LITTLE TOR SUBSTATION

Town of Clarkstown, Rockland County, New York

FINAL ENVIRONMENTAL IMPACT STATEMENT

Appendices
Volume III

Applicant:

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Prepared: February 2014
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STATE OF NEW YORK : COUNTY OF ROCKLAND

TOWN OF CLARKSTOWN

- -x

THE TOWN OF CLARKSTOWN PLANNING BOARD

REVIEW UNDER THE PROVISIONS OF STATE ENVIRONMENTAL QUALITY REVIEW ACT (SEQRA) AND PUBLIC HEARING ON DRAFT SCOPING DOCUMENT FOR SUPPLEMENTAL DRAFT ENVIROMENTAL IMPACT STATEMENT: ORANGE AND ROCKLAND UTILITIES INC./LITTLE TOR ROAD SUBSTATION, SL 35.5-1-6 (FKA 25B1) NEW CITY (Proposed construction of a new electric substation and upgrade to an existing gas regulator, and existing cellular communications antenna on 10.2 acres of R-40 zoned land, located on the southwest corner of North Little Tor Road and South Mountain Road.)

- -x

Wednesday,
February 27, 2013
7:00 p.m.
Town of Clarkstown Town Hall
10 Maple Avenue - Room 301
New City, New York

MINUTES of the meeting of the Town of Clarkstown Planning Board taken in the above-captioned matter, before a Shorthand Reporter and Notary Public for the State of New York.

B E F O R E:

PLANNING BOARD

SHIRLEY J. THORMANN, Chairwoman
RUDOLPH J. YACYSHYN, Vice Chairman
GILBERT J. HEIM, Member
PETER E. STREITMAN, Member
MARY JANE E. O'CONNOR, Member
ARLEEN G. WHITTAKER, Member
STEPHEN M. PAPAS, Member

oOo

A L S O P R E S E N T:

PROFESSIONAL BOARD

AMY MELE, Town Attorney
JOSE C. SIMOES, Principal Planner
CHARLES MANERI, Building Plans Examiner
DENNIS M. LETSON, Deputy Director of
Enviromental Control
MORTON LEIFER

oOo

A P P E A R A N C E S:

MONTALBANO, CONDON & FRANK, P.C.
Attorneys for Applicant,
Orange and Rockland Utilities, Inc.
67 North Main Street
New City, New York 10956
BY: BRIAN J. QUINN, ESQ.

1

2 THE CHAIRWOMAN: The Planning Board

3 of February 27th is now in session.

4 Please rise and we'll salute the
5 flag.
6 (Whereupon, the Pledge of
7 Allegiance was recited.)
8 THE CHAIRWOMAN: Will you call the
9 roll, please?
10 Shirley Thormann, present.
11 Rudolph Yacyshyn.
12 MR. YACYSHYN: Present.
13 THE CHAIRWOMAN: Gilbert Heim.
14 Peter Streitman.
15 MR. STREITMAN: Present.
16 THE CHAIRWOMAN: Mary Jane
17 O'Connor.
18 MS. O'CONNOR: Present.
19 THE CHAIRWOMAN: Arleen Whittaker.
20 MS. WHITTAKER: Present.
21 THE CHAIRWOMAN: Stephen Papas.
22 MR. PAPAS: Present.
23 THE CHAIRWOMAN: Would you come up,
24 Mr. Quinn, and whoever else is here?
25 MR. QUINN: Nobody, just me.

1 (LITTLE TOR ROAD SUBSTATION)
2 THE CHAIRWOMAN: Well, don't say
3 nobody, you're somebody.
4 All right. I have a document that

I would like to read into the record.

Review under the provisions of SEQRA and public hearing on draft scoping document for Supplemental Draft Enviro-mental Impact Statement: Orange and Rockland Utilities Inc., Little Tor Road Substation, Site Layout 35.5-1-6, New City. Proposed construction of a new electrical substation and upgrade to an existing gas regulator and existing cellular communications antenna on 10.2 acres of R-40 zoned land, located on the southwest corner of North Little Tor Road and South Mountain Road. Background information: On March 7th, 2012, the Planning Board deemed the Draft Environment Impact Statement, the DEIS, complete for public review. The public hearing was held on May 2nd, 2012, and continued to date to June 6th, 2012. On June 6th, 2012, the matter was again

continued date certain June 13th, 2012.

On June 13th, 2012, the Planning Board determined that a Supplemental DEIS was necessary to adequately address all

6 of the potential adverse impacts of the
7 project. The matter was continued date
8 certain to June 27th, 2012 to allow the
9 Applicant time to prepare a draft scoping
10 document for the Supplemental DEIS.
11 On June 27th, 2012, Attorney Quinn,
12 on behalf of Orange and Rockland,
13 requested that this matter be continued
14 to a later date without a date certain
15 agreeing to waive any time requirements
16 within the SEQRA regulations with regards
17 to the draft scope.
18 On August 14th, 2012, Birdsall
19 Services Group on behalf of Orange and
20 Rockland submitted a draft scoping
21 document for the Supplemental DEIS. The
22 draft scoping document was found by the
23 Planning Board and its staff to be
24 inadequate as it did not address or
25 inadequately address many of the

1 (LITTLE TOR ROAD SUBSTATION)
2 significant environment issues identified
3 by the Planning Board and by the public.
4 As the content of a Supplemental
5 DEIS remains the responsibility of the
6 lead agency, the Applicant scoping

7 document was revised by the Planning
8 Board staff. The draft scoping document
9 and related materials were made available
10 to the public for comment via the Town's
11 website, the Planning Department office
12 and the New City Library. The purpose of
13 tonight's hearing is to obtain verbal
14 comments on the draft scoping document
15 for the Supplemental DEIS.
16 To be clear, the scoping document
17 is an outline of potentially significant
18 adverse impacts related to the DEIS
19 including the content and level of
20 analysis, the range of alternatives,
21 mitigation measures needed, and identi-
22 fication of nonrelevant issues. The
23 scope outlines the matters which must be
24 considered in the Supplemental DEIS.
25 Once adopted, the scoping document will

1 (LITTLE TOR ROAD SUBSTATION)
2 be used to measure the adequacy of the
3 Supplemental DEIS, which itself will
4 address the enviromental impacts which
5 were not addressed or inadequately
6 addressed in the DEIS.
7 The Applicant's attorney has

8 indicated that he will provide written
9 comments on the scoping document. Once
10 the Planning Board closes the public
11 scoping session, Planning Board staff
12 will proceed in making any modifications
13 the Board may want to the scoping
14 outline. The scoping outline will then
15 be sent to the involved agencies allowing
16 for a response time frame of at least ten
17 days upon their receipt. Should the
18 Planning Board close the public scoping
19 session tonight, they should be in a
20 position to establish a written comment
21 period ending on March 20th, 2013. All
22 comments from the public, the Applicant,
23 and any interested and involved agency
24 must be received by this date to be
25 considered by the Planning Board.

1 (LITTLE TOR ROAD SUBSTATION)
2 Once this is accomplished, the
3 Planning Board will review any additional
4 comments, make any modifications, and
5 ultimately adopt the scoping outline.
6 The Planning Board has tentatively
7 scheduled a meeting on April 3rd, 2013 to
8 consider adoption of a scoping outline

9 provided that the scoping session is
10 closed tonight.
11 I'll give you a few minutes to
12 digest all of this.
13 Any questions? Board comments?
14 Any consultants have any comments,
15 questions?
16 All right. If not, the we'll open
17 it.
18 Do you have any, sorry, Mr. Quinn?
19 MR. QUINN: Yes. On behalf of the
20 Applicant, my name is Brian Quinn from
21 Montalbano, Condon & Frank, 67 North Main
22 Street, New City, New York, attorney on
23 behalf of the Applicant.
24 Madam Chairwoman and Board, we will
25 not be making a presentation this

1 (LITTLE TOR ROAD SUBSTATION)
2 evening. Rather, the Applicant has
3 previously stated the position with
4 respect to the necessity of the
5 Supplemental DEIS. We submitted a
6 proposed scoping document with a
7 Supplemental DEIS. We have received Mr.
8 Geneslaw's proposed scoping document. We
9 understand that you will be holding open

10 public comment period until March the
11 20th. The Applicant will be submitting a
12 written response on or before that date.
13 I can only point out to you that the
14 public meeting notice that is on the Town
15 website indicated that the public comment
16 is following the close of the scoping
17 discussion within ten days of receipt, in
18 fact, right now it's March the 20th.
19 THE CHAIRWOMAN: It's ten days from
20 receipt of the document.
21 MR. QUINN: Of the final document?
22 THE CHAIRWOMAN: Yes.
23 MR. QUINN: Okay. We will be
24 taking public comments and written
25 comments on the proposed document in

1 (LITTLE TOR ROAD SUBSTATION)
2 which on the 20th the Applicant will be
3 submitting a written response.
4 THE CHAIRWOMAN: Okay.
5 MR. QUINN: We have a court
6 reporter here this evening recording any
7 comments which will be part of the
8 record, and we will respond to additional
9 comments received.
10 THE CHAIRWOMAN: Okay. So I'm

11 going to ask any of you, do you have any
12 comments about the document before us?
13 If not, if nobody here has any
14 question or comment?
15 All right. Now open to the public.
16 Remember, it's just on this document.
17 Please come forward and identify
18 yourself for the record.
19 MR. GRANIRER: Martus Granirer,
20 M-A-R-T-U-S G-R-A--N-I-R-E-R. I'm
21 Executive Director of West Branch
22 Conservation Association, which has an
23 address at 100 South Mountain Road here
24 in New City. I'm here to say that we
25 were very pleased with the scoping

1 (LITTLE TOR ROAD SUBSTATION)
2 document, it included many things I would
3 have hoped to have seen, and I'm glad you
4 got it in that shape. I just have one
5 remark to make because it might clarify
6 something.
7 We had, in the proceedings that
8 have happened so far, been concerned that
9 O&R was not required to do any enviro-
10 mental review on the so-called temporary
11 installation that was put on the site,

12 and we were told here that the reason was
13 that O&R had an emergency which forced it
14 to put in this temporary device and it
15 was entitled by law to an exemption from
16 SEQRA proceedings.
17 The only kind of emergency I would
18 understand is that somehow the utility
19 was caught by surprise by the proposal to
20 get the substation going and the cutoffs
21 that would have happened in the large
22 part of New City, and the Applicant
23 described that as downtown New City along
24 New Hemptead Road and most of northern
25 New City would have been cut off unless

1 (LITTLE TOR ROAD SUBSTATION)
2 they had this emergency supply. I was
3 surprised to hear that O&R was caught by
4 surprise, and so I checked the records.
5 The Highway Department which is
6 responsible for the New Hempstead Road
7 improvement have been meeting with the
8 utilities, the phone company, the gas
9 company and O&R in its capacity as
10 electric supplier and some of the cable
11 companies since 2003 and took minutes of
12 those meetings. I have here copies, and

13 I'll let you tell me how to distribute
14 them so each of you can see what
15 transpired at the meetings of the public
16 utilities that might be affected by
17 building the or making the changes to New
18 Hempstead Road, and I think you'll see
19 that O&R had a representative at every
20 one of those meetings from 2003 until
21 2011, which is just about when this whole
22 business began, and if there's some way
23 that O&R was caught by surprise, I
24 couldn't produce it. So, I'm very happy
25 to see that the current scoping document

1 (LITTLE TOR ROAD SUBSTATION)
2 requires information concerning these --
3 this temporary installation because it is
4 as vulnerable to causing fire or catching
5 fire, to exploding, to dropping oil into
6 the water source or putting radiation
7 into the neighborhood. I'm glad to see
8 it's being covered because I personally
9 couldn't accept the idea that it was
10 surprised, and the only reason you allow
11 the emergency exemption is when it's a
12 real surprise and not the poor planning.
13 How do you want me to hand these

14 out?

15 THE CHAIRWOMAN: Just pass them

16 around.

17 (Documents submitted.)

18 MR. GRANIRER: There's enough for

19 everyone on the Board to consult, and if

20 we're short, I'll get you some more.

21 THE CHAIRWOMAN: Thank you.

22 Is there anyone else in the

23 audience who wishes to address or comment

24 to the scoping document?

25 Well, then I think -- and no one on

1 (LITTLE TOR ROAD SUBSTATION)

2 the Board has any question or comments?

3 You don't want any expansion of anything

4 that's in the document?

5 MS. O'CONNOR: Actually, on the

6 matter discussing the explosion in the

7 Congers substation, one of the questions

8 to be answered under the settlement

9 agreement was that Con Ed acknowledged

10 not repairing the oil water separator

11 until after the fire and explosion, they

12 agreed to make changes to prevent future

13 malfunctions, they consented to a

14 comprehensive review/audit of its similar

15 facilities in the Hudson Valley. I
16 remember asking about that, and I don't
17 see that in the document. If you can
18 include it, I would appreciate it.
19 THE CHAIRWOMAN: All right. I have
20 one question that I couldn't really find
21 the answer to, and this is why is O&R
22 closing the station at Tilcon and not
23 keeping it operational. I looked through
24 the document and I wasn't able to discern
25 that reason, so that is something I would

1 (LITTLE TOR ROAD SUBSTATION)
2 like to see answered.
3 MR. QUINN: Why they're closing the
4 substation in Haverstraw?
5 THE CHAIRWOMAN: Right.
6 The Town Attorney, Amy Mele.
7 MS. MELE: Thank you, Madam
8 Chairwoman. I just wanted to point out
9 just briefly, the scoping document,
10 Section D, Impact on Public Health, I
11 just want to clarify for the record that
12 that is relating to the substation and
13 transformers and gas regulator upgrade
14 and not to the cell tower antenna.
15 THE CHAIRWOMAN: Thank you. That

16 was an important clarification.

17 All right, if not, I'll entertain a

18 motion. There being no one who wishes to

19 speak? Yes.

20 MR. ADIB: Good evening. My name

21 is Fuad Adib. I talked several times in

22 the past. I'm a professional engineer of

23 the State of New York.

24 I reviewed the document, I didn't

25 see anything about dissolved phase

1 (LITTLE TOR ROAD SUBSTATION)

2 organics transporting into well water. I

3 can understand that oil water separator

4 might receive or might remove some of the

5 oil which is dissolved, undissolved

6 filtration, but the dissolved components

7 which would vibrate the well water people

8 who drink from those wells is not

9 dissolved. Thank you.

10 THE CHAIRWOMAN: Yes. Mr. Baum,

11 come up, please. You weren't here when I

12 read it. We're only entertaining

13 comments relating to the draft.

14 MR. BAUM: I will defer to the next

15 meeting. I just wanted to repoint out,

16 there were discrepancies that I had

17 identified, I just want to emphasize that
18 for the Board, that the temporary sub-
19 station which I believe was mentioned in
20 the document, the temporary substation
21 text differs from the DEIS, and so I
22 think that's important when you have a
23 temporary substation which is claiming
24 that New City is only getting power from
25 one substation and you have DEIS that

1 (LITTLE TOR ROAD SUBSTATION)
2 actually gives a map showing which
3 substations are servicing that area, it's
4 important those be integrated, and if
5 they're not integrated, you're getting
6 different information and it creates more
7 problems. So I just wanted to emphasize
8 that discrepancy.
9 THE CHAIRWOMAN: Thank you. I'll
10 entertain a motion to close the public
11 hearing.
12 Moved by Heim, seconded by
13 Yacyshyn. In favor?
14 (Whereupon, a motion having been
15 made and duly seconded, was put to a vote
16 and was unanimously carried.)
17

18 oOo

19

20 (Time noted - 7:24 p.m.)

21

22

23

24

25

C E R T I F I C A T I O N

I, JENNIFER BLOOM, a Shorthand Reporter and Notary Public of the State of New York, hereby CERTIFY that I recorded the foregoing proceeding at the time and place herein stated, and the preceding transcript is a true record thereof, to the best of my knowledge and belief.

_____

JENNIFER BLOOM

CLASSIC SHORTHAND REPORTING LIMITED

67 North Main Street

New City, New York 10956

(845) 634-2022

FAX: (845) 634-3846

STATE OF NEW YORK : COUNTY OF ROCKLAND

TOWN OF CLARKSTOWN

- -x

THE TOWN OF CLARKSTOWN PLANNING BOARD

REVIEW UNDER THE PROVISIONS OF STATE ENVIRONMENTAL QUALITY REVIEW ACT (SEQRA) AND PUBLIC HEARING ON DRAFT SCOPING DOCUMENT FOR SUPPLEMENTAL DRAFT ENVIROMENTAL IMPACT STATEMENT: ORANGE AND ROCKLAND UTILITIES INC./LITTLE TOR ROAD SUBSTATION, SL 35.5-1-6 (FKA 25B1) NEW CITY (Proposed construction of a new electric substation and upgrade to an existing gas regulator, and existing cellular communications antenna on 10.2 acres of R-40 zoned land, located on the southwest corner of North Little Tor Road and South Mountain Road.)

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Wednesday,
April 3, 2013
7:00 p.m.
Town of Clarkstown Town Hall
10 Maple Avenue - Room 301
New City, New York

MINUTES of the meeting of the Town of Clarkstown Planning Board taken in the above-captioned matter, before a Shorthand Reporter and Notary Public for the State of New York.

B E F O R E:

PLANNING_BOARD
_____ _____

SHIRLEY J. THORMANN, Chairwoman
RUDOLPH J. YACYSHYN, Vice Chairman
GILBERT J. HEIM, Member
PETER E. STREITMAN, Member
MARY JANE E. O'CONNOR, Member
ARLEEN G. WHITTAKER, Member
STEPHEN M. PAPAS, Member

oOo

A L S O P R E S E N T:

PROFESSIONAL_BOARD
_____ _____

AMY MELE, Town Attorney
JOSE C. SIMOES, Principal Planner
CHARLES MANERI, Building Plans Examiner
DENNIS M. LETSON, Deputy Director of
Enviromental Control
DIANE K. PAPENMEYER, Secretary
MORTON LEIFER
ROBERT GENESLAW

oOo

A P P E A R A N C E S:

MONTALBANO, CONDON & FRANK, P.C.
Attorneys for Applicant,
Orange and Rockland Utilities, Inc.
67 North Main Street
New City, New York 10956
BY: BRIAN J. QUINN, ESQ.,
-and-
RICHARD H. SARAJIAN

oOo

A L S O P R E S E N T:

JOANE LANZA, Orange & Rockland Utilities, Inc.
JOHN COFFEY, Orange & Rockland Utilities, Inc.
CHUCK UTSCHIG, BSG Engineering

THE CHAIRWOMAN: The meeting of the Planning Board, April 3rd, 2013, is now in session.

Please rise and we're salute the flag.

(Whereupon, the Pledge of Allegiance was recited.)

THE CHAIRWOMAN: Would you call the roll, please?

MS. PAPENMAYER: Yes. Shirley Thormann.

THE CHAIRWOMAN: Present.

MS. PAPENMAYER: Rudolph Yacyshyn.

MR. YACYSHYN: Present.

MS. PAPENMAYER: Gilbert Heim.

Peter Streitman.

MR. STREITMAN: Present.

MS. PAPENMAYER: Mary Jane O'Connor.

MS. O'CONNOR: Present.

MS. PAPENMAYER: Arleen Whittaker.

MS. WHITTAKER: Present.

MS. PAPENMAYER: Stephen Papas.

MR. PAPPAS: Present.

THE CHAIRWOMAN: All right. We're

(LITTLE TOR ROAD SUBSTATION)

here under the provisions of State Enviromental Quality Review Act, SEQRA, on Draft Scoping Document for Supplemental Draft Enviromental Impact Statement, SDEIS. Orange and Rockland Utilities Inc./Little Tor Road Substation, Site Layout 35.5-1-6, New City, proposed construction of a new electrical substation and upgrade to an existing gas regulator and existing cellular communications antenna on 10.2 acres of R-40 zoned land located on the southwest corner of North Little Tor Road and South Mountain Road.

Would you gentlemen and lady introduce yourselves, please?

MR. UTSCHIG: Chuck Utschig with BSG Engineering.

MR. SARAJIAN: I'm Richard Sarajian. I'm with Montabano, Condon & Frank, counsel for the Applicant.

MR. QUINN: Brian Quinn, co-counsel for the Applicant.

MS. LANZA: Joanne Lanza, Project Manager, Orange & Rockland Utilities.

(LITTLE TOR ROAD SUBSTATION)

MR. COFFEY: John Coffey, Chief Engineer, Orange & Rockland Utilities.

THE CHAIRWOMAN: All right. We're here tonight to deal with the scoping document. Is there anything that any of you would like to say before we begin?

MR. QUINN: Madam Chairwoman, we've submitted a written response within the time frame indicated previously by the Planning Board for receipt of written comments that substantially states our position on this. We don't believe that an SDEIS is necessary. There are none of the criteria under 6 NYCRR Section 617.9 (a)7(i), in that there are no changes to the project, there's no newly discovered information or change in the circumstances related on the project which are of such significance that we require an SDEIS.

However, we have indicated that we are willing to provide a substantial amount of information as may be required and if you feel it's necessary in an FEIS.

THE CHAIRWOMAN: Before I say

(LITTLE TOR ROAD SUBSTATION)

anything, any of my colleagues on the Board wish to make a comment or ask a question?

All right. After my fourth reading of this document, I have a few questions that I would like to ask, and I think that what I'm going say is not argumentive, it's meant with the best intentions.

I think there are gaps in the information in your scoping document, perhaps maybe not from your perspective, but from ours. We had on I think Page 19, and I don't know whether you recall, I don't remember whether it was at a public hearing or whether it was at an informal discussion, it was a conversation that Mr. Simoes and I had with the, I guess you call the Assistant Captain of the New City Fire Department, a one Mr. Rodriguez, identifying type and quantity of materials, substances at the facility that may cause hazards to first responders, neighbors, water courses, and other sensitive receptors due to spillage mishandling, fire, explosion or compromise to the

1 (LITTLE TOR ROAD SUBSTATION)
2 environment or individual. This, as I
3 recall -- and, Mr. Simoes, feel free to
4 jump in -- Mr. Rodriguez was concerned
5 about the cans that contain the oil that
6 you use in your --
7 MS. LANZA: The oil in the
8 transformers?
9 THE CHAIRWOMAN: Yes. How it was
10 being handled and what was in it. Because
11 he said they need to know what's in it,
12 because when they are called in, need to
13 know what to wear and what chemicals to use
14 to fight. And I didn't think that's an
15 unfair question for a first responder to
16 ask because he's laying his life on the
17 line. So that's an example of something
18 that lacks meat in this.
19 MR. SARAJIAN: Madam Chairwoman,
20 that's actually our point. There's been no
21 change in what's going to be on the site.
22 We've identified that contaminant. If you
23 require a little bit more information about
24 that contaminant, that's not something that
25 justifies a full SDEIS.

(LITTLE TOR ROAD SUBSTATION)

THE CHAIRWOMAN: You're jumping the gun. Mr. Quinn has done a very good job so far in representing O&R. All right? And he knows that I respond, I'm an Italian, and I have a temper. He's done an outstanding job. What we can't deal with tonight, we may be able to deal with at another discussion. All right? But please don't say there has been no change because I did not see this before. I didn't know that you had that particular kind of oil in that site. That's new information for us.

MS. LANZA: It's mineral oil, and unfortunately we do periodically and at the request of the fire companies do training, and we certainly -- if we haven't done it in a while, unfortunately if Mr. Rodriguez hasn't gotten the training, then maybe we're due to go back.

THE CHAIRWOMAN: Well, he's the assistant chief, so he should know what's going on in the fire department.

MS. LANZA: He should, and if the fire department wants to come in and train

(LITTLE TOR ROAD SUBSTATION)

now and then when the new substation is in service --

THE CHAIRWOMAN: Then it should have been here.

MS. LANZA: Okay. I guess, you know, to our understanding, we train them regularly, so we didn't realize perhaps that some of the firefighters in this town didn't realize what we're using. It's the same mineral oil we're using at Snake Hill and the other substations. So you're right, it's something they should be aware of.

MR. QUINN: It seems like a relatively easy question to respond to.

MS. LANZA: Yeah, sure.

THE CHAIRWOMAN: But it's lacking the information it's lacking.

What I would like to ask is a general question now. There are some fifty responses in this document, and in many of them I think you say it can be answered in an FEIS, but I didn't see it will be answered in an FEIS. And so as this Board,

(LITTLE TOR ROAD SUBSTATION)

and I think I speak for my colleagues on that, we need to have a commitment from O&R that it will be answered in an FEIS, not that it can be or it may be, but it will be.

MR. QUINN: Well, number one, of course we have to do an FEIS, and it's one of the requirements of an FEIS, is all those issues that are raised be responded to as this Board may determine. And so perhaps the language was a little mis-understood with those items which we indicated can be addressed in an FEIS, perhaps should have said will be addressed in FEIS.

THE CHAIRWOMAN: So do I have O&R's commitment that they will be addressed in the FEIS?

MR. COFFEY: Yes.

MS. LANZA: Yes.

THE CHAIRWOMAN: Okay. Thank you.

MR. COFFEY: Part of the document that we've said that we would answer, we would, yes.

1 (LITTLE TOR ROAD SUBSTATION)

2 THE CHAIRWOMAN: Okay. Now, what

3 about the ones that maybe we have a

4 difference of opinion on? How do we deal

5 with that?

6 Now, all your responses to that will

7 impact how this Board will respond on

8 whether you have to give a supplement.

9 This a not a shakedown, sir, it's good

10 negotiation, good old-fashioned American

11 negotiation.

12 MR. QUINN: Shirley, I know you well

13 enough to know that you have not been

14 shaking us down.

15 I have a suggestion, you know, just

16 based on some initial comments. There's a

17 tremendous amount of information that is

18 suggested and proposed in the proposed

19 scoping documents. Some of the language in

20 the proposed scoping documents, when we

21 were responding, we had a great deal of

22 difficulty because of the broadness with

23 which it was worded, and maybe some of the

24 responses that we came out with were

25 misunderstood or perhaps could have been

(LITTLE TOR ROAD SUBSTATION)

worded a little better. We were kind of under the gun in trying to get this to you as well, too.

You know, early on when it was first suggested that additional material perhaps may be required to complete the EIS, we were certainly agreeable to that, and the suggestion was made perhaps there should be a meeting to discuss some of this stuff to understand what it was that you were looking for. We have told you that we're willing to do those items that state that they can be addressed in a FEIS, and so we are willing to do those in an FEIS.

I did have a very brief conversation with Amy Mele, the Town Attorney, about this because I presumed that this Board will look to Amy for legal interpretation of whether an SDEIS is required or is it sufficient that these items be addressed in an FEIS. And I suggested that perhaps it might be helpful if the two of us, Amy and myself, sat down and reviewed some of these circumstances to kind of flesh out exactly

(LITTLE TOR ROAD SUBSTATION)

what you felt might be appropriate by way of a response, how lengthy the response, how broad the response should be, and just kind of go over these other issues so that we understand what you're concerned with.

I must tell you I think it's apparent in this document that there are things that we're not willing to do, that we don't think are appropriate, and I think they're clearly stated in our response. Howe-ver --

THE CHAIRWOMAN: There are some things in there, sir -- sorry to interrupt, but there are some things in there where we have a difference of opinion.

MR. QUINN: And maybe we can find common ground, but might be willing to explore --

THE CHAIRWOMAN: Oh, absolutely.

MR. QUINN: -- that possibility.

THE CHAIRWOMAN: Don't you agree?

MR. PAPPAS: Yeah.

THE CHAIRWOMAN: Yes or no?

MS. O'CONNOR: Yes, I do.

(LITTLE TOR ROAD SUBSTATION)

THE CHAIRWOMAN: Counsel?

MS. MELE: I'm always happy to meet, if it's okay with the Board. I would request that perhaps we have the ability to invite some technical staff to assist the discussions because Mr. Quinn and I are lawyers, but we're not engineers, and it might be a more fruitful meeting if we were able to draw upon the knowledge of some of both the town and O&R's technical staff.

THE CHAIRWOMAN: I think it will be important for Mr. Simoes to be there because he knows the sense of this Board.

MS. MELE: I agree.

THE CHAIRWOMAN: And he's been in on it since day one. So, whoever, you have no objections to the technical staff?

MR. STREITMAN: Absolutely not.

THE CHAIRWOMAN: Bear in mind, there is no FEIS. I mean, there's -- tonight this has to be worked out, and we'll make it very clear to, Mr. Simoes knows where the disagreements are in terms of the Board. Is there any question that you're

1 (LITTLE TOR ROAD SUBSTATION)
2 happy to ask the Board, Mr. Simoes?
3 MR. SIMOES: Well, at this point I
4 went through the scoping document and the
5 responses from O&R, and about 60 percent or
6 thirty out of fifty items here are
7 essentially, essentially the responses
8 that -- it's not something you would
9 provide information on either the project
10 or what's being requested is burdensome or
11 unreasonable. The example that the
12 Chairwoman just raised about in particular,
13 fires or lightning strikes on the
14 facilities, your responses that would be
15 burdensome, unreasonable, the materials
16 that would be there that the first
17 responders might run into. Yes, the oil we
18 know is in the transformers, but any other
19 materials you're saying requiring the
20 Applicants to provide detailed information
21 about all materials used in this facility
22 is unreasonable. There's, like I said,
23 there's about sixty of these or 60 percent
24 of what the Board found to be information
25 that they would like to see whether we're

1 (LITTLE TOR ROAD SUBSTATION)
2 talking about FEIS or an SDEIS. Really,
3 the responses from my perspective was a
4 no.
5 Now, there may be some middle ground.
6 Maybe there needs to be some clarifications
7 to the extent of that information, and it's
8 not just open-ended, that needs to be
9 worked on. But as it stands, a good
10 portion of this is something that, at least
11 from my first read of this, is not some-
12 thing you -- you usually want to provide
13 information for either document.
14 THE CHAIRWOMAN: One of the other
15 things, Mr. Quinn, too, that several times
16 it says "under normal circumstance," but
17 what about the unusual circumstances? I
18 mean, we're talking about, you know, water
19 supply, which I am told is going be the oil
20 of the next fifty years. So we're going to
21 have to be sure that that water supply is
22 protected. It would just be for
23 assurances.
24 And I have something here, I am a rat
25 packer, and having been a history teacher,

(LITTLE TOR ROAD SUBSTATION)

I cut newspaper articles. And this was an article that appeared when you first came in back in 2008, and Mr. Donovan at that time was the spokesman for -- I understand he's no longer with O&R -- oh, Mr. Donovan, there you are. Somebody said you're not there with them anymore.

MR. DONOVAN: Perhaps I'm not, but I'm here.

THE CHAIRWOMAN: It was a surprise to me when the person just said it tonight.

So I'm quoting you, sir. It has to do with the river and flowing into Lake Lucille which feeds into Lake DeForest, a reservoir used for drinking water in Rockland and Bergen counties. "Donovan said O&R would undertake the enviromental review if the town asked for it," which you know we did. "It has already been asked to respond to dozens of questions and concerns brought up at last week's meeting," which was -- I think was the 3rd of December or something like that. "Those will be presented at a future Planning Board

(LITTLE TOR ROAD SUBSTATION)

meeting" he said. Quote, "We're following the process. Whatever the Planning Board stipulates, that's what we'll do, we'll follow their requests," end quote. And so we're going to try and hold you to Mr. Donovan --

MR. QUINN: Well, I guess my response to that would be as follows. When we first started this process, it was a scoping document that was done, and we worked on it and we submitted it for an EIS. And there were concerns and calls for additional information, and it was requested that a proposed scoping document for SDEIS be prepared, which is what is before this Board right now. There's been no determination by this Board as to whether the extent of the requested information
is what this Board is going to require. You're the ones who make this decision.

THE CHAIRWOMAN: Your answers to this, to these meetings or this meeting with the consultants and that information

1 (LITTLE TOR ROAD SUBSTATION)
2 will determine. And I think if O&R is
3 willing to make a commitment to answer the
4 questions, I think this Board is adult
5 enough and open enough to consider not
6 forcing the supplement.
7 MR. QUINN: And I think that bears
8 some exploring on the part of the town and
9 on the part of the applicant.
10 THE CHAIRWOMAN: Absolutely.
11 MR. QUINN: However, what we were a
12 little taken back by is the fact that the
13 proposed scoping document to the SDEIS was
14 far more detailed than what was originally
15 adopted as the scoping document for the
16 EIS. This process is supposed to have a
17 beginning, a middle and an end.
18 THE CHAIRWOMAN: We follow the time
19 frames, sir. And the other day I got the
20 letter about the rattlesnake, which I sent
21 to you. I mean, information keeps coming
22 in all the time. Now we won't be getting
23 more. It's up to you to provide that
24 information.
25 So, Counsel, would you set up that

(LITTLE TOR ROAD SUBSTATION)

meeting?

MS. MELE: I'd be happy to.

THE CHAIRWOMAN: Okay. Do I have a resolution empowering?

MR. QUINN: Madam Chairwoman, the only thing I would ask for is, and I think it's in everybody's interest to move this along. If we're going to continue this discussion, I'd like to try to have the meeting as soon as possible, and, you know, I'd like to be back on the Planning Board calender for the next available date. Next month, if that's possible.

THE CHAIRWOMAN: I can put a place holder there for that, and hoping that it will be a fruitful meeting.

MR. QUINN: Yes, as do we.

THE CHAIRWOMAN: Move to resolution.

All right. Yacyshyn seconds it.

MR. YACYSHYN: Second.

THE CHAIRWOMAN: All in favor?

(Whereupon, a motion having been made and duly seconded, was put to a vote and was unanimously carried.)

(LITTLE TOR ROAD SUBSTATION)

THE CHAIRWOMAN: It's in your ballpark now. Thank you, counsel.

Anything else?

MR. QUINN: No. Thank you.

(Time noted - 7:21 p.m.)

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C E R T I F I C A T I O N

I, JENNIFER BLOOM, a Shorthand Reporter and Notary Public of the State of New York, hereby CERTIFY that I recorded the foregoing proceeding at the time and place herein stated, and the preceding transcript is a true record thereof, to the best of my knowledge and belief.

_____

JENNIFER BLOOM

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STATE OF NEW YORK

TOWN OF CLARKSTOWN

- -x

THE TOWN OF CLARKSTOWN PLANNING BOARD

RE: DEIS for completeness,
O & R Utilities, Inc./Little Tor Road
substation, SL 34.5-1-6, New City.

- -x

Wednesday,
May 2, 2012
7:02 p.m.
Town of Clarkstown Town Hall
10 Maple Avenue
New City, New York

MINUTES of the meeting of the Town of Clarkstown Planning Board taken in the above-captioned matter, before a Shorthand Reporter and Notary Public of the State of New York.

B E F O R E:

SHIRLEY J. THORMANN, Chairwoman

RUDOLPH J. YACYSHYN, Vice Chairman

PETER E. STREITMAN, Member

THOMAS A. TREVOR, Member

MARY JANE E. O'CONNOR, Member

MARA S. BLUMENTHAL, Member

oOo

P R E S E N T:

JOSE C. SIMOES, Principal Planner

JAMES CREIGHTON, Planner

DENNIS LETSON, Deputy Director
of Environmental Control

KEITH J. CORNELL, ESQ., Deputy Town Attorney

ROBERT GENESLAW, Planning Consultant

ROSALIE CAUTILLO, Administrative Aide Planning

oOo

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BY: ANTHONY J. MONTALBANO, ESQ.

ORANGE & ROCKLAND UTILITES, INC.

390 West Route 59

Spring Valley, New York 10977

BY: JOHN COFFEY, P.E.,

-and-

JOANNE H. LANZA

BIRDSALL SERVICES CROUP

Consultants for Applicant

1131 Mamaroneck Avenue

Suite 50

White Plains, New York 10606

BY: W. CHARLES UTSCHIG, JR., P.E.

CHAIRWOMAN THORMANN: The meeting of the Planning Board, May 2, 2012, is now in session.

Please rise and we'll salute the flag.

(Pledge of Allegiance recited.)

CHAIRWOMAN THORMANN: Would you call the roll, please?

MS. CAUTILLO: Shirley Thormann.

CHAIRWOMAN THORMANN: Present.

MS. CAUTILLO: Rudolph Yacyshyn.

MR. YACYSHYN: Present.

MS. CAUTILLO: Gilbert Heinz.

MR. HEINZ: Present.

MS. CAUTILLO: Peter Streitman.

MR. STREITMAN: Present.

MS. CAUTILLO: Thomas Trevor.

MR. TREVOR: Present.

MS. CAUTILLO: Mary Jane O'Connor.

MS. O'CONNOR: Present.

MS. CAUTILLO: Mara Blumenthal.

MS. BLUMENTHAL: Present.

CHAIRWOMAN THORMANN: Public

(PLANNING BOARD)

hearing, DEIS O&R Utilities, Inc. Little Tor Road Substation SL 34.5-1-6 New City. The proposed construction of a new electrical substation and upgrade existing gas regulator on 10.2 acres R-40 zoned land, corner of North Little Tor Road and South Mountain Road, with a street address of 549-555 North Little Tor Road.

Would you please identify yourselves for the record?

MR. MONTALBANO: Anthony Montalbano. I'm the attorney for the Applicant.

MR. COFFEY: John Coffey, Chief Engineer, Orange & Rockland Utilities.

MS. LANZA: Joann Lanza, Senior Engineer, O&R.

MR. UTSCHIG: Charles Utschig, Birdsall Engineering.

CHAIRWOMAN THORMANN: Thank you.

The order of business tonight, I'm going to set a few little ground rules. There are cards there for anyone, index

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cards for anyone who wishes to speak. So please, Rosalie.

Would you raise your hand if you intend to speak? No, they'll be distributed. You don't need to get up. She will give you an index card.

I would ask that if a previous speaker has asked a question or made a comment that you were going to do, please no redundancies this evening. Our Town Consultant, Robert Geneslaw, is going to explain the process to you, where we've come from, what we're doing tonight and where we're going. Mr. Geneslaw?

MR. GENESLAW: Thank you. The first public meeting was held in December of 2008, and there was quite a large turnout and a number of people were interested. The hearing went on for about two to two and a half hours and a lot of comments were regarding the proposal, which was then in its really earliest stages as far as the Planning Board was concerned. A lot of the

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comments that were made reflected in the documents that were provided. O&R went away for a while and they eventually came back and they have prepared a Draft of the Environmental Impact Statement which is this document, and there is also a technical appendix of at least the same size with specialized reports in it.

When the Draft of the Environmental Impact Statement was submitted, the staff consultants to the Board reviewed it first to make sure that it was complete and it included all the information the Board was looking for. As a result of that review, a number of changes were made to the document, and it was finally submitted in February of this year, and after the Board members looked at it, it was accepted.

The purpose of tonight's hearing is to receive public comments from the public. It is not intended as a back- and- forth discussion or a debate. It's intended for the Board to collect

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information and questions and comments, and they can receive responses in the next phase. The public hearing may go on after tonight, but whenever it's closed, whether it be tonight or a future night, the written record has to be kept open for a minimum of ten days so that people can leave comments after the meeting.

The next phase will be a preparation of something called Final Environmental Impact Statement. The first draft of that will be prepared by the project's sponsors team and the Town's consultants will review it to make sure that it comes to as close as possible to reflecting the Planning Board's point of view in its responses. This is critical, the responses to the comments, each and every one, must represent the Board's point of view. And if there is somewhere the Board hasn't discussed the issue, the Board will have to discuss them in another meeting so that the Final Environmental Impact

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Statement will be prepared.

Once it's accepted and prepared by the Board, the next phase will be a Finding Statement, which is a summary of projects, an identification of any adverse impacts and mitigation measures that will be taken to take care of them. That would conclude the environmental process, the state Environmental Quality Review Act requirements. Then the various town agencies go on to conduct their own hearings and then act on their applications.

There will be a series of meetings of various town agencies to review various aspects of the proposal, then they will come back to the Planning Board for formal site plan approval. We anticipate this process will go on for somewhere in the neighborhood of four to six months, possibly longer. Thank you.

CHAIRWOMAN THORMANN: Thank you.

Mr. Montalbano, would you present or one of your colleagues a synopsis of

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the project, please?

MR. MONTALBANO: Ms. Foreman, I would like Mr. Coffey, the chief engineer for Orange and Rockland, to describe, again, to the Board a brief summary of the project. We're going to keep it brief, because, really, the project was well described in the executive summary of the DEIS draft of the Environmental Impact Statement which you have.

John?

MR. COFFEY: Thank you.

As far as the description of the project for the Little Tor Road/South Mountain Road proposed substation, starting with a justification on the reason for this substation. We have basically an area in North New City that's being fed from neighboring stations that includes the New Hempstead Road substation near the Palisades Parkway, the Congers substation, as we call it, on Gilchrest Avenue in Congers, and also the West Haverstraw sub up on

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Route 202 in Haverstraw. Those three stations collectively feed this area. Those stations have reached capacity, while in the last many years load has grown in the Clarkstown North New City area. Once those stations have reached capacity, the next solution for us is to look for a new source, which for us is a substation. Similar to if you needed to add an outlet to your home, the sub-station is an outlet that will feed this North New City area.

So when we look at the parcel that we propose here, the criteria for a new substation, we need to place it where the load has to be served, and we also have to try to place it as close to our transmission facility which will connect to the substation. And the ten-acre parcel that is proposed here meets that criteria.

When you look at the parcel, the first Lot 5, we've a long-term history of utility services on that parcel. From

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the 1920s all the way up to the 1980s, we added a former given substation that served the area. We presently still have transmission lines that traverse the area. We also have a gas regulator station that's in the area as well as Verizon communication facility. So the site has had communication service for a long time.

When we acquired Lot 6, the additional parcel, the history on that was there were several single-family cottages, if you will, that were in disrepair and they were condemned by the Rockland County Department of Health. We moved forward in the last two years to clean up the site, and the cottages themselves had asbestos as well as contaminants on the site as far as chemical waste, et cetera. So we cleaned that up in preparation for the proposed project.

When you look at the development of the ten acres, we tried to strategically

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locate the station in an environmentally sensitive area. There's obviously some wetlands on the property. The station is not located in that area. We've also, out of the ten acres, developed totally about three acres, leaving about seven acres as a buffer, which includes a pretty heavily forested area which we're going to enhance with landscaping and planting over a hundred trees.

So, in conclusion, this is a large investment for the company. It's, we think, part of economic growth for the Town of Clarkstown and the North New City area. This economic stimulus includes a tax benefit to the Town, as well, but more importantly, it's really a reliability upgrade for service in the Town of Clarkstown.

Thank you.

CHAIRWOMAN THORMANN: All right. And now I'm going to open the meeting for public questions and comments.

Terry Thaw.

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MS. THAW: I live in Lake Lucille, about half a mile east of the proposed station.

CHAIRWOMAN THORMANN: Could you speak into the mic?

MS. THAW: I thought I was.

CHAIRWOMAN THORMANN: Now you are.

MS. THAW: I am? Okay.

I live in Lake Lucille, about half a mile east of the proposed substation, and I'm on the Board of the West Branch Conservation Association. Other people will talk about a lot of the other potential problems with the proposed power station. In particular --

CHAIRWOMAN THORMANN: Excuse me, Ms. Thaw. Would you address the Board?

MS. THAW: Right. In particular, someone who lives on Lake Lucille and is part of West Branch which has a long history as you all know of protecting land and waterways, particularly in the South Mountain area, and are being very concerned with the streams that go down

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into Lake Lucille and then flow into the Hackensack River. I've read with interest the information, the stuff that tells us that nothing is going to go into those streams. I understand that the engineer who is supposed to talk about this, I don't think he's here yet, but I understand that the oil that will be stored in the transformers is going to kind of like sit there, and if any, but if there will be gravel below it. If one so much -- we've had somebody who did research. As I said, I would have preferred they spoke first because he knows more about this stuff. If so much as one drop of oil of any kind, and I'm not talking about the oil necessarily that's stored in the transformers, but if one drop of any kind of oil, lubricant oil, baby oil, motor oil is spilled, then the stuff that keeps the oil from coagulating or the oil coagulated and from not going into the stream stops working. The Environmental Statement

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doesn't mention that, it just says that the oil will coagulate, there'll be gravel, it will never leave, it will never go into the stream. And I find it curious that we're expected to be so convinced that nobody, even somebody who isn't supposed to be on the property like a kid, isn't going to drop one drop of oil and have it float down and silt up, ruin my lake again. And I know that the Town of Clarkstown doesn't want to hear Lake Lucille residents coming back yet again to say you destroyed Lake Lucille.

I'm also sure that since the lake is the opening to the Hackensack River, that the Town is very concerned about the water that floats down into the Hackensack River. There are reservoirs. It's an important part of the water course. That's my major thing. I may come back. Thank you.

I'm sorry if I sound sarcastic, but there are a number of things in the Environmental Statement that make

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2 assumptions that we're -- that everyone

3 is just expected to accept without giving

4 us the proper analysis or facts. I think

5 they're really missing from --

6 CHAIRWOMAN THORMANN: Are you

7 asking them to please substantiate their

8 generalizations? Is that what you're

9 saying?

10 MS. THAW: Totally. I would like

11 to see reports that do, in fact --

12 preferably not developed by the industry

13 that makes these things.

14 CHAIRWOMAN THORMANN: Okay. Thank

15 you.

16 Jan Conner.

17 MS. CONNER: I am Jan Conner. I

18 live at 370 South Mountain Road. I have

19 been a real estate broker in the county

20 for thirty-five years, retired now, and

21 my office was on South Mountain Road, so

22 I'm familiar with the area a lot. I also

23 looked through the DEIS and noticed the

24 Beckmann report that says that there will

25 be really little or no diminution of

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property values as a result of this substation, and the Coyle review of that report that pretty much says the same thing and agreed with them.

So, as a good 21st Century person, I went on the internet to look to see if there were studies that dealt with property values in the vicinity of substations, and most of the studies I found had to do with transmission lines, but we have one of those too, so I figured that the same things might apply.

Many of the studies I read differed in the values that they said would be lost. One said three to seven percent, another 12 percent, another said 10 to 30 percent, another 15 to 34 percent, but most of the things I read said that there will be some negative effect on property values in proximity to the transmission lines and/or substations.

Homeowners were surveyed and 66 percent of them, according to one study, felt negatively affected. Appraisers

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were surveyed and 83 percent of the appraisers surveyed said the presence of power lines negatively affected values.

In one instance in Wisconsin, the power company bought a house for 221,000, erected a power line next to it, fixed up the property, eight to ten thousand dollars worth of new paint, doors, sinks, dishwashers, all the good stuff, put it on the market at 179 and finally sold it Ten months later after the initial purchase at a hundred twenty-eight five, 42 percent less than the company paid for it originally. So that's just an illustration of one of the property values being affected by being next to this stuff.

The Beckmann report dealt with comparable properties near the New Hempstead Road substation and Congers, and sales that were from 2005 to 2009. In the Coyle review of that, they pointed out that there were only about four sales within that time next to the New

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Hempstead project. And the Coyle Report says it does not appear to be a large enough set of data to provide any substantial result. They also point out that in Congers, two of the four sales they used was comparable were next to railroad tracks, and they said any value effects due to the substation may be overshadowed by the effects on the value of this entire area because of the railroad tracks. So, it may or may not have been a good indication of what the substation does to the value.

The two substations, incidentally, have been there for years, and since the comparable sales only compared from 2005 to 2009, it may be that the diminution of values had already been taken care of years before in the value of those properties next to the substation.

Other than monetary value, just from my experience in the real estate business, there are people who won't even look at a property that's anywhere near a

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power line or a substation. What happens is that that cuts down the number of prospective buyers because a lot people won't look at the properties.

One lady even brought her own gaussmeter and I let her run testing. Buyers that look at a property next to a power thing see themselves as resellers down the line, and even though it might not bother them, they see themselves as being saddled with a possibly difficult property to resell. It can increase time on the market. If you have a problematic property, it may take a longer time to sell and longer time on the market, often leads to a reputation as a stigmatized property. Whether it's that's causing it or not, or whether that too can affect a property's value on the market.

Finally, the fear of the unknown is something that really affects all of us, particularly in buying and selling properties. One study that I read said that it really doesn't matter, that they

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may be uninformed or inaccurate judgments. Variance with the facts of the market, buyers and sellers base their actions on their expectations and anticipations. If fear is a widespread influence, whether justified or not, it will affect value adversely, and I'm sure that there is some fear out there about this project. Thank you very much.

CHAIRWOMAN THORMANN: Thank you.

Marvin Baum.

MR. BAUM: The first thing I noticed in reviewing the DEIS is that the photo simulations were inconsistent with the landscape plan that was presented. In other words, the photo stimulations are unrealistic and not showing what the landscape plan shows. The photo simulations do not represent the landscape plans and the actual impacts that will be seen from South Mountain Road and also from Little Tor Road.

If you look here on the proposed landscaping plans for the substation,

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you'll see there are absolutely no trees with the utility right-of-way. By law, Case O4-E-O822 from New York State Public Service Commission, they're not allowed to put tall growing trees underneath those transmission lines, so there's a noticeable clearing that would have a clear view from South Mountain Road directly toward the substation facility.

When you look, and I'll show you the substation perspective from South Mountain Road first, the first thing that I noticed is that the perspective is taken from beyond the clearing point, it's actually to the east of the transmission lines sufficiently that you don't really get the clearance that exists, whatever it is, the seventy-five-foot wide clearance, whatever the clearance is for right-of-way. Usually it's like a hundred feet, so you don't see it.

The second thing that's noticeable here with the little bit of right-of-way

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2 that is visible, they have tall growing
3 trees that are quite some age directly
4 under the transmission lines. Their
5 landscaping plans do not show those trees
6 at all. So there's a major inconsistency
7 between the reality, and I believe the
8 landscaping plan is the reality and the
9 photo simulation -- you have the same
10 kind of problem with the photo simulation
11 for Little Tor Road. The top of the
12 substation is about eighty-one feet high,
13 I believe, and you can see that the trees
14 from Little Tor Road are pretty much
15 covering the entire facility. So this
16 represents probably between twenty and
17 maybe as much as forty years' worth of
18 growth of the Norway spruces that are put
19 in the front of the substation. So what
20 people will see with these seven- and the
21 ten- or twelve-foot trees that are going
22 to be planted is not what's being
23 represented in these photo simulations.
24 So I think that the applicant needs
25 to go back with their photo simulations

and do photo simulations that represent reality of when the substation is first created, built, five years and ten years out. I don't think that in something that's twenty or forty years, most people are going to be all that much worried about, twenty or forty years.

And, again, I think the South Mountain Road perspective, particularly because it's a town-designated historic road, it's really important to have that correct and that the perspective should be taken from the actual viewpoint. It would be as though you wanted to buy a house and the real estate agent showed you the house next door instead of the house they wanted to sell you. So that's a problem.

The second major problem I found in the DEIS is that it talked about the dangers of the substation and it talked about events. It used a very euphemistic term "Events." In reality, the event can be quite substantial at substations. So,

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I just wanted to show what an event actually looks like. This will only take a few seconds here.

(At this time, Mr. Baum plays a video on his iPad for the Planning Board.)

MR. BAUM: What you're seeing here is a substation in a residential neighborhood in Florida and in a combination of equipment failure and human error and some poor planning, resulted in a substation exploding. That was in 1993.

If you go onto the internet to Google and/or You Tube and you just put in the words substation explosions or substation fires, you will find many, many substation fires and explosions.

For instance, in November 2009, I believe it was November 4, 2009, there was a major fire, explosion fire at the Dunwoodie substation in Yonkers, New York, and I can pass this around.

(At this time, Mr. Baum hands his iPad to Chairwoman Thormann.)

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2 MR. BAUM: And just to keep things
3 very current that you don't think these
4 are totally rare things, yeah, they don't
5 happen every day at every substation, but
6 they can and do happen. And I think that
7 what we saw at the Fukushima Daiichi
8 plant in Japan, that not enough planning
9 was done for worst case scenario.
10 So, I think what the DEIS needs to
11 include is planning for worst case
12 scenario, and that's clearly not here.
13 They clearly have underestimated at a
14 pretty extreme level what the potential
15 for problems are at the substation. When
16 you're considering a fairly heavily
17 wooded area, there are parks nearby with
18 steep slopes, there's residential houses,
19 I think the dangers are very real and
20 need to be considered and need to be
21 detailed, including what kind of
22 materials are in the substation. For
23 instance, they talk about mineral oil.
24 Typically, mineral oil is something that
25 you might put on a baby. In fact,

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2 usually substations do have other
3 materials that are more toxic like
4 PCBs. The description of the substation
5 says that, generally, it will be allowed
6 to burn out. That is their preferred
7 route. They have to first de-electrify
8 it so the firefighters can get in there,
9 but if there's any wind, any conditions
10 that necessitate it, they will be using
11 water. If you look at the Yonkers
12 picture, you'll see that water was being
13 used on that fire. So, yes, in an ideal
14 situation, they may let it burn out. Not
15 great to breathe, and I have some
16 articles that I'll give you which you can
17 put into the record both about that fire
18 and the fire at the Dunwoodie substation
19 was then replicated in June of 2010.
20 There was yet another major fire and
21 explosion at that facility.
22 Now, on Saturday there was an
23 explosion and fire at Pleasantville, New
24 York at one of the other Con Ed
25 facilities, and this Orange and Rockland,

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the applicant, is part of the same Con Ed, Incorporated. So, I will hand this around. Again, it started a brush fire. And the applicant has proposed putting trees. Now, trees may provide nice screening and, you know, that's fine, but the problem is that they're putting trees in a densely wooded area already, it actually increases the danger. There are other ways, which I'll talk about a little later, where they could minimize it. One way to minimize it is to really cut down more trees and not to plant so close to the substation. If you read in the DEIS, they talk about using a weedkiller product throughout the substation because they don't want the littlest blade of grass growing because it does create a fire hazard. And so here they're putting in tall growing trees in relatively close proximation to the substation. That should be moved much further back and/or eliminated from it, and the alternatives, and I guess

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I'll jump ahead anyway, the alternatives are that the substation could be put underground and it could be enclosed.

Now, I know the town has tried to do somethings to get substation or utility facilities looking nicer and not just being bland utility facilities. In New York City, Con Edison has spent billions of dollars to create substations that are very attractive and that blend into the neighborhood, whether it's at South Street Seaport where it blends into the seaport style, whether it be the Academy substation where they put the transmission lines underground. And the Academy substation is right along the East River in Northern Manhattan. There they have a whole nautical design facility including a lighthouse that they put into it, and we're not getting any lighthouses or any nice attractive things that will blend into the residential and wooded area of Northern New City.

So, again, here's Pleasantville.

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Not to be outdone, New York City, they had their own substation fire on Sunday. Major, you can see how big that explosion was. That's in the Dumbo neighborhood.

I'm going to show you one more quick video here. This is another substation that is also somewhat comparable in size to the substation being proposed.

(At this time, Mr. Baum plays video on his iPad.)

MR. BAUM: You can pretty much get the sense of --

CHAIRWOMAN THORMANN: I think we get the idea.

MR. BAUM: You get the idea. So, okay. So, I wanted to just show you that.

Again, I think that the DEIS, with it's two paragraphs dedicated to emergency-type situations, really has not gone sufficiently into what can go wrong and what they're doing to plan for it to ensure that people will not be put at

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risk or that property or parklands or anything will not be put at risk.

Again, I would encourage you to Google and go on You Tube and look for additional -- there are many of these things online, literally hundreds of them. You know, hopefully this will never happen, but it's much better that we be prepared to make sure it doesn't happen, and if it does happen, particularly in a worst case scenario, that we're able to deal with it.

As I said earlier, alternatives were not described of an alternative location. I did bring along some documents, for instance, here transmission and distribution has a whole thing about an underground substation in Anaheim, California where a park was built right on top of it. It cost 19 million dollars, which is somewhat more than this one. This also involved ten miles of underground utility wires, ten linear miles of underground wires and the

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development of the park right above it.

So there are newer alternatives. These actually have smaller footprints and are gas cooled, I believe. So I think that'll be good to look at.

I also want to point out that with the first fire that was at the substation in Yonkers, the fluids that were used by the fire department ran off into the storm drains in the area, and then two weeks later it showed up in the Bronx River. I think one of the concerns of area residents is will it wind up in our drinking water. And in the Bronx, two weeks later, they discovered that the oil from that original spill had showed up two miles away. We're talking about just a few yards away from the Hackensack River. So I think that again, it needs to be better dealt with than in the DEIS.

Again, I have some of those documents here to share with you.

(At this time, Mr. Baum hands documents to the Planning Board members.)

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MR. BAUM: And the other, one of the other major problems I saw, that the applicant is claiming that 85 percent of power would be dedicated to homeowners and 15 percent for commercial and municipal. But if you add up their transformers, they have two 15-megawatt transformers and one dedicated to Tilcon, which is 20 megawatts, that's 20 percent right there, not including anybody else's usage. So those numbers are not correct. There's more like 35 percent at a minimum if we can accept the 15 percent as being realistic. One of the concerns that I have is whether this facility which is determined for backup purposes is somehow part of the larger plan to supply more electricity to Tilcon which may in turn result in other environmental impacts elsewhere. I mean, has some of the power from the Haverstraw facility been kind of redirected and drained off for use at Tilcon versus used for homeowners in North New City? Now, that's perfectly

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legitimate. I'm a Con Ed shareholder. It's perfectly legitimate to make money, but it should be part of the DEIS as to where the electricity is really going and what percentage is for who, and clearly, from looking at the percentages in the DEIS, the numbers are incorrect.

And that I think covers everything that I wanted to -- I apologize to the audience who couldn't see everything that I was showing and couldn't hear necessarily, I don't know if you could hear, but I can e-mail you the videos.

CHAIRWOMAN THORMANN: I could hear everything, Mr. Baum.

MR. BAUM: Thank you very much.

CHAIRWOMAN THORMANN: Thank you.

Henry Vogel.

MR. VOGEL: My name is Henry Vogel, and I'm here to say that this is a very rural area and I'm concerned with fire. I don't think we have any water available in that area. There are no fire hydrants. How do they intend to put out

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a fire? I don't know if they can answer that, but this whole mountain is probably all wooded and it's all leaves that people leave there, they don't pick up because it's all rural, there's no trucks that go up and pick them up on the mountain. There's no accessibility if there is a fire. There are very few roads up there. In fact, I don't think there are any, other than maybe two or three, those that go up the mountain. If they have a fire, what are they going to put it out with, helicopters? They'll lose half the houses in the town. All it takes is an electrical fire with the -- I've seen electric lightning hit some of these power stations and they explode and they send sparks all over. I don't know how they're going to handle it, but since there's no water, unless they're going to supply a whole water supply line to the town. Thank you.

CHAIRWOMAN THORMANN: Thank you.

Martus Granirer.

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MR. GRANIRER: First name is M-A-R-T-U-S, last name, G-R-A-N-I-R-E-R. I'm president of West Branch Conservation Association.

I first have to ask a courtesy. Your record will close ten days from whenever you close this hearing. We've been trying -- we decided to look into a fundamental question, one of them is how much radiation will come off this site. I know there's detailed study in the DEIS, but the people have prepared this study --

CHAIRWOMAN THORMANN: You can't be heard.

MR. GRANIRER: Is this better? Your hearing, whenever it closes, you have now an obligation to extend the record opening ten days more for written submissions. We've decided to look into what we consider fundamentals, one of which is how much radiation will this site generate. I know there's a lengthy section on that in the DEIS, but we

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2 wanted to do our own investigation. It

3 took until very recently for us to

4 identify a firm that can do a worthwhile

5 and trustworthy modeling of the radiation

6 that would be caused by this station. We

7 need three weeks to get that study

8 completed. We're already set for ten

9 days. Can I ask for three, or better

10 yet, since I'd like to review the thing

11 before we submit it, for four weeks to

12 get a new study in or our study in on the

13 radiation that will come off that site?

14 And if you're interested, I've got the

15 credentials of the firm involved. I'd

16 like you to pass them around.

17 (Documents submitted to Board

18 members.)

19 MR. GRANIRER: I hope you can

20 indulge us that much, because I think the

21 study we'd like to pay for may illuminate

22 what's going on here. If the values are

23 the same as the applicant's, that's fine,

24 but they might not be. Anyway, I do hope

25 you will be able to give us this time to

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get the study we're commissioning to you before you close your record.

CHAIRWOMAN THORMANN: I'm not going to do anything now, continue.

MR. GRANIRER: I will continue. I just wanted to make sure the question is raised fairly.

CHAIRWOMAN THORMANN: The Board heard it and the Board will decide what they want to do.

MR. GRANIRER: Fine. There's one more technical question. I've heard more than one mention of the way Orange and Rockland intends to enlarge other or has begun to enlarge other power stations in the town. I believe that Orange and Rockland had earlier announced that it plans to make thirty-two stations bigger than they are now.

CHAIRWOMAN THORMANN: Excuse me for interrupting. Ms.

O'Connor, would you please speak to Mr. Cornell? He's waving bye-bye. So would you go out and ask him where he's

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going?

(At this time, Ms. O'Connor exited the hearing room.)

MR. GRANIRER: Shall I wait?

CHAIRWOMAN THORMANN: Yes, please.

(At this time, Ms. O'Connor and Mr. Cornell enter the hearing room.)

MR. GRANIRER: What I was talking about was that Orange and Rockland plans this substation expansion along with perhaps thirty more. SIPA requires that you look at the entire action, not segments of it. I know this question has come up before, but there is no question now that this is not an isolated extension. I think when it came up before, what I'm talking about is considered speculative and it might not happen, but Orange and Rockland has announced plans to enlarge thirty-two substations, three or four of them in Clarkstown. To consider this substation expansion by itself is examining a segment of a larger action.

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CHAIRWOMAN THORMANN: I think this was said when the other substations came in, Mr. Granirer.

MR. GRANIRER: Well, I want it on the record that I don't think it's settled.

CHAIRWOMAN THORMANN: I think that particular condition, Mr. Cornell, that question of segmentation, wasn't that settled in relationship to the other substations?

MR. CORNELL Yes, I believe it was.

MR. GRANIRER: I must have missed something. Was it settled in court?

CHAIRWOMAN THORMANN: I can't tell you, but I know that it was settled.

Please don't laugh.

MR. GRANIRER: You made a decision about it?

CHAIRWOMAN THORMANN: The town attorney will be here in a little bit and she can respond to that question. But I knew that the question of segmentation was going to be raised tonight.

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MR. GRANIRER: Well, just for the record, I'm raising it, too.

CHAIRWOMAN THORMANN: All right, Mr. Granirer, go ahead.

MR. GRANIRER: I assume you made a decision about it. I don't believe it was settled, with respect. Our problem is that we have questions about factual matters in the Impact Statement. Some of them rely on the results of a study that has not yet been completed, but I'd like the opportunity to complete it. The question of the appearance of this site has definitely, as you heard from Mr. Baum, there's no way to know from the material that was submitted what this site will look like. The criticism Mr. Baum made seems to be correct. To paint in a mature forest where seven-foot trees are being planted, there's no way to give anyone an idea of what the station will look like. To show trees in the right-of-way of the conductors' overhead wires, where PSE requires that those trees not

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be there, is faking, and I wish we could see a reliable visual impact study instead of the one we have.

It may not have been clear from what Terry Thaw said, but as I understand it, the material that the we were given that there's supposed to be a substance underneath the gravel on top of which the transformers will be placed that will take oil leaks and turn the oil into jelly, and I think the problem with that is that the substance is good for one shot only. If any oil gets in there, the stuff stops dealing with more oil, and then what happens to the oil that leaks? Well, obviously, it gets into the stream. We have other people who will talk about other problems with this site, and I'm going to yield to them or sit down. I know I've gone more than three minutes.

CHAIRWOMAN THORMANN: There was no three-minute rule.

MR. GRANIRER: Wonderful.

CHAIRWOMAN THORMANN: But that

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doesn't mean you can go on infinitum.

MR. GRANIRER: I don't have an infinite amount to talk about. There's an article from the New York Times that says the solar flares that are occurring now force or cause the transformers to substations to blow up, and we're at the peak of the solar storm period now. I'll give this to the Board.

(Document submitted to members of the Board.)

MR. GRANIRER: Anyway, I'll be interested to hear the decision about whether we can have another couple weeks so we can get the study done, and I thank you for your time.

MR. YACYSHYN: Mr. Granirer, before you leave, so you can answer, reviewing this, your proposed radiation consultants, very impressive list of clients that they have had, and in among the commercial lists shows Orange and Rockland substation in Stony Point.

MR. GRANIRER: Yes. They did a

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very interesting study there, that's how I learned they exist. I've spoken to the head of the company, he has no conflict. He says, "Facts are facts, I'll report what I find." He has no conflict with working for us today and Orange and Rockland yesterday.

CHAIRWOMAN THORMANN: Thank you, Mr. Granirer.

Is it William Terribile?

MR. TERRIBILE: Yes. My name is William Terribile. I live at 290 South Mountain Road. I'm also the president of the Lake Lucille Property Owners Association. I have some things.

First off, I wanted to answer this gentleman. I looked and it is four-tenths of a mile is the closest fire hydrant that I found on South Mountain Road. The reason I know that is because yesterday there were men from O&R on South Mountain Road because they have some kind of gas line leak they were saying under the road that they were

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checking for, and this would be three-tenths of a mile from the proposed substation.

Today we had a company at our lake called Allied Biological, and what they're doing is they're testing the water to make sure everything's clean, and we want it to be as healthy as possible because you have to realize this is the mouth of the Hackensack River. This is the water that Jersey is drinking right now and we have to protect that.

This process that we're going through with Allied Biological cost the homeowners six thousand dollars and we were more than happy to put it up just to make sure that the environment around us is very safe and clean of all types of things that were going on.

Another thing that concerned us was there's a line that goes through our lake from O&R. This is an O&R power line that has 384 watts, it's more than the normal line. And they have an easement, Lake

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Lucille gave them an easement, this is going back years ago, that said that they could use this so they can feed Tilcon. Now, this was only for Tilcon, so if they're planning on having other people use this line, I would like to see the plan that who's electric is going through this because it should only be Tilcon and Tilcon only.

Another thing that I was grabbed at just by talking, the gentleman, the first thing he said was they were trying to put it someplace that's environmentally safe. Well, if I was somebody who wanted to destroy a town or something like that and I wanted to destroy their water, the first thing I would do is put up something like that near it. That is not an environmentally safe place to put this.

Another thing that I saw was, you know, I was here back in 2008 and I told O&R at the time that they had problems with their telephone poles. I don't know

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if you could see the lake up here, but their telephone poles run straight through our lake. There's, I think, four or five of them. There's one right in front of Crum Creek, and because of all the hurricanes and everything that we've had, there is an island that's probably as big as this room now that has been created at the end of the lake. It was at one time about three feet deep and now it's about three feet high. That's how much soil has come down. And not only has it come down, but if this is the telephone pole, it has been pushing the telephone pole so the telephone pole is now like this (indicating), and the top of the telephone pole that has the supports has actually snapped off and gone into the lake. Now, this was reported to them a while back and they still have not done anything since 2008. And if you notice, I had brought this to their attention at that time, they still have not fixed it. So, when they're

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2 talking about substations and how

3 environmentally safe they're looking at

4 situations, I don't think they're putting

5 that into play at all. What they're

6 looking at is putting something there on

7 a road that's been an historical road

8 ever since I've been here since 1961,

9 And that is a road that, you just, right

10 now when you go on the lake, it's a

11 beautiful lake, don't let anybody tell

12 you any different, but all of a sudden at

13 the end, if you're at the dam and you're

14 looking towards the substation, all of a

15 sudden one day a Verizon line popped up

16 there, a pole popped up there that now

17 you see in the mountain range. Okay?

18 The next thing you're going to see is the

19 substation that you're going to be

20 looking at from the lake. So, you know,

21 when you're talking about how it impacts

22 people, when people are putting out their

23 own money to support a lake and you're

24 putting up substations next to the lake,

25 that really -- I mean, you know, I use

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electricity, but I don't want to see it environmentally hurt our lake and you're just setting us up for a big disaster.

And if they're not going to fix something, even a telephone pole, and you're going to allow them to put a substation before the telephones are even fixed -- I'm sorry, I keep calling it telephone poles, but it's actually electrical poles. If you're going to have them actually put up a substation without having the electrical poles even fixed, there's something wrong here, I'm sorry to say, but we're not looking at this close enough.

Thank you very much.

CHAIRWOMAN THORMANN: Susan Stava.

MS. STAVA: Hi. Good evening, Susan Stava, and I am a resident of South Mountain Road, 251 South Mountain Road.

I have to say that these meetings are fabulous because they're so informative. I'm a photojournalist who has been working on the road, documenting

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the road for probably about seven or eight years, a long time. So, I have been in and out of all different areas. I photograph the environment and I photograph people. And I have to say that, you know, it's a pretty rare and amazing road, and when I drove down it the other day coming back from Concklin Farms, I want to say two weeks ago, it really had an impressive -- the substation I'm speaking about had a very impressive impact on my ability to see the lovely Ernie Kovacs home across the street because the wind had kicked in and we had a dry spell, a real, real dry spell and the wind had really kicked up so much dirt and soil that it had completely covered the road. And there was an owner, a man out there who was sort of helping people get through. So, I at that point had called the town and I said -- I don't remember who I spoke with. Was it what's his name? But he -- I said, you need to come down here and

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see what's going on. This is a classic situation where regardless of all the beautiful isometrics and the visuals that were brought to the Planning Board, I think when you go to the site and you see how it has been absolutely cleared out from edge to edge and right now eroding, it's rained, so it's not as dusty, but it has eroded. So, my concern amongst many concerns that have been brought up already, I think they're amazing what people have brought up here, is the fire hazard. I think there's a couple of issues here that, you know, we talked about that it seems like how are we going to protect that whole area from eroding, from becoming dried out? If there's a strong storm, by the way, which we've had many torrential downpours over the past two years and severe flooding on the road.

