indicative of regional typical concentrations.

In addition, the highest background levels were compared to the average site levels, which is not acceptable.

In accordance with NJDEP 2015, Section 5.5, "Statistics at a minimum should also include mean, maximum, 95 percent Upper Confidence Limit (UCL) (if appropriate based on number of samples), concentration range, and frequency of detection." Like statistics from background locations should be compared to like statistics for site data.

Response: Section 5.3.4 of the EE guidance indicates "*For a relatively small background area sample size, the mean and range of background contaminant concentrations should be used for comparison with individual sample points from site data, based on professional judgment*". While we concur that, when formally determining if a site is above background, a statistical test comparing "like to like" is appropriate.

The incorporation of additional data available for the upgradient area west (see attached Plate 1) of the site results in a background data set sufficient for statistical analysis. The data set is normally distributed resulting in a 95% UCL of the mean for HMW PAH of 104 mg/kg. Calculation of background threshold values (BTVs) based on the 95/95 UTL in accordance with EPA procedures result in values higher than the maximum detected concentration of 158.5 mg/kg, so conservatively defaulting back to the maximum is appropriate. The 95%UCL of the mean for the background is used to compare to the 95% UCL of the mean of soil concentrations. The 95/95 UTL (or maximum detected in this case) is appropriate BTV for comparison of individual samples to a BTV.

Only acute toxicity tests were performed for the earthworm (14-day survival) and ryegrass (c1nergence and root elongation) instead of chronic tests (i.e. reproductive tests for earthworms). Chronic toxicity tests, particularly for the earthworm, may be more appropriate for site contaminants.

Response: In Appendix E of the EE guidance, it states that sublethal and longer duration endpoints are not always appropriate for soil toxicity tests, as they may result in false positives and/or misleading results. The earthworm test used for this study is a standard method commonly applied when considering terrestrial soil toxicity, as true chronic tests are difficult to implement reliably in terrestrial toxicity testing. The acute earthworm remains a valuable line of evidence for the risk assessment. The ryegrass test should be considered an appropriate chromic endpoint for plants.

Figure 7 of the ERA indicates that complete delineation of PAHs, including off-site, has not been achieved in accordance with NJ.AC 7:26E-4.1(a), -4.2(a), -4.2(b) and -4.8(c).

Response: As stated previously, the RIR submitted for the site in April, 2014 documents delineation of impacted environmental media. The site is bound to the west and south by historical fill not associated with the operation of the former MGP. Per 7:26E-4.7(a)1., the Historic Fill was delineated to the property boundary. The ecological evaluation was

not intended as a complete delineation of contaminants in accordance with NJAC 7:26E. It is specifically focused on evaluating potential ecological risk to ESNRs in the "ERA site" based on the available information about the site. We note that additional work has been presented elsewhere on this topic. The figures do show the extent of the "ERA site" relative to other portions of the site where free or residual product has been previously noted and is not addressed under this ERA.

Additionally, GEI also noted during review some curious results related to selenium, where earthworm tissue data were highly elevated relative to the soil matrix in which they were tested. Such a result is not consistent with established biology of earthworms (i.e. earthworms are expected to have tissue burdens more or less in 1:1 equilibrium with their soil matrix, and are not known to accumulate selenium, particularly in the absence of hyper-accumulating vegetation providing selenium enriched detritus). This results in substantially overestimated risk. Based on the observed soil concentrations, and applying standard eco-SSL accumulation factors, the expected reportable selenium-related risk to shrews should be much lower, in the range of HQ=1 to 2 for the maximum detected soil concentrations of around 2 mg/kg. These are HQs in line with the other metals at the site, and would not require consideration for a remedial goal. There appears to be something problematic with the earthworm selenium data that needs to be considered, and suggests that developing a PRG for selenium is premature and possibly unnecessary. A discussion of concerns about these results will be added.

The additional analysis of the data based on NJDEP feedback from the November 15, 2016 conference call has yielded a more conservative PRG of 117.1 mg/kg (corresponding to a HQ=1 at LOAEL). GEI recalculated the background concentrations from additional soil samples from the RIR, which yielded a concentration of 104 mg/kg for HMW PAHs. GEI also verified through historic research that the soil samples used to calculate the background concentration were not under "potential influence" of the site. Based on the additional analysis, we are proposing the use of the background concentration as a conservative PRG for HMW PAHs.

If you have any questions, please feel free to contact me at (973) 873-7127. We would be happy to hold an on-site meeting with you to help develop a better understanding of site conditions to support your further review.

Sincerely,

GEI CONSULTANTS, INC.

Robert Blauvelt, LSRP
Senior Consultant

Jamey A. Stynchula, P.G.
Project Manager

RB:JAS/lsf
Enclosures

c: Ms. Nancy Hamill

Memo

To: Kevin Schick, NJDEP
Nancy Hamill, NJDEP
Mark Davis, NJDEP (LURP Meeting)
Dennis Contois, NJDEP (LURP Meeting)

From: Bob Blauvelt, LSRP

Re: Summary of August 25, 2015 Technical Consultation Meeting

Discussion of institutional and engineering controls necessary to address exposure pathway for human health and ecological receptors for soil containing PAHs and lead above the NRDCSRS and ESC in the wetland and wetland buffer areas of the former Flemington MGP site (PI No. 001038).

Date: September 3, 2015

Attendees: Elaine Comings, JCP&L
Steve Cook, Pivotal Utility Holdings
Steven Pernick, Pivotal Utility Holdings
Jamey Stynchula, GEI
Tara Waterhouse, GEI
Barry Raus, GEI
Bob Blauvelt, LSRP(License No. 575013)

Purpose of Consultation: To discuss the use of Institutional Controls and Engineering Controls related to exposure pathways for potential human health and ecological receptors from soil impacted with low levels of PAHs above Non-Residential Direct Contact Soil Remediation Standards (NRDCSRS) and Ecological Screening Criteria in the wetland and wetland buffer areas at the former Flemington Manufactured Gas Plant (MGP) site, PI No. 001038. This possible approach may be used in conjunction with excavation of soil and sediment impacted with free and residual product (coal tar) as part of the remedial strategy for the site.

The meeting began with personnel introductions and sign in sheet (attached).

Kevin Schick welcomed the group and explained the role of a technical consultation, which is not intended to approve or reject plans presented by the project team. Rather, the NJDEP is acting in an advisory role to assist the LSRP's use of professional judgment in selecting and implementing an appropriate remedial solution for the site.

The site LSRP, Bob Blauvelt led the discussion and began by providing an orientation to the site and site background and stating that there were several remedial options being considered for the wetlands and wetland soil. One alternative actively being considered is to remove the areas of identified

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free and residual product and allow soils with low concentrations of metals (particularly lead) and PAH impacts to remain in place. From a standpoint of preserving a natural resource this was desirable versus complete disturbance and later restoration of the wetland and adjoining areas. Mr. Blauvelt stated that he would need a high level of comfort that the institutional and engineering controls would be protective of human health and local ecology and that an ecological risk assessment (ERA) would be necessary in order to determine that there was no unacceptable risk to ecological receptors before he would approve this approach.

Jamey Stynchula then discussed the site data and Remedial Investigation Report. The following was presented regarding the remedial status of the site:

- The Remedial Investigation Report was submitted in April 2014 and has been accepted by the NJDEP.

- Soil remediation has been completed in two areas (Phase 1 and Phase 2) to facilitate construction of a new building and yard for Elizabethtown Gas (ETG). The footprint of the new facility was selected to be outside of the wetland buffer zone to avoid the need for permitting and to expedite the project. The remediation in these areas consisted of removal of free and residual product (coal tar) to the bedrock surface with removal of soil with adsorbed phase impacts to a depth of two feet, and backfill with clean fill.

- Two applications for Letters of Interpretation (LOI) have been submitted for the site and been accepted by NJDEP. Permits were issued for remedial investigation activities within the wetlands in 2009 and 2013.

- Figure 1 (attached to the proposed meeting agenda) shows the areas of identified free and residual product in relationship to the delineated wetlands and buffer zone.

- The MGP site is surrounded by mapped Historic Fill, which has been documented on adjacent properties and observed during installation of a culvert to the east of the site. Remedial investigation activities by GEI has identified the fill as including, among other things, coal residues, ash, glass, brick fragments, trash, and other debris. In places, the fill can be more than 12 feet thick.

- The Bushkill Brook is fed by two culverts, which are connected upstream, one older culvert to the north and a more recent culver to the south. These culverts provide drainage for a substantial portion of Flemington Borough and Raritan Township.

- Multiple sources of Diffuse Anthropogenic Pollution (DAP) are fed into and surround the Bushkill Brook.

- A conservation easement, which coincides with the 50 feet wetland buffer zone has been established by Raritan Township and is waiting to be recorded.

- A deed restriction will be placed on the properties as concentrations above the RDCSRS will remain on the Site.

Mr. Schick stated that in cases like this, institutional and engineering controls have been used to preserve natural resources including split rail fence and signage. If the LSRP was comfortable that the proposed controls were protective of human health and the ERA found that there was no unacceptable risk to ecological receptors, the NJDEP would not reject this approach.

Further questions were asked by the NJDEP regarding the ERA:

- The NJDEP had concerns that the soil and sediment samples used to determine background were close to the Site and may have been affected by former MGP operations. GEI explained that the Remedial Investigation had delineated on-site impacts and that local topography and land use patterns supported our final determination as to the extent of MGP related soil impacts.

- The NJDEP remarked that concentrations in the wetland soil in the RIR seemed elevated. GEI explained that the data set included samples in the area of free and residual product. GEI reevaluated the data excluding points that were within the area of free and residual product and that concentrations in the resulting data set were much lower overall. GEI's ecological group looked at the revised data set and had a level of comfort that the soils would pass an ERA. Revised figures and tables would be presented in the ERA.

- GEI's meeting agenda had a description of the ERA problem formulation, which was done in accordance with the current NJDEP Ecological Evaluation technical guidance.

- NJDEP stated that toxicity and macro invertebrate samples would be beneficial. GEI confirmed that our ERA work plan which may include the collection of worm and beetle tissue for analysis and toxicity testing.

- NJDEP clarified that sediment will be removed from the Bushkill Brook so no aquatic ERA will be necessary.

The NJDEP concurred with the overall ERA approach and had several suggestions to enhance the usability of the ERA:

- Site-specific standards will be developed for the wetland soils based on the findings of the ERA.

- Some soil samples areas with higher concentrations may need to be excluded (i.e., designated for excavation and disposal).

- The RAWP submittal form will have a box to be checked for ERA which will trigger forwarding and review to the eco group.

- The NJDEP advised that there is a difference between a background location and reference or control location. Our ERA should identify areas that qualify as both. The reference location

should be similar to the site, but be a non-impacted negative control. GEI stated that we may need to be a substantial distance from the site to meet those criteria.

- A tree survey would be beneficial to the decision process if removal of the trees would be detrimental to the ecosystem.

In conclusion, the NJDEP will not object to allowing soil with low-levels of adsorbed-phase PAH and metals (lead) impacts to remain in place if the LSRP confirms that the proposed controls are protective of human health and the ERA demonstrates there are no unacceptable risks to ecological receptors.

A meeting was then held later in the day with the Division of Land Use Regulation to discuss the permitting needs of the Site. Mark C. Davis, Acting Supervisor of the Office of Dredging and Sediment Technology as well as Dennis Contois, who specializes in Flood Hazard Area issues, provided guidance.

The meeting began with personnel introductions and sign in sheet (attached).

Mark Davis welcomed the group and stated that the role of the meeting was to explain the permits that will be needed based upon the determined remedial scope. Mark Davis stated that he and Kevin Schick discussed the outcome of the Technical Assist meeting prior to the permitting meeting.

Jamey Stynchula provided a site background and based upon the discussions at the technical assist meeting, provided the proposed remedial alternative of removing sediment, removing the areas of identified free and residual product and allowing soils with low concentrations of metals (lead) and PAH impacts to remain in place with institutional and engineering controls (deed restrictions, fencing, signage). This approach would be acceptable to the LSRP, and would not be rejected by the NJDEP, if the results of the ERA found that there was no unacceptable risk to ecological receptors.

Mark Davis and Dennis Contois stated that based upon the provided information, a Freshwater Wetlands General Permit 4: Hazardous Site Investigation and Cleanup Permit as well as an Individual Flood Hazard Area Permit would be required to authorize remedial activities within the regulated areas.

Mark Davis stated that the RAWP must be submitted prior to, or concurrent with, the permit applications and permit review may take up to 90 calendar days (then it's deemed approved by regulation), assuming the application is deemed administratively complete (determination must occur within 20 working days).

Rb:lsf

Technical Consultation
Attendance Sheet

Site Name: Flemington MGP/Elizabethtown Gas Co	PI# 001038	Date: August 25, 2015
Meeting Location: NJDEP – 401 E. State Street, Trenton		
LSRP Name/#: Robert Blauvelt / LSRP# 575013		

Attendees

NAME	AFFILIATION	TELEPHONE	EMAIL
Kevin Schick	NJDEP/SRP/BEERA	(609) 984-1825	Kevin.schick@dep.nj.gov
Nancy Hamill	NJDEP/SRP/BEERA	(609) 633-1353	Nancy.hamill@dep.nj.gov
Bob Blauvelt	GEI / LSRP	973-873-7127	RBLAUVELT@GEICONSULTANTS.com
Elaine Comings	JCP&L	973-401-8784	ecomings@firstenergycorp.com
Jamey Stynchula	GET	856-291-5657	jstynchula@geiconsultants.com
STEVEN PERNICK	ETG	(732) 816-2580	spernick@aglresources.com
Steven Cook	ETG	(908) 662-8317	scook@aglresources.com
Barry Raws	GEI	609-614-4893	braws@geiconsultants.com
Tara Waterhouse	GEI	856-797-5511	twaterhouse@geiconsultants

New Jersey Department of Environmental Protection
Site Remediation Program
Office of Dredging and Sediment Technology

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401 East State Street, 6th Floor
Trenton, New Jersey 08625-0420
Phone: (609) 292-3801

Date: August 25, 2015

Subject: JCP&L – Pre-application meeting

Attendance

Name	Affiliation	Phone	E-Mail
Mark Davis	NJDEP / ODST	609-633-1357	mark.davis @ dep.nj.gov
Jamey Stynchula	GEI	856-291-5657	jstynchula@geiconsultants.com
Bob Blauvelt	GEI	973-873-7127	RBLAUVELT@GEICONSULTANTS.COM
Elaine Comings	JCP&L	973-401-8784	ecomings@firstenergycorp.com
Tara Waterhouse	(GEI)	856-797-5511	twaterhouse@geiconsultants.com
Barry Raus	GEI	609-694-4893	braus@geiconsultants.com
Steven Cook	ET 6	908.662.8317	scook@aglresources.com
Steven Pernick	ET 6	732-816-9580	spernick@aglresources.com
Dennis Conton	PEP - LUR	(609)633-6563	dennis.conton@dep.nj.gov

From: Schick, Kevin [mailto:Kevin.Schick@dep.nj.gov]
Sent: Monday, September 14, 2015 10:42 AM
To: Waterhouse, Tara
Subject: RE: Flemington (PI#001038) Tech Assist & Pre-App Meeting 8.25.15

Hello Tara,

Sorry for the delay, I was awaiting responses from staff away on vacation. All NJDEP attendees have reviewed the Technical Consultation Summary and found it to be acceptable. The document has been inserted into NJEMS today.

Kevin Schick
NJDEP/Site Remediation Program
Chief - Bureau of Environmental Evaluation & Risk Assessment
P.O. Box 420
Mailcode 401-05W
Trenton, N.J. 08625
(609) 984 – 1825 (Direct Line)
kevin.schick@dep.nj.gov
Please note that my email address has changed.