I mean, moving on to another problem, which is if we do have that, we all know as well owners, since I own a

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well, you have to have your water tested after you have these big, big storms because the way that the water, after it's been dry in the area, especially dry in your own, your backyard where mine is very dry up on the top of the hill, I have to have the water tested immediately after a strong torrential downpour because of the strange sediment that does develop and they say it's feces and it's other things, but my concern is when you have a substation that has oil and all kinds of substances that might be coming out of there, how is that going to be protected from the storm, the residue or whatever you want to call it, water pouring through? And I know that it will probably affect, obviously, wells that are nearby if they haven't put on the water system, Lake Lucille for sure, obviously, and I think the Hackensack River. I was just told by a friend who lives right across from the substation that there is also a spring that comes up

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through that area, which I think that we do need time, you know, to hear about, you know, or to have that substantiated from the engineer to see, in fact, the impact of having a spring across, how that will be impacted, if there is some storm runoff and obviously the wells in the area.

My other question, I have a lot of questions, but everyone's is touching everything and they did amazingly, but the impact of the noise. I guess again as a journalist had done a story over in Valhalla in that area last year, a couple years ago, and it was about the noise that comes from substations. And they're really -- they really protect their property there, they really do protect their town. I'm always impressed when I go to the town meetings and document those. And I guess that would be something that would -- you know, I have a few contacts in Congers, 'cause there is a substation in Congers that I'd like

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to talk to those people and have maybe an engineer that we should do studies also, and we need the time and maybe we will be granted the time to also do studies on the impact of the noise. Because there are several substations already in Rockland, but there is one in Congers, and like I said, I do have a couple contacts and they can really talk about what they do have to deal with it. I think it's over by, I think it's French Avenue or French Street. So, you know, that I think is something that I think somebody has had substantiating evidence on whether noise is or isn't a problem, but it is a problem when you live right, you know, across. Basically, I'm within a mile, I'm half a mile, five-tenths of a mile, so that would make me crazy. And I like to have my windows opened and I like to hear the sounds outside. I live on South Mountain Road. It's an absolutely beautiful road.

CHAIRWOMAN THORMANN: Mr. Furad

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Adip.

MR. ADIP: Good evening. My name is Furad Adip.

Just to start my, as an introduction, I have a doctorate in civil engineering with a specific area of environmental engineering. I also have a PE, professional engineering license in the State of New York. Also, I live at 151 South Mountain Road.

Within the last sixteen years I've been living on that corner. Previously I was living in Lake Lucille, now I'm on the other side of Little Tor. Now, basically, our work as a professional is to review and to prepare Environmental Impact Statements. So, when we looked at a statement, a report, the main things that we look at is whether it's complete or it's something prepared as a bunch of documents together. When I reviewed this document, more than a thousand pages, I was looking specifically to find very technical issues. For example,

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geocomposite material. What is it? Is there any specification mentioned? Manufacturers, any qualities? I didn't find any. Maybe I didn't see all through it. Also, I wanted to know how much oil will be in each transformer. Was there any information? I didn't see any. But there were five hundred pages of Phase 1 which is basically site assessment, environmental site assessment. All sorts of databases, unnecessary, because no one practically reviews them which are useless and you can summarize them in a couple pages, and that would be the summary which everyone would have a chance to review it.

Now, based on that, I didn't quite find the information. I was specifically looking for a section of the foundation of the transformers, which lays out exactly transformers sitting on what, below that is what and then with the section of foundation of transformer.

Now, there are many issues, of

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course, many touched upon. For example, noise. I'm glad that the last speaker, she discussed that. The report basically said all areas are in compliance except north and west of the property, which they are planning on using barriers to mitigate that. Historical, they -- basically they're saying that this will be provided later and there will be an impact. Residential value, I'm not an expert in residential value. They basically claim that there is no association, which I find it hard to believe, living in this same area.

I picked up to two areas I wanted to discuss. One would be the magnetic field and the other would be the specific geocomposite material. The magnetic field is a subject which is unknown to engineers, to experts in this field. State accepted 200 hundred milliGauss because there was some reference, I mean, basically it was just picked up out of blue. It was something that they could

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2 not find for anything better than that.
3 This was basically considered some
4 existing best management. It doesn't
5 mean it cannot change. Right now the
6 plan says, basically, the magnetic field
7 is in the area of .2 and could be raised
8 to 73.6 milliGauss, which is still under
9 200 hundred, which is the state require-
10 ment. I have an example I always
11 actually provide. You might have a very
12 clean water which might be very pristine,
13 very nice and a state or city might
14 require, for example, drinking water
15 should have this minimum amount of
16 arsenic in it. Are you going to allow
17 someone to add arsenic to your pristine
18 water to the level which the state
19 requires or the city requires and still
20 claim that this is a state waterway? You
21 will, basically, want to make sure that
22 if there's any pristine condition, if
23 there's any acceptable quality condition
24 in your water, it would remain so. Not
25 that you would allow someone to raise it

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to the level that for time being is accepted, in future would definitely be questioned. I would say the impact of electromagnetic field is unknown, is unknown to professionals and it would definitely be questioned in the future.

If you allow this to happen, it would be established in the future, it would be grandfathered in, it would not be changed.

The next one is the geocomposite material which was discussed. I didn't find any information on that. I had to go search myself on internet. I actually came up to a material which is very close and I thought this would be something that they had in mind, but they didn't introduce that. This is called Sorb Web, Sorb Web Plus. This is a material which is -- basically was discussed that comes in contact with petroleum material, oil in general, becomes solidified, not in the sense solid, it becomes a gel-type material and it would provide a barrier.

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But in this specific brochure that the manufacturer has provided, they very clearly say, however, they recommend it for transformers, basically, and all the wording exactly the same as in the impact statement, as well. However, transformers frequently develop chronic leaks that may exist for prolonged periods of time. In order to maximize the effectiveness of this material, it has to be prevented.

Now, the question is, this material would be buried like a foot or probably more than that. Now, are they -- every chronic impact, let's say every two, three months that there might be leaks, are they going to dig up everything and remove it and put it back again? I don't believe so. And the question becomes who is monitoring this? Now, if this is going to go without any monitoring, what is the possibility of this thing being mitigated or being cleaned or being removed and replaced? So I think in my view, based on my understanding, this is

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not a situation which I would call safe given especially the fact that this is very close to a drinking water source and would impact the community, as well. The rest of the stuff, as I said, there are many issues, but I think I would just rest and ask other to discuss those.

CHAIRWOMAN THORMANN: Kirsten Walker.

MS. WALKER: Hi. So, my name is Kirsten Walker. I live at 211 South Mountain Road. So, I get to live right across the street from the substation. I live in Ernie Kovacs' old house. It is a beautiful house that I love and I bought because I have a baby who is two years old who runs away from me all the time towards an electrified fence that's around the substation, that sometimes I can catch him and sometimes it's very, very close. In addition to that, the house is made of logs. So, the fire safety issue is huge for me, and I would think for the Town of Clarkstown because

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it is actually a historic home for town, the whole street I think is historic, the feeling of that street is absolutely magical and it's been, completely been destroyed by the fact that we now have to look at this substation, and I know that nobody wants this kind of thing in their backyard, but when I was out playing with my two-year-old son last weekend and I was looking across the street at it because all the trees have also been taken down because I also get to be on the right-of-way, I thought I would have never, ever bought this house and I couldn't sell it in good conscience to anyone else.

So I started doing some research on it and the effect on the electromagnetic field, and I found some very interesting information from the National Cancer Institute. So, it wasn't a small study, it wasn't, you know, a study sponsored by Con Edison, it was a study from the National Cancer Institute that said that

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there are increased risks of things like brain cancer and leukemia, specifically. And for fun, they also said that the most impacted demographic is African-American women. So, I have the most easily impacted demographic is me, I'm the embodiment of that.

So, the other thing is that I have a child who is amazing in every single way, and as he's growing, we are learning that he now shows signs of autism. And I also got to read that one of the other things that could be a side effect of electromagnetic fields is brain function and brain development. I'm not saying that his autism is a direct result of living where we live, but I know that he grew up in this house and I moved in when he was three months old, and I know that up until the time he was about one and a half, like many other autistic children, he was completely normal in every way, made beautiful eye contact, made beautiful conversation, and now when you

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say hello to him, he says triangle.

So, these are real people that you're planning about, these are real people's life savings that you're playing bad corporate citizen with. And I think that more has to go be done because I think there are so many things out there to refute everything that these people have said. These people do have the land that they bought, but so do I and so does my son who now inherits something that's worth not very much.

When I wrote to Kathy Conklin who's the assessor for the Town, she said, I really don't have any market data for the difference that you could pay in taxes because I just have no idea and I can't pull a number out of the air, so it's up to you to research that. And it's not up to me to research that, it's up to you to do that research for everybody here to know what happens and what the full impact is because with all the money that you're getting what you should be doing

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is reassessing all the properties on that land and you should be reassessing everybody's value. It's completely ridiculous that none of this has been done. These are real people with real lives with real situations that are really impacted by this substation.

CHAIRWOMAN THORMANN: Now, since the public has spoken, I throw this to my colleagues.

Do any of you have any questions that you would like to ask because you certainly have the right to do so?

MR. YACYSHYN: Could the second speaker, I believe identified herself as the real estate broker -- is that right?

CHAIRWOMAN THORMANN: Yes. Jan Conner, I believe it was.

MR. YACYSHYN: You made reference to the Beckmann report, which is the basis for the applicant's contribution on property values, et cetera with regard to this type of facility. Did you remember seeing in that report that even though

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property values may be affected adversely, in some instances, after a time and distance from the specific location, from the site, diminishes and actually will grow in the normal fashion as all property values do in given circumstances in different communities?

Do you remember that?

MS. CONNER: I do, I remember that.

MR. YACYSHYN: So that's a fact. Now in your experience, has that been true? You said you have a long tenure in the real estate field. Have you experienced that over the years?

'Cause I can tell you that sitting on this board the years that I have, with the cycles that we've been going through in real estate values in the Town of Clarkstown and Rockland County and the region, that has happened time and time again, the ups and downs, the highs and lows. So I think that issue has to be very carefully expounded rather than just to say blanketly that would be an adverse

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impact on values. Property values in the Fifty years that I've been in Clarkstown, since 1961, I can assure you from my first house to my current one, circumstance, five different ones in between have appreciated a hundredfold.

MR. GRANIRER: I just want to answer what he said, that is that it really doesn't matter because in a situation like this, if a substation is put in, I'm putting my house up for sale, I'll tell you that right now.

CHAIRWOMAN THORMANN: Sir, we said at the very beginning, if you recall, that there wasn't to be any back and forth. The Board does have the right to ask any of the speakers for clarification or comment.

Ms. O'Connor?

MS. O'CONNOR: Actually, I have a question about the electromagnetic fields because I checked it out on the internet, and actually as of 2009, they came up with a comprehensive review document by

1 (PLANNING BOARD)

2 the World Health Organization that

3 confirmed elevation and stated that there

4 are open questions with respect to health

5 effects other than cancer, namely neuro-

6 degenerative disorders, miscarriage, and

7 further confusing the timing of melatonin

8 release and altered control of the heart

9 and changes in the number of natural

10 pillar cells. I would like O&R to tell

11 me whether or not based on any in-depth

12 studies rather than just there isn't

13 anything bad, is a problem because the

14 World Health Organization is saying that

15 there are problems. I would like to know

16 where you got your information from. You

17 still have to answer that question.

18 CHAIRWOMAN THORMANN: Anybody else?

19 Mara?

20 MS. BLUMENTHAL: I have a question

21 for the individual who gave us all the

22 articles, please.

23 MR. BAUM: Yes.

24 MS. BLUMENTHAL: In one of the

25 articles, it talked about how none of the

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houses lost power during the substation fire because it said it was a redundant system, and I was wondering if you could tell us what happened.

MR. BAUM: That was an article that I had provided to you.

MS. BLUMENTHAL: That was in this article.

MR. BAUM: Okay. Just because a substation has a fire or you have a transmission line that gets knocked out or you have a power station that gets knocked out, it doesn't mean everything goes down. There's a grid. Electricity is coming from multiple areas. So, again, an incident at your local telephone pole or utility pole doesn't mean you're going to be without power necessarily. So, in that case in Pleasantville you're referring to, I believe, there was not an outage of power, but that doesn't mean the brush fire doesn't create a hazard for the neighborhood. People can still use their

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iPads and iPhones and stuff.

MS. BLUMENTHAL: But why would that be called a redundancy?

MR. BAUM: Redundancy is referring to the grid system, that there are backup things in place to provide electricity. If you could bring down the electricity so readily, you might look at third world countries where their systems are not redundant, where you have a lot of inadequacies. But there are many problems, like the outage of 2003 showed that the redundancies in the system and controls were not popular back in August of 2003, and again it was situation where you had a combination of human error, system inadequacies, natural conditions plus other things that impacted. So each situation is going to be different. I think even in the Dumbo fire, you can see from pictures there, it was quite substantial, the smoke that was there and the flames were very substantial. Again, hazards associated with that, but I don't

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think New York City went into a blackout mode because of it. Again, they have redundancies built in to prevent that. It doesn't mean that that system couldn't create an outage, and New York City certainly has had outages over the years. They've even had a squirrel cause an outage at a substation.

CHAIRWOMAN THORMANN: Do you want to say something, Mr. Streitman?

MR. STREITMAN: Yeah. I have a question for Mr. Baum.

Mr. Baum, can you just clarify one thing? You mentioned that the pictures weren't in so-called reality world?

MR. BAUM: Correct.

MR. STREITMAN: But then you also went on saying that you would prefer, correct me if I heard it wrong, you preferred that you would rather have the trees cleared and the trees away from it because of brush fires?

MR. BAUM: I'm just speaking from a safety standpoint, not aesthetic

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standpoint. Not having the trees or putting them much further back would be safe.

MR. STREITMAN: So you would prefer the trees further away and away the from the grid?

MR. BAUM: Away from the possibility of catching fire in a high wind, dry situation. And I think that the close proximity of those trees enhances the danger to the public. It doesn't mean --

MR. STREITMAN: You clarified it. Thank you.

The second thing, thank you for all the articles, but if you could find out the causes, 'cause not all of them are saying what the causes are of these transformers. Do we know, was it? One says it was a mechanical issue, that they were trying to do maintenance on it. Were the others due to over-utilization of the transformer? And the question is, if that's the reason --

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CHAIRWOMAN THORMANN: And a couple of them said cause not known as yet.

MR. BAUM: Those are the ones that happened over the weekend, one on Saturday, one on Sunday. It usually takes a couple days or a couple weeks to do the proper investigation to determine what the cause was.

MR. STREITMAN: The earlier ones.

MR. BAUM: What was that?

MR. STREITMAN: The earlier ones. There was nothing shown as to what the causes were.

CHAIRWOMAN THORMANN: But I think that O&R is going to have to respond to the questions.

MR. STREITMAN: Right.

CHAIRWOMAN THORMANN: We have a question before us now about whether the public hearing should be closed. I think we have -- there are outstanding issues here, so I would prefer, gentlemen and ladies, to continue, all right, until such time as we have some responses.

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Would that be appropriate, Mr. Geneslaw?

MR. GENESLAW: I think it would, and I was going to recommend the same thing. Remember, though, that if you don't adjourn to a specific date, it will have to be, the hearing will have to re-advertised. And at the moment I'm not sure how long it's going to take to get some additional information. So if you do adjourn to a specific date, you may have to re-adjourn again depending on how much information can be accumulated and analyzed and whether additional outside experts will be needed.

MR. YACYSHYN: It would call for a re-advertisement.

CHAIRWOMAN THORMANN: Yes. I know what it's called, Mr. Yacyshyn. It would call for a re-advertisement. Can we do it out as far as a month?

MR. GENESLAW: As far as I know, I'm not aware of any limit as to how long out you can set the date. My only point

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is the longer it is, obviously the more people are going to lose track of what's going on.

CHAIRWOMAN THORMANN: Well, I think Orange and Rockland, that you heard tonight that the two things that are really a concern are the electromagnetic fields, and what did you perceive to be the second?

MR. YACYSHYN: Fire and explosions.

CHAIRWOMAN THORMANN: Excuse me, please. This is serious. So when you look at me and smile as if it's funny, I don't perceive it to be funny, and you have to understand the responsibility that each of us have sitting behind this dias. I don't take it lightly and neither does anyone sitting here.

Yes, Mr. Montalbano?

MR. MONTALBANO: May I ask Mr. Geneslaw a question? I do think that we would prefer, really, that we would like to see the public hearing closed. You've heard from the public. We have to now

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prepare responses to the comments in writing --

CHAIRWOMAN THORMANN: I know that.

MR. MONTALBANO: -- to the public's comments. Rather than come back and engage in a dialogue back and forth, we would prefer to close the public hearing, prepare our responses to the public's comments for your review and further clarification and --

CHAIRWOMAN THORMANN: Did you hear Mr. Geneslaw? If we keep it open, we have time to receive written comments, and I am going to afford the public that, Mr. Montalbano. I don't have anything against Orange and Rockland, please.

MR. MONTALBANO: No. The public does have a period after the public hearing is closed for a period of ten days to provide you with written comment.

CHAIRWOMAN THORMANN: I would like to keep it open, and the recommendation of my consultant who is a very respected

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person in land use, as you well know.

MR. MONTALBANO: And I'll respect it, too.

CHAIRWOMAN THORMANN: Well, then you respect his opinion, too. Now it's in your bailiwick, Mr. Geneslaw.

MR. GENESLAW: Wait a second. First of all, it's a minimum of ten days in the regulations, a minimum of ten days, and many boards give a longer period of time depending upon the particular circumstances.

I would also point out that when it gets to the Final Environmental Impact Statement phase which Mr. Montalbano refers to, there is no requirement for public hearing. The only requirement is that when it's done, it be made available to the public for comment. The Board is not required to take their comments into account.

So, I think for realistic public participation, the best alternative would be to adjourn the meeting and continue it

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at a future date. That would be give all the applicants and the Town an opportunity to do more research, and the public, as well.

CHAIRWOMAN THORMANN: What would you say, Mr. Geneslaw, would be a fair timeframe?

MR. GENESLAW: I would say, based on what we've heard tonight and the need to do some additional research, something on the order of a month.

CHAIRWOMAN THORMANN: Okay. Are you available June 13th?

MR. GENESLAW: No, I'm not. I had given you two dates which I think were already committed and I have three additional dates based on my own commitments. May 30th, August 1st and August 29th are my next available Wednesdays beyond the two that I gave you which are already committed by the Board. I don't know what your meeting schedule is in the summer.

CHAIRWOMAN THORMANN: It's usually

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only one meeting during the summer, one in July and one in August. And I need you there for that one.

MS. O'CONNOR: May 30th isn't that bad. It gives us twenty-nine days.

CHAIRWOMAN THORMANN: I can't do May 30th, because of the calendar, Ms. O'Connor. I can't kick off people I already ejected.

What about June 6th? You gave me that date, Mr. Geneslaw.

MR. GENESLAW: June 6th would be okay.

CHAIRWOMAN THORMANN: I took it down when he gave it.

MR. GENESLAW: I think that was one of the ones you initially said wouldn't work.

CHAIRWOMAN THORMANN: June 6th, please. I've got June 6th, let's say, 7:30 p.m.

MR. MONTALBANO: We'll make it for then, June 6th.

Just so I understand the process

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that we're now getting involved in -- let me speak, if I may -- I think we would like to follow the simpler process, which is if you're continuing this hearing and you're keeping the public hearing open until June 6th, that's fine. With respect to the public comment period, that's fine, too. We don't expect, however, that we will make oral responses to the questions raised by the Board. The more appropriate way for us to do that is to put those responses in writing.

CHAIRWOMAN THORMANN: But that doesn't preclude the Board asking questions about your responses in writing, Mr. Montalbano.

MR. MONTALBANO: No, it doesn't.

CHAIRWOMAN THORMANN: No, it doesn't.

While I respect you enormously and I've known you for years, we're going to have to follow Mr. Geneslaw.

MR. MONTALBANO: Madam Chairwoman,

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I'm trying to understand, we're trying to understand so we can provide this Board with the information that they're looking for. The process, we're trying to get Mr. Geneslaw to further explain.

CHAIRWOMAN THORMANN: Would you like Mr. Geneslaw to explain again to Orange and Rockland?

MR. GENESLAW: The balance of the process?

MR. MONTALBANO: No. What happens next on June 6th?

MR. GENESLAW: Well, what I was going to suggest was that Orange and Rockland follow-up on researching some of the questions that were asked and be prepared to discuss them with the Board, whether it's in oral form or written form, things like the visual impacts comments that were made, I think have to be provided both in a written and an oral form. And the Board's consultants could do some initial research. I'd like to talk to Mr. Lettson who is the Board's --

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and Mr. Leifer who are the Board's professional engineering advisors as to what additional information should be provided and whether additional outside consulting services should be sought. And the Town's three outside consultants should also be asked to weigh in on any additional information they think would be appropriate.

CHAIRWOMAN THORMANN: Thank you. And before we close, I want to thank everybody in this room for the level that transpired in this room tonight. While people may differ, the respect that was shown, this is an example that civility still exists, so thank you.

Do I have a motion?

MR. YACYSHYN: I move.

MS. O'CONNOR: Second.

CHAIRWOMAN THORMANN: First motion by Yacyshyn, second by O'Connor.

All in favor?

THE BOARD: Aye.

Whereupon, a motion having been

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made and duly seconded, was put to a vote and was unanimously carried.)

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(Time noted - 8:38 p.m.)

C E R T I F I C A T I O N

I, JOAN BEHN CARUSO, a Shorthand Reporter and Notary Public of the State of New York, hereby CERTIFY that I recorded the foregoing proceeding at the time and place herein stated, and the preceding transcript is a true record thereof, to the best of my knowledge and belief.

_____

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STATE OF NEW YORK

TOWN OF CLARKSTOWN

- -x

THE TOWN OF CLARKSTOWN PLANNING BOARD

RE: DEIS for completeness,
O & R Utilities, Inc./Little Tor Road
substation, SL 34.5-1-6, New City.

- -x

Wednesday,
June 6, 2012
7:32 p.m.
Town of Clarkstown Town Hall
10 Maple Avenue
New City, New York

MINUTES of the meeting of the Town of Clarkstown Planning Board taken in the above-captioned matter, before a Shorthand Reporter and Notary Public of the State of New York.

B E F O R E:

SHIRLEY J. THORMANN, Chairwoman

RUDOLPH J. YACYSHYN, Vice Chairman

PETER E. STREITMAN, Member

THOMAS A. TREVOR, Member

MARY JANE E. O'CONNOR, Member

MARA S. BLUMENTHAL, Member

oOo

P R E S E N T:

JOSE C. SIMOES, Principal Planner

JAMES CREIGHTON, Planner

DENNIS LETSON, Deputy Director
of Environmental Control

AMY MELE, ESQ., Deputy Town Attorney

ROBERT GENESLAW, Planning Consultant

ROSALIE AMICUCCI, Administrative Aide,
Planning

oOo

A P P E A R A N C E S:

MONTALBANO, CONDON & FRANK, P.C.

Attorneys for Applicant

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New City, New York 10956

BY: ANTHONY J. MONTALBANO, ESQ.

ORANGE & ROCKLAND UTILITES, INC.

390 West Route 59

Spring Valley, New York 10977

BY: JOHN COFFEY, P.E.,

-and-

JOANNE H. LANZA

BIRDSALL SERVICES CROUP

Consultants for Applicant

1131 Mamaroneck Avenue

Suite 50

White Plains, New York 10606

BY: W. CHARLES UTSCHIG, JR., P.E.

ny

CHAIRWOMAN THORMANN: The meeting of the Planning Board of June 6, 2012 is now in session.

Please rise and salute the flag.

(Pledge of Allegiance recited.)

CHAIRWOMAN THORMANN: Would you call the roll, please?

MS. AMICUCCI: Shirley Thormann.

CHAIRWOMAN THORMANN: Present.

MS. AMICUCCI: Rudolph Yacyshyn.

MR. YACYSHYN: Present.

MS. AMICUCCI: Gilbert Heim.

(Mr. Heim not present.)

MS. AMICUCCI: Peter Streitman.

MR. STREITMAN: Present.

MS. AMICUCCI: Thomas Trevor.

MR. TREVOR: Present.

MS. AMICUCCI: Mary Jane O'Connor.

MS. O'CONNOR: Present.

MS. AMICUCCI: Mara Blumenthal.

MS. BLUMENTHAL: Present.

CHAIRWOMAN THORMANN: Thank you.

As you may recall, if you were here last time, we were discussing the

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completeness of the DEIS, and at the end of that meeting certain information came during the public hearing and it was the consensus of this Board that those -- that submitted information that came forth should be explored.

Our consultant, our planning consultant, Mr. Robert Geneslaw, was asked to do a listing of the those comments and he has done so. He has given us a memorandum, as well as the Applicant, and what I intend to do is to have him go through his memorandum point by point. After that is done, I will open it to the people who have come tonight who wish to speak asking you that you not repeat what has already been said because it's down in the record. We have a court stenographer here and she has taken it down. You will have time to say your peacepiece, you will come forward, give your name and your address and say what you have to say. Thank you.

Mr. Geneslaw?

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MR. GENESLAW: Mrs. Thormann, do you want the Applicant to report to the Board first on the responses of some of the questions raised?

CHAIRWOMAN THORMANN: I thought that as you made your statements, he would respond.

MR. MONTALBANO: Okay, fine.

MR. GENESLAW: Okay, fine. We prepared a memo for the Board dated May 29th, it's labeled "Draft," but it shouldn't say draft on it, which was a follow-up to the May second Planning Board hearing. And in the introductory paragraph, we recommended that the Board require Supplemental Environmental Impact Statements be prepared for the proposed substation, and we indicated the source of that recommendation with respect to the SEQR regulations and with the SEQR handbook which was published in 2010 by DEC. What I'd like to do is go into the specific issues that are shown in bullet points.

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Mrs. Thormann, would you like me to stop after each to allow for the Applicant to respond or shall I go through all of them first?

CHAIRWOMAN THORMANN: No, I'd like to do it one at a time. I think people will understand it more clearly if we do it one at a time.

Any problems with that?

MR. MONTALBANO: Are you asking us to respond to each item?

CHAIRWOMAN THORMANN: That he raises. You have the memo.

MR. MONTALBANO: That's fine, whatever pleases you.

MR. GENESLAW: These were intended to be elements that would be examined as part of a Supplemental Environmental Impact Statement. Public health issues of EMFs, to review data from the World Health Organization, National Cancer Institute, National Institute of Health, include the use of EMF barriers, shielding to protect the public. Since

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various scientific studies are not conclusive with respect to potential impacts, the Board should consider the prudent avoidance concept that the Board has applied with respect to the placement of cell phone antennas.

MR. MONTALBANO: Mr. Coffey who is the chief engineer for Orange & Rockland will be responding.

CHAIRWOMAN THORMANN: And I apologize, I neglected to ask you each to identify yourselves tonight.

MS. LANZA: Joanne Lanza, Senior Engineer, Orange & Rockland.

CHAIRWOMAN THORMANN: Thank you.

MR. COFFEY: John Coffey, Chief Engineer, Orange & Rockland Utilities.

MR. MONTALBANO: Anthony Montalbano, the attorney for Orange & Rockland Utilities.

MR. UTSCHIG: Chuck Utschig, Birdsall Engineering.

CHAIRWOMAN THORMANN: Thank you.

MR. COFFEY: From an EMF

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perspective, the EMF section and the body of the work that is covered in the DEIS in Section 3 and it's supplemented by reports and correspondence and the associated appendices, but in general, both the Orange & Rockland report, which was done by Intertech Consultants, and The Town of Clarkstown as per Mr. Morton Leifer, has deemed that the EMF contribution from the substation is insignificant. From Mr. Leifer's April 29th memo, if I may just read the quote, "I have carefully considered the technical issues associated with the proposed Little Tor substation project in regard to cellular antennas, the electrical equipment, transformers and underground 13 kV transmission lines. I can conclude that the proposed Little Tor substation project will have no significant or measurable effect on the existing ambient magnetic fields in the area."

Again, that corresponds with the

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2 detailed report that Intertech

3 consultants produced in the DEIS.

4 Also, Mr. Geneslaw refers to the

5 National Institute of Environment Health

6 and Science. And on Page 36 of the

7 report, it corresponds to, "Beyond the

8 substation fence, the EMF produced by the

9 substation equipment is typically

10 indistinguishable from background

11 levels."

12 So the main point here is that the

13 substation itself has a lot of real

14 estate around it. The equipment has

15 fields inside the substation, but it

16 really attenuates off at the fence line.

17 The dominant field in the area is the

18 existing transmission lines, they are

19 there, but the substation itself, outside

20 the fence, magnetic field goes back down

21 to background level.

22 So, I know, Ms. O'Connor mentioned

23 the World Health Organization, and as we

24 reviewed that website, the conclusion

25 there, and I can certainly hand the

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2 report out to the Board, is that despite
3 extensive research to date there is no
4 evidence to conclude that the exposure to
5 low level of electromagnetic fields is
6 harmful to human health. And again, when
7 we look at electromagnetic fields, there
8 is a lot of research that's gone on
9 that's a lot more consumed with cellular
10 phones and communication and high
11 frequency communication fields.
12 In the 90s and in around 2000,
13 early 2000s, there was a tremendous
14 amount of research done. And if you
15 looked at the National Institute for
16 Environmental Health and Science, and if
17 you look at the National Cancer Institute
18 websites, they really refer to all this
19 data that was collected and researched,
20 you know, ten to fifteen years ago. And
21 because of the conclusions, and again,
22 there's a lot of material and it can be
23 very complex, the overall conclusions
24 really point to the fact that electric
25 substations do not generally create

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magnetic fields, and, again, because of the Little Tor situation and it's ten acres and the fact that it can attenuate through that ten acres, that it's really, the substation itself doesn't have an effect outside of the perimeter, and that's more detailed in the DEIS. It's in there, and I suggest that we could take another look, certainly, for the Board's sake, at that report. And Mr. Leifer confirmed that, and it's really been -- it's a standard, substations by themselves. Is there fields associated with the existing lines that are there? Yes. But just bringing it into the substation for power, the substation itself and that property, the signal, the EMF does not attenuate beyond the property.

So, again, in conclusion, I think the most important point for us is that there's a lot of study out there and I think it's worthwhile looking at, but at the end of the day, we're just finding

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that the fields that are there in the area are dominated by the transmission line and that the substation itself has its own fields that attenuate around the property. That's the conclusion there.

MR. GENESLAW: Mr. Coffey is referring to reports from various agencies. The reports or summaries that would be comprehensible to the lay person shall be supplied as part of the record. Part of the SEQR process is the disclosure process, and if there are conclusive statements or any information, they should be backed up by data. That would be information that the Board would review in the course of the continuing review of the application.

CHAIRWOMAN THORMANN: Would you identify Mr. Leifer for the people in the audience so that they understand?

MR. GENESLAW: Mr. Leifer is sitting opposite me. He is a consultant to the Planning Board on a number of areas. My own familiarity is consulting

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with the Board with respect to telephone phone towers. He is a faculty member at RCC, and I'll leave it to Mr. Leifer to give more about his background if cares to.

MR. LEIFER: My name is Morton Leifer and I live in New City. I'm a graduate electrical engineer, I'm a licensed professional engineer for the State of New York. I served for thirty-three years as the chair of the Division of Electrical Engineering Technology and Information Technology at RCC. I've been working for the Clarkstown Police Department and I'm responsible for all of their communications, and I have many of the FCC licenses, practically all of the FCC licenses that a person can have. I also serve on the Federal Communications Commission Board called ERIC, which is the Emergency Response Interoperability and Committee or Center. That's an FCC committee. And I also serve on the

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Region 8 Radio Planning Committee for the FCC, and I've done considerable study on this particular project.

There's no question in my mind that the electrical fields which are generated by the devices within the substation attenuate exponentially with distance, and by the time you measure on the perimeter, you would be much, much lower in electric field intensity than the ambient electric fields due to the existing power lines. That means that you could not measure any difference whether the substation is there or not in terms of the electrical field density. And that's a matter of physics and math. It's not an opinion. I'm not making an opinion about safety of electromagnetic fields, it's not an issue here. The issue here is that the substation will not produce electromagnetic fields any greater than you already have as a result of it being built. So as far as I can see, it is absolutely not an issue. And

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if anyone has questions, I'd be glad to answer them.

UNIDENTIFIED SPEAKER: Can you define attenuate, please?

MR. LEIFER: Attenuate?

UNIDENTIFIED SPEAKER: Yes.

MR. LEIFER: Attenuate is the diminishing of the electromagnetic field, if that's what you're talking about. And all radiated energy diminishes as one over the distance squared, so it's an exponential difference. Actually, the transformer is a point source, and because of it's geometry, it diminishes one over a cube of the distance, whereas the wires that are delivering the power to all of your homes are basically infinite sources in that they're not point sources, but they continually exist, and, therefore, wherever you walk, those magnetic fields exist. That's why the substation has absolutely no increase in magnetic field density once you're outside the perimeter of that substation.

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CHAIRWOMAN THORMANN: Okay. Mr. Geneslaw, do you want to go with your second point?

MR. GENESLAW: Yes. With respect to water quality, we are recommending a more in depth study into protection of local water sources both Lake Lucille and the Hackensack River from contamination from oil and other contaminants including contamination from geo-composite material. It would also include collection methods from oil spillage from leakage from the proposed facility and methods for protection of water courses from the effects of fire or explosion should be demonstrated.

MR. COFFEY: In terms of water quality, oil containment is addressed. There are a lot of questions concerning oil containment and geo-composite material, and Chuck Utschig is more of an expert than I. But in general, I want to point the Board to the fact that all the containment was addressed in the EIS

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Section Number 3, but what I want to reiterate, more importantly, is that there's three levels of protection for oil here. There's the transformer tank itself, which, again, is monitored 24/7 for oil level, oil temperature and all the important qualities on transformers. So the tank itself, in its own device, is what we call Containment System Number 1. And again, between the monitoring and the maintenance, that is our first protection for the area.

We have a second containment area that's basically a concrete block wall that is above ground and below ground that attaches to this geo-composite material that acts as a liner. For many years we really practiced just containment, that is basically the bottom of the stoned area was left open, and if we were having leaks, we would generally clean up that leak and did not alter the material and put it back in. But there wasn't that liner, if you will, to sort of make

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it more like a bathtub. The geo-composite material is there to allow water to pass as normal rainwater would. We don't want that tub to fill up in that regard. And it's a layered fabric, which there were some questions about if drips are going to now activate the geo-composite material and make it now solid. The drips, number one, are handled and monitored monthly. We monitor that with inspections, and if there's anything in the stone, that gets cleaned up immediately. We can't allow it to have any drips that are evident on the surface. But it if were to get past the stone and get to the membrane, there is this other layer that blocks the oil that doesn't activate the geo-composite part of it. If there were a larger incident where there were more significant oil spills, that would activate the shut-off and have the material block the oil from progressing, so that's an added measure that we've included in our last few

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substations. If there were a significant event, we would go in, dig out the stone and dig out the geo-composite material and replace it as new because it would have served its purpose and blocked the oil.

In addition to that, if for some reason the concrete wall ruptured above surface and allowed oil to get out above the ground, we've included a berm, if you will, that goes -- and Chuck you can correct me -- about six inches above grade and six inches below grade that's made of the geo-composite material that acts as a berm around the entire perimeter of the substation. So the 200 by 200 area now has this additional six inches, which if you do the volume, it's a tremendous amount for both, any oil or if there were water that were to go over ground.

So, I think the main thing is that we certainly want to, for the FEIS, explain in more detail that there are

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truly three layers of protection. That third layer around the perimeter of the substation is an added feature in order to provide additional protection for the west branch that we have this third tertiary containment system. That's really all I had on water quality.

MR. YACYSHYN: Define the geo-composite.

MR. COFFEY: I'm going to pass it on to Chuck.

MR. UTSCHIG: The geo-composite material is an engineered material that's specifically designed to react when it comes in contact with the oil, and in case, in essence, it's a liner to the bottom of the containment area, and it is permeable to water, but it reacts with the oil itself, and that reaction solidifies it. So, in essence, this containment area's entire concrete structure is around the transformer and it's sized to hold 110 percent of the total amount of oil that's in the

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transformer. Plus, it's designed to handle a certain amount of storm water. So that just in case there was a rain event and there was water in this containment area and you were to have an occurrence and the transformer would lose all of its oil, this containment area is designed for 110 percent of the oil plus a certain amount of storm water that may be in it. And the way it works is that this underlying material, in essence, becomes concrete when the oil comes in contact with it, and it closes off this containment area and creates a bathtub to keep it in. That's when you have a complete failure of a transformer and all of the oil leaked out.

For the drip situation, there's a similar material on the surface so it's almost two layers of this that are buried, and it is the surface material that deals with the drips. So the first thing that has to happen is the oil that's dripping has to work its way

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through the stone, and much of those drips get attached to the gravel that's in this area. And as John said, they inspect it monthly and those are cleaned up immediately. If the drips should get so far as to the bottom of the gravel where it encounters this material, the first layer of the material is designed to -- basically you'd have spots where it would come in contact with the material and solidify. Not until you had a major event and you had a large push of oil would it reach the second level, in which case that would create an entire bottom.

So your transformers are monitored 24/7 for any significant fluctuations in oil, your drips are handled through the gravel and the first layer of containment, and then the bottom layer of containment is what closes off the system, in essence, and keeps it contained in one area. Once that's occurred, Orange & Rockland will know that there's been a failure, all that

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material is then completely removed, properly disposed of and the system is basically reset again.

Now, the third level of containment, and these systems have evolved over time, there used to be a simple oil/water separator tank that they used to use as the relief for this. Even this containment system has evolved as they've used it, been exposed to problems, and the third level of protection here is, in essence, the same material that encircles the entire station. So that if for some reason there were to be, let's assume, potentially that the containment area that's the transformer had more water in it than what was expected or there was a reason why all of the oil couldn't be contained within it, then this perimeter is constructed of the same material, so it becomes a dam around the perimeter of the entire site, and the ability for it to contain oil in terms of volume is in

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the order of magnitude of probably ten times how much oil as is in one of these transformers because it's in such a large area.

So you've got these multiple levels of protection that come into play to deal with the incidental spill of oil, the catastrophic failure of a transformer, and then the third level of protection should the main containment area be compromised. And, again, just to repeat, all of this is, and we'll go into more detail in the FEIS, but all of this is described in the appropriate section of the DEIS.

MR. GENESLAW: The next item we have was with respect to aesthetic resources. South Mountain Road is a town-designated historic road and the project sponsor should work to architecturally integrate the substation into the surrounding area using the historic elements of the area and the architectural design. The facility

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should blend into the environment. We have several photo examples of how substations have been blended into an environment to look like a home or building, which we've attached for Board review, and those are attached to the memo to the Board.

MR. COFFEY: As far as the comparison of the O & R system to some of the examples that Mr. Geneslaw pointed out, Orange & Rockland is an overhead transmission and distribution system. When you look at the Little Tor parcel, you have the overhead lines coming in and the station designed overhead. The examples that were shown are typically urban and city applications where the system, number one, is underground to begin with and the space and real estate that's available is reduced. Gas-insulated switchgear, which reduces the footprint of the facility has been used for decades. But it's typically used, you know, Con Edison uses it, Boston

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Edison uses it, it is used in urban applications. It is really meant to integrate with an underground system.

Here in Little Tor, you know, it's a typical Orange & Rockland substation, which is more of a suburban application. We center the station on ten acres, have a tremendous buffer around the station, and it's really meant for an overhead application, where the lines are overhead, the station is air insulated. And that really follows the Orange & Rockland standards, our policy and how our rates and tariffs are agreed upon with the Public Service Commission.

As far as unique enclosed facilities that are more of this urban nature, they were not considered here at this time. They are a much different order of magnitude in cost and they are not supported by our present tariff structure with the Public Service Commission. If something were to be required by The Town of Clarkstown for

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this installation, there would have to be consideration for a special tax district set up for such a unique installation.

Again, I understand that there's a sensitivity about cost, but there is an agreement that we have also with the Commission on how we design our stations and we have them spread out over acres of property and we put them in a standard design which is an air design. We feel like the underground suggestion is even more of an environmental issue as far as placing structures in the ground that would have oil and possibly SF6 gas and they would now be closer to the water sources in the ground. We don't think that that's an environmental way to go, and that's not the way Orange & Rockland builds their substations. Again, they're out there, the technology is not new. It is order of magnitudes more in cost than the installation that we've presented here. But, again, the main point is that we have a rate structure set up with the

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Public Service Commission that has our substation designed to standard and this would be a unique application if requested by the Board.

CHAIRWOMAN THORMANN: May I ask you a question, Mr. Coffey?

Is there anywhere in Rockland County that you have a substation where things are underground?

MR. COFFEY: No, we do not.

CHAIRWOMAN THORMANN: Thank you.

MR. GENESLAW: Are there any sub-stations that are enclosed with building facades or within structures that appear to be buildings in Rockland County?

MR. COFFEY: We've recently completed a station on the Verizon Wireless property that was enclosed by a wall. That was a request by Verizon Wireless, and that was funded by Verizon Wireless for that application.

MR. GENESLAW: Is there some special characteristics for that situation because of the Verizon

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participation?

MR. COFFEY: I'd say in line with my previous statement, that is an underground-fed facility that was because of the distance between the location of the substation on an existing overhead system that was fed underground, so it had an ability to have a walled facade. But again, just to clarify, that was requested by the owner of the property, Verizon Wireless, to fit in with their existing architecture on their property.

MR. UTSCHIG: To put that station in perspective, that substation was located, actually, on part of the existing parking lot to the building. So we were locating a station there that was not in a rural, wooded area, but directly adjacent to the Verizon facility and their parking lot. So there were different aesthetic issues that Verizon was taking into consideration when that station was being constructed.

MR. COFFEY: And just one point.

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The transition from -- and I'm sorry, Mr. Yacyshyn, the transition from that overhead system that was existing to underground occurs on the southern side of Orangeburg Road, sort of in proximity to the Palisades Parkway. That transition introduced in that area significant structures, while it's not a substation, for to us to go from overhead to underground, there are transition structures in that vicinity which introduces an entire other project, if you will, in order to make that transition. That would be the case in this area, as well, that if we were to feed this station underground from the existing overhead system, it would introduce transition structures that are significant. We can certainly share with the Board pictures of that application so they can get a reference of what a transition structure is. But there is another element and almost another mini substation, if you will, that has to be

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built in order to transition underground.

MR. YACYSHYN: You anticipated my question, but just to encapsulate it, if you would, the popular conception in the public is that anything that's under-ground is better than anything that's above ground or overhead. We know, most of us know better. But would you briefly give us the pros and cons of both?

MR. COFFEY: Well, again, if we consider, there's really two different topics, there's transmission and distribution lines that run around our local streets and our transmission that runs on the right-of--way. Again, Orange & Rockland is an overhead system. Our cost base is based on an overhead system. And while there are advantages to going underground from the standpoint of aesthetics and the fact that it's not exposed to the environment, et cetera, the cost and, again, not to make it about cost because I understand that is a sensitive issue, it is several orders of

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2 magnitudes greater to go from an overhead
3 system to an underground system. And so
4 facilities like Con Edison, because of
5 space and proximity, migrated over many
6 years from an overhead system to an
7 underground system as technology advanced
8 in allowing cables to go under the
9 ground, and that insulation and the heat
10 dissipation that goes on with cables
11 allowed for the reliability to increase.
12 But that is, again, a rate structure and
13 a design that is far different than the
14 suburban utilities that Orange & Rockland
15 is right now. As far as substations, we
16 don't have one. Again, Con Edison has
17 air-insulated substations that they
18 spread out in their outer substations,
19 but in the city, they do have ones that
20 are more enclosed in vaults and that are
21 placed in buildings. And again, that's
22 more of a city design.
23 And again, the pros and cons, it's
24 more out of you're trying to fit in with
25 the space allocation you have and your

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surrounding environment, and that's really more of the application.

MR. YACYSHYN: Thank you.

MR. COFFEY: You're welcome.

CHAIRWOMAN THORMANN: Mr. Geneslaw?

MR. GENESLAW: I think that the Board is interested in pursuing either the underground or the facade or building solution. The Applicant should be asked to provide some additional information. They talk about orders of magnitude, greater cost, but I don't think the Board has much idea what that would be and what the transition structures might look like.

CHAIRWOMAN THORMANN: Well, he said he would provide pictures of the structures, if I'm not mistaken. And you might provide the monetary component.

MR. COFFEY: Okay.

CHAIRWOMAN THORMANN: We would appreciate that. Thank you.

MR. GENESLAW: The next item I had in the memorandum refers to home values,

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and we're suggesting that the scope of the real estate valuation be increased to include the entire region, the Hudson Valley or beyond, if necessary, because the sample size that was utilized is very small. That was noted by the real estate expert that the Planning Board used to review their material, and also because some of the substation locations are immediately adjacent to railroad tracks, in the case of the Congers substation, a very active freight line and it may be that the valuations on the part of prospective home purchasers are more influenced by the sound and sight of the trains than they would be by the substations. So we're asking that some additional analysis be done in a broader number of locations.

MR. MONTALBANO: If I may, we submitted a report by Beckmann Associates with respect to impact on property values located near a substation, and in reviewing Mr. Beckmann's report, the

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report of his office, although it would appear that there was a small sample, I would like to note there was a total of a hundred and eighteen sales that they looked at with respect to the Congers substation, and a a hundred and six sales -- excuse me I have it backwards, a hundred and eighteen sales with respect to the New Hempstead substation and a hundred and six sales with respect to the Congers substation. They then looked at a series of variables, location, size, area of the parcel, whether it was a colonial house, whether it was a raised ranch. And out of the a hundred and thirty-six sales, they found fifty-six good subjects. They then did what they called a regression analysis, which means they looked at the property and they went out twenty-five hundred feet from each location in increments of five hundred feet.

Their conclusion of their report, which by the way the town's consultant

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agreed with, was that they didn't find any statistical difference of any significance with respect to the impact of properties adjacent to a substation. There was a slight impact with respect to properties immediately abutting the substation, but as you got away from the substation itself, there was a minimal impact.

The rail line was also considered as part of the variable when they did their analysis with respect to the Congers substation. Now, I would suggest if they looked at a hundred and eighteen sales and a hundred and thirty-six sales, reduced them down to fifty-six and fifty on both locations, that's a broad enough sample. Nor did the town's consultant request us to do anything more. To expand this study beyond that I don't think serves any purpose.

MR. GENESLAW: As I recall, the Town's consultants indicated the sample size was very small.

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MR. MONTALBANO: But he didn't request that we expand it and look elsewhere, did he?

MR. GENESLAW: No, he didn't.

MR. MONTALBANO: Thank you.

MR. COFFEY: If I may, just one thing to add. If we look at the site, there's been a utility usage on that site since 1925. The former given substation was on that site from around that time all the way into the 1980's. We have a communication shelter on the site that's owned by Verizon, and there have been -- again, the lines that are there today. So, I would just echo Mr. Montalbano's comments and the fact that there's been a long time utility usage on that parcel there.

MR. GENESLAW: The next item we have was fire hazard. To investigate and employ fire stopping technologies and to employ the latest fire explosion extinguishing and technologies. It's been touched on this evening. I don't

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know if Mr. Coffey wanted to add anything more to it.

MR. COFFEY: I would just say that we could certainly, at the board's request, look at supplementing the information that we have in there already.

Just a few key points and, I think to address some of the questions that have come up from the public. First of all, we have been in contact with Vincent Narciso who is The Town of Clarkstown's chief fire inspector and he's reviewed the plans and he's been satisfied with them to date. We previously met the New City fire chief, Arthur Kunz, and he was satisfied with the project plans, as well. He's been replaced and we're going to be meeting with the new fire chief, as well.

CHAIRWOMAN THORMANN: Excuse me, Mr. Coffey. Just for the benefit of the public, the New City fire company is the fire company that would service the area

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if there were an incident?

MR. COFFEY: There was a discussion on the hydrant locations and we've located the nearest hydrant in the area of Denver Drive and Culver Drive, and we can certainly have that surveyed to give a distance and allow the Board to consider its relative distance to the substation.

Again, the other key points are, you know, the station is centered on a large property, and we're again not to keep hitting, we're monitored 24/7, but we are, from a firematic standpoint, we have a tremendous buffer around the station. We're not sitting on top of other dwellings, if you will. The station is designed with automatic protector relays and circuit breakers to isolate if there were an event. Most of the time if a transformer fails, no one knows about it other than us. As far as that, it's shut off, similar to a circuit breaker in your home, if something

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faults, it shuts off and we go and test and find out what the condition is. But certainly we can't say that failures haven't happened in as far as that produce fires and other catastrophic events. And I know that the public had brought up a few events that I'd like to address real briefly, as well.

Again, the main focus that we do throughout our system is that we work with local firefighting officials in the town and the county because we think that preplanning and the training and the information exchange is critical. We've recently had more information coming to us from Con Edison who produced training videos, as well, that we would be sharing with the local firefighting officials. So, certainly training and planning for an event is paramount and that communication is key.

But the three Con Edison events that were bought up a month or so ago, Dunwoody substation was mentioned over in

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the Yonkers area, that was November 9, 2009. That was a catastrophic failure of a large power transformer. Very different than what we have in Little Tor, but, again, a substation. But this was not a 345 kV station, an extra high-voltage station that's really a super highway for power going into the city. There is a different energy level, there is a different short circuit level. And without, again, killing everyone with the technical side of it, when there's a higher energy and short circuit levels available when a fault happens, there's more forces and there's more catastrophic capabilities that happen. This is not a 345 station, we do not have a transformer with thirty thousand gallons of oil. This is really a local distribution station that serves customers. But the Dunwoody event did happen. There was a failure of an oil/water separator, that again when you start to discharge this oil, it goes to a retention pond, and

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there is an oil/water valve that says I have oil, I need to shut off, or I have water, I allow it to pass it through. Chuck had mentioned that a few minutes ago. The oil/water separator had failed and allowed the discharge of oil. So there were definitely many lessons learned for Con Edison that were some facilities that were not working properly, number one. But to differentiate, in Little Tor, we do not have a system that is allowing water or oil to get out of the containment system, that we are a local containment system. We are not practicing what we call a point discharge system that allows it to go to a retention area. So, to differentiate from Dunwoody, we do not allow the oil component to hit pipes to another area, number one.

Pleasantville, which happened on April 20, 2012, it was a failure of a small metering transformer in the station. There was a brush fire that

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2 happened as a result of it. Again, it's
3 a small metering transformer that has
4 less than a hundred gallons of oil. It's
5 meant to measure the voltage and it's not
6 a power transformer, very different than
7 the Dunwoody scenario, but there was an
8 event there. The lessons learned or the,
9 I'll say the good point of it, Con
10 Edison's emergency management folks had
11 just finished training with the local
12 municipality for fire protection and the
13 event was very short lived. There was
14 nothing that went off site. And the fact
15 that the fire officials were actually
16 very pleased that they understood the
17 technology and they were able to put out
18 the fire, and, again, a relatively small
19 event, but something that, again, has to
20 be planned for and, again, very different
21 from Dunwoody.
22 And lastly, the last event that was
23 mentioned as far as Con Edison is
24 concerned was the Brooklyn event. Again,
25 345 kV, extra high-voltage system, large

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2 power transformer, had a bushing fail

3 which are the top mounting devices that

4 allow the power to go through the device,

5 if you will. It had failed, there was a

6 fire, there was an explosion, all of the

7 systems in the substation worked as far

8 as containment. There was no off-site

9 leakage, and, again, the systems in place

10 worked for that application.

11 So, again, in summary, we plan for

12 these events, we train with the fire

13 department. We think that our system and

14 our energy levels and our long-term

15 history of failures are very small. We

16 have very few failures, number one. We

17 have fewer failures that actually cause

18 fire, and we've had very few, and I can

19 only think of a couple of isolated

20 instances where any material was

21 effectively off site, and that was again

22 on a different part of the system, unlike

23 Little Tor, larger power transformer, 345

24 kV, very different application. But,

25 again, we learned from that.

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And I'm sorry, Ms. O'Connor?

MS. O'CONNOR: May I ask you a question?

The situation that happened down in Dunwoody resulted in a seven hundred thousand dollar fine against Con Ed and we learned that you had agreed to make changes to prevent future mal-functions and consented to a comprehen-sive review and audit of similar facilities in the Hudson Valley.

Now, you had something happen again on April the 28th. Can I ask you what your comprehensive review was, what you did to change how you function, and what was different with Dunwoody than what we're having here? Are those substations not monitored twenty-four hours a day when they're such a high voltage substation?

MR. COFFEY: I can only say that being it's Con Edison's procedures and audit as an Orange & Rockland employee, we were not involved with that. We can

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certainly follow-up with the Board to make sure, because, again, we don't have the oil/water separator system, so their audit and their designs are different. We certainly share information, but because of our designs being localized and not being as complex as the Con Ed system, they had to go through a process that we certainly monitor, but we did not have to live with because of the fact that it affected their system and not ours. But Dunwoody is, again, a thirty thousand gallons larger power transformer and they've had failures of systems that ended up causing the off-site discharge. We don't have those same systems here in Little Tor.

MS. O'CONNOR: But we do have a concern about Lake Lucille and the Hackensack River. You were fined because of Bronx River, for the oil going into the Bronx River. We have a similar concern here. So if you could share what your preventative measures are or what

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Con Ed has decided those preventive measures are, I think it would allay some fears.

MR. COFFEY: And, again, I'll just point back to the previous discussion on water quality that Chuck had gone through where we talked about the primary, secondary and tertiary. Chuck?

MR. UTSCHIG: I think the distinction here is, as we've been saying, some of it is lessons learned. The Con Ed failure was a single-point discharge. So, we've talked about having multiple levels of protection. That goes well beyond what the situation was at the Con Ed station. So we have, in fact, by virtue of learning those lessons, done exactly what you're suggesting, and that is develop a system that has not a single level of protection but multiple levels of protection. And in our case, we've gone away from the valve, which is a mechanism that could stick. We put in the category of mechanical systems versus

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the one that we believe which is much more foolproof and that is the use of this geo-composite material, keeping the potential for our oil contained in a single area and having multiple areas of protection, and that's the evolution that you're suggesting should be and has been done and has been implemented in this station.

MS. O'CONNOR: Thank you.

MR. TREVOR: I have a question.

What is the amount of oil in the current station and what is the actual capacity for containing that oil through all three stages of protection that you're talking about?

MR. UTSCHIG: Unlike the Dunwoody station, which was a thirty-thousand-gallon transformer, and as Mr. Coffey has indicated, that's a high energy system and the transformers are much larger, the three transformers that are proposed on this station have oil capacities that are, two of them are just less than five

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thousand gallons, and one of them is just over seven thousand gallons, and the containment systems are designed to hold 110 percent of that entire volume in the first level of protection. And, as I said before, that containment area also has a provision for capacity for a certain amount of storm water in it. So if there were no storm water, the holding capacity would actually be more than 110 percent. That's the first level of protection in the primary containment area. We have not calculated the volume for the perimeter containment area, but that's a piece of information that we can easily supplement in an FEIS to address that question.

MR. TREVOR: Please. And because you said it suggested that the perimeter containment would be protection from a major storm event. In other words, would that include flood?

MR. UTSCHIG: No. The perimeter containment area is unrelated to storm

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water. It functions, as does the primary containment area, in that when oil comes in contact with it, it solidifies. So it is, in essence, if oil were to breach the primary holding area, travel from that location, in most cases, I'm going to think it's about a hundred feet to the perimeter of the fenced area, it comes in contact with this additional material that solidifies and holds it in. One of the challenges here is always to try and figure out a way to manage storm water and yet control the oil.

We would like to be able to think that we could build a wall around this whole thing at a certain height and oil would never get out. The problem with that is you don't have a mechanism to get your storm water out. In the early designs of the oil separators was the first attempt to do that. In essence, they connected the containment area to an oil/water separator, and that allowed, through baffles, like a conventional

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oil/water separator, the holding of the oil.

MR. TREVOR: Right. So the question, basically, the essence of my question is, if you had a major storm event, not necessarily like Irene, but we do get events where you have many inches of water, an inch of water an hour over a period of time, if at the same time you had a failure of the transformers, what capacity would there be to contain both the oil and the water from this rain event? Because you could have quite a few inches of rain before you managed to alleviate the problem.

MR. UTSCHIG: I understand your question, and I can give you the short answer tonight, and we can, again, supplement your questions in an FEIS.

MR. LETSON: About a hundred fifty thousand gallons. The 200 by 200 by geo-composite perimeter is six inches above brief. So that's fortt thousand square feet, six inches deep. It's

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twenty thousand square feet times 7.48, it's about a a hundred forty-nine thousand gallons.

MR. TREVOR: But in times of rainfall?

MR. LETSON: Six inches deep, you're talking about a rainfall event that rivals a fifty-year storm.

MR. TREVOR: Which we get in this area about every three years.

MR. UTSCHIG: But there needs to be a clarification to that. What you're suggesting is that there should be a containment area that holds the storm water and the oil. This system is designed specifically not to contain that. So as it rains, the water is moving through this material around the perimeter. So even if it's raining, you'd have to have a situation where your storm water system backed up completely. You had a rainfall event in excess of a twenty-five-year storm before it got out of the initial containment area. You'd

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have to have another six inches of rainfall to where you had containment failure on the perimeter. And that's assuming that none of the storm water worked its way out through the filter, which it can do while it was raining. You're starting to add up these components to an order of magnitude that is, even given the current rain events, probably reaches the most severe rain events you've had in terms of protection once you add all the levels together.

MR. TREVOR: I understand that, but we've had two rain events like that in the last twelve months.

MR. UTSCHIG: And this system as described will function fine under those conditions.

MR. LETSON: What's the absorbent capacity of that material as far as either gallons per square yard of material or --

MR. UTSCHIG: I'd have to get the specific answer of how much oil has to

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come in contact with it before it solidifies. I don't have that number like per foot of material. But it's designed so that when that contact occurs, it does solidify. We can, again, answer that question as part our responses, hopefully, in an FEIS.

MR. LETSON: Mr. Trevor, if you put it into relative terms, the gallonage figures that you pull in for all three transformers amounts to about twenty-two hundred cubic feet, and the perimeter containment, like I said, amounts to about twenty thousand cubic feet. So, you have the ability for a certain amount of water to pass through that barrier until such time as the oil comes in contact with it, it will absorb a particular volume of oil and will still continue to pass storm water. So it's not necessarily a static equation.

I can continue to give you the simple calculations upward, but that's the reason I asked for the absorbent

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capacity for the material. If you have an absorbent capacity of event perimeter that will absorb the entire twenty-two hundred gallons and still have the capacity to flow or overflow storm water, it's not an issue. If it doesn't or the multiple levels don't have a combination capacity to absorb the blocked out material, then you may have to look at additional methods.

MR. TREVOR: So what we need is that additional information?

CHAIRWOMAN THORMANN: He said he'd provide it.

MR. TREVOR: Thank you.

CHAIRWOMAN THORMANN: Mr. Geneslaw?

MR. GENESLAW: The next one we covered, but it was to investigate substation feasibility. I would add to that above ground, but any building or at least behind a facade so that it's integrated architecturally with the area.

The last item was to investigate the use of gas-insulated switchgear

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technology as an alternative as there are several features of such technology that reduce adverse impacts. That was not discussed at all in the DEIS. It was apparently not something that O & R commonly uses.

CHAIRWOMAN THORMANN: Mr. Coffey?

MR. COFFEY: Again, we can certainly cover that in the supplemental information. I think I went into it a little bit that GIS is similar really to that urban application. You're taking the conductors that are insulated by air and separated by feet and putting them in a gas tube and that they're separated by inches. And, again, it's a different application, it's more of an urban city application that has not been the O & R standard, but we can certainly address that in the FEIS.

CHAIRWOMAN THORMANN: Is there anything else?

MR. GENESLAW: Just the closing, closing two sentences. The foregoing,

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the items we just discussed, are items we believe to relevent to a Supplemental EIS. There may be other items raised at the public hearing that would be appropriately discussed in the FEIS.

CHAIRWOMAN THORMANN: We'll discuss this, if you don't mind, after we have the public input. But before I open to the public, I would like to ask whether any of the consultants have any questions or comments that they want to make before I open it to the public?

MR. STREITMAN: Just one simple one. When you were talking about the other fires and so forth, you were kind of alerting to the magnitude of those stations as major substations holding a lot of gallons of oil. When you get to this substation, you kind of downplayed it as being rather small, just for our local area. Still, those seem to be containing seventeen thousand gallons, which is more than half of what this gigantic one is. Why were you

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downplaying it so much?

MR. COFFEY: Just for clarification, that's a good question. The Dunwoody transformer we referred to is one transformer in a yard that has several major pieces of equipment in it. So, the one transformer that failed has thirty thousand, but that's not what the whole station has as far as oil, it's much more than that. So a lot of the surrounding transformers, and I forget how many there are, because, again, the details elude me, so when we talk about the total for Little Tor, and just for clarification, Chuck had, it's two seven-and-a-half-thousand gallon units and it's one fofty-four hundred, so it's about fifteen, it's about twenty thousand gallons as compared to the thirty. But we're talking about the entire station as compared to one unit. The volume of Dunwoody would be, again, several times the thirty thousand gallons that's there.

MR. STREITMAN: Thank you.

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MR. COFFEY: You're welcome.

CHAIRWOMAN THORMANN: All right. One question I would like to ask, because I had a call come into the office about who and what is being served by this substation that you wish to build, so would you be good enough to explain, and I don't care who does it, who and what will be served by this new substation?

MR. COFFEY: When you look at the, I'll call it, the North New City area, we have a Congers substation that was mentioned to the east, we have a New Hempstead substation that's close to the Palisades Parkway, and we also have a West Haverstraw substation located on Route 202. Those three combined to serve a large portion of the Clarkstown area. And those stations together serve about thirty-seven thousand customers. So with, again, in the past we've gone to sort of an ink blot theory, but if you picture those three stations, and, again, stations are not fed by town boundaries,

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it's an integrated system, just so that everybody's on the same page, and so because of the fact that the capacity has been reached at those neighboring sub-stations and the area in the North New City area has, load has grown over the last several years, the Little Tor substation would occupy, you know, the local area and service in the vicinity -- Ms. Lanza, can you help me? Is it about fifteen or twenty thousand customers?

MS. LANZA: Yes.

MR. COFFEY: But, again, we would have a new source that would, again, cooperate with the other substations. They all have the ability to connect to one another, but it would be mostly serving the North New City area. But in the DEIS there's actually a justification that shows the before and the after. And there's these colored ink blots, if you get a chance, and we can supplement you with that.

CHAIRWOMAN THORMANN: The other

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part of that question I was asked is what portion of this energy is going to the quarry?

MS. LANZA: That's easy to answer, but let me just go back to what John said. 85 percent of the customers on Little Tor substation are residential. Only 15 percent are non-residential, and that would include, I believe, the county facilities on Main Street, possibly Tony's office. I did look into this the other day anticipating this question. Right now Tilcon is fed out of a small transformer that's on the outside of the fence in its own enclosure up at West Haverstraw. It is a seven-and-half MVA transformer. At peak, they're using two.

Now, the reason that we're putting -- you know, we're moving that source from Tilcon to the substation is it removes now exposure to them and we can retire the older transformer. We are using a transformer that I removed from the Crestkill substation, so we're

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2 recycling the transformer, it's free. So

3 that's why there's a 25 MVA transformer

4 going to Tilcon. So that transformer is

5 being supplied by the two 50 MVA

6 transformers in the yard. So the two 50

7 MVA transformers that supply that area

8 and maybe 2 MVA at peak will supply

9 Tilcon.

10 CHAIRWOMAN THORMANN: Thank you.

11 MS. LANZA: You're welcome.

12 CHAIRWOMAN THORMANN: All right.

13 Now I'm going to open it to the public.

14 One at a time, come forward, identify

15 yourself for the record and give your

16 address and say your peace. And, again,

17 I request that you not be repetitive.

18 Thank you.

19 MR. TERRIBILE: Hi, my name is Bill

20 Terribile, President of Lake Lucille

21 Property Owners Association. I just had

22 some questions because they were saying

23 stuff about remote diagnostics. Remote

24 diagnostics is a term that is, you know,

25 is very vague. You could have somebody

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in India looking over a substation and all of a sudden you have a power outage or something like that, and a lot of times, I know, with remote diagnostics you have to reboot the server and stuff like that which takes a lot of time. So, what they could actually be doing is having somebody it India doing remote diagnostics. That was my first question.

CHAIRWOMAN THORMANN: On your first question, I said that it is -- who is in charge of the remote diagnostics?

MR. TERRIBILE: And how does the remote diagnostics work?

CHAIRWOMAN THORMANN: All right. If you can give them a chance to answer, I appreciate it. Thank you.

MR. COFFEY: The proposed substation would be monitored, like all our substations, by our Energy Control Center that's located in Spring Valley, New York on Route 59 right across from the high school. So everything is there. We have, again, multiple senior operators

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on shift that monitor the system 24/7.

MR. TERRIBILE: But is this something that if it goes out it has to be reprogrammed or something like that from the substation?

MR. COFFEY: Again, the remote alarms feed what we call a remote terminal unit that's fed off of station batteries. So even if we have a failure of the service to the station or if the station were out of service, we would still have batteries that would be running the remote diagnostic systems.

MR. TERRIBILE: Okay. Another question I had was, you were speaking of Tilcon, and if I could point to something, and I'll be loud. This is the property that we're talking about, and it's ten acres and Lake Lucille is about seventeen acres. You have a line going through here, telephone lines, I'm sorry, power lines going through here, and four years ago I told them that these lines had be to fixed and that there were

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cables on top, they were like guiderails on top that had broken off and gone into the lake. As of today, they're still not fixed. And I don't even know how they'd be able to be fixed. Is there a reason why these things are not being fixed? If we're gonna be putting a big substation and these lines are going to the sub-station, you're talking about doing maintenance on the substation and it makes it sound like, you know, this maintenance is going to be real quick, and I've been waiting for four years now for those telephone poles to be fixed 'cause now they're leaning and no one's going out to fix these.

CHAIRWOMAN THORMANN: Is that the island that you spoke about at the last meeting?

MR. TERRIBILE: Yes, yes.

CHAIRWOMAN THORMANN: Well, we went up there and we couldn't find it.

MR. TERRIBILE: You couldn't find the telephone poles?

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CHAIRWOMAN THORMANN: We couldn't find the island.

MR. TERRIBILE: The island is out there. The island is out there. It's not in the middle of the lake, it's where the telephone poles are.

MR. TREVOR: I was there, as well, a group of us went, and my recollection was they was they were on the south side of the lake, the southwest side running west to east and they appeared to be somewhat tilted, but we didn't see anything that looked like it was broken off the way --

MR. TERRIBILE: I could show you pictures of it. Next time I'm here I'll bring pictures.

CHAIRWOMAN THORMANN: No, no, that's okay. Hopefully we'll have this all resolved.

MR. TREVOR: We made a site visit, and after your comments, we took it quite seriously and we took a look, but we couldn't find the things that were

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described the way you described them, so...

MR. TERRIBILE: On top, you know, when they go over the telephone poles, they have those big balls on top, whatever you call them. Whatever you call them, I call them guardrails?

CHAIRWOMAN THORMANN: Yes.

MR. TERRIBILE: Well, the middle ones have broken off and they're not there anymore.

CHAIRWOMAN THORMANN: Would it be possible, Mr. Coffey --

MR. COFFEY: Just to comment. We received a comment a couple of years ago or three years ago and we did visit with operations, our overhead line maintenance department, engineering visited the site, and, again, they -- I can't go into the details 'cause I don't have them in front of me, but it has been inspected and it was okay for continued service. But, again, just because I know Mr. Terribile is concerned, we can certainly go out

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there and try to make sure that if there's something he's seen that we haven't seen, we can follow-up with it.

CHAIRWOMAN THORMANN: This Board would request that you do whatever needs to be done.

MR. COFFEY: But we did not ignore the request and we did visit it and we can try to arrange that.

CHAIRWOMAN THORMANN: All right. Thank you.

I would like to give some other people a chance, if you don't mind.

UNIDENTIFIED SPEAKER: No. Let him speak.

CHAIRWOMAN THORMANN: Does he speak for you? It's usually one question, it's not a litany.

MR. TERRIBILE: I did this because I didn't want eighty-five people to come up here.

CHAIRWOMAN THORMANN: Well, all right, I'm telling you that they can, but that's fine.

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MR. TERRIBILE: Thank you. So the other one, I just wanted to explain to you, you're talking about seventeen thousand gallons like it's really nothing. Three weeks ago we incurred, a garbage truck came into Lake Lucille and by mistake one of his hydraulic lines broke and ten gallons went over by the dam and it leaked all the way down and we had to have environmental people there, we had to have a cleanup done. We had to take the soil out and have it tested.

To make a long story short, all those things are still bagged up and on the side of somebody's lawn and they've been there for three weeks.

My question is, this was ten gallons and it took up a space that was huge. If we're even talking about a thousand gallons going into the drinking water, it's very scary for anybody to live there and know that this is overhead of you. And at any moment we have storm drains that can't even hold three inches

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of rain right now and you're telling us that it's gonna hold. We've lived there, we see what's happening in those woods, and it's quite dangerous right there right now. And for anybody to tell me that seventeen thousand gallons is an environmentally safe situation, I find that hard to believe.

The last thing I just wanted to say is, I told you last time about the fire hydrants. And what you're talking about is over on Denver, going over on Denver, if you have -- by the way, this is all wooded area here. If you have a fire up here and your closest fire hydrant is here, you're going through woods, streams, everything to get to a fire hydrant. And I don't know how firemen could that.

That's all I wanted to say, thank you very much.

MS. SCHAEFER: My name is Juli Schaefer. I also live on Lake Lucille. And I have a few comments and questions.

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If somebody -- I probably should know this, but on that map, where exactly is the substation?

CHAIRWOMAN THORMANN: Mr. Simoes will show you.

MR. SIMOES: There's another map that might be more useful.

(Map displayed on laptop computer.)

MS. SCHAEFER: It kind of fronts on South Mountain; is that right?

MR. SIMOES: You can see it. It's superimposed on this map. That's tilted where north is to your right.

CHAIRWOMAN THORMANN: Do want to get up there, Mr. Simoes, so the people in the audience can see?

MR. SIMOES: Sure.

CHAIRWOMAN THORMANN: Thank you.

MR. SIMOES: Here's South Mountain Road, here's Little Tor Road, here's the access and here's the substation, here's the stream (indicating).

MS. SCHAEFER: And the property goes way back.

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MR. SIMOES: The property boundaries are to here and then back and to this corner along the roadway (indicating).

MS. SCHAEFER: Okay. So, it's essentially almost in the middle of the property. So, it's not exactly where the temporary substation is?

UNIDENTIFIED SPEAKER: The temporary is under the lines.

MS. SCHAEFER: The temporary is very close to South Mountain Road. Okay.

CHAIRWOMAN THORMANN: Isn't that on the property lines, the temporary?

UNIDENTIFIED SPEAKER: It's under the power lines.

MS. LANZA: It's very close to the property lines. You see that circular driveway? It's toward South Mountain Road under the lines.

MS. SCHAEFER: It's essentially on South Mountain Road, it's right there, but that is not -- okay.

CHAIRWOMAN THORMANN: No.

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MS. SCHAEFER: Okay. I just ---- the fires, I just want to reiterate that I can't imagine how our fire department would say that they could handle a fire in that wooded area. How, if the fire goes up the mountain, do they get up there to put it out? How do they use one hydrant, like Bill said, to get a hose, water through wooded area and streams? But if the fire spread, I mean, there is no way to put a fire out with one hydrant in that area. Across South Mountain Road it's also all wooded area. Everywhere around South Mountain Road is wooded area.

CHAIRWOMAN THORMANN: This might be helpful to you. I asked one of the firemen that work here about that, and I was told that the first thing they do is secure the perimeter.

MS. SCHAEFER: Yeah, except that if it's out of control, if it's like a brush fire that's gone off on its own, I have no idea how --

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CHAIRWOMAN THORMANN: I can't imagine, and I'm not an apologist for the Applicant or anything because we represent the people here, I can't imagine that our fire people, the town fire inspector, the chief fire inspector or the captain of the company that's going to service it would be putting his own men in danger.

MS. SCHAEFER: I know, it defies logic, but to me, you know, in my world living there, I just can't imagine.

CHAIRWOMAN THORMANN: I understand.

MS. SCHAEFER: And lastly, I hate to say the same things that Bill was saying, but shame on you, really. These poles, leaning. How can you say they're operational? They're leaning. They're like at an angle going towards people's property. Thank God they're not going the other way into the lake or people will be electrocuted.

CHAIRWOMAN THORMANN: The Board asked them to please take care of it,

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and, Mr. Coffey, what did you respond?

MR. COFFEY: We'll follow-up.

MS. SCHAEFER: Yeah. Well, we heard that three years ago, four years ago.

CHAIRWOMAN THORMANN: Did you hear the Board making the request?

MS. SCHAEFER: Okay, okay.

CHAIRWOMAN THORMANN: We made a formal request.

MS. SCHAEFER: Okay. Thank you very much.

CHAIRWOMAN THORMANN: You're very welcome.

MR. ROSEN: Hi. My name is Bob Rosen. I live on South Mountain Road on the mountain side.

CHAIRWOMAN THORMANN: Excuse me? Would you give your street address?

MR. ROSEN: 287 South Mountain Road.

CHAIRWOMAN THORMANN: Okay. Thank you, for the record.

MR. ROSEN: You spoke earlier about

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the geo-material and the membrane. I'd like to know how many installations you have that already use that technique, how long they've been in operation and what the results have been with them.

MR. COFFEY: As far as years of operation for the material, that I would have to research with the vendor.

MR. ROSEN: No, I'm not asking the material. I'm asking how many installations you already have that employ these techniques. I wouldn't want to be the first one.

MR. COFFEY: As far as in our present substations, we've used the material in different forms, not always in a liner, but in more of a sump arrangement. But, again, I would have to research a bit. It's probably in an order of a handful of substations. And the liner itself, again, this is one of our first one or two substations that we're using it in.

UNIDENTIFIED SPEAKER: Oh, great.

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MR. ROSEN: So we don't really have --

MR. COFFEY: The material's been in service for a long time elsewhere.

MR. ROSEN: I guess what I'm really asking here is whether we have a well-founded basis for the plan that they're suggesting would contain everything. If we're gonna be the guinea pigs, I don't really want to hear that. If you can demonstrate that there's evidence that this entire system, because you talked about the tertiary aspects of it, where you've got layer on layer on layer, and that's fine, unless you haven't already employed layer on layer on layer, so I'd like the Board to please consider that and look for experience in that regard.

Thank you.

CHAIRWOMAN THORMANN: Mr. Baum is next, sir. One at a time. I hope you're not going to read that whole thing,

Marvin.

MR. BAUM: There's critical

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information that I am bringing here tonight including answering some of your questions and also dealing with some of the issues that were brought up tonight. Things that you said, "Oh, we'll get it in the future," or they said they'll provide it in the future, I will provide it tonight. So let me start off by saying my name is Marvin Baum and I'm a resident of Valley Cottage. I wanted just to start off, I had appeared last time. Can everyone hear me?

CHAIRWOMAN THORMANN: Yes, we can hear you, Marvin.

MR. BAUM: I appeared last time and raised some of the issues that Mr. Geneslaw had gone over and were raised tonight. I followed up on May 25th, by May 25th with the attachments and just kind of a summary of some of the points that I had made. Some of the issues were kind of brought up, Mr. Geneslaw touched on it, but never really got answered tonight with regard to the issue of a

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catastrophic event and dealing with it. The problem with the Dunwoody was from the amount of water that was used by the firefighters. In the DEIS it says that it will take care of the fire simply by letting it burn out. But if the conditions are such, high winds, very dry conditions, they will use massive amounts of water. So the question I had, and I think that perhaps Mr. Geneslaw had tried to touch on it but it wasn't answered by the Applicant, is what happens if the fire department has to use water to put this fire out, can't let it burn out on its own? If there's perhaps water, you know, that's not getting out there for whatever reason, what's going to happen? And that was the question. That is what happened to Bronx River, and, of course, people don't drink water out of the Bronx River. We do drink it out of the Hackensack River. So I think it's an important issue that needs to go along with the overall emergency services

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issues.

And I would strongly encourage you, Madame Chair, if you could forward the document that I had sent you on the 25th along with the links which showed the fires at substations that are substantially smaller, either I believe there were either 138 kilovolts or 69 kilovolts, and you saw from what I showed you last time how massive those fires are and how big those explosions could be. We are dealing with a densely wooded area, steep slopes and all kinds of other conditions that could make it harder for the firefighters because they're not aware of some of that information. I think that it might give them a new perspective if you were to forward it to them.

I also want to point out that although I did say that there were a couple of specific Con Edison substation fires and explosions that had taken place at that period of time, as I did a very

1 (PLANNING BOARD)

2 simple search on the internet, I found
3 out there were other substation fires not
4 too far from here, around the same period
5 of time, in the last couple of weeks in
6 places like Edison New Jersey, Boston,
7 Massachusetts, Portland, Oregon, New
8 Orleans, and even on the day that they
9 sent this, in Asheville, North Carolina,
10 that was caused by a snake, a black snake
11 trying to get at some eggs.
12 What I didn't mention last time,
13 although I did raise it in my e-mail and
14 I want to raise for the benefit of the
15 public, is since there is a potential for
16 an explosion and fire at this facility,
17 the fact that there will also be a gas
18 substation, I wanted to find out, and I
19 think it should be part of the DEIS, it
20 should be part of the final record, the
21 confluence of both a gas substation --
22 CHAIRWOMAN THORMANN: Can you go a
23 little slower, please?
24 MR. BAUM: Okay.
25 CHAIRWOMAN THORMANN: Marvin, you

1 (PLANNING BOARD)

2 know, too much all at once, it clouds, so

3 please go a little slower.

4 MR. BAUM: Okay. So we have at

5 that location a gas substation as well as

6 a proposed electrical substation. What I

7 want to question is whether there is some

8 additional risk by putting those two

9 facilities at relatively close proximity

10 from a firefighting and safety stand-

11 point. I mentioned the Fukushima Daiichi

12 plant, problems with the nuclear plant in

13 Japan. It was a worst case scenario that

14 they had not planned for --

15 CHAIRWOMAN THORMANN: From whom do

16 you wish the response?

17 MR. BAUM: From the Applicant.

18 CHAIRWOMAN THORMANN: From the

19 Applicant, okay.

20 MR. BAUM: The Applicant should

21 deal with the combined possibility of

22 those two having a problem.

23 Now, I did in my letter to you and

24 to the Board, I did send links to the

25 deadly gas line explosion and fire in

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California which destroyed a number of homes and also killed at least one person that I was aware of, it may have killed more, it injured many more people, as well as one that took place in Edison, New Jersey. So we seem to have a possibility of a combined risk, and so I want that looked at.

The issue you raised earlier with -- I'm sorry, I don't know your name at the end there.

MS. LANZA: Joanne Lanza.

MR. BAUM: Lanza?

MS. LANZA: Lanza, L-A-N-Z-A.

MR. BAUM: -- Lanza, what Ms. Lanza had talked about is that 85 percent is for residential purpose and 15 percent is for commercial customers and municipal customers. Now there are two 50 MVA transformers at the location and there is one 20, not 25, I think you may have said 25, the 20, and the 20 according to DEIS is not the primary as was described here tonight, it is the backup.

(PLANNING BOARD)

It says in the DEIS that Tilcon is being serviced from the Haverstraw facility. Didn't say anything was being removed there. So, what we got tonight was very different information than the written documentation that you have before you. And if you add up 50, 50 and 20, that's 120. And if one customer is getting 20, it means they already have 20 percent. How can we state in the DEIS that it's only 15 percent for commercial and municipal customers?

CHAIRWOMAN THORMANN: All right. Ms. Lanza, do you want to take care of that statement?

MR. COFFEY: I'll take care of it, Ms.Thormann.

Again, keep in mind, there's nothing for Tilcon. The only thing that's changing the Tilcon load-wise is that instead of the line coming out of West Haverstraw, running over the mountain, coming through the parcel and then on to Tilcon, we're simply locating

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a transformer, the 20 MVA transformer is way oversized for the applications, they're not being served a 20, as Joanne Lanza stated earlier, they're in a 2 MVA range. So, the simple math that Mr. Baum is attempting to do is not what their load is really served at. They're being served in the 2 MVA out of the 20. So the transformer capacity is much more than what they're being served at. And then the 50 MVA transformers, the two of them are out to feed the local community. So, again, the size of the transformer does not match the load in which the customer is consuming, that's where the error is.

MS. THAL: Excuse me. I have no idea what the hell you're talking about.

CHAIRWOMAN THORMANN: Excuse me.

MS. THAL: I would really like a chart to show me that.

CHAIRWOMAN THORMANN: Who's speaking, please? I can't see. Who's speaking?

(PLANNING BOARD)

Yes, Ms. Thal?

MS. THAL: I don't know what the hell you're talking about.

CHAIRWOMAN THORMANN: That's why I have an engineer because I don't understand all of the intricacies either. All right?

MS. THAL: Well, I'm sorry, I would like to ask for something that shows 2 plus 2 equals 4 equals 6.

CHAIRWOMAN THORMANN: Unfortunately, we live in a world where there's technology. All right?

MR. MONTALBANO: Our stenographer can't possibly get all of this down.

CHAIRWOMAN THORMANN: I'm trying to maintain some sort of order here.

MS. THAL: I understand that.

CHAIRWOMAN THORMANN: All right. Then wait until you're recognized, please. Please wait until you're recognized.

Do you want to have to explain it from the chart, Marvin?

(PLANNING BOARD)

MR. BAUM: Well, I actually want to talk to Mr. Coffey first. I'm going to jump out of order from what I was going to do tonight.

Mr. Coffey, can you just quickly repeat what you just said for the Board?

MR. COFFEY: Again, we can certainly supplement the information and the DEIS for the FEIS to make sure that the Board understands, but the point is that the size of the transformers at 20 MVA is not what the customer is being served at.

CHAIRWOMAN THORMANN: That's right. We understood that.

MR. COFFEY: It is much bigger, and that is not what, that the ratio that Mr. Baum is attempting to make cannot be made by capacity because we have the information for what the customer loads are. We can furnish that.

CHAIRWOMAN THORMANN: All right. So you'll furnish that.

Yes, Mr. Letson?

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MR. LETSON: If I can, just to go back. The bottom line is, and I would hope that Mr. Coffey's previous statement that you've got 120 MVA capacity in this plant is not what the current demand is because I would certainty think it to be somewhat counterproductive to put in a plant that only meets the current capacity. This plant had better have a twenty-year projected demand capacity to it or we all shouldn't be sitting here.

CHAIRWOMAN THORMANN: Mr. Coffey?

MR. COFFEY: And that's correct. The two transformers are there to back each other up, so the actual load served on the distribution end would not exceed a single transformer and there is capacity for at least twenty years of growth in the future.

MR. YACYSHYN: What is the current load?

MR. COFFEY: The initial load?

MR. YACYSHYN: No. Right now, what is the average that's being sent?

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MR. COFFEY: Initially, the station will feed four circuits of capacity out of the station. We have a total capacity for the future for eight, so it will be much less than half.

CHAIRWOMAN THORMANN: Yes, Mr. Baum?

MR. BAUM: Ms. Lanza first had said some things which again I feel need clarification. We're not going to be using the full hundred, two 50s at full capacity, and we're not going to be using the Tilcon at full capacity, but we go by what the capacities of the transformers are, and that's the only way I can measure because those full capacities or at least a good chunk of those capacities may be utilized at some point in the future, we're talking about the environmental impacts here. And so the environmental impact is not just for --

CHAIRWOMAN THORMANN: Slow down, please.

MR. BAUM: -- not just for startup

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day, it's for every day into the future.

But now I want to get to a point. Again I'm jumping ahead of my presentation. That gets to Mr. Coffey's point because we have to hear information and we have to believe information. If you could ask Mr. Coffey, and I realize I'm talking to you, but if you could ask him once again the question you asked him before, you ask him, are there under-ground transmission facilities in Rockland County? He said no, but qualified it that in Orangetown they did add in a substation on Line 702 at Verizon, and in order to access it, they put the mile and a quarter, whatever it is, underground.

CHAIRWOMAN THORMANN: Yes, at Verizon's cost.

MR. BAUM: At Verizon's cost, very good.

Mr. Coffey, are there any other underground facilities in your service territory of the Rockland County area?

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MR. COFFEY: The question before by Mr. Geneslaw was are there any underground substations, and the answer to underground substations was no.

As far as underground facilities, we do you have underground facilities, an isolated amount, but we do have some isolated transmission and we do have some underground distribution, but it is a small percentage of the overall system. But the answer to Mr. Geneslaw's question was for underground substations.

MR. BAUM: I think you had mentioned underground transmission lines as part of it. Is that correct, do you recall, Mr. Geneslaw?

CHAIRWOMAN THORMANN: Marvin, please, you need to slow down. This is not a court of law.

MR. BAUM: Well, but he --

CHAIRWOMAN THORMANN: No, no, no. Please, and you need to slow down, and if you have a question, you can't shift from me to Mr. Geneslaw.

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MR. BAUM: Okay.

CHAIRWOMAN THORMANN: All right, please.

MR. BAUM: What I want to do is show you the type of device that enables a transmission line to go underground. Here, one of the pictures shows it going out one way and the other picture shows it going out the other way, and the middle is the community that has all of the facilities underground. That's what it looks like. I think that had been raised as a question. There is one community in Rockland County that has its transmission lines completely underground.

CHAIRWOMAN THORMANN: All right. Just say what it is.

MR. BAUM: I'm just taking out the pictures to give you.

CHAIRWOMAN THORMANN: Well, just tell us where it is so they can respond.

MR. BAUM: It's right on this particular transmission line in the

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Village of New Square. These are the entry points.

(Photographs submitted to the Board members.)

MR. YACYSHYN: What's the relevance here?

MR. BAUM: It will be relevant relative to the presentation I give tonight. Just moving on ahead here for on second.

CHAIRWOMAN THORMANN: Do you serve New Square, Mr. Coffey?

MR. COFFEY: Yes. As I just stated, we have underground facilities that are transmission and distribution. The question before was do we have underground substations. We do not have an underground substation, but this line does dip in the New Square area and, again, it was funded outside of Orange & Rockland in order to have that installation done.

CHAIRWOMAN THORMANN: May I ask who funded it?

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MR. COFFEY: I'd have to verify that, but I don't have the information.

CHAIRWOMAN THORMANN: I'd like to know how it was funded.

All right. Your next point?

MR. BAUM: There is a temporary substation that is on the site now, and I have quite a bit of concern from the segmentation standpoint. This I'm raising with the Board that there was a process that did not include incorporating the temporary substation and the supposed need for the temporary substation into the DEIS. Mr. Mark Skenier did a FOIL request, and in the FOIL request he asked for the documents related to submissions and there is two references to an original narrative and a revised narrative, we did not get that narrative.

CHAIRWOMAN THORMANN: Well, the temporary facility did not come before the Planning Board. That was handled through the Building Department.

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MR. BAUM: I realized that the appearance of segmentation since, in essence, that is giving a one-quarter capacity for final product for a plan that needs to be approved by a special permit.

CHAIRWOMAN THORMANN: The Counsel has gotten up. We had nothing to do with a temporary. Oh, there she is. He's talking about the temporary station, that it didn't appear in the narrative. I told him that there wasn't any request before the Planning Board, that it was handled strictly with the Building Department, the temporary facility. He says that's indicative of segmentation.

MS. MELE: Well, A, I disagree, and B, yes, it was handled by the Building Department. We do handle temporary requests in that manner. I know that Mr. Maneri is here. I don't know if he has anything to elaborate with respect to that application, but I do know it was reviewed by the Building Department and

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not this Board or the Town Board.

MR. MANERI: That's correct. The request came from Orange & Rockland to install a temporary as part of the New Hempstead road project, as a backup operation contingency that may happen with them moving the power lines. The building inspector looked at it with zoning administration and with, I believe, the Director of the DEC. It was noted that, as being an emergency situation and a temporary facility, that it did not require SEPA.

MS. THAL: Why was it temporary?

CHAIRWOMAN THORMANN: Excuse me, Ms. Thal. You don't speak out. Everybody has been so orderly.

MS. THAL: Yeah, I know, I know.

CHAIRWOMAN THORMANN: It's not funny. Let me just tell you something. It's not funny. There's a lot of information to absorb. And everybody on this Board takes their job seriously, and if you expect to be taken seriously, then

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I ask for a little respect and decorum in the room.

MR. BAUM: Madame Chair, the permit was issued for a hundred eighty days. Now, recently, there was some switchover of equipment by Orange & Rockland in my neighborhood.

MR. MANERI: Excuse me. I don't believe that's the case. The permit was not issued for a hundred and eighty days.

MR. BAUM: Yes, it says a hundred and eighty days.

MR. MANERI: I have the permit right here.

MR. BAUM: And so for how long is it?

MR. MANERI: They needed it for the duration of the present substation.

MR. BAUM: That's exactly what I'm talking about. It means what you're telling us is that it's not for the switchover which only takes a few minutes to switch the New Hempstead just like the North Main Street and the South Main

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Street lines were switched over, and if you do it during low usage times, like on a Sunday morning at 5 a.m. or 4 a.m., it would have minimal impact, and it may not even result in the power coming down. I would assume that's an answer that Mr. Leifer might give be able to give eventually.

CHAIRWOMAN THORMANN: We'll take that under consideration.

MR. BAUM: And, again, when I looked at the handwritten note of Mr. Melman, it specifically said that it was based on the narrative. I have not seen the narrative as part of the FOIL request. So what I would like to do is see the narrative, the original narrative that was referred to by Mr. Montalbano in his letter and also the revised narrative, and it should explain why it needs to be there until the new substation is built because it seems to me it's predicated on the new substation getting its approvals. It like almost

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it's already a done deal regardless of this process.

MS. MELE: First, Mr. Baum, if you would be so kind as to follow-up that request with an e-mail to me, I'll certainly address the FOIL request.

Secondly, my understanding is that the temporary substation was to address the construction on New Hempstead Road. It was more of a construction issue as opposed to a precursor to this substation. It certainly couldn't handle the capacity that we're talking about here. It was specifically to address that particular construction event.

MR. BAUM: Yeah, but the switchover's take a very short period of time and it could be done when the power usage is low --

CHAIRWOMAN THORMANN: Please, Mr. Baum, if you will put in your request, I will see that you get your information.

MR. BAUM: I will do that. Thank you.

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Question with this dedicated Tilcon transformer. How will the power from the dedicated transformer be delivered? Are there additional structures or wires that would need to be put in place that are formerly built or haven't been built for this purpose?

CHAIRWOMAN THORMANN: Could you deal with that, please? Not now. Put it in for information how Tilcon will be fed.

MR. COFFEY: Yes. They're on the plans. The site plan shows everything.

CHAIRWOMAN THORMANN: All right. Thank you.

MR. BAUM: And specifically I was interested in South Mountain Road, if it's going to run along South Mountain Road down towards the quarry.

MR. COFFEY: It's taking the existing path that it does now.

MR. BAUM: The service area diagram that is in the DEIS appears to exclude Tilcon, so I think that needs to be

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revised based on what we've been discussing tonight. I have copies of the original press release from Orange & Rockland announcing the substation, and I just have a couple of copies.

CHAIRWOMAN THORMANN: Mr. Baum, when you were on the Planning Board, do you recall a meeting that we had with -- I don't know whether you would call it future planner for Orange & Rockland, when he came in with a map with a grid on it and the different colors of the rainbow and he showed how the electrical system was growing and what would have to occur and that there would be different things absorbed? I can't remember the gentleman's name, but I think you were on the board.

MR. BAUM: I was not part of that. However, the only point I'm making with providing the documentation is that showing the 120 MVA substation and so we get our numbers correct on this particular application.

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CHAIRWOMAN THORMANN: Do you have a copy of that? Do you remember? Do you have it in your file?

MR. COFFEY: We have it in the file.

CHAIRWOMAN THORMANN: I need to alert you, I have a cut off at 9:30.

MR. BAUM: I have critical information, critical, critical information. I will try and get through it as quickly as I possibly can.

CHAIRWOMAN THORMANN: Can you submit it and have it put into the record?

MR. BAUM: I think the public here needs to hear it. It's important enough that people really need to hear.

Particularly one aspect that deals with the electromagnetic fields, information that this Board is not aware of, perhaps Mr. Leifer's not aware of, but it's really, really relevent to the health and safety --

CHAIRWOMAN THORMANN: Can I ask you

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the source of this critical information?

MR. BAUM: Yes. The Oxford University Children's Cancer Research Center, it was funded by the British government and it was supported by National Grid which is -- also happens to be one of the transmission operators in New York State.

CHAIRWOMAN THORMANN: All right. Well, I'm going to ask you to submit it for the record and to ---

UNIDENTIFIED SPEAKER: Let's hear it. Let's hear it. Does everyone want to hear it? I want to hear it.

CHAIRWOMAN THORMANN: Well, Mr. Baum, can you have it reproduced for the people in this room?

UNIDENTIFIED SPEAKER: No. I want to hear it verbally.

CHAIRWOMAN THORMANN: Excuse me?

UNIDENTIFIED SPEAKER: You're excused.

CHAIRWOMAN THORMANN: I will close the meeting right now. No, I will. I'm

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sorry, but that's totally uncalled for.

UNIDENTIFIED SPEAKER: I have something to say, and I'm going to say my name. My name is Denise Colette, 510 South Mountain Road. I have one thing to say. You said that you're working for the people?

CHAIRWOMAN THORMANN: Absolutely.

MS. COLETTE: Well, you're giving him a very hard time and I want to know why. He has information to hand out and you're sniping at him.

CHAIRWOMAN THORMANN: Do you understand what I just said?

MS. COLETTE: I understand that you're treating us like children and saying that you're going to cut us off at 9:30.

CHAIRWOMAN THORMANN: May I say something to you?

MS. COLETTE: You very well may.

CHAIRWOMAN THORMANN: I do not understand that you can't appreciate that you are not the only application on the

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agenda tonight, and we have a Cinderella law in this town and the next application is the Palisades Mall.

MS. COLETTE: Well, the people here are not going to be turned out onto the road.

CHAIRWOMAN THORMANN: Excuse me. I told Mr. Baum that we would take his information, which is critical, and have it incorporated into the record, legally it becomes part of the record. All right?

MR. BAUM: Madame Chair, can I give just a very quick two-minute summary of the Oxford Research?

CHAIRWOMAN THORMANN: For the public, I want to ask you a question and I want you to answer it truthfully, and, you know, we've known each other for a long time. Have I always given you the right to speak and to produce information and to give it and did I not speak with you on the phone, Mr. Baum?

MR. BAUM: Yes, you did. However,

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Madame Chair, and I do fully respect you and I think anyone who's been skeptical of this Board and particularly of the Chair is wrong in doing that. I would certainly say that I know Shirley Thormann and I know her to be an honest person of integrity, and, please, even though you may be very upset, it affects your home, it affects your neighborhood, don't question her intentions, that she really truly, and this goes for at least the other members of the Board that I know, which are kind of limited now, Gil and Mr. Yacyshyn, that they really do care about this town and they care about the people and they're not going to do whatever the Applicant tells them to do. They're going to do what's in the best interest, I believe, I hope. Although when I spoke to you the other day, you were unaware of this issue with Tilcon that I had brought up previously at the meeting about the percentages.

CHAIRWOMAN THORMANN: I had had

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that down in my things for questions to ask.

MR. BAUM: After we spoke about it.

CHAIRWOMAN THORMANN: No. Before.

UNIDENTIFIED SPEAKER: We've already taken ten minutes of this back and forth. He's got two minutes he wanted to say something. Take the two minutes and say it without preface, say it.

MR. BAUM: In the DEIS it talks about magnetic fields and it says the results are, there's going to be no impact with the magnetic fields. On the National Library of Medicine which is part of National Institute of Health they have the published study from 2005, June 4, 2005. It was published originally in BMJ, which I believe stands for British Medical Journal. I have a couple of copies of it here, and there are some other supporting documentation from other states. Basically, they studied thirty thousand children with cancer. It was

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twenty-nine and change. Of that, exactly ninety-seven hundred had childhood leukemia. The results they found were very surprising. That the distance from these types of facilities from, like, high voltage transmission lines which can be affected by the amount of usage on those lines as well as the substations with transformers and transformers are mentioned specifically in this, that the impacts were as far away as approximately eighteen hundred feet, six hundred meters, and within two hundred meters there was a substantially increased risk of childhood leukemia. And I believe Mr. Leifer might have heard of these kinds of things before related to childhood leukemia in a possible impact of electro-magnetic fields associated with transmission facilities. Is that correct?

MR. LEIFER: Are you testing me?

MR. BAUM: If the Board doesn't mind.

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CHAIRWOMAN THORMANN: I would just rather that you discuss your information.

MR. BAUM: I just want to know that the information -- again, I have a couple more copies here, you can have them. This is the most comprehensive study. The study was from an old study, they're old studies from the 1980s and 90s. There's been a lot of back and forth through that period of time, but there are more studies and those studies are comprehensive. So I've included the information here that you can get access to. I don't think there is anybody in this room that hasn't been affected by cancer one way or another. And if we're talking about a substantial increase in risk, and I believe it's the World Health Organization that specifically has said EMF exposure is a carcinogen, that should be in the DEIS. We should have that kind of information. I only showed information related to this study. Children with Down Syndrome have a twenty times

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2 increase in childhood leukemia among

3 children with Down Syndrome. The problem

4 may relate to DNA breaks. And I have

5 information in that, in this package I

6 just gave out to you that talks about

7 finally perhaps understanding why

8 children get leukemia. That's been the

9 big challenge. They've known for a long

10 time that there has been this problem

11 with leukemia, but now they have a better

12 understanding, positive reason which was

13 published on leukemia and lymphoma.

14 I also want to point out some

15 experts from Yale University School of

16 Medicine, including Dr. Carl Baum, no

17 relation to myself, Peter Rabinowitz and

18 John Crystal, all of whom in dealing with

19 this in the Connecticut legislature said

20 they believe these kinds of facilities do

21 create problems. These are experts,

22 environmentalists, toxicologists,

23 physicians, people who have great

24 expertise in this area. So I ask you to

25 each very, very carefully read these

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documents. Anything that you've heard tonight was based on smaller studies, older studies. This is some of the latest information, and you can't look at a study of thirty thousand children with cancer and not say it's not comprehensive and that that should not be part of our decisionmaking process in this town.

CHAIRWOMAN THORMANN: All right. Let me just say one thing. I just took your conclusion, there seems to be an association between childhood leukemia and proximity of home address at birth to high voltage power lines. I don't see anything about substations here.

MR. BAUM: Right, but if you look at, some of the other details do mention transformers.

CHAIRWOMAN THORMANN: All right. So you just need to know that the high voltage power lines are there. And I would suggest that if you have something specific to recommend, that you do so.

MR. BAUM: Well, I think the town

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should hire consultants that have expertise in this area.

CHAIRWOMAN THORMANN: We have consultants here.

MR. BAUM: Medical expertise.

CHAIRWOMAN THORMANN: I'll take that under advisement.

MR. BAUM: This is a medical issue. Protecting the health and safety should be the number one priority of any town. I believe it's a priority of this Board.

We talked about property value earlier, and when you look at the studies, and again it does talk about transformers, and I looked at another version of this which has some more detail that given the Oxford study, would anyone on this Board or in this room buy a house within six-hundred-feet, the two-hundred-meter meter range, approximately, that is identified either, this facility or any facility in a residential area, this should have a really high level before it gets put into a residential

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area, a high level to ensure that the public is safe, with things going underground, and that's why I showed the pictures from New Square earlier, you reduce approximately 99 percent of the EMF going out twenty-five feet from the facility. You significantly reduce the risk. And so I ask that you look at all things.

I also ask that the search area which is identified in the DEIS should be expanded. We have commercial facilities available in North New City along with Route 304 as well as the Tilcon facility. The Tilcon facility got the substation in West Nyack, it could get the substation up there. The line could go underground just like it did in Orangetown. I think that commercial properties should be looked at that could service Northern New City from another angle and that the broad area that they looked at was too narrow.

CHAIRWOMAN THORMANN: Thank you,

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Mr. Baum. The engineer wants to speak.

MR. ABIB: Thank you, Madame Chair. Does everyone hear me?

Thank you very much for allowing me to speak. Also I want to thank Mr. Trevor for asking the question which I had initially about the volume of the oil in the system.

Now, first, my name is Fuad Abib, F-U-A-D A-B-I-B, and I'm an engineer, I hold a doctorate in environmental engineering. Also I'm a professional engineer in the State of New York and Maryland. I talked last time. I have four very short questions.

And the first one, a continuation of the same question that was asked by Mr. Trevor. For seventeen thousand gallons, that's a major amount of oil, how come it was not mentioned in the Draft EIS? That's the first question.

And that should come in the first page of the Draft EIS because that's a major issue.

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Number two, everything what was discussed tonight was about separation of oil from water based on the geo-composite. As we know, when we mix oil and water, some phase of oil would enter water and will not be removed by physical separation. We would need a biochemical separation which would be far beyond just removing the oil or keeping the oil. In addition to that was discussed that if there would be a major storm, we would have overflow of oil which is on top of water into the river, so that has to be addressed.

MR. UTSCHIG: No one said that.

MR. ABIB: So, please, maybe they want to, maybe I'm mistaken, maybe they want answers.

MR. MONTALBANO: Given the hour, I would suggest that you just take the comments and note the comments.

CHAIRWOMAN THORMANN: I understand what to do. I don't need help. Thank you. Go ahead, what's your question?

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MR. ABIB: The other question is, there was word about absorption. Geo-composite is not an absorptive complex or matrix. And again, I have this question, how come geo-composite, the name was not mentioned in the DEIS? Geo-composite is a material which would solidify in contact with oil, petroleum specifically, so it doesn't have any absorptive capacity. So please clarify that so we will know that none of it would absorb oil, but keep it, it will basically act like a barrier.

My last question is again back to electromagnetic field. The Draft EIS does recognize that there would be an impact of increase in EMF, but it would basically say that it would be within 200 milligrams state threshold allowed. So it's not that it would be negligible or it would be just nothing. There is an impact, but it would based on the DEIS that this would be within 200 milligrams. I discussed last time that 200 was

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basically picked up as an initial threshold. It's something that should be considered forever. It can be reviewed.

Thank you very much and I appreciate it. I'll sit down.

CHAIRWOMAN THORMANN: Go ahead.

MR. GIANONDO: My name is Pat Gianondo, and I live at 116 South Mountain Road.

In terms of the fire department putting the fire out, they said they could handle the fire at the station.

CHAIRWOMAN THORMANN: Yes.

MR. GIANONDO: Is that correct?

CHAIRWOMAN THORMANN: There is a letter from the chief, from the New City Fire Company, and there is a letter from fire the inspector for the Town of Clarkstown.

MR. GIANONDO: So they can the contain a fire in the station?

CHAIRWOMAN THORMANN: They can handle the fire.

MR. GIANONDO: If the fire is

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outside of the containment station and is set in the area outside the -- I'm just asking a question.

CHAIRWOMAN THORMANN: He's not here.

MR. GIANONDO: Who?

CHAIRWOMAN THORMANN: And I am not a fireman.

MR. GIANONDO: I understand, but South Mountain Road has no fire hydrants.

CHAIRWOMAN THORMANN: I'm well aware of it. I'm concerned about the people up on the too of the hill. How you would even get the water up there?

MR. GIANONDO: Correct. So all the other substations that O & R has the community surrounding the substations have fire hydrants. They would be able to handle those fires if they blew up, but we don't have that ability.

CHAIRWOMAN THORMANN: Sir, all I can say to you is that the fire people, the fire experts have put their name on a piece of paper that they can take care of

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a fire.

MR. GIANONDO: That they can fight a fire at the station, not at my house, not at my neighbor's house at the same time. They only carry five hundred thousand gallons of water. They cannot pump water from any other source.

MR. YACYSHYN: They have mutual aid, meaning they come from other communities.

MR. GIANONDO: In 1980, French's house burned down in a matter of twenty-five minutes because of the water. There was no water on the mountain. They quickly used the water that they came with and they just watched the house burn down.

CHAIRWOMAN THORMANN: All right. I will take this under advisement.

MR. GIANONDO: That's what you should do.

MR. GRANIRER: I'm Marty Granirer, G-R-A-N-I-R-E-R. I'm president of West Branch Conservation Association.

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Look, I have more than a two-minute presentation to make. Will you be adjourning this meeting to another day? Because I have more to say.

CHAIRWOMAN THORMANN: I'm leaving that to my consultant over there. I have my own personal opinion I haven't told the Board, but I'm leaving that to the man in charge.

MR. GRANIRER: Of course. I would like the courtesy of as much time as some of the other speakers have had. I've got an engineering study to discuss. I've got legal questions to raise and discuss, and I've got a few other things on my list, they are all relevant and cogent, and I hope I get some time later.

CHAIRWOMAN THORMANN: Mr. Geneslaw, what is your considered opinion in this matter?

MR. GENESLAW: Well, obviously from the number of people who came here tonight and the lengthy time they stayed, my recommendation would be to continue

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the public hearing at a future date.

CHAIRWOMAN THORMANN: When is the next available date please?

MS. AMICUCCI: Our next meeting is July.

CHAIRWOMAN THORMANN: What's on the agenda at the end of this month?

MS. AMICUCCI: I don't have the agenda with me. I think you have four items on there already.

CHAIRWOMAN THORMANN: What do we have next week? What's on the 13th? Can we fit it on the 13th? To my recollection, there are only two items on the 13th.

I would like to handle this as rapidly as possible. I think there are only two items. We'll handle it next week on the 13th.

MR. GENESLAW: I may not be able to make it on the 13th. I would have to check another commitment that I may have.

CHAIRWOMAN THORMANN: We could delegate it to Mr. Letson, who is very

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knowledgeable.

MR. LETSON: The bottom line is that you're going to continue it for the purpose of additional public input, so as far as having an expert, I will be here next week.

CHAIRWOMAN THORMANN: All right. But he needs somebody who is speaker oriented and you're obviously that person. Would you be willing to do that for the Board?

MR. LETSON: What would I be doing?

CHAIRWOMAN THORMANN: Being Mr. Geneslaw.

MR. LETSON: I could not possibly fill Mr. Geneslaw's shoes, but I'll do my best. He's been doing it for a little bit longer than I have.

CHAIRWOMAN THORMANN: We have an agenda. There are three items on it.

MR. MONTALBANO: Mrs. Thormann, if I may be heard.

We have been through two meetings and we've heard the comments from the

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public. Mr. Granirer, in our last meeting, had requested of you that he have some time to have a report prepared which he wanted to submit to this Board. I would like to ask Mr. Granirer if he does have that report, is he going to submit it this evening so that we would have an opportunity to review it?

CHAIRWOMAN THORMANN: You're jumping the gun.

MR. MONTALBANO: Okay. I'm sorry if I jumped the gun.

CHAIRWOMAN THORMANN: We will put it in Item Number 3 next week and we will defer the local law.

MR. GRANIRER: So that will be one week from tonight?

CHAIRWOMAN THORMANN: It will be one week from tonight. Do you have the report? I was going to ask, I have it down in my notes.

MR. GRANIRER: I have it, but I'd like to talk about it when I present it.

CHAIRWOMAN THORMANN: Could you

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give them a copy so they have it to be prepared to respond?

MR. GRANIRER: I'll give them what I brought and then I'll have to send the rest.

MR. MONTALBANO: We would appreciate having that much the way Mr. Baum submitted information at the hearing without sharing it with the Board and sharing it with our office prior to this evening's meeting. I think it helps both the Applicant and the Board if we get the information at the earliest possible date rather than people from the public commenting and distributing information during the hearing and we haven't had an opportunity to review or even respond to it.

CHAIRWOMAN THORMANN: I understand, but we're in the same position of having to deal with it. So could you fax it?

MR. GRANIRER: No, I won't fax it, I'll send it e-mail, unless you want me to spend a week watching the pages go

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through. I'll work it out.

CHAIRWOMAN THORMANN: Now, is there anyone else in the audience who is going to want to speak next week with new information?

MR. GRANIRER: While we're on the subject of sharing information, it took over ten days for me to find out what the temporary installation equipment is. I was told by the engineer who signed the application for the permit to build that he was forbidden to speak to me on the subject by Mr. Coffey and it took until yesterday for Mr. Coffey to tell me what the temporary equipment was. Let's share the damn stuff.

CHAIRWOMAN THORMANN: As I said before, Mr. Granirer, we had nothing to do with that temporary installation.

MR. GRANIRER: No. I'm just asking that it be a two-way street.

CHAIRWOMAN THORMANN: Well, you can have that conversation with Mr. Montalbano and Mr. Coffey yourself.

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MS. THAL: I will have new information next week.

CHAIRWOMAN THORMANN: I'm sorry, Ms. Thal, I can't hear you. Will you stand up?

MS. THAL: I will have new information.

CHAIRWOMAN THORMANN: You will have information, too? So then we'll have two new speakers next week.

UNIDENTIFIED SPEAKER: It may be beneficial to the Board and to the court reporter and to everyone in the audience if you took a list of names for people who wish to speak next week so you can avoid, you can give the people who haven't spoken more of an opportunity to speak.

CHAIRWOMAN THORMANN: Thank you. That's why I had asked the question.

I don't know your name. I know Ms. Thal's name. Your name, sir?

MR. EPSTEIN: Gary Epstein.

MS. WALKER: I won't be here next

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week, but I did have some new information.

CHAIRWOMAN THORMANN: Is it new information other than what you gave last time?

MS. WALKER: It's just a follow-up. It's an EMF study on children with autism. There's also information on the airborne chemicals from fires.

CHAIRWOMAN THORMANN: Do you think you can send it in to Ms. Amicucci, the secretary to the Planning Board, please, to be incorporated into the hearing?

MS. WALKER: Yes.

MR. TERRIBILE: I wanted to bring those pictures in.

CHAIRWOMAN THORMANN: Just to hand in pictures, you don't need to be here.

MR. TERRIBILE: I do want to bring in more information.

CHAIRWOMAN THORMANN: You can submit that.

MR. TERRIBILE: If I can't make it next week, can I have him talk for me?

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CHAIRWOMAN THORMANN: Yes, fine. And we will meet then next week. This time you will have to go to the office because you're Number 3 on the agenda. Thank you very much.

Motion to continue the public hearing.

MR. TREVOR: At what time?

CHAIRWOMAN THORMANN: I'll just say 7:45.

MR. TREVOR: So moved.

MS. O'CONNOR: I second the motion.

(Whereupon, a motion having been made and duly seconded, was put to a vote and as unanimously carried.)

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(Time Noted - 9:42 p.m.)

C E R T I F I C A T I O N

I, JOAN BEHN CARUSO, a Shorthand Reporter and Notary Public of the State of New York, hereby CERTIFY that I recorded the foregoing proceeding at the time and place herein stated, and the preceding transcript is a true record thereof, to the best of my knowledge and belief.

_____

JOAN BEHN CARUSO

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STATE OF NEW YORK

TOWN OF CLARKSTOWN

- -x

THE TOWN OF CLARKSTOWN PLANNING BOARD

RE: DEIS for completeness,
O & R Utilities, Inc./Little Tor Road
substation, SL 34.5-1-6, New City.

- -x

Wednesday,
June 13, 2012
7:32 p.m.
Town of Clarkstown Town Hall
10 Maple Avenue
New City, New York

MINUTES of the meeting of the Town of Clarkstown Planning Board taken in the above-captioned matter, before a Shorthand Reporter and Notary Public of the State of New York.

B E F O R E:

SHIRLEY J. THORMANN, Chairwoman

RUDOLPH J. YACYSHYN, Vice Chairman

PETER E. STREITMAN, Member

THOMAS A. TREVOR, Member

MARY JANE E. O'CONNOR, Member

MARA S. BLUMENTHAL, Member

oOo

P R E S E N T:

JOSE C. SIMOES, Principal Planner

JAMES CREIGHTON, Planner

DENNIS LETSON, Deputy Director
of Environmental Control

DANIEL KRAUSHAAR, ESQ., Deputy Town Attorney

ROBERT GENESLAW, Planning Consultant

ROSALIE AMICUCCI, Administrative Aide,
Planning

oOo

A P P E A R A N C E S:

MONTALBANO, CONDON & FRANK, P.C.

Attorneys for Applicant

67 North Main Street

New City, New York 10956

BY: ANTHONY J. MONTALBANO, ESQ.

ORANGE & ROCKLAND UTILITES, INC.

390 West Route 59

Spring Valley, New York 10977

BY: JOHN COFFEY, P.E.,

-and-

JOANNE H. LANZA

BIRDSALL SERVICES CROUP

Consultants for Applicant

1131 Mamaroneck Avenue

Suite 50

White Plains, New York 10606

BY: W. CHARLES UTSCHIG, JR., P.E.

MS. O'CONNOR: The second item on the agenda tonight is the continuation of public hearing, the DEIS: O & R Utilities, Inc./Little Tor Road Substation, SL34.5-1-6, New City, proposed construction of a new electrical substation and upgrade and existing gas regulator on 10.2 acres with a street address of 549-55 North Little Tor Road.

Background information: At the Planning Board meeting of June 8, 2012, the public hearing was continued to date certain of June 13th, 2012 at 7:45 p.m. Verbatim transcript to follow, which we received.

Would you identify yourselves?

MR. COFFEY: John Coffey, Chief Engineer, Orange & Rockland Utilities.

MS. LANZA: Joanne Lanza, Senior Engineer, Orange & Rockland Utilities.

MR. MONTALBANO: Anthony Montalbano, attorney for Orange & Rockland Utilities.

MR. UTSCHIG: Charles Utschig,

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Engineer Birdsall, Engineering.

CHAIRWOMAN THORMANN: Okay, thank you.

Before we continue with our public hearing, which we were in the midst of last time and I've a list of people who put their name down who wish to speak, I would like to clarify what I feel is a miscommunication.

At that meeting, the Applicant said, when we were talking about, I think it's you, Mr. Coffey, I have here, "I think, to address some of the questions that have come up from the public. First of all, we have been in contact with Vincent Narciso who is The Town of Clarkstown's chief fire inspector and he's reviewed the plans and he's satisfied with them to date. We previously met the New City fire chief, Arthur Kunz, and he was satisfied with the project plans, as well. He's been replaced and we're going to be meeting with the new fire chief, as well." So I

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think the miscommunication there, and I don't think anybody is at fault, it was what you said and what I assumed. You write, assumed, we're talking about the 2010 plans that were sent and not the copy of the DEIS. Now, I know they're interested parties, Mr. Montalbano, I know you don't have to send to interested parties, only the notice of completion, but I think the public assumed and I assumed as the Chair of the Board, and I'm laying it right out there to the public, that it was most up-to-date information that the chief fire inspector and the town of Clarkstown had received, so I have asked a representative from the fire inspector's office to be here tonight, Mr. Stephen Ungerleider.

Would you please clarify the record for us?

MR. UNGERLEIDER: All I can give you is the memo that Mr. Narciso wrote, and that is what he wrote to the Planning Board as of June 8 was that he had not

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received any correspondence from Orange & Rockland since October 2010. It was not included in the distribution list of the DEIS. "I do not recall any correspondence by mail or by telephone with any O & R representative nor were any letters of approval sent by my office. O & R and should consider installing fire hydrants closer to the substation and the gate and roadway should be widened from sixteen to twenty feet to allow for access of fire apparatus."

CHAIRWOMAN THORMANN: Thank you, Mr. Ungerleider.

Is there any comments?

MR. COFFEY: I'm going to turn it over to Joanne Lanza, the one who's had the conversation. I wanted to clarify that I don't think there was any testimony that we had any documentation from Mr. Narciso. We had meetings and we had telephone conversations that I think Ms. Lanza will be able to explain in more

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detail.

MS. LANZA: I did speak to Mr. Narciso about two weeks ago. I called him on the phone and I asked him if he had seen the plans for the Little Tor substation. Now, he said yes, he had reviewed the plans, those were his exact words, and he did not have any issues with them. They may not have been the most recent ones. I don't see that there's been a substantive change in the substation, but he did tell me that he really didn't see any issues. Because I certainly would have taken those steps to provide them weeks ago had I heard them from him.

CHAIRWOMAN THORMANN: Well, that's why I said there was miscommunications.

MS. LANZA: Right. But I did speak with him. And I have subsequently spoken with Chief Flynn and he asked me and I told him I was fine with anything he wanted and he's going to bring the information to his Board of Fire

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Commissioners?

CHAIRWOMAN THORMANN: Yes.

MS. LANZA: So I said that was fine. I was fine with whatever he needs.

CHAIRWOMAN THORMANN: I just wanted the record clear.

MS. LANZA: Okay, that's fine.

CHAIRWOMAN THORMANN: Now, I have the people who wish to speak.

Martus Granirer.

Excuse me. Yes?

UNIDENTIFIED SPEAKER: Could I add my name to the list?

CHAIRWOMAN THORMANN: I will ask for anybody who wants else to speak afterwards, but these are the people who, in fact, Martus had come up to speak when the meeting had ended.

UNIDENTIFIED SPEAKER: All right.

CHAIRWOMAN THORMANN: Would you please come up to the microphone, Martus?

Could you, in the interest -- I know you have a lot of information. I see what you have here, but what I'm

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going to ask you, to synthesize it and we'll put everything that you have in that report into the record in its totality.

MR. GRANIRER: I expect you to put everything I give you into the record in its totality, but there are certain things I have to explain. Am I close enough?

CHAIRWOMAN THORMANN: No. The people can't hear you.

MR. GRANIRER: I say -- I'll be glad, assume you put everything I give you into the record.

CHAIRWOMAN THORMANN: Absolutely, Mr. Granirer.

MR. GRANIRER: But I'm going to have to discuss some details or what I say won't make any sense.

CHAIRWOMAN THORMANN: As long as it's not lengthy.

MR. GRANIRER: I'll do my best. Maybe you can solve what amounts to a protocol problem here. I need to know

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something from the Applicant that we've been trying to found out elsewhere.

CHAIRWOMAN THORMANN: Well, you ask me and I'll ask them.

MR. GRANIRER: That's what I'm going to do. I need to know how the temporary equipment that was installed about a month ago came to be installed without any environmental review.

CHAIRWOMAN THORMANN: That was discussed in part, I believe, at the last meeting, was it not?

MR. MONTALBANO: It was.

CHAIRWOMAN THORMANN: Do you want to respond to that or should I throw it over to Mr. Maneri?

MR. COFFEY: I believe it was covered last week in detail from Mr. Maneri in detail, so I guess I'll pass it over to you.

CHAIRWOMAN THORMANN: Do you have anything to add, Mr. Maneri?

MR. MANERI: We referred the application over to the Department of

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Environment Control. They reviewed it and determined that under the SEQR requirements, being that it was an emergency installation, that it did not require a SEQR review.

MR. GRANIRER: I thought that would be the explanation. Give me a minute to get something out of my folder.

CHAIRWOMAN THORMANN: If you want the preliminary, there was a letter sent to the supervisor by Ken Campbell about the need to put the temporary installation in and I believe the Applicant sent notices to people within five hundred feet as I recall the information of the area, and so that they were notified that the installation was going up. That's the information that this Board had.

MR. GRANIRER: Just a second. Let me get a folder.

CHAIRWOMAN THORMANN: Is that true or not?

MR. COFFEY: That is correct.

MR. GRANIRER: I will pull out some

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of this because it will make some difference.

(Mr. Granirer submits documentation to the Board.)

MR. MONTALBANO: Can the Applicant have a copy?

(Mr. Granirer submits documentation to Mr. Montalbano.)

MR. GRANIRER: I'm reading from something called the SEQR Handbook which is published by the Department of Environmental Conservation and it is a little easier to read in some ways than the regulations, but it doesn't contain anything that isn't in the regulations.

On the second page, if you turn over, there's a heading that says, "What is an Emergency Action?" That section says, "Emergency actions are actions taken in response to an urgent situation. These are actions which are immediately necessary on a limited and temporary basis for the protection and preservation of life, health, property or natural

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resources. Classification of something as an emergency action should be done only in extreme cases for true unforseeable emergencies, not to justify a proceeding or with an action despite poor planning by an agency or an applicant."

MR. MONTALBANO: May I be heard, Ms. Thormann?

CHAIRWOMAN THORMANN: Can you let him finish? When you finish this comment on this specific thing, Mr. Montalbano will respond.

MR. GRANIRER: The emergency as I understand it was that the wires or the conductors on New Hempstead Road had to be cut over to a new source because they didn't want to black out the properties that were served there.

CHAIRWOMAN THORMANN: As I recall the letter, it had to do the with county project on New Hempstead Road.

Mr. GRANIRER: Right. That's a project that was put on the boards three

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years ago or whenever it was, it wasn't last month or the month before. And the construction began months and months ago. This need for electricity when the cut-over time came was no surprise. If O & R wasn't ready for it, that's poor planning.

CHAIRWOMAN THORMANN: Well, there was no indication of a surprise in the letter.

MR. GRANIRER: Right. But the point is, this does not meet SEQR definitions of an emergency action.

CHAIRWOMAN THORMANN: Okay. I hear your point of view, but our department, our DEC, gave it the okay.

MR. GRANIRER: Well, I'm disputing it.

CHAIRWOMAN THORMANN: Well, it's your right to dispute, but I'm not so sure it's at this meeting.

MR. GRANIRER: It needs to be disputed because the question of whether your review is being segmented occurred

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partly because you've got a whole thing, an installation that's not even mentioned in the EIS and I think that's improper segmentation.

CHAIRWOMAN THORMANN: Now, Marvin raised that at the last meeting, the question of segmentation. We took it under advisement. We're aware of the feeling about it.

MR. GRANIRER: Good enough. I leave it as need be. We'll go into it some more eventually.

MR. MONTALBANO: May I be heard on that?

CHAIRWOMAN THORMANN: Now you may. We didn't do that, yes.

MR. MONTALBANO: This was truly an emergency. The county was under constraints with respect to completing the New Hempstead Road project and I believe there were Federal funds involved. The question of the temporary substation was an application to the Building Department. The question arose

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as to whether or not we could install it on a temporary basis. The Building Department spoke with the Zoning Administrator, spoke with the Department of Environmental Control and it was determined that we were entitled to a permit for a temporary substation. That has nothing to do with this application this evening. If Mr. Granirer has questions with respect to segmentation, I believe he heard last week the Town Attorney, Amy Miele, advise this Board that the question of segmentation was not something, it had been addressed and the question had been answered.

CHAIRWOMAN THORMANN: We heard it.

MR. MONTALBANO: Okay. And that's all I need to say. And I understand what Mr. Granirer is saying and I don't think it's a proper subject for this meeting.

CHAIRWOMAN THORMANN: He can have his say, if he wants it.

MR. GRANIRER: I was not able to print as many copies of the section from

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the handbook on segmentation.

CHAIRWOMAN THORMANN: I will put it in the record. The Town Attorney ruled at the last meeting and we have, I don't know how many people in this room, and there may be more people who wish to speak, Mr. Granirer, and it's not fair to continue to hack away at the question of segmentation. We already had our Town Attorney make a ruling.

MR. GRANIRER: I don't think she did.

CHAIRWOMAN THORMANN: Excuse me. I was sitting here and I heard her.

MR. GRANIRER: I asked her for a copy of the ruling and I asked her a memo that she did on another O & R substation and she said there wasn't one.

CHAIRWOMAN THORMANN: All right. Well, then you take that up with the Town Attorney, but not here with the Planning Board.

MR. GRANIRER: I need what I'm talking about on your record.

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CHAIRWOMAN THORMANN: It will be put into the record.

MR. GRANIRER: I'm speaking now for that purpose. I would like to mention a couple of other things that I think are segments just within this one site. There is a gas line. I know Mr. Baum mentioned it too, a gas substation that's meant to be installed. Same site, same owner, same site plan, but it is not part of the EIS. That's a segment that was lifted out, and by the definition of segmentation, it means breaking the action up into separate, more easily approved steps than if you look at them all together.

CHAIRWOMAN THORMANN: Excuse me. Are you talking about a substation or are you talking about a gas regulator?

MR. GRANIRER: The gas regulator is described in O & R's material as a gas substation.

CHAIRWOMAN THORMANN: Excuse me. Would you explain, for the edification of

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this Board, the difference between a regulator and a gas substation? Or Mr. Coffey, whoever is going to take that.

MR. COFFEY: Well, I have Jim Buoniconti here from our Gas Department that, if I could, he's the gas specialist.

CHAIRWOMAN THORMANN: Okay. Would you please, sir?

MR. BUONICONTI: The term regulator station refers to a smaller facility that provides natural gas and distribution system. The gas substation is really not used, the larger, next step up would be a natural gas gate station and that is where we'll receive natural gas from a supplier that's transporting the gas interstate and then we introduce that into the system. But a regulator station is where we're taking gas that's already in the system at a higher pressure and reducing that down to a lower pressure.

CHAIRWOMAN THORMANN: Is it a substation, a gas substation?

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MR. BUONICONTI: We would not refer to it as a natural gas substation. We don't use that term. Substation is reserved for electrical facilities.

MR. GRANIRER: I'll accept that substation is not the O & R term, but it is some kind of a gas regulator.

CHAIRWOMAN THORMANN: We're aware that it's there, yes.

MR. GRANIRER: Yes. Well, it is not in the EIS.

MR. LETSON: Page 2-5 of the DEIS.

CHAIRWOMAN THORMANN: Yes, it's there.

MR. LETSON: Item 2, Site Plan. "The proposed development would include a new electrical substation, a new upgraded gas regulator station, an access driveway and storm water management facility."

And then further back in the document there is some extensive discussion with regard to the fact that the gas regulator would not have met the town's or county's noise standards and

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is, therefore, enclosed in a masonry wall enclosure.

CHAIRWOMAN THORMANN: Thank you, but I thought I had missed something. Thank you.

MR. GRANIRER: Very well. I'm just making sure that it's in the record.

CHAIRWOMAN THORMANN: Excuse me?

MR. GRANIRER: I said, just making sure that it's in the record. I'm also concerned with the larger question of segmentation, but we'll take that up in some other way.

CHAIRWOMAN THORMANN: Okay. Thank you.

MR. GRANIRER: Just a minute.

CHAIRWOMAN THORMANN: Is that it or --

MR. GRANIRER: No, no, no. I had two packets of papers that I'd like you to take and I'll give some to the Applicant too. These are in response to Mr. Leifer at the last meeting.

CHAIRWOMAN THORMANN: Are you

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talking about this report?

MR. GRANIRER: I don't think it's the report that I'm going to give you.

CHAIRWOMAN THORMANN: The emissions report? It says Martus Granirer, Lawyer, 100 South Mountain Road.

MR. GRANIRER: What is the date?

CHAIRWOMAN THORMANN: June 11th.

MR. GRANIRER: I have a more up-to-date version. It's mainly been edited for clarity and simplification.

(Mr. Granirer submits documentation to the Board.)

CHAIRWOMAN THORMANN: All right. Could you let us know, Martus, what you want us to do with this and what you want to highlight in it? Because I can't -- I don't have time infinitum.

MR. GRANIRER: I'm not asking you for infinite time. I'm just asking for time enough to distribute and explain it.

Mr. Leifer says that it is a matter of physics and arithmetic, but not of opinion, there would be no measurable

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off-site emissions of electromagnetic forces from this substation. And we retained an engineering firm that's using its physics and maybe there's more than one set modeled on a computer. The emissions, EMFs that would be coming from all the new equipment and the overhead wires and the towers and poles which are being relocated and that's maybe why Mr. Leifer didn't think it would be a measurable offsite because these towers are to one pole tower are pretty close to ninety feet high and they function as antennas and they broadcast EMFs. To keep it as simple as I can at this stage, there would be anywhere from .1 milligauss to .5 milligauss spreading around offsite, depending on where you go. One of the places there would be radiation would be on Denver Drive. This is Denver Drive. It's on the far side of the stream (indicating).

CHAIRWOMAN THORMANN: You need to talk into the mic, Mr. Granirer, because

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my Board cannot here you.

MR. GRANIRER: Across the stream from the site is Denver Drive. You will find in this new packet I gave you a cross-section view of the emissions from the poles or the equipment showing that there's, whatever it is, in milligauss, reaching those houses as well as reaching the houses over here for certain and a couple just west of the power line. This is a question of what the public health significance of this kind of radiation is not settled. I've seen standards that are run from anywhere from .1 to 10. I mean, it's magnitudes of order apart in milligauss as being considered bad for human health. I think the whole question of exposing people in their houses, people and their children to radiation of this sort is serious.

Now, we've heard before that Orange & Rockland doesn't want to underground any of this equipment because it isn't what O & R does. It's what they do in

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the city with Con Edison, O & R does not underground its equipment and it would be expensive. On the question of expenses, I would point out that right now the expense is now being shifted to the population when you have all the wires on poles and there's a little rain or a lot of rain with some wind, a tree always falls down somewhere and cuts the power. And when the power gets cut, people have to throw away all the food in their freezers and their fridge, and super-markets, when that goes off, throw away what's in their refrigerated equipment and we're paying a lot money through our own sources.

CHAIRWOMAN THORMANN: No clapping.

MR. GRANIRER: I enjoy it. The fact is, there's a great expense that O & R does not think of from having its overhead lines, but when it comes to a site like this where the EMFs reach houses on the surrounding properties and where there's a risk that people will get

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cancer, the cost is in my mind immeasurably bigger.

And so I would suggest that this may be the place where to avoid the cost to the population in health, that O & R be asked to put its new equipment underground, and in fact, although I know Mr. Yacyshyn at the last meeting thought that the underground thing was some kind of misguided popular opinion, there's no doubt that this is a very good substance for attenuating EMFs and I think that the direction this Board ought to look is to see whether O & R can't be told to bury or enclose all of this equipment so that people don't have to wonder, am I at .1 or .5? And how long can my child's brain accept this kind of radiation?

And I have to point out too, we all remember when slow cookers were very popular. You could make this thing, this pot warm and you put a piece of meat in it and went away and did a day's work, and when you came home you had a pot

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roast. It didn't have to be that hot to cook meat and you don't have to have that much EMFs I suspect to do something to the tissues of the human bodies.

CHAIRWOMAN THORMANN: I heard you, Mr. Granirer, but do you have another question? Because they're going to have to respond to this. You've made your point. You've written it all out. You may have something here.

MR. GRANIRER: I may have. They do have to respond to this. This is important.

CHAIRWOMAN THORMANN: Yes, it is important, but I heard you, we all heard you, and they will have to respond to it.

MR. GRANIRER: Good.

CHAIRWOMAN THORMANN: That's the whole purpose of this exercise that we're going through.

MR. GRANIRER: I think I do understand that.

CHAIRWOMAN THORMANN: Is there anything else? Because if not, I have to

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continue.

MR. GRANIRER: Just a moment. I have --

CHAIRWOMAN THORMANN: Well, I gave you longer than a moment, I gave you a half hour.

MR. GRANIRER: You're hustling me. Come on!

CHAIRWOMAN THORMANN: Excuse me. I resent that and you are being impertinent. I don't hustle anybody.

MR. GRANIRER: You're pushing me is what I'm saying.

CHAIRWOMAN THORMANN: No, I'm not pushing you. I ask you to consider everybody else that's here.

UNIDENTIFIED SPEAKER: Let him finish. He's making a very important point. Let him finish.

CHAIRWOMAN THORMANN: I know he has, but do you understand how this process works?

UNIDENTIFIED SPEAKER: I under-stand, I understand. Okay? But I live

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very close to what they're trying to do, and if there's radiation that goes through my kitchen, my grandchildren, my children, I'm concerned.

CHAIRWOMAN THORMANN: I am too.

UNIDENTIFIED SPEAKER: So let him finish.

CHAIRWOMAN THORMANN: It's all written down and they're going to have to hire somebody to respond to this.

UNIDENTIFIED SPEAKER: Let them hire it.

CHAIRWOMAN THORMANN: That's right.

UNIDENTIFIED SPEAKER: That's right.

CHAIRWOMAN THORMANN: There are other people here to speak.

UNIDENTIFIED SPEAKER: So give them, everybody a chance to speak.

CHAIRWOMAN THORMANN: We have a Cinderella law, at 12:00 everything shuts down.

UNIDENTIFIED SPEAKER: All right. We have two hours.

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CHAIRWOMAN THORMANN: No, he's not speaking for two hours.

UNIDENTIFIED SPEAKER: I'm not saying that.

CHAIRWOMAN THORMANN: Yes, Martus?

MR. GRANIRER: I wanted to repeat something Mr. Baum said, too. There's a lot of material in this written stuff I've given you. It will take a little digesting. It's not easy reading, it's not easy to decipher, but I know you'll take the time. Mr. Baum suggested that you get yourself, the town here, get a consultant, someone that who is familiar with the public health questions related to EMFs, and that you get his advice and not just depend on the Applicant's rebuttal.

CHAIRWOMAN THORMANN: I hear you and I am very aware of cancer, I've had it myself, Mr. Granirer, so I don't play games.

MR. GRANIRER: Okay. I quit. Thank you.

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CHAIRWOMAN THORMANN: Thank you.

Terri Thal.

MS. THAL: Terri Thal, T-H-A-L. I'm with West Branch Conservation Association, 8 Lake Road, New City. Part of this a question, Mark Baum sent you a statement, he e-mailed it to you?

CHAIRWOMAN THORMANN: Yes, and it's going to be put into the record in its entirety, yes, Terri.

MS. THAL: He wanted it read.

CHAIRWOMAN THORMANN: No, I'm not going to read it in its entirety.

MS. THAL: He asked me to read it. Marvin asked me to read. He can't be here tonight, he asked me to read it into the record and he wants everyone to hear it.

CHAIRWOMAN THORMANN: How many pages do you have there?

MS. THAL: Three. This was his request.

CHAIRWOMAN THORMANN: There are a lot of requests.

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MS. THAL: I know, I know.

CHAIRWOMAN THORMANN: He sent me more than three pages.

MS. THAL: Well, it goes over by two lines.

CHAIRWOMAN THORMANN: No. I have a packet like that.

UNIDENTIFIED SPEAKER: Let's hear what they have to say.

CHAIRWOMAN THORMANN: Excuse me, sir.

UNIDENTIFIED SPEAKER: I don't mean to keep interrupting, but putting into the record doesn't allow the people to hear what's there.

CHAIRWOMAN THORMANN: The record is produced and you can get it and read it.

UNIDENTIFIED SPEAKER: Yes, but you cannot make comments in the moment, so there might be some person sitting here whose name you do not have who might want to make a statement based on what's being read.

UNIDENTIFIED SPEAKER: I'd like to

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hear it.

MS. THAL: "Dear Ms. Thormann, I am unable to attend tonight's meeting on the proposed substation in New City. Due to time limitations at the meeting last week, I did not have a chance to finish my presentation and to raise a number of additional critical questions that need to be answered in the DEIS. Therefore, I ask that you read the following into the record for the benefit of the public.

One: The proposed substation site already has cellular communication power from Verizon. The potential health affection of cell towers remains controversial and long-term exposure impacts are unknown, but the Town of Clarkstown has implemented regulations that take a, quote, "prudent avoidance," unquote, approach to placement of these facilities in residential neighborhoods, your schools and other areas where young children spend significant time. Given the existing EMFs generated by the

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existing high voltage transmission lines and the provided data suggesting potential health impacts of EMFs on children, for example, the Oxford University study," and I have a copy here, "the DEIS should provide data about the cumulative risks of a cell tower, transmission lines and the proposed substation.

Two: Given the health risk information that I provided on EMFs exposure, the Town of Clarkstown should retain consultants with technical and medical expertise to better understand the risks associated with a combination of the existing transmission lines and the cell tower with a proposed new substation. I can provide the town with a list of potential expert consultants. However, I've been told that David Carpenter of the University at Albany is a top expert in this field and would be a very appropriate choice." I'm not going to read the URL. "And I have some

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information on him. I also would recommend Dr. Gerald Draper of the Oxford study, although he now is retired, so I don't know if he's still doing consultant work. Dr. Carl Baum," no relation to Marvin, "of the Yale School of Medicine is available too and we have been in touch with him."

CHAIRWOMAN THORMANN: I think he mentioned that last week, Terri.

MS. THAL: Maybe.

CHAIRWOMAN THORMANN: Well, because he said the same thing, Dr. Carl Baum, no relation.

MS. THAL: Maybe, I don't know. "The DEIS has a very limited explanation of the potential impact of electrical substations on the value of neighboring residential properties. It does not explore the combined impact of an electrical substation and related overhead transmission lines, plus a gas station and related gas lines, plus a cell tower and related facilities. The

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DEIS should provide information on similar electric substations in residential neighborhoods around the U.S. that are co-located with gas substations and cellular towers since these facilities collectively create more risks than sites with just one of those installations. Projected property value impacts should only be determined using these locations with co-existing thing-a-ma-jigs, not just by using stand-alone substation facilities."

Therefore, he finds the DEIS deficient in not doing a proper evaluation.

"Four: The DEIS should provide data about the current EMF levels along the transmission lines between the two neighboring Haverstraw substations and the Pascack Road substation in Spring Valley. With the addition of the substation at South Mountain Road and the increased usage, (for example, with a switch of Tilcon's dedicated transformer

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from Haverstraw to New City), closed paren, will the EMF levels along the transmission lines increase? Any comments? Usage/levels of transmission lines do impact levels and a lower powered transmission line can actually produce more EMFs than a higher powered one.

Five: Why does O & R plan to move Tilcon's dedicated transformer from Haverstraw to New City? Please describe in detail and give all information on how the 20 MVA transformer will be connected between the substation and the facility. The DEIS should provide peak load data at startup for Tilcon, not just standard load data.