From: Waterhouse, Tara [mailto:twaterhouse@geiconsultants.com]
Sent: Friday, September 11, 2015 1:52 PM
To: Schick, Kevin
Subject: FW: Flemington (PI#001038) Tech Assist & Pre-App Meeting 8.25.15

Good Afternoon,
I just wanted to follow up on the memo that we sent that summarized our Technical Consult/Pre-App meeting that took place on August 25th. Please let me know if you have and comments or questions.
Thank you again for your assistance with this project.

Tara J. Waterhouse
Staff Scientist
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Consulting Engineers & Scientists
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From: Waterhouse, Tara
Sent: Thursday, September 03, 2015 3:38 PM
To: 'kevin.schick@dep.nj.gov'; 'nancy.hamill@dep.nj.gov'; Mark Davis (Mark.Davis@dep.nj.gov);

RESIDENTIAL TOWN HOUSES
AGWAY PROPERTY
WATER COMPANY PROPERTY
RESIDENTIAL HOMES
RESIDENTIAL HOMES
LATER MGP AREA
ORIGINAL MGP AREA
WOODED AREA
formerly LEHIGH VALLEY R.R.
ELEVATED RAILROAD SIDING
CONCRETE LOADING/STORAGE AREA
CONCRETE SUPPORTS FOR FORMER RAILROAD TRESTLE
UNDERGROUND GASOLINE TANK
2-6,000 gallon UNDERGROUND GASOLINE TANKS (REMOVED 1987)
12,000 gallon OIL TANK
HIGH PRESSURE GAS HOLDER
CONCRETE SUPPORTS FOR FORMER NATURAL GAS TANK
APPROXIMATE PROPERTY LINE
DRIVEWAY
PARKING AREA
TRAILER
GAS PUMP
GAS PUMP
LT. PUMPS
STACK
STORAGE SHED
WAREHOUSE
GENERATING PLANT
PULSATION TANK
PROTECTIVE PIPES AROUND PROPANE TANK
COMPRESSOR HOUSE
OFFICE
CANOPY
CONC. PAD
METER ROOM
RELIEF GAS HOLDER
GAS CYLINDER STORAGE BUILDING
TAR PIT
PURIFIERS
SCRUBBER GAS
COOLING COILS
HORIZONTAL TANK DEHYDRATOR
10,000 gallon PROPANE TANK
30,000 gallon PROPANE TANK
chain link fence
PILE
SS-1
DRIP OIL TANK
PURIFIER
RETORTS
GAS HOLDER
GAS HOLDER
MAILBOX
SANITARY SEWER EASEMENT
SANITARY SEWER LINE NOT MARKED IN FIELD APPROXIMATE LOCATION FROM BOROUGH PLANS
25' WIDE DRAINAGE EASEMENT
10' WIDE SIDEWALK & UTILITY EASEMENT
25' WIDE DRAINAGE EASEMENT
25' WIDE SANITARY SEWER EASEMENT
25' WIDE DRAINAGE EASEMENT
GUARD RAIL
CONCRETE SIDEWALK
PAVED DRIVE
GRAVEL DRIVE
CONCRETE CURB
WALL
OLD CHANNEL
RARITAN TOWNSHIP
FLEMINGTON BOROUGH
BUSHKILL BROOK
EAST MAIN STREET
LINCOLN CIRCLE
BLOCK 18
TAX LOT 14
BLOCK 5
TAX LOT 15
TAX LOT 14
TAX LOT 13.01
TAX LOT 13
TAX LOT 12
TAX LOT 11
TAX LOT 10
TAX LOT 9
TAX LOT 8
TAX LOT 6
TAX LOT 5
TAX LOT 4.04
TAX LOT 4.05
TAX LOT 4.03
TAX LOT 4.02
TAX LOT 4.01
TAX LOT 4.07
TAX LOT 4.06
TAX LOT 3
TAX LOT 2
MW-1
MW-2
MW-2WT
MW-3
MW-3DD
MW-4
MW-5S
MW-5D
MW-6DD
MW-6S
MW-6D
MW-7S
MW-7D
MW-8S
MW-8D
MW-9S
MW-9D
MW-9WT
MW-10S
MW-10D
MW-10WT
MW-11S
MW-11D
MW-11WT
MW-12S
MW-13S
MW-13D
MW-13DD
MW-14S
MW-15S
MW-15D
MW-17S
MW-17D
MW-18S
MW-18D
MW-19S
MW-19D
MW-19WT
MW-20S(WT)
MW-20D
MW-21D
MW-21DD
0
80
160
SCALE, FEET

LEGEND

- MW-1 EXISTING MONITORING WELL
  WT = WATER TABLE, S = SHALLOW BEDROCK, D,DD = DEEP BEDROCK
- CONFIRMED HISTORIC FILL BASED ON SUBSURFACE INVESTIGATION OBSERVATIONS AND FIELD OBSERVATIONS
- HISTORIC FILL IDENTIFIED ON 1994 JMZ GEOLOGY REPORT
- NJDEP IDENTIFIED HISTORIC FILL
- PRESUMED HISTORIC FILL BASED ON FIELD OBSERVATIONS AND TOPOGRAPHY
- CURRENT STRUCTURE
- CURRENT FOUNDATION
- FORMER NON-MGP RELATED STRUCTURE
- FORMER MGP RELATED STRUCTURE
- WATERCOURSE
- 100 GROUND SURFACE CONTOUR (FEET)
- GUARD RAIL
- CHAIN LINK FENCE

SOURCES:

1. *TAX LOTS 14 & 12.03 BLOCK 18, TOWNSHIP OF RARITAN, TAX LOTS 14 &15 BLOCK 5, BOROUGH OF FLEMINGTON,* HUNTERDON COUNTY, NEW JERSEY, PREPARED BY GERALD G. DEGROAT, L.S., SCHOOLEY'S MOUNTAIN, NEW JERSEY, SCALE: 1" = 50', REVISED DATED JUNE 15, 2005.
2. *FIGURE 2-1: COMPOSITE OF HISTORICAL STRUCTURES, PHASE III REMEDIAL INVESTIGATION ADDENDUM REPORT* PREPARED BY GEI, DATED MARCH 24, 1998 (DRAFT FINAL).
3. *HISTORIC FILL FOR NEW JERSEY AS OF FEBRUARY 2009,* NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION (NJDEP), NEW JERSEY GEOLOGICAL SURVEY (NJGS).
4. *EXPERT REPORT FOR TRENCHING CONDUCTED AT 54 EAST MAIN STREET, AND HISTORICAL RESEARCH WITHIN FLEMINGTON, NJ,* PREPARED BY JMZ GEOLOGY, FLEMINGTON, NJ DATED DECEMBER 22, 1994.

SUPPLEMENTAL PHASE IV REMEDIAL INVESTIGATION REPORT
FLEMINGTON FORMER MGP SITE
FLEMINGTON, NEW JERSEY

JERSEY CENTRAL POWER & LIGHT COMPANY
AND ELIZABETHTOWN GAS COMPANY

GEI Consultants

Project 972600-1-1107

IDENTIFIED HISTORICAL FILL MAP

April 2011 Figure 7

I:\Project\JCP&L\Flemington\972600\Supp Phase IV RI Report\Figures\Flemington-Historic Fill Map.DWG

Sample Name:	SS-30	SS-30
Sample Interval (feet):	1.5-2	1.5-2
Sample Date:	11/25/2009	11/25/2009
PAHs (mg/kg)		
Total HPAH (10 of 17)	118.51	117.96

Sample Name:	SS-102	SS-102
Sample Interval (feet):	0-0.5	0.5-1
Sample Date:	10/13/2015	10/13/2015
PAHs (mg/kg)		
Total HPAH (10 of 17)	149.1	120.5

Sample Name:	SS-04	SS-04A
Sample Interval (feet):	0-2	0-2
Sample Date:	5/1/1997	5/7/1997
PAHs (mg/kg)		
Total HPAH (10 of 17)	20600	6.64

Sample Name:	TP-65A
Sample Interval (feet):	1.5-2
Sample Date:	4/29/1997
PAHs (mg/kg)	
Total HPAH (10 of 17)	6.4

Sample Name:	SS-108	SS-108
Sample Interval (feet):	0-0.5	0.5-1
Sample Date:	10/13/2015	10/13/2015
PAHs (mg/kg)		
Total HPAH (10 of 17)	237.6	196.3

Sample Name:	SD-3	SD-3
Sample Interval (feet):		
Sample Date:	10/26/1993	11/11/2009
PAHs (mg/kg)		
Total HPAH (10 of 17)	94.9	44.087

Sample Name:	SS-111	SS-111
Sample Interval (feet):	0-0.5	0.5-1
Sample Date:	10/14/2015	10/14/2015
PAHs (mg/kg)		
Total HPAH (10 of 17)	27.26	56.27

Sample Name:	SS-103	SS-103
Sample Interval (feet):	0-0.5	0.5-1
Sample Date:	10/13/2015	10/13/2015
PAHs (mg/kg)		
Total HPAH (10 of 17)	550.7	1394

Sample Name:	SS-21
Sample Interval (feet):	1.5-2
Sample Date:	6/1/2007
PAHs (mg/kg)	
Total HPAH (10 of 17)	2576

Sample Name:	SS-107	SS-107
Sample Interval (feet):	0-0.5	0.5-1
Sample Date:	10/13/2015	10/13/2015
PAHs (mg/kg)		
Total HPAH (10 of 17)	48.5	107.6

Sample Name:	SD-8
Sample Interval (feet):	
Sample Date:	11/11/2009
PAHs (mg/kg)	
Total HPAH (10 of 17)	28.44

Sample Name:	SS-28
Sample Interval (feet):	
Sample Date:	10/5/2009
PAHs (mg/kg)	
Total HPAH (10 of 17)	0.998

Sample Name:	SD-02
Sample Interval (feet):	
Sample Date:	5/7/1997
PAHs (mg/kg)	
Total HPAH (10 of 17)	47.8

Sample Name:	SS-06
Sample Interval (feet):	0-2
Sample Date:	5/7/1997
PAHs (mg/kg)	
Total HPAH (10 of 17)	44.32

Sample Name:	SS-07
Sample Interval (feet):	0-2
Sample Date:	5/14/1997
PAHs (mg/kg)	
Total HPAH (10 of 17)	1.8

Sample Name:	SS-11
Sample Interval (feet):	0-2
Sample Date:	5/5/1997
PAHs (mg/kg)	
Total HPAH (10 of 17)	2.24

Sample Name:	SS-31
Sample Interval (feet):	0.5-1
Sample Date:	11/25/2009
PAHs (mg/kg)	
Total HPAH (10 of 17)	136.31

Sample Name:	TP-58
Sample Interval (feet):	4-5
Sample Date:	4/29/1997
PAHs (mg/kg)	
Total HPAH (10 of 17)	91.1

Sample Name:	SS-23
Sample Interval (feet):	0.6-1.1
Sample Date:	6/1/2007
PAHs (mg/kg)	
Total HPAH (10 of 17)	22.647

Sample Name:	SS-110	SS-110
Sample Interval (feet):	0-0.5	0.5-1
Sample Date:	10/14/2015	10/14/2015
PAHs (mg/kg)		
Total HPAH (10 of 17)	98.79	98.48

Sample Name:	SS-16
Sample Interval (feet):	0-2
Sample Date:	5/5/1997
PAHs (mg/kg)	
Total HPAH (10 of 17)	9.55

Sample Name:	SS-101	SS-101
Sample Interval (feet):	0-0.5	0.5-1
Sample Date:	10/13/2015	10/13/2015
PAHs (mg/kg)		
Total HPAH (10 of 17)	176.7	291.2

Sample Name:	TP-69	TP-69
Sample Interval (feet):	4-5	5.5-6
Sample Date:	4/29/1997	4/29/1997
PAHs (mg/kg)		
Total HPAH (10 of 17)	3.43	2.67

Sample Name:	SS-32
Sample Interval (feet):	1.5-2
Sample Date:	10/5/2009
PAHs (mg/kg)	
Total HPAH (10 of 17)	26.918

Sample Name:	SS-109	SS-109
Sample Interval (feet):	0-0.5	0.5-1
Sample Date:	10/14/2015	10/14/2015
PAHs (mg/kg)		
Total HPAH (10 of 17)	115.9	123.4

Sample Name:	SD-1	Duplicate of SD-1
Sample Interval (feet):		
Sample Date:	5/7/1997	5/7/1997
PAHs (mg/kg)		
Total HPAH (10 of 17)	77.6	89.1

Sample Name:	SS-35
Sample Interval (feet):	1-1.5
Sample Date:	10/5/2009
PAHs (mg/kg)	
Total HPAH (10 of 17)	0.67

Sample Name:	SS-106	SS-106
Sample Interval (feet):	0-0.5	0.5-1
Sample Date:	10/13/2015	10/13/2015
PAHs (mg/kg)		
Total HPAH (10 of 17)	14.2	6.563

Sample Name:	SD-4
Sample Interval (feet):	
Sample Date:	11/11/2009
PAHs (mg/kg)	
Total HPAH (10 of 17)	67.324

Sample Name:	SD-3	SD-3
Sample Interval (feet):		
Sample Date:	10/26/1993	11/11/2009
PAHs (mg/kg)		
Total HPAH (10 of 17)	94.9	44.087

Sample Name:	SS-33
Sample Interval (feet):	1-1.5
Sample Date:	10/5/2009
PAHs (mg/kg)	
Total HPAH (10 of 17)	5.067

Sample Name:	SS-105	SS-105
Sample Interval (feet):	0-0.5	0.5-1
Sample Date:	10/13/2015	10/13/2015
PAHs (mg/kg)		
Total HPAH (10 of 17)	7.3	2.37

Sample Name:	SS-34
Sample Interval (feet):	1-1.5
Sample Date:	00/5/2007
PAHs (mg/kg)	
Total HPAH (10 of 17)	91.54

Sample Name:	SS-112	SS-112
Sample Interval (feet):	0-0.5	0.5-1
Sample Date:	10/14/2015	10/14/2015
PAHs (mg/kg)		
Total HPAH (10 of 17)	158.5	130.3

Sample Name:	SS-37
Sample Interval (feet):	1-1.5
Sample Date:	11/25/2009
PAHs (mg/kg)	
Total HPAH (10 of 17)	2.549

Sample Name:	SS-05
Sample Interval (feet):	0-2
Sample Date:	5/7/1997
PAHs (mg/kg)	
Total HPAH (10 of 17)	75.6

Sample Name:	SS-104	SS-104
Sample Interval (feet):	0-0.5	0.5-1
Sample Date:	10/13/2015	10/13/2015
PAHs (mg/kg)		
Total HPAH (10 of 17)	301.9	335.6

Sample Name:	SS-37
Sample Interval (feet):	1-1.5
Sample Date:	11/25/2009
PAHs (mg/kg)	
Total HPAH (10 of 17)	2.549

Sample Name:	SS-38
Sample Interval (feet):	1.5-2
Sample Date:	11/25/2009
PAHs (mg/kg)	
Total HPAH (10 of 17)	129.53

Sample Name:	SD-1
Sample Interval (feet):	
Sample Date:	10/26/1993
PAHs (mg/kg)	
Total HPAH (10 of 17)	27.27

Sample Name:	SD-5
Sample Interval (feet):	
Sample Date:	11/11/2009
PAHs (mg/kg)	
Total HPAH (10 of 17)	57.78

PHASE 1 IRM AREA

PHASE 2 IRM AREA

PARKING AREA

ORIGINAL MGP AREA

DRIP OIL TANK

GAS HOLDER

PURIFIER

RETORTS

BLOCK 18

TAX LOT 14

TAX LOT 13

TAX LOT 12

TAX LOT 11

TAX LOT 10

TAX LOT 9

TAX LOT 8

TAX LOT 7

TAX LOT 6.01

TAX LOT 4.04

TAX LOT 4.03

TAX LOT 4.05

TAX LOT 4.02

TAX LOT 4.01

TAX LOT 4.07

TAX LOT 4.06

TAX LOT 5

BLOCK 7

RESIDENTIAL TOWNHOUSES

RESIDENTIAL HOMES

BUSINESSES

WATER COMPANY PROPERTY

AGWAY PROPERTY

OLD CHANNEL

APPROXIMATE PROPERTY LINE

WOODED VALLEY WAY

WALTER E FORAN BLVD

LINCOLN CIRCLE

MAIN AVENUE

RARITAN TOWNSHIP / FLEMINGTON BOROUGH

SOUTH BRANCH RARITAN RIVER

LEGEND

- SITE PROPERTY BOUNDARY
- PROPERTY BOUNDARY
- PHASE 3 RA PROJECT BOUNDARY
- UTILITY EASEMENT
- SS-107 — 2015 ERA SAMPLE LOCATIONS (SEE APPENDIX D FOR DETAILS)
- SS-29 — SURFACE SOIL SAMPLE LOCATION (COLLECTED IN 2009)
- SS-20 — SURFACE SOIL SAMPLING LOCATION (CONDUCTED IN 2007)
- SS-01 — EPA SURFACE SOIL SAMPLE (COLLECTED IN 1993)
- MW-10D (SS-12) — DEEP BEDROCK MONITORING WELL SURFACE SOIL SAMPLE LOCATION
- MW-12S (SS-17) — SHALLOW MONITORING WELL LOCATION SURFACE SOIL SAMPLE LOCATION
- MW-19S — MONITORING WELL LOCATION (INSTALLED IN 2007)
- SB-15 — SOIL BORING LOCATION (CONDUCTED IN 2009)
- SB-9 — SOIL BORING LOCATION (CONDUCTED IN 2007)
- SB-5 (SS-14) — SOIL BORING LOCATION SURFACE SOIL SAMPLE LOCATION
- TP-66 — TEST PIT LOCATION (EXCAVATED IN 1997)
- TP-100 — TEST PIT LOCATION (EXCAVATED IN 2013, NO SAMPLES TAKEN))
- TP-1 — TEST PIT (TP-1 THROUGH TP-8 CONDUCTED IN 1987) (TP-9 THROUGH TP-23 CONDUCTED IN 1991) (TP-24 THROUGH TP-53 CONDUCTED IN 1993)
- LEADER INDICATES SAMPLES USED FOR BACKGROUND CONCENTRATION CALCULATION
- PROPOSED EXCAVATION AREA
- PROPOSED EXCAVATION TO ADDRESS ENVIRONMENTAL RISK
- ENVIRONMENT RISK ASSESSMENT AREA

N

0 50 100

SCALE, FEET

SOURCE:

TAX LOTS 14 & 12.03 BLOCK 18, TOWNSHIP OF RARITAN, TAX LOTS 14 &15 BLOCK 5, BOROUGH OF FLEMINGTON, HUNTERDON COUNTY, NEW JERSEY, PREPARED BY GERALD G. DEGROAT, L.S., SCHOOLEY'S MOUNTAIN, NEW JERSEY, SCALE: 1" = 50', REVISED DATED JUNE 15, 2005.

PHASE 3 SOIL REMEDIAL ACTION WORK PLAN
FLEMINGTON FORMER MGP SITE
FLEMINGTON, NEW JERSEY

JERSEY CENTRAL POWER & LIGHT COMPANY
AND ELIZABETHTOWN GAS COMPANY

PROJECT 972600

GEI Consultants
18000 HORIZON WAY, SUITE 200
MOUNT LAUREL, NJ 08054

SURFACE AND SHALLOW SUBSURFACE SOIL ANALYTICAL SUMMARY

November 2016 Plate 1

H:\TECH\project\JCP&L\flemington\Phase 3 Soil RAWP\Figures\CAD - Xu\ Flemington-Phase 3 Soil Analytical Results Summary.dwg \Nov 21, 2016

State of New Jersey

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Enforcement, Technical and Financial Support
Bureau of Environmental Evaluation and Risk Assessment
P.O. Box 420, Mail Code 401-05W
Trenton, NJ 08625-0420
Phone: (609) 633-7413
Fax:(609) 633-1454

BOB MARTIN
Commissioner

December 14, 2016

Steven Cook, Manager
Environmental Programs
AGL Resources, Inc.
520 Green Lane
Union, NJ 07083

RE: Alternative/New Soil Remediation Standard Application Response to Comments (Revision 1)
Flemington Former Manufactured Gas Plant
60 East Main Street
Flemington Borough/Raritan Township, NJ 08822
PI# 001038

Dear Mr. Cook,

An Alternative/New Soil Remediation Standard Application Response to Comments (Revision 1) was submitted to the Department on November 29, 2016 for the above referenced property by the licensed site remediation professional that you retained, Robert P. Blauvelt (LSRP ID #575013) of GEI Consultants, Inc. Following are NJDEP's response to Mr. Blauvelt's responses to NJDEP comments. The responses were not numbered, so they are presented below in order they appear in the November 29, 2016 letter.

Response 1: The letter states that "the ERA relied on two distinct lines of evidence;" however, the letter missed the point that an ARS must be developed with a risk-based approach in accordance with the *Ecological Evaluation Technical Guidance* (NJDEP 2015), **Section 7.0** which states "Ecological risk-based remediation goals are soil and sediment concentrations protective of specified ecological receptors that are calculated from site-specific biological tests." The levels offered in the original application were based strictly on the second highest level observed at the site. NJDEP 2015 offers three acceptable methods for calculating risk-based preliminary remediation goals (PRGs) for a site in **Sections 7.1-7.2.2**. These procedures should be used in calculating a site-specific risk-based PRG, with the food chain modeling being the most likely procedure given the information presented.

Response 2: The letter references Section 9.2 of NJDEP 2015; however, fails to comply with Section 9.2 which states "RMDs involve adjusting ecological risk-based remediation goals for remedial decision making and implementation." In other words, an acceptable ecological risk-based PRG must first be developed, then, if there is justification, one can move off of the ecological risk-based PRG using a risk management decisions (RMD). The original application started directly by using the second highest level detected on site and stating that this was an RMD, which is not acceptable. An appropriate ecological risk-based PRG must first be developed.

Response 3: The letter agrees to use the appropriate TRV from Culp et al. (1988); however, it is still applied in an unacceptable manner. Using the 95% UCL divided by the TRV is not an acceptable method to develop

DRAFT

a PRG. An ecological risk-based PRG must be developed in accordance with NJDEP 2015, **Section 7.0, et seq**.

Response 4: The letter arbitrarily picks 0.5 as a bioavailability factor without any site-specific studies. Site-specific studies would be required to use a bioavailability factor, otherwise a bioavailability factor of one must be used.

Responses 5 & 6: The letter states that SS-111 and SWS-112 are background and influenced by historic fill and a railroad. NJDEP generally observes PAHs in the 1-5 ppm range in historic fill and in the 1-10 pm range for railroads; however, SS-111 and SS-112 reported results for HMW-PAHs levels ranging from 31 mg/kg to 177 mg/kg. These levels are more indicative of SS-30, SS-31 and SS-38, which are adjacent to the site and SS-111 or between the site and SS-112 and exhibit HMW-PAHs levels ranging from 54 mg/kg to 67 mg/kg. The site soils exhibit free product and HMW-PAHs in the thousands of mg/kg, and no clean zone or decreasing HMW-PAH concentration gradient between the site and SS-111 and SS-112 has been established. In addition, review of the LiDAR images of the site indicate that SS-111 and SS-112 are at the same or lower gradient as the site indicating that runoff from the site could potentially impact these areas. As stated previously, background samples cannot be under the influence of the site.

Response 7: The letter states that since only two (2) sample points were presented for background, statistics were not appropriate. NJDEP 2015, **Section 5.4.3** recommends a minimum of 3-5 background samples, but advocates for more. Given the size of the site and the magnitude of the contaminant levels, more background samples are needed, and the background samples must be from areas outside of the sites influence.

Response 8: The letter states that the EE was not intended to delineate the contamination; however, N.J.A.C. 7:26E-4.8(c)1 requires full delineation of site contaminants. In addition, the presence of historic fill does not preclude the need to delineate site contaminants. N.J.A.C. 7:26E-4.7(c) states that the "person responsible for conducting the remediation shall conduct a remedial investigation of each area of concern located within or situated upon the historic fill material independently of the remedial investigation of the historic fill material itself." Finally, this document was submitted as an ARS request. Full delineation will be required.

Summary: The letter states that "some curious results related to selenium" were found; however, the proposed Se ARS was based on the second highest level observed at the site, which is not an acceptable method. An ARS must be developed in accordance with NJDEP 2015, **Sections 7.1-7.2.2**.

The summary also stated that the samples collected for background purposes were not under site influence; however, the concentration gradient from the site and the topography suggest otherwise.

If you have questions regarding this information, you may contact Allan Motter at (609) 984-4532.

Sincerely,

Kevin Schick
Bureau Chief, BEERA

c: Robert P. Blauvelt, GEI Consultants, Inc. (LSRP ID #575013)
Allan Motter, NJDEP, BEERA
Nancy Hamill, NJDEP, BEERA

References:

NJDEP, 2015. Ecological Evaluation Technical Guidance (Version 1.3).
http://www.nj.gov/dep/srp/guidance/srra/ecological_evaluation.pdf.

From:	Motter, Allan
To:	Blauvelt, Robert; Hamill, Nancy
Cc:	Stynchula, Jamey; Bjorkman, Bjorn; Steven Pernick; ecomings@firstenergycorp.com; SLCOOK@southernco.com; Snyder, Erica
Subject:	RE: Flemington MGP - January 5 meeting minutes (draft) PI 001038
Date:	Tuesday, January 17, 2017 2:04:14 PM

Bob, thank you for the meeting minutes. NJDEP revisions are in red embedded into your original email. In addition, based on observations of the background location and wetland conditions on the site, we recommend the NOAEL-based PRG of approximately 23 mg/kg total PAH (or lower, if warranted by GEI recalculations). It is NJDEP's opinion that because background locations appear to have possibly been impacted by site materials (coal and slag in fill material), background data should not be relied upon for remedial decisions. Moreover, given the disturbed nature of the existing habitat, habitat preservation is not a priority in this area and the benefit of additional excavation would outweigh habitat disruption (i.e., concern for tree removal is minimized; appropriate restoration of trees will be adequate). NJDEP also believes that since Bushkill Creek will be remediated, removal of upgradient source levels of PAHs is needed to minimize recontamination. Please let me know if you have any questions or need any additional information. Thank you.

Allan S. Motter
Technical Coordinator
Bureau of Environmental Evaluation and Risk Assessment
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From: Blauvelt, Robert [mailto:rblauvelt@geiconsultants.com]
Sent: Thursday, January 12, 2017 7:36 AM
To: Motter, Allan <Allan.Motter@dep.nj.gov>; Hamill, Nancy <Nancy.Hamill@dep.nj.gov>
Cc: Stynchula, Jamey <jstynchula@geiconsultants.com>; Bjorkman, Bjorn <bbjorkman@geiconsultants.com>; Steven Pernick <Steven.Pernick@obg.com>; ecomings@firstenergycorp.com; SLCOOK@southernco.com
Subject: Flemington MGP - January 5 meeting minutes (draft) PI 001038

Nancy & Allan

Here is a draft of the meeting minutes. Please review and let me know if you have any comments or revisions. I then will revise, attach the attendees list, and send out a final version to the entire team. Give a call if you have any questions.

Bob Blauvelt
973-873-7127

RE: Meeting Minutes
TOPIC: Site Visit and Eco-Risk Assessment Discussion
MEETING DATE: January 5, 2017
LOCATION: Former Flemington Manufactured Gas Plant (MGP) Site

DISCUSSION ITEMS

1. The meeting started with introductions and descriptions of individual project activities/responsibilities for meeting attendees (see attached list)

2. The Licensed Site Remediation Professional (~~LSO.RP~~LSRP) gave a summary of the meeting agenda (overview of site conditions, GEI clarification of eco-risk assessment report methodologies, Preliminary Remedial Goals (PRGs) for upland, wetland soil, and a site tour). New Jersey Department of Environmental Protection (DEP) stated they would not be able to make a decision or offer final guidance on RGs at this meeting.

3. A synopsis of site conditions was provided by GEI that included a review of Historic Fill conditions and regional drainage patterns as significant contributors to background. Planned and ongoing remedial actions (excavation) within and adjacent to the wetlands and stream also were described.

4. GEI led a discussion of its revised eco-risk assessment within the context of the 12/14/16 draft DEP comment letter. This discussion clarified the following:

    a. Bjorn (GEI risk assessor) explained the revisions to eco risk procedures and proposed PRGs presented in GEI's 11/29/16 letter to DEP. He made clear that the revised PRGs (as described in the 11/29/16 letter) were consistent with the procedures and approach outlined in DEP's Ecological Evaluation Technical Guidance (EETG), which GEI acknowledged may not have been sufficiently clear. The confusion arose from the way GEI described the calculation. GEI indicated it would provide further clarity in an Ecological Risk Assessment (ERA) Addendum and DEP agreed that they would review it;

    b. GEI further confirmed the source of toxicity data, accepting the use of the Culp et al., toxicity values for high molecular weight polycyclic aromatic hydrocarbons (HMW PAHs) from the ecological soil screening levels (EcoSSL)

development documents. GEI developed a PRG based on a No Observable Adverse Effects Level (NOAEL) of 23.5 mg/kg and on a Lowest Observable Adverse Effects Level (LOAEL) of 117 mg/kg and discussed the appropriateness of one over the other. DEP suggested looking into the use of the geometric mean of NOAEL and LOAEL, i.e., the maximum acceptable toxicant concentration (MATC). This value was calculated to be 52.5 mg/kg.

c. GEI presented some calculations of residual risk considering the removal of selected "hot spots", explaining that the residual risk is based on the 95% upper confidence level (UCL) of the mean of the remaining unexcavated area. DEP suggested recalculating the residual risk using replacement values appropriate for the proposed clean backfill for the entire area. GEI agreed to do this.

d. The source and rationale for the proposed "background" values was discussed and reviewed on maps (and later during the site walk). NJDEP questioned the source of the historic fill given the presence of coal and slag in the fill material and given the site is a former MGP facility.

e. GEI and DEP held a discussion of receptors and why the shrew was selected.

5. During the discussion, DEP advised that:

a. Background levels for PAHs calculated for the Flemington ERA were considered very high (104 mg/kg) by the DEP. Based on the state-wide study that is underway and soon will be published, background concentrations are expected in the 1 – 10 mg/kg range, which is considerably lower than the calculated values from off-site, upgradient soil data;

b. The Department stated it "has never approved a PRG for PAHs above 10 ppm"; a discussion ensued on the basis for such a value, examples of where this would have been applied, and the potential uniqueness of the site and its surrounding impacts. This issue was not fully clarified, and GEI requested information on some examples.

c. DEP reiterated that it is responsible for approval of Alternative Remediation Standards/ecological risk-based remediation goals; however, the LSRP is responsible for submitting viable candidate PRGs~~for risk management decisions, not the person responsible for conducting the remediation (PRCR)~~. Any decision to adjust~~not accept~~ the calculated risked-based or background based PRGs and approve a more or less conservative value, will be dependent on the technical analysis and other factors via a risk management decision;

d. While recontamination of upland, and wetland soil may occur because of drainage or Historic Fill upgradient of the Site, it will not approach recontamination levels similar to the concentrations seen in the background Historic Fill; and

e. DEP advised they expected to see revisions to the ERA in the form of an addendum, and not as a revision of~~to~~ the original ERA.