Six: United Water plans to build a controversial desalinization plant in Haverstraw. The desalination filtration and pumping process will require a massive amount of electricity. Which substation or substations will be providing that power? Will United Water

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need dedicated transformers or a new substation? And if so, where will those facilities be placed? Does the move of the Tilcon transformer have anything to do with O & R being able to meet the needs of United Water? Currently, the Haverstraw substation provides electricity to Northern New City, yet there is no indication in the DEIS that the New City substation will provide service coverage for backup to Haverstraw. Why not? Won't this become more important if the desal plant comes online?

Eight: If the United Water project is approved, is it possible that the New City substation then will need to be expanded? Will the Applicant guarantee that this substation will never be expanded beyond the current proposed substation as it already has done elsewhere?

Nine: The former president of Orange & Rockland, John McMahon stated at

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an annual meeting in 2008 that his company, quote, unquote, "planned to build twenty-one substations and to modify or upgrade others. Are there any plans to add, upgrade or modify any stations that directly or indirectly connect to the proposed New City substation, including the Haverstraw substation, the New Hempstead substation, the Pascack Road substation, the Congers substation and the Route 59 West Nyack substation?

Ten: The Applicant gives very limited alternatives in the DEIS. The DEIS should include; A, plans placing the substation and related transmission lines underground; B, plans for alternate locations such as the Tilcon quarry in Haverstraw and at the Burkes Road industrial park in Northern New City; C, plans for meeting New City's future electrical needs using clean, locally generated solar electricity.

Eleven: New Jersey has installed

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more solar power in the first two months of 2012 than New York State has done in its entire history. In PSE&G's service territory, solar panels will be generating 80 megawatts of power. 40 megawatts will come from solar panels placed on existing utility poles and 40 megawatts will come from centralized locations." And the URL for that is in here, I'm not going to read. "If Clarkstown is already considering using a former landfill in Nyack for the installation of a solar farm and the State of New York is considering the bipartisan solar jobs act, and that's in quotes, to significantly increase the generation for solar power for our grid, the applicant's existing DEIS proposes to perpetuate the current antiquated system, it should explore forward-thinking alternatives, as well as ways to reduce current energy usage and growth in Northern New City such as switching to LED streetlights.

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Twelve: The DEIS should provide actual usage data for Northern New City and projections for future use. Residential and commercial growth in the area has slowed especially after the economic downturn of 2008 and the town is now virtually built out. Government employees are being reduced, everyone is going green, with lower wattage light bulbs, appliances, heating, air conditioning systems, et cetera. Today's big LED TVs and computers use significantly less electricity than older devices."

And I would like to interject here that LEDs do not give off electro-magnetic EMIs as substantiated from the old CRTs and that is a bit of information in the Vitatech report that Martus has submitted to the town.

Back to Marvin. "The usage data is needed to evaluate the needs of Northern New City and to understand if other factors like the proposed water treatment

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plant in Haverstraw are the underlying need for the proposed substation. If so, this might raise additional questions about segmentation.

Thirteen". How could Orange & Rockland ensure that employee or contractor errors like those that happened with a massive gas explosion earlier this year in Haverstraw won't happen at this facility? I will separately submit a variety of supporting documentation in an e-mail to the Planning Board.

Thank you very much, Marvin Baum, Valley Cottage, New York."

And he asked me to distribute two handouts. And I am going to add one. This one is a statement on green solutions and it's a promotional thing, but it does discuss --

CHAIRWOMAN THORMANN: Please don't read it in.

MS. THAL: I'm not going to read it, I'm passing it out. It discusses

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what PSE&G is doing, and the other from the University of Albany, it's a biography, a brief biography of David Carpenter who Marvin is suggesting would be...

I'm also handing out, and you may have gotten this before, the front happens to be a letter that I circulated to about a hundred people yesterday asking them come to today's meeting. You're welcome to read it, although I crossed out the front, because what I really want read is the back which is an abstract, and, again, he may have given you this, an abstract from the British Medical Journal of a study conducted by researchers at Oxford University to determine whether there's an association between the distance of where a newborn baby lives from high voltage power lines and incidence of leukemia and other cancers in children in England and Wales. And the finding was that, yes, there was an association between where a child

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lived when it was born and the rate of leukemia among those children was much higher than that of kids who did not spend their early babyhood near high voltage power lines. So I think that is important. And I also would like to point out that in the Vitatech report we did learn that house -- and we were surprised because we never thought of it, that houses on Denver Drive are receiving EMFs now and that the new station will expand the amount of EMFs that are being emitted into, minimally, six of those homes. And we have the identifying addresses, and, of course, there are about eight homes on South Mountain Road.

CHAIRWOMAN THORMANN: I realize that. I understand how many there are.

MS. THAL: And I thank you.

CHAIRWOMAN THORMANN: The validity of those comments will have to be reviewed.

MS. THAL: And the Vitatech report.

CHAIRWOMAN THORMANN: In fact, we

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have Vitatech, we already have that. And that's what you want put into the record?

Would you give it to Rosalie so that she can put it in?

MS. THAL: All of that stuff?

CHAIRWOMAN THORMANN: Yes. All of the information that you want put in, can you give it to Rosalie, please?

This is not to belittle what is said tonight, and I'm very interested in cell phones and I had read all kinds of reports on cell phones and how our children are going to be impacted and perhaps have some kind of cancer later on in life because cell phones are an extension of their personalities. No matter where we go today, we run the risk of all kinds of things. And I wasn't belittling what was being said. We're very aware of all the problems. And they're going to have to respond in kind to satisfy this Board.

Gary Epstein, are you here? Gary Epstein?

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UNIDENTIFIED SPEAKER: Gilbert.

MR. TERRIBILE: Actually, what he said was I was going to ask his questions.

CHAIRWOMAN THORMANN: He didn't say that. I have down here --

MS. O'CONNOR: Actually, he did say somebody else could read for him.

CHAIRWOMAN THORMANN: Then you give your name if you're going to come up.

You're the gentleman from Lake Lucille?

MR. TERRIBILE: Yes. First I have something I want to pass out. I only have twelve copies. I want to apologize.

CHAIRWOMAN THORMANN: Excuse me, the man who is in charge of our process, he has to have one.

MR. TERRIBILE: My name is Bill Terribile. I'm president of Lake Lucille.

The first question that we have is last week Mr. Coffey said that he'd find out for us how many fire hydrants were on

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Denver Drive. I didn't get that number on how many there were.

CHAIRWOMAN THORMANN: Did you find out, Mr. Coffey?

MR. COFFEY: We've been in contact with United Water as far as where the hydrant locations are presently and where the water main is in the vicinity of Little Tor Road and South Mountain Road, so we have been in contact with that. We can certainly look further into that report.

CHAIRWOMAN THORMANN: Is it more than one hydrant on Denver Drive?

MR. COFFEY: I know the closest hydrant is in the vicinity of Culver Drive and we are again inquiring with United Water about the possibility of extending something closer to our driveway.

CHAIRWOMAN THORMANN: Well, I think one of the things that came up in a discussion that we had amongst ourselves after the last meeting, given all the

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discussion about fire, and I think you read into the record that the fire inspector wants another hydrant.

MR. UNGERLEIDER: His comments were that they should consider installing hydrants closer than the ones that were there.

CHAIRWOMAN THORMANN: All right. In fact, there was also a discussion about that, and I don't know whether anyone spoke to you about it, about that we might consider extending the water main there to put more hydrants which you would have to in order to have those hydrants.

MR. MONTALBANO: I believe the company is looking into that.

MR. COFFEY: We are presently working with United Water.

CHAIRWOMAN THORMANN: Did you all hear that?

UNIDENTIFIED SPEAKER: The answer is no. The answer to the original question that this gentleman asked is no.

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He wanted to know many --

MR. TERRIBILE: The question was, he was going to come back with us and tell us how many hydrants were on Denver Drive, and did he?

UNIDENTIFIED SPEAKER: No.

MR. MONTALBANO: That question was not asked. I read the transcript today. No one asked us how many hydrants there were on Denver Drive --

CHAIRWOMAN THORMANN: You asked where the nearest hydrant was.

MR. MONTALBANO: Right, on Denver Drive.

MR. COFFEY: We located the main, I can furnish that for the Board, and we are looking at trying to see if we can get the hydrant closer to the facility.

CHAIRWOMAN THORMANN: Well, I think you should really consider extending the water line and the fire inspector himself said that he wants more hydrants.

All right, Mr. Terribile.

MR. TERRIBILE: The pictures that

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I've given you, and I apologize for people that aren't able to see them, if you look at the first picture, that is one of the telephone poles that go through Lake Lucille. That actually goes through Lake Lucille. If you look at the second picture -- and this is exactly how a pole should look. If you look at the second picture, this is the pole that I'm concerned with. If you notice, there's only five little balls there that guide the wires instead of --

CHAIRWOMAN THORMANN: Right, you said that last week.

MR. TERRIBILE: But if you notice underneath, there's also a piece of wood missing too, okay, so there's not only the guardrail, but now there's a piece of wood that's missing underneath. Do you see that piece? Is that clear? Okay. So if you look at -- can you see it?

CHAIRWOMAN THORMANN: What's this piece here?

MR. TERRIBILE: Well, there's

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supposed to be four of them. On this one it's missing, and if you notice, there's six here.

CHAIRWOMAN THORMANN: Yeah, I see that. We were up there.

MR. TERRIBILE: Okay. But you also said you didn't find the island, so I wanted to explain that to you. Okay? So if you look at the third picture, the picture, that's all the telephone poles. So if you look at the second telephone pole in this picture, you can see that there's no -- and if you look at the bottom of it, there's just a little bit of dirt next to it. Okay? And that used to have an island that came all the way, but it got washed away. Okay? So that island's gone. But if you look at the fourth picture, that's the same telephone pole, it's leaning even more now. And you see all that grass and everything there? That is the island that's actually moved there. And what it's done, it's taken the telephone pole

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that's like this and the earth comes from Crum Creek and an island bigger than that room has hit it and made the telephone pole go like this (indicating). By doing that, the pieces of wood on top have snapped off and gone into the lake.

CHAIRWOMAN THORMANN: All right. If you recall, I said last week, I believe I did, I said that they would have to take care of it. They said they would. It's in the record.

MR. TERRIBILE: What they did say, though, is that they had their engineers check it and their engineers came back and said that everything was fine. Now, my question was, how did they get out there?

CHAIRWOMAN THORMANN: That's not quite it. I have the record here. I have the record here.

Mr. Coffey, would you like to respond to that?

MR. COFFEY: Just to interject, back in 2009, between January and

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February, when the request was made, there were onsite meetings, inspections and correspondence with Mr. Terribile. We've reached out to him again through our Public Affairs Department to reengage to make sure that if there's a concern that we see it both from our Maintenance Department and our Engineering Department. So, we have a record of correspondence back to that three-year period and we are going to continue at the Board's request.

CHAIRWOMAN THORMANN: Is that Kim Campbell?

MR. COFFEY: Yes, it is.

CHAIRWOMAN THORMANN: Will you please see that Kim Campbell does call him?

MR. COFFEY: She had done it.

MR. TERRIBILE: Can I make a statement here because I want to explain this?

They're saying that they've reached out they reached out. For three years

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I've been complaining about this. They reached out four hours ago. That's the first time in three years --

CHAIRWOMAN THORMANN: Well, they reached out, did they not?

MR. TERRIBILE: Is that how we're going to describe things? We're talking about people's lives here with fire, and I'm very, very nervous about this because I'm out there and I think I know more about that than anybody when it comes to that telephone pole and I've seen them move. I'm out there every single day and I know how dangerous this pole is. And what you're doing is you're telling them now you can even put more electricity through it. And they're telling you this is safe. This has been like this for three years.

CHAIRWOMAN THORMANN: Mr. Terribile, I said they have to take care of it. They do not have an approval yet, do they?

MR. TERRIBILE: No. But this

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shouldn't have come this far, that's why I'm saying this.

CHAIRWOMAN THORMANN: And we have people who will go out and check.

MR. TERRIBILE: Well, when they say they reach out, that's like saying everything else, like we've talked to the fire inspector. When I talked to the fire inspector, the day after this meeting, I called the fire inspector, that's how this all started, and I e-mailed everybody on the Board, most of you didn't get it, but some of you did.

CHAIRWOMAN THORMANN: I didn't.

MR. TERRIBILE: On that information that I talked to Vincent, the fire inspector, and he told me he had no idea that up to seventeen thousand gallons of cooling oil were going to be at this location.

CHAIRWOMAN THORMANN: Mr. Terribile, what did I say? How did I open the meeting? How did I open the meeting?

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MR. TERRIBILE: Well, what I'm is, they're saying that they're reaching out to him and I'm telling you what reality is. Reaching out, they just reached out to me, they did, four hours ago, after three years.

CHAIRWOMAN THORMANN: All right, but at least they reached out.

UNIDENTIFIED SPEAKER: That's unsatisfactory.

MR. COFFEY: Just as a note, we can send a complete documented history of the correspondence back to 2009. And I'll send that to you tomorrow if you'd like. That's not an issue.

MR. YACYSHYN: How much of an issue is it to fix? Is it a big issue?

UNIDENTIFIED SPEAKER: Bravo, bravo. Good for you.

MR. YACYSHYN: Excuse me.

MR. COFFEY: The location was inspected --

MR. YACYSHYN: What is the procedure for O & R to correct the

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situation as described by --

MR. COFFEY: We send our maintenance crew out there to review the issue.

MR. YACYSHYN: What happens then?

MR. COFFEY: If a repair needs to be done, it will be done.

MR. YACYSHYN: On the spot?

MR. COFFEY: Of course.

MR. YACYSHYN: Okay. All right?

CHAIRWOMAN THORMANN: Mr. Coffey, that pole looks likes it's the Tower of Pisa. Okay?

MR. TERRIBILE? Can I just explain something to you? In 2009 --

CHAIRWOMAN THORMANN: I don't want to do that. I'm not interested in past history right now. I want it taken care of.

MR. TERRIBILE: But he just said something and you're just taking it. I want to know --

CHAIRWOMAN THORMANN: Do you want to prove a point or do you want it taken care of?

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MR. TERRIBILE: I want it taken care of.

CHAIRWOMAN THORMANN: Well, then so do I.

MR. TREVOR: I want to ask a question. Is this what you consider, your Safety and Engineer Department, is this what they consider safe and on a standard par with what your maintenance requirements are? Yes or no?

MR. COFFEY: I have not been out there. I cannot make a comment. We have professionals that do this every day that are reliant on the reliability of the system and it was inspected back in 2009 and it will be done again.

CHAIRWOMAN THORMANN: Just a minute. It's not that it needs to be inspected, it needs to be taken care of, that's all, Mr. Coffey. And what happened in the past, we want it taken care of before we move forward. All right?

MR. COFFEY: Yes.

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CHAIRWOMAN THORMANN: Thank you.

Kirsten Walker, is she here?

MS. THAL: She couldn't come.

CHAIRWOMAN THORMANN: All right. She couldn't come, but didn't you get me something from her, Mr. Simoes?

MR. SIMOES: Yes. Did you want it read into the record?

CHAIRWOMAN THORMANN: Yes, please. What is it, Martus?

MR. GRANIRER: Since there are a number of people who couldn't make it tonight or are having things read that they might have liked to have said, I hope when you conclude this meeting, I hope that you leave the record open so people can send written submissions.

CHAIRWOMAN THORMANN: We're not going anywhere tonight, Mr. Granirer, so, please.

MR. GRANIRER: Even better.

CHAIRWOMAN THORMANN: The record will be kept open, he knows that. Did you get it? Would you?

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MR. SIMOES: Yes. This e-mail was sent on June 8, 2012. "I'm attaching an article about the fire at the Dumbo Substation in New York City. What we did not mention in the last meeting was the effects of the actual fire. This point has gone largely unquestioned. We have studied the effect of the potential for leaks with the substation and the containment of those substances. This article speaks to the fire releasing PCBs, a known carcinogen into the air that even three days after the fire were still at unacceptable levels. Con Ed was slow to release the report and slow or negligent about any resulting property damage. As a homeowner, I need to know what effect the release of massive amounts of PCBs would do to my home, my child and to my real estate value. Additionally, I want to know what Con Ed would do to address an airborne contaminant. My assumption, based on this article, is that they would not do

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much. Considering that most of these concerns are alleviated by putting systems underground including the surrounding lines, I'm not sure why this is not the protocol given the potential environmental hazards. It certainly is the protocol in other countries."

And then there's a link to that article.

CHAIRWOMAN THORMANN: All right. I have it also. We'll put it into the record.

MR. SIMOES: "I'm also sending along information on PCBs to put this in perspective." And there's another link as to the PCBs for the EPA website. "I had the great misfortune of living in downtown Manhattan during 9/11. The air was heavy with toxic smoke well after the fires had subsided. I have friends who worked in the relief effort and are paying the price now with their health. Being in the aftermath of a toxic hazardous fire is not a situation I want

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to repeat. I realize that this concern is over a "what if" scenario, but the problem is that these fires are quite common. They have been caused by lightning strikes, snakes in the area, which are abundant and other animals in the area and other animal interference. Since I moved to South Mountain Road, I have personally witnessed four lightning strikes on my property and have had six stricken trees removed. My point here is that excessive lightning is not a rare event in this wooded area. The method of reducing interference through an electrified fence is also problematic. I have a two-year-old rambunctious boy. If he makes it across the street and touches an electrified fence, what will Con Ed do for me? Surely they don't expect that a child this age would be able to read or comprehend the warning sign. Two weekends ago he wandered out of the house and after ten minutes of frantically searching for him, I found him by the

little bridge in my front yard. He woke up from a nap and went looking for me. At a minimum, it is up to Con Ed to provide a suitable barrier for my property, as well.

Many experts spoke about the safety of background EMF. I don't disagree that background EMF is less dangerous, but they spoke to the permanent location of the substation. They spoke to when the substation would be firmly planted in the middle of the property. For now, it is not in the middle of the ten-acre lot. It is right on South Mountain Road and is analogous to standing us in front of a microwave for twenty-four hours a day. The experts questioned only examined the proposed scenario, not the immediate scenario. Even background EMF has an effect. The article I mentioned before studied the effect of EMF in African-American women and what they used as the low-grade source was an electrical blanket.

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There are also a number of articles which turn my conjecture about the effects of EMF on autism into fact. It isn't just harmful in its role as a contributing factor of autism, it also slows any improvement and development."

And there's a link for that about the connection between radiation and autism.

"While we are not debating the significant demolition of the trees in the right-of-way that Con Ed is undertaking simultaneously on my property, I do feel that it is particularly unjust to have one house as the apex of all of this destruction. Yes, it's one house, but it's my house. The trees in the right-of-way offer a barrier to the EMF caused by power lines and the erosion and excessive storms have wiped out the barrier of trees on the south end of the property facing the substation. In essence, my house has become a radioactive disaster. At a minimum, it should

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be up to Con Ed to measure the levels of EMF on everyone's perimeter borders and rectify any overages in acceptable levels of EMF.

CHAIRWOMAN THORMANN: Thank you. And would you please see that that's put into the record in its entirety, Mr. Simoes?

MR. SIMOES: Yes.

CHAIRWOMAN THORMANN: Thank you.

Mr. Robert Dillon, D-I-L-L-O-N.

MR. DILLON: Good evening. My name is Robert Dillon. I'm a resident of 170 Old Route 304, New City, about one mile down the Hackensack River from this proposed project. I've lived in Clarkstown for fifty-seven years. I've been active in a number of water issues in the county. I just have a few points to make. I'm not going to get into a great deal of detail. A lot of the points have already been made by others.

First I want to talk about water. In this area, most of the residents rely

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on well water, as I do. It's very common from this area all the way up to the Ramapo line down to Lake DeForest for the residents who rely on well water. So if there is any kind of contamination to the water in this area, it will have broad implications. I also have spent a lifetime in the petroleum business. I've heard the containment devices that are going to be used here. They're basically pervious, and when they come into contact with hydrocarbons, they become impervious. You need to know that there are many compounds that will mix with oil and water such as MTBE, which is used -- was used in the petroleum business. So it's a possibility in my mind that there were, if there is a release, we could have the oil retained, but possibly other compounds released into the water supply which also goes into Lake DeForest.

So in addition to that, we'll move on to the next point, fire suppression systems. One thing we use in the gas

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2 station business, now it's mandatory, is
3 chemical fire suppression. I didn't see
4 anything in this DEIS that referred to an
5 automated fire suppression system which
6 would react to a fire before the fire
7 department could react. That's something
8 that I think should be considered. Also,
9 there are not a lot of fire hydrants in
10 this area. Within an eighth of a mile
11 there are a couple of hydrants. I did my
12 own survey. So I think the fire
13 department would be able to respond and
14 have adequate resources to suppress a
15 fire initially. But you have to remember
16 that in this area there are not a lot of
17 fire hydrants. If we have a situation
18 where our firefighters -- incidentally,
19 our volunteer firefighters in Rockland
20 County have an exemplary record. So, I
21 don't doubt their abilities. But if we
22 have a situation in Fort Collins where
23 over seventy square miles is burning in a
24 community of three hundred and twenty
25 thousand people, roughly the same as

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Rockland, and there are eight hundred professional firefighters on that fire tonight, my son is one, so there's a possibility that fire could escape, and in this area where you have steep slopes and you have a lot of unburned fuel for generations, that it could be catastrophic and ordinary firefighting mechanisms may not be adequate. So that's something to consider as far as siting of this location.

Need: It seems to me that Clarkstown, Northern New City is highly developed. Expansion in terms of development, as you know, we're near Ramapo and we're near Haverstraw. It seems that that might be a more suitable location for developing additional substations. I think it's a great thing what O & R is doing down in Tilcon and West Nyack, they're siting a substation in a commercial area with very low risk to the residential areas in terms of downside or fire or explosion, very low

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risk. We're not very far in this situation from the Haverstraw/Congers quarry, which would probably be very well suited as an alternative for siting of this facility and probably would be very well suited to meeting the needs of Orange & Rockland in terms of providing power. I don't know exactly where the nearest facility is in Ramapo, but we do have a lot of vacant land, it's preserved land up at the northern end of South Mountain Road, Route 45, closer to the area where there will most likely be additional development. So I think that area also should be looked at in terms of an alternative.

And that's about it, that's all I have to say for now. I'll submit my official comments in writing.

CHAIRWOMAN THORMANN: The gentleman in the blue shirt, you wanted to speak, sir?

MR. FIEL: Yes, I would. My name is Martin, Fiel, F-I-E-L. I've been a

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resident of New City about forty years and my present house almost thirty years. I live on Roberts Road which is not shown on this map here. I don't know how old that picture is, but I think Roberts Road may be even closer than Denver, and there's been no comments regarding anybody from Roberts Road as far as fire hydrants. But the development I live in is about forty or fifty homes. This a highly residential area. The surrounding area, there's actually no, that I know of, anything commercial. I get a bill from Orange & Rockland every month like clockwork for the last forty years almost, and this is the first time I've heard that they're building or attempting or applying for a substation. I've never been notified and I'm a little ignorant as to the facts. I'm learning, I'm getting an education tonight. Some of the reading of the record were boring, but it's highly educational. And it seems to me that from the speakers that

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preceded me is that there's a very high health risk here, hazardous health risk, and has Orange & Rockland supplied any data or any information, any studies in connection with the downside, the negatives are of this application?

CHAIRWOMAN THORMANN: Are you asking me or are you asking them?

MR. FIEL: If I could ask them directly.

CHAIRWOMAN THORMANN: Mr. Coffey, would you like to respond to that, or Mr. Montalbano?

MR. FIEL: I mean, point blank, is this a hazard to the residents?

CHAIRWOMAN THORMANN: I don't have that answer for you.

MR. MONTALBANO: I'm not an engineer, but we did provide and the town requested that we provide a study of EMFs, which we did. That study was reviewed by the town's consultant with respect to EMF fields, and the result of the study was that, number one, the

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substation itself does not increase EMF fields. What is there with the tension lines is there.

Now, I believe if you had Mr. Leifer respond, who is the town's consultant, perhaps he can answer better than I can this gentleman's question.

CHAIRWOMAN THORMANN: The question, Mr. Montalbano, was did you provide for any information? I intended to ask Mr. Leifer, but he wanted to know if you in your report had provided any information about any health risk.

MR. FIEL: Let me just put it this way, and I'll try to compare it to purchasing a stock, what they call initial public offering. They submitted, and I'm sure everybody's aware of what happened with Facebook, but the bottom line is they give you a prospectus, they tell you everything about the company and then they tell you the negatives. And a person does due diligence and they make an intelligent decision, which this Board

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would make. This is the first time I've ever been before the Board, living here forty years, I see how it's working. But to make an intelligent decision, I think it incumbent upon Orange & Rockland to supply serious data whether or not this, whatever they're building, and I don't even know what it is, a substation with an antenna, a ninety-foot antenna, whether or not it increases or is a health hazard to the children and the residents of Clarkstown who are in the immediate area. And from what I'm hearing is they want to do this, they want to do that, but they have not supplied any pertinent information to make some sort of decision part.

CHAIRWOMAN THORMANN: No, no. You misunderstood.

MR. FIEL: All right. Let me just finish. And I think it's incumbent upon them and not at taxpayers' expense to do all these studies, but they should initially supply the information. And

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I'm asking a very simple question and nobody's answering it.

CHAIRWOMAN THORMANN: Excuse me. Mr. Leifer, who is the town's consultant on all of these matters, would you like to explain, again, what you do so he understands that you're not just somebody off the street coming in to make an analysis?

MR. LEIFER: I've been working for the Town of Clarkstown, this is my thirty-ninth year, and I'm a communications consultant, I'm a full-time employee of the Town of Clarkstown and I do the communications for the Town of Clarkstown. I'm a graduate electrical engineer, I'm a licensed professional engineer and I hold several technical positions and licenses for Federal Communications Commission and their Emergency Response Interoperability Committee and I also work locally for the Radio Planning Committee for the tri-state region, and I'm totally

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familiar with electromagnetic fields.

And I'm anxious to talk to the public here that, I think, in all good intentions, I think, you've been unnecessarily, I think, scared is the word about the electromagnetic fields specifically from the substation. And let me tell you why. I have here an electromagnetic flux meter. And as I sit here talking about a substation, if I turn the meter on, at this particular location I'm measuring three milligauss, that's what's here. Now I just walked around the room and just walked outside the hall by the switches, the electrical switches, everybody has it in their house and I measured a hundred milligauss. In other words, electromagnetic fields are all around us. I'm not talking, necessarily about a can opener, an electric can opener in your house where when you turn that on and you're near it, I can measure 150 milligauss, way beyond any of the numbers that are involved

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here. Now, of course an electric can opener is to not so insidious because it is exposing for a just a few seconds, whereas when we talk about, the longer I sit here, I'm being irradiated and probably you are too, you're in the same room, with probably three milligauss. That's because we're in an environment where there's electromagnetic fields being generated by the currents that are flowing through the walls. I think I'm the person that basically invented the words prudent avoidance. And prudent avoidance really means that if you have a choice of where a radiator should be, an electronic radiator should be, whether it's cellular or anything else, choose a place which is as far away from places where people are around. If you have a choice, choose one that's as far away as possible. But in our homes we are totally surrounded by electromagnetic fields, and I would say, when I bought my house in New City and I had a very small

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child in a crib, I took a meter like this and I walked around in the room and I found certain locations where the electromagnetic field was over 150 milligauss. Why? Because you had two switch gears in the garage and all the wires were coming up inside the wall up into the attic and being distributed throughout the house. So all of the electric currents were at that location. You wouldn't want to put a crib there. So what I would do is I would put a TV there or some type of cabinet. In other words, in your home with levels that are way above what your own consultants say is being produced in your neighborhood, the only place that the electromagnetic fields in this site is greater than what I usually measure is if you're under-standing under the existing transmission lines, and that is not supposed to be visited by the public. As you walk away, when you get, for instance, to Little Tor Road and South Mountain Road, you're

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talking 5 milligauss, 3 milligauss, now, now. Because of the overhead distribution lines, you're going to get 5 or more. In your own home, sitting by a TV, you're gonna be getting that kind of magnetic flux.

So, what I'm saying is, the numbers that O & R presented in terms of magnetic flux density in different areas in your neighborhood and the numbers that your own consultant provided here are talking about .5, milligauss, 1 milligauss. The maximum in here is 5 milligauss until you stand right in the substation transformer itself and then it's 10 milligauss. But I found a hundred right outside in the hall, and anyone who wants to take a look at it, please do. But what I'm saying is that the device that's being installed, and you have other issues that are very valid issues that have to be determined, electromagnetic density due to the substation is not an issue that you need to pursue because it will not in any way

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increase the magnetic flux density in any residential area above what you are already having at this point.

MR. ABIB: Excuse me. Allow me to disagree.

MR. LEIFER: Okay.

MR. ABIB: Number one, because Draft Environmental Impact Statement says 76 milligauss would be the level which is at the site.

MR. LEIFER: 76 was under the wires. 76 was under the wires.

MR. ABIB: 76 milligauss under permanent conditions is totally different than anything else on a temporary basis.

MR. LEIFER: I used that number, 76, because I personally measured that number. I have it in my written report. I personally walked up and down Little Tor, North Little Tor and South Mountain and as I stood under the distribution lines, I was getting 75 milligauss at that point and I have written that in my report, on my June report. So I

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acknowledge, if you're standing under a distribution line, not a transmission line but a distribution line, the ones that are in the street, on the curb, you're going to be having 75 milligauss, no question about it. When I walk in the street, I walk across the street from where the distribution lines are, that's prudent avoidance. And the reason I'm mentioning this to you at this point is that you all should be aware that there are many, many devices right on your lawns, the transformers that are feeding you or the transformers that may be on your poles in your neighborhood, you're going to get 75 or more. I found a hundred right out here in the hall --

MR. TERRIBILE: Did you check the lines that go through Lake Lucille? Did you check the lines that go through Lake Lucille? Because kids are under there all the time swimming.

MR. LEIFER: You know what? That is a problem, if you have lines that are

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carrying electrical currents, you are going to have an electrical field. If you would like to measure it, I'll be happy to bring the meter there and measure it. And you know what? It's gonna be higher than you would really want and I would avoid any place where there are distribution lines, where there are electric transformers. But please notice this, as you walk away from the source, the electromagnetic field density diminishes exponentially as the square of the distance, inversely to the square of the distance. So the whole idea is to stay away from those devices and the wiring. Now I never put a crib or a bed next to a wall where there are wires inside the wall.

MR. TERRIBILE: No. But under these wires --

CHAIRWOMAN THORMANN: Mr. Terribile, you can't just stand up and ask questions. I'm trying to maintain order. I want everybody to be able to

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have a say.

Did you have a question to ask?

Mr. Fiel, you're not finished, I know that. But she had a question to direct to him. You're not finished.

MR. YACYSHYN: Madame Chairman, I have something to add to Mr. Leifer's, and I want him to explain it.

CHAIRWOMAN THORMANN: Can it wait until after she asks her question?

MR. YACYSHYN: No. I beg at this time the privilege of having Mr. Leifer answer my position. Okay?

CHAIRWOMAN THORMANN: No.

MR. YACYSHYN: With your permission. Not this Board, the present membership, but the Clarkstown Planning Board has gone through O & R substations in the past. The Nanuet Mall, when it was fully operational, if we remember the electrical substation that was there. You were a part of that professional team that made the testing and everything else we went through. Would you explain, now

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that is much closer than any of the possibilities that we have for this exhibit; right?

MR. LEIFER: Yes.

MR. YACYSHYN: Would you explain what happened at that point?

MR. LEIFER: With your permission. With the transformer at the Nanuet Mall, right across the street, directly south of where that transformer was placed were homes and the people there were absolutely concerned and rightly so. And I was asked by the town to make measurements and we determined that they had a gate that was built around the transformer, and if you stood outside the gate, the magnetic field density was what I would call ambient, 2, 3 milligauss. Just like right now I'm measuring that amount. As I walked away towards the residency, the meter went to zero. And then as I approached the residences, the meter came back up again because the residences themselves, the building there

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themselves were generating electro-magnetic fields due to the electricity flowing in that dwelling.

MS. THAL: And you consider this a scientific measurement?

MR. LEIFER: Excuse me?

MS. THAL: Your little toy, you consider this a scientific measurement?

MR. LEIFER: If you would like to buy one like this, I can tell you where to get it.

MS. THAL: I know what they are. I know what they are. I've used them.

MR. LEIFER: And this is not a toy. You're not looking for knowledge. This is a scientific instrument, as small as it is. You can get a much bigger one if it needs to impress you.

CHAIRWOMAN THORMANN: All right. Excuse me, please.

MR. FIEL: So, why do so many public agencies recommend that you don't put these substations near children or residential areas?

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MR. LEIFER: Because you're not supposed to go near them, and the size of this site is so very large and the size of the electromagnetic devices which are the transformers and the switch gear are in the center of this site, so that any person who is going along with the gating and the signage and they're not trespassing on the site will not have any more electromagnetic flux density than you get in your own home. The problem is that there is a big fear factor out there. There is a lot of written information that's written about cell towers. Now I avoid cell towers. I have radios and I don't use the radios if I can help it for the police department. I have a cell phone, I don't use it if I don't have to. I stay away as much as I can. But what there is is what you call a benefit versus risk. In other words, if I need to make a phone call and it's so important that I'm willing to irradiate myself, that will be my choice.

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I can assure you that any cell tower in the Town of Clarkstown has been placed far enough away that the electromagnetic fields at your residence will be ambient, and the FCC, in their 1996 tele-communications act forbids any town from denying cell tower placement based on health. And this is, by the way, something that -- I work at the FCC, I'm on the committee, and I think that health should be considered, but right now, the towns are prohibited from considering health.

MR. FIEL: Would you recommend this substation be installed in a non-residential area, commercial area? Do you have an opinion on that?

MR. LEIFER: The substation has to be located where the transmission lines are, and the transmission lines are exactly right over that particular plot of land which determines where the location has to be. Now, if you can find another location in a commercial area

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away from residents, that's also under those transmission lines, then I'm sure O & R would prefer to put it there. But it turns out the combination of the existence of those transmission lines and that plot of land make it the appropriate spot for O&R.

MR. FIEL: Could it be done underground?

MR. LEIFER: Excuse me?

MR. FIEL: Could it be done underground as opposed to --

MR. LEIFER: Anything could be done if you're willing to pay for it, but I would tell you that if you put it underground or even above ground, it is not going to affect the electromagnetic field in your house. I can say that with certainty and I wrote it in my report.

MR. FIEL: Well, not in my house, but if I'm in my backyard playing with my grandkids, is there any danger?

MR. LEIFER: I have not had the pleasure of being in your backyard, but

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if you want, we can make measurements now. By the way, I just want to say this report shows clearly that with the substation or without the substation, the electromagnetic field outside of the perimeter of the site is unchanged.

MR. MONTALBANO: Mr. Leifer, the report you're referring to is the report Mr. Granirer submitted?

MR. LEIFER: That is correct.

MR. FIEL: Has Orange & Rockland given you any documentation?

CHAIRWOMAN THORMANN: It's in the DEIS.

Do you have anything else you want to say?

MR. FIEL: No.

CHAIRWOMAN THORMANN: All right. Then this lady over here wishes to speak. She's Dr. Mcguffie daughter.

MS. HUDSON: Hi. My name is Pamela Hudson and I live at 288 South Mountain Road which is the western-most residence in Lake Lucille, and I've been a resident

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of South Mountain Road for fifty-three of my fifty-five years. As the Chairwoman stated, I'm Dr. Mcguffie's daughter, and I'm actually personally happy she's not here to see this because she loved this road, and just from an aesthetic point of view, but that's not the point I want to bring up.

Two quick points. I was a student at SUNY New Paltz in the early '90's when there was a catastrophic transformer explosion which contaminated a dormitory severely and also the Coykendall science building which became -- it was a terrible mess. Thank God the campus, it was during Christmas break, and I'm sure that people would have been severely compromised. It was a miracle that there was nobody there to be actually injured in the explosion. But the subsequent contamination and damage, it was an ongoing cleanup. They finally had to demolish the science building. It took over five years to do the cleanup and the

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transformers were by no means any kind of -- on the scale of what is proposed for a station like this substation.

And I also -- so it concerns me very much. What the content, I hear people talking about the oil, and this is not Wesson oil, this is electrolytic fluid. That all precautions aside, I've already experienced the worst case scenario from contamination from electrolytic oil. And so I guess I would like to know what's in this oil. Is there still PCBs? And I'm an organic gardener along with also having a well that the community shares. And even if I were still living at 591 South Mountain Road, I'd have the well water, but that was already brought up.

The second issue, besides the oil and the possible contamination, no one expects the worst case scenario, but we know that it does happen. And this has to do with, and I also want to thank the Board for extending, giving us this

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opportunity, it's really important because I've heard a lot people in the last three meetings share a lot of things and I reserved my statement till I had listened to what everybody had to say and what the concerns were, I contacted my sister who is an oncologist, she's been a oncologist for decades. She teaches at the University of Syracuse, she's done research. I asked her to research this for me. Somewhat, unfortunately, because I know I have my own reasons to not want this substation right up the hill from me, we're very close to it.. But she said couldn't find a lot in terms of the epidemiological studies. And that it -- sort of the jury was still out about that and there's been a lot of talk about that. But there are some new studies indicating that concentrations, EMFs, I think, electromagnetic fields, and I know that may be at the perimeter of the site, there's a dispute about whether it's a significant amount and it's beyond

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ambient and all of that, and I'm not a scientist and I don't have a lot of handouts, but I am continuing to research this and she's researching it for me, and the biggest concern lately, and I haven't heard this mentioned, is that large electromagnetic fields they're now discovering attracts radon gas. And that really concerns me, and I haven't heard anybody mention that, so it makes me question, well, I don't know what the extent of that research is and my investigation is ongoing and so is hers. But that really concerned me, and it just sort of makes me realize, you know, that there's a lot of we don't know and it's ongoing. So, I guess that's really all I have to say. So, thank you.

MS. JAFARI: Good evening. My name is Marzie Jafari, M-A-R-Z-I-E J-A-F-A-R-I. I've been living on South Mountain Road since 1996.

The reason I decided to speak up tonight is because I would like to share

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my professional opinion with you on this matter. I have a Ph.D. in environmental science. I teach, I'm a professor and a college dean at the City University of New York. So, I looked at the impact statement. There is nothing about the health risk. The gentleman here asked about the health risk. It's not about just the electromagnetic fields, okay, because as soon as someone talks about the health risks, so then you assume that it's only just the electromagnetic fields, but when you add that the amount of that with higher voltage and then the oil and also many other things, there is definitely a direct correlation between all those amounts that you're talking about, and as an educator and a scientist and a researcher, I guess I feel responsible to share this with you. There is a great impact right there. There are research that have proved and science has proved that there is a direct correlation between cancer and all these

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things that O & R is proposing to bring to our community here. The risk is even higher among women, pregnant women and children. So, I humbly ask the decision-makers tonight that, please, when you make a decision about this matter, think about that your decision will have impact on the lives of people in this room and the lives of people of those individuals who were not able to come tonight and the lives of our children and the children of our children. We want to live and we want to live healthy, please. Thank you.

MS. KOCH: Thank you for the opportunity. My name is Nana Koch, N-A-N-A K-O-C-H. I live at 45 South Mountain Road which is less than a mile from the substation. Given the technical considerations that have already been identified by my neighbors, I don't have to go there, but I do want to make my comments personal. I have but two questions that I would like to ask each Board member to consider when making a

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decision about the substation.

Chairwoman Thormann, Vice Chair Yacyshyn, Member Streitman, if I'm saying it correctly, Thomas Trevor, Ms. O'Connor, Ms. Blumenthal, two questions. Given the information available and in all good faith, can you say that you personally would like to live next to the substation? Given the dangers that have already been identified, would you risk your families, would you risk each one of you living next to the substation?

Number two: Would you buy a house next to the substation if given the opportunity? South Mountain Road is pretty pretty, and I think you might enjoy it if the substation wasn't there. I do wonder how far each one of you lives from a substation, and I bet that if you don't live near a substation, you're pretty happy about that.

So, as you consider, think about in all good faith, would you live next to a substation? If your answer to that is

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yes, well, then you'll make one decision. And if your answer to that is no and if you wouldn't buy a house next to a substation and if your answer to that is no, then you will make the decision we hope is for our community. Thank you.

CHAIRWOMAN THORMANN: Mr. Kiegler.

MR. KIEGLER: My name is Larry Kiegler. I live at 25 Roberts Road. I just have two questions and maybe you can ask it to them.

Your concerns with as far as the oil in the transformers and the PCBs, that question was asked by another woman. Do they contain PCBs?

And the other question is, has a design been -- a containment system been designed for the base of this unit? I mean, all these people have concerns about water getting contaminated and this and that, but it's my concern too. My question is is there a containment system built around it and does it contain any PCBs?

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MR. MONTALBANO: Do you want us to answer that now?

CHAIRWOMAN THORMANN: Please.

MR. COFFEY: There's no PCBs in the insulation oil and in any of the equipment onsite, and there is a containment system. I think we explained that in the DEIS as well as in past testimony.

CHAIRWOMAN THORMANN: Did you hear that?

MR. KIEGLER: Yes, thanks.

MR. ABIB: Good evening. My name is Fuad Abib. I'm an engineer. I introduced myself last time. I also hold a professional engineering in the State of New York and Maryland. My question last time was about mixing, intermixing of oil with water. And now I have upgraded that question to the contain-ment. I reviewed whatever which was proposed as containment. It's my professional opinion, if you want to accept it, this is not a containment.

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This would basically allow oil to mix with water in a way I would say is more dangerous because it would keep it in contact with oil. Whatever leaks from all of those transformers in all of the water streams around site, there's no doubt in my mind that every droplet of leak would eventually end up in ground water or in water streams, whatever which is produced or somehow proposed as a containment does not contain any oil. That's my question. Now, again, my last one which I asked about the intermixing of those products, I didn't get any answer, I would appreciate it if someone would refer to that. Thank you.

CHAIRWOMAN THORMANN: Anybody wish to say anything? All right. We have to decide how we move forward.

And I'm going to turn the meeting over to Mr. Geneslaw who is our consultant, but before we begin, if you have no objections, I need a five-minute break because our backs are ready to

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break. So you will have to wait for five minutes before we reconvene. Thank you.

(Recess taken at 9:43 p.m.)

CHAIRWOMAN THORMANN: We're going to have a little intermezzo before I turn it over to Mr. Geneslaw.

Mr. Knight, do you want to go over there?

MR. KNIGHT: I'm Robert Knight and I'm the chairman of the Clarkstown Historical Review Board. This matter came before us last year because of the fact that South Mountain Road is one of the officially designated historic roads in the Town of Clarkstown, and this property has frontage on South Mountain Road, so it did come before us to review, and Orange & Rockland did make an appearance. Our primary concern was in we didn't want that new substation to be visible by motorists going up and down South Mountain Road. We try as best we can to protect the view shed along the entire length of South Mountain Road all

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the way through to Ramapo. We felt that this might be an intrusion on that view shed. They brought in some very detailed maps and we went out and actually walked the site to see where the facility would actually be built, and it looked like it would not be visible from South Mountain Road at all which relieved our one major fear.

We did speak with the O & R officials, however, because when we went out, it was summertime and all the foliage was in full bloom. We didn't know what it might be like in the winter-ime when there is no foliage. The facility might be visible. So to cover that contingency, we put a provision in our approval that if, in fact, the facility is visible from South Mountain Road in the wintertime, that Orange & Rockland plant some evergreen trees or pine trees between the facility and South Mountain Road so that when they mature it would effectively hide any vestige of

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them, and they agreed that they would do that.

We also discovered in the process of walking the site that there is an historic landmark of sorts on the property which is a sandstone quarry that was used by the original settlers in the area, in particular, the people directly across the street that built the Roberts house in the 1700s. They quarried the sandstone blocks to build the Roberts house from the property that O & R now owns, and the open pit quarry is still on the property and visible, and we were a little concerned as to where the facility might be built in relation to that. And, again, they showed us maps that -- Larry can you come up and point to it while I talk? We can show you where the quarry is and the facility will be quite far away from the quarry and the road leading to it from North Little Tor Road will also avoid the quarry site.

UNIDENTIFIED SPEAKER: This is

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Little Tor Road and South Mountain Road. The quarry is located up in this area up here (indicating).

MR. KNIGHT: And the yellow dot is the facility?

UNIDENTIFIED SPEAKER: Well, it's back there, I believe it's back further, but it's up in this area here (indicating).

MR. KNIGHT: So, we did add a provision, it's in our approval, that Orange & Rockland take pains to protect that quarry site. Since they hadn't planned on disturbing that area anyway, they saw no problem with it. The only thing I would add to our approval is because I suspect the conditions of the Planning Board probably carry more weight than conditions of the Historical Review Board, we would ask it include the same two conditions, if at some point you do end up approving this or a variation of it, that you include those two conditions that the facility not be visible from

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South Mountain Road and that the sandstone quarry be protected. And other than that, our approval was unanimous.

CHAIRWOMAN THORMANN: All right. Thank you.

Act II of the intermezzo, Mr. Montalbano has asked for the right to respond.

MR. MONTALBANO: Let me just consult with my clients, but I think we've heard all the comments, I think we've responded to most of these comments at our last public hearing last week. So rather than again publicly responding to the comments that we've heard this evening, we've responded with respect to the EMFs studies and Mr. Leifer has confirmed that the substation is not a threat with EMFs to the health and safety of the surrounding community. We spoke to the question of the substation and tertiary system that we have to make sure that the mineral oil that services the station does not wind up in the local

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water supply. We have responded to the question that the Board had with respect to fire by aggressively having conversations with United Water, and I believe Mr. Coffey has given you the company's commitment that if necessary, they will arrange to extend the main and provide for a fire hydrant at the site.

We've also, I believe, shared with you, and it may be in the DEIS, but I think we've just heard testimony to the effect that we have met with the fire company, that Mr. Coffey has suggested, has testified that what we have done is had meetings with the fire company and O & R has regular meetings with the fire company. They've reviewed practices and procedures. If an accident should occur here, a fire should occur, the instructions are let the transfer station burn and just keep the surrounding area safe as required.

With respect to the threat of lightning, a substation has a lightning

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pole for that very reason, to ensure that we avoid a lightning strike.

The water line and the hydrant was in response to the concern of the community with respect to what happens if there's an explosion and then there's wind, there's no water there, how are we going to stop a fire on the hillside, so the company at its expense is prepared to do that. So I think we've answered all the questions that have been repeated, I must say in part by the members of the community. We have heard it, we have heard it loud and clear.

And one further thing. And I do know that we've had, and we keep coming back to this same question about, well, why don't you put the substation underground?

Well, firstly Mr. Leifer said when you put it underground or above ground, the EMFs are the same. So there's no threat to health or safety whether the substation is underground or above

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ground.

You also heard Mr. Coffey testify last week with respect to putting a substation underground and the multiple increase in cost to do such a thing and that the company would have to set up a special tax district the way they did when they put lines underground in New Square that the residents of New Square are paying for. So I think we have answered all of your questions.

I would like to say to you that all of the things we have heard tonight, many of the questions that were raised were answered in the DEIS. There is nothing new, there is nothing new, there is studies upon studies upon studies upon studies. The fact of the matter is that New York State has a regulation with respect to milligauss or EMFs that we're well below those standards, that the substation does not, does not in any respect create more EMFs whether it's there or not, the EMF level remains the

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same at the property line. So when the question is do we need a supplemental EIS, the question is what's new, and there really is nothing new.

I would respectfully suggest to this Board that you let us proceed with the process in an orderly manner. And my suggestion is the following. You've heard from the community and we've listened respectfully and so has this Board. You had heard in 2008 and three meetings this year. It is time that we close the public hearing. We've had the same individuals over the last few weeks testify on various issues and we've heard and listened. Most of those issues that were raised were addressed in the DEIS. There is nothing really new here.

I would suggest and respectfully request that you close the public hearing, that you give the public an opportunity to put additional written comments on the record and that we proceed to a FEIS, to stop the process

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now and say what we need is a supplemental EIS because there are new facts or new questions that have arisen,

I dare say, tell me what those questions or facts are that we haven't addressed.

The question of public health was addressed in the DEIS because we did the EMF study. It was confirmed that EMF study was accurate that the substation is not a threat to the public.

With respect to public health on the area of -- if I may, with respect to public health in the area of water protection and public health in the Hackensack River and Lake Lucille, we provided you with a tertiary system and also with a system that says we will absorb the oil if it should leak from the substation.

With respect to the public health and potentially a fire, we have said to you what we will do is we will arrange with United Water to extend the main and

1 (PLANNING BOARD)

2 provide you with fire hydrants. So, I

3 don't know where the public health issue

4 is, I really don't.

5 You can say that there are new

6 issues, but I respectfully say that they

7 have to be substantial new issues. They

8 just can't be new issues for the sake of

9 being new issues. They have to have

10 substance and they have to have meaning

11 with respect to the application. And

12 we're preparing to work with this Board

13 in preparing a finding statement that

14 addresses all of the public comments

15 which must be addressed in a final EIS

16 We must address those comments. So to

17 say to provide us with a supplemental

18 EIS, I say on what? So that's the end of

19 my speech, and thank you for listening to

20 me.

21 CHAIRWOMAN THORMANN: All right.

22 Now you've had your say, we're

23 going to move forward now. You have done

24 an admirable job of presenting your

25 client's position.

1 (PLANNING BOARD)

2 MR. MONTALBANO: Well, thank you,

3 and I hope that you agree with me.

4 CHAIRWOMAN THORMANN: But I don't.

5 All right? No clapping, no clapping,

6 because this isn't a popularity contest.

7 This is serious. All right? And we take

8 it seriously. And it's up to this Board,

9 is going to have to make a decision

10 whether --- what path you want to follow

11 from here on in. And I'm turning this

12 over to Mr. Geneslaw to lay out the

13 possibilities for the program.

14 MR. GENESLAW: Thank you. Can you

15 hear me okay?

16 CHAIRWOMAN THORMANN: Absolutely,

17 nice and clearly.

18 MR. GENESLAW: I think the first

19 thing the board will have to decide is

20 whether you want to close the public

21 hearing or leave it open for a longer

22 period, and what are the potential next

23 steps, because I see three possibilities.

24 One of them would be -- well, let

25 me point out that there's an enormous

1 (PLANNING BOARD)

2 amount of new material both verbal and
3 printed that's been provided. Some of it
4 is fairly technical, and I think some of
5 it may require additional technical
6 support and O & R may need to retain
7 additional help for some of it,
8 particularly the items that are health
9 related. There's a great amount of
10 information that requires careful
11 evaluation both from Orange & Rockland
12 and the Board.
13 And the first of three
14 possibilities would be to say, prepare a
15 new Draft Environmental Impact Statement
16 incorporating all of the information that
17 has been offered to the Board. In
18 particular, I'm concerned about the
19 participation by emergency services.
20 They apparently did not receive the
21 Environmental Impact Statement. Given
22 the nature of the proposal and the kinds
23 of questions that have come up, I think
24 all three emergency services need to be
25 given an opportunity to review the

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document as it was submitted because I don't see any other logical way for them to participate in the process. So one way to do it would be to start with a new Draft Environmental Impact Statement and precede that with a scoping session. Scoping session essentially creates an outline. According to the regulations, the Applicant prepares the first draft of the scoping outline, so the Board may modify it with or without the help of staff.

The second alternative would be a Supplement EIS. This is one that Mr. Montalbano just spoke about. This would deal with the newly identified issues that were not covered in the broad range and the DEIS would include, the process is the same, the aPplicant prepares the first draft, the staff of the Board may modify it and the Board ultimately approves the scoping outline. And from that the supplemental material is prepared.

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The third alternative is the Final Environmental Impact Statement, and that's the one that Mr. Montalbano would prefer. That is set up as a comments and response format. And that is, again, first prepared by the Applicant and then reviewed by the Board. All the responses must be in the Board's voice, not in the consultant's. So whatever they draft would be subject to modification by the staff on your behalf and then by the Board members to be sure it met the Board's intentions. I see the difficulty with that at this point of pulling all of that material together because of the diversity of material that's been provided.

That's kind of a thumbnail description of the choices that the board has. I don't know if you have any questions.

CHAIRWOMAN THORMANN: I'm going to ask you the same question that I asked you at the very beginning of this. What

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is your considered opinion as to the path we should take?

MR. GENESLAW: I would say the Supplemental Environmental Impact Statement would be the best alternative. Now, I don't know if Mr. Simoes or Mr. Letson has anything to contribute to this discussion, but they might, so you may want to give them an opportunity.

CHAIRWOMAN THORMANN: Mr. Letson?

MR. LETSON: Well, there have been a number of issues raised with regards to several of the areas and elements in the depth of the material that's been presented in the Environmental Impact Statement, you know, both here and some of the discussions that Pat may have had with the Applicant. I would agree with Mr. Geneslaw.

CHAIRWOMAN THORMANN: Mr. Simoes?

MR. SIMOES: Same, I too would agree.

CHAIRWOMAN THORMANN: Now, ladies and gentlemen --

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MR. YACYSHYN: Before we call for a vote or a motion, I'd like Mr. Geneslaw to, again to give us the mechanics of the Supplemental.

MR. GENESLAW: Its procedure would be --

MR. YACYSHYN: Well, let's start with, would it be with the closing of the public hearing?

MR. GENESLAW: I think you can do it either way. You can close the hearing, include everything on the record and then hold a new public hearing when the Supplemental is completed.

MR. YACYSHYN: Which means it will have to be re-notified?

MR. GENESLAW: Yes. Because the regulations provide that the process for the Supplemental is the same as it would be for a Draft EIS. It would be the same hearing and notification process for both of them.

MR. YACYSHYN: And is there any way of expediting it? I mean, what we've

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gone through already, which has been somewhat laborious, we certainly have had more than ample public comment, written comment, extended comment and everything else. I mean, is there anything that could be done to compress the timeframe and everything else for the Supplemental. Because if you're talking about restarting the process --

MR. GENESLAW: My own feeling is you're going to need to retain some additional specialists to help review the material. I don't know how long that will take, but if O & R's preparing the document first, you may want to wait and hold off on retaining someone. I don't know what kind of time would be involved. This is a very unique kind of application.

MR. MONTALBANO: May I be heard?

MS. BLUMENTHAL: I just have a question. The first option that you presented, can that in any way be combined with the Supplement EIS with

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emergency services?

CHAIRWOMAN THORMANN: First you go back to square one.

MR. MONTALBANO: The DEIS stands. The question is, really, and I think I'm responding to what Mr. Yacyshyn is saying, who is going define the scope of this new Supplemental and what issues are there? I must say, sitting on this side of the table, I am somewhat confused because I think we've addressed most of them. Now, you've had a wealth of information that's been provided to you which we said we could review in an FEIS, and if there was something new, substantive and it's new, then you have the right to say, you know what, give us a Supplemental EIS, but I haven't seen anything. And I agree with you, what's going happen is I'm going to go back to square one and start all over.

CHAIRWOMAN THORMANN: No, no, we're not asking for a new EIS. We're not asking for that, Mr. Montalbano.

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MR. MONTALBANO: But it's still the same process, Ms. Thormann, you have to go through scoping, we have to submit a draft to you, you have to review it, you have it reviewed by your consultants, you will probably want to have a public hearing, you will have a public hearing again, and then you will vote on whether or not you accept the Supplemental DEIS.

CHAIRWOMAN THORMANN: If you do what we're asking you to do, do you think that, in all honesty, do you think the Board would turn it down if you did what you're supposed to do? Do you really think that, Mr. Montalbano?

MR. MONTALBANO: I don't understand what you mean, Ms. Thormann.

CHAIRWOMAN THORMANN: Do you think that we would not accept it if you did what we're asking you to do?

MR. MONTALBANO: No, I'm not saying that. I'm just responding to what Mr. Yacyshyn said that the process will be long winded by its very nature.

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CHAIRWOMAN THORMANN: Well, I don't think he said that. I think what Mr. Yacyshyn, if I'm not mistaken, is just asking is, could it be expedited, that's all.

MR. MONTALBANO: And my response to that is that the regulations require that a process be followed. Am I right?

MR. GENESLAW: The process would be the same for the Supplemental as it would be for the Draft EIS, and part of that, as I pointed out last time, is the disclosure process.

MR. YACYSHYN: The point that I was making, so that it's clearly understood, is that we have a volume, and this is only one part of it, a volume of material already. So to say that we go to square one which is as the Chairwoman says is not going to be the case, nor should it be the case, because we have gone through all of this already, and the public has been invited and participated in this, that's why I asked if there was any means

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by which we could compress it, expedite it, use whatever term you want to telescope so that we got to the salient issues that were purportedly addressed, okay, and not go through this. I realize the procedures will be the same, but the timeframe and all the rest of it is to me an issue.

MR. GENESLAW: If you pursue the Supplemental, the Applicant takes the first step towards drafting a proposed scoping outline. That gives them the opportunity to either leave or reduce in complexity some of the items. So, for example, if there were items for which there were no comments either from the Board or staff or the public, those would not have to be addressed in the Supplemental. And once they complete a draft, the staff would review it and then either send it back or send it on to the Board. The Board will ultimately decide what the scope will include. The scope is in the table of contents we didn't

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have that last time. We didn't have that based on the Board approving the scoping outline. This time the Board would be approving it.

MR. YACYSHYN: Is it possible that there were issues, Mr. Geneslaw, I ask you that there were issues that were raised by the public, either verbally or in written form, that you've had heard that were not in the original scoping document?

MR. GENESLAW: I think all of the public health issues and most of the emergency service issues were not adequately addressed and probably the water quality.

MR. YACYSHYN: Not adequately?

MR. GENESLAW: They were addressed, they were addressed, but based on the testimony we've had in the hearings --

MR. YACYSHYN: That's very important.

MS. O'CONNOR: Excuse me, Mr. Yacyshyn, I disagree with it. I think

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that many of the items that were brought up vis-a-vis medical, World Health Organization issues, water issues, whether or not this containment situation that you're using in case there's spillage, whether it's been used anyplace else and if it's been used successfully, I think many of these issues have to be addressed in order for us to make a solid determination about whether or not this is safe for our community. And I don't think that the questioning -- we lose, we spent an awful lot of time reading and rereading and trying to do the best that we possibly can for the all the residents of our community, and I think it's not untoward to say the questions that were brought up were valid questions, and I do think that we should request a Supplemental. So, that's my opinion. I think we can address the issues that were brought up more fully and we will be doing our due diligence.

MR. UTSCHIG: Just so this Board

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understands it, from the SEQR perspective, all questions that have been raised, which are very valid, are questions that were initiated after reading a section of the DEIS and the people who created this process envisioned that happening and said, you know what's gonna happen, people are gonna take the information that's been presented in the DEIS and they're gonna ask a bunch of questions, and so they created the FEIS as the process by which we address them. So it's not a step in avoiding the questions and answers, it's actually the way the process is set up. If you go to the handbook --

CHAIRWOMAN THORMANN: We know --

MR. UTSCHIG: I know, but I would ask the opportunity to make sure everyone is clear on this. The handbook talks about why you do a Supplemental and it talks about clearly new issues, not there's some questions about how the water quality works that we want

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answered. It's about there was nothing in the book about water quality. So it's important to understand that, and the process also talks about creating a scope that is finely tuned to the subjects that are determined to be absent but relevant, which goes to your being able to take the scope and identify those issues that were untouched in the process, missed.

CHAIRWOMAN THORMANN: I understand that.

MR. UTSCHIG: And I think that we would say to you is, and what Mr. Montalbano has been saying is we can't quite figure out what those are. Lots of questions, absolutely, but where is the issue that was missed?

MS. O'CONNOR: I'd like a medical opinion. We don't have a medical expert on this Board, and I'd like a medical opinion based on what these people's concerns are. I understand that we have an engineer's opinion and I certainly do respect his opinion and his expertise,

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but I want, I do want a doctor's opinion, a researcher's opinion, so that I know that we have done everything we can to protect our own people.

CHAIRWOMAN THORMANN: I have a question for emergency services. I haven't heard anywhere if there is an accident how the medical people could get in. No reference to it. In terms of fire, all right, there was very little in the report how fire would be handled. And when I spoke with Mr. Narciso and we spoke with the assistant chief of the New City Fire Department whose specialty is foam, okay, and he said to us would you like to put it on the record? That's what he said to us.

MR. SIMOES: His particular concern was the gas regulator and how that would interact with the transformer, but his specific expertise was actually supplying the foam that I believe -- I don't know if we ever mentioned it, but I believe there was other meetings where Orange &

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Rockland has mentioned about having some kind of fire retardant foam. The equipment that's on the fire trucks, there are two different types of foam that are used. There was also concern as to where that would be stored, whether it would be on the site in a central location. He believed it would be preferable to have it at that company, but that really hasn't been discussed. Fire retardant systems, whether there would actually be an automated system on the site, which is all pretty much new.

MR. UTSCHIG: That's not new, that's a question and an answer.

CHAIRWOMAN THORMANN: Where is it addressed in here?

MR. UTSCHIG: It's not. Fire is there. There's a section in the book about fire protection and it talks about the company's policy, it talks about the discussions. The community services are there. What you're saying is there's not enough.

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CHAIRWOMAN THORMANN: And there's no validation for it, substantiation, Mr. Utschig.

MR. UTSCHIG: I understand that. That's what the process is intended to do. You have a new foam, you have a new fire chief, he has a different opinion. These are all very valid questions. But the process is what you're talking about. It's not about avoiding the questions, it's not about avoiding the medical opinions, it's about saying there's a section in the document that deals with community services and fire protection and the Board and the public has said we have lots of questions. Are there going to be a lot of pages to answer those questions? Absolutely. But the information can be presented in that format in that process which is how SEQR is meant to function.

CHAIRWOMAN THORMANN: You're arguing the process. I hear you. Okay? And I know Mr. Montalbano is going around

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in his head, this is substantive enough, I know what he's saying.

MR. MONTALBANO: There is nothing new here, by the way.

CHAIRWOMAN THORMANN: Please, sir, this is a conversation between the Board and the Applicant. The public doesn't participate in this. And we differ. I'm going to poll the Board and our consultant the town hired because SEQR is his expertise. And I know you have your expert sitting next to you. But we are going to listen to the recommendations, at least I am, of our expert. I'm going to poll the Board.

Mr. Trevor?

MR. TREVOR: I'm inclined to go with our consultant.

MR. YACYSHYN: What did he say?

CHAIRWOMAN THORMANN: He's inclined to go with the consultant, Mr. Geneslaw's recommendation for the Supplemental.

Mr. Streitman?

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MR. STREITMAN: Agreed. Originally, when he drafted out A, B and C, I was still somewhat open to A, and with what he said and so forth, I am more inclined with B. To go all the way down to C, I'm not ready to do that.

CHAIRWOMAN THORMANN: Ms. Blumenthal?

MS. BLUMENTHAL: Yes.

CHAIRWOMAN THORMANN: You've heard the Board. Do you want to explain then where we go now?

MR. GENESLAW: Well, the next step you have to decide is if you want to leave the hearing open to collect any additional information. I would suggest that at minimum, you keep it open for ten days --

CHAIRWOMAN THORMANN: All right, ten days.

MR. GENESLAW: -- for additional written material and then ask the Board to ask the Applicant to prepare the first draft on the Supplemental, and if the

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Board would like, we can circulate it among staff after you completed it and do that over the summer.

CHAIRWOMAN THORMANN: If they can get that back quickly.

MR. GENESLAW: I'm sorry, I misspoke apparently. I was referring to the scope. If the Board asks the Applicant to prepare the scope over the summer so the staff can review it and suggest modifications before they take it to the Board, we have to hold some sort of public participation for the scoping outline. It doesn't necessarily have to be a formal hearing, but it would have to be on your agenda. So, as the schedule permits, one of the meetings in July or August.

CHAIRWOMAN THORMANN: I'd like to handle this as rapidly as possible. We could get it together in July.

MR. GENESLAW: That would be dependent on how quickly they could get it together and whatever else is on your

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agenda.

CHAIRWOMAN THORMANN: I will see that it gets on the agenda in July, if they can get their work done.

MR. YACYSHYN: For what?

CHAIRWOMAN THORMANN: Scoping, Mr. Yacyshyn.

MR. YACYSHYN: Okay. If that's the case, we're talking about the summer with the potential of absenteeism, the public being involved, and that's not the appropriate time.

CHAIRWOMAN THORMANN: Well, I'm not going to put them under the burden of stringing them out forever, and if the public is interested, they will be here in July.

MR. MONTALBANO: You know what my preference would be, to tell you the truth, is for you to reconsider the vote, move to a Final Environmental Impact Statement, if at the end process with the Final Environmental Impact Statement you find it wanting, you have the right at

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any time to require us to do a Supplemental Environmental Impact Statement. Am I correct?

MS. O'CONNOR: Don't we have that right right now?

CHAIRWOMAN THORMANN: Of course we have the right. I understand what he's doing.

MR. MONTALBANO: Because, honestly, you're putting us through a process, a process that is more form than it is substance is what I'm saying. I know what your issues are. You have an issue with public health, he's got an issue with fire and containment. So let us treat it in an FEIS. If you find at the end of the FEIS process that it's inadequate, you know what, then tell us to do a Supplemental and we'll start all over again.

CHAIRWOMAN THORMANN: No, I don't want you to have to start all over again. And you have to understand one thing. I resent -- I understand your frustration.

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MR. MONTALBANO: Well, I hope Mr. Geneslaw respects me. Bob, can that happen?

MR. GENESLAW: Can it wait till the end?

MR. MONTALBANO: Yeah.

MR. GENESLAW: Good, 'cause I would advise it.

UNIDENTIFIED SPEAKER: I think if they're going to ask for the Supplemental, they ought to do it now and get all of the issues addressed.

CHAIRWOMAN THORMANN: Excuse me. I didn't have any votes, sir. I took a poll of the Board. There was no vote.

MR. MONTALBANO: I'm finished, Mrs. Thormann. I've said my peace.

CHAIRWOMAN THORMANN: Can you be prepared for July?

MR. MONTALBANO: We can be prepared for July because to prepare a scope on this is nothing.

CHAIRWOMAN THORMANN: Can you be prepared before?

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MR. UTSCHIG: We can be prepared in a week, and I'm not trying to make little of this, the scope is very straight-forward.

CHAIRWOMAN THORMANN: Excuse me? Do we have time on the 27th for that? It's just scoping. It's just scoping. All right. There's nothing that should take a long period of time. We have four items. This will be the 5th.

MR. GENESLAW: I have another commitment that evening. I don't think I'll be able to change it. Mr. Letson can sit in.

CHAIRWOMAN THORMANN: Okay. Then our SEQR expert in residence, Mr. Letson, will be with us that night.

MS. THAL: May I ask a question?

CHAIRWOMAN THORMANN: Did you hear me? Let me just tell you something, I'm not trying to cut off the public lines, but there comes a point beyond which, unless it's new information, the Board will not entertain any more public

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comment. We have a plethora of information to deal with, and unless it's coming from divine providence, I don't see anything new coming in.

MR. TERRIBILE: But they said they were going to fix the lines. If they don't go in to fix the lines --

CHAIRWOMAN THORMANN: That's not part of this process, Mr. Terribile.

MR. MONTALBANO: So as I understand it, you're going to vote on closing the public hearing?

CHAIRWOMAN THORMANN: No, I didn't say that. He recommended that we not for ten days. So public comments for ten days, would you repeat it and then we'll vote, Mr. Geneslaw?

MR. GENESLAW: What I suggested was that if the Board wants to close the public hearings, then you should leave the record open for written comments for a minimum of ten days. The Applicant can start preparing the scoping outline tomorrow morning if they choose to. And

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I'm assuming you'll want staff to review it before it gets to the Board.

CHAIRWOMAN THORMANN: Absolutely. So the sooner you can get it, the better.

MR. GENESLAW: So, close, but leave the record open for ten days is what I'm recommending.

MR. TREVOR: Move to close and leave the record open for ten days.

MS. O'CONNOR: And request a Supplemental EIS.

MR. TREVOR: And request a Supplemental EIS.

CHAIRWOMAN THORMANN: All right. Moved by Trevor. Seconded by O'Connor.

MR. SIMOES: We did say during the Supplemental a new public hearing would be open, so the audience knows. Is that correct?

MR. GENESLAW: You will have to have public participation, not necessarily a hearing for the scoping outline. You will have to hold a public hearing similar to this when the

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Supplemental is finished. The process is the same as it was for the Draft Environmental Impact Statement.

MR. SIMOES: Make sure they know.

CHAIRWOMAN THORMANN: They're experts at it, so don't worry.

All in favor?

(Whereupon, a motion having been made and duly seconded, was put to a vote and unanimously carried.)

CHAIRWOMAN THORMANN: What will happen is, they have been asked to do a Supplemental and then all of the issues that you have raised, they're going to deal with. And do you understand what this scoping is?

UNIDENTIFIED SPEAKER: No.

CHAIRWOMAN THORMANN: Mr. Geneslaw, would you explain that, please?

MR. GENESLAW: The easiest way to describe it is it's an enhanced table of contents to list all of the subject areas that would be addressed in the Supplemental both as to breadth as well

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as to depth, and they will prepare a draft, staff will review it and we will advise the Board whether we think there should be changes. And there has to be an element of public participation. It doesn't have to be an advertised hearing, but at least it has to be on the Board's agenda and the public has to be allowed to participate. And it should be available a week or so ahead of the night it's scheduled for the Board so members of the public can review it ahead of time.