6. A site tour then was held, after the required safety briefing. The tour included a walk-through of the former Agway property to look at upgradient ("Background") sampling locations, view of a stream cuts showing the presence of Historic Fill (tires, asphalt, concrete); and a walk over of former MGP process areas (i.e., gas holder area). After the tour, a short de-briefing meeting was held.

7. Action Items

a. GEI will recalculate the residual ecological risk based on "replacement" of removed soil with clean fill.

b. GEI will prepare a brief summary of the calculation steps for the PRG to clarify how the values were achieved in accordance with the EETG.

c. Following these action items, informal clarification about any questions related to these items might be requested by DEP prior to submittal of formal correspondence.

d. The full revision to PRGs will take the form of an Addendum.

e. DEP will issue final approval of a PRG for HMW PAHs in a letter issued by the Department to support the Response Action Outcome (RAO).

-

The meeting was adjourned at approximately 3:15 PM.

Bob Blauvelt
Senior Consultant
GEI Consultants
Consulting Engineers & Scientists
GEI Consultants, Inc.
300 Broadacres Drive, Suite 100 | Bloomfield, NJ 07003
T: 973.873.7127 | **M:** 973.803.0167 | **F:** 973.509.9625
www.geiconsultants.com | vCard | map | LinkedIn | Twitter | Facebook

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RE: Meeting Minutes
TOPIC: Site Visit and Eco-Risk Assessment Discussion
MEETING DATE: January 5, 2017
LOCATION: Former Flemington Manufactured Gas Plant (MGP) Site

DISCUSSION ITEMS

1. The meeting started with introductions and descriptions of individual project activities/responsibilities for meeting attendees (see attached list).

2. The Licensed Site Remediation Professional (LSRP) gave a summary of the meeting agenda (overview of site conditions, GEI clarification of eco-risk assessment report methodologies, Preliminary Remedial Goals (PRGs) for upland, wetland soil, and a site tour). New Jersey Department of Environmental Protection (DEP) stated they would not be able to make a decision or offer final guidance on RGs at this meeting.

3. A synopsis of site conditions was provided by GEI that included a review of Historic Fill conditions and regional drainage patterns as significant contributors to background. Planned and ongoing remedial actions (excavation) within and adjacent to the wetlands and stream also were described.

4. GEI led a discussion of its revised eco-risk assessment within the context of the 12/14/16 draft DEP comment letter. This discussion clarified the following:

    a. Bjorn (GEI risk assessor) explained the revisions to eco risk procedures and proposed PRGs presented in GEI's 11/29/16 letter to DEP. He made clear that the revised PRGs (as described in the 11/29/16 letter) were consistent with the procedures and approach outlined in DEP's Ecological Evaluation Technical Guidance (EETG), which GEI acknowledged may not have been sufficiently clear. The confusion arose from the way GEI described the calculation. GEI indicated it would provide further clarity in an Ecological Risk Assessment (ERA) Addendum and DEP agreed that they would review it;

    b. GEI further confirmed the source of toxicity data, accepting the use of the Culp et al., toxicity values for high molecular weight polycyclic aromatic hydrocarbons (HMW PAHs) from the ecological soil screening levels (EcoSSL) development documents. GEI developed a PRG based on a No Observable Adverse Effects Level (NOAEL) of 23.5 mg/kg and on a Lowest Observable Adverse Effects Level (LOAEL) of 117 mg/kg and discussed the appropriateness of one over the other. DEP suggested looking into the use of the geometric mean of NOAEL and LOAEL, i.e., the maximum acceptable toxicant concentration (MATC). This value was calculated to be 52.5 mg/kg.

    c. GEI presented some calculations of residual risk considering the removal of selected "hot spots", explaining that the residual risk is based on the 95% upper confidence level (UCL) of the mean of the remaining unexcavated area. DEP suggested recalculating the residual risk using replacement values appropriate for the proposed clean backfill for the entire area. GEI agreed to do this.

d. The source and rationale for the proposed "background" values was discussed and reviewed on maps (and later during the site walk). NJDEP questioned the source of the historic fill given the presence of coal and slag in the fill material and given the site is a former MGP facility. The LSRP does not concur with NJDEP's concerns about the source of the historic fill based on multiple lines of evidence including aerial photographs from 1940 through 1991 and the composition of the historic fill material. See Section 5.1.5 of the May 9, 2016 RAW for supporting information. This documentation will be forwarded in a separate email.

e. GEI and DEP held a discussion of receptors and why the shrew was selected.

5. During the discussion, DEP advised that:

   a. Background levels for PAHs calculated for the Flemington ERA were considered very high (104 mg/kg) by the DEP. Based on the state-wide study that is underway and soon will be published, background concentrations are expected in the 1 – 10 mg/kg range, which is considerably lower than the calculated values from off-site, upgradient soil data;

   b. The Department stated it "has never approved a PRG for PAHs above 10 ppm"; a discussion ensued on the basis for such a value, examples of where this would have been applied, and the potential uniqueness of the site and its surrounding impacts. This issue was not fully clarified, and GEI requested information on some examples.

   c. DEP reiterated that it is responsible for approval of Alternative Remediation Standards/ecological risk-based remediation goals; however, the LSRP is responsible for submitting viable candidate PRGs. Any decision to adjust the calculated risked-based or background based PRGs and approve a more or less conservative value, will be dependent on the technical analysis and other factors via a risk management decision;

   d. While recontamination of upland and wetland soil may occur because of drainage or Historic Fill upgradient of the Site, it will not approach recontamination levels similar to the concentrations seen in the background Historic Fill; and

   e. DEP advised they expected to see revisions to the ERA in the form of an addendum, and not as a revision of the original ERA.

6. A site tour then was held, after the required safety briefing. The tour included a walk-through of the former Agway property to look at upgradient ("Background") sampling locations, view of a stream cuts showing the presence of Historic Fill (tires, asphalt, concrete); and a walk over of former MGP process areas (i.e., gas holder area). After the tour, a short de-briefing meeting was held.

7. Action Items

   a. GEI will recalculate the residual ecological risk based on "replacement" of removed soil with clean fill.

b. GEI will prepare a brief summary of the calculation steps for the PRG to clarify how the values were achieved in accordance with the EETG.

c. Following these action items, informal clarification about any questions related to these items might be requested by DEP prior to submittal of formal correspondence.

d. The full revision to PRGs will take the form of an Addendum.

e. DEP will issue final approval of a PRG for HMW PAHs in a letter issued by the Department to support the Response Action Outcome (RAO).

The meeting was adjourned at approximately 3:15 PM.

Potanovich, Susan L.

From: Nick DeRose <nderose@Langan.com>
Sent: Friday, June 09, 2017 4:36 PM
To: Lawson, Frank D; Cook, Steven L.; Rusu, Jennifer; Pernick, Steven
Cc: Candace Baker; Karianne Czajkowski
Subject: FW: Newton I Former MGP Site: Ecological Component Review
Attachments: Newton MGP Site ERA May 2017.docx

Follow Up Flag: Follow up
Flag Status: Flagged

Good afternoon –
Pelisse see below and attached.
We will review these and advise on our upcoming call.
Thank you
Nick

Nicholas De Rose
Managing Principal

Direct: 215.491.6510 (PA)/949-255-8649 (CA)
Mobile: 215.534.8217
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From: Hamill, Nancy [mailto:Nancy.Hamill@dep.nj.gov]
Sent: Friday, June 09, 2017 4:10 PM
To: Nick DeRose
Cc: Frasco, Barry; Schick, Kevin; Turner, Matthew; Hahn, Gerald
Subject: Newton I Former MGP Site: Ecological Component Review

Hello Nick,

Attached please find the Ecological Component Review for the Newton I Former MGP Site, *Off-Site Wetland Complex Ecological Risk Assessment Report, May 24, 2017.* I believe each comment was generally discussed at the 5/31/17 Technical Consultation, with more detail provided herein following my full review. In case you are not aware, in order to streamline the Component Review process, comments are now being sent to LSRPs directly from technical support staff and will not be issued by the Bureau of Inspection and Review (BIR). BIR managers will be copied. Responses to comments for this project can be directed to me.

Please contact me if you have any questions.

Nancy E. Hamill
Research Scientist
Bureau of Environmental Evaluation and Risk Assessment
Mailcode: 401-04M
P.O. Box 420
Trenton, NJ 08625
Phone: 609-633-1353
Fax: 609-292-0848

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ECOLOGICAL COMPONENT REVIEW MEMORANDUM

TO: Nicholas De Rose, Licensed Site Remediation Professional
Langan Environmental Engineering and Environmental Services, Inc.

FROM: Nancy Hamill, Research Scientist
Bureau of Environmental Evaluation and Risk Assessment

SUBJECT: Newton I Former MGP Site, Newton Township, Sussex County, NJ: Ecological Component Review of *Off-Site Wetlands Complex Ecological Risk Assessment Report*, May 24, 2017

PI# 001041
Referral Date: May 31, 2017
Completion Date: June 8, 2017
PAC: 31870020/V6RC

The referenced document was prepared by Langan Engineering and Environmental Services, Inc., Parsippany, NJ, for JCP&L, Morristown NJ and Pivotal Utility Holdings, Union, NJ. I have reviewed the document in accordance with N.J.A.C. 7:26E-1.16 and 4.8, and the *Ecological Evaluation Technical Guidance* (EETG, February 2015), and offer the following comments for your consideration. The comments additionally reflect discussions during the May 31, 2017 Technical Consultation.

Comments

1. General comment – please provide a discrete table for background data that presents PAH, antimony, and lead concentrations for each of the nine (9) background samples identified in section 5.2.2 (p. 11). PAHs should be presented as individual constituents, Low Molecular Weight (LMW), High Molecular Weight (HMW), and total PAHs. It appears from examination of the Table 3 series and Table 4 that maximum background concentrations are used for comparison with study area data. It is also apparent that the background location with maximum PAH concentrations (SED-42, unnamed tributary background location) is elevated well-above the other eight (8) background locations, with total PAHs (estimated by this reviewer) of @ 135 mg/kg (30 times the sediment screening criterion (LEL) of 4 mg/kg). Therefore, it is my opinion that use of maximum background from this location is not representative of background conditions, nor is the use of maximum background advocated in the EETG. If SED-42 could potentially receive site contamination, e.g., during high flow events since it is the vicinity of "approximate surface water flow" (Figures 8 and 9), it should be removed from the background data set. This reviewer notes that background locations upgradient from SED-42, i.e., SED-48, 50, 51, and 52 are labeled "no exceedences." It is recommended that the Ecological Risk Assessment (ERA) text and tables compare study area data to average background concentrations, not maximum. For example, text (p. 24) discusses "background HQs" and

certain contaminants being "below background concentrations," but it is not clear if maximum background concentrations are the benchmarks.

(NOTE: NJDEP was advised at the Technical Consultation to consult the May 2016 RIR for a background data table. This reviewer found that Table 10 in the RIR has soil data for one sample, S-41, and Table 4a in the May 2016 Ecological RIR has background data for two samples, TB-28 and TB-53, none of which are listed as background locations in this ERA report – please explain whether these locations are considered background for the ERA.)

2. Table 4 - The substitution of maximum background under the LEL column heading is confusing, as are "HQ $_{LELs}$" that are actually HQs relative to maximum background. As per comment 1, use of average background concentrations for metrics in this and other tables and text is recommended. Also, please verify that the total maximum and total average detected LMW and HMW PAH concentration in Table 4 and Appendix D tables are accurate and reflect all constituents (e.g., for Table 4 indicates 674 mg/kg maximum total LMW PAHs vs 1003 mg/kg, summed by this reviewer). As discussed at the Technical Consultation, please verify that 2-methylnaphthalene was not excluded from the LMW PAH sum.

3. Tables D-1, D-2, D-4 – Regarding the American Bittern's dietary composition, 50% benthic macroinvertebrates and 50% wetland soil invertebrates is recommended (rather than using "0 mg/kg" PAHs with a 50% small mammal diet). In consideration of its status as State endangered (breeding population), conservative toxicity reference values (TRVs) are recommended. Avian TRVs from USEPA 2014 are recommended:

TRV, mg COPEC/kg BW-day	ERA NOAEL Table D-4	Recommended NOAEL	ERA LOAEL Table D-4	Recommended LOAEL
LMW PAHs	1653	0.67	16,530	6.7
HMW PAHs	2.0	0.048	20	0.48

It is also recommended that risk be characterized for a terrestrial avian invertivore using 100% wetland soil invertebrates as the dietary composition.

4. Table D-3 - Regarding the Short-tailed Shrew's dietary composition, as a terrestrial invertivore, Shrew diet should be 100% wetland invertebrates (as opposed to 50% benthic macroinvertebrates, 50% wetland soil invertebrates).

5. A discussed during the Technical Consultation, sample location figures that depict surface and subsurface data only as hazard quotients (HQs) above maximum background/SELs have increased review time and caused misunderstandings regarding actual concentrations. NJDEP recommended that the figures be revised to show actual surface and subsurface contaminant concentrations; HQs relative to LELs and or average background concentrations can be included.

It would facilitate future reviews to present PAH data as individual constituents, LMW, HMW, and total PAHs. As agreed to at the Technical Consultation, if the LSRP decides figure edits are not feasible at this time, updated isoconcentration maps will be submitted.

Please contact me at 609-633-1353 if there are any questions.

References

USEPA 2014. *Focused Feasibility Study Report for the Lower Eight Miles of the Lower Passaic River, (2014)* – Table 4-14 , available at (http://passaic.sharepointspace.com/Public%20Documents/2014-02-20%20Appendix%20D%20Risk%20Assessment.pdf).

Cc
Barry Frasco, Ph.D.
Kevin Schick
Mathew Turner
Gerald Hahn

Potanovich, Susan L.

From: Nick DeRose <nderose@Langan.com>
Sent: Thursday, June 29, 2017 5:13 PM
To: Frasco, Barry
Cc: Schick, Kevin; Hamill, Nancy; Lawson, Frank D; Cook, Steven L.; Karianne Czajkowski
Subject: RE: Newton Meeting
Attachments: 5-31-17mtgFinal.docx

Hello Barry –

I have attached my notes from our meeting on May 31. Please consider these draft for the Department's review and input. They do not take into account the comments that were sent from Nancy Hamill following our meeting. We are working on revisions to the ERA taking into account dialog from our meeting and the recent provided comments. We expect to submit the final ERA both electronically and in hard copy to Nancy We will also address the comments in a separate letter. We expect to provide these documents by the end of July.

Please let me know if you have any comments on the attached.

Thank you,
Nick

Nicholas De Rose
Managing Principal

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From: Frasco, Barry [mailto:Barry.Frasco@dep.nj.gov]
Sent: Monday, May 15, 2017 11:24 AM
To: Nick DeRose
Cc: Schick, Kevin; Hamill, Nancy
Subject: RE: Newton Meeting

Hi Nick-

Sorry for the delay in responding to you.

I don't have a problem meeting with you and your staff to discuss your concerns, however, I believe such a meeting would be more productive if the new information/material that you have be sent to the Department prior to the meeting in order to give us time to review such information. It would be preferable if you could submit your ERA prior

to the meeting so that my staff can get a full understanding of your position concerning background PAH levels. Once we have had an opportunity to review this information we could then have a meeting to discuss the issue. I don't know if this can be accomplished by May 31st.

Please contact me if you have any questions.

Barry

From: Nick DeRose [mailto:nderose@Langan.com]
Sent: Wednesday, May 10, 2017 3:45 PM
To: Frasco, Barry <Barry.Frasco@dep.nj.gov>
Subject: Newton Meeting

Good afternoon Barry,

Can you let me know if Weds May 31 at 10AM would work to meet for this project. There are two clients involved and I have a couple of folks from Langan, in addition to myself that I would like to attend. This is the first date/time that we all have availability. I assume that you and Nancy Hamill would attend. Kevin Schick was involved with the first technical consultation, as well.

Thank you and thank you for your participation and input on today's call.

Nick

Nicholas De Rose
Managing Principal
Direct: 215.491.6510
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Memorandum

To: Barry Frasco, Kevin Schick, Nancy Hamill - NJDEP

From: Nick DeRose, LSRP - Langan

Info.: Frank Lawson, Jenn Rusu – JCP&L
Steve Cook, Steve Pernick – Elizabethtown Gas
KariAnne Czajkowski, Candace Baker, Bob Bond - Langan

Date: June 1, 2017

Re: Former Newton 1 MGP Site – NJDEP Meeting, May 31, 2017

DRAFT

SUMMARY

On Wednesday, May 31; NJDEP hosted a technical consultation, as requested by JCP&L and Elizabethtown Gas to discuss the Ecological Risk Assessment (ERA) and related topics for the Former Newton 1 MGP Site. The technical consultation was requested to allow Langan to present additional information regarding observed total polyaromatic hydrocarbons (PAH) concentrations and observed petroleum sheen as a follow-up to an earlier technical consultation and follow up discussions with the Department.
A copy of the attendee list is attached to this memo. The meeting agenda was as follows:

PAH BACKGROUND EVALUATION

- Multiple Lines of Evidence
  - Background sample locations / results / transects
  - Supporting forensics
- Relationship to Observed Sheen

APPLICATION OF SOIL REMEDIATION STANDARDS/ INACCESSIBILITY

Ecological Risk Assessment (ERA) SUMMARY

PAH BACKGROUND/ PETROLEUM SHEEN

Langan reviewed background sampling results that were obtained during the Remedial Investigation and included nine (9) sampling locations including six (6) generally located upstream of wetlands adjacent to the site and three (3) from upstream manholes. These included three (3) locations south of Sparta Road including location SED-50 with levels of total PAHs of 90.3 PPM. Langan also presented aerial photos illustrating potential sources of PAHs to the wetlands unrelated to the MGP site, including stormwater runoff from nearby parking lots, roadways and industrial facilities. Stormwater outfall locations were also shown on the photos. In addition, the locations of current and previous industrial facilities were noted in the areas near the wetlands.

Bob Bond of Langan presented handouts including a series of PAH Diagnostic Double Ratio Plots to distinguish between PAH results indicative of pyrogenic (which would include MGP residues) and those more typical of petroleum sources. These plots indicate the each of four sediment samples collected within the onsite drainage ditch, are consistently representative of pyrogenic source material. Plots for off-site sediment samples, including samples with the highest reported total PAH concentrations from within the offsite wetlands area and background locations, with only one exception, represented results that were not indicative of a pyrogenic source. These samples were representative of a mixture of petroleum and combustion sources typically including waste oils, which have been exposed to high engine heat, auto emissions from combusted and partially combusted gasoline and diesel fuels, and fuel oil mixed with petroleum combustion products. Bob also noted that several samples with the highest total PAH concentrations from the off-site wetland plotted with similar results compared to samples from background locations. While not conclusive, these plots suggest that PAH impacts in the wetlands are predominantly impacted by other non-MGP-related sources. .

Nick DeRose summarized the re-sampling that was done at the Department's request to further characterize reported petroleum odors and sheen observed at the following

sediment sampling locations: SED-46, T11–SED-3, and; T12–SED-3. The sample collected from SED-46 at 2.0 to 2.5 feet below grade was brought to the meeting as it represented observed worst case conditions observed during this sampling event. The sample exhibits a slight sheen without the occurrence of separate phase product. All agreed that the sample had a "strong oil smell" with an odor indicative of fuel or diesel oil, not MGP coal tar. Nancy Hamill asked how this material compares to what is observed onsite. Frank Lawson (JCP&L) explained that is very different from coal tar that has been observed onsite.

Kevin Schick expressed concern that from his experience, it is highly unusual not to find off-site impacts at MGP sites. Also, he and Nancy Hamill expressed concern about the representativeness of the background sampling that was conducted based on the Department's ongoing study of background PAH concentrations in urban sediments. Frank Lawson, explained that offsite impacts are present adjacent to areas near the former gas holders. Nick DeRose, Frank Lawson and Steve Cook also pointed out that the history of the area surrounding this wetlands area has included numerous industries and decades of stormwater discharges to the wetlands. This has included runoff from the Town of Newton which included several industries that operated in the past. Frank also stated that the onsite ditch did contain MGP materials and would be remediated.

APPLICATION OF SOIL REMEDIATION STANDARDS/ INACCESSIBILITY

Nick DeRose summarized the location within the offsite wetlands of PAH exceedances of Direct Contact Soil Remediation Standards (DCSRS). These exceedances occur along a relatively narrow band parallel to and overlapping the channel of the unnamed tributary in the off-site wetlands. Based on field reconnaissance, these impacts all occur in saturated sediments within or adjacent to the stream channel that are unlikely to present a potential for human exposure. This conclusion is based on the occurrence of standing water and, or soft sediments combined with dense vegetation. In addition, Nick explained that Langan had reviewed the feasibility of future development in the impacted wetlands area and concluded that future development would be extremely unlikely given the natural resource permitting and wetlands mitigation requirements as well as engineering challenges. Based

on current NJDEP regulations, Nick explained that he has therefore concluded that the DCSRS do not apply to the off-site sediment impacts. Barry Frasco agreed with the LSRP's interpretation of the NJDEP regulations regarding application of the DCSRS.

ERA SUMMARY

Nancy Hamill summarized the Department's concerns, noting that the off-site wetlands are a Rank 4 (State Endangered) wetland according to the letter from the National Heritage Program (NHP) dated September 6, 2012 that has reported several threatened and endangered species in the area. Breeding and foraging sites are reported to potentially be located at the site for the American bittern, great blue heron, the red-shoulder hawk, veery and bobcat. Additionally, vernal pools were noted as potentially areas at the site. Kari informed Nancy that the receptors selected for the dietary models were determined based on the NHP response. Additionally, Kari informed Nancy that Figure 4 illustrated those receptors and habitats mapped within the wetland. Nancy acknowledged these details and further stated that the approach to the ERA should be conservative and efforts made to ensure protection of this resource. In particular, Nancy suggested that the ERA should consider evaluating risk based on the individual level. Mrs. Hamill also provided several comments based on her initial review of the informally submitted ERA. Karianne Czajkowski reviewed these comments with Mrs. Hamill and it was agreed that they would be considered for incorporation into the ERA and the revised ERA would then be submitted both directly to Mrs. Hamill and through the electronic portal for entry into the Department's tracking system. Upon completion of the ERA and the review by the Department, discussions would be necessary to determine how to assess responsibility given the question of which sources are contributing to the off-site wetlands.

There was also discussion regarding concerns expressed by Mrs. Hamill regarding the occurrence of higher PAH concentrations at depths greater than 6 inches including at location SED-46. The concern is that erosion could expose these deeper sediments to benthic species. Langan clarified that the wetlands area of concern is a low flow depositional environment. This is supported by the deposits of fine sand, silt and clay that

were found in the areas adjacent to the tributary channel. The only observed areas of identified higher flow and coarser grained deposits are located closer to the site and not in the areas where higher PAH concentrations were found in sediment.

Ms. Hamill also requested that Langan prepare PAH results maps that include concentrations for individual PAH compounds, as well as total PAHs, at each sampling location for all depths. Langan, JCP&L and Elizabethtown Gas agreed to consider providing additional plans and will review options.

ADDITIONAL ITEMS

JCP&L and Elizabethtown Gas also clarified that impacted sediments within the on-site drainage ditch exceeding severe effect levels (SEL) would be removed for proper off-site disposal.

Submission of the revised ERA will need to be arranged through NJDEP. It was suggested to make these arrangements through Mr. Rafael Rivera or Ms. Myrna Campion of NJDEP, Bureau of Case Assignment/Initial Notice to identify the proper process for submission.

Kevin Schick provided a copy of the Report of Incident form that documents Langan calling in impacts that were found in the off-site wetlands unrelated to the MGP site. Kevin noted that 'silver acetate' was identified as one of the hazardous substances on the incident form. (Note: Nick DeRose followed up with Langan's Senior Project Manager, Ms. Candace Baker who called in the release and she confirmed that she had reported the release as silver, not silver acetate. Kevin also noted that it was unclear as to what was meant by 'Verified Unknown Off Site Source' and he questioned if a known source was identified. Nick DeRose stated that there were a number of identified potential sources for observed PAH and selenium impacts to the wetlands including several industrial facilities, former nearby sewer plant operations (mentioned by Steve Cook) and storm water runoff. Barry Frasco clarified

that the LSRP only has to present the rationale supporting that impacts are contributed from an offsite source, but does not have to identify the actual source.

FOLLOW UP

Based on the discussions from the meeting, the following next steps were identified:

- Langan will prepare revisions to the ERA and submit copies both directly to Nancy Hamill and to NJDEP through the electronic portal. Langan will confirm details in the submittal process. Langan will present conclusions and recommendations within the ERA. (Note: Langan received comments from Ms. Nancy Hamill of NJDEP on June 9, 2017. These comments will be addressed including in the revised ERA.)

- NJDEP will complete its review of the ERA on an expedited basis and upon completion share its comments with Langan.

- Future discussions may be requested based on the results of the final ERA.

MFR-4 **For each of the same three MGP sites, provide expense documentation for any contractor or supplier whose invoices for the RAC period exceed $250,000 in aggregate. The expense documentation should include descriptions of services rendered, applicable invoices, and any tracking of invoiced charges vs. budgets. The expense detail need not include expense reports or time sheets, but it should include supporting documentation for any subcontractor and third party expenses totaling $100,000 or more for the period.**

Please see attachment MFR-1.1 for the list of vendor costs by site. Attachment MFR-4.1 contains a detailed list of invoices for three contractors or suppliers (Charter Contracting Company, GEI Consultants, and Langan Engineering) that met the $250,000 criteria detailed above.

Please note no subcontractor tables are provided for JCP&L at the Flemington site or Henkels & McCoy at the Erie Street site although they meet the $250,000 criteria detailed above. No table is provided for the Flemington site as the Company pays a 40% share of what is billed to JCP&L directly to JCP&L in accordance with the remediation cost sharing agreement for the Flemington site. No table is provided for Henkels & McCoy as they are contracted directly through the Company's operations and not as part of the Company's remediation contracting although they did provide remediation-related services for the Company at the Erie Street site. Vendor information is included in the backup to confidential invoices for both JCP&L and Henkels & McCoy provided as part of this MFR.

Summaries for the subcontractors employed by Charter, GEI and Langan used to determine which subcontractors met the $100,000 threshold described above are attached. Attachment MFR-4.2 provides the summary for Charter Contracting Company, attachment MFR-4.3 is the summary for GEI Consultants, and

Attachment MFR-4.4 is the summary for Langan Engineering. Charter Contracting Company had subcontractors exceeding the $100,000 threshold based on timing of payment to subcontractors.

The Company considers the requested invoices confidential and proprietary. Such information is competitively sensitive in that it would provide potential vendors with information that is normally not made available in negotiations. The requested information will be provided to parties executing an appropriate confidentiality agreement.

Vendors With Invoices Exceeding $250,000
July 2016 - June 2017
Charter - Erie St

Site Name	Vendor	GL Status	Invoice No.	RAC Total	Account Date Approved	Acct	DeptID
Erie St	Charter Contracting Company Llc	Posted	1	467,324.00	Feb-17	166063	0452
Erie St	Charter Contracting Company Llc	Posted	2	1,055,355.00	Feb-17	166063	0452
Erie St	Charter Contracting Company Llc	Posted	3	1,371,163.60	Feb-17	166063	0452
Erie St	Charter Contracting Company Llc	Posted	4	1,214,230.14	Apr-17	166063	0452
Erie St	Charter Contracting Company Llc	Posted	5	2,191,772.20	Apr-17	166063	0452
Erie St	Charter Contracting Company Llc	Posted	6	2,559,771.41	May-17	166063	0452
Erie St	Charter Contracting Company Llc	Posted	7	2,461,787.80	Jun-17	166063	0452
			Total $	**11,321,404.15**			

Site Name	Vendor	GL Status	Invoice No.	RAC Total	Account Date Approved	Acct	DeptID
Erie St	GEI Consultants, Inc	Posted	3005041	2,900.28	Jul-16	166063	0452
Erie St	GEI Consultants, Inc	Posted	3005287	12,278.75	Jul-16	166063	0452
Erie St	GEI Consultants, Inc	Posted	3005288	78,216.53	Jul-16	166063	0452
Erie St	GEI Consultants, Inc	Posted	3006848	1,148.50	Aug-16	166063	0452
Erie St	GEI Consultants, Inc	Posted	3006850	7,695.00	Aug-16	166063	0452
Erie St	GEI Consultants, Inc	Posted	3008171	757.50	Sep-16	166063	0452
Erie St	GEI Consultants, Inc	Posted	3008173	3,725.61	Sep-16	166063	0452
Erie St	GEI Consultants, Inc	Posted	3009126	98.75	Sep-16	166063	0452
Erie St	GEI Consultants, Inc	Posted	3009128	4,260.60	Sep-16	166063	0452
Erie St	GEI Consultants, Inc	Posted	3010722	516.05	Nov-16	166063	0452
Erie St	GEI Consultants, Inc	Posted	3010724	2,188.34	Nov-16	166063	0452
Erie St	GEI Consultants, Inc	Posted	3012571	236.50	Nov-16	166063	0452
Erie St	GEI Consultants, Inc	Posted	3012573	13,516.47	Nov-16	166063	0452
Erie St	GEI Consultants, Inc	Posted	3006807	66,337.97	Dec-16	166063	0452
Erie St	GEI Consultants, Inc	Posted	3006841	14,625.00	Dec-16	166063	0452
Erie St	GEI Consultants, Inc	Posted	3007977	11,963.75	Dec-16	166063	0452
Erie St	GEI Consultants, Inc	Posted	3007980	112,408.80	Dec-16	166063	0452
Erie St	GEI Consultants, Inc	Posted	3009591	20,635.00	Dec-16	166063	0452
Erie St	GEI Consultants, Inc	Posted	3009600	74,715.93	Dec-16	166063	0452
Erie St	GEI Consultants, Inc	Posted	3010772	4,870.00	Dec-16	166063	0452
Erie St	GEI Consultants, Inc	Posted	3010774	61,416.94	Dec-16	166063	0452
Erie St	GEI Consultants, Inc	Posted	3011874	6,640.00	Dec-16	166063	0452
Erie St	GEI Consultants, Inc	Posted	3011930	49,188.94	Dec-16	166063	0452