CHAIRWOMAN THORMANN: All right. And Mr. Coffey did say he would, it's not part of his application, but he did say they would take care of your poles, so you can go home and rest easy.

Thank you.

oOo

(Time noted - 10:37 p.m.)

C E R T I F I C A T I O N

I, JOAN BEHN CARUSO, a Shorthand Reporter and Notary Public of the State of New York, hereby CERTIFY that I recorded the foregoing proceeding at the time and place herein stated, and the preceding transcript is a true record thereof, to the best of my knowledge and belief.

_____

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APPENDIX K-
Stormwater Polution Prevention Plan

STORMWATER POLLUTION PREVENTION PLAN

for

LITTLE TOR SUBSTATION
Clarkstown, New York

Prepared For:

Orange and Rockland Utilities, Inc
390 West Route 59
Spring Valley, NY 10977

Prepared By:

Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
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LANGAN

February 2014
Revised October 28, 2014
190011601

LITTLE TOR SUBSTATION
CLARKSTOWN
Rockland County, New York

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8 DETAILS

9 AREAS, SURFACE SAND FILTER CALCULATION, CHANNEL PROTECTIONVOLUME CALCULATION, DRY SWALE CALCULATION, RAIN GARDEN CALCULATIONS, PIPE CALCULATIONS AND ROCK OUTLET PROTECTION COMPUTATIONS

10 NYSDEC MAINTENANCE AND INSPECTION CHECKLIST

SECTION 1

NOTICE OF INTENT
MS4 ACCEPTANCE FORM

NOTICE OF INTENT

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

NYR ☐☐☐☐☐☐
(for DEC use only)

Stormwater Discharges Associated with Construction Activity Under State Pollutant Discharge Elimination System (SPDES) General Permit # GP-0-10-001

All sections must be completed unless otherwise noted. Failure to complete all items may result in this form being returned to you, thereby delaying your coverage under this General Permit. Applicants must read and understand the conditions of the permit and prepare a Stormwater Pollution Prevention Plan prior to submitting this NOI. Applicants are responsible for identifying and obtaining other DEC permits that may be required.

-IMPORTANT-

RETURN THIS FORM TO THE ADDRESS ABOVE

OWNER/OPERATOR MUST SIGN FORM

Owner/Operator Information

Owner/Operator (Company Name/Private Owner Name/Municipality Name)
ORANGE AND ROCKLAND UTILITIES, INC.

Owner/Operator Contact Person Last Name (NOT CONSULTANT)
COFFEY

Owner/Operator Contact Person First Name
JOHN

Owner/Operator Mailing Address
390 WEST ROUTE 59

City
SPRING VALLEY

State
NY

Zip
10977 - ☐☐☐☐

Phone (Owner/Operator)
845 - 577 - 3700

Fax (Owner/Operator)
845 - 577 - 3720

Email (Owner/Operator)
COFFEYJO@ORU.COM

FED TAX ID
13 - 1727729 (not required for individuals)

Project Site Information

Project/Site Name
LITTLE TOR SUBSTATION

Street Address (NOT P.O. BOX)
LITTLE TOR ROAD

Side of Street
○ **North** ○ **South** ○ **East** ✓ **West**

City/Town/Village (THAT ISSUES BUILDING PERMIT)
CLARKSTOWN

State: NY
Zip: 10956 -
County: ROCKLAND
DEC Region: 3

Name of Nearest Cross Street
SOUTH MOUNTAIN ROAD

Distance to Nearest Cross Street (Feet)
0

Project In Relation to Cross Street
○ **North** ✓ **South** ○ **East** ○ **West**

Tax Map Numbers
Section-Block-Parcel
34.05-1-56

Tax Map Numbers

1. Provide the Geographic Coordinates for the project site in NYTM Units. To do this you **must** go to the NYSDEC Stormwater Interactive Map on the DEC website at:

www.dec.ny.gov/imsmaps/stormwater/viewer.htm

Zoom into your Project Location such that you can accurately click on the centroid of your site. Once you have located your project site, go to the tool boxes on the top and choose "i"(identify). Then click on the center of your site and a new window containing the X, Y coordinates in UTM will pop up. Transcribe these coordinates into the boxes below. For problems with the interactive map use the help function.

X Coordinates (Easting): 583327

Y Coordinates (Northing): 4559642

2. What is the nature of this construction project?

○ **New Construction**

✓ **Redevelopment with increase in impervious area**

○ **Redevelopment with no increase in impervious area**

3. Select the predominant land use for both pre and post development conditions.
SELECT ONLY ONE CHOICE FOR EACH

Pre-Development Existing Land Use

- ○ FOREST
- ○ PASTURE/OPEN LAND
- ○ CULTIVATED LAND
- ○ SINGLE FAMILY HOME
- ✓ SINGLE FAMILY SUBDIVISION
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY
- ○ PARKING LOT
- ○ OTHER

Post-Development Future Land Use

- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION — Number of Lots
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ MUNICIPAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY (water, sewer, gas, etc.)
- ○ PARKING LOT
- ○ CLEARING/GRADING ONLY
- ○ DEMOLITION, NO REDEVELOPMENT
- ○ WELL DRILLING ACTIVITY *(Oil, Gas, etc.)
- ✓ OTHER: ELEC SUBSTATION

***Note**: for gas well drilling, non-high volume hydraulic fractured wells only

4. In accordance with the larger common plan of development or sale, enter the total project site area; the total area to be disturbed; existing impervious area to be disturbed (for redevelopment activities); and the future impervious area constructed within the disturbed area. (Round to the nearest tenth of an acre.)

Total Site Area	Total Area To Be Disturbed	Existing Impervious Area To Be Disturbed	Future Impervious Area Within Disturbed Area
10.2	3.4	.8	1.7

5. Do you plan to disturb more than 5 acres of soil at any one time? ○ **Yes** ✓ **No**

6. Indicate the percentage of each Hydrologic Soil Group(HSG) at the site.

A	B	C	D
%	%	85 %	15 %

7. Is this a phased project? ○ **Yes** ✓ **No**

8. Enter the planned start and end dates of the disturbance activities.

Start Date 03/01/2015 – **End Date** 10/01/2016

9. Identify the nearest surface waterbody(ies) to which construction site runoff will discharge.

Name

WEST BRANCH HACKENSACK RIVER

9a. Type of waterbody identified in Question 9?

- ○ Wetland / State Jurisdiction On Site (Answer 9b)
- ○ Wetland / State Jurisdiction Off Site
- ✓ Wetland / Federal Jurisdiction On Site (Answer 9b)
- ○ Wetland / Federal Jurisdiction Off Site
- ✓ Stream / Creek On Site
- ○ Stream / Creek Off Site
- ○ River On Site
- ○ River Off Site
- ○ Lake On Site
- ○ Lake Off Site
- ○ Other Type On Site
- ○ Other Type Off Site

9b. How was the wetland identified?

- ○ Regulatory Map
- ○ Delineated by Consultant
- ✓ Delineated by Army Corps of Engineers
- ○ Other (identify)

10. Has the surface waterbody(ies) in question 9 been identified as a 303(d) segment in Appendix E of GP-0-10-001? ○ **Yes** ● **No**

11. Is this project located in one of the Watersheds identified in Appendix C of GP-0-10-001? ○ **Yes** ✓ **No**

12. Is the project located in one of the watershed areas associated with AA and AA-S classified waters? ○ **Yes** ✓ **No**
If no, skip question 13.

13. Does this construction activity disturb land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey? ○ **Yes** ✓ **No**
If Yes, what is the acreage to be disturbed?

.

14. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area? ○ **Yes** ✓ **No**

15. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)? ○ **Yes** ✓ **No** ○ **Unknown**

16. What is the name of the municipality/entity that owns the separate storm sewer system?

17. Does any runoff from the site enter a sewer classified as a Combined Sewer? ○ **Yes** ✓ **No** ○ **Unknown**

18. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law? ○ **Yes** ✓ **No**

19. Is this property owned by a state authority, state agency, federal government or local government? ○ **Yes** ✓ **No**

20. Is this a remediation project being done under a Department approved work plan? (i.e. CERCLA, RCRA, Voluntary Cleanup Agreement, etc.) ○ **Yes** ✓ **No**

21. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book)? ✓ **Yes** ○ **No**

22. Does this construction activity require the development of a SWPPP that includes the post-construction stormwater management practice component (i.e. Runoff Reduction, Water Quality and Quantity Control practices/techniques)? ● **Yes** ○ **No**
If No, skip questions 23 and 27-39.

23. Has the post-construction stormwater management practice component of the SWPPP been developed in conformance with the current NYS Stormwater Management Design Manual? ○ **Yes** ● **No**

The post-construction stormwater management practice components of the SWPPP has been developed in conformance with the 2008 Stormwater Management Design Manual. Refer to #39 for explanation.

24. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:

- ● **Professional Engineer (P.E.)**
- ○ **Soil and Water Conservation District (SWCD)**
- ○ **Registered Landscape Architect (R.L.A)**
- ○ **Certified Professional in Erosion and Sediment Control (CPESC)**
- ○ **Owner/Operator**
- ○ **Other**

SWPPP Preparer
LANGAN ENGINEERING

Contact Name (Last, Space, First)
UTSCHIG, W. CHARLES

Mailing Address
707 WESTCHESTER AVE, SUITE 304

City
WHITE PLAINS

State Zip
NY 10604 -

Phone
914 - 323 - 7400

Fax
914 - 323 - 7401

Email
CUTSCHIG@LANGAN.COM

SWPPP Preparer Certification

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-10-001. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

First Name
W. CHARLES

MI

Last Name
UTSCHIG

Signature

Date
/ /

25. Has a construction sequence schedule for the planned management practices been prepared? ☑ Yes ○ No

26. Select **all** of the erosion and sediment control practices that will be employed on the project site:

Temporary Structural

- ☑ Check Dams
- ○ Construction Road Stabilization
- ☑ Dust Control
- ○ Earth Dike
- ○ Level Spreader
- ☑ Perimeter Dike/Swale
- ○ Pipe Slope Drain
- ○ Portable Sediment Tank
- ○ Rock Dam
- ☑ Sediment Basin
- ○ Sediment Traps
- ☑ Silt Fence
- ☑ Stabilized Construction Entrance
- ☑ Storm Drain Inlet Protection
- ☑ Straw/Hay Bale Dike
- ○ Temporary Access Waterway Crossing
- ○ Temporary Stormdrain Diversion
- ☑ Temporary Swale
- ○ Turbidity Curtain
- ○ Water bars

Biotechnical

- ○ Brush Matting
- ○ Wattling

Vegetative Measures

- ○ Brush Matting
- ○ Dune Stabilization
- ○ Grassed Waterway
- ☑ Mulching
- ○ Protecting Vegetation
- ○ Recreation Area Improvement
- ☑ Seeding
- ○ Sodding
- ○ Straw/Hay Bale Dike
- ○ Streambank Protection
- ○ Temporary Swale
- ☑ Topsoiling
- ○ Vegetating Waterways

Permanent Structural

- ☑ Debris Basin
- ○ Diversion
- ○ Grade Stabilization Structure
- ☑ Land Grading
- ○ Lined Waterway (Rock)
- ○ Paved Channel (Concrete)
- ○ Paved Flume
- ☑ Retaining Wall
- ○ Riprap Slope Protection
- ☑ Rock Outlet Protection
- ○ Streambank Protection

Other

Post-construction Stormwater Management Practice (SMP) Requirements

Important: Completion of Questions 27-39 is not required if response to Question 22 is No.

27. Identify all site planning practices that were used to prepare the final site plan/layout for the project.

- ● **Preservation of Undisturbed Areas**
- ○ **Preservation of Buffers**
- ● **Reduction of Clearing and Grading**
- ○ **Locating Development in Less Sensitive Areas**
- ○ **Roadway Reduction**
- ○ **Sidewalk Reduction**
- ○ **Driveway Reduction**
- ○ **Cul-de-sac Reduction**
- ● **Building Footprint Reduction**
- ○ **Parking Reduction**

27a. Indicate which of the following soil restoration criteria was used to address the requirements in Section 5.1.6("Soil Restoration") of the Design Manual (2010 version).

- ● All disturbed areas will be restored in accordance with the Soil Restoration requirements in Table 5.3 of the Design Manual (see page 5-22).
- ○ Compacted areas were considered as impervious cover when calculating the **WQv Required**, and the compacted areas were assigned a post-construction Hydrologic Soil Group (HSG) designation that is one level less permeable than existing conditions for the hydrology analysis.

28. Provide the total Water Quality Volume (WQv) required for this project (based on final site plan/layout).

Total WQv Required

0.107 **acre-feet**

29. Identify the RR techniques (Area Reduction), RR techniques(Volume Reduction) and Standard SMPs with RRv Capacity in Table 1 (See Page 9) that were used to reduce the Total WQv Required(#28).

Also, provide in Table 1 the total impervious area that contributes runoff to each technique/practice selected. For the Area Reduction Techniques, provide the total contributing area (includes pervious area) and, if applicable, the total impervious area that contributes runoff to the technique/practice.

Note: Redevelopment projects shall use Tables 1 and 2 to identify the SMPs used to treat and/or reduce the WQv required. If runoff reduction techniques will not be used to reduce the required WQv, skip to question 33a after identifying the SMPs.

Table 1 - Runoff Reduction (RR) Techniques and Standard Stormwater Management Practices (SMPs)

	Total Contributing Area (acres)		Total Contributing Impervious Area (acres)
RR Techniques (Area Reduction)			
○ Conservation of Natural Areas (RR-1)		and/or	
○ Sheetflow to Riparian Buffers/Filters Strips (RR-2)		and/or	
○ Tree Planting/Tree Pit (RR-3)		and/or	
○ Disconnection of Rooftop Runoff (RR-4)		and/or	
RR Techniques (Volume Reduction)			
○ Vegetated Swale (RR-5)			
✓ Rain Garden (RR-6)			0.04
○ Stormwater Planter (RR-7)			
○ Rain Barrel/Cistern (RR-8)			
○ Porous Pavement (RR-9)			
○ Green Roof (RR-10)			
Standard SMPs with RRv Capacity			
○ Infiltration Trench (I-1)			
○ Infiltration Basin (I-2)			
○ Dry Well (I-3)			
○ Underground Infiltration System (I-4)			
○ Bioretention (F-5)			
✓ Dry Swale (O-1)			0.06
Standard SMPs			
○ Micropool Extended Detention (P-1)			
○ Wet Pond (P-2)			
○ Wet Extended Detention (P-3)			
○ Multiple Pond System (P-4)			
○ Pocket Pond (P-5)			
✓ Surface Sand Filter (F-1)			1.6
○ Underground Sand Filter (F-2)			
○ Perimeter Sand Filter (F-3)			
○ Organic Filter (F-4)			
○ Shallow Wetland (W-1)			
○ Extended Detention Wetland (W-2)			
○ Pond/Wetland System (W-3)			
○ Pocket Wetland (W-4)			
○ Wet Swale (O-2)			

Table 2 - Alternative SMPs
(DO NOT INCLUDE PRACTICES BEING USED FOR PRETREATMENT ONLY)

Alternative SMP	Total Contributing Impervious Area(acres)
○ **Hydrodynamic**	___.___
○ **Wet Vault**	___.___
○ **Media Filter**	___.___
○ **Other** _____	___.___

Provide the name and manufacturer of the Alternative SMPs (i.e. proprietary practice(s)) being used for WQv treatment.

Name _____

Manufacturer _____

Note: Redevelopment projects which do not use RR techniques, shall use questions 28, 29, 33 and 33a to provide SMPs used, total WQv required and total WQv provided for the project.

30. Indicate the Total RRv provided by the RR techniques (Area/Volume Reduction) and Standard SMPs with RRv capacity identified in question 29.

Total RRv provided

___.___ **acre-feet**

31. Is the Total RRv provided (#30) greater than or equal to the total WQv required (#28).

○ **Yes** ✓ **No**

If Yes, go to question 36.
If No, go to question 32.

32. Provide the Minimum RRv required based on HSG.
[Minimum RRv Required = (P)(0.95)(Ai)/12, Ai=(S)(Aic)]

Minimum RRv Required

___.___ **acre-feet**

32a. Is the Total RRv provided (#30) greater than or equal to the Minimum RRv Required (#32)?

○ **Yes** ○ **No**

If Yes, go to question 33.
Note: Use the space provided in question #39 to summarize the specific site limitations and justification for not reducing 100% of WQv required (#28). A detailed evaluation of the specific site limitations and justification for not reducing 100% of the WQv required (#28) must also be included in the SWPPP.
If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

33. Identify the Standard SMPs in Table 1 and, if applicable, the Alternative SMPs in Table 2 that were used to treat the remaining total WQv(=Total WQv Required in 28 - Total RRv Provided in 30).

Also, provide in Table 1 and 2 the total impervious area that contributes runoff to each practice selected.

Note: Use Tables 1 and 2 to identify the SMPs used on Redevelopment projects.

33a. Indicate the Total WQv provided (i.e. WQv treated) by the SMPs identified in question #33 and Standard SMPs with RRv Capacity identified in question 29.

WQv Provided

0.128 **acre-feet**

Note: For the standard SMPs with RRv capacity, the WQv provided by each practice = the WQv calculated using the contributing drainage area to the practice - RRv provided by the practice. (See Table 3.5 in Design Manual)

34. Provide the sum of the Total RRv provided (#30) and the WQv provided (#33a). 0.128

35. Is the sum of the RRv provided (#30) and the WQv provided (#33a) greater than or equal to the total WQv required (#28)? ✓ **Yes** ○ **No**

If Yes, go to question 36.
If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

36. Provide the total Channel Protection Storage Volume (CPv) required and provided or select waiver (36a), if applicable.

CPv Required

0.108 **acre-feet**

CPv Provided

0.166 **acre-feet**

36a. The need to provide channel protection has been waived because:

○ Site discharges directly to tidal waters or a fifth order or larger stream.

○ Reduction of the total CPv is achieved on site through runoff reduction techniques or infiltration systems.

37. Provide the Overbank Flood (Qp) and Extreme Flood (Qf) control criteria or select waiver (37a), if applicable.

Total Overbank Flood Control Criteria (Qp)

Pre-Development

30.12 **CFS**

Post-development

27.12 **CFS**

Total Extreme Flood Control Criteria (Qf)

Pre-Development

65.22 **CFS**

Post-development

61.84 **CFS**

37a. The need to meet the Qp and Qf criteria has been waived because:

- ○ Site discharges directly to tidal waters or a fifth order or larger stream.
- ○ Downstream analysis reveals that the Qp and Qf controls are not required

38. Has a long term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed? ☑ **Yes** ○ **No**

If Yes, Identify the entity responsible for the long term Operation and Maintenance

ORANGE AND ROCKLAND UTILITIES, INC.

39. Use this space to summarize the specific site limitations and justification for not reducing 100% of WQv required(#28). (See question 32a) This space can also be used for other pertinent project information.

This project has undergone substantial review prior to the adoption of the 2010 NYS Stormwater Management Design Manual, and SPDES General Permit for Stormwater Discharges GP-0-10-001. The Town of Clarkstown MS4 has acknowledged this and the project is designed based on the 2008 Stormwater Management Design Manual, and SPDES General Permit for Stormwater Discharges GP-0-08-001.

40. Identify other DEC permits, existing and new, that are required for this project/facility.

- ○ Air Pollution Control
- ○ Coastal Erosion
- ○ Hazardous Waste
- ○ Long Island Wells
- ○ Mined Land Reclamation
- ○ Solid Waste
- ○ Navigable Waters Protection / Article 15
- ○ Water Quality Certificate
- ○ Dam Safety
- ○ Water Supply
- ○ Freshwater Wetlands/Article 24
- ○ Tidal Wetlands
- ○ Wild, Scenic and Recreational Rivers
- ○ Stream Bed or Bank Protection / Article 15
- ○ Endangered or Threatened Species(Incidental Take Permit)
- ○ Individual SPDES
- ○ SPDES Multi-Sector GP N Y R
- ○ Other
- ● None

41. Does this project require a US Army Corps of Engineers Wetland Permit? ○ **Yes** ☑ **No**
If Yes, Indicate Size of Impact. .

42. Is this project subject to the requirements of a regulated, traditional land use control MS4? ☑ **Yes** ○ **No**
(If No, skip question 43)

43. Has the "MS4 SWPPP Acceptance" form been signed by the principal executive officer or ranking elected official and submitted along with this NOI? ☑ **Yes** ○ **No**

44. If this NOI is being submitted for the purpose of continuing or transferring coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned. N Y R

Owner/Operator Certification

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

Print First Name: JOHN

MI:

Print Last Name: COFFEY

Owner/Operator Signature:

Date: / /

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

MS4 Stormwater Pollution Prevention Plan (SWPPP) Acceptance Form

for

Construction Activities Seeking Authorization Under SPDES General Permit

*(NOTE: Attach Completed Form to Notice Of Intent and Submit to Address Above)

I. Project Owner/Operator Information	
1. Owner/Operator Name:	Orange & Rockland Utilities
2. Contact Person:	John Coffey
3. Street Address:	390 West Route 59
4. City/State/Zip:	Spring Valley, NY 10977
II. Project Site Information	
5. Project/Site Name:	Little Tor Substation
6. Street Address:	Little Tor Road
7. City/State/Zip:	Clarkstown, NY 10956
III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance Information	
8. SWPPP Reviewed by:	
9. Title/Position:	
10. Date Final SWPPP Reviewed and Accepted:	
IV. Regulated MS4 Information	
11. Name of MS4:	New York - Clarkstown
12. MS4 SPDES Permit Identification Number: NYR20A 329	
13. Contact Person:	Dennis Letson, PE
14. Street Address:	Clarkstown Town Hall - 10 Maple Avenue
15. City/State/Zip:	New City, NY 10956
16. Telephone Number:	845-639-2111

(NYS DEC - MS4 SWPPP Acceptance Form - January 2010)

MS4 SWPPP Acceptance Form - continued

V. Certification Statement - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative

I hereby certify that the final Stormwater Pollution Prevention Plan (SWPPP) for the construction project identified in question 5 has been reviewed and meets the substantive requirements in the SPDES General Permit For Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4s).
Note: The MS4, through the acceptance of the SWPPP, assumes no responsibility for the accuracy and adequacy of the design included in the SWPPP. In addition, review and acceptance of the SWPPP by the MS4 does not relieve the owner/operator or their SWPPP preparer of responsibility or liability for errors or omissions in the plan.

Printed Name:

Title/Position:

Signature:

Date:

VI. Additional Information

SECTION 2

REPORT

LITTLE TOR SUBSTATION
Clarkstown, New York
County of Rockland

Report Table of Contents:

A. INTRODUCTION

B. SITE DESCRIPTION

C. STORMWATER MANAGEMENT METHODOLOGY

D. STORMWATER RATE OF RUNOFF ANALYSIS

E. MOSQUITO BREEDING SUPPRESSION PLAN

F. CONSTRUCTION PHASING PLAN AND STORMWATER MANAGEMENT FACILITIES MAINTENANCE PROGRAM

G. MATERIAL HANDLING AND WASTE MANAGEMENT

H. NARRATIVE REPORT

I. FINAL STABILIZATION

J. CONCLUSION

A. Introduction

This report has been prepared as part of the permit application for a Stormwater Pollution Prevention Plan for the construction of an electrical substation located at the intersection of South Mountain Road and Little Tor Road in the Town of Clarkstown, Rockland County, State of New York. The site is approximately 10.2 acres. This document is required by the New York State Department of Environmental Conservation (NYSDEC) pursuant to the Phase II regulations for more than one acre of disturbance (3.4 ac.). This project had undergone substantial review prior to the adoption of the 2010 NYS Stormwater Management Design Manual (NYSSMDM), and SPDES General Permit for Stormwater Discharges (GP-0-10-001). The Town of Clarkstown MS4 Administrator has acknowledged that the project had under gown substantial review. This Stormwater Pollution Prevention Plan (SWPPP) has been prepared based on the requirements set forth in SPDES General Permit for Stormwater Discharges, GP-0-08-001.

B. Site Description

The site consists primarily of Ra (D soil) and WeB soils (C soil) with the exception of some outcrop rock (4,047 S.F.); hydrologic soil groups are based on the NRCS Web Soil Survey. The site was previously developed and contained several single-family dwellings, utility infrastructure, accessory buildings and a Verizon Wireless building and tower. Some of these structures have been removed for environmental reasons. The property is divided by an existing ridge running southerly causing the site to slope toward existing wetlands and the West Branch Hackensack River; similarly, this ridge causes the site to slope easterly towards existing wetlands and a concrete box culvert across Little Tor Road. The river flows to the west branch of the Lake Lucille.

The grading and drainage plans have been designed to capture and treat all of the stormwater runoff from all impervious surfaces on site (proposed and existing). Stormwater will be collected and/or conveyed to stormwater treatment practices using catch basins, piping systems, swales and surface grading.

Water quality for the proposed impervious surfaces will be treated by a surface sand filter with storage above (F-1), dry swale (O-1) and two (2) rain gardens and the stormwater runoff rates for the 1, 10 (Overbank Protection), 25 and 100-year (Extreme Flood) storm events have been analyzed and routed in the pre-development and post-development conditions utilizing computer software by HydroCad. The design assumptions and results are attached herewith and made part of this report. In the pre-development conditions, the site is divided in three (3) drainage areas (Subarea 1, 2 & 3) generally formed by a ridge line running through the site near the northern property line. Subarea 1 drains towards the southeastern property corner to the Hackensack River; Subarea 2 discharges easterly towards Little Tor Road to an existing culvert; Subarea 3 discharges westerly to and existing drainage ditch. Subarea 3 is to remain completely undisturbed.

In the post-development conditions, the site is divided into six (6) subareas (Subarea 1, 2A, 2B, 2C, 2D & 3); these subareas have similar drainage patterns and design points as the pre-development ones; Subareas 2A, 2B, 2C and 2D discharge at the same design point (DP-2) as in the pre-development conditions.

Stormwater quality for Subareas 2B, & 2C is provided by the proposed sand filter (F-1). Stormwater quality for Subarea 2D is provided by an open channel system (Dry Swale "O-1") and two (2) rain gardens. The dry swale shall have the following characteristics: 2.5 feet in

depth, six feet wide at bottom, 2:1 side slopes, 2' (min) separation distance from groundwater and a channel slope of 0.5%.

It is expected that construction will last 12 months from the time of ground breaking to final completion, with work commencing within 10 days following the receipt of all necessary approvals. Throughout the construction process strict adherence to the Erosion and Sediment Control Plan and Specifications will be maintained to ensure all sediments are contained within the site.

C. Stormwater Management Methodology

Stormwater management computations provided in this report are based upon the Soil Conservation Service (SCS) TR-20 and TR-55 methodologies. The stormwater management design is based on the NYSSMDM, (2008) and "Controlling Urban Runoff: A practical Manual for Planning and Designing Urban BMP's", by the Metropolitan Washington Council of Governments. Water quality volume computations are herewith attached and made part of this report.

Participation values for the 90% rainfall event, 1-Year, 10-Year, 25-Year, and 100-Year, 24-hour design storm events were obtained from the most recent NERCC rainfall intensity values (published on August 12, 2014, Extreme Precipitation Estimates). The values provided for all design storms analyzed have been listed below:

Precipitation Values for Corresponding Design Storms

Design Storm	24-Hour Rainfall
90% Rainfall Event	1.5
1-Year	2.8
10-Year	5.0
25-Year	6.4
100-Year	9.0

In accordance with the "Five Step Process for Stormwater Site Planning and Practice Selection" (Chapter 3 of the NYSSMDM), following are the criteria implemented in the development of this SWPPP:

Step 1: Site Planning

Preservation of Natural Resources:

The substation and related improvements are proposed on a parcel having 10.2 acres in area; only 3.4 acres of this parcel are proposed to be disturbed (+/-33% of the total parcel area) with 1.7+/- acres resulting as permanent impervious areas; 6.8 acres will remain undisturbed.

Further consideration for the proposed substation (and related improvements) included: preservation of wetland areas/water resources (entire substation was designed outside of wetlands areas, except for a minor wetland impact to construct the driveway; locating development in less sensitive areas (majority of the disturbed areas are proposed outside of tree lines); and the reduction of clearing and grading (majority of the disturbed areas are proposed on flatter terrain).

Reduction of Impervious Cover:
Switchgear, electrical equipment and related machinery within the substation will rest on a gravel bed; no sidewalk is proposed for this development and minimum parking area is proposed for maintenance vehicles.

Step 2: Determine Water Quality Treatment Volume (WQv)
Water quality volume has been calculated for the proposed impervious areas in accordance with the NYSSMDM; numerical values are provided in this report.

Step 3: Runoff Reduction by Applying Green Infrastructure Techniques and Standard SMPs
Water quality has been provided entirely within the proposed sand filter, dry swale and two rain gardens.

Step 4: Apply Standard Stormwater Management Practices to Address Remaining Water Quality Volume
No additional practice is proposed to address water quality volumes; the proposed stormwater management practice serves as a flow control practice exclusively.

Step 5: Apply Volume and Peak Rate Control Practices if Still Needed to Meet Requirements
Quantity control requirements were addressed by the proposed stormwater management practices. Pre and post development rates of storm water runoff have been computed for comparison for the 1, 10, 25 and 100-year storms events; all rates of runoff were reduced in the post development condition.

Stormwater Quantity:
The Overbank Flood Control requirement is intended to prevent an increase in the frequency and magnitude of over bank flooding events generated by urban development. Overbank control requires storage to attenuate the post-development 10-year, 24-hour peak discharge to pre-development rates. The Extreme Flood Control requirement is intended to prevent the increased risk of flood damage from large storm events, maintain the boundaries of the pre-development 100-year flood plain, and protect the physical integrity of stormwater management practices. Extreme flood control requires storage to attenuate the post-development 100-year, 24-hour peak discharge to pre-development rates. A detailed analysis of the pre- and post-development peak rates of runoff for the 1, 10, 25 and 100-year 24-hour storm events has been included in this report. The most recent NERCC rainfall intensity values have been utilized to calculate the pre and post-development peak discharge rates. Refer to Section D of this Report for the pre- and post-development peak flow rates.

Stormwater Quality:
The project will reduce the total increase in pollutants carried by stormwater runoff. This has been accomplished through the use of filtering practices and swales (F-1, O-1 and rain gardens) that infiltrate the water quality volume through a stormwater management practice and into the natural soils.

The Water Quality Volume (WQv) is designed to improve water quality sizing to capture and treat 90% of the average annual stormwater runoff volumes. The WQv is directly related to the

amount of impervious cover located on the site. The table below shows the WQv Summary per the calculations provided in the post development hydraulic WQv (1.5 inch) rainfall event.

WQv Summary Table

Subcatchment	WQv (ac-ft)*	WQv Required(cf)	WQv Provided (cf)
PDA-2B/PDA-2C	0.102	4,443	5,589
PDA-2D	0.005	217	588

*Information regarding WQv is shown in the hydraulic analysis.

The F-1 surface sand filter is sized to provide percentages of the WQv in the forebay and the sand filter practice. The practice must provide 25% of the WQv in the forebay as pre-treatment and the entire treatment system (including pre-treatment) shall be sized to temporarily hold at least 75% of the WQv prior to filtration. The table below summarizes the required WQv provided by the surface sand filter. Further details of the practice can be found in the post development hydraulic analysis.

Surface Sand Filter Summary

Treatment Practice	NYSDEC Design Practice Designation	Minimum % WQv In Practice	Volume Required (cf)	Volume Provided Below Weir (cf)*	Weir Elevation in Practice
FB	Surface Sand Filter (F-1)	25%	1,111	1,406	142.5
SF		75% Total	3,332	4,183	141.3

*Information regarding volume provided refers to the stage-storage tables in the post development hydraulic analysis.

The surface sand filter is sized to capture and treat a total of 5,589 cf, or 126% of the water quality volume.

Per the NYSSMDM, the WQv swale is sized to provide 30 minute detention of the WQv event. The WQv peak flow was determined as noted on page B-3 of the NYSSMDM. The modified CN and WQv peak flow was then modeled in HydroCAD to size the low flow orifice for the WQv swale. The table below summarizes the required and provided detention times. Further detail can be found in the post development hydraulic analysis (WQv rainfall event). Pre-treatment is provided by a forebay which holds approximately 33 cubic feet at elevation 134.6, or 15% of the WQv.

WQv Swale Detention Time

Subcatchment	Detention Time Required	Detention Time Provided
DS	30 minutes	94.9 minutes

As noted in the tables above, the surface sand filter and the WQv swale have been sized in accordance with the NYSSMDM. Through the implementation of these practices, it is assumed that the WQv requirements of the NYSDEC have been met.

Maintenance of temporary and permanent structures and practices:
Temporary and permanent erosion control measures will be maintained and inspected in accordance with the NYSDEC general permit.

The proposed soil erosion and sediment control devices include: protective earthmoving procedures and grading practices, vegetated cover, hay bale dikes, and silt fencing. The approach of the plan is to control sedimentation, and re-establish vegetation as soon as practicable.

Standards and Erosion and Sediment Control Plan:
Peak flow rates have been controlled to ensure that the post-development rate of runoff from the site will not exceed pre-development rates for 1, 10, 25 and 100-year 24-hour storm events.

All proposed soil erosion and sediment control practices are designed in accordance with the following publications:

- New York State Guidelines for Urban Erosion and Sediment Control, latest edition,
- New York State General Permit for Stormwater Discharges, GP-0-10-001 (General Permit),
- "Reducing the Impacts of Stormwater Runoff from New Development", as published by the New York State Department of Environment Conservation (NYSDEC), second edition, April 1993.

D. Stormwater Rate of Runoff Analysis

Design Point 1 (DP-1)

Design Storm	Pre-Development (cfs)	Post-Development (cfs)
1	3.94	3.05
10	9.54	7.80
25	13.21	10.95
100	20.03	16.85

Design Point 2 (DP-2)

Design Storm	Pre-Development (cfs)	Post-Development (cfs)
1	6.98	5.09
10	18.31	17.11
25	25.92	25.49
100	40.21	40.06

Design Point 3 (DP-3)

Design Storm	Pre-Development (cfs)	Post-Development (cfs)
1	0.87	0.82
10	2.27	2.21
25	3.22	3.15
100	4.98	4.93

Pre and post-development drainage maps are included in this report including: time of concentration, coverage types, and hydrograph/stormwater calculations for the pre and post development conditions are provided in the HydroCad routings attached herewith and made part of this report.

The computer software used to develop the Stormwater Runoff Calculations was HydroCad. This program is based on the USDA Soil Conservation Service (SCS) Technical Release 55 (TR 55).

E. Mosquito Breeding Suppression Plan

In order to prevent mosquito breeding in any of the detention structures due to potential standing stormwater, the Owner shall be responsible to follow and implement the following plan:

1. Prevent stagnant water to remain on any part of the property for more than four consecutive days, including puddles which may eventually become a breeding environment for mosquitoes.

Proposed detention basin (Surface Sand Filter F-1) has been designed to release all stormwater through infiltration in less than 40 hours and during high rainfall events detention basin will be set with an overflow spillway system.

F. Construction Phasing Plan and Stormwater Management Facilities Maintenance Program

Because of the size of the proposed disturbance (3.4 ac.), only one (1) phase of construction shall be implemented in the following order:

- Erosion and sediment control (ESC) measures implementation,
  - Install silt fences
  - Construct stabilized construction entrance for the site
  - Construct diversion temporary swales and install straw bale dikes
- Clearing and grubbing within LOD,
- Tree removal,
- Excavation and rough grading of proposed driveway and areas within LOD
  - Establish topsoil stockpiles as shown on ESC plans
  - Install silt fences around the stockpiles and temporarily stabilize the stockpiles with tarp or mulch or temporary seeding
  - Disturbed areas where construction will cease for more than 14 days will be stabilized with erosion controls, such as hydro-seeding, hydro-mulch, or hay.
- Utility installation
  - Construct combined staging and materials storage area as shown on ESC plans
  - Install temporary sanitary facilities (portasans, etc.)
  - Install utilities and electrical substation
- Rough access driveway construction and paving
  - Prepare pavement subgrade and install curbs, storm drain inlets, swales
  - Install inlet protection as indicated on ESC plans and details

Contractor shall be responsible for the proper implementation of the ESC practices. The following maintenance program is proposed in order to maintain the proper function of all drainage and erosion and sediment control facilities:

- All disturbed areas will be stabilized after the construction is completed, any areas disturbed shall be stabilized immediately after the required work is completed.
- During construction, erosion and sediment controls must be inspected by a qualified professional every seven days or as required by the MS4 Administrator. The owner shall inspect the facilities once a month. A report by the professional engineer shall be submitted to

the owner and Town officials in the event deficiencies are found. In addition, the owner shall inspect the systems after each major storm event to ensure the inlets remain open. Specific attention should be paid to the following:

- Evidence of clogging in inlets and end sections
- Erosion of the flow path through the temporary swales
- Accumulation of sediments

➢ All sediment removal and/or repairs will be followed immediately by re-vegetation.

➢ Maintenance and inspection checklists (as per NYSDEC) are attached herewith in section 10 of this plan. (Completed forms shall be kept on site at all times and made available to authorities upon request).

➢ Clean catch basins and other drainage structures from silt regularly, but not less than twice a year. Remove sediment build up in the pond as required, but a minimum of every five (5) years.

➢ Minimize the use of road salt for maintenance of parking areas.

➢ Restore and re-seed any eroded areas and gullies as soon as possible; a seeding schedule is provided as part of the Project Erosion and Sediment Control Plan and Landscape Plan (design by others).

➢ The Stormwater Management Facilities Maintenance Program will be managed by the owner.

➢ In accordance with the New York State Stormwater Management Design Manual "[…the] owner of a post-construction stormwater management practice, including the SMPs included in this Design Manual, shall erect or post, in the immediate vicinity of the stormwater management practice, a conspicuous and legible sign of not less than 18 inches by 24 inches […] bearing the following information:"

➢ STORMWATER MANAGEMENT PRACTICE – (name of the practice)
➢ Project Identification – (SPDES Construction Permit #, other)
➢ Must be maintained In Accordance with O&M Plan
➢ DO NOT REMOVE OR ALTER

The Stormwater Management Facilities Maintenance Program will be managed by the owner during construction and eventually by Orange & Rockland Utilities, Inc. The contact person is John Coffey and the 24-hour contact number is (845) 577-3700.

G. Material Handling and Waste Management

Operator shall be responsible for all waste materials being collected and disposed of into one (1) metal trash dumpster located in the combined staging area as shown on the site plans. Dumpster shall have a secure watertight lid, be placed away from stormwater conveyances and drains, and meet all local and state solid-waste management regulations. Only trash and construction debris for the site will be deposited in the dumpster.

Operator shall not store erodible or hazardous materials on any roadway. Oil and machinery fuels shall be kept to a necessary minimum and stored in structurally sound and sealed shipping containers. All hazardous-material storage is to be segregated from other non-waste materials. All hazardous materials will be disposed of in accordance with federal, state, and municipal regulations.

Operator shall provide adequate designated concrete washout areas throughout the construction project and will be responsible for proper disposal of the concrete, mortar or grout collected there.

One (1) temporary sanitary facility (portable toilet) shall be provided at the site in the combined staging area. The toilet shall be away from a concentrated flow path and traffic flow.

Wood pallets, cardboard boxes, and other recyclable construction scraps will be disposed of in a designated dumpster for recycling.

Construction equipment and maintenance materials shall be stored at the combined staging area.

All spills shall be cleaned up immediately upon discovery. Spent absorbent materials and rags will be hauled off-site immediately after the spill is cleaned up for disposal. Any spills shall be recorded to Orange and Rockland Utilities and shall be handled in accordance the Site Specific SPCC. Material safety data sheets, a material inventory, and emergency contact information will be maintained on site.

H. Narrative Report

The primary goal of the soil erosion and sediment control measures is to reduce soil erosion from areas stripped of vegetation during and after construction, and to prevent discharge of silt offsite. Erosion control barriers shall be placed around exposed areas during construction. The barriers shall consist of silt fence.

Any areas stripped of vegetation during construction will be left bare for the shortest time possible. Any topsoil removed during construction will be temporarily stockpiled for future use in grading and landscaping. Stockpile locations have been provided on the **Erosion and Sediment Control Plan** and shall be contained within a silt fence/ hay bale barrier.

Temporary vegetation will be established to protect exposed soil areas during construction. If growing conditions are not suitable for the temporary vegetation, mulch will be used. Materials that may be used for mulching include; straw, hay, wood fiber, synthetic soils stabilizers, mulch netting, and sod. A permanent vegetative cover will be established upon completion of construction of those areas that have been brought to finish grade and to remain undisturbed.

A temporary stabilized construction entrance comprised of three inches clean stone will be constructed at the entrances to the site. The purpose of a stabilized entrance is to remove as much soil from the construction vehicle tires prior to exiting the site and traveling on the existing roadways. During construction, inlet protection will be installed at each storm sewer inlet to minimize the conveyance of silt and sediment through the storm sewer system.

If the contractor encounters ground water during the excavation of the stormwater management area, he shall notify the design engineer immediately, the contractor shall store all excavated material at the designated location shown on the **Erosion and Sediment Control Plan** with the appropriate erosion control measures corresponding to the stockpile detail.

I. Final Stabilization

Permanent seeding shall be applied immediately after the final design grades are achieved as applicable throughout the site but no later than fourteen (14) days after construction activities have ceased. After stabilization, accumulated sediment shall be removed from site for disposal

along with construction debris, trash and temporary BMP's e.g. silt fences, straw bales, material storage areas, sanitary toilets, etc.

Seeding preparation/grass application:
A minimum depth of 2 to 6 inches of topsoil shall be applied on areas where disturbance results in subsoil being the final grade surface. The seedbed shall be free of large clods, rocks, woody debris and other intrusive materials; fertilized shall be applied accordingly.

Seeding schedule and application procedure notes are shown on the Landscape Plan (design by others).

J. Conclusion

The use of the BMP's as designed will significantly reduce the pollutant loadings in the post development conditions. By capturing and treating the runoff from the new impervious surfaces and developed areas to the greatest extent possible, this plan meets the requirements of the NYSDEC for Water Quality and Flood Control, providing minimal impact to downstream waters.

Respectfully Submitted,

W. Charles Utschig, Jr., P.E.
N.Y.LIC. No. 62303
Langan Engineering

SECTION 3

SOILS MAP
FEMA MAP
MS4 MAP

United States Department of Agriculture

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Rockland County, New York

February 5, 2014

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group (Little Tor Substation)

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report
Map—Hydrologic Soil Group (Little Tor Substation)

Map Scale: 1:1,920 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

Table—Hydrologic Soil Group (Little Tor Substation)

Hydrologic Soil Group— Summary by Map Unit — Rockland County, New York (NY087)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
Ra	Rippowam sandy loam	A/D	2.3	20.2%
WeB	Wethersfield gravelly silt loam, 3 to 8 percent slopes	C	9.1	79.8%
Totals for Area of Interest			**11.4**	**100.0%**

Rating Options—Hydrologic Soil Group (Little Tor Substation)

Aggregation Method: Dominant Condition

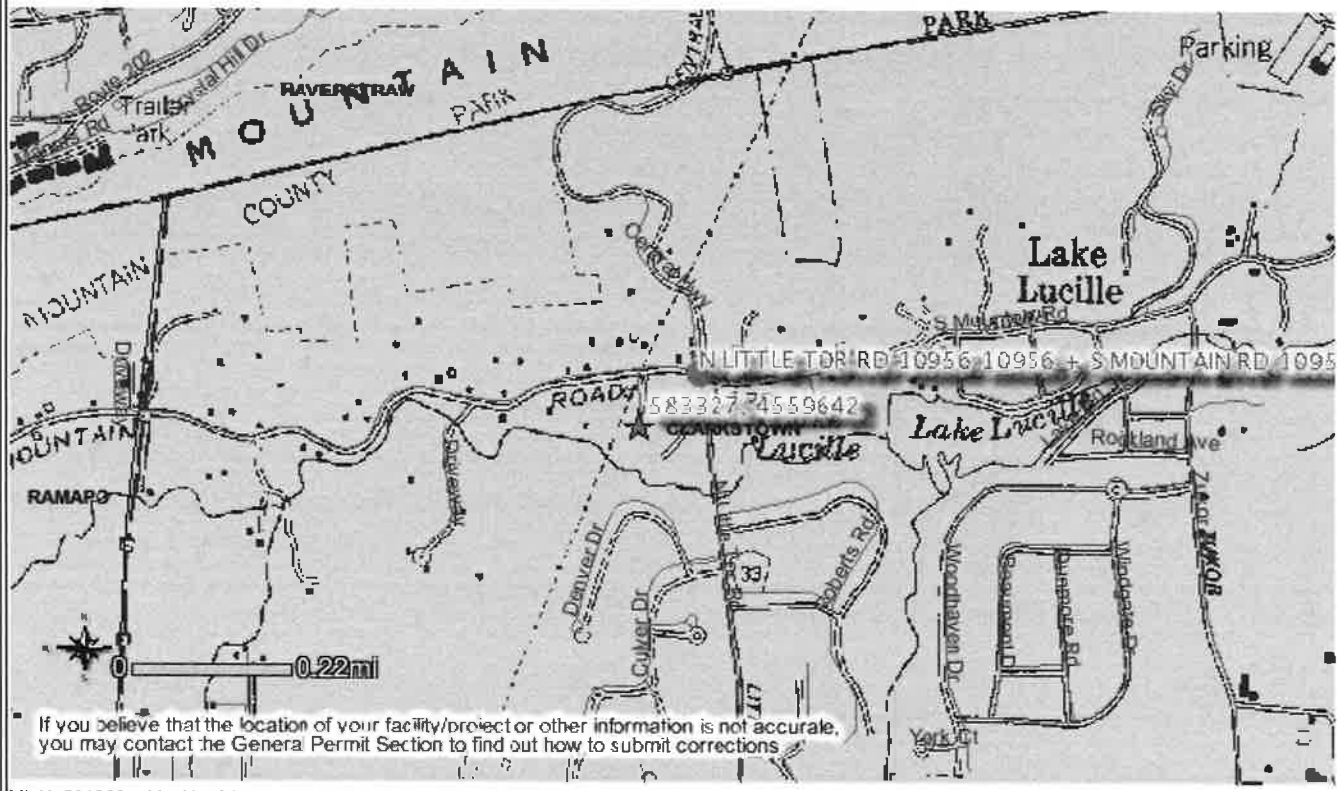
Component Percent Cutoff: None Specified

Tie-break Rule: Higher

[print page] [close window]

Please set your printer orientation to "Landscape".

Coordinates



MinX: 581963, MaxX: 584826, MinY: 4560419, MaxY: 4559004

Visible Layers

SECTION 4

ENGINEER AND CONTRACTOR CERTIFICATIONS

Date:

RE: Little Tor Substation
Clarkstown, New York
Langan Project Number: 190011601

Dear Sir or Madam:

Please consider this letter, written confirmation of the following acknowledgement being made this 5 day of November, 2014.

ENGINEER CERTIFICATION:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that false statements made herein are punishable as a class A misdemeanor pursuant to Section 210.45 of the Penal Law.

W. Charles Utschig, Jr. P.E.
Langan Engineering
707 Westchester Ave, Suite 304
White Plains, NY 10604
Phone: 914-323-7400
Fax: 914-323-7401

SPDES General Permit for Stormwater Runoff from Construction Activity, GP-0-10-001.

Date:

RE: Little Tor Substation
Clarkstown, New York
Langan Project Number: 190011601

Dear Sir or Madam:

Please consider this letter, written confirmation of the following acknowledgement being made this _____ day of _____, 2014.

CONTRACTOR STATEMENT:

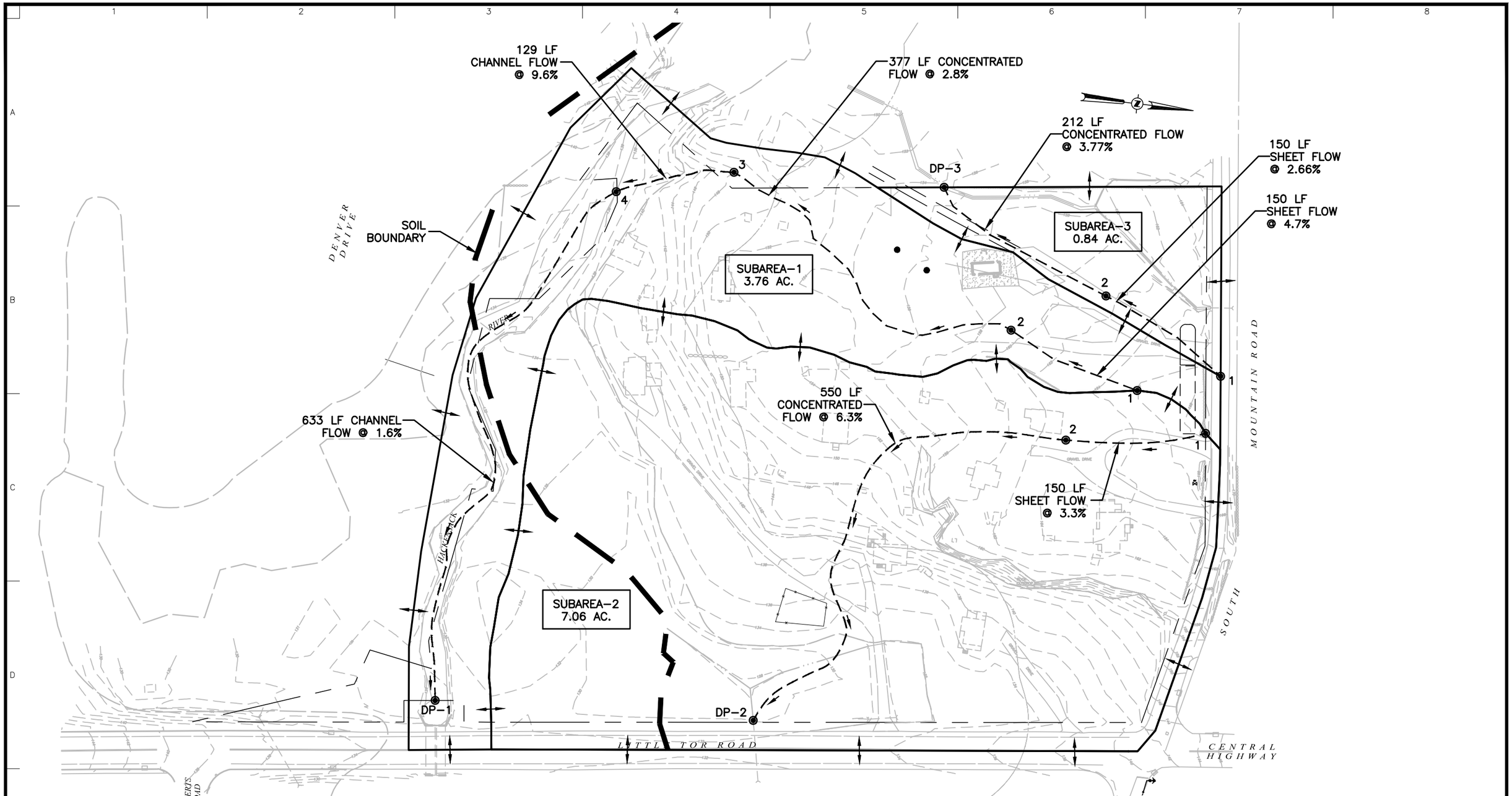
I certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP for the construction site identified in such SWPPP as a condition of authorization to discharge stormwater. I also understand that the operator must comply with the terms and conditions of the New York State Pollutant Discharge Elimination System (SPDES) general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards.

_____
Signature

SPDES General Permit for Stormwater Runoff from Construction Activity, GP-0-10-001.

SECTION 5

EXISTING CONDITIONS DRAINAGE AREA MAP AND ROUTING COMPUTATIONS



WARNING: IT IS A VIOLATION OF THE NYS EDUCATION LAW ARTICLE 145 FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS ITEM IN ANY WAY.

10-15-14	Revised per Town Comments	1.

LANGAN

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Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
Langan Engineering and Environmental Services, Inc.
Langan CT, Inc.
Langan International LLC

Collectively known as Langan

Project

LITTLE TOR SUBSTATION

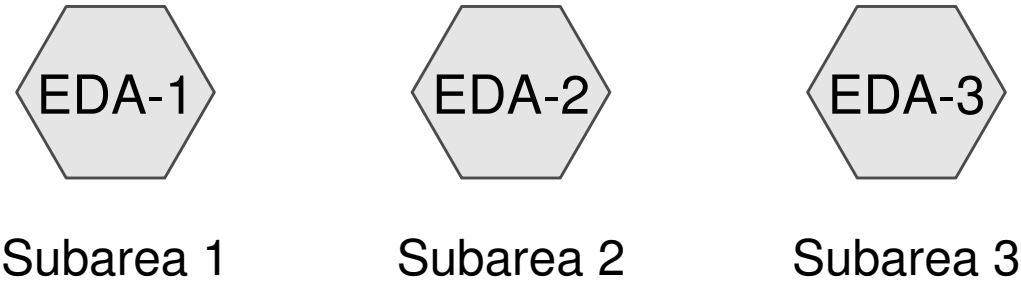
CLARKSTOWN
ROCKLAND COUNTY NEW YORK STATE

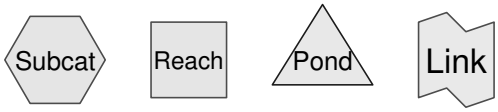
Drawing Title

PRE-DEVELOPMENT DRAINAGE MAP

Project No. 190011601	Drawing No. FG01
Date 02-05-2014	
Scale 1" = 100'	
Drawn By MC / Checked By MF	
Submission Date –	Sheet 1 of 2

© 2013 Langan





Routing Diagram for Pre-Development
Prepared by Langan Eng & Env Srvcs, Inc, Printed 10/21/2014
HydroCAD® 10.00 s/n 08101 © 2013 HydroCAD Software Solutions LLC

Summary for Subcatchment EDA-1: Subarea 1

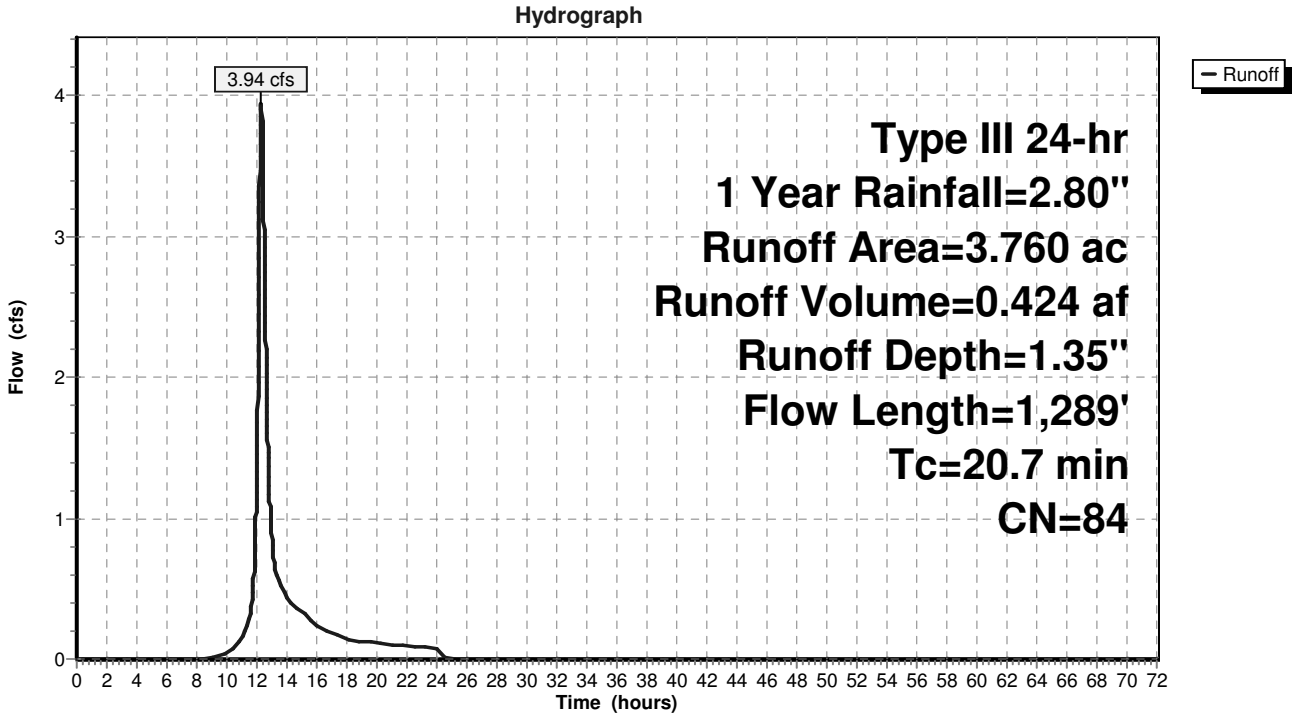
Runoff = 3.94 cfs @ 12.30 hrs, Volume= 0.424 af, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year Rainfall=2.80"

Area (ac)	CN	Description
2.267	79	50-75% Grass cover, Fair, HSG C
0.793	84	50-75% Grass cover, Fair, HSG D
0.700	98	Paved parking, HSG C
3.760	84	Weighted Average
3.060		81.38% Pervious Area
0.700		18.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	150	0.0470	0.27		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
5.4	377	0.0280	1.17		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
0.5	129	0.0960	4.65		**Shallow Concentrated Flow, 3 to 4** Grassed Waterway Kv= 15.0 fps
5.6	633	0.0160	1.90		**Shallow Concentrated Flow, 4 to 5** Grassed Waterway Kv= 15.0 fps
20.7	1,289	Total			

Subcatchment EDA-1: Subarea 1



Summary for Subcatchment EDA-2: Subarea 2

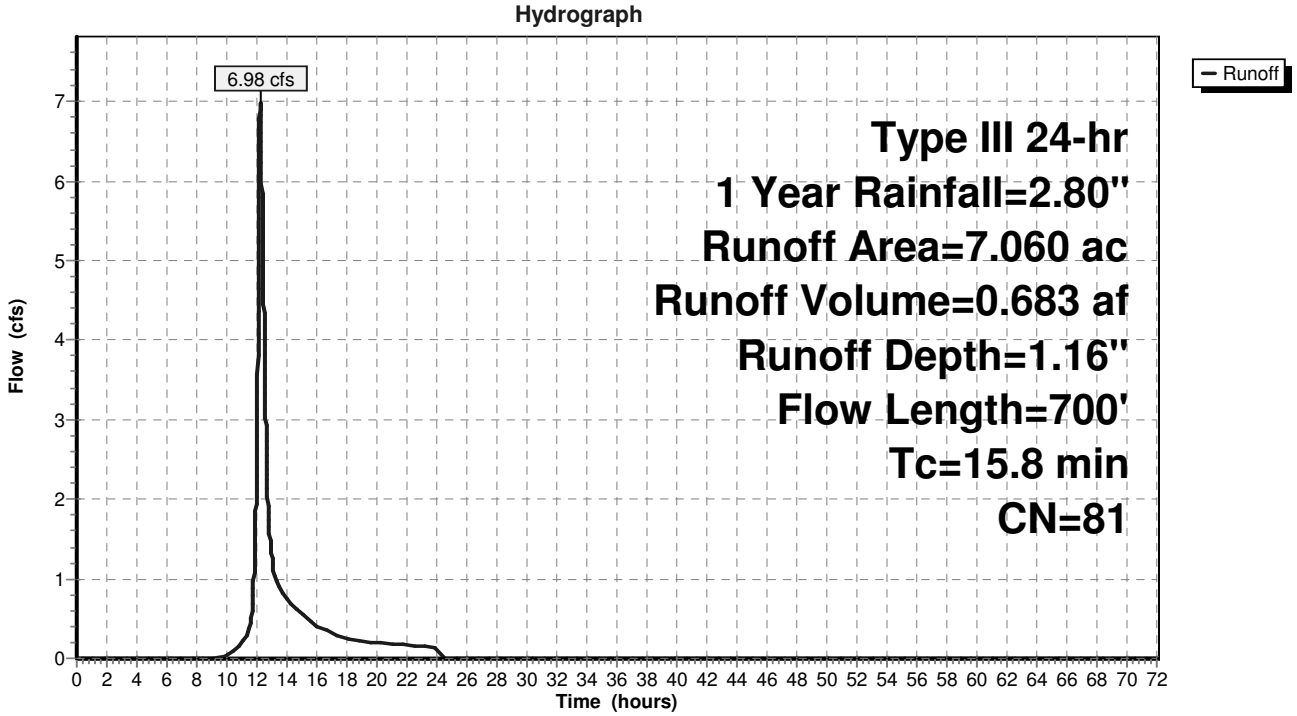
Runoff = 6.98 cfs @ 12.23 hrs, Volume= 0.683 af, Depth= 1.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year Rainfall=2.80"

Area (ac)	CN	Description
5.548	79	50-75% Grass cover, Fair, HSG C
0.620	98	Paved parking, HSG C
0.892	84	50-75% Grass cover, Fair, HSG D
7.060	81	Weighted Average
6.440		91.22% Pervious Area
0.620		8.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	150	0.0330	0.24		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
5.2	550	0.0630	1.76		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
15.8	700	Total			

Subcatchment EDA-2: Subarea 2



Summary for Subcatchment EDA-3: Subarea 3

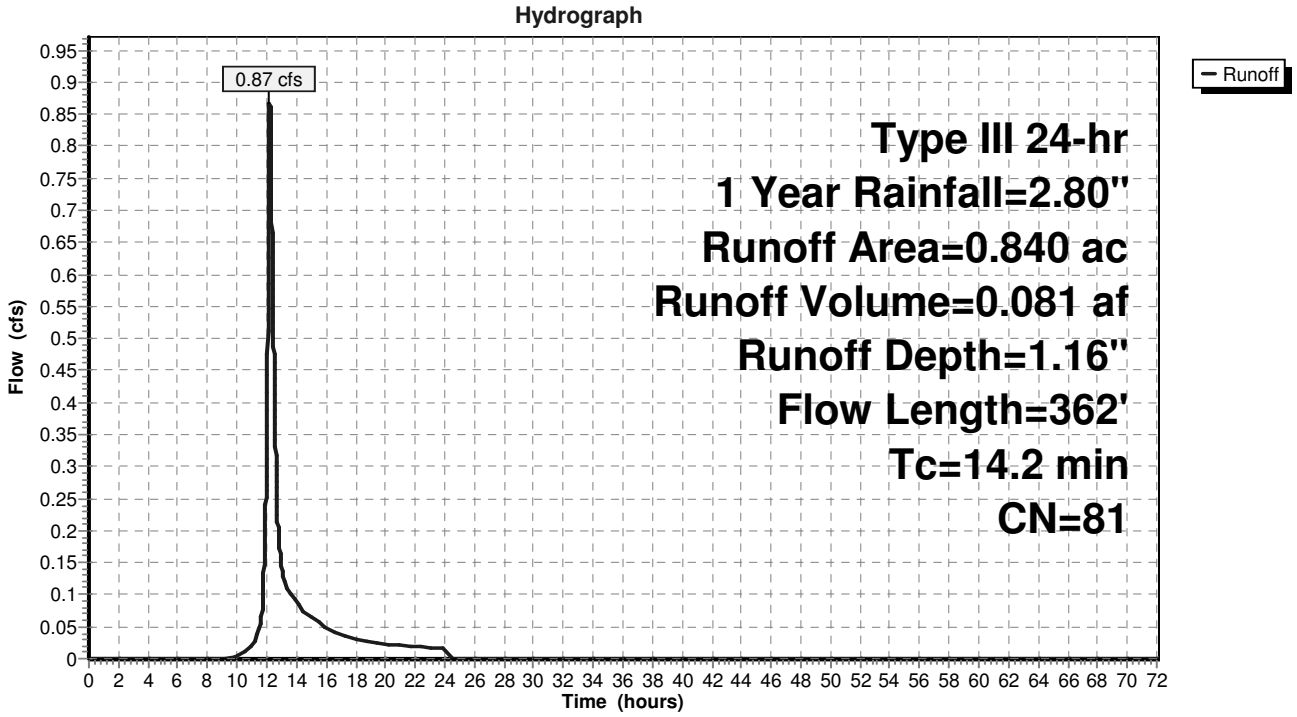
Runoff = 0.87 cfs @ 12.20 hrs, Volume= 0.081 af, Depth= 1.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year Rainfall=2.80"

Area (ac)	CN	Description
0.734	79	50-75% Grass cover, Fair, HSG C
0.106	98	Paved parking, HSG C
0.840	81	Weighted Average
0.734		87.38% Pervious Area
0.106		12.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	150	0.0266	0.22		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
2.6	212	0.0377	1.36		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
14.2	362	Total			

Subcatchment EDA-3: Subarea 3



Summary for Subcatchment EDA-1: Subarea 1

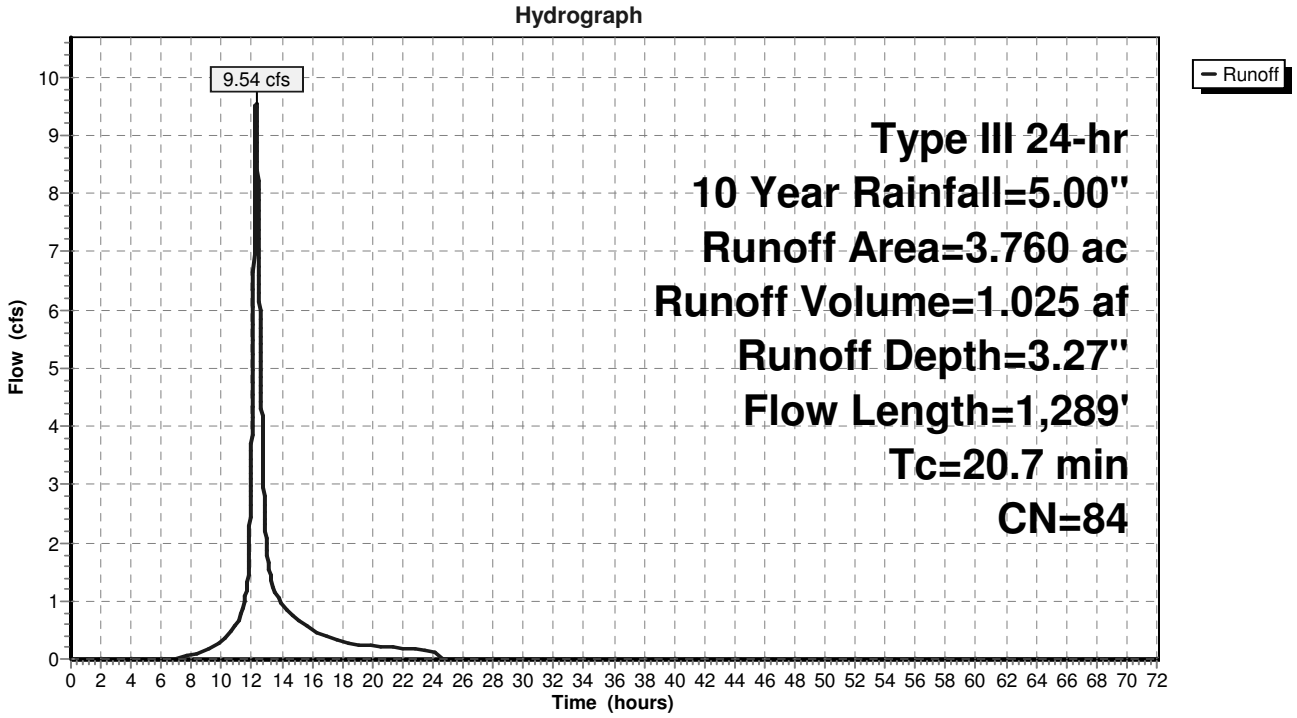
Runoff = 9.54 cfs @ 12.28 hrs, Volume= 1.025 af, Depth= 3.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.00"

Area (ac)	CN	Description
2.267	79	50-75% Grass cover, Fair, HSG C
0.793	84	50-75% Grass cover, Fair, HSG D
0.700	98	Paved parking, HSG C
3.760	84	Weighted Average
3.060		81.38% Pervious Area
0.700		18.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	150	0.0470	0.27		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
5.4	377	0.0280	1.17		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
0.5	129	0.0960	4.65		**Shallow Concentrated Flow, 3 to 4** Grassed Waterway Kv= 15.0 fps
5.6	633	0.0160	1.90		**Shallow Concentrated Flow, 4 to 5** Grassed Waterway Kv= 15.0 fps
20.7	1,289	Total			