Site Name	Vendor	GL Status	Invoice No.	RAC Total	Account Date Approved	Acct	DeptID
Erie St	GEI Consultants, Inc	Posted	3013365	6,597.50	Dec-16	166063	0452
Erie St	GEI Consultants, Inc	Posted	3013372	950.94	Dec-16	166063	0452
Erie St	GEI Consultants, Inc	Posted	3013374	1,958.25	Dec-16	166063	0452
Erie St	GEI Consultants, Inc	Posted	3013380	58,137.61	Dec-16	166063	0452
Erie St	Audit Journal reclass - GEI #10371	Posted		(340.00)	Dec-16	166063	0452
Erie St	GEI Consultants, Inc	Posted	3014863	6,278.08	Feb-17	166063	0452
Erie St	GEI Consultants, Inc	Posted	3014867	75,373.92	Feb-17	166063	0452
Erie St	GEI Consultants, Inc	Posted	3015430	880.31	Feb-17	166063	0452
Erie St	GEI Consultants, Inc	Posted	3016183	3,865.00	Feb-17	166063	0452
Erie St	GEI Consultants, Inc	Posted	3016442	118,124.02	Feb-17	166063	0452
Erie St	GEI Consultants, Inc	Posted	3016099	10,247.50	Mar-17	166063	0452
Erie St	GEI Consultants, Inc	Posted	3017146	7,585.00	Mar-17	166063	0452
Erie St	GEI Consultants, Inc	Posted	3016443	5,973.75	Apr-17	166063	0452
Erie St	GEI Consultants, Inc	Posted	3017150	61,951.11	Apr-17	166063	0452
Erie St	GEI Consultants, Inc	Posted	3017151	8,968.11	Apr-17	166063	0452
Erie St	GEI Consultants, Inc	Posted	3018959	7,108.25	Apr-17	166063	0452
Erie St	GEI Consultants, Inc	Posted	3018964	3,741.80	Apr-17	166063	0452
Erie St	GEI Consultants, Inc	Posted	3018966	89,023.54	Apr-17	166063	0452
Erie St	GEI Consultants, Inc	Posted	3019029	10,891.25	Apr-17	166063	0452
Erie St	GEI Consultants, Inc	Posted	3020346	4,183.46	Jun-17	166063	0452
Erie St	GEI Consultants, Inc	Posted	3020358	2,959.50	Jun-17	166063	0452
Erie St	GEI Consultants, Inc	Posted	3020360	75,395.10	Jun-17	166063	0452
Erie St	GEI Consultants, Inc	Posted	3020431	20,155.34	Jun-17	166063	0452

Vendors With Invoices Exceeding $250,000
July 2016 - June 2017
GEI - Erie St

Site Name	Vendor	GL Status	Invoice No.	RAC Total	Account Date Approved	Acct	DeptID
Erie St	GEI Consultants, Inc	Posted	3021588	3,666.36	Jun-17	166063	0452
Erie St	GEI Consultants, Inc	Posted	3021589	93,328.26	Jun-17	166063	0452
Erie St	GEI Consultants, Inc	Posted	3021634	2,205.00	Jun-17	166063	0452
Erie St	GEI Consultants, Inc	Posted	3021636	22,175.29	Jun-17	166063	0452
			Total $	**1,251,725.46**			

Vendors With Invoices Exceeding $250,000
July 2016 - June 2017
Langan - Perth Amboy

Site Name	Vendor	GL Status	Invoice No.	RAC Total	Account Date Approved	Acct	DeptID
Perth Amboy	Langan Engineering & Environmental	Posted	LAN0248093	48,936.65	Sep-16	166067	0455
Perth Amboy	Langan Engineering & Environmental	Posted	LAN0249556	25,249.25	Sep-16	166067	0455
Perth Amboy	Langan Engineering & Environmental	Posted	LAN0251889	17,520.61	Nov-16	166067	0455
Perth Amboy	Langan Engineering & Environmental	Posted	LAN0253336	15,767.22	Dec-16	166067	0455
Perth Amboy	Langan Engineering & Environmental	Posted	LAN0255062	21,306.23	Dec-16	166067	0455
Perth Amboy	Langan Engineering & Environmental	Posted	LAN0256526	9,301.50	Feb-17	166067	0455
Perth Amboy	Langan Engineering & Environmental	Posted	LAN0257595	50,695.25	Mar-17	166067	0455
Perth Amboy	Langan Engineering & Environmental	Posted	LAN0258535	13,492.25	Apr-17	166067	0455
Perth Amboy	Langan Engineering & Environmental	Posted	LAN0260003	25,008.47	May-17	166067	0455
Perth Amboy	Langan Engineering & Environmental	Posted	LAN0261188	126,912.48	Jun-17	166067	0455
			Total $	**354,189.91**			

XXX MGP Site, Elizabeth NJ
Subcontractor and Vendor Expenses July 1, 2016 through June 30, 2017

Subcontractor or Vendor Name	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Grand Total	Work Description
Geo-Solutions Inc.								$ 515,250.00	$ 1,082,124.00	$ 1,297,375.00	$ 1,129,945.00	$ 1,055,814.00	**$ 5,080,508.00**	**In-Situ Stabilization**
KPS								$ 3,039.00	$ 3,643.00	$ 3,962.00	$ 3,984.00	$ 4,761.00	**$ 19,389.00**	Security
Neuber Environmental												$ 32,298.00	**$ 32,298.00**	Abatement & Demolition
AFX Fencing					$ 14,547.00	$ 23,172.00				$ 18,447.00	$ 6,443.00		**$ 62,609.00**	Fencing
United Construction						$ 22,261.00	$ 33,116.00						**$ 55,377.00**	Soft Dig
Pantaleo Electric						$ 40,610.00	$ 60,935.00	$ 18,475.00	$ 7,071.00				**$ 127,091.00**	Electric
HazTek					$ 5,810.00	$ 11,637.00	$ 11,795.00	$ 14,062.00	$ 16,420.00	$ 11,795.00	$ 14,718.00	$ 10,290.00	**$ 96,527.00**	Site Safety
Ameridrill									$ 4,500.00	$ 5,560.00	$ 11,730.00		**$ 21,790.00**	Drilling
Grand Total													**$ 5,495,589.00**	

CODES: E=EQUIPMENT;L=LABORATORY;UL=UTILITY CLEARANCE;D=DRILLING;Do=DOCUMENT REPRO

GEI Consultants **MFR-4.3**

Erie St MGP Site, Elizabeth NJ

Subcontractor and Vendor Expenses July 1, 2016 through June 30, 2017

Subcontractor or Vendor Name	16-Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	17-Jan	Feb.	Mar.	Apr.	May	June	Grand Total	CODE
ARC (EDDYSTONE)					129								**129**	
CH2M, INC							44,424						**44,424**	
EDR				145									**145**	
FIELD ENVIRONMENTAL INSTRUMENTS INC	3,054												**3,054**	
INTEGRATED ANALYTICAL LABORATORIES					3,998		2,231	1,247				4,540	**12,016**	
PINE ENVIRONMENTAL SERVICES, INC.				2,528	1,395	157						36	**4,116**	
PULS INC					950								**950**	
SUMMIT DRILLING CO., INC				4,372			7,495	-					**11,867**	
TESTAMERICA LABORATORIES, INC												13,686	**13,686**	
TTI ENVIRONMENTAL INCORPORATED	10,930												**10,930**	
U.S. ENVIRONMENTAL RENTAL CORP	213			580		2,318	213	-		452	2,125	2,400	**8,301**	
UNDERWOOD ENGINEERING, INC	300												**300**	
WILLIAMS SCOTSMAN, INC.	349	349		697	349	454		697	359	359	358.75	359	**4,329**	
Grand Total	14,846.00	349		8,322.00	6,821.00	2,929	54,363.00	1,944.00	359	811	2,483.00	21,021.00	**114,247.00**	

Langan Engineering

MFR-4.4

Perth Amboy MGP Site, Perth Amboy, New Jersey
Subcontractor and Vendor Expenses July 1, 2016 through June 30, 2017

Subcontractor or Vendor Name	07 2016	08 2016	09 2016	10 2016	11 2016	12 2016	01 2017	02 2017	03 2017	04 2017	05 2017	06 2017	Grand Total	CODE
GWTT			2,675										**2,675**	**Other**
TestAmerica					420								**420**	L
Treasurer, State of NJ (NJDEP)							6484						**6,484**	Other
City of Perth Amboy								1,600	478				**2,078**	Other
Advanced Drilling									10,676	2,432			**13,108**	D
Aqua Pro-Tech									1,070	70,706			**71,776**	L
Enviro Physics									2,140				**2,140**	UL
Verizon											5,236		**5,236**	UL
Freehold Conservation District											4,050		**4,050**	Other

Grand Total **107,966**

CODES: E=EQUIPMENT;L=LABORATORY;UL=UTILITY CLEARANCE;D=DRILLING;Do=DOCUMENT REPRO

MFR-5 **For each of the same three MGP sites, provide a narrative description and organization chart for that site, showing the vendors and project control structure for the remediation effort. The response should show what entities supervise all significant contractors and subcontractors and which Company personnel are involved in site and remediation supervision and control.**

Erie Street

The main engineering consultant utilized for the remedial investigation work at the site is GEI Consultants. GEI was contracted directly with AGL Resources (now Southern Company Gas or "SCG") and reports directly to Steven Cook, Manager, Environmental Programs. Steven Cook has day to day responsibility for management of ongoing remediation efforts. Steven Cook reports directly to Greg Corbett, Managing Director, Environmental Services ("ES"). Greg Corbett has oversight responsibility for the ETG remediation program. Greg Corbett reports through Jay Sutton, Senior Vice President, Operations Services.

Charter Contracting Company LLC is the construction contractor for remediation of Areas B and G. Charter was contracted directly with AGL Resources/SCG and reports directly to Steven Cook who reports through the ES organization as described above.

Creamer Environmental is the construction contractor for remediation of Area A. Creamer was contracted directly with AGL Resources/SCG and reports directly to Steven Cook who reports through the ES organization as described above.

Henkels & McCoy is the contractor providing utility abandonment and relocation services. Henkels & McCoy was contracted directly with AGL Resources/SCG and reports directly to Mike Redding, site supervisor, who in turn coordinates Henkels & McCoy activities with Steven Cook who reports through the ES organization as described above.

Shelby Mechanical provided site preparation for remedial action. Shelby Mechanical was contracted directly with AGL Resources/SCG and reports directly to Mike Redding, site supervisor, who in turn coordinates Henkels & McCoy activities with Steven Cook who reports through the ES organization as described above.

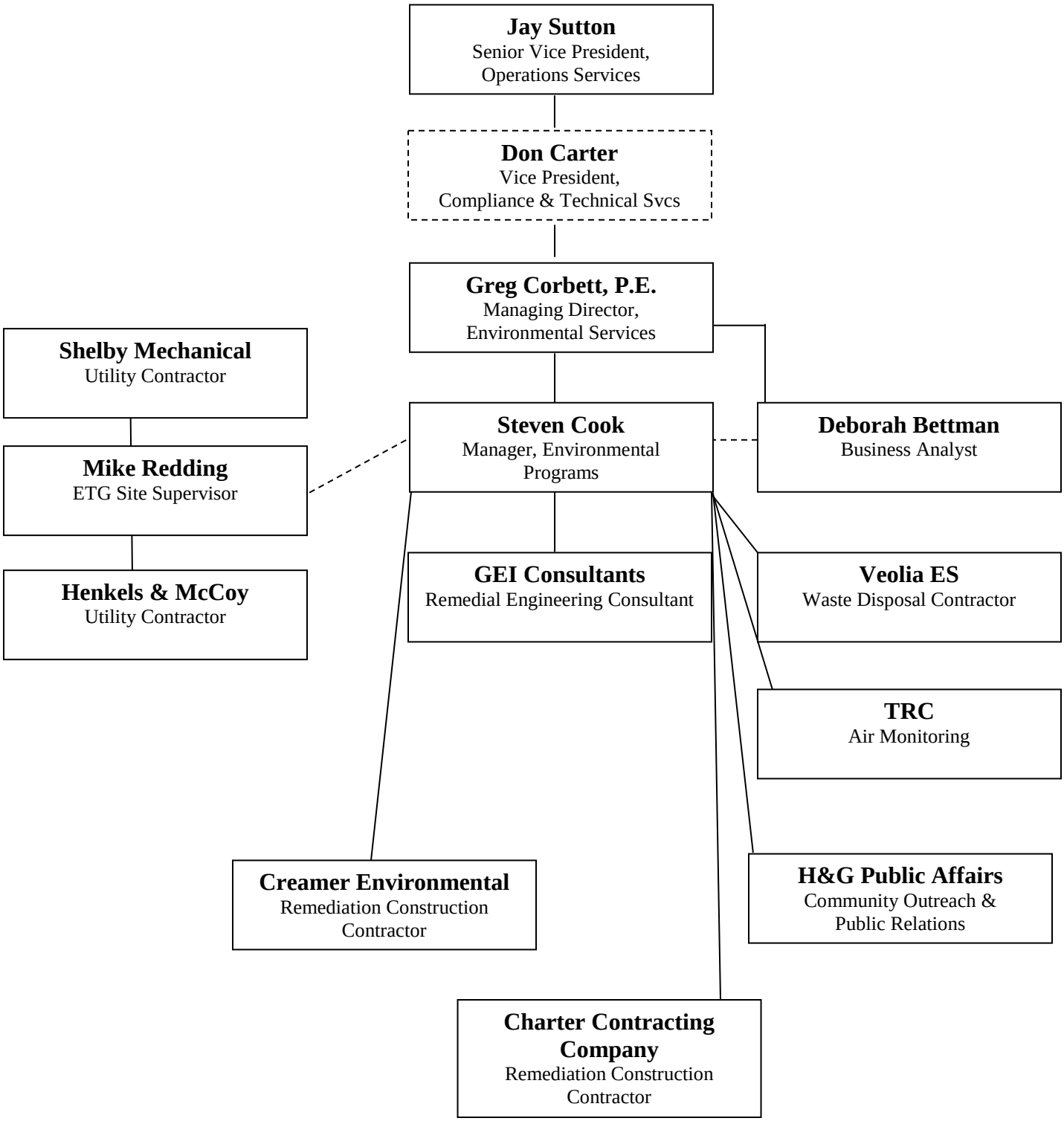
TRC provides perimeter air monitoring during remedial construction. TRC was contracted directly with AGL Resources/SCG and reports directly to Steven Cook who reports through the ES organization as described above.

Waste disposal is performed by Veolia ES. Veolia was contracted directly to AGL Resources/SCG and reports directly to Steven Cook who reports through the ES organization as described above.

H&G Public Affairs, LLC provides community outreach and public relations services regarding the site. H&G was contracted directly to AGL Resources/SCG and reports directly to Steven Cook who reports through the ES organization as described above.

Deborah Bettman, Business Analyst for Southern Company Gas, provides project budgeting and cash flow tracking.