Subcatchment EDA-1: Subarea 1



Summary for Subcatchment EDA-2: Subarea 2

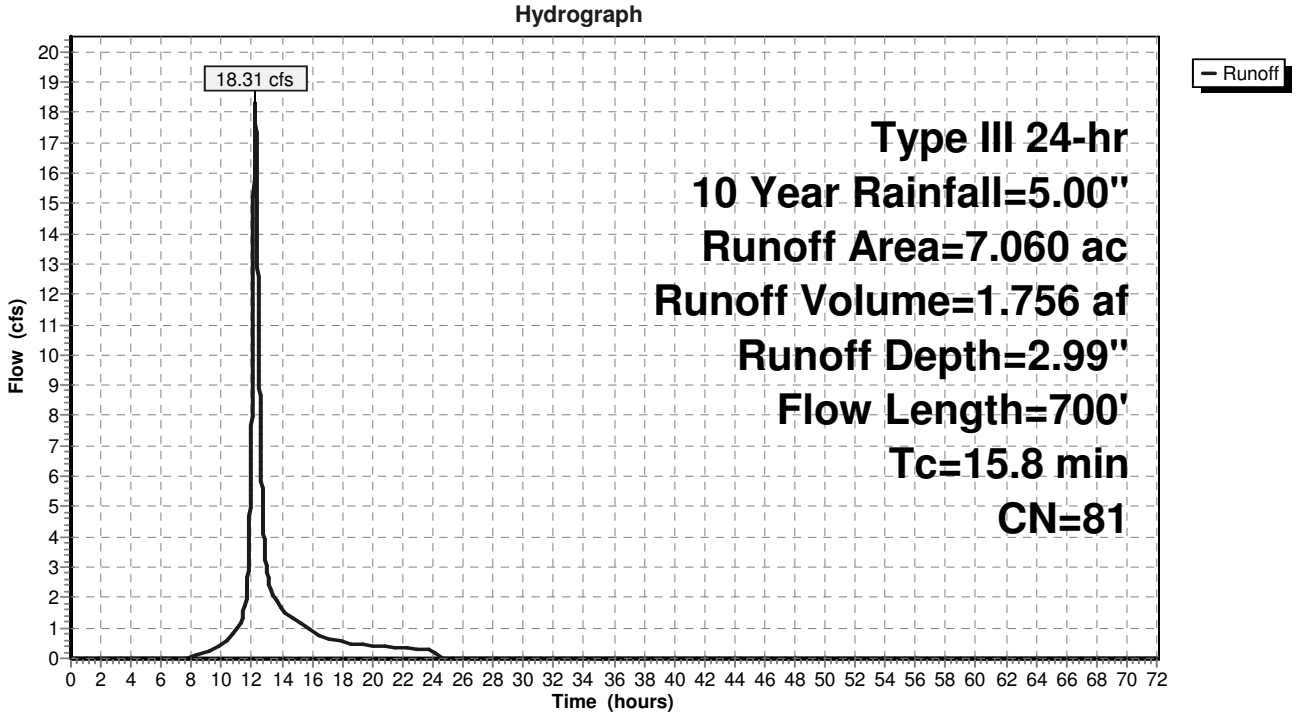
Runoff = 18.31 cfs @ 12.21 hrs, Volume= 1.756 af, Depth= 2.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.00"

Area (ac)	CN	Description
5.548	79	50-75% Grass cover, Fair, HSG C
0.620	98	Paved parking, HSG C
0.892	84	50-75% Grass cover, Fair, HSG D
7.060	81	Weighted Average
6.440		91.22% Pervious Area
0.620		8.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	150	0.0330	0.24		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
5.2	550	0.0630	1.76		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
15.8	700	Total			

Subcatchment EDA-2: Subarea 2



Summary for Subcatchment EDA-3: Subarea 3

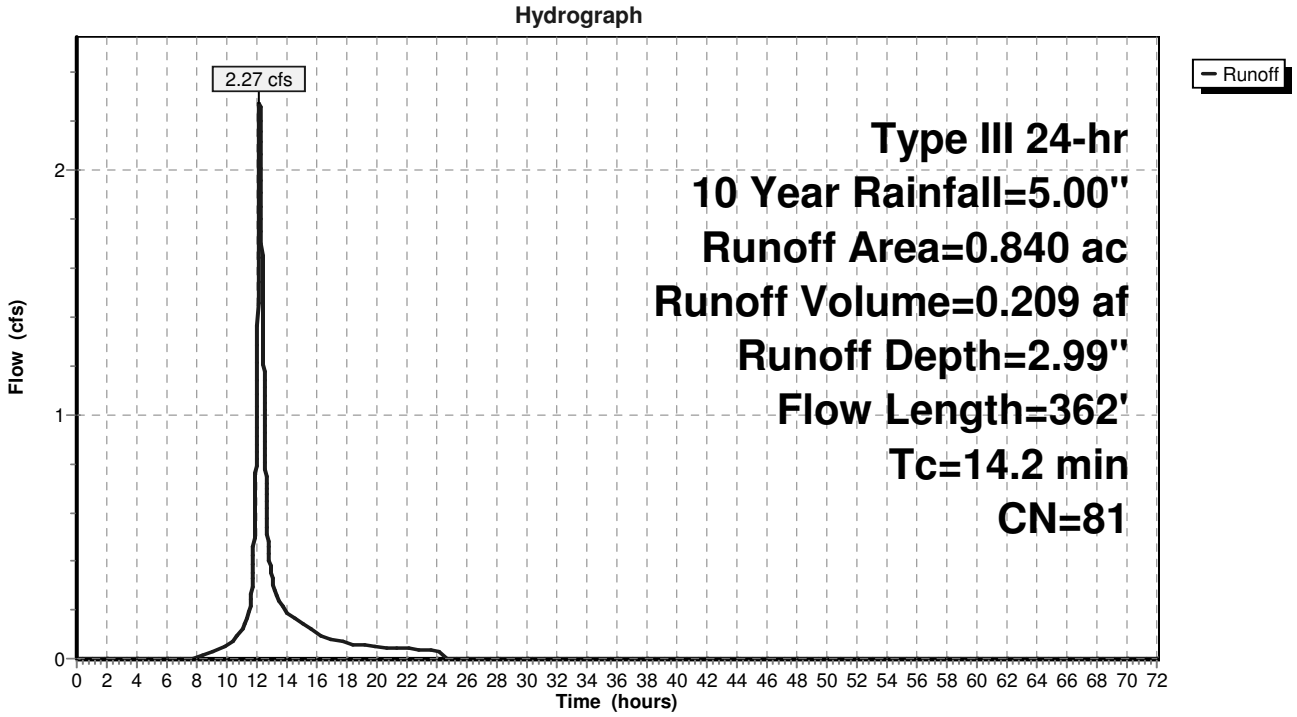
Runoff = 2.27 cfs @ 12.20 hrs, Volume= 0.209 af, Depth= 2.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.00"

Area (ac)	CN	Description
0.734	79	50-75% Grass cover, Fair, HSG C
0.106	98	Paved parking, HSG C
0.840	81	Weighted Average
0.734		87.38% Pervious Area
0.106		12.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	150	0.0266	0.22		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
2.6	212	0.0377	1.36		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
14.2	362	Total			

Subcatchment EDA-3: Subarea 3



Summary for Subcatchment EDA-1: Subarea 1

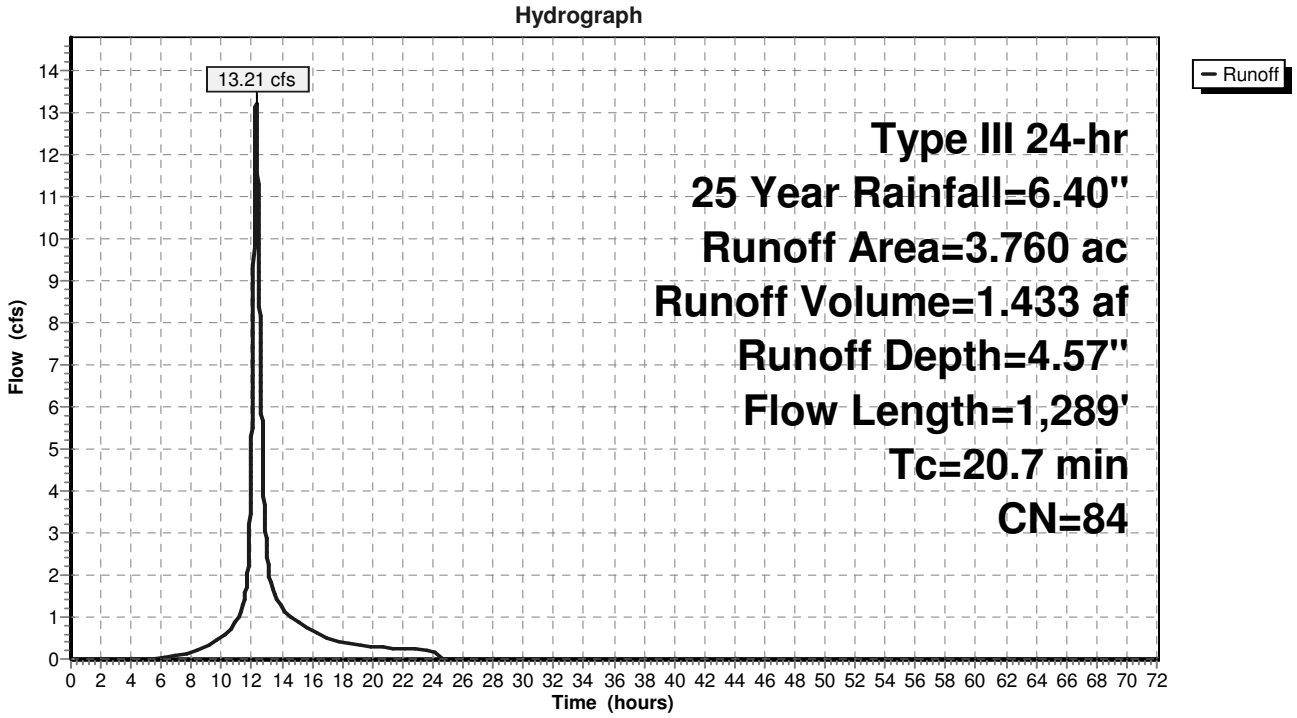
Runoff = 13.21 cfs @ 12.28 hrs, Volume= 1.433 af, Depth= 4.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=6.40"

Area (ac)	CN	Description
2.267	79	50-75% Grass cover, Fair, HSG C
0.793	84	50-75% Grass cover, Fair, HSG D
0.700	98	Paved parking, HSG C
3.760	84	Weighted Average
3.060		81.38% Pervious Area
0.700		18.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	150	0.0470	0.27		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
5.4	377	0.0280	1.17		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
0.5	129	0.0960	4.65		**Shallow Concentrated Flow, 3 to 4** Grassed Waterway Kv= 15.0 fps
5.6	633	0.0160	1.90		**Shallow Concentrated Flow, 4 to 5** Grassed Waterway Kv= 15.0 fps
20.7	1,289	Total			

Subcatchment EDA-1: Subarea 1



Summary for Subcatchment EDA-2: Subarea 2

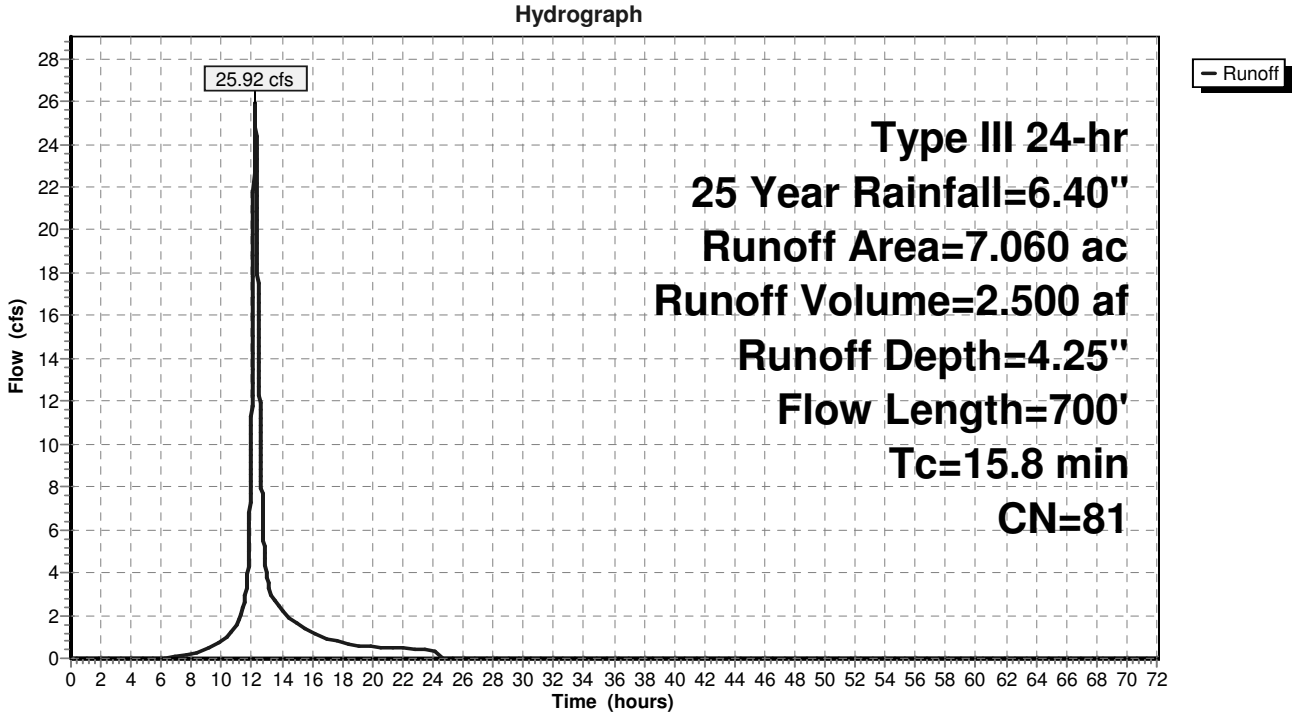
Runoff = 25.92 cfs @ 12.21 hrs, Volume= 2.500 af, Depth= 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=6.40"

Area (ac)	CN	Description
5.548	79	50-75% Grass cover, Fair, HSG C
0.620	98	Paved parking, HSG C
0.892	84	50-75% Grass cover, Fair, HSG D
7.060	81	Weighted Average
6.440		91.22% Pervious Area
0.620		8.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	150	0.0330	0.24		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
5.2	550	0.0630	1.76		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
15.8	700	Total			

Subcatchment EDA-2: Subarea 2



Summary for Subcatchment EDA-3: Subarea 3

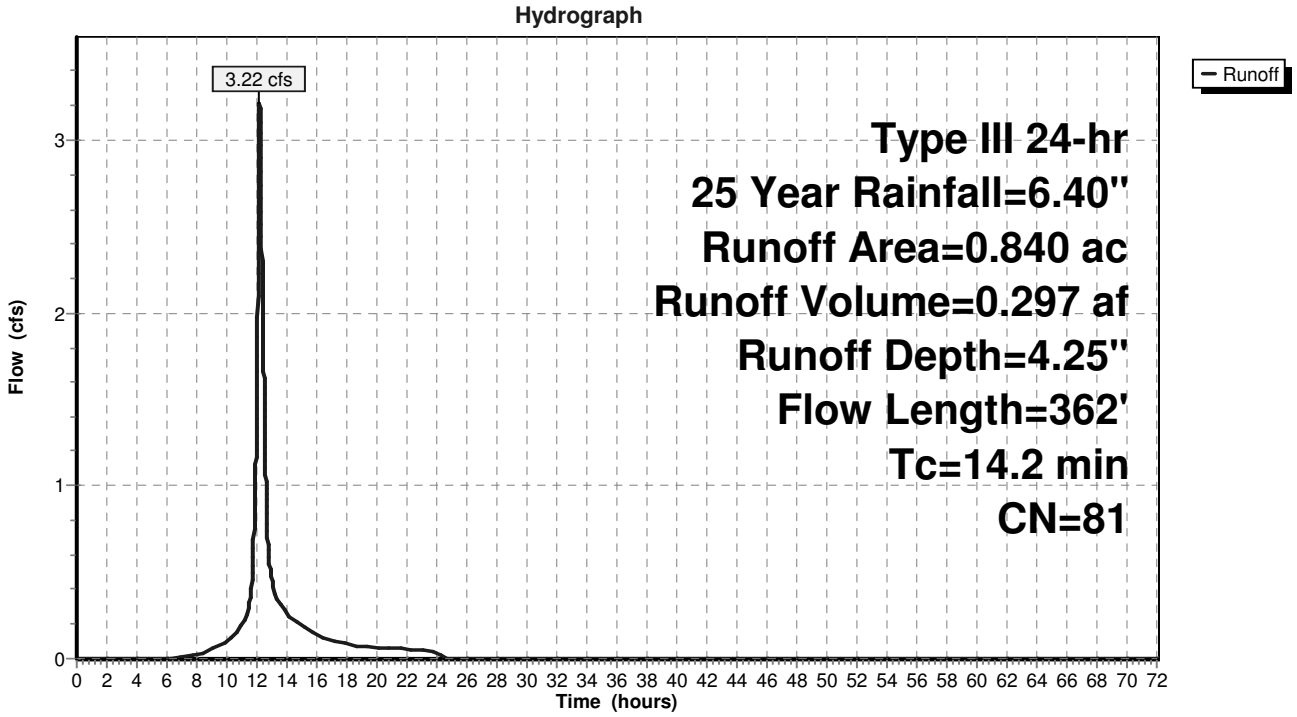
Runoff = 3.22 cfs @ 12.19 hrs, Volume= 0.297 af, Depth= 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=6.40"

Area (ac)	CN	Description
0.734	79	50-75% Grass cover, Fair, HSG C
0.106	98	Paved parking, HSG C
0.840	81	Weighted Average
0.734		87.38% Pervious Area
0.106		12.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	150	0.0266	0.22		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
2.6	212	0.0377	1.36		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
14.2	362	Total			

Subcatchment EDA-3: Subarea 3



Summary for Subcatchment EDA-1: Subarea 1

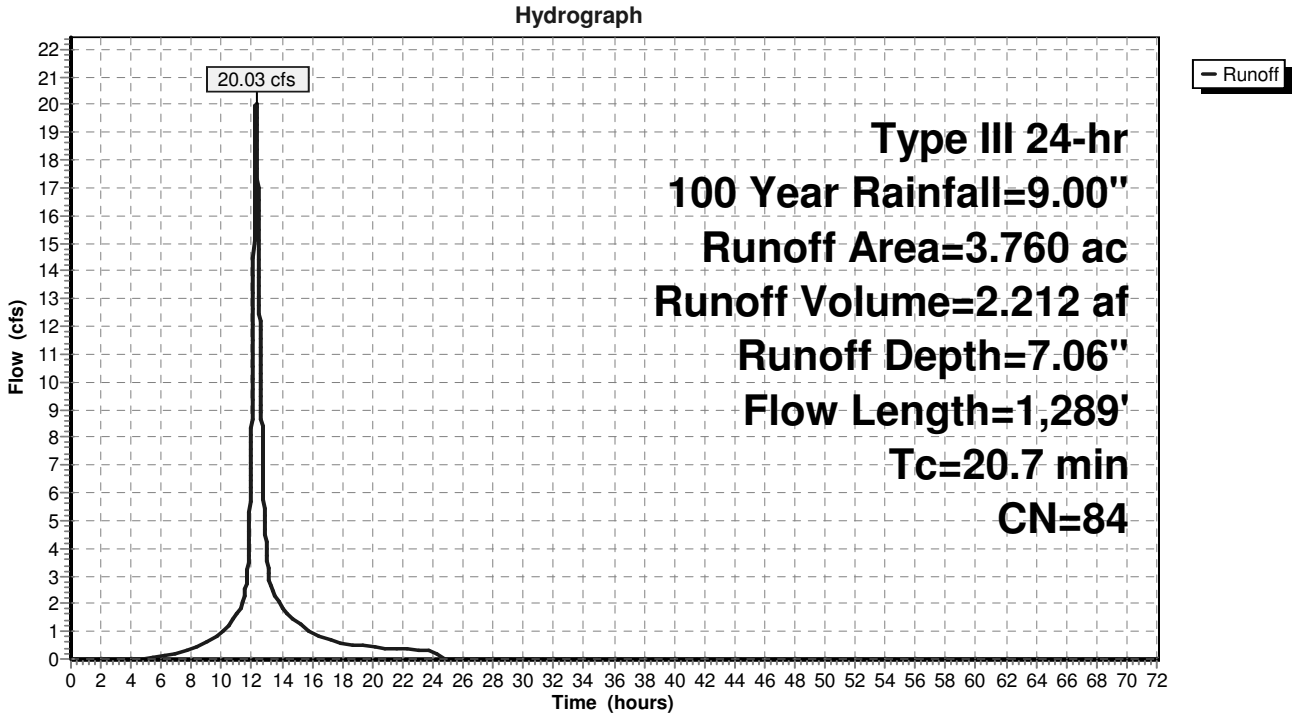
Runoff = 20.03 cfs @ 12.27 hrs, Volume= 2.212 af, Depth= 7.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=9.00"

Area (ac)	CN	Description
2.267	79	50-75% Grass cover, Fair, HSG C
0.793	84	50-75% Grass cover, Fair, HSG D
0.700	98	Paved parking, HSG C
3.760	84	Weighted Average
3.060		81.38% Pervious Area
0.700		18.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	150	0.0470	0.27		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
5.4	377	0.0280	1.17		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
0.5	129	0.0960	4.65		**Shallow Concentrated Flow, 3 to 4** Grassed Waterway Kv= 15.0 fps
5.6	633	0.0160	1.90		**Shallow Concentrated Flow, 4 to 5** Grassed Waterway Kv= 15.0 fps
20.7	1,289	Total			

Subcatchment EDA-1: Subarea 1



Summary for Subcatchment EDA-2: Subarea 2

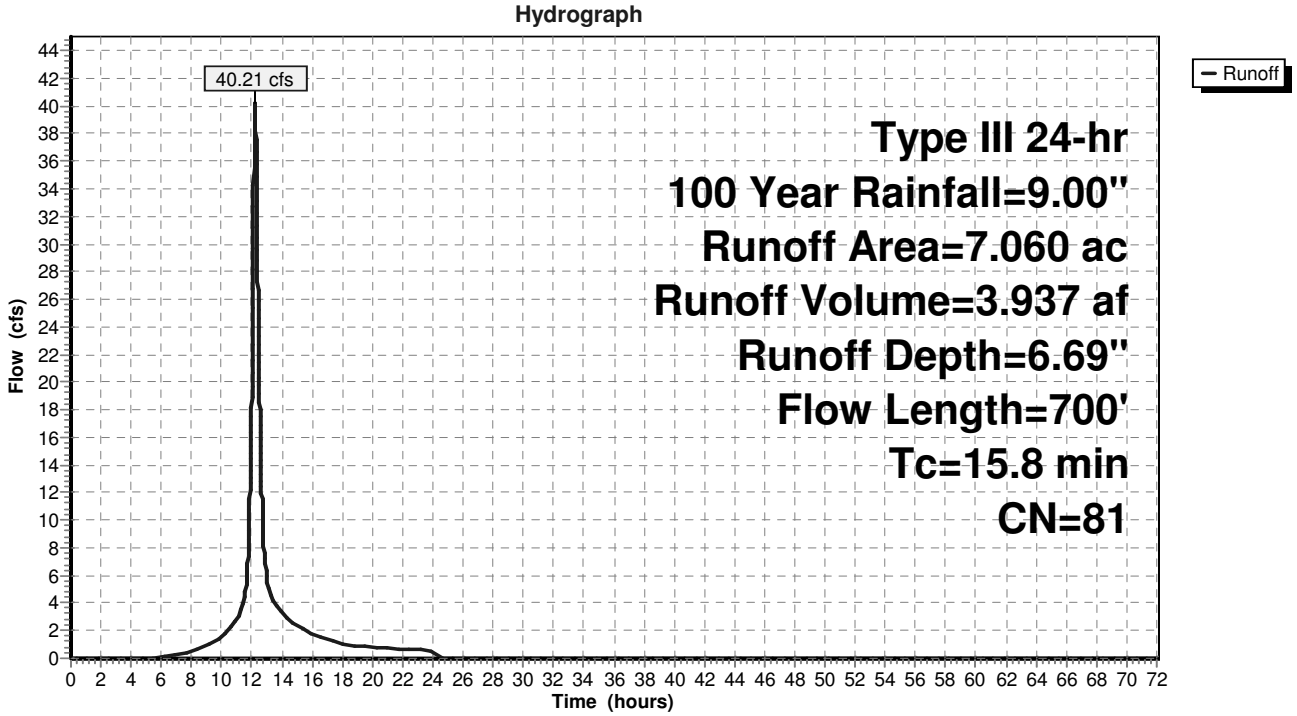
Runoff = 40.21 cfs @ 12.21 hrs, Volume= 3.937 af, Depth= 6.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=9.00"

Area (ac)	CN	Description
5.548	79	50-75% Grass cover, Fair, HSG C
0.620	98	Paved parking, HSG C
0.892	84	50-75% Grass cover, Fair, HSG D
7.060	81	Weighted Average
6.440		91.22% Pervious Area
0.620		8.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	150	0.0330	0.24		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
5.2	550	0.0630	1.76		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
15.8	700	Total			

Subcatchment EDA-2: Subarea 2



Summary for Subcatchment EDA-3: Subarea 3

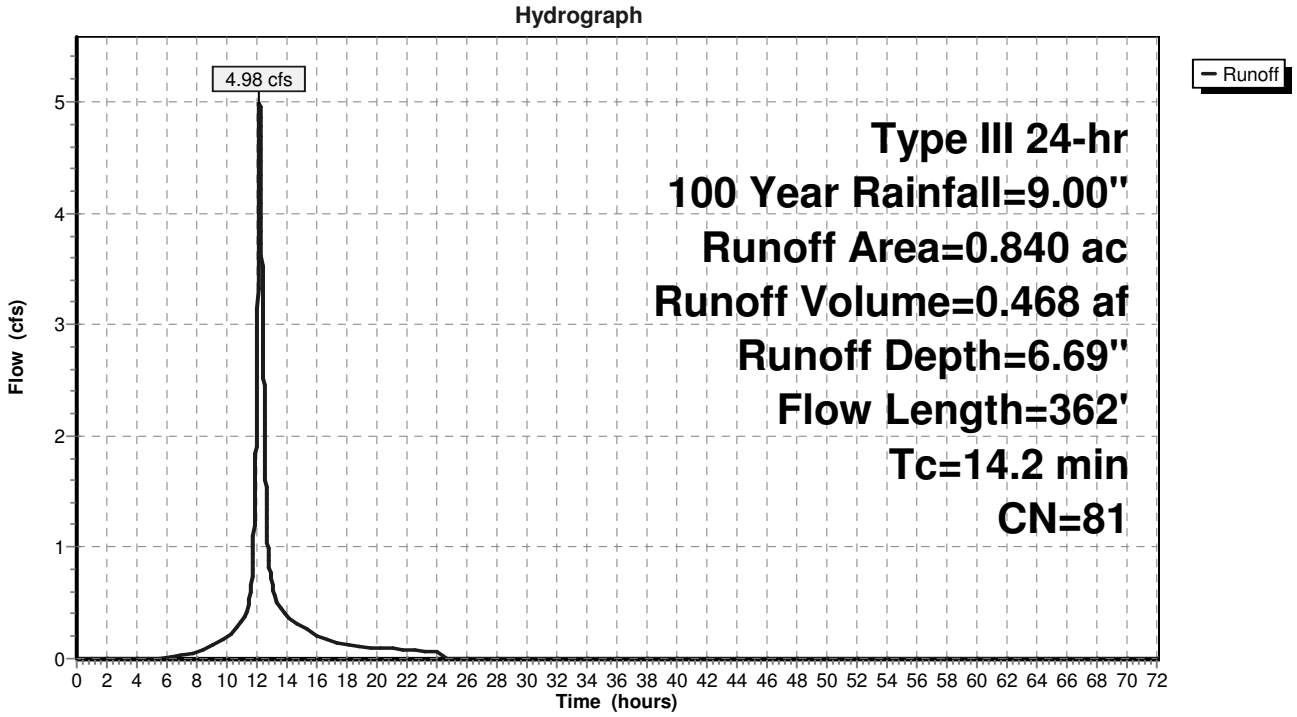
Runoff = 4.98 cfs @ 12.19 hrs, Volume= 0.468 af, Depth= 6.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=9.00"

Area (ac)	CN	Description
0.734	79	50-75% Grass cover, Fair, HSG C
0.106	98	Paved parking, HSG C
0.840	81	Weighted Average
0.734		87.38% Pervious Area
0.106		12.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	150	0.0266	0.22		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
2.6	212	0.0377	1.36		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
14.2	362	Total			

Subcatchment EDA-3: Subarea 3



Summary for Subcatchment EDA-1: Subarea 1

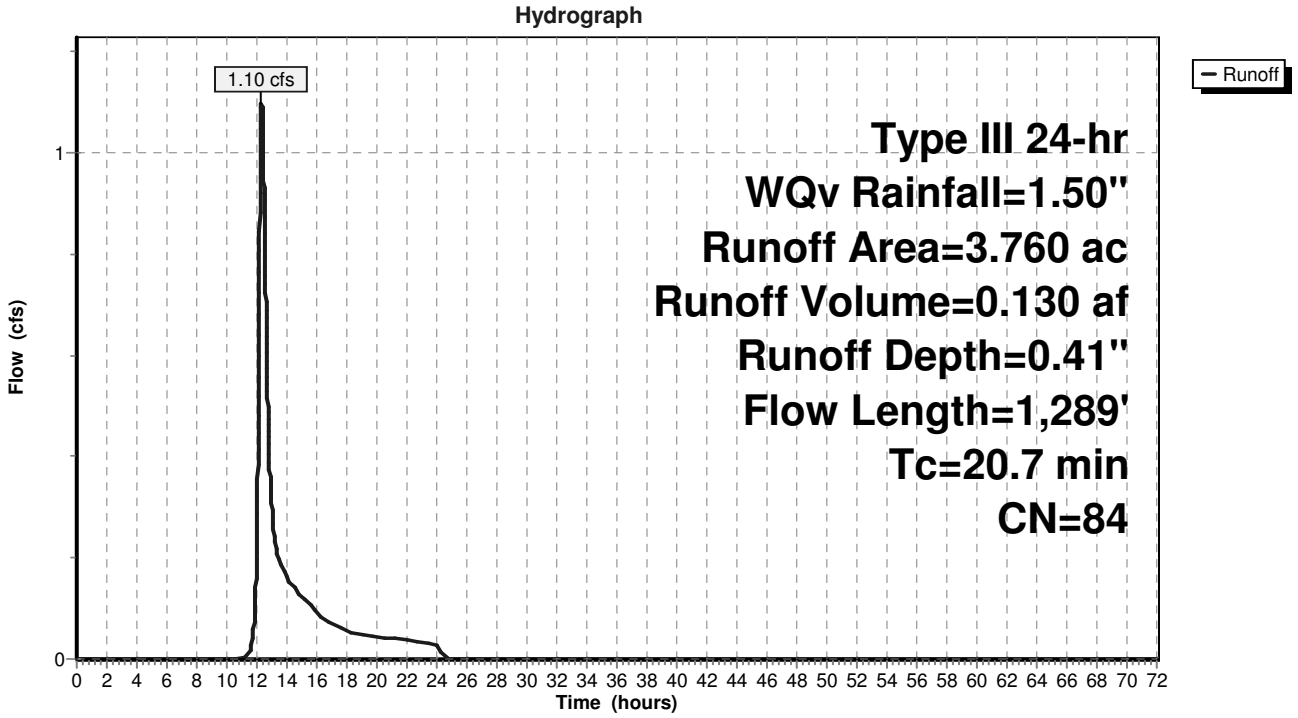
Runoff = 1.10 cfs @ 12.31 hrs, Volume= 0.130 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr WQv Rainfall=1.50"

Area (ac)	CN	Description
2.267	79	50-75% Grass cover, Fair, HSG C
0.793	84	50-75% Grass cover, Fair, HSG D
0.700	98	Paved parking, HSG C
3.760	84	Weighted Average
3.060		81.38% Pervious Area
0.700		18.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	150	0.0470	0.27		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
5.4	377	0.0280	1.17		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
0.5	129	0.0960	4.65		**Shallow Concentrated Flow, 3 to 4** Grassed Waterway Kv= 15.0 fps
5.6	633	0.0160	1.90		**Shallow Concentrated Flow, 4 to 5** Grassed Waterway Kv= 15.0 fps
20.7	1,289	Total			

Subcatchment EDA-1: Subarea 1



Summary for Subcatchment EDA-2: Subarea 2

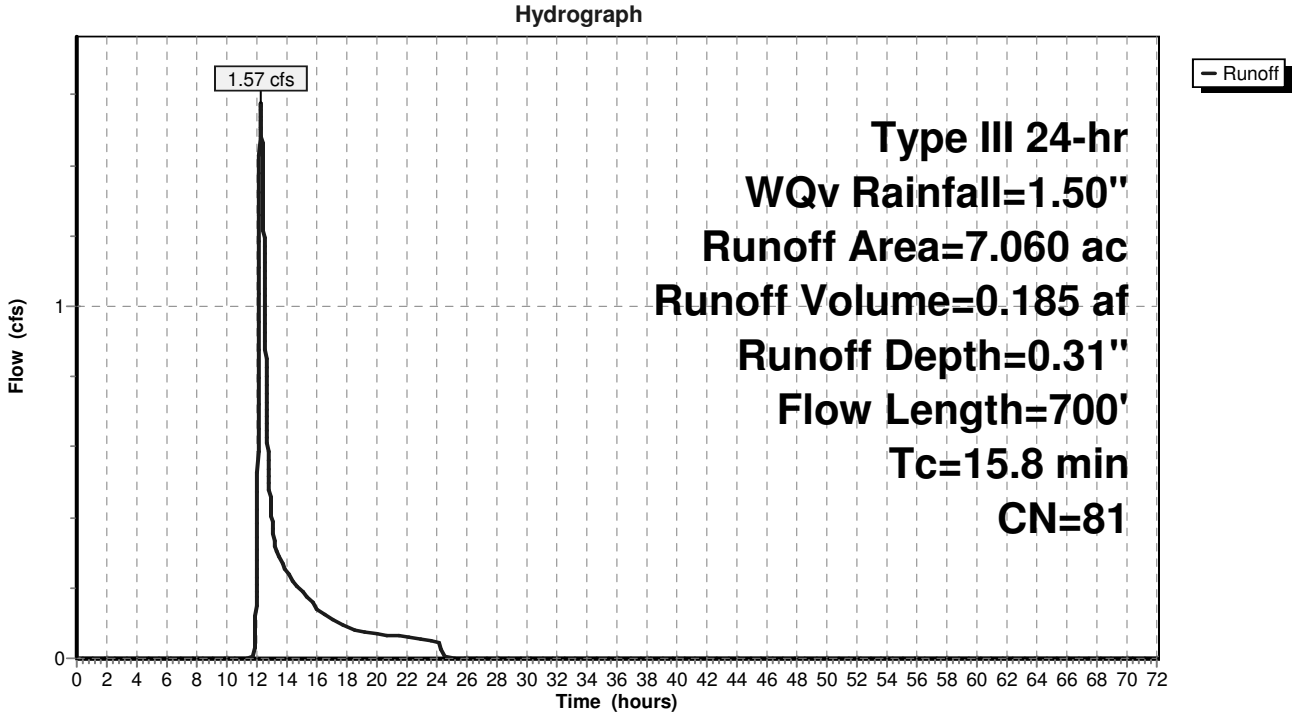
Runoff = 1.57 cfs @ 12.26 hrs, Volume= 0.185 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr WQv Rainfall=1.50"

Area (ac)	CN	Description
5.548	79	50-75% Grass cover, Fair, HSG C
0.620	98	Paved parking, HSG C
0.892	84	50-75% Grass cover, Fair, HSG D
7.060	81	Weighted Average
6.440		91.22% Pervious Area
0.620		8.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	150	0.0330	0.24		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
5.2	550	0.0630	1.76		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
15.8	700	Total			

Subcatchment EDA-2: Subarea 2



Summary for Subcatchment EDA-3: Subarea 3

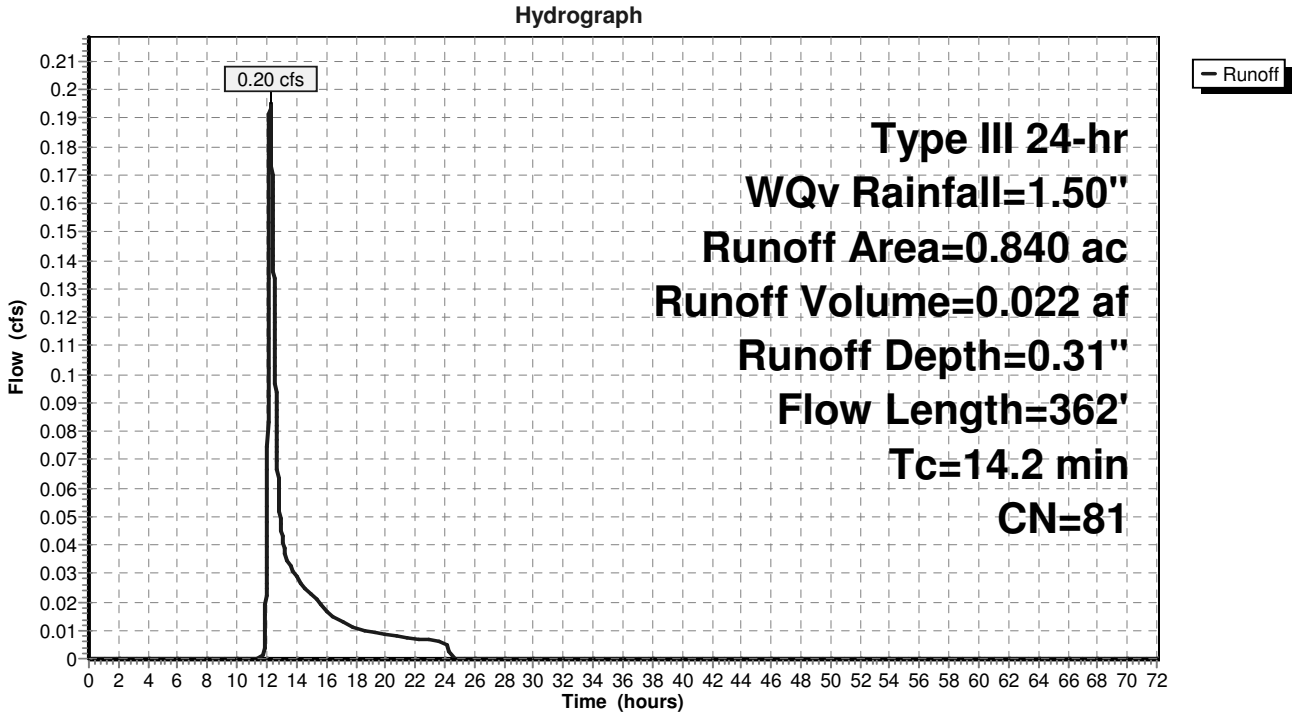
Runoff = 0.20 cfs @ 12.23 hrs, Volume= 0.022 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr WQv Rainfall=1.50"

Area (ac)	CN	Description
0.734	79	50-75% Grass cover, Fair, HSG C
0.106	98	Paved parking, HSG C
0.840	81	Weighted Average
0.734		87.38% Pervious Area
0.106		12.62% Impervious Area

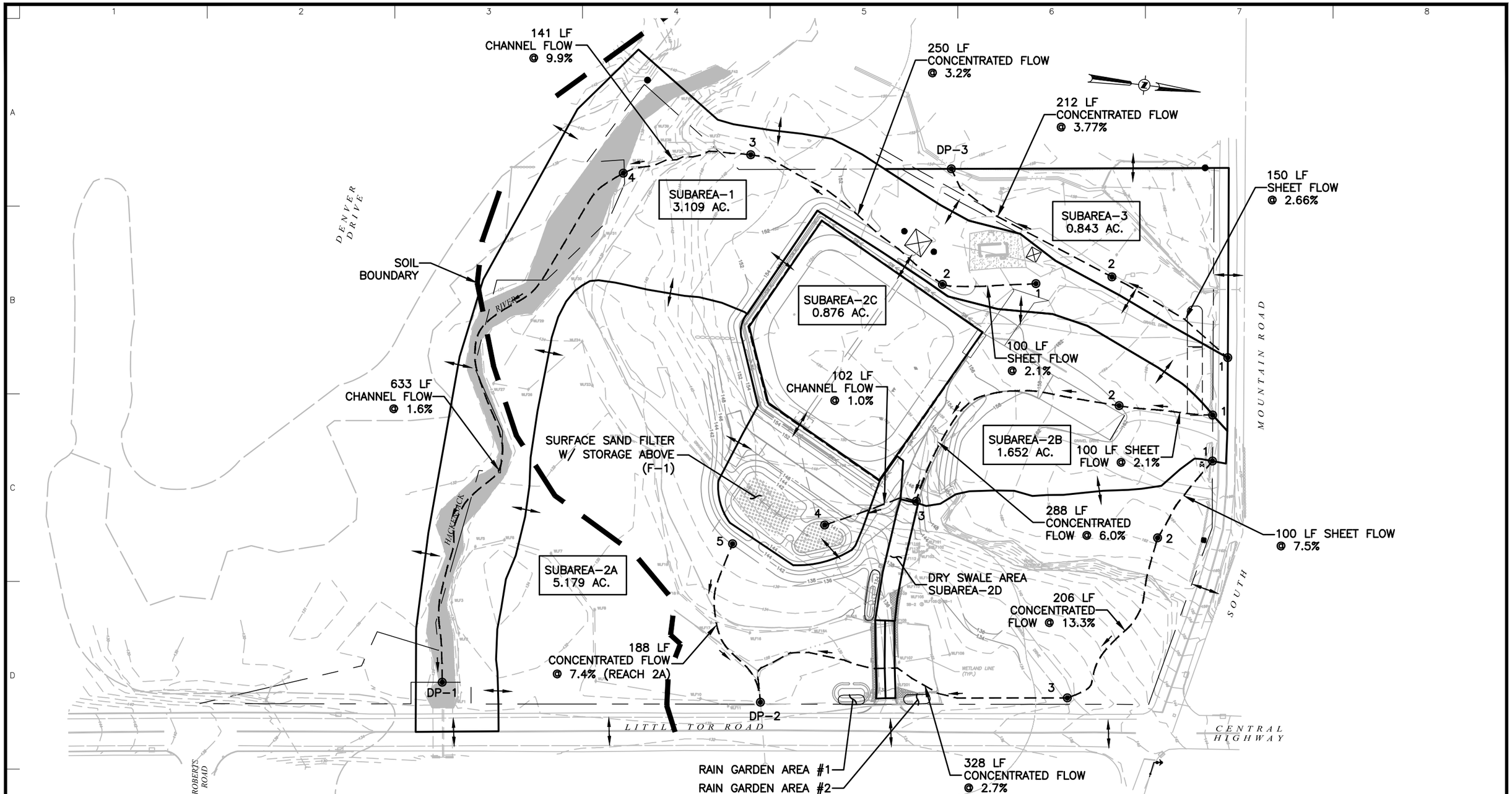
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	150	0.0266	0.22		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
2.6	212	0.0377	1.36		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
14.2	362	Total			

Subcatchment EDA-3: Subarea 3



SECTION 6

PROPOSED CONDITIONS DRAINAGE AREA MAP AND ROUTING COMPUTATIONS



WARNING: IT IS A VIOLATION OF THE NYS EDUCATION LAW ARTICLE 145 FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS ITEM IN ANY WAY.

10-15-14	Revised per Town Comments	1.

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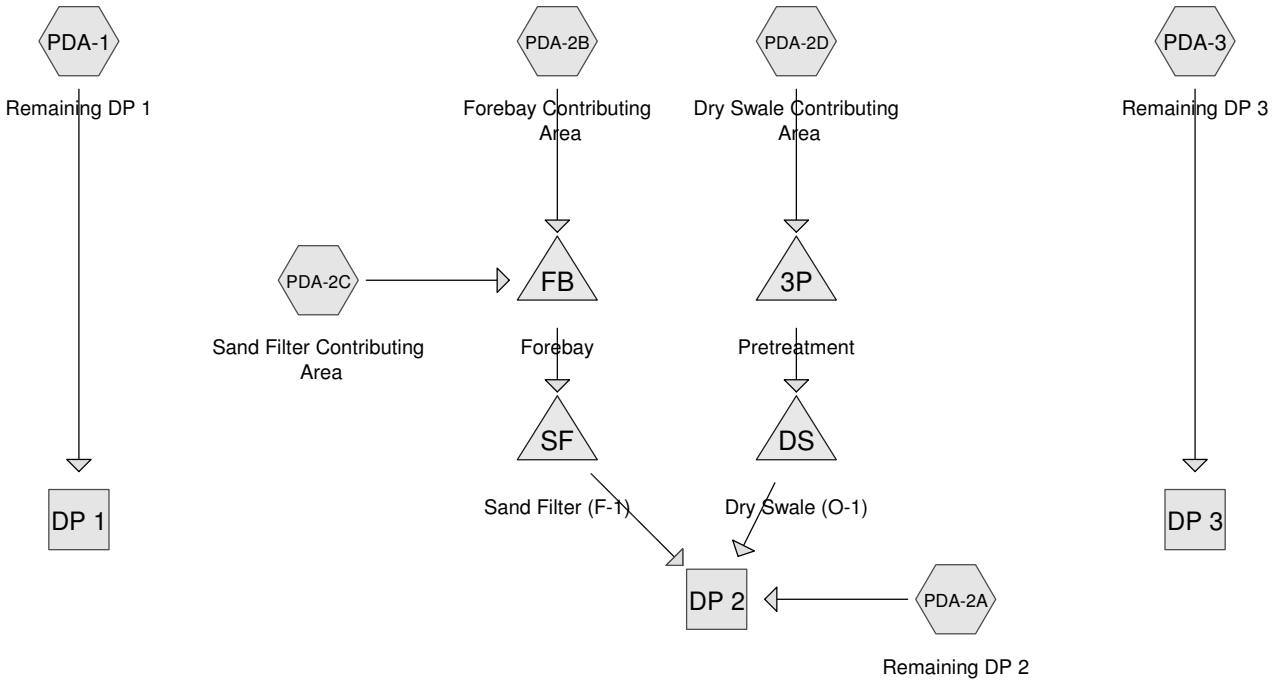
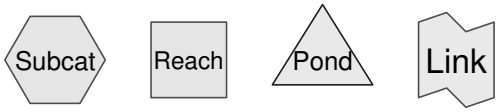
Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
Langan Engineering and Environmental Services, Inc.
Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project
LITTLE TOR SUBSTATION
CLARKSTOWN
ROCKLAND COUNTY NEW YORK STATE

Drawing Title
POST-DEVELOPMENT DRAINAGE MAP

Project No. 190011601	Drawing No. FG02
Date 02-05-2014	
Scale 1" = 100'	
Drawn By MC / Checked By MF	
Submission Date –	Sheet 2 of 2





Routing Diagram for Post-Development
Prepared by Langan Eng & Env Srvcs, Inc, Printed 10/22/2014
HydroCAD® 10.00 s/n 08101 © 2013 HydroCAD Software Solutions LLC

Summary for Subcatchment PDA-1: Remaining DP 1

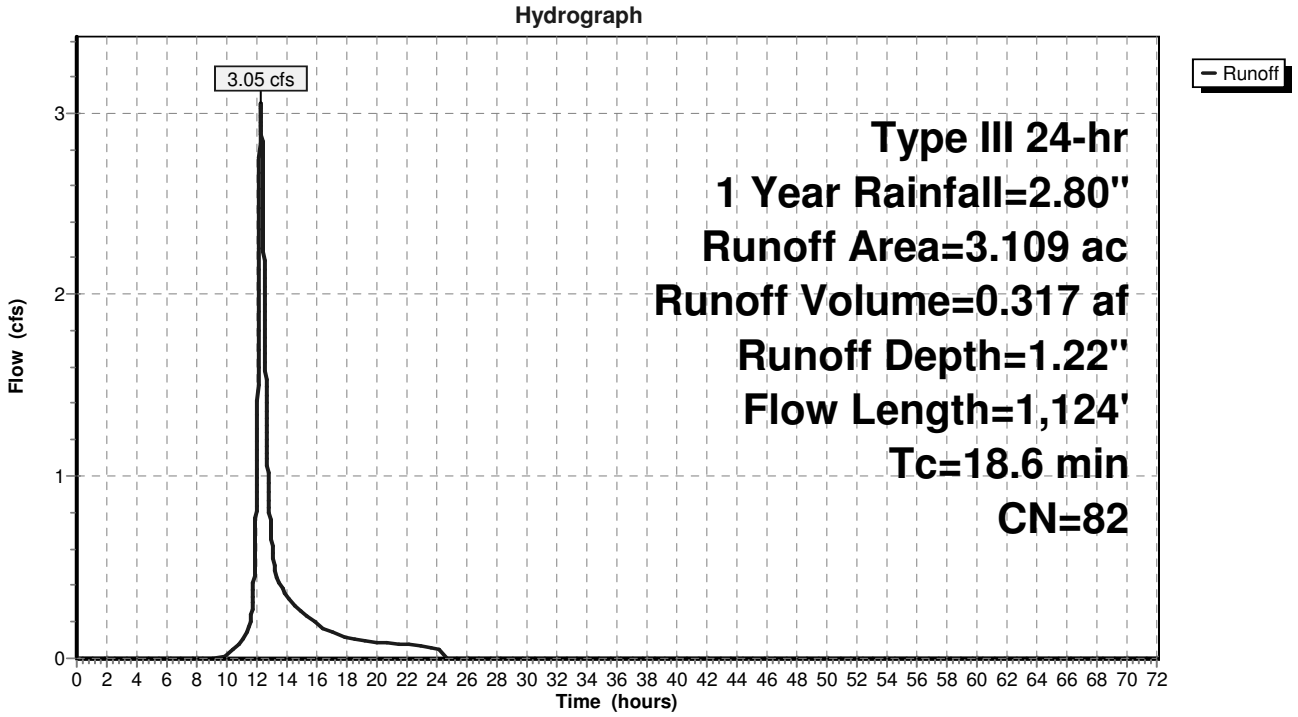
Runoff = 3.05 cfs @ 12.26 hrs, Volume= 0.317 af, Depth= 1.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year Rainfall=2.80"

Area (ac)	CN	Description
1.752	79	50-75% Grass cover, Fair, HSG C
0.791	79	50-75% Grass cover, Fair, HSG C
0.118	89	Gravel roads, HSG C
0.448	98	Paved parking, HSG C
3.109	82	Weighted Average
2.661		85.59% Pervious Area
0.448		14.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0210	0.18		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
3.3	250	0.0320	1.25		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
0.5	141	0.0990	4.72		**Shallow Concentrated Flow, 3 to 4** Grassed Waterway Kv= 15.0 fps
5.6	633	0.0160	1.90		**Shallow Concentrated Flow, 4 to 5** Grassed Waterway Kv= 15.0 fps
18.6	1,124	Total			

Subcatchment PDA-1: Remaining DP 1



Summary for Subcatchment PDA-2A: Remaining DP 2

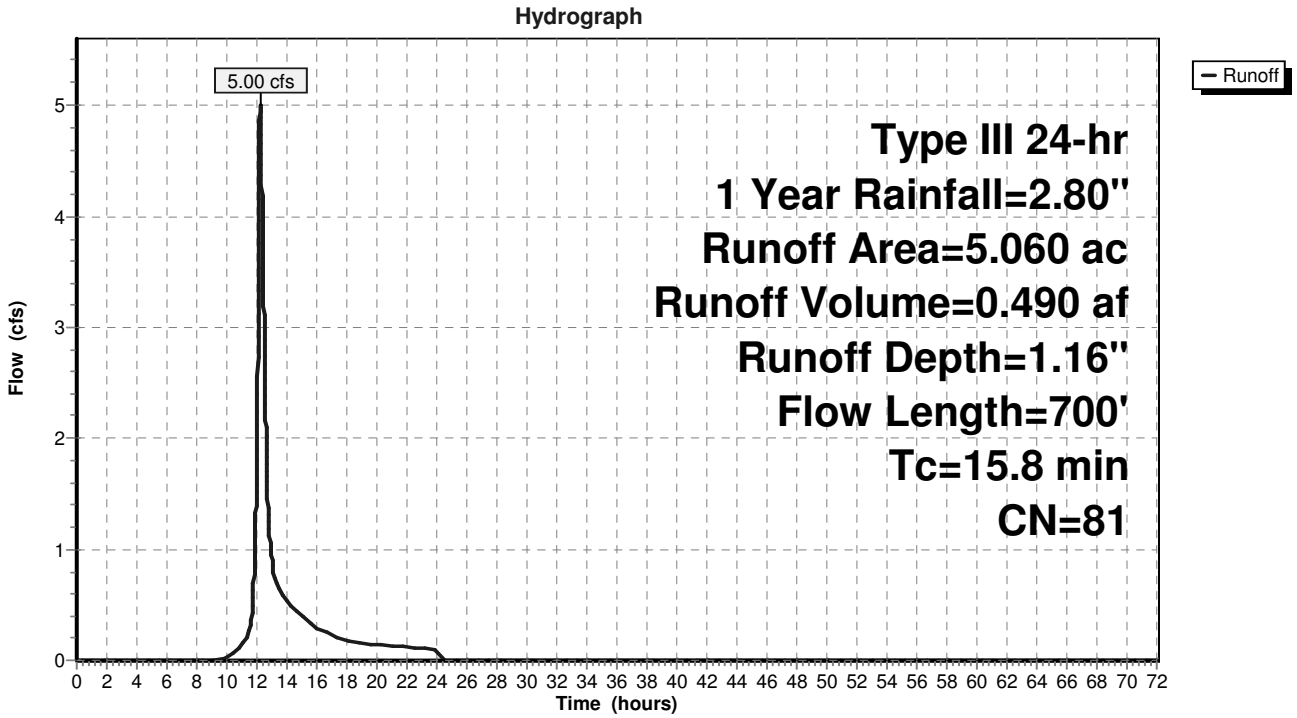
Runoff = 5.00 cfs @ 12.23 hrs, Volume= 0.490 af, Depth= 1.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year Rainfall=2.80"

Area (ac)	CN	Description
0.892	84	50-75% Grass cover, Fair, HSG D
3.971	79	50-75% Grass cover, Fair, HSG C
0.197	98	Paved parking, HSG C
5.060	81	Weighted Average
4.863		96.11% Pervious Area
0.197		3.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	150	0.0330	0.24		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
5.2	550	0.0630	1.76		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
15.8	700	Total			

Subcatchment PDA-2A: Remaining DP 2



Summary for Subcatchment PDA-2B: Forebay Contributing Area

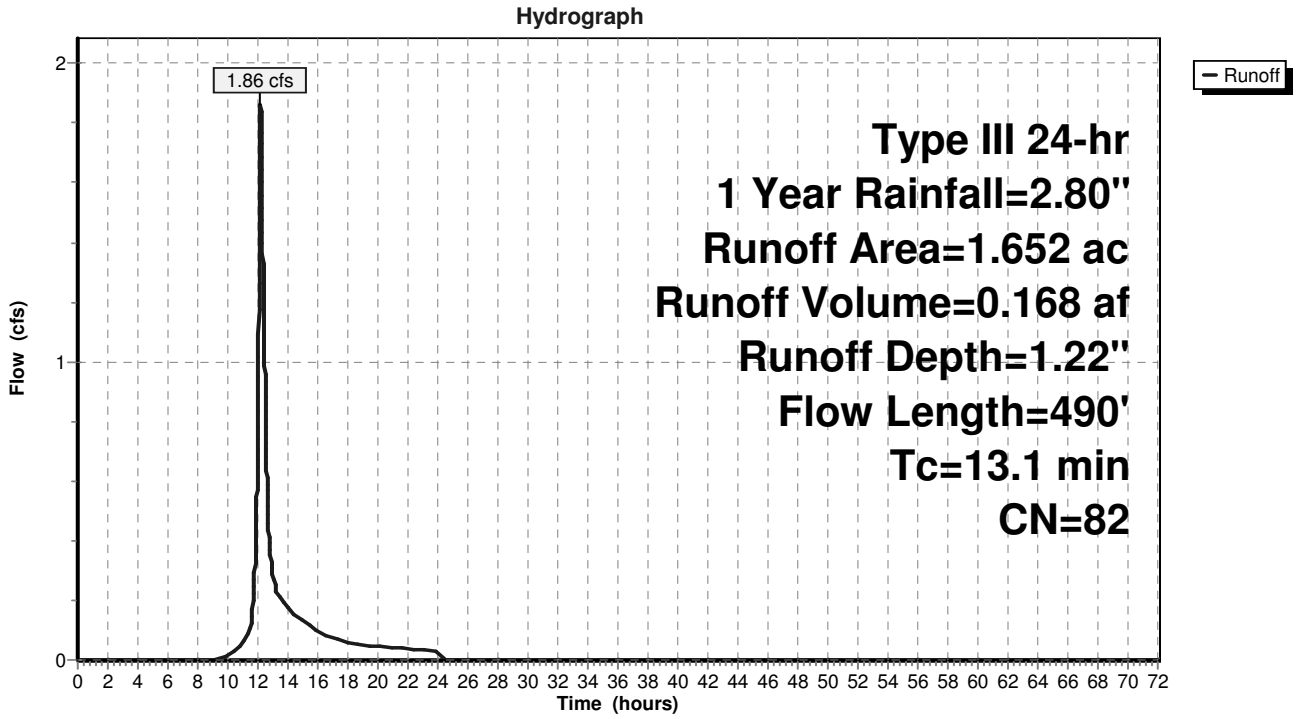
Runoff = 1.86 cfs @ 12.18 hrs, Volume= 0.168 af, Depth= 1.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year Rainfall=2.80"

Area (ac)	CN	Description
0.286	98	Paved parking, HSG C
0.895	74	>75% Grass cover, Good, HSG C
0.471	89	Gravel roads, HSG C
1.652	82	Weighted Average
1.366		82.69% Pervious Area
0.286		17.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0210	0.18		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
2.8	288	0.0600	1.71		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
1.1	102	0.0100	1.50		**Shallow Concentrated Flow, 3 to 4** Grassed Waterway Kv= 15.0 fps
13.1	490	Total			

Subcatchment PDA-2B: Forebay Contributing Area



Summary for Subcatchment PDA-2C: Sand Filter Contributing Area

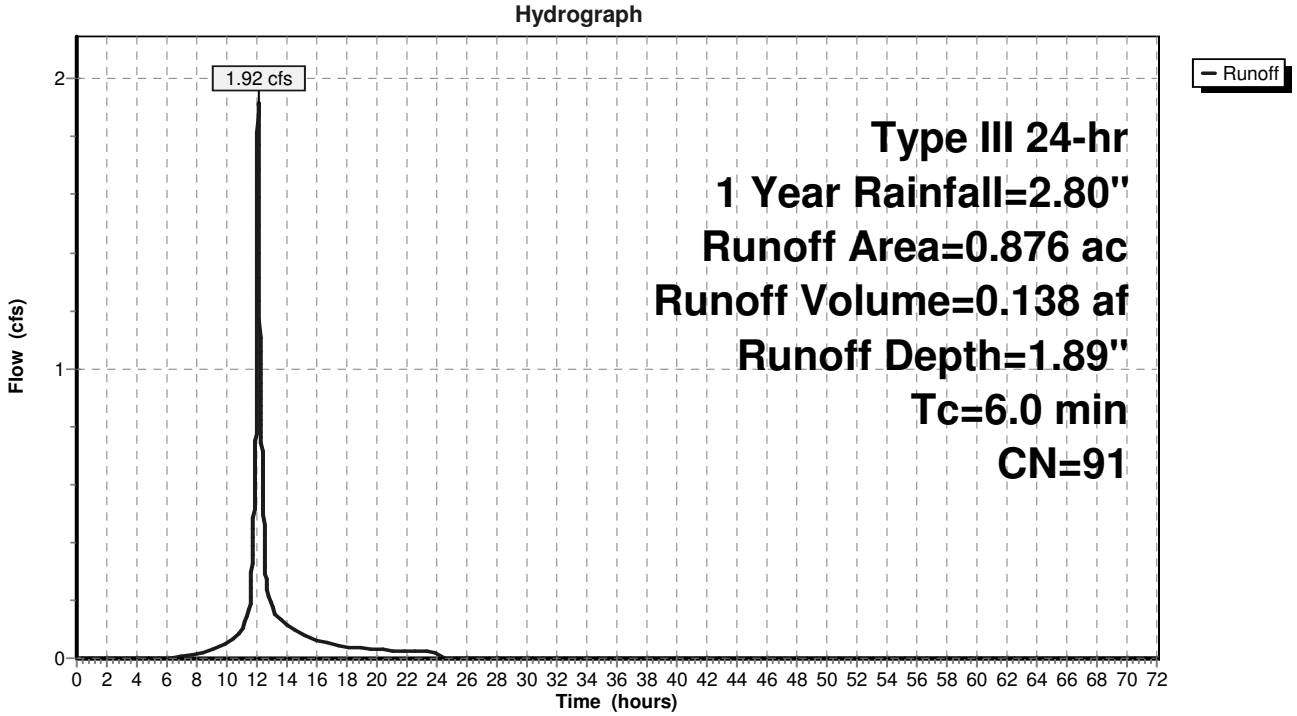
Runoff = 1.92 cfs @ 12.09 hrs, Volume= 0.138 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year Rainfall=2.80"

Area (ac)	CN	Description
0.029	74	>75% Grass cover, Good, HSG C
0.600	89	Gravel roads, HSG C
0.247	98	Paved parking, HSG C
0.876	91	Weighted Average
0.629		71.80% Pervious Area
0.247		28.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PDA-2C: Sand Filter Contributing Area



Summary for Subcatchment PDA-2D: Dry Swale Contributing Area

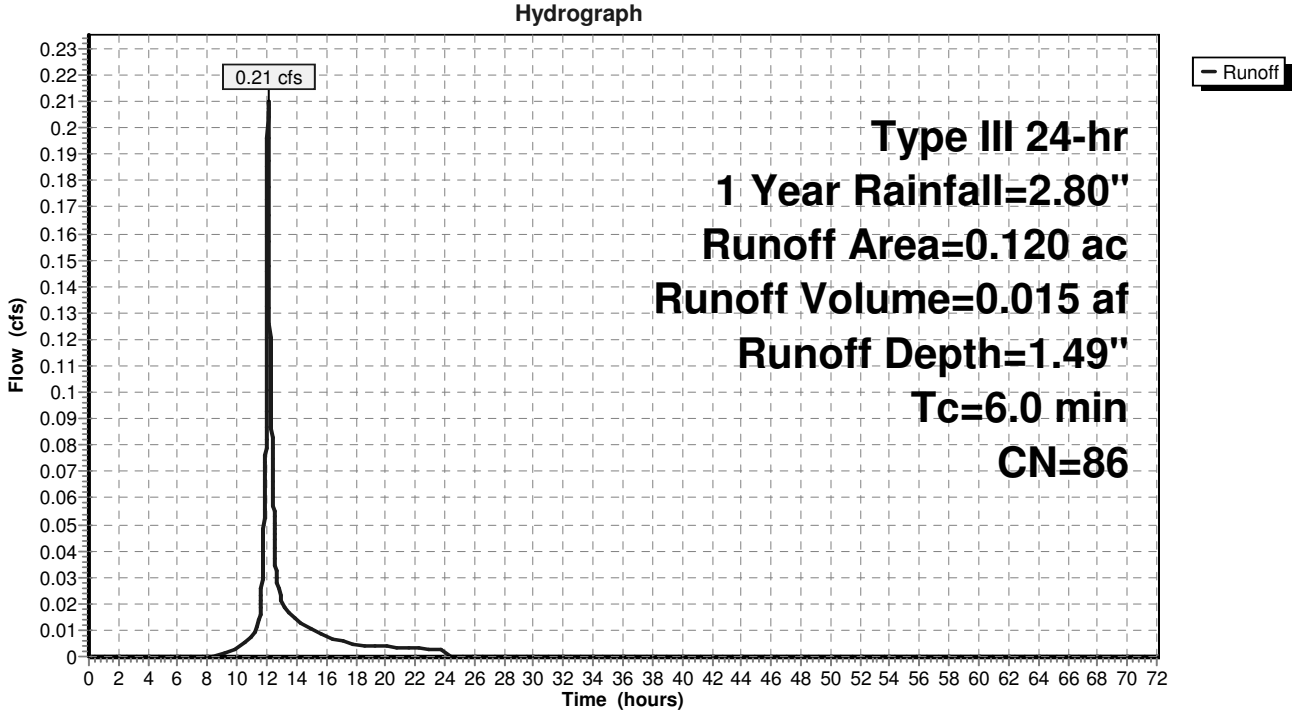
Runoff = 0.21 cfs @ 12.09 hrs, Volume= 0.015 af, Depth= 1.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year Rainfall=2.80"

Area (ac)	CN	Description
0.060	98	Paved parking, HSG C
0.060	74	>75% Grass cover, Good, HSG C
0.120	86	Weighted Average
0.060		50.00% Pervious Area
0.060		50.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct**

Subcatchment PDA-2D: Dry Swale Contributing Area



Summary for Subcatchment PDA-3: Remaining DP 3

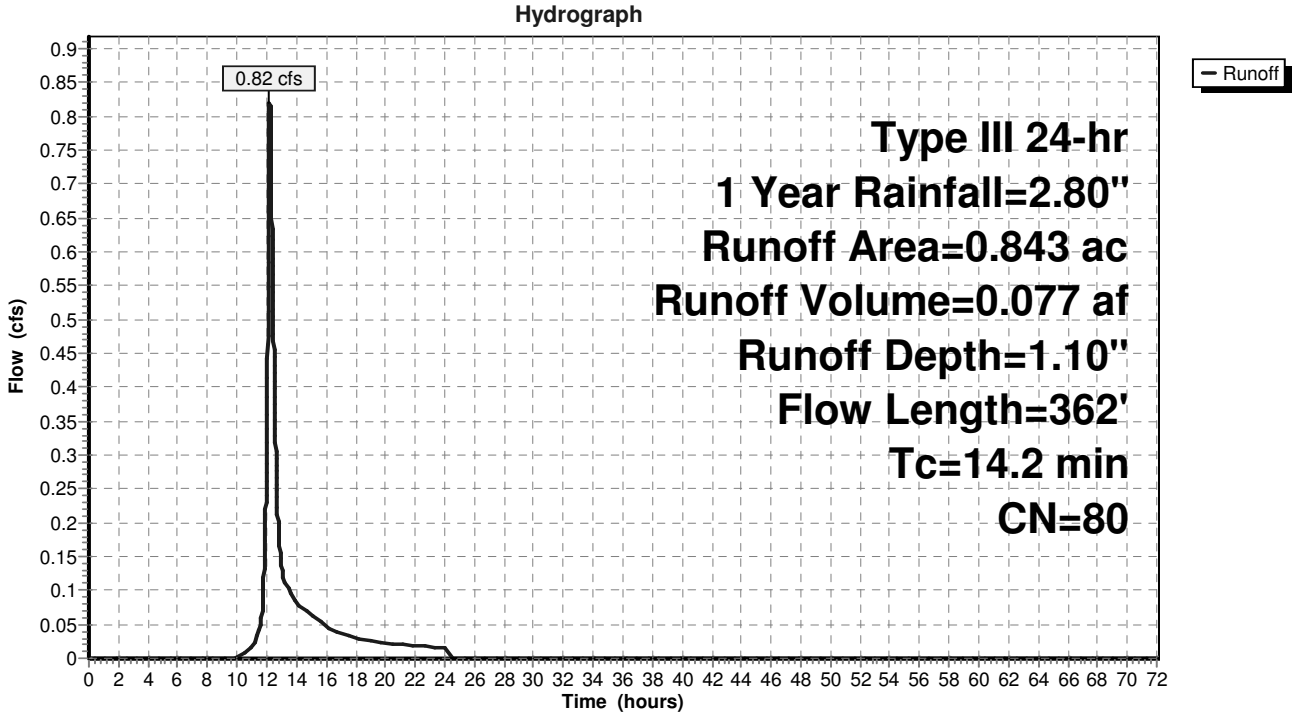
Runoff = 0.82 cfs @ 12.20 hrs, Volume= 0.077 af, Depth= 1.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 Year Rainfall=2.80"

Area (ac)	CN	Description
0.737	79	50-75% Grass cover, Fair, HSG C
0.106	89	Gravel roads, HSG C
0.843	80	Weighted Average
0.843		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	150	0.0266	0.22		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
2.6	212	0.0377	1.36		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
14.2	362	Total			

Subcatchment PDA-3: Remaining DP 3

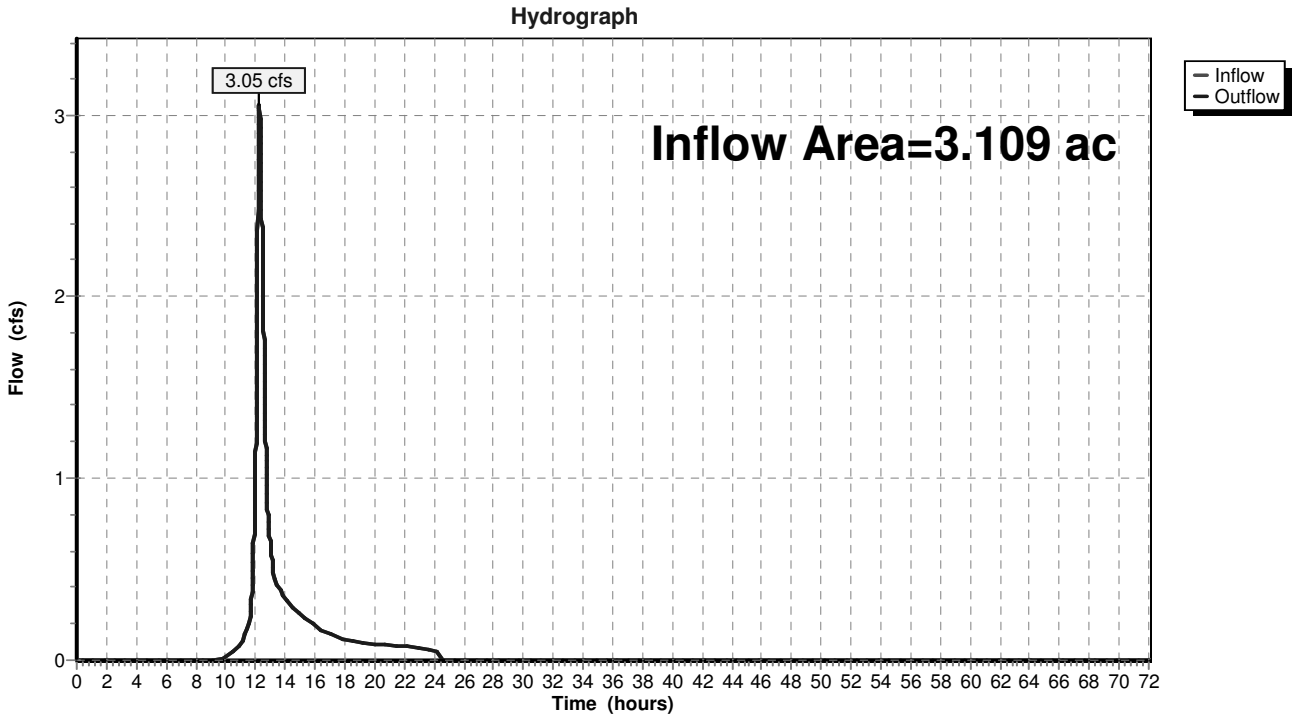


Summary for Reach DP 1:

Inflow Area = 3.109 ac, 14.41% Impervious, Inflow Depth = 1.22" for 1 Year event
Inflow = 3.05 cfs @ 12.26 hrs, Volume= 0.317 af
Outflow = 3.05 cfs @ 12.26 hrs, Volume= 0.317 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 1:

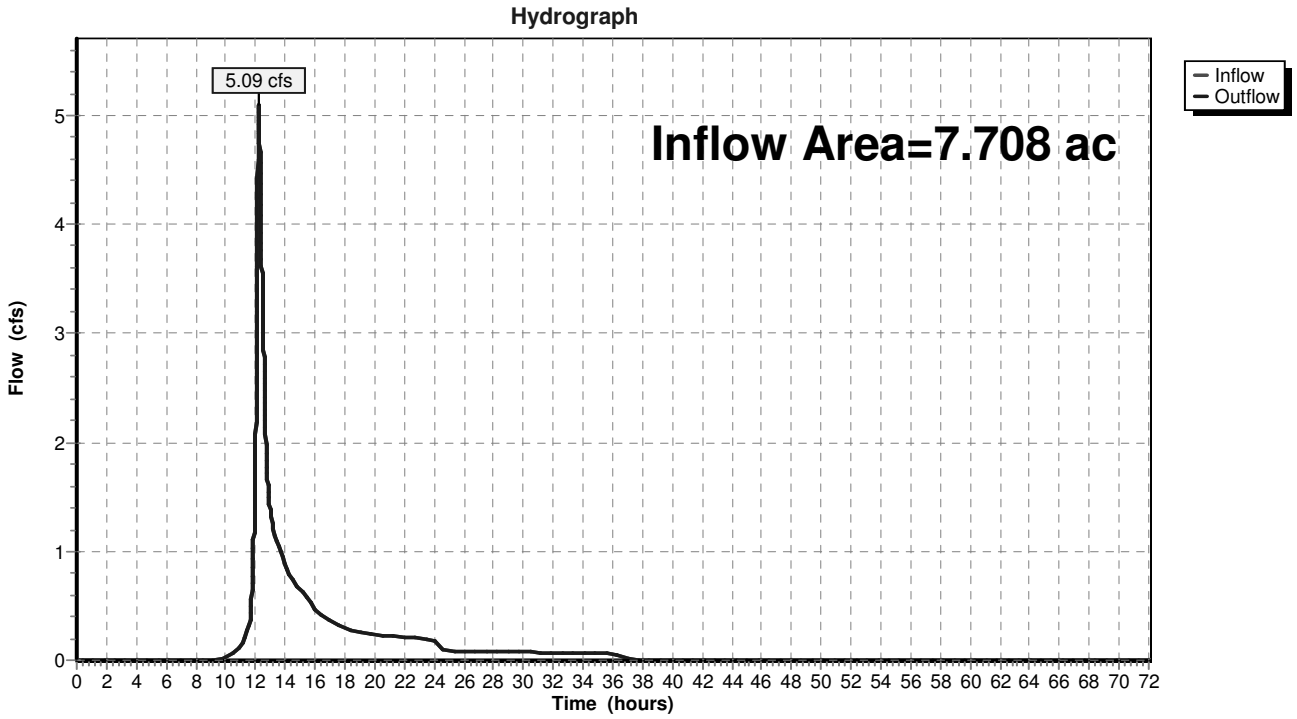


Summary for Reach DP 2:

Inflow Area = 7.708 ac, 10.25% Impervious, Inflow Depth = 1.15" for 1 Year event
Inflow = 5.09 cfs @ 12.23 hrs, Volume= 0.740 af
Outflow = 5.09 cfs @ 12.23 hrs, Volume= 0.740 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 2:

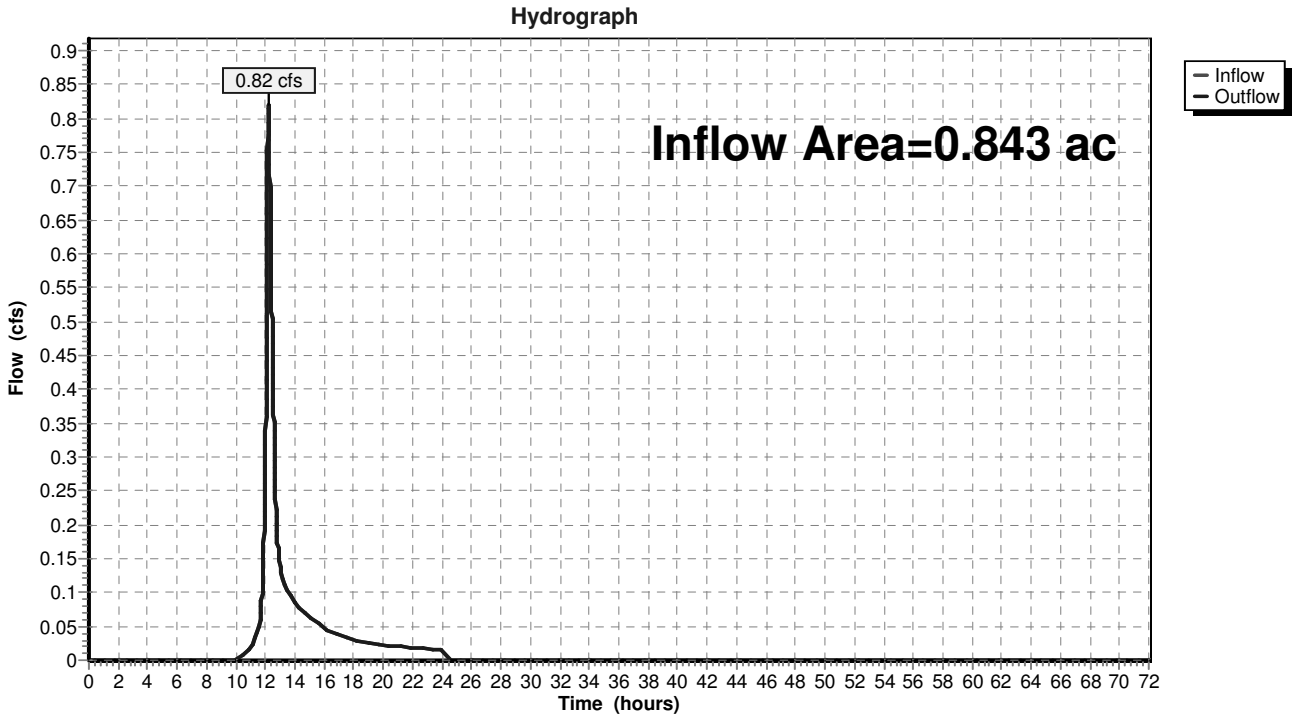


Summary for Reach DP 3:

Inflow Area = 0.843 ac, 0.00% Impervious, Inflow Depth = 1.10" for 1 Year event
Inflow = 0.82 cfs @ 12.20 hrs, Volume= 0.077 af
Outflow = 0.82 cfs @ 12.20 hrs, Volume= 0.077 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 3:



Summary for Pond 3P: Pretreatment

Inflow Area = 0.120 ac, 50.00% Impervious, Inflow Depth = 1.49" for 1 Year event
Inflow = 0.21 cfs @ 12.09 hrs, Volume= 0.015 af
Outflow = 0.21 cfs @ 12.09 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.1 min
Discarded = 0.00 cfs @ 12.09 hrs, Volume= 0.002 af
Primary = 0.21 cfs @ 12.09 hrs, Volume= 0.012 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 134.64' @ 12.09 hrs Surf.Area= 60 sf Storage= 35 cf

Plug-Flow detention time= 51.1 min calculated for 0.015 af (100% of inflow)
Center-of-Mass det. time= 51.2 min (879.7 - 828.5)

Volume	Invert	Avail.Storage	Storage Description
#1	134.00'	130 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

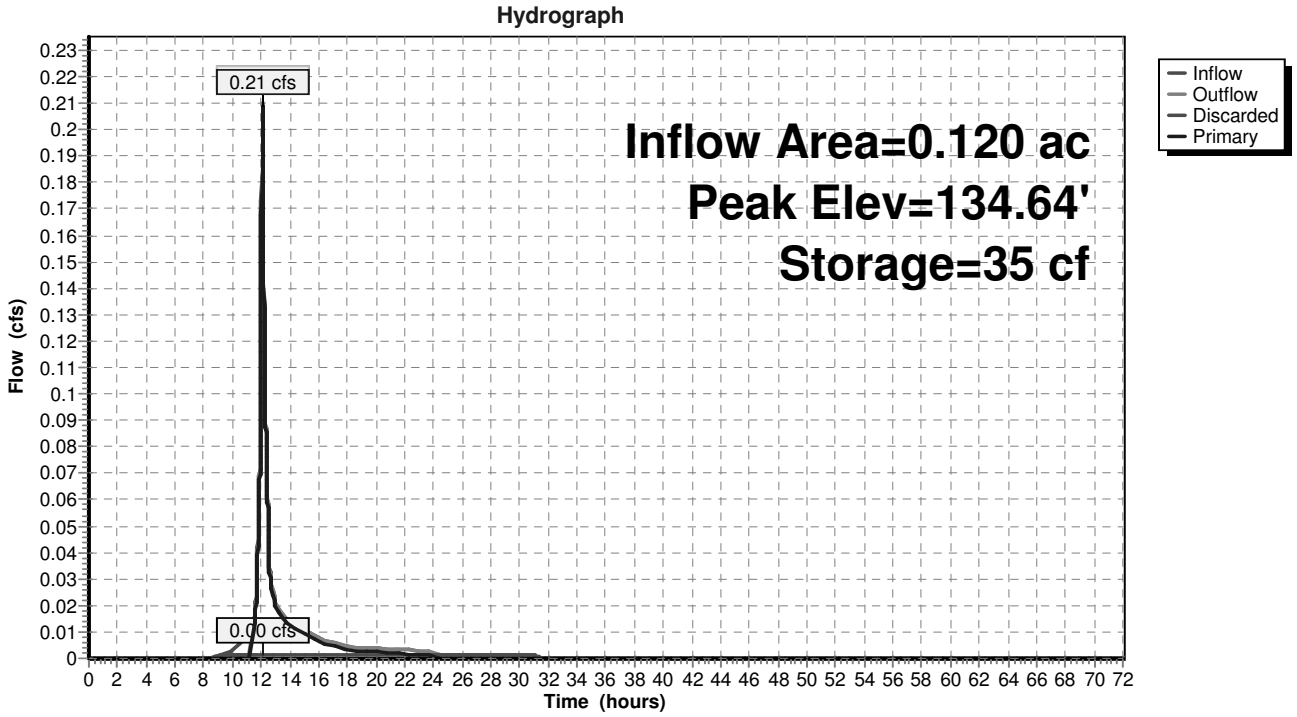
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
134.00	50	0	0
136.00	80	130	130

Device	Routing	Invert	Outlet Devices
#1	Discarded	134.00'	**1.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	134.60'	**8.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.00 cfs @ 12.09 hrs HW=134.64' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.21 cfs @ 12.09 hrs HW=134.64' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 0.21 cfs @ 0.59 fps)

Pond 3P: Pretreatment



Stage-Area-Storage for Pond 3P: Pretreatment

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
134.00	50	0
134.02	50	1
134.04	51	2
134.06	51	3
134.08	51	4
134.10	51	5
134.12	52	6
134.14	52	7
134.16	52	8
134.18	53	9
134.20	53	10
134.22	53	11
134.24	54	12
134.26	54	14
134.28	54	15
134.30	55	16
134.32	55	17
134.34	55	18
134.36	55	19
134.38	56	20
134.40	56	21
134.42	56	22
134.44	57	23
134.46	57	25
134.48	57	26
134.50	58	27
134.52	58	28
134.54	58	29
134.56	58	30
134.58	59	32
134.60	59	33
134.62	59	34
134.64	60	35
134.66	60	36
134.68	60	37
134.70	60	39
134.72	61	40
134.74	61	41
134.76	61	42
134.78	62	44
134.80	62	45
134.82	62	46
134.84	63	47
134.86	63	49
134.88	63	50
134.90	64	51
134.92	64	52
134.94	64	54
134.96	64	55
134.98	65	56
135.00	65	58
135.02	65	59
135.04	66	60
135.06	66	61
135.08	66	63
135.10	66	64
135.12	67	65
135.14	67	67
135.16	67	68
135.18	68	69
135.20	68	71
135.22	68	72
135.24	69	74
135.26	69	75
135.28	69	76
135.30	70	78
135.32	70	79
135.34	70	80
135.36	70	82
135.38	71	83
135.40	71	85
135.42	71	86
135.44	72	88
135.46	72	89
135.48	72	90
135.50	73	92
135.52	73	93
135.54	73	95
135.56	73	96
135.58	74	98
135.60	74	99
135.62	74	101
135.64	75	102
135.66	75	104
135.68	75	105
135.70	75	107
135.72	76	108
135.74	76	110
135.76	76	111
135.78	77	113
135.80	77	114
135.82	77	116
135.84	78	117
135.86	78	119
135.88	78	121
135.90	79	122
135.92	79	124
135.94	79	125
135.96	79	127
135.98	80	128
136.00	**80**	**130**

Summary for Pond DS: Dry Swale (O-1)

Inflow Area = 0.120 ac, 50.00% Impervious, Inflow Depth = 1.25" for 1 Year event
Inflow = 0.21 cfs @ 12.09 hrs, Volume= 0.012 af
Outflow = 0.01 cfs @ 14.79 hrs, Volume= 0.012 af, Atten= 95%, Lag= 161.7 min
Primary = 0.01 cfs @ 14.79 hrs, Volume= 0.012 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 134.52' @ 14.79 hrs Surf.Area= 423 sf Storage= 327 cf

Plug-Flow detention time= 391.6 min calculated for 0.012 af (100% of inflow)
Center-of-Mass det. time= 391.6 min (1,208.6 - 817.0)

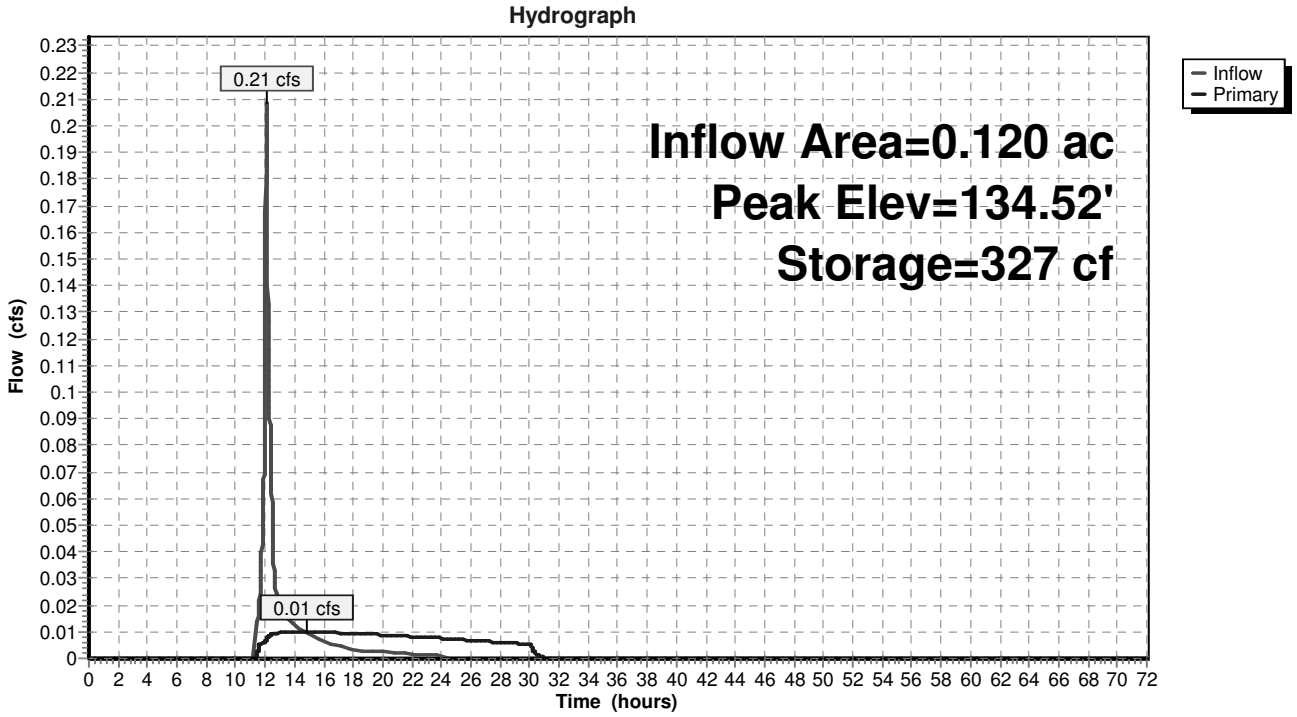
Volume	Invert	Avail.Storage	Storage Description
#1	133.50'	1,175 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
133.50	220	0	0
136.00	720	1,175	1,175

Device	Routing	Invert	Outlet Devices
#1	Primary	130.50'	**4.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 130.50' / 130.30' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#2	Device 1	133.50'	**1.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#3	Primary	135.00'	**8.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.01 cfs @ 14.79 hrs HW=134.52' (Free Discharge)
- **1=Culvert** (Passes 0.01 cfs of 0.65 cfs potential flow)
  - **2=Exfiltration** (Exfiltration Controls 0.01 cfs)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond DS: Dry Swale (O-1)



Stage-Area-Storage for Pond DS: Dry Swale (O-1)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
133.50	220	0
133.55	230	11
133.60	240	23
133.65	250	35
133.70	260	48
133.75	270	61
133.80	280	75
133.85	290	89
133.90	300	104
133.95	310	119
134.00	320	135
134.05	330	151
134.10	340	168
134.15	350	185
134.20	360	203
134.25	370	221
134.30	380	240
134.35	390	259
134.40	400	279
134.45	410	299
134.50	420	320
134.55	430	341
134.60	440	363
134.65	450	385
134.70	460	408
134.75	470	431
134.80	480	455
134.85	490	479
134.90	500	504
134.95	510	529
135.00	520	555
135.05	530	581
135.10	540	608
135.15	550	635
135.20	560	663
135.25	570	691
135.30	580	720
135.35	590	749
135.40	600	779
135.45	610	809
135.50	620	840
135.55	630	871
135.60	640	903
135.65	650	935
135.70	660	968
135.75	670	1,001
135.80	680	1,035
135.85	690	1,069
135.90	700	1,104
135.95	710	1,139
136.00	**720**	**1,175**

Summary for Pond FB: Forebay

Inflow Area =	2.528 ac, 21.08% Impervious, Inflow Depth = 1.45" for 1 Year event				
Inflow =	3.37 cfs @	12.12 hrs,	Volume=	0.306 af	
Outflow =	3.36 cfs @	12.13 hrs,	Volume=	0.306 af,	Atten= 0%, Lag= 0.7 min
Discarded =	0.03 cfs @	12.13 hrs,	Volume=	0.069 af	
Primary =	3.33 cfs @	12.13 hrs,	Volume=	0.237 af	

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 142.65' @ 12.13 hrs Surf.Area= 1,342 sf Storage= 1,602 cf

Plug-Flow detention time= 134.5 min calculated for 0.306 af (100% of inflow)
Center-of-Mass det. time= 134.4 min (965.1 - 830.7)

Volume	Invert	Avail.Storage	Storage Description
#1	141.00'	4,650 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

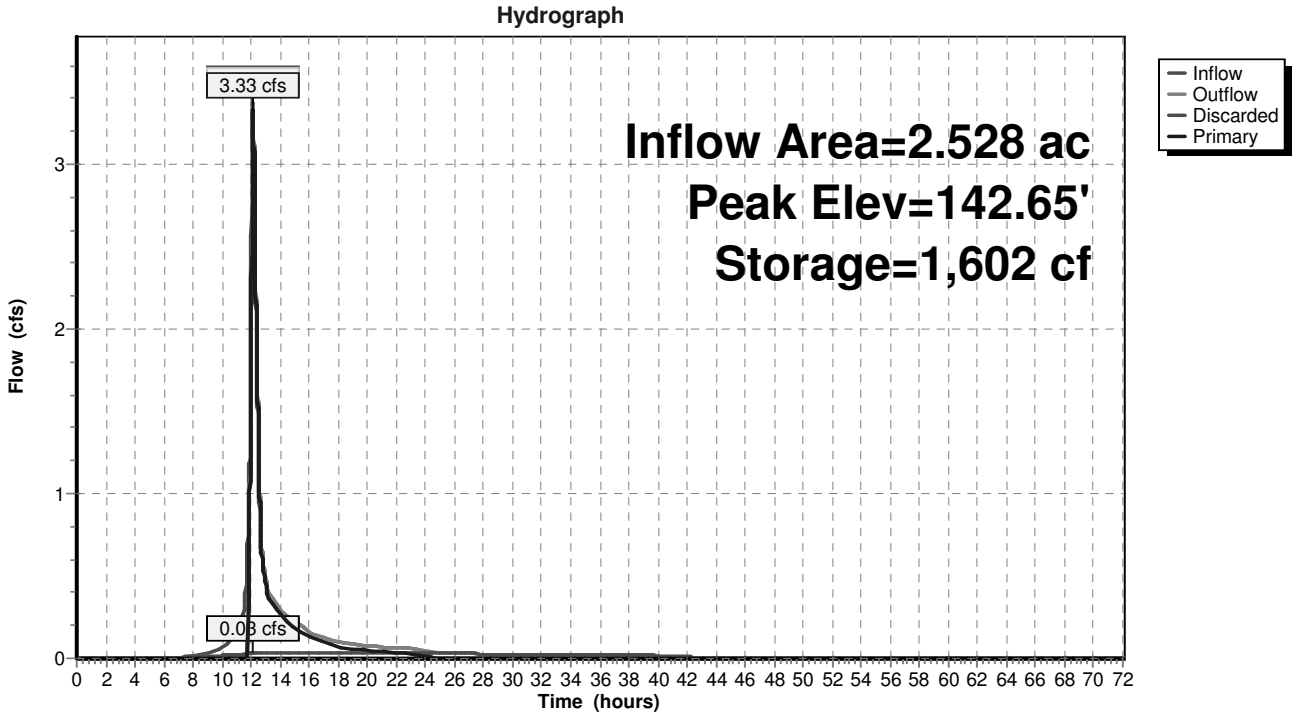
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
141.00	600	0	0
143.00	1,500	2,100	2,100
144.50	1,900	2,550	4,650

Device	Routing	Invert	Outlet Devices
#1	Primary	142.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#2	Discarded	141.00'	**1.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#3	Primary	142.50'	**20.0' long x 0.5' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00
			Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.03 cfs @ 12.13 hrs HW=142.65' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=3.32 cfs @ 12.13 hrs HW=142.65' (Free Discharge)
├─**1=Orifice/Grate** (Orifice Controls 0.07 cfs @ 1.32 fps)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 3.25 cfs @ 1.08 fps)

Pond FB: Forebay



Stage-Area-Storage for Pond FB: Forebay

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
141.00	600	0
141.05	623	31
141.10	645	62
141.15	668	95
141.20	690	129
141.25	713	164
141.30	735	200
141.35	757	238
141.40	780	276
141.45	802	316
141.50	825	356
141.55	848	398
141.60	870	441
141.65	893	485
141.70	915	530
141.75	938	577
141.80	960	624
141.85	982	673
141.90	1,005	722
141.95	1,027	773
142.00	1,050	825
142.05	1,073	878
142.10	1,095	932
142.15	1,118	988
142.20	1,140	1,044
142.25	1,163	1,102
142.30	1,185	1,160
142.35	1,207	1,220
142.40	1,230	1,281
142.45	1,252	1,343
142.50	1,275	1,406
142.55	1,298	1,471
142.60	1,320	1,536
142.65	1,343	1,603
142.70	1,365	1,670
142.75	1,388	1,739
142.80	1,410	1,809
142.85	1,432	1,880
142.90	1,455	1,952
142.95	1,477	2,026
143.00	1,500	2,100
143.05	1,513	2,175
143.10	1,527	2,251
143.15	1,540	2,328
143.20	1,553	2,405
143.25	1,567	2,483
143.30	1,580	2,562
143.35	1,593	2,641
143.40	1,607	2,721
143.45	1,620	2,802
143.50	1,633	2,883
143.55	1,647	2,965
143.60	1,660	3,048
143.65	1,673	3,131
143.70	1,687	3,215
143.75	1,700	3,300
143.80	1,713	3,385
143.85	1,727	3,471
143.90	1,740	3,558
143.95	1,753	3,645
144.00	1,767	3,733
144.05	1,780	3,822
144.10	1,793	3,911
144.15	1,807	4,001
144.20	1,820	4,092
144.25	1,833	4,183
144.30	1,847	4,275
144.35	1,860	4,368
144.40	1,873	4,461
144.45	1,887	4,555
144.50	**1,900**	**4,650**

Summary for Pond SF: Sand Filter (F-1)

Inflow Area = 2.528 ac, 21.08% Impervious, Inflow Depth = 1.13" for 1 Year event
Inflow = 3.33 cfs @ 12.13 hrs, Volume= 0.237 af
Outflow = 0.48 cfs @ 12.93 hrs, Volume= 0.237 af, Atten= 86%, Lag= 48.0 min
Primary = 0.48 cfs @ 12.93 hrs, Volume= 0.237 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 141.56' @ 12.93 hrs Surf.Area= 4,085 sf Storage= 5,227 cf

Plug-Flow detention time= 407.8 min calculated for 0.237 af (100% of inflow)
Center-of-Mass det. time= 407.9 min (1,236.2 - 828.3)

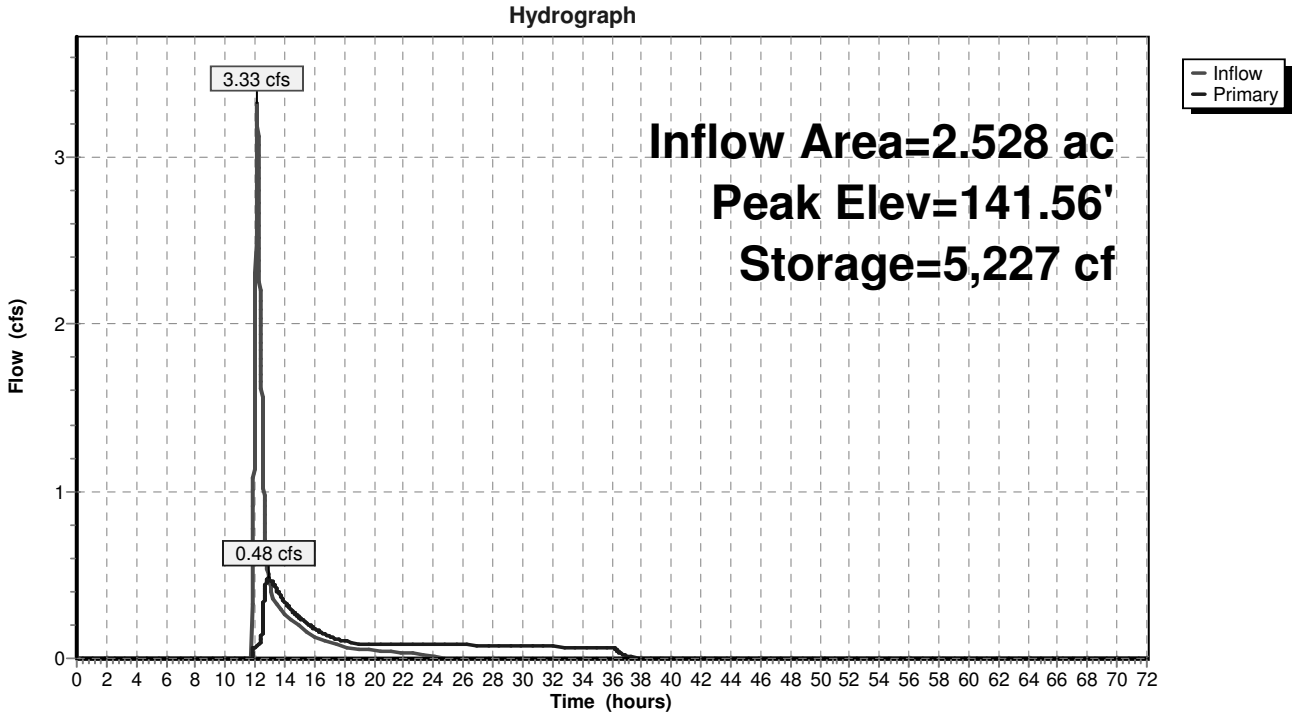
Volume	Invert	Avail.Storage	Storage Description
#1	140.00'	24,050 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
140.00	2,600	0	0
142.00	4,500	7,100	7,100
145.00	6,800	16,950	24,050

Device	Routing	Invert	Outlet Devices
#1	Primary	137.75'	**15.0" Round Culvert** L= 60.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 137.75' / 137.00' S= 0.0125 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	137.75'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Device 2	140.00'	**1.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#4	Device 1	141.30'	**1.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.48 cfs @ 12.93 hrs HW=141.56' (Free Discharge)
└─**1=Culvert** (Passes 0.48 cfs of 10.55 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes 0.09 cfs of 1.78 cfs potential flow)
  │ └─**3=Exfiltration** (Exfiltration Controls 0.09 cfs)
  └─**4=Broad-Crested Rectangular Weir** (Weir Controls 0.38 cfs @ 1.46 fps)

Pond SF: Sand Filter (F-1)



Stage-Area-Storage for Pond SF: Sand Filter (F-1)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
140.00	2,600	0
140.05	2,648	131
140.10	2,695	265
140.15	2,743	401
140.20	2,790	539
140.25	2,838	680
140.30	2,885	823
140.35	2,932	968
140.40	2,980	1,116
140.45	3,027	1,266
140.50	3,075	1,419
140.55	3,123	1,574
140.60	3,170	1,731
140.65	3,218	1,891
140.70	3,265	2,053
140.75	3,313	2,217
140.80	3,360	2,384
140.85	3,407	2,553
140.90	3,455	2,725
140.95	3,502	2,899
141.00	3,550	3,075
141.05	3,598	3,254
141.10	3,645	3,435
141.15	3,693	3,618
141.20	3,740	3,804
141.25	3,788	3,992
141.30	3,835	4,183
141.35	3,882	4,376
141.40	3,930	4,571
141.45	3,977	4,769
141.50	4,025	4,969
141.55	4,073	5,171
141.60	4,120	5,376
141.65	4,168	5,583
141.70	4,215	5,793
141.75	4,263	6,005
141.80	4,310	6,219
141.85	4,357	6,436
141.90	4,405	6,655
141.95	4,452	6,876
142.00	4,500	7,100
142.05	4,538	7,326
142.10	4,577	7,554
142.15	4,615	7,784
142.20	4,653	8,015
142.25	4,692	8,249
142.30	4,730	8,485
142.35	4,768	8,722
142.40	4,807	8,961
142.45	4,845	9,203
142.50	4,883	9,446
142.55	4,922	9,691
142.60	4,960	9,938
142.65	4,998	10,187
142.70	5,037	10,438
142.75	5,075	10,691
142.80	5,113	10,945
142.85	5,152	11,202
142.90	5,190	11,461
142.95	5,228	11,721
143.00	5,267	11,983
143.05	5,305	12,248
143.10	5,343	12,514
143.15	5,382	12,782
143.20	5,420	13,052
143.25	5,458	13,324
143.30	5,497	13,598
143.35	5,535	13,874
143.40	5,573	14,151
143.45	5,612	14,431
143.50	5,650	14,713
143.55	5,688	14,996
143.60	5,727	15,281
143.65	5,765	15,569
143.70	5,803	15,858
143.75	5,842	16,149
143.80	5,880	16,442
143.85	5,918	16,737
143.90	5,957	17,034
143.95	5,995	17,333
144.00	6,033	17,633
144.05	6,072	17,936
144.10	6,110	18,240
144.15	6,148	18,547
144.20	6,187	18,855
144.25	6,225	19,166
144.30	6,263	19,478
144.35	6,302	19,792
144.40	6,340	20,108
144.45	6,378	20,426
144.50	6,417	20,746
144.55	6,455	21,068
144.60	6,493	21,391
144.65	6,532	21,717
144.70	6,570	22,044
144.75	6,608	22,374
144.80	6,647	22,705
144.85	6,685	23,039
144.90	6,723	23,374
144.95	6,762	23,711
145.00	**6,800**	**24,050**

Summary for Subcatchment PDA-1: Remaining DP 1

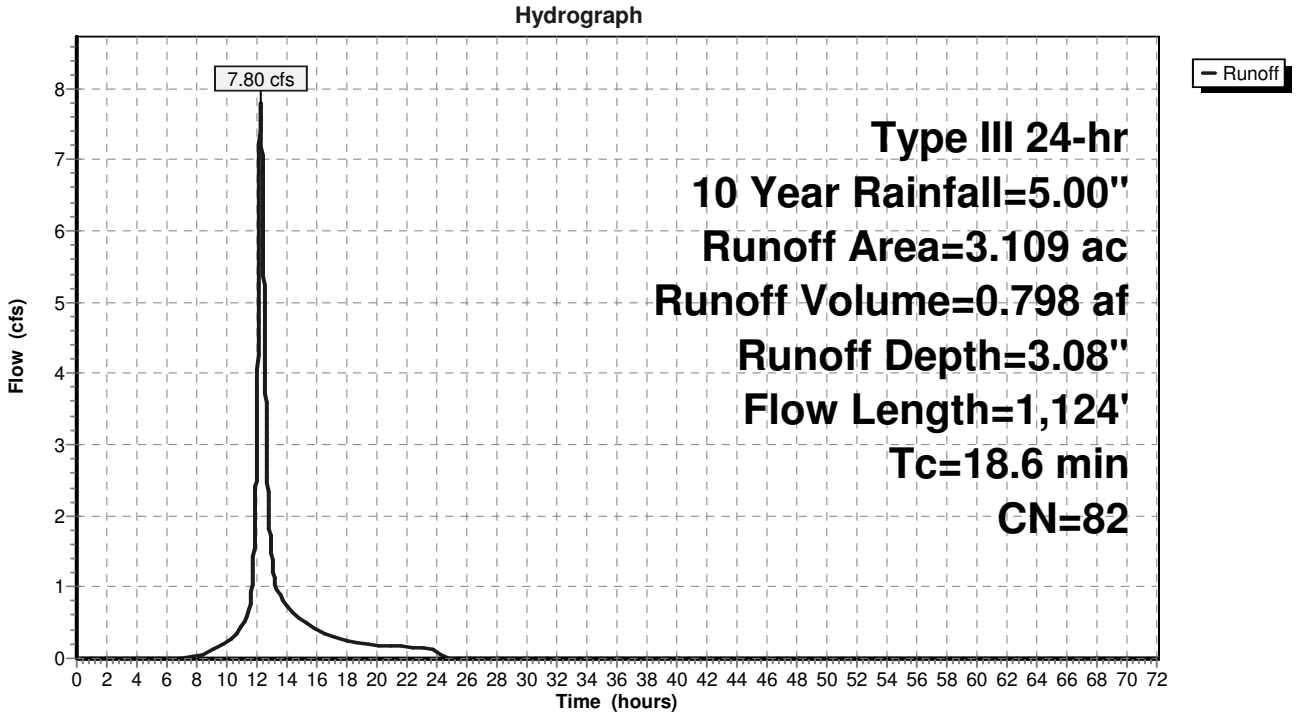
Runoff = 7.80 cfs @ 12.25 hrs, Volume= 0.798 af, Depth= 3.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.00"

Area (ac)	CN	Description
1.752	79	50-75% Grass cover, Fair, HSG C
0.791	79	50-75% Grass cover, Fair, HSG C
0.118	89	Gravel roads, HSG C
0.448	98	Paved parking, HSG C
3.109	82	Weighted Average
2.661		85.59% Pervious Area
0.448		14.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0210	0.18		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
3.3	250	0.0320	1.25		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
0.5	141	0.0990	4.72		**Shallow Concentrated Flow, 3 to 4** Grassed Waterway Kv= 15.0 fps
5.6	633	0.0160	1.90		**Shallow Concentrated Flow, 4 to 5** Grassed Waterway Kv= 15.0 fps
18.6	1,124	Total			

Subcatchment PDA-1: Remaining DP 1



Summary for Subcatchment PDA-2A: Remaining DP 2

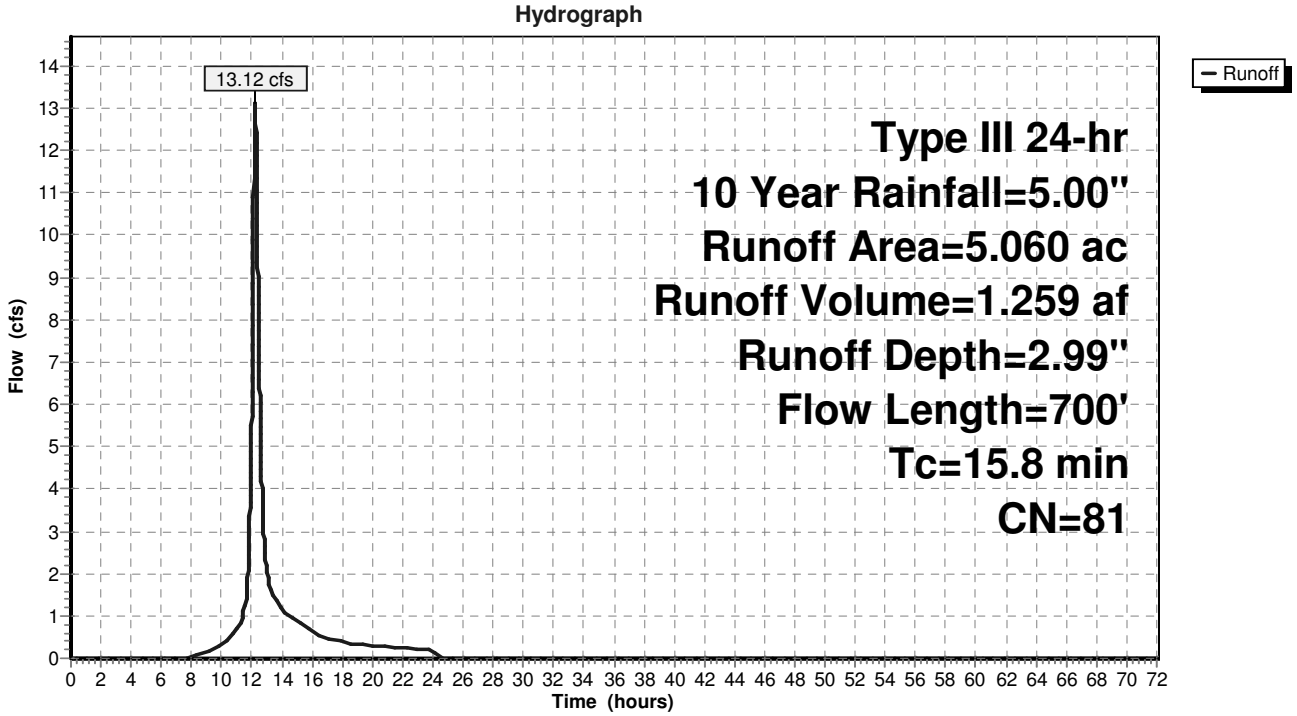
Runoff = 13.12 cfs @ 12.21 hrs, Volume= 1.259 af, Depth= 2.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.00"

Area (ac)	CN	Description
0.892	84	50-75% Grass cover, Fair, HSG D
3.971	79	50-75% Grass cover, Fair, HSG C
0.197	98	Paved parking, HSG C
5.060	81	Weighted Average
4.863		96.11% Pervious Area
0.197		3.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	150	0.0330	0.24		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
5.2	550	0.0630	1.76		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
15.8	700	Total			

Subcatchment PDA-2A: Remaining DP 2



Summary for Subcatchment PDA-2B: Forebay Contributing Area

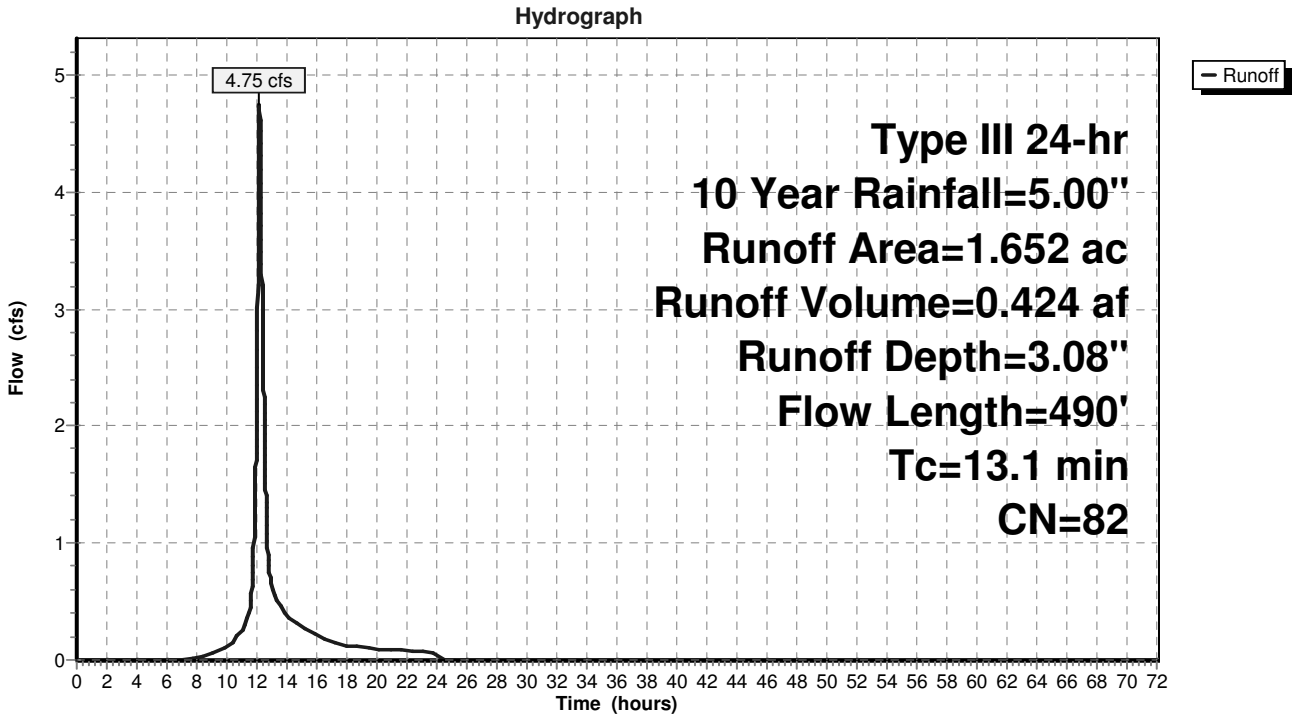
Runoff = 4.75 cfs @ 12.18 hrs, Volume= 0.424 af, Depth= 3.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.00"

Area (ac)	CN	Description
0.286	98	Paved parking, HSG C
0.895	74	>75% Grass cover, Good, HSG C
0.471	89	Gravel roads, HSG C
1.652	82	Weighted Average
1.366		82.69% Pervious Area
0.286		17.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0210	0.18		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
2.8	288	0.0600	1.71		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
1.1	102	0.0100	1.50		**Shallow Concentrated Flow, 3 to 4** Grassed Waterway Kv= 15.0 fps
13.1	490	Total			

Subcatchment PDA-2B: Forebay Contributing Area



Summary for Subcatchment PDA-2C: Sand Filter Contributing Area

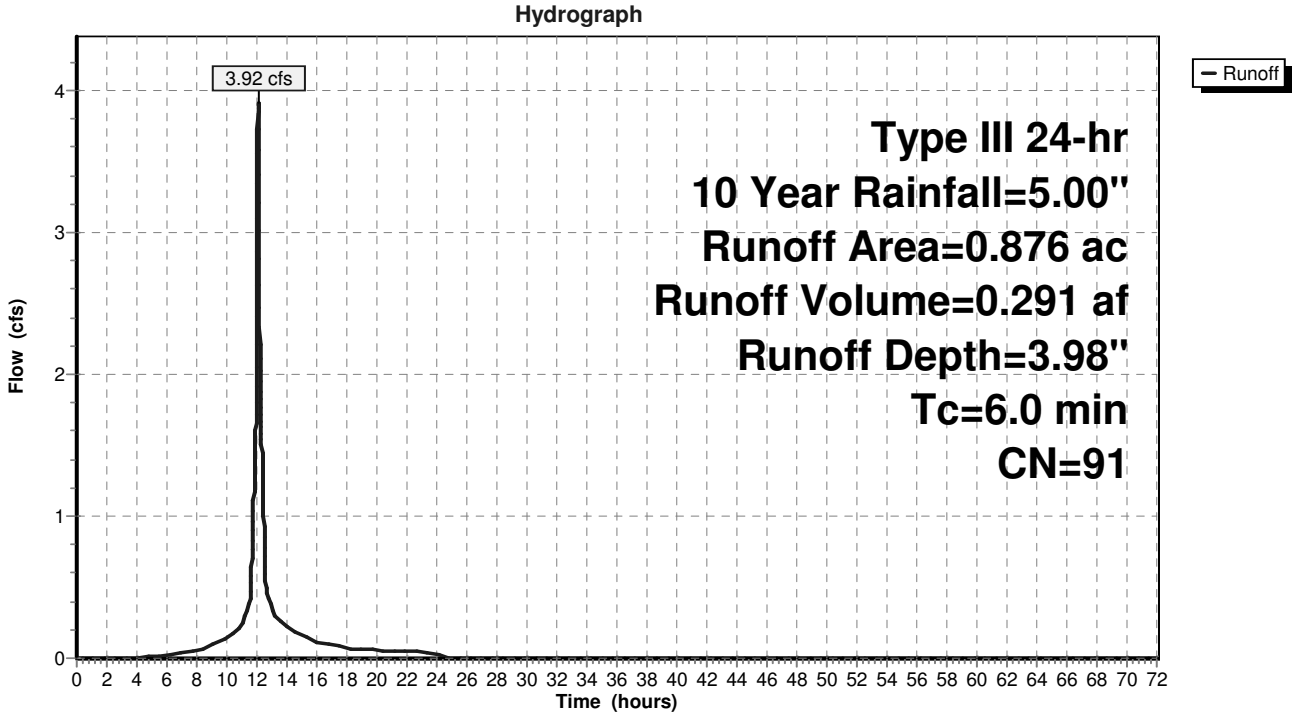
Runoff = 3.92 cfs @ 12.08 hrs, Volume= 0.291 af, Depth= 3.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.00"

Area (ac)	CN	Description
0.029	74	>75% Grass cover, Good, HSG C
0.600	89	Gravel roads, HSG C
0.247	98	Paved parking, HSG C
0.876	91	Weighted Average
0.629		71.80% Pervious Area
0.247		28.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PDA-2C: Sand Filter Contributing Area



Summary for Subcatchment PDA-2D: Dry Swale Contributing Area

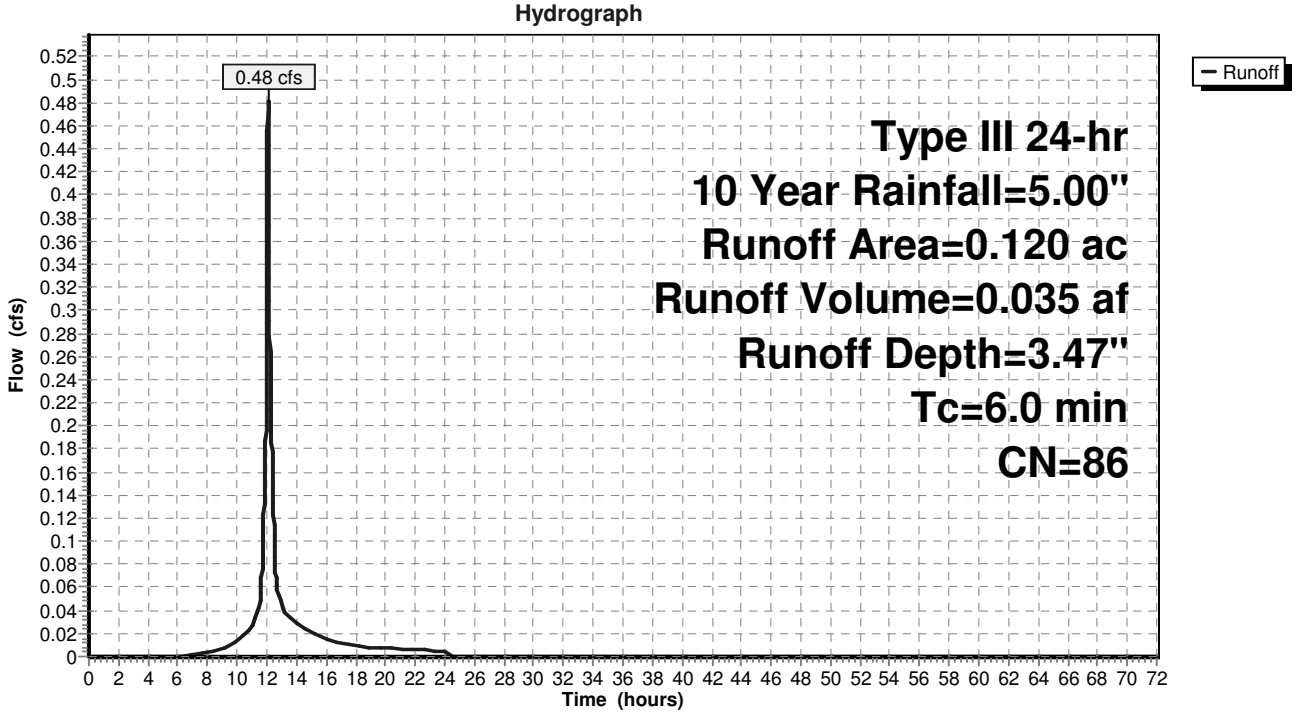
Runoff = 0.48 cfs @ 12.09 hrs, Volume= 0.035 af, Depth= 3.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.00"

Area (ac)	CN	Description
0.060	98	Paved parking, HSG C
0.060	74	>75% Grass cover, Good, HSG C
0.120	86	Weighted Average
0.060		50.00% Pervious Area
0.060		50.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct**

Subcatchment PDA-2D: Dry Swale Contributing Area



Summary for Subcatchment PDA-3: Remaining DP 3

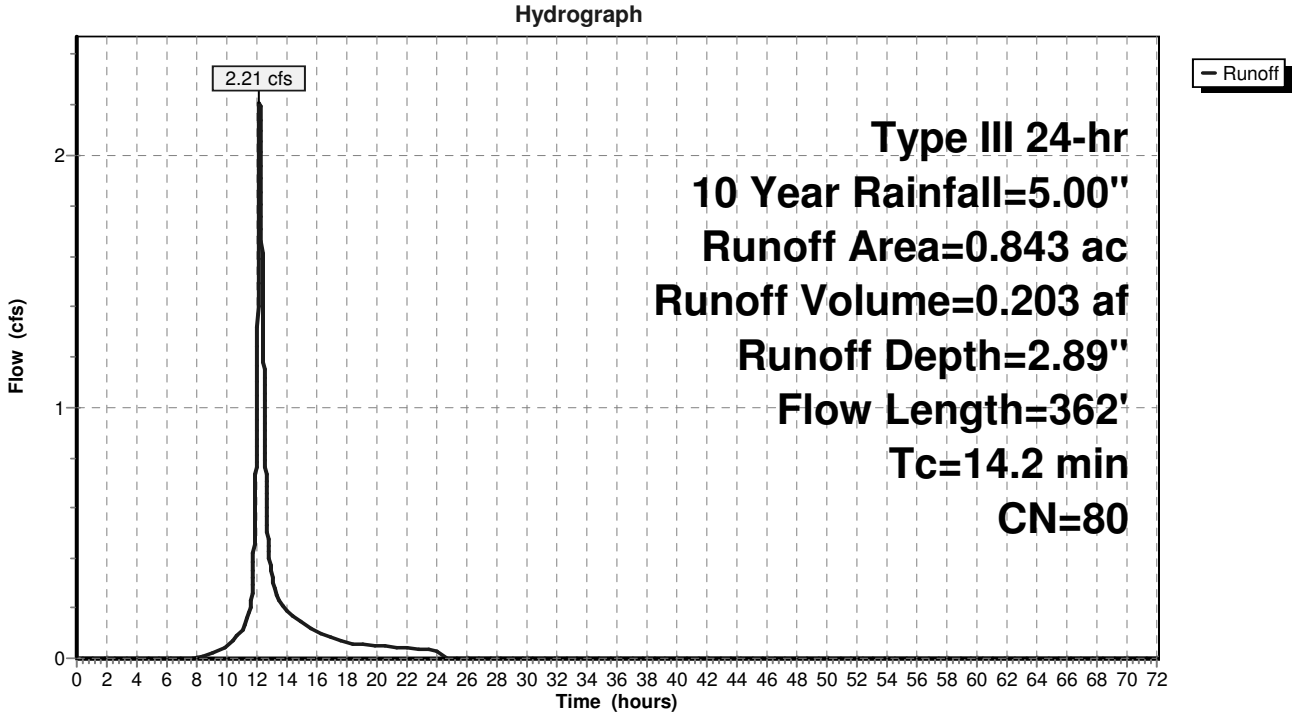
Runoff = 2.21 cfs @ 12.20 hrs, Volume= 0.203 af, Depth= 2.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Rainfall=5.00"

Area (ac)	CN	Description
0.737	79	50-75% Grass cover, Fair, HSG C
0.106	89	Gravel roads, HSG C
0.843	80	Weighted Average
0.843		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	150	0.0266	0.22		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
2.6	212	0.0377	1.36		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
14.2	362	Total			

Subcatchment PDA-3: Remaining DP 3

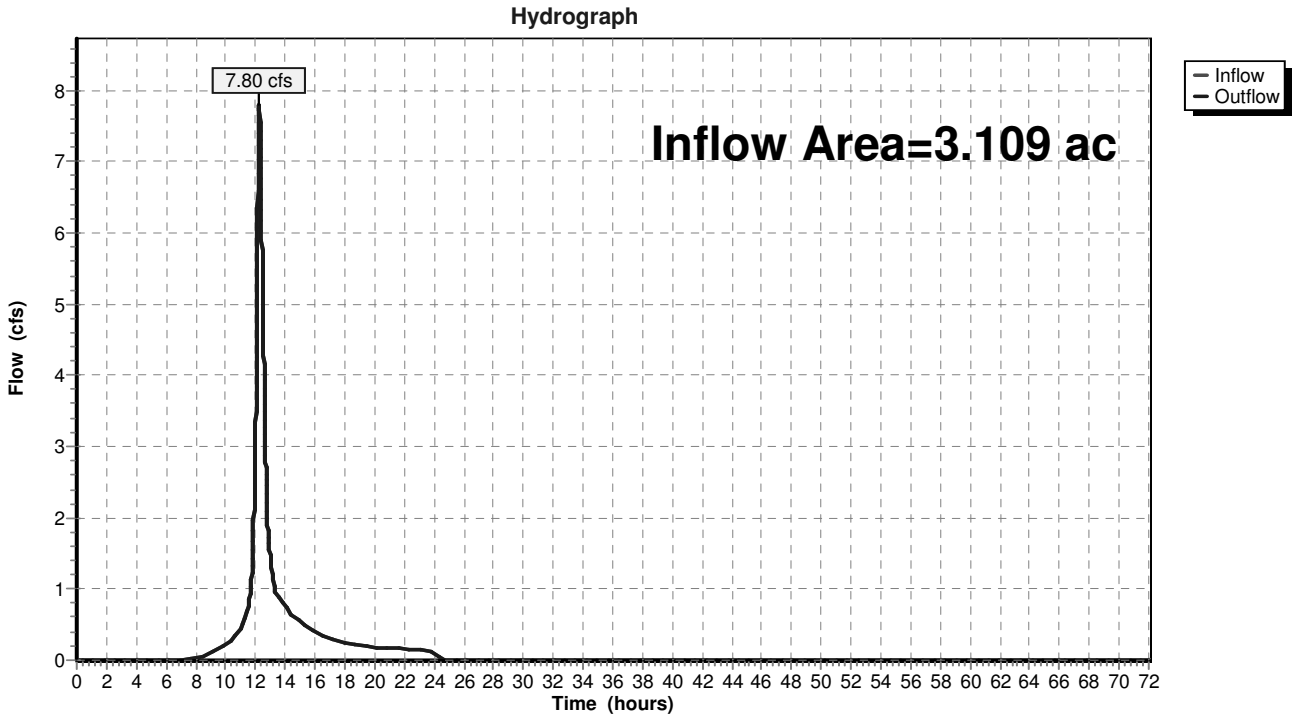


Summary for Reach DP 1:

Inflow Area = 3.109 ac, 14.41% Impervious, Inflow Depth = 3.08" for 10 Year event
Inflow = 7.80 cfs @ 12.25 hrs, Volume= 0.798 af
Outflow = 7.80 cfs @ 12.25 hrs, Volume= 0.798 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 1:

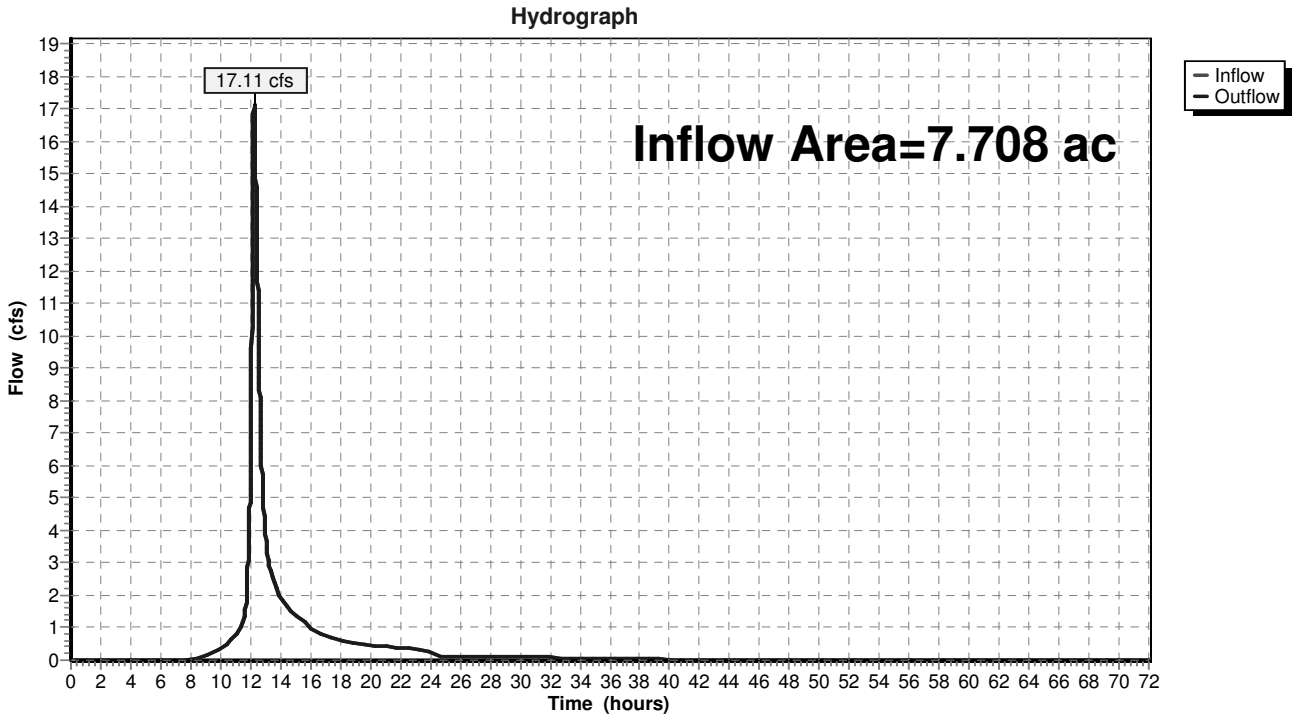


Summary for Reach DP 2:

Inflow Area = 7.708 ac, 10.25% Impervious, Inflow Depth = 3.01" for 10 Year event
Inflow = 17.11 cfs @ 12.24 hrs, Volume= 1.931 af
Outflow = 17.11 cfs @ 12.24 hrs, Volume= 1.931 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 2:

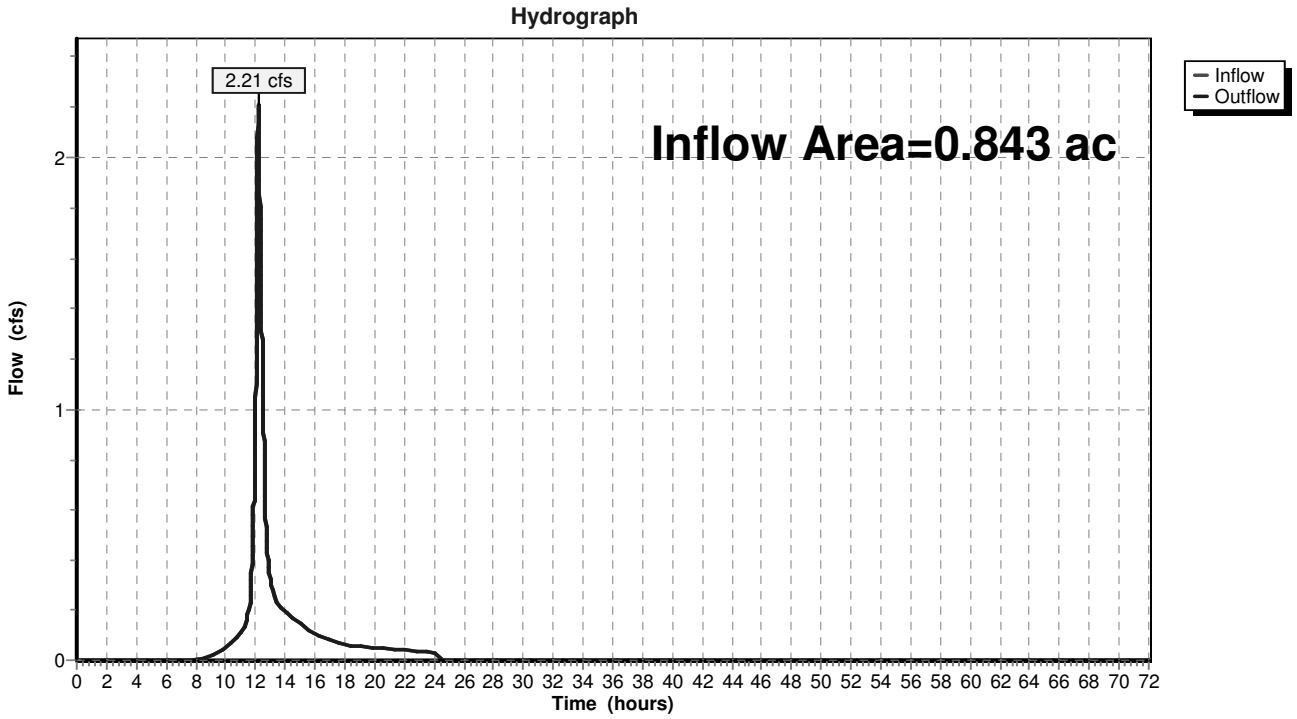


Summary for Reach DP 3:

Inflow Area = 0.843 ac, 0.00% Impervious, Inflow Depth = 2.89" for 10 Year event
Inflow = 2.21 cfs @ 12.20 hrs, Volume= 0.203 af
Outflow = 2.21 cfs @ 12.20 hrs, Volume= 0.203 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 3:



Summary for Pond 3P: Pretreatment

Inflow Area = 0.120 ac, 50.00% Impervious, Inflow Depth = 3.47" for 10 Year event
Inflow = 0.48 cfs @ 12.09 hrs, Volume= 0.035 af
Outflow = 0.48 cfs @ 12.09 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.1 min
Discarded = 0.00 cfs @ 12.09 hrs, Volume= 0.003 af
Primary = 0.48 cfs @ 12.09 hrs, Volume= 0.032 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 134.68' @ 12.09 hrs Surf.Area= 60 sf Storage= 37 cf

Plug-Flow detention time= 24.9 min calculated for 0.035 af (100% of inflow)
Center-of-Mass det. time= 25.0 min (829.4 - 804.4)

Volume	Invert	Avail.Storage	Storage Description
#1	134.00'	130 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

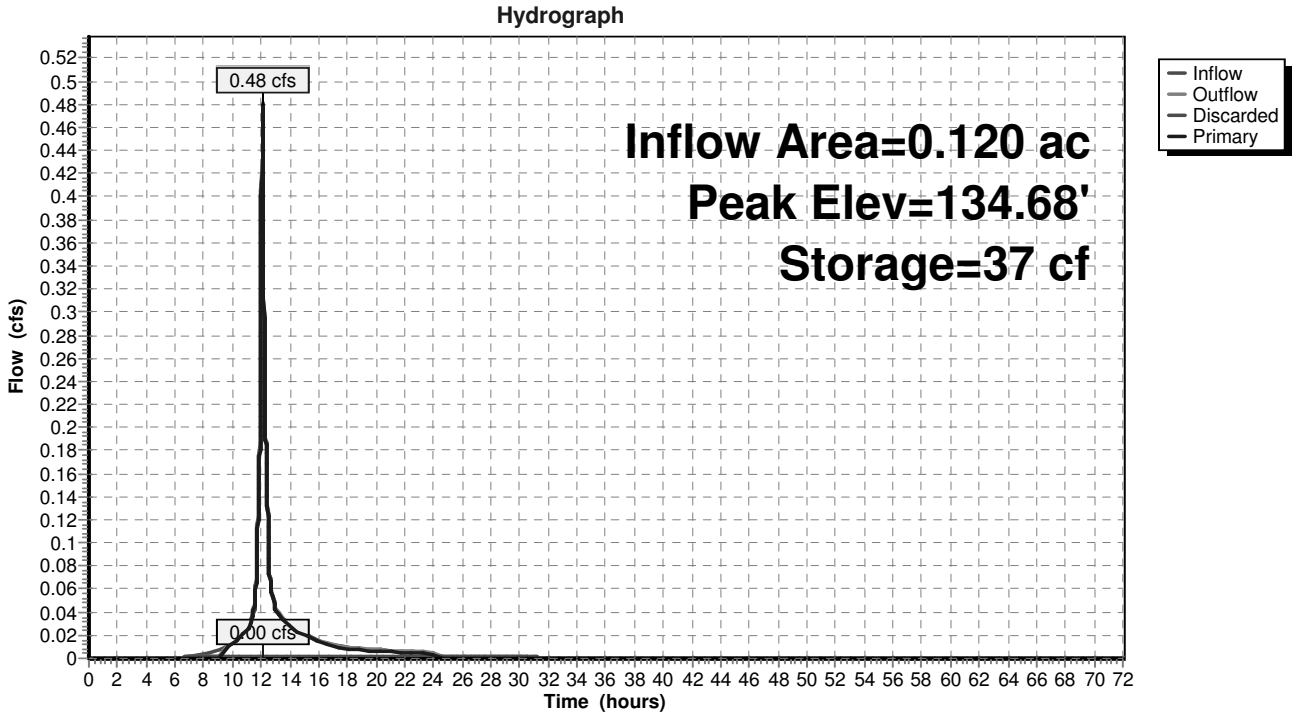
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
134.00	50	0	0
136.00	80	130	130