Erie Street


Jay Sutton
Senior Vice President,
Operations Services
Don Carter
Vice President,
Compliance & Technical Svcs
Greg Corbett, P.E.
Managing Director,
Environmental Services
Shelby Mechanical
Utility Contractor
Steven Cook
Manager, Environmental
Programs
Deborah Bettman
Business Analyst
Mike Redding
ETG Site Supervisor
Henkels & McCoy
Utility Contractor
GEI Consultants
Remedial Engineering Consultant
Veolia ES
Waste Disposal Contractor
TRC
Air Monitoring
Creamer Environmental
Remediation Construction
Contractor
H&G Public Affairs
Community Outreach &
Public Relations
Charter Contracting
Company
Remediation Construction
Contractor

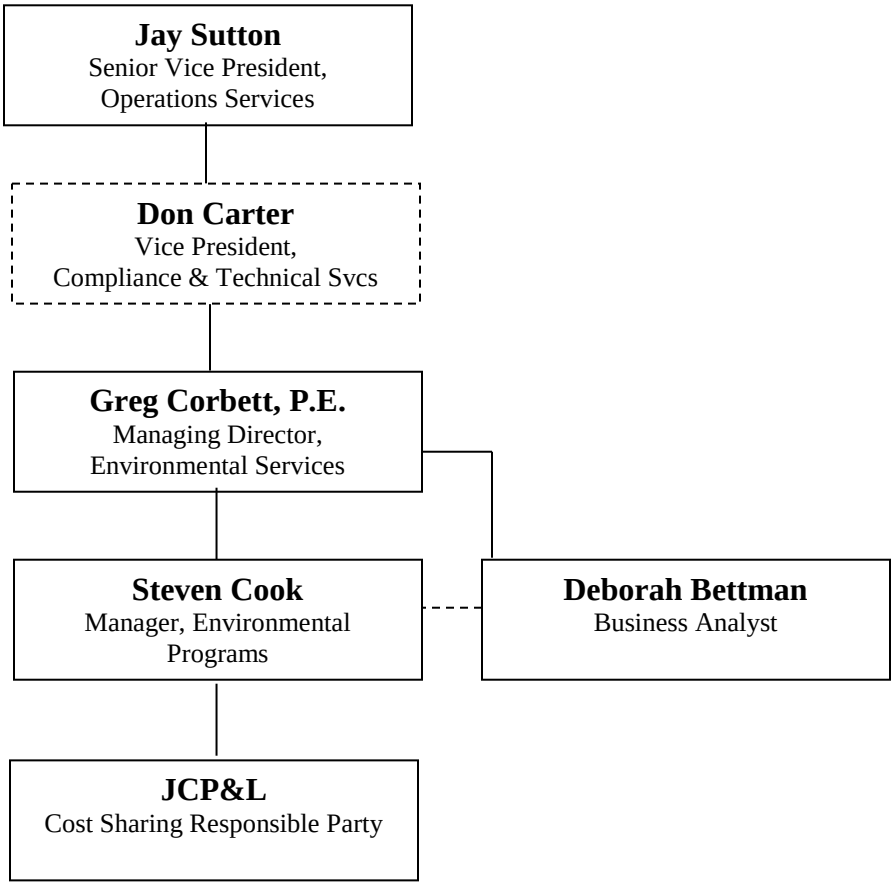
Flemington

Steven Cook, Manager, Environmental Programs, has day to day responsibility for management of ongoing remediation efforts. Steven Cook reports directly to Greg Corbett, Managing Director, Environmental Services ("ES"). Greg Corbett has oversight responsibility for the ETG remediation program. Greg Corbett reports through Jay Sutton, Senior Vice President, Operations Services.

JCP&L is a cost sharing responsible party with AGL Resources/SCG pursuant to a cost sharing agreement. JCP&L is responsible for 60% of remediation costs while AGL Resources/SCG is responsible for 40% of remediation costs with equal decision making for each party.

Deborah Bettman, Business Analyst for Southern Company Gas, provides project budgeting and cash flow tracking.

Flemington


Jay Sutton
Senior Vice President,
Operations Services
Don Carter
Vice President,
Compliance & Technical Svcs
Greg Corbett, P.E.
Managing Director,
Environmental Services
Steven Cook
Manager, Environmental
Programs
Deborah Bettman
Business Analyst
JCP&L
Cost Sharing Responsible Party

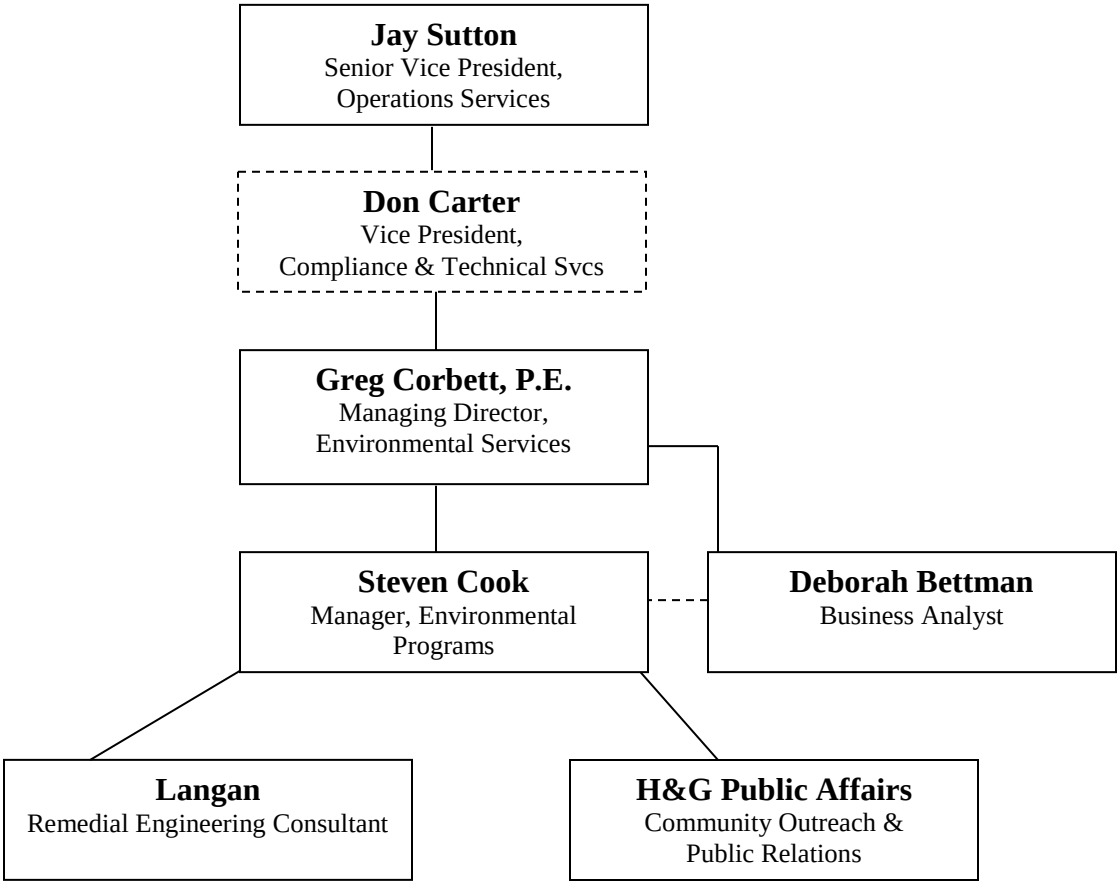
Perth Amboy

The main engineering consultant utilized for remedial construction oversight at the site is Langan Engineering and Environmental Services. Langan was contracted directly with AGL Resources/SCG and reports directly to Steven Cook, Manager, Environmental Programs. Steven Cook has day to day responsibility for management of ongoing remediation efforts. Steven Cook reports directly to Greg Corbett, Managing Director, Environmental Services ("ES"). Greg Corbett has oversight responsibility for the ETG remediation program. Greg Corbett reports through Jay Sutton, Senior Vice President, Operations Services.

H&G Public Affairs, LLC provides community outreach and public relations services regarding the site. H&G was contracted directly to AGL Resources/SCG and reports directly to Steven Cook who reports through the ES organization as described above.

Deborah Bettman, Business Analyst for Southern Company Gas, provides project budgeting and cash flow tracking.

Perth Amboy


Jay Sutton
Senior Vice President,
Operations Services
Don Carter
Vice President,
Compliance & Technical Svcs
Greg Corbett, P.E.
Managing Director,
Environmental Services
Steven Cook
Manager, Environmental
Programs
Deborah Bettman
Business Analyst
Langan
Remedial Engineering Consultant
H&G Public Affairs
Community Outreach &
Public Relations

MFR-6 **Provide a detailed narrative describing Company activities and any reimbursements related to insurance claims or potentially responsible parties' liabilities for all of the Company's MGP sites. The narrative, with supporting documentation, should cover the prior RAC period. In addition, the Company should provide a listing of all insurance reimbursements received from each insurance company through the end of the year covered by the filing, but need not disclose any insurance company's identity.**

During the RAC period July 2016 - June 2017, the Company continued its ongoing efforts to keep its insurers periodically informed regarding the status of the MGP sites, pursue claims against insolvent insurers and seek negotiated resolutions with solvent insurers of coverage for the MGP sites.

During the July 2016 - June 2017 RAC period, the Company received a settlement that is reflected in the calculation of the RAC rate shown on Schedule TK-1.

MFR-7 **Provide copies of any RAC audit reports or related materials prepared by the Board's Audit Staff, FERC, or the Company's internal or external auditors during the previous twelve months. To the degree applicable, please also provide any materials prepared in response to the audits or in compliance with any audit findings.**

There have been no RAC audit reports or related materials prepared by the Board's Audit Staff or FERC during the previous twelve months that the Company is aware of. Per the Board's Order dated November 30, 2011 in Docket No. GA10110840, the Company's Internal Audit group conducted an audit of the RAC periods July 1, 2013 through June 30, 2016.

The Company considers the requested information confidential and proprietary. A copy of the audit report dated December 21, 2016 will be provided to parties executing an appropriate confidentiality agreement as confidential attachment MFR-7.1.

MFR-8 **Provide a narrative concerning all material events, whether related to NJDEP mandates or not, which could have an impact on the Company's ultimate MGP remediation liability, with claimed confidential information provided pursuant to a confidentiality agreement. The narrative should encompass all sites, whether or not active remediation efforts on the site are under way.**

MGP impacts from the Erie Street site were identified and delineated within an adjacent City street and on a residential property across the street from the site. The Company is considering strategies to address these impacts.

The NJDEP is in disagreement with the ecological remedial investigation performed at the Erie Street site. This may result in additional remedial investigation activities regarding the adjacent Elizabeth River.

The NJDEP is in disagreement with the results of an ecological risk assessment regarding offsite sediments and wetlands at the Newton site. Based on NJDEP's position, this could substantially increase the area of offsite sediments and wetlands that will require remediation.

MFR-10 **Provide the Company's bid evaluation studies, reports, workpapers or other material related to the two largest MGP remediation contracts awarded during the previous RAC period. The response should include the criteria utilized for bid evaluation and the comparisons between the terms and conditions offered by the competitive bidders.**

The Company considers the requested information confidential and proprietary. Such information is competitively sensitive in that it would provide potential vendors with information that is normally not made available in negotiations. The requested information will be provided to parties executing an appropriate confidentiality agreement. Confidential attachment MFR-10.1 includes bid evaluations for awarding a remedial action contract for the Perth Amboy site. Confidential attachment MFR-10.2 contains bid evaluations for a remedial action contract for the Erie Street Areas B&G remediation. Due to the voluminous nature of these documents, only the overall presentations have been included. Additional information will be made available at the Company's offices upon request.

MFR-11 **Provide documentation relating to the two largest supplemental contract amendments authorized by the Company during their previous RAC period. The response should provide the contractor's request for supplemental funding, the reasons cited for the request, and the Company's evaluation and action taken concerning the request.**

Per the Board Order in Docket No. GR13090839, the Company agrees that as part of its response to MFR-11 the Company will provide affirmative support that unit prices were maintained from the original master agreement for change orders or supplemental contracts that were not subject to competitive bidding or otherwise explain any unit price variations.

The Company considers this information confidential and proprietary. Such information is competitively sensitive in that it would provide potential vendors with information that is normally not made available in negotiations. The requested information will be provided to parties executing an appropriate confidentiality agreement as confidential attachments MFR-11.1 and MFR-11.2.

Confidential attachments MFR-11.1 and MFR-11.2 contain documentation regarding the two largest supplemental contract amendments authorized by the Company during the previous RAC period, including the contactor's request for supplemental funding and the reason for the request.

The Company evaluates all requests for additional funding based on whether the reason for the requested funding was known or should have been known at the time of bidding and contract award. The Company also evaluates requests for additional funding on proposed costs compared to unit costs, if available, reasonableness of the requested costs and whether the need for the requested additional funding was a result of the contractor's action or inaction.

Based on the Company's evaluation, the Company ultimately approved the attached requests for additional funding.

MFR-12 **Provide documentation relating to any instances during the previous RAC period where the Company sought to modify, change, or eliminate the NJDEP site remediation requirements for any of its MGP sites. The response should provide copies of any such Company requests, the NJDEP responses, and the ultimate outcome concerning the requests.**

The Company and JCP&L negotiated the extent of sediment and wetlands removal at the Flemington site based on the results of an ecological risk assessment prepared for the site. The Company and JCP&L are currently negotiating off site areas that may require remediation at the Newton site with NJDEP. Please see attachments MFR-3.1 and MFR-3.2 which provide correspondence regarding these negotiations.

MFR-14 **The Company currently provides a schedule that summarizes the expenditures incurred by major cost category by site on a quarterly basis. These data will be reported with its annual filing.**

Please see attachment MFR-14.1 for schedules that summarize the expenditures incurred by major cost category by site on a quarterly basis.

Pivotal Utility Holdings, Inc. d/b/a Elizabethtown Gas
Manufactured Gas Plant Remediation Program

Summary Statement of Site Expenses
Quarterly Report
July 2016 through September 2016

Line No.	Description	Consulting/ Remediation	Legal	NJDEP Oversight	Natural Resource Damages (NRD)	Other	(1) **Total Remediation Expenses**	(2) NRD Deferral 100%	(3) Ins. Lit./ Third Party Deferral 50%	(4) Recovery of Prior Deferred Expenses	(5) Third Party Recoveries	**Amortizable Recoverable Expenses This Quarter**	**Year To Date Recoverable Expenses**
1	Elizabeth (Erie Street)	$304,841		$19,630			**$324,471**					**$324,471**	**$324,471**
2	Elizabeth (South Street)	$13,712					**$13,712**					**$13,712**	**$13,712**
3	Rahway	$385					**$385**					**$385**	**$385**
4	Perth Amboy	$74,186	$2,814				**$77,000**					**$77,000**	**$77,000**
5	Flemington	-$2,575					**($2,575)**					**($2,575)**	**($2,575)**
6	Newton	$2,575					**$2,575**					**$2,575**	**$2,575**
7	Renora (Erie Street)						**$0**					**$0**	**$0**
8	Internal					$7,887	**$7,887**					**$7,887**	**$7,887**
9	Misc.	$78,978				$3,659	**$82,636**					**$82,636**	**$82,636**
10	Insurance Litigation/ Third Party Claims		$126,956				**$126,956**		($63,478)			**$63,478**	**$63,478**
11		$472,101	$129,770	$19,630	$0	$11,546	**$633,046**	$0	($63,478)	$0	$0	**$569,568**	**$569,568**

Notes:

1 Line 10 - Pursuit of Third Party Claims at 100% of expenses incurred, 50% of which is deferred pending a Third Party recovery.
2 100% of Natural Resource Damages deferred pending BPU resolution.
3 50% of the expenses incurred in the pursuit of Insurance and/or Third Party Claims.
4 Allowable recovery of the deferred expenses incurred in pursuit of Insurance and/or Third Party recoveries.
5 Credit of 100% of amounts received from Third Parties.

Pivotal Utility Holdings, Inc. d/b/a Elizabethtown Gas
Manufactured Gas Plant Remediation Program

Summary Statement of Site Expenses
Quarterly Report
October 2016 through December 2016

Line No.	Description	Consulting/ Remediation	Legal	NJDEP Oversight	Natural Resource Damages (NRD)	Other	(1) **Total Remediation Expenses**	(2) NRD Deferral 100%	(3) Ins. Lit./ Third Party Deferral 50%	(4) Recovery of Prior Deferred Expenses	(5) Third Party Recoveries	**Amortizable Recoverable Expenses This Quarter**	**Year To Date Recoverable Expenses**
1	Elizabeth (Erie Street)	$522,661	$1,117				**$523,778**					**$523,778**	**$848,248**
2	Elizabeth (South Street)	$7,627					**$7,627**					**$7,627**	**$21,338**
3	Rahway*	($495,665)					**($495,665)**					**($495,665)**	**($495,280)**
4	Perth Amboy	$154,594					**$154,594**					**$154,594**	**$231,594**
5	Flemington						**$0**					**$0**	**($2,575)**
6	Newton						**$0**					**$0**	**$2,575**
7	Renora (Erie Street)						**$0**					**$0**	**$0**
8	Internal					$11,027	**$11,027**					**$11,027**	**$18,914**
9	Misc.	$83,002				$3,956	**$86,957**					**$86,957**	**$169,593**
10	Insurance Litigation/ Third Party Claims		$142,480				**$142,480**		($71,240)	$2,400	($2,400)	**$71,240**	**$134,718**
11		$272,218	$143,596	$0	$0	$14,982	**$430,796**	$0	($71,240)	$2,400	($2,400)	**$359,557**	**$929,125**

Notes:
1 Line 10 - Pursuit of Third Party Claims at 100% of expenses incurred, 50% of which is deferred pending a Third Party recovery.
2 100% of Natural Resource Damages deferred pending BPU resolution.
3 50% of the expenses incurred in the pursuit of Insurance and/or Third Party Claims.
4 Allowable recovery of the deferred expenses incurred in pursuit of Insurance and/or Third Party recoveries.
5 Credit of 100% of amounts received from Third Parties.