Device	Routing	Invert	Outlet Devices
#1	Discarded	134.00'	**1.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	134.60'	**8.0' long x 0.5' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00
			Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.00 cfs @ 12.09 hrs HW=134.68' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.48 cfs @ 12.09 hrs HW=134.68' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.48 cfs @ 0.78 fps)

Pond 3P: Pretreatment



Stage-Area-Storage for Pond 3P: Pretreatment

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
134.00	50	0
134.02	50	1
134.04	51	2
134.06	51	3
134.08	51	4
134.10	51	5
134.12	52	6
134.14	52	7
134.16	52	8
134.18	53	9
134.20	53	10
134.22	53	11
134.24	54	12
134.26	54	14
134.28	54	15
134.30	55	16
134.32	55	17
134.34	55	18
134.36	55	19
134.38	56	20
134.40	56	21
134.42	56	22
134.44	57	23
134.46	57	25
134.48	57	26
134.50	58	27
134.52	58	28
134.54	58	29
134.56	58	30
134.58	59	32
134.60	59	33
134.62	59	34
134.64	60	35
134.66	60	36
134.68	60	37
134.70	60	39
134.72	61	40
134.74	61	41
134.76	61	42
134.78	62	44
134.80	62	45
134.82	62	46
134.84	63	47
134.86	63	49
134.88	63	50
134.90	64	51
134.92	64	52
134.94	64	54
134.96	64	55
134.98	65	56
135.00	65	58
135.02	65	59
135.04	66	60
135.06	66	61
135.08	66	63
135.10	66	64
135.12	67	65
135.14	67	67
135.16	67	68
135.18	68	69
135.20	68	71
135.22	68	72
135.24	69	74
135.26	69	75
135.28	69	76
135.30	70	78
135.32	70	79
135.34	70	80
135.36	70	82
135.38	71	83
135.40	71	85
135.42	71	86
135.44	72	88
135.46	72	89
135.48	72	90
135.50	73	92
135.52	73	93
135.54	73	95
135.56	73	96
135.58	74	98
135.60	74	99
135.62	74	101
135.64	75	102
135.66	75	104
135.68	75	105
135.70	75	107
135.72	76	108
135.74	76	110
135.76	76	111
135.78	77	113
135.80	77	114
135.82	77	116
135.84	78	117
135.86	78	119
135.88	78	121
135.90	79	122
135.92	79	124
135.94	79	125
135.96	79	127
135.98	80	128
136.00	**80**	**130**

Summary for Pond DS: Dry Swale (O-1)

Inflow Area = 0.120 ac, 50.00% Impervious, Inflow Depth = 3.20" for 10 Year event
Inflow = 0.48 cfs @ 12.09 hrs, Volume= 0.032 af
Outflow = 0.23 cfs @ 12.26 hrs, Volume= 0.032 af, Atten= 53%, Lag= 10.0 min
Primary = 0.23 cfs @ 12.26 hrs, Volume= 0.032 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 135.04' @ 12.26 hrs Surf.Area= 529 sf Storage= 578 cf

Plug-Flow detention time= 390.5 min calculated for 0.032 af (100% of inflow)
Center-of-Mass det. time= 390.6 min (1,194.6 - 804.0)

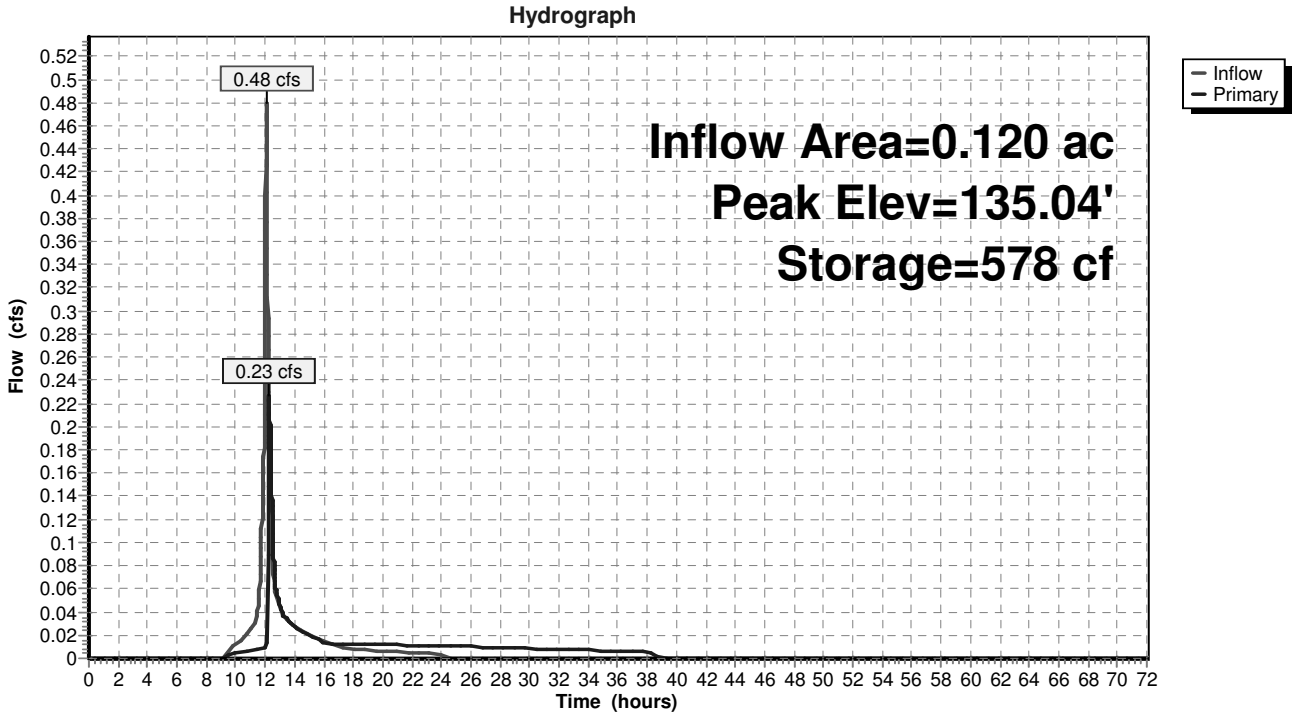
Volume	Invert	Avail.Storage	Storage Description
#1	133.50'	1,175 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
133.50	220	0	0
136.00	720	1,175	1,175

Device	Routing	Invert	Outlet Devices
#1	Primary	130.50'	**4.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 130.50' / 130.30' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#2	Device 1	133.50'	**1.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#3	Primary	135.00'	**8.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.22 cfs @ 12.26 hrs HW=135.04' (Free Discharge)
- **1=Culvert** (Passes 0.01 cfs of 0.69 cfs potential flow)
  - **2=Exfiltration** (Exfiltration Controls 0.01 cfs)
- **3=Broad-Crested Rectangular Weir** (Weir Controls 0.21 cfs @ 0.59 fps)

Pond DS: Dry Swale (O-1)



Stage-Area-Storage for Pond DS: Dry Swale (O-1)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
133.50	220	0
133.55	230	11
133.60	240	23
133.65	250	35
133.70	260	48
133.75	270	61
133.80	280	75
133.85	290	89
133.90	300	104
133.95	310	119
134.00	320	135
134.05	330	151
134.10	340	168
134.15	350	185
134.20	360	203
134.25	370	221
134.30	380	240
134.35	390	259
134.40	400	279
134.45	410	299
134.50	420	320
134.55	430	341
134.60	440	363
134.65	450	385
134.70	460	408
134.75	470	431
134.80	480	455
134.85	490	479
134.90	500	504
134.95	510	529
135.00	520	555
135.05	530	581
135.10	540	608
135.15	550	635
135.20	560	663
135.25	570	691
135.30	580	720
135.35	590	749
135.40	600	779
135.45	610	809
135.50	620	840
135.55	630	871
135.60	640	903
135.65	650	935
135.70	660	968
135.75	670	1,001
135.80	680	1,035
135.85	690	1,069
135.90	700	1,104
135.95	710	1,139
136.00	**720**	**1,175**

Summary for Pond FB: Forebay

Inflow Area =	2.528 ac, 21.08% Impervious, Inflow Depth = 3.39" for 10 Year event				
Inflow =	7.80 cfs @	12.12 hrs,	Volume=	0.715 af	
Outflow =	7.78 cfs @	12.13 hrs,	Volume=	0.715 af,	Atten= 0%, Lag= 0.5 min
Discarded =	0.03 cfs @	12.13 hrs,	Volume=	0.075 af	
Primary =	7.75 cfs @	12.13 hrs,	Volume=	0.640 af	

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 142.76' @ 12.13 hrs Surf.Area= 1,392 sf Storage= 1,754 cf

Plug-Flow detention time= 63.7 min calculated for 0.714 af (100% of inflow)
Center-of-Mass det. time= 63.9 min (872.1 - 808.2)

Volume	Invert	Avail.Storage	Storage Description
#1	141.00'	4,650 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

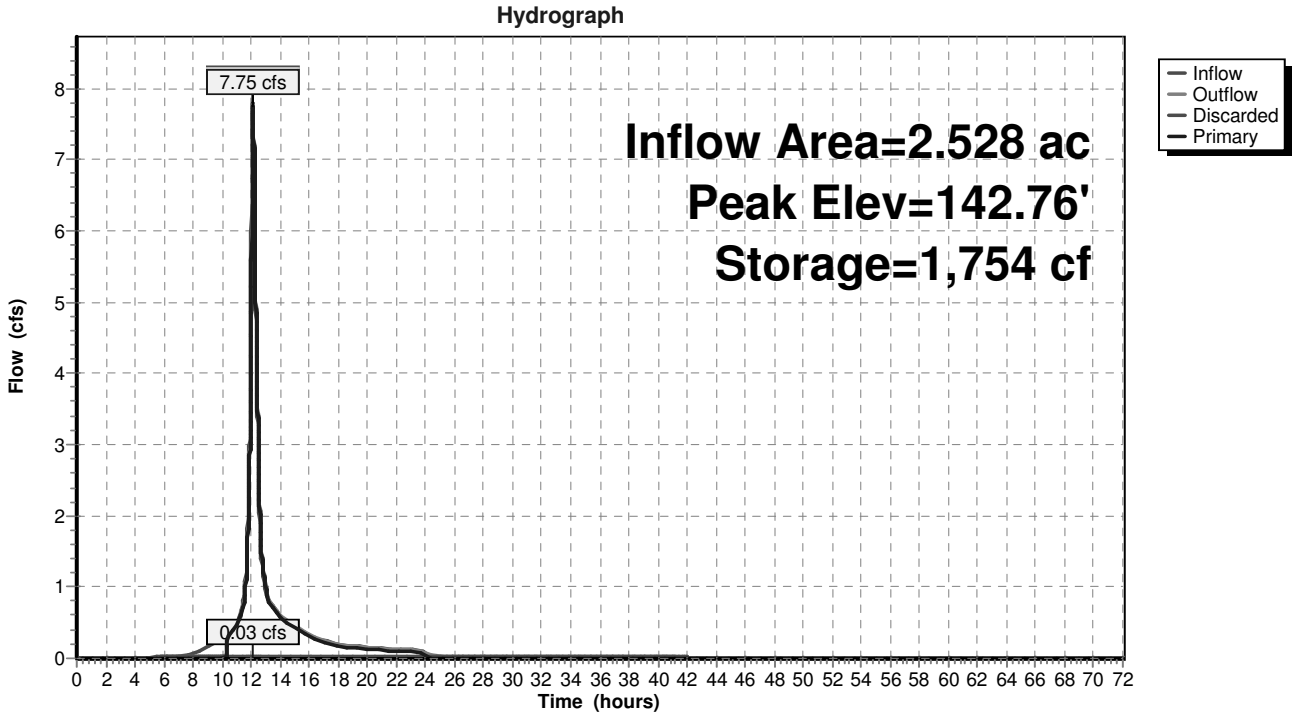
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
141.00	600	0	0
143.00	1,500	2,100	2,100
144.50	1,900	2,550	4,650

Device	Routing	Invert	Outlet Devices
#1	Primary	142.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#2	Discarded	141.00'	**1.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#3	Primary	142.50'	**20.0' long x 0.5' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00
			Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.03 cfs @ 12.13 hrs HW=142.76' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=7.73 cfs @ 12.13 hrs HW=142.76' (Free Discharge)
├─**1=Orifice/Grate** (Orifice Controls 0.18 cfs @ 1.74 fps)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 7.55 cfs @ 1.45 fps)

Pond FB: Forebay



Stage-Area-Storage for Pond FB: Forebay

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
141.00	600	0
141.05	623	31
141.10	645	62
141.15	668	95
141.20	690	129
141.25	713	164
141.30	735	200
141.35	757	238
141.40	780	276
141.45	802	316
141.50	825	356
141.55	848	398
141.60	870	441
141.65	893	485
141.70	915	530
141.75	938	577
141.80	960	624
141.85	982	673
141.90	1,005	722
141.95	1,027	773
142.00	1,050	825
142.05	1,073	878
142.10	1,095	932
142.15	1,118	988
142.20	1,140	1,044
142.25	1,163	1,102
142.30	1,185	1,160
142.35	1,207	1,220
142.40	1,230	1,281
142.45	1,252	1,343
142.50	1,275	1,406
142.55	1,298	1,471
142.60	1,320	1,536
142.65	1,343	1,603
142.70	1,365	1,670
142.75	1,388	1,739
142.80	1,410	1,809
142.85	1,432	1,880
142.90	1,455	1,952
142.95	1,477	2,026
143.00	1,500	2,100
143.05	1,513	2,175
143.10	1,527	2,251
143.15	1,540	2,328
143.20	1,553	2,405
143.25	1,567	2,483
143.30	1,580	2,562
143.35	1,593	2,641
143.40	1,607	2,721
143.45	1,620	2,802
143.50	1,633	2,883
143.55	1,647	2,965
143.60	1,660	3,048
143.65	1,673	3,131
143.70	1,687	3,215
143.75	1,700	3,300
143.80	1,713	3,385
143.85	1,727	3,471
143.90	1,740	3,558
143.95	1,753	3,645
144.00	1,767	3,733
144.05	1,780	3,822
144.10	1,793	3,911
144.15	1,807	4,001
144.20	1,820	4,092
144.25	1,833	4,183
144.30	1,847	4,275
144.35	1,860	4,368
144.40	1,873	4,461
144.45	1,887	4,555
144.50	**1,900**	**4,650**

Summary for Pond SF: Sand Filter (F-1)

Inflow Area = 2.528 ac, 21.08% Impervious, Inflow Depth = 3.04" for 10 Year event
Inflow = 7.75 cfs @ 12.13 hrs, Volume= 0.640 af
Outflow = 4.42 cfs @ 12.36 hrs, Volume= 0.640 af, Atten= 43%, Lag= 14.0 min
Primary = 4.42 cfs @ 12.36 hrs, Volume= 0.640 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 142.49' @ 12.36 hrs Surf.Area= 4,876 sf Storage= 9,396 cf

Plug-Flow detention time= 202.9 min calculated for 0.640 af (100% of inflow)
Center-of-Mass det. time= 203.0 min (1,017.3 - 814.4)

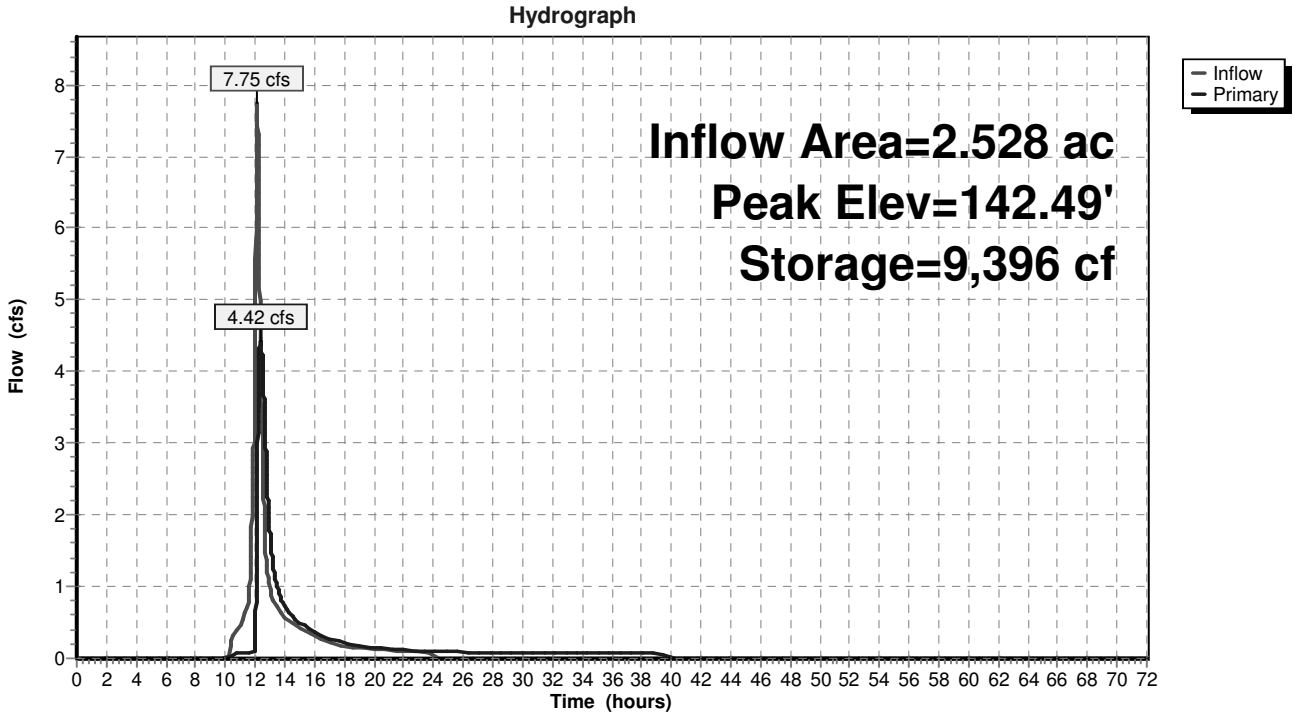
Volume	Invert	Avail.Storage	Storage Description
#1	140.00'	24,050 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
140.00	2,600	0	0
142.00	4,500	7,100	7,100
145.00	6,800	16,950	24,050

Device	Routing	Invert	Outlet Devices
#1	Primary	137.75'	**15.0" Round Culvert** L= 60.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 137.75' / 137.00' S= 0.0125 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	137.75'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Device 2	140.00'	**1.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#4	Device 1	141.30'	**1.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=4.42 cfs @ 12.36 hrs HW=142.49' (Free Discharge)
└─**1=Culvert** (Passes 4.42 cfs of 11.99 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes 0.11 cfs of 2.00 cfs potential flow)
  │ └─**3=Exfiltration** (Exfiltration Controls 0.11 cfs)
  └─**4=Broad-Crested Rectangular Weir** (Weir Controls 4.31 cfs @ 3.62 fps)

Pond SF: Sand Filter (F-1)



Stage-Area-Storage for Pond SF: Sand Filter (F-1)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
140.00	2,600	0
140.05	2,648	131
140.10	2,695	265
140.15	2,743	401
140.20	2,790	539
140.25	2,838	680
140.30	2,885	823
140.35	2,932	968
140.40	2,980	1,116
140.45	3,027	1,266
140.50	3,075	1,419
140.55	3,123	1,574
140.60	3,170	1,731
140.65	3,218	1,891
140.70	3,265	2,053
140.75	3,313	2,217
140.80	3,360	2,384
140.85	3,407	2,553
140.90	3,455	2,725
140.95	3,502	2,899
141.00	3,550	3,075
141.05	3,598	3,254
141.10	3,645	3,435
141.15	3,693	3,618
141.20	3,740	3,804
141.25	3,788	3,992
141.30	3,835	4,183
141.35	3,882	4,376
141.40	3,930	4,571
141.45	3,977	4,769
141.50	4,025	4,969
141.55	4,073	5,171
141.60	4,120	5,376
141.65	4,168	5,583
141.70	4,215	5,793
141.75	4,263	6,005
141.80	4,310	6,219
141.85	4,357	6,436
141.90	4,405	6,655
141.95	4,452	6,876
142.00	4,500	7,100
142.05	4,538	7,326
142.10	4,577	7,554
142.15	4,615	7,784
142.20	4,653	8,015
142.25	4,692	8,249
142.30	4,730	8,485
142.35	4,768	8,722
142.40	4,807	8,961
142.45	4,845	9,203
142.50	4,883	9,446
142.55	4,922	9,691
142.60	4,960	9,938
142.65	4,998	10,187
142.70	5,037	10,438
142.75	5,075	10,691
142.80	5,113	10,945
142.85	5,152	11,202
142.90	5,190	11,461
142.95	5,228	11,721
143.00	5,267	11,983
143.05	5,305	12,248
143.10	5,343	12,514
143.15	5,382	12,782
143.20	5,420	13,052
143.25	5,458	13,324
143.30	5,497	13,598
143.35	5,535	13,874
143.40	5,573	14,151
143.45	5,612	14,431
143.50	5,650	14,713
143.55	5,688	14,996
143.60	5,727	15,281
143.65	5,765	15,569
143.70	5,803	15,858
143.75	5,842	16,149
143.80	5,880	16,442
143.85	5,918	16,737
143.90	5,957	17,034
143.95	5,995	17,333
144.00	6,033	17,633
144.05	6,072	17,936
144.10	6,110	18,240
144.15	6,148	18,547
144.20	6,187	18,855
144.25	6,225	19,166
144.30	6,263	19,478
144.35	6,302	19,792
144.40	6,340	20,108
144.45	6,378	20,426
144.50	6,417	20,746
144.55	6,455	21,068
144.60	6,493	21,391
144.65	6,532	21,717
144.70	6,570	22,044
144.75	6,608	22,374
144.80	6,647	22,705
144.85	6,685	23,039
144.90	6,723	23,374
144.95	6,762	23,711
145.00	**6,800**	**24,050**

Summary for Subcatchment PDA-1: Remaining DP 1

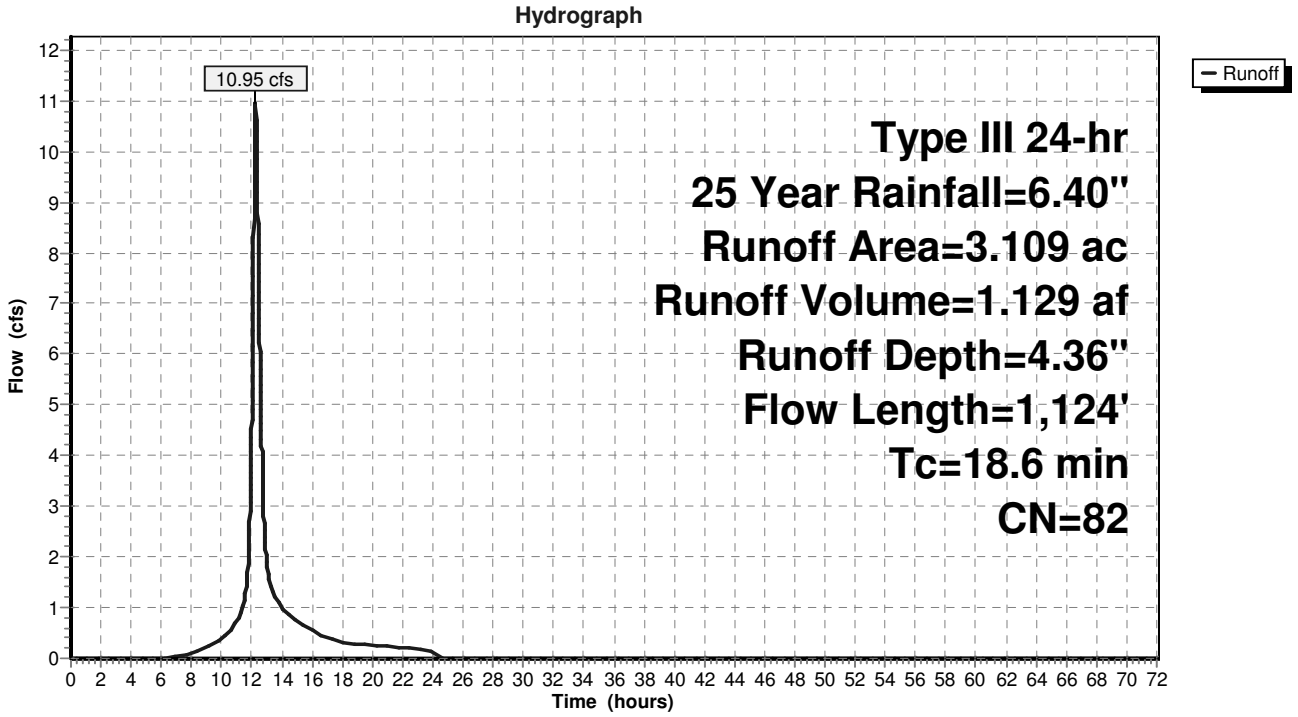
Runoff = 10.95 cfs @ 12.25 hrs, Volume= 1.129 af, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=6.40"

Area (ac)	CN	Description
1.752	79	50-75% Grass cover, Fair, HSG C
0.791	79	50-75% Grass cover, Fair, HSG C
0.118	89	Gravel roads, HSG C
0.448	98	Paved parking, HSG C
3.109	82	Weighted Average
2.661		85.59% Pervious Area
0.448		14.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0210	0.18		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
3.3	250	0.0320	1.25		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
0.5	141	0.0990	4.72		**Shallow Concentrated Flow, 3 to 4** Grassed Waterway Kv= 15.0 fps
5.6	633	0.0160	1.90		**Shallow Concentrated Flow, 4 to 5** Grassed Waterway Kv= 15.0 fps
18.6	1,124	Total			

Subcatchment PDA-1: Remaining DP 1



Summary for Subcatchment PDA-2A: Remaining DP 2

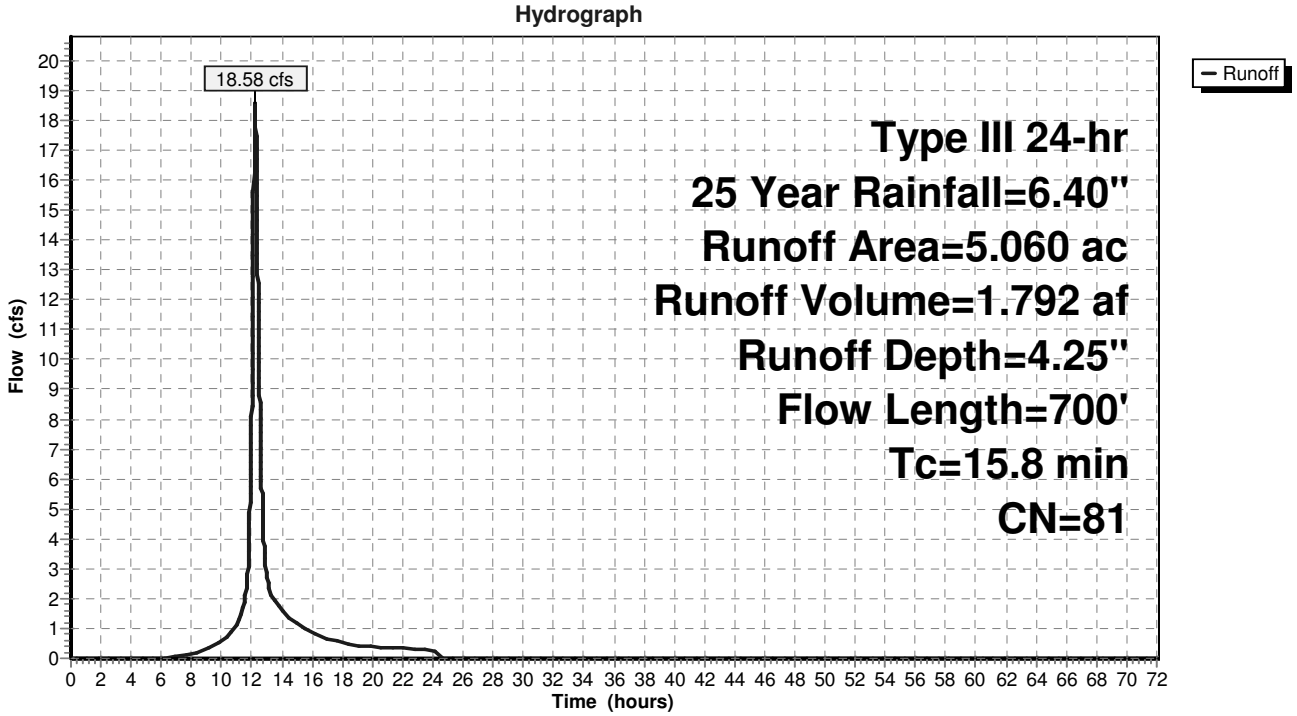
Runoff = 18.58 cfs @ 12.21 hrs, Volume= 1.792 af, Depth= 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=6.40"

Area (ac)	CN	Description
0.892	84	50-75% Grass cover, Fair, HSG D
3.971	79	50-75% Grass cover, Fair, HSG C
0.197	98	Paved parking, HSG C
5.060	81	Weighted Average
4.863		96.11% Pervious Area
0.197		3.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	150	0.0330	0.24		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
5.2	550	0.0630	1.76		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
15.8	700	Total			

Subcatchment PDA-2A: Remaining DP 2



Summary for Subcatchment PDA-2B: Forebay Contributing Area

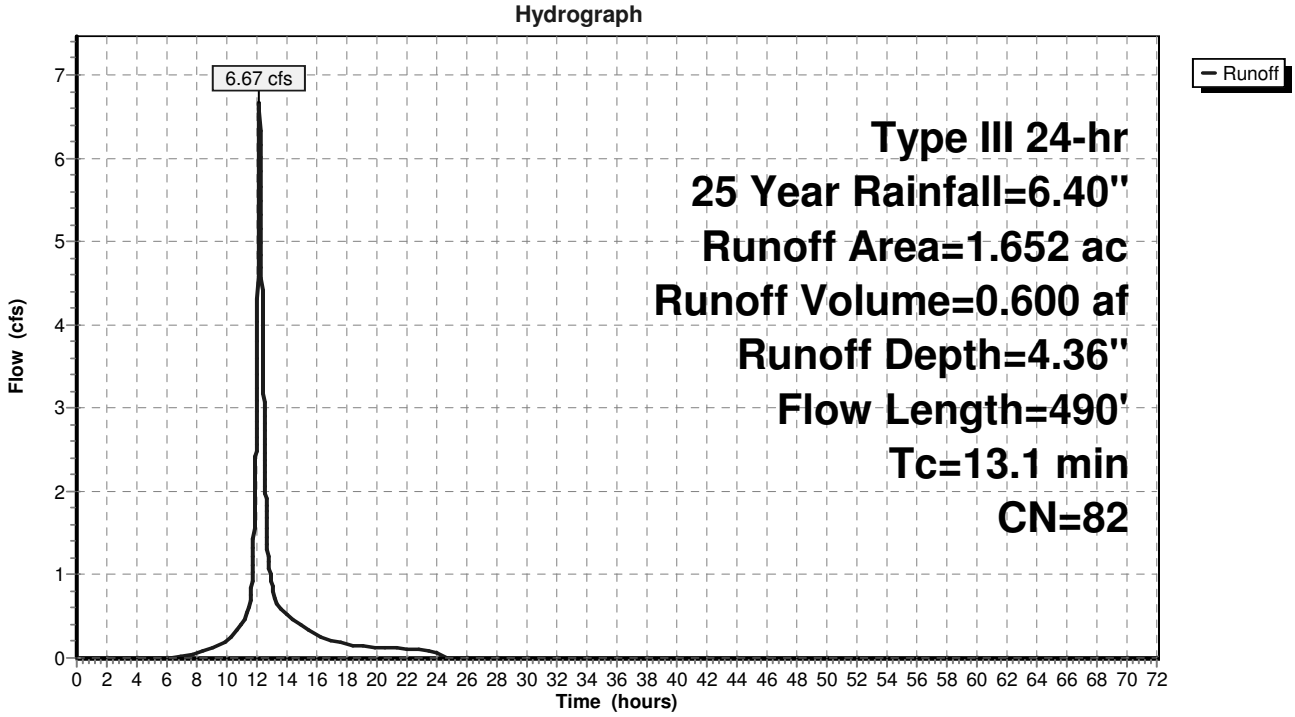
Runoff = 6.67 cfs @ 12.18 hrs, Volume= 0.600 af, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=6.40"

Area (ac)	CN	Description
0.286	98	Paved parking, HSG C
0.895	74	>75% Grass cover, Good, HSG C
0.471	89	Gravel roads, HSG C
1.652	82	Weighted Average
1.366		82.69% Pervious Area
0.286		17.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0210	0.18		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
2.8	288	0.0600	1.71		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
1.1	102	0.0100	1.50		**Shallow Concentrated Flow, 3 to 4** Grassed Waterway Kv= 15.0 fps
13.1	490	Total			

Subcatchment PDA-2B: Forebay Contributing Area



Summary for Subcatchment PDA-2C: Sand Filter Contributing Area

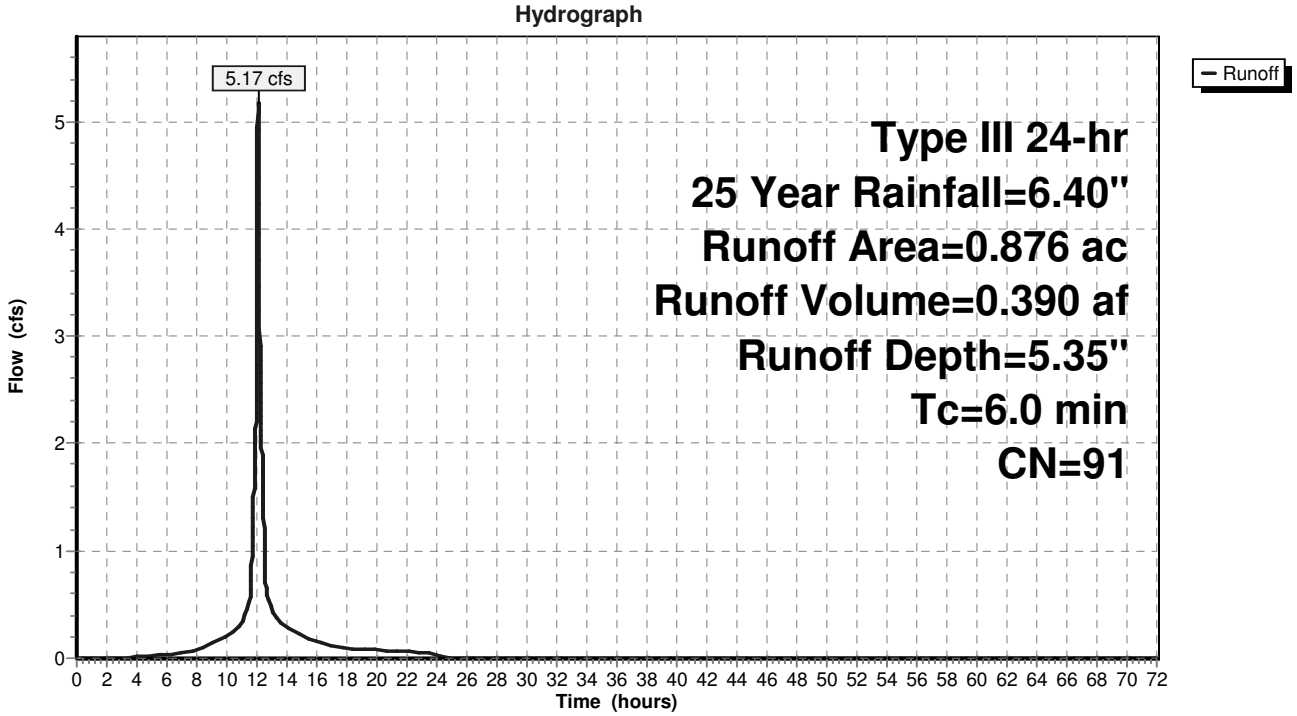
Runoff = 5.17 cfs @ 12.08 hrs, Volume= 0.390 af, Depth= 5.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=6.40"

Area (ac)	CN	Description
0.029	74	>75% Grass cover, Good, HSG C
0.600	89	Gravel roads, HSG C
0.247	98	Paved parking, HSG C
0.876	91	Weighted Average
0.629		71.80% Pervious Area
0.247		28.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PDA-2C: Sand Filter Contributing Area



Summary for Subcatchment PDA-2D: Dry Swale Contributing Area

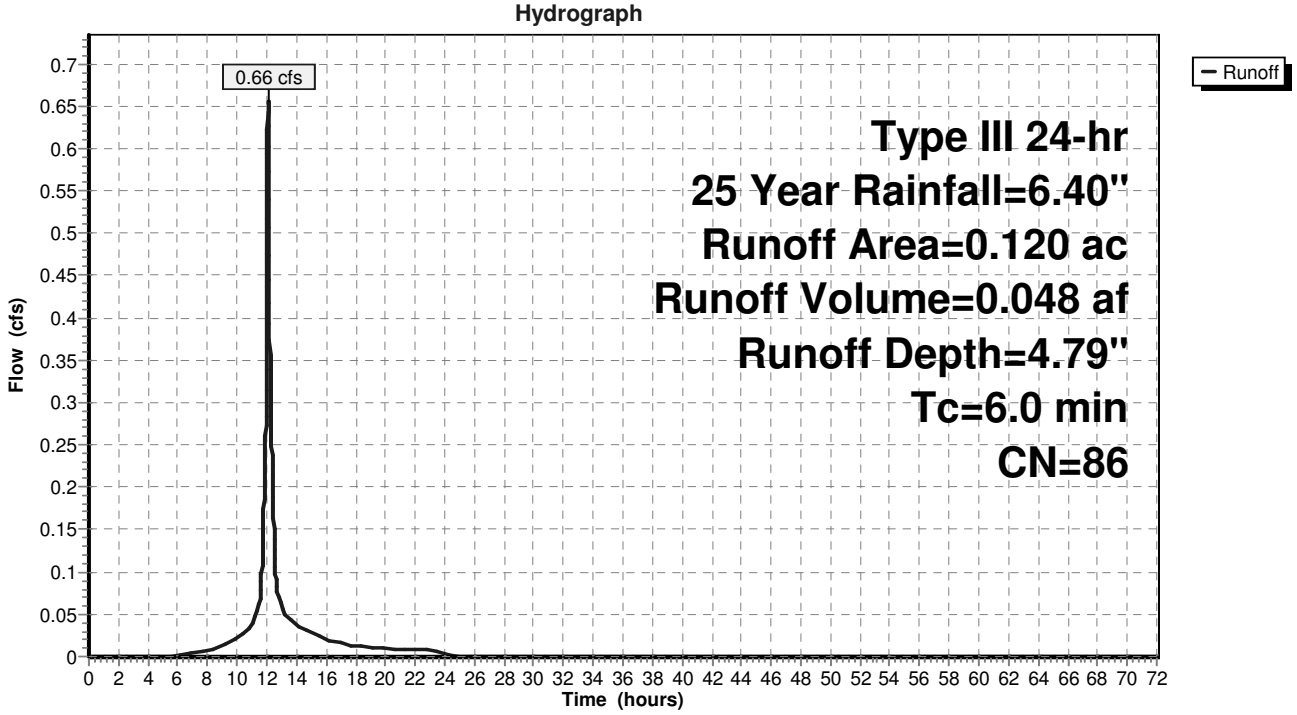
Runoff = 0.66 cfs @ 12.09 hrs, Volume= 0.048 af, Depth= 4.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=6.40"

Area (ac)	CN	Description
0.060	98	Paved parking, HSG C
0.060	74	>75% Grass cover, Good, HSG C
0.120	86	Weighted Average
0.060		50.00% Pervious Area
0.060		50.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct**

Subcatchment PDA-2D: Dry Swale Contributing Area



Summary for Subcatchment PDA-3: Remaining DP 3

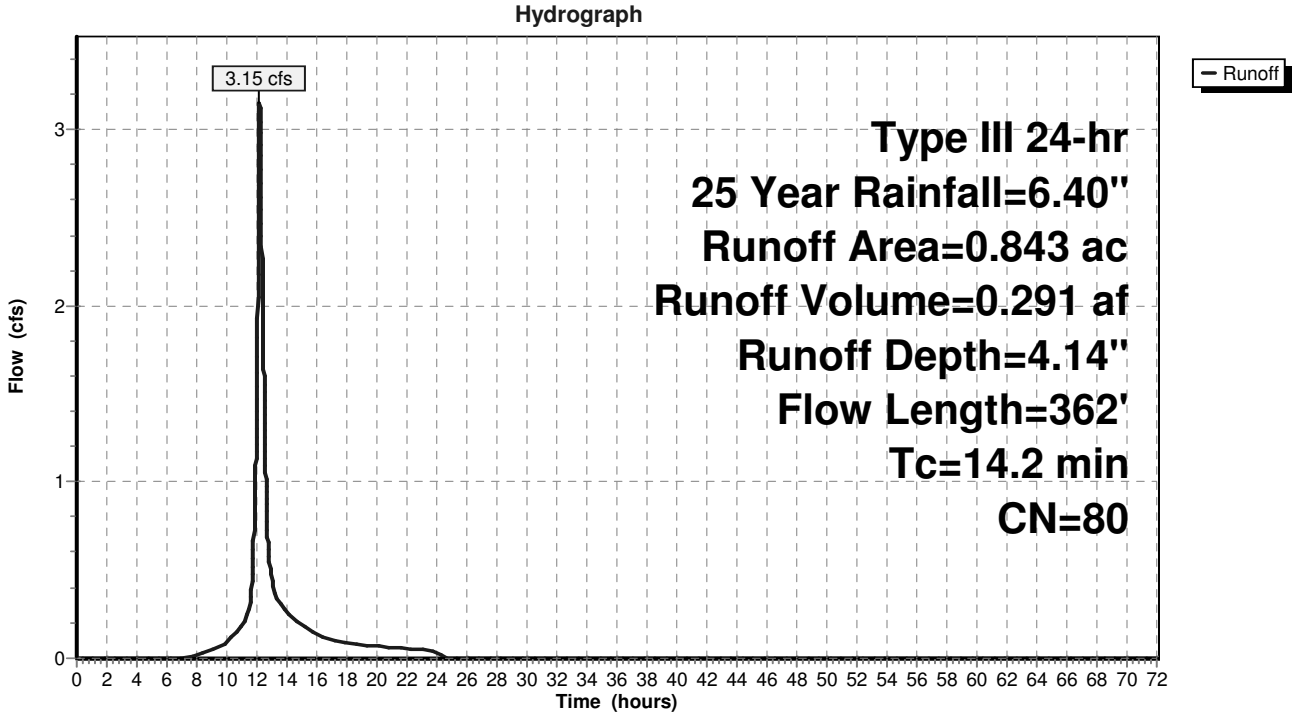
Runoff = 3.15 cfs @ 12.19 hrs, Volume= 0.291 af, Depth= 4.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Rainfall=6.40"

Area (ac)	CN	Description
0.737	79	50-75% Grass cover, Fair, HSG C
0.106	89	Gravel roads, HSG C
0.843	80	Weighted Average
0.843		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	150	0.0266	0.22		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
2.6	212	0.0377	1.36		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
14.2	362	Total			

Subcatchment PDA-3: Remaining DP 3

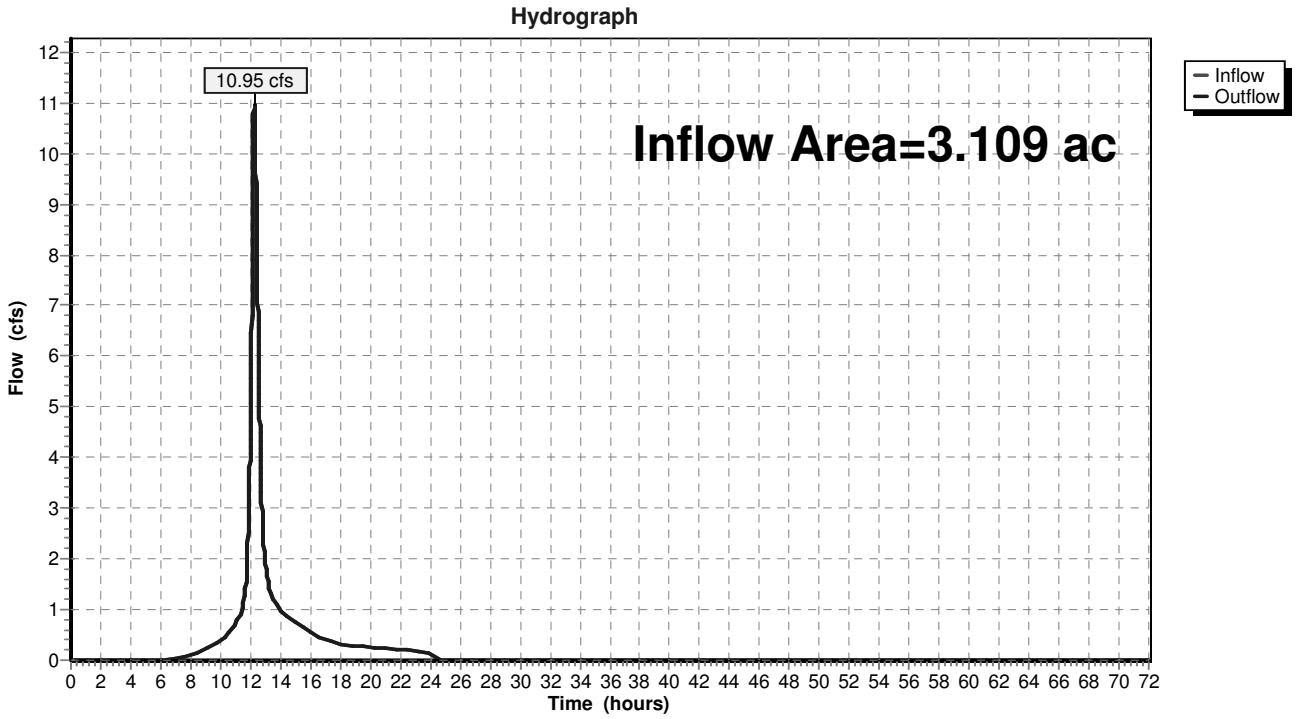


Summary for Reach DP 1:

Inflow Area = 3.109 ac, 14.41% Impervious, Inflow Depth = 4.36" for 25 Year event
Inflow = 10.95 cfs @ 12.25 hrs, Volume= 1.129 af
Outflow = 10.95 cfs @ 12.25 hrs, Volume= 1.129 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 1:

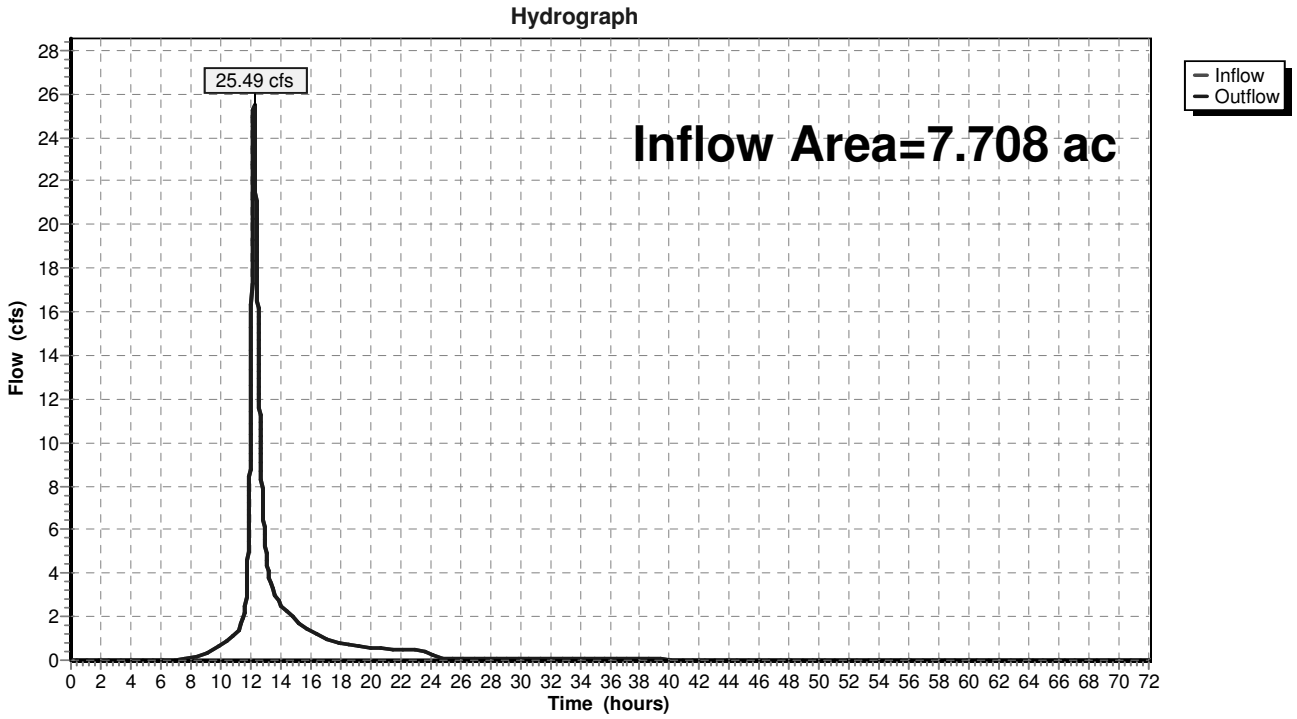


Summary for Reach DP 2:

Inflow Area = 7.708 ac, 10.25% Impervious, Inflow Depth = 4.28" for 25 Year event
Inflow = 25.49 cfs @ 12.23 hrs, Volume= 2.750 af
Outflow = 25.49 cfs @ 12.23 hrs, Volume= 2.750 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 2:

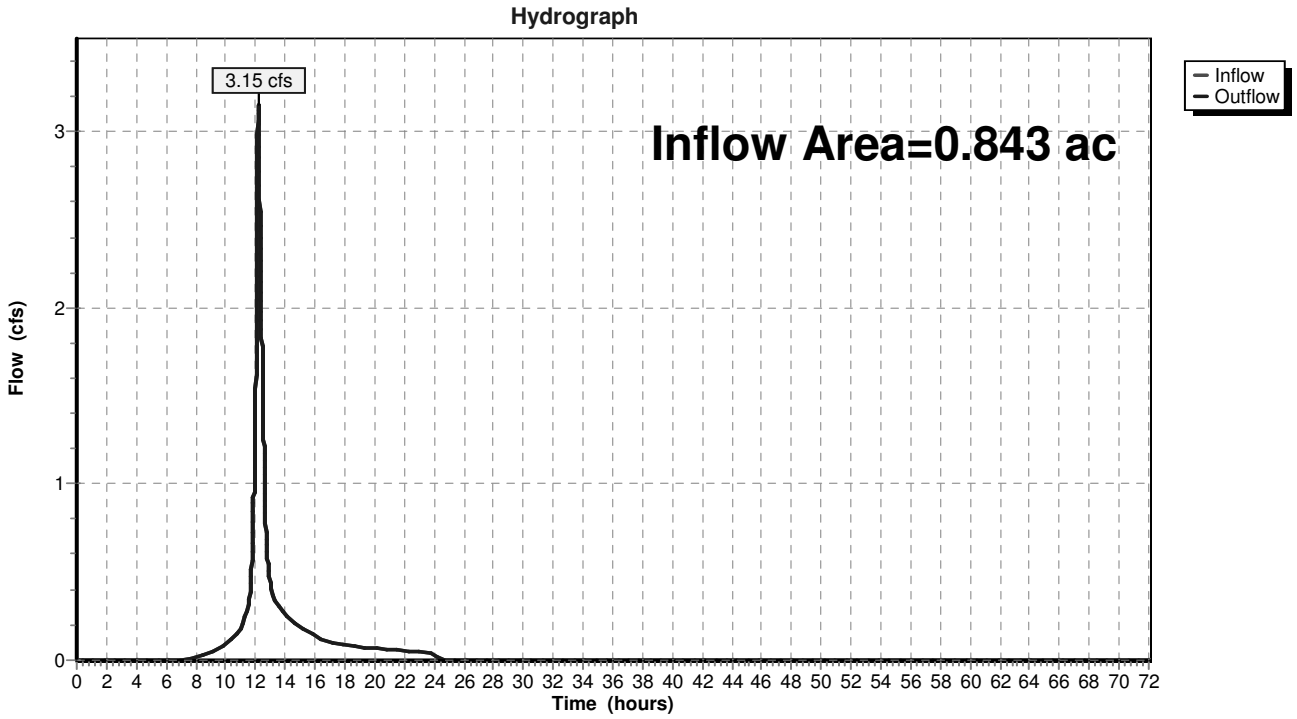


Summary for Reach DP 3:

Inflow Area = 0.843 ac, 0.00% Impervious, Inflow Depth = 4.14" for 25 Year event
Inflow = 3.15 cfs @ 12.19 hrs, Volume= 0.291 af
Outflow = 3.15 cfs @ 12.19 hrs, Volume= 0.291 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 3:



Summary for Pond 3P: Pretreatment

Inflow Area = 0.120 ac, 50.00% Impervious, Inflow Depth = 4.79" for 25 Year event
Inflow = 0.66 cfs @ 12.09 hrs, Volume= 0.048 af
Outflow = 0.66 cfs @ 12.09 hrs, Volume= 0.048 af, Atten= 0%, Lag= 0.1 min
Discarded = 0.00 cfs @ 12.09 hrs, Volume= 0.003 af
Primary = 0.65 cfs @ 12.09 hrs, Volume= 0.045 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 134.69' @ 12.09 hrs Surf.Area= 60 sf Storage= 38 cf

Plug-Flow detention time= 19.1 min calculated for 0.048 af (100% of inflow)
Center-of-Mass det. time= 19.1 min (814.5 - 795.4)

Volume	Invert	Avail.Storage	Storage Description
#1	134.00'	130 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

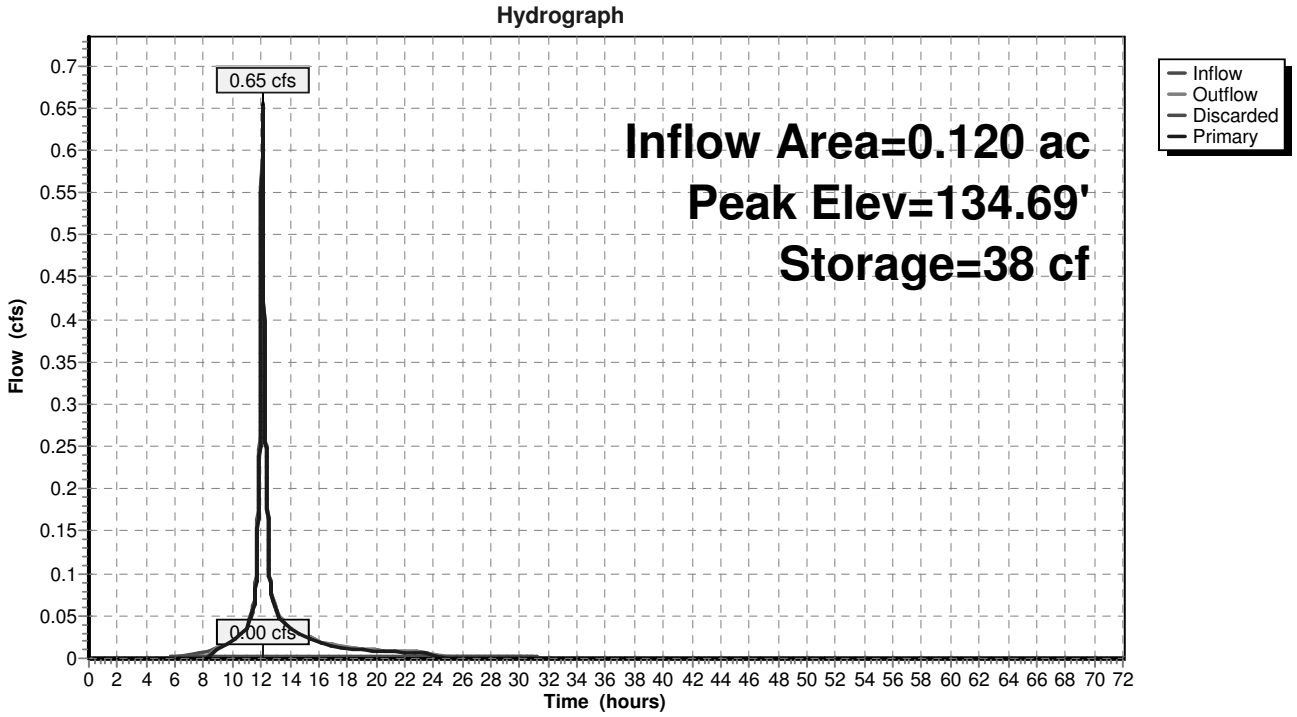
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
134.00	50	0	0
136.00	80	130	130

Device	Routing	Invert	Outlet Devices
#1	Discarded	134.00'	**1.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	134.60'	**8.0' long x 0.5' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00
			Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.00 cfs @ 12.09 hrs HW=134.69' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.65 cfs @ 12.09 hrs HW=134.69' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.65 cfs @ 0.86 fps)

Pond 3P: Pretreatment



Stage-Area-Storage for Pond 3P: Pretreatment

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
134.00	50	0
134.02	50	1
134.04	51	2
134.06	51	3
134.08	51	4
134.10	51	5
134.12	52	6
134.14	52	7
134.16	52	8
134.18	53	9
134.20	53	10
134.22	53	11
134.24	54	12
134.26	54	14
134.28	54	15
134.30	55	16
134.32	55	17
134.34	55	18
134.36	55	19
134.38	56	20
134.40	56	21
134.42	56	22
134.44	57	23
134.46	57	25
134.48	57	26
134.50	58	27
134.52	58	28
134.54	58	29
134.56	58	30
134.58	59	32
134.60	59	33
134.62	59	34
134.64	60	35
134.66	60	36
134.68	60	37
134.70	60	39
134.72	61	40
134.74	61	41
134.76	61	42
134.78	62	44
134.80	62	45
134.82	62	46
134.84	63	47
134.86	63	49
134.88	63	50
134.90	64	51
134.92	64	52
134.94	64	54
134.96	64	55
134.98	65	56
135.00	65	58
135.02	65	59
135.04	66	60
135.06	66	61
135.08	66	63
135.10	66	64
135.12	67	65
135.14	67	67
135.16	67	68
135.18	68	69
135.20	68	71
135.22	68	72
135.24	69	74
135.26	69	75
135.28	69	76
135.30	70	78
135.32	70	79
135.34	70	80
135.36	70	82
135.38	71	83
135.40	71	85
135.42	71	86
135.44	72	88
135.46	72	89
135.48	72	90
135.50	73	92
135.52	73	93
135.54	73	95
135.56	73	96
135.58	74	98
135.60	74	99
135.62	74	101
135.64	75	102
135.66	75	104
135.68	75	105
135.70	75	107
135.72	76	108
135.74	76	110
135.76	76	111
135.78	77	113
135.80	77	114
135.82	77	116
135.84	78	117
135.86	78	119
135.88	78	121
135.90	79	122
135.92	79	124
135.94	79	125
135.96	79	127
135.98	80	128
136.00	**80**	**130**

Summary for Pond DS: Dry Swale (O-1)

Inflow Area = 0.120 ac, 50.00% Impervious, Inflow Depth = 4.51" for 25 Year event
Inflow = 0.65 cfs @ 12.09 hrs, Volume= 0.045 af
Outflow = 0.62 cfs @ 12.11 hrs, Volume= 0.045 af, Atten= 5%, Lag= 1.6 min
Primary = 0.62 cfs @ 12.11 hrs, Volume= 0.045 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 135.09' @ 12.11 hrs Surf.Area= 538 sf Storage= 603 cf

Plug-Flow detention time= 306.7 min calculated for 0.045 af (100% of inflow)
Center-of-Mass det. time= 306.7 min (1,103.4 - 796.8)

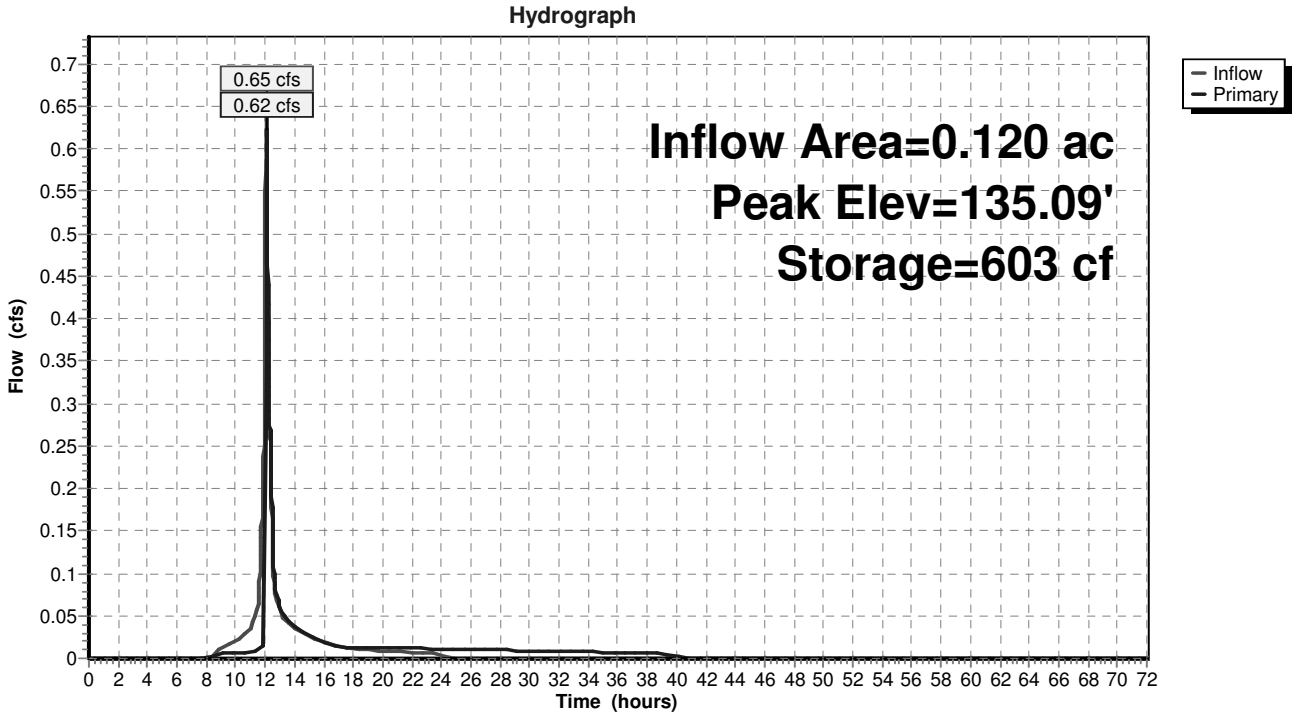
Volume	Invert	Avail.Storage	Storage Description
#1	133.50'	1,175 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
133.50	220	0	0
136.00	720	1,175	1,175

Device	Routing	Invert	Outlet Devices
#1	Primary	130.50'	**4.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 130.50' / 130.30' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#2	Device 1	133.50'	**1.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#3	Primary	135.00'	**8.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.62 cfs @ 12.11 hrs HW=135.09' (Free Discharge)
- **1=Culvert** (Passes 0.01 cfs of 0.70 cfs potential flow)
  - **2=Exfiltration** (Exfiltration Controls 0.01 cfs)
- **3=Broad-Crested Rectangular Weir** (Weir Controls 0.60 cfs @ 0.84 fps)

Pond DS: Dry Swale (O-1)



Stage-Area-Storage for Pond DS: Dry Swale (O-1)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
133.50	220	0
133.55	230	11
133.60	240	23
133.65	250	35
133.70	260	48
133.75	270	61
133.80	280	75
133.85	290	89
133.90	300	104
133.95	310	119
134.00	320	135
134.05	330	151
134.10	340	168
134.15	350	185
134.20	360	203
134.25	370	221
134.30	380	240
134.35	390	259
134.40	400	279
134.45	410	299
134.50	420	320
134.55	430	341
134.60	440	363
134.65	450	385
134.70	460	408
134.75	470	431
134.80	480	455
134.85	490	479
134.90	500	504
134.95	510	529
135.00	520	555
135.05	530	581
135.10	540	608
135.15	550	635
135.20	560	663
135.25	570	691
135.30	580	720
135.35	590	749
135.40	600	779
135.45	610	809
135.50	620	840
135.55	630	871
135.60	640	903
135.65	650	935
135.70	660	968
135.75	670	1,001
135.80	680	1,035
135.85	690	1,069
135.90	700	1,104
135.95	710	1,139
136.00	**720**	**1,175**

Summary for Pond FB: Forebay

Inflow Area = 2.528 ac, 21.08% Impervious, Inflow Depth = 4.70" for 25 Year event
Inflow = 10.69 cfs @ 12.12 hrs, Volume= 0.990 af
Outflow = 10.67 cfs @ 12.13 hrs, Volume= 0.990 af, Atten= 0%, Lag= 0.5 min
Discarded = 0.03 cfs @ 12.13 hrs, Volume= 0.077 af
Primary = 10.64 cfs @ 12.13 hrs, Volume= 0.913 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 142.82' @ 12.13 hrs Surf.Area= 1,419 sf Storage= 1,837 cf

Plug-Flow detention time= 48.2 min calculated for 0.990 af (100% of inflow)
Center-of-Mass det. time= 48.4 min (848.0 - 799.6)

Volume	Invert	Avail.Storage	Storage Description
#1	141.00'	4,650 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

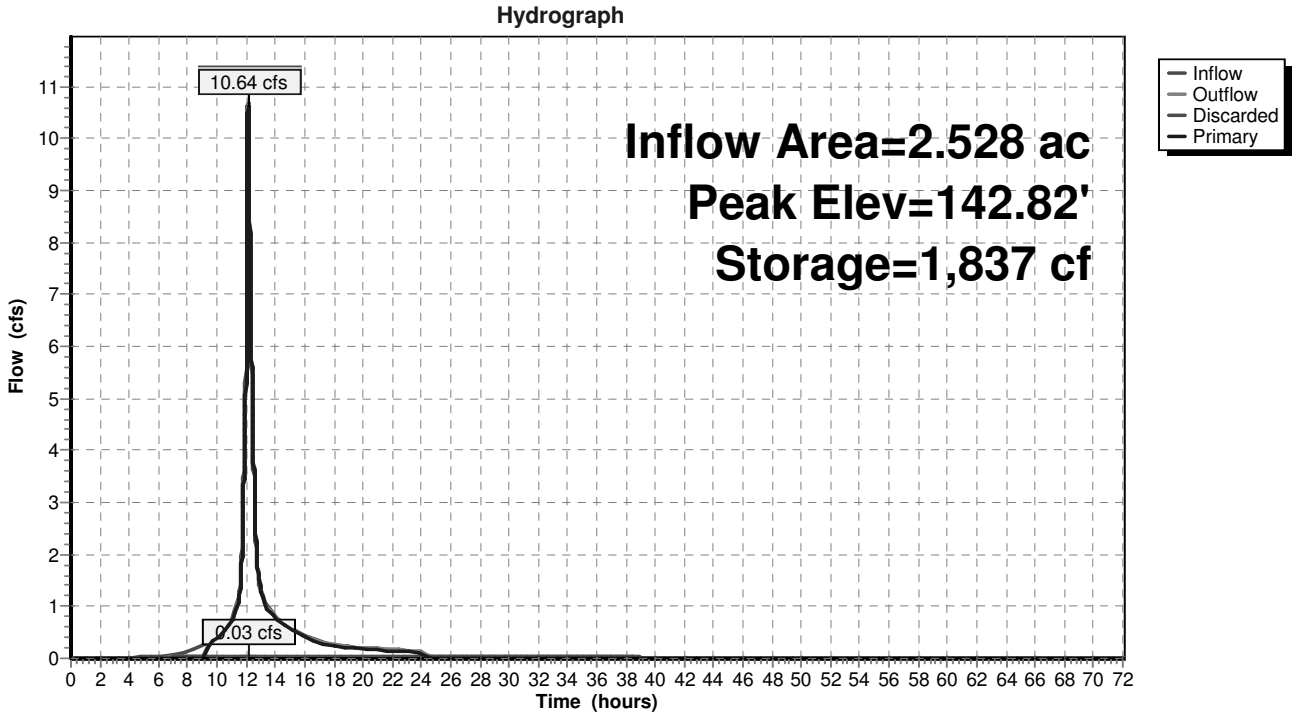
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
141.00	600	0	0
143.00	1,500	2,100	2,100
144.50	1,900	2,550	4,650

Device	Routing	Invert	Outlet Devices
#1	Primary	142.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#2	Discarded	141.00'	**1.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#3	Primary	142.50'	**20.0' long x 0.5' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00
			Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.03 cfs @ 12.13 hrs HW=142.82' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=10.63 cfs