* Includes $496,051 credit from the sale of Rahway site.

Pivotal Utility Holdings, Inc. d/b/a Elizabethtown Gas
Manufactured Gas Plant Remediation Program

Summary Statement of Site Expenses
Quarterly Report
January 2017 through March 2017

Line No.	Description	Consulting/ Remediation	Legal	NJDEP Oversight	Natural Resource Damages (NRD)	Other	(1) **Total Remediation Expenses**	(2) NRD Deferral 100%	(3) Ins. Lit./ Third Party Deferral 50%	(4) Recovery of Prior Deferred Expenses	(5) Third Party Recoveries	**Amortizable Recoverable Expenses This Quarter**	**Year To Date Recoverable Expenses**
1	Elizabeth (Erie Street)	$3,463,420	$886	$13,710			**$3,478,015**					**$3,478,015**	**$4,326,263**
2	Elizabeth (South Street)	$1,209		$3,775			**$4,984**					**$4,984**	**$26,322**
3	Rahway	$515					**$515**					**$515**	**($494,765)**
4	Perth Amboy	$59,997	$6,715	$3,775			**$70,487**					**$70,487**	**$302,081**
5	Flemington						**$0**					**$0**	**($2,575)**
6	Newton						**$0**					**$0**	**$2,575**
7	Renora (Erie Street)						**$0**					**$0**	**$0**
8	Internal					$17,461	**$17,461**					**$17,461**	**$36,374**
9	Misc.	$64,963				$2,484	**$67,447**					**$67,447**	**$237,040**
10	Insurance Litigation/ Third Party Claims		$154,877				**$154,877**		($77,438)			**$77,438**	**$212,156**
11		$3,590,103	$162,477	$21,260	$0	$19,945	**$3,793,785**	$0	($77,438)	$0	$0	**$3,716,347**	**$4,645,471**

Notes:

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4 Allowable recovery of the deferred expenses incurred in pursuit of Insurance and/or Third Party recoveries.
5 Credit of 100% of amounts received from Third Parties.

Pivotal Utility Holdings, Inc. d/b/a Elizabethtown Gas
Manufactured Gas Plant Remediation Program

Summary Statement of Site Expenses
Quarterly Report
April 2017 through June 2017

Line No.	Description	Consulting/ Remediation	Legal	NJDEP Oversight	Natural Resource Damages (NRD)	Other	(1) **Total Remediation Expenses**	(2) NRD Deferral 100%	(3) Ins. Lit./ Third Party Deferral 50%	(4) Recovery of Prior Deferred Expenses	(5) Third Party Recoveries	**Amortizable Recoverable Expenses This Quarter**	**Year To Date Recoverable Expenses**
1	Elizabeth (Erie Street)	$9,059,612					**$9,059,612**					**$9,059,612**	**$13,385,875**
2	Elizabeth (South Street)	$18,653					**$18,653**					**$18,653**	**$44,975**
3	Rahway	($337)		$30			**($307)**					**($307)**	**($495,072)**
4	Perth Amboy	$196,534	$3,400	$3,775			**$203,709**					**$203,709**	**$505,790**
5	Flemington	$1,040,356					**$1,040,356**					**$1,040,356**	**$1,037,781**
6	Newton	$113,000					**$113,000**					**$113,000**	**$115,575**
7	Renora (Erie Street)						**$0**					**$0**	**$0**
8	Internal					$13,858	**$13,858**					**$13,858**	**$50,233**
9	Misc.	$99,398				$2,361	**$101,759**					**$101,759**	**$338,799**
10	Insurance Litigation/ Third Party Claims		$55,193				**$55,193**		($27,597)			**$27,597**	**$239,753**
11		$10,527,216	$58,593	$3,805	$0	$16,219	**$10,605,834**	$0	($27,597)	$0	$0	**$10,578,237**	**$15,223,708**

Notes:

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4 Allowable recovery of the deferred expenses incurred in pursuit of Insurance and/or Third Party recoveries.
5 Credit of 100% of amounts received from Third Parties.

Pivotal Utility Holdings, Inc. d/b/a Elizabethtown Gas
Manufactured Gas Plant Remediation Program

Summary Statement of Site Expenses
Annual Report
July 1, 2016 through June 30, 2017

Line No.	Description	Consulting/ Remediation	Legal	NJDEP Oversight	Natural Resource Damages (NRD)	Other	(1) **Total Remediation Expenses**	(2) NRD Deferral 100%	(3) Ins. Lit/ Third Party Deferral 50%	(4) Recovery of Prior Deferred Expenses	(5) Third Party Recoveries	**Net Remediation Cost This Period**
1	Elizabeth (Erie Street)	13,350,533	2,002	33,340			**$13,385,875**					**$13,385,875**
2	Elizabeth (South Street)	41,200		3,775			**$44,975**					**$44,975**
3	Rahway	(495,102)		30			**($495,072)**					**($495,072)**
4	Perth Amboy	485,311	12,929	7,550			**$505,790**					**$505,790**
5	Flemington	1,037,781					**$1,037,781**					**$1,037,781**
6	Newton	115,575					**$115,575**					**$115,575**
7	Renora (Erie Street)						**$0**					**$0**
8	Internal					50,233	**$50,233**					**$50,233**
9	Misc.	326,340				12,459	**$338,799**					**$338,799**
10	Insurance Litigation/ Third Party Claims		479,506				**$479,506**		($239,753)	$2,400	($2,400)	**$239,753**
11		$14,861,638	$494,437	$44,695	$0	$62,692	**$15,463,461**	$0	($239,753)	$2,400	($2,400)	**$15,223,708**

Notes:

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4 Allowable recovery of the deferred expenses incurred in pursuit of Insurance and/or Third Party recoveries.
5 Credit of 100% of amounts received from Third Parties.

MFR-15 **For each of the Company's MGP sites, provide a schedule showing the status of the remediation effort and estimated dates for the completion of remaining milestones, along with a discussion of major remediation problems. The parties understand that the timeframes to complete the remediation efforts are subject to a great deal of uncertainty due to factors beyond the Company's control.**

The following provides the current status of remedial activities at each of the Company's MGP sites, an estimated schedule for completion of remaining milestones and a discussion of major remediation problems. Please note that the estimated time frames are subject to a great deal of uncertainty due to factors beyond the Company's control.

Erie Street

- The Company has completed remediation of the first of eight Areas of Concern ("AOCs") at the site, Area A.
- The Company began the remediation of Areas B & G during this RAC period and expects to complete these activities during the second quarter of the following RAC year.
- An estimated date for the completion of all remedial activities at the site, except for groundwater, is by the end of 2020 in accordance with NJDEP mandatory timeframes for remediation.
- Groundwater remediation will likely be a long term process and include a pump and treat scenario.

Major remediation problems at Erie Street include offsite impacts in two city streets and two offsite properties. The site's proximity to residential properties and the fact that the site continues to be an important operational facility to the Company may also complicate remedial activities.

South Street

- Groundwater remedial alternatives are being assessed along with strategies for addressing MGP impacts beneath the NJDOT elevated highway that bisects the former MGP site. The remedy for the NJDOT parcel is expected to be completed by the end of 2020 in accordance with NJDEP mandatory timeframes for remediation.
- The Company estimates that a long term groundwater remedy, likely including a pump and treat scenario, will be in place and operational by 2017.

Major remediation problems include MGP related non-aqueous phase liquids ("NAPL") with bedrock fractures beneath the location of the former large gas holder, the inability to excavate within the NJDOT right of way ("ROW") beneath the elevated highway, and negotiations concerning a deed notice with the City of Elizabeth.

Rahway

- Remediation at the site has been completed, a deed notice has been filed, NJDEP has issued a Remedial Action Permit for the site institutional and engineering controls and the LSRP has issued a sitewide Remedial Action Outcome ("RAO") for restricted use for the site which closes out the soil and sediment remediation of the site. A Classification Exception Area ("CEA") for groundwater has been issued by the NJDEP but the Company has no responsibilities to maintain the CEA.
- The property was sold to the Rahway Redevelopment Authority during the RAC period.

Perth Amboy

- Design specifications for the remediation of onsite and offsite soil were revised.
- The Company has reached an agreement with the property owner and conducted permitting and planning for the implementation of a remedial action at the site. The Company conducted procurement for remedial

action and perimeter air monitoring contractors. Implementation of the remedial action is expected to begin in the late summer of 2018 and is expected to be completed within one year.

- The Company anticipates a monitoring and natural attenuation groundwater remedy to begin subsequent to the completion of Remedial Action Workplan ("RAWP") implementation.

A potential remediation issues is a result of the property owner requiring an unrestricted use remediation without institutional or engineering controls. The Company anticipates that it will be able to achieve an unrestricted use remediation. However, unknown conditions may be encountered which makes an unrestricted use remediation impractical.

Flemington

- The Company and JCP&L completed the negotiation of the extent of stream sediment and wetlands remediation based on the ecological risk assessment, conducted design, permitting, procurement for remedial action and perimeter air monitoring contractors and initiated and completed a Phase III remedial action at the site.
- The Company estimates that a long term groundwater remedy, likely including a pump and treat scenario, will be in place and operational by the following RAC period.

A potential remedial problem regarding groundwater is the presence of NAPL in bedrock.

Newton

- The Company performed an ecological risk assessment evaluating MGP impacts in sediments and wetland soils adjacent to the site.
- Remediation of MGP source areas on the property will be evaluated and addressed in the following RAC period.
- The Company will implement a long-term groundwater remedy which includes a pump and treat scenario upon approval of the Remedial Action Report ("RAR").

Potential remedial problems include NJDEP's disagreement with the conclusions of the ecological risk assessment require extensive remediation of offsite sediment and wetlands. Other remedial problems include NAPL in bedrock and access to adjacent property.

MFR-16 **Provide an update concerning the status of discussions with the NJDEP concerning its NRD initiative as well as any other NRD-related activities, with claimed confidential information provided pursuant to a confidentiality agreement. Such update will include information about NRD-related expenditures during the prior RAC period and related documentation, as well as total NRD-related expenses deferred to date.**

The Company has not had any discussions with the NJDEP concerning natural resources damages ("NRD") issues during the prior RAC period. The Company has not incurred any NRD-related costs -- defined as compensation to the State of New Jersey for injury to its natural resources -- above and beyond costs incurred to investigate, contain or remediate former manufactured gas plant sites. NRD-related costs also include any administrative, legal or consulting costs incurred by the Company associated with NRD claims being investigated by the New Jersey Department of Environmental Protection, as well as any amounts paid by the Company to resolve such claims.

The Company has not deferred any NRD-related expenses to date as none were incurred.

MFR-17 **Provide information about unreasonable delays in remediation efforts caused by the inability to obtain requisite approvals, clearances or other rights from the NJDEP, local authorities or property owners, or other circumstances that are unduly impeding remediation efforts. The Company will address issues that are outside of the ordinary experience for these matters.**

Per the Board Order in Docket No. GR13090839, the Company agrees that as part of its response to MFR-17, the Company will provide a detailed explanation of the causes of any variances between budgeted and actual expenditures in the RAC period at issue in the filing.

Negotiations with St. Demetrios Greek Orthodox Church regarding access to the Perth Amboy MGP site have been completed and the Company is moving forward with a planned remedial action. The delay in site access caused discrepancies between budgeted and actual expenditures based on timing as budgeted expenses for remedial action in the RAC period were not incurred during the RAC period.

MFR-18 **Provide details concerning all remediation related charges to the Company from or through Southern Company Gas and its affiliates for the past RAC period. The response should show amounts by month, by entity, and should describe the nature of services provided.**

Attachment MFR-18.1 contains details of charges to the Company from or through Southern Company Gas ("SCG") and its affiliates for the past RAC period.

The only affiliate charges included in the RAC are those related to expenses which were allocated to Elizabethtown from AGL Services Company, "AGLSC". The charges were incurred by Jay Sutton, Senior Vice President, Operation Services and Greg Corbett, Director, Environmental Services, based at SCG's corporate headquarters in Atlanta, GA, primarily related to insurance recovery meetings and concurrent reviews of the Company's MGP program. Jay Sutton and Greg Corbett had overall corporate responsibility for oversight of the Company's MGP remediation program.

Affiliate charges included in RAC
July 2016 - June 2017

MFR-18.1

Vendor	Name	Details	Meeting Date	Account Date Approved	RAC Total
Expense Report	Greg Corbett	Insurance Settlement mtgs - air travel	Jul-16	Jul-16	$584.20
Expense Report	Jay Sutton	Insurance Settlement mtgs - air travel	Jul-16	Jul-16	$556.00
Expense Report	Greg Corbett	Insurance Settlement mtgs - hotel, meals, parking	Jul-16	Aug-16	$594.30
Expense Report	Jay Sutton	Insurance Settlement mtgs - hotel, meals, parking	Jul-16	Aug-16	$584.21
Expense Report	Greg Corbett	MGP LCE review - air travel	Aug-16	Sep-16	$900.35
Expense Report	Jay Sutton	Insurance Settlement mtgs - air travel	Oct-16	Sep-16	$325.70
Expense Report	Greg Corbett	Erie St bidders meeting and LCE review - hotel, meals, parking	Sep-16	Oct-16	$511.25
Expense Report	Greg Corbett	Insurance Settlement mtgs - air travel	Oct-16	Nov-16	$465.20
Expense Report	Jay Sutton	Insurance Settlement mtgs - air travel change fee	Oct-16	Nov-16	$607.00
Expense Report	Jay Sutton	Insurance Settlement mtgs - air travel	Oct-16	Dec-16	$465.20
Expense Report	Greg Corbett	Insurance Settlement mtgs - hotel, meals, parking	Nov-16	Dec-16	$466.60
Expense Report	Jay Sutton	Insurance Settlement mtgs - air travel, hotel, meals, parking	Nov-16	Dec-16	$944.61
Expense Report	Greg Corbett	Insurance Settlement mtgs - air travel, hotel, meals, parking	Dec-16	Jan-17	$940.88
Expense Report	Jay Sutton	Insurance Settlement mtgs - air travel, hotel, meals, parking	Dec-16	Jan-17	$969.52
Expense Report	Greg Corbett	MGP LCE review - air travel	Feb-17	Mar-17	$354.80
Expense Report	Greg Corbett	MGP LCE review - air travel, hotel, meals, parking	Mar-17	Apr-17	$888.92
Expense Report	Greg Corbett	Adjust to remove 25%		May-17	($222.23)
Expense Report	Jay Sutton	Insurance Settlement mtgs - air travel	May-17	May-17	$366.40
Expense Report	Greg Corbett	Insurance Settlement mtgs - hotel, meals, parking	May-17	Jun-17	$500.80
Expense Report	Jay Sutton	Insurance Settlement mtgs - hotel, meals, parking	May-17	Jun-17	$541.78
				Total	**$11,345.49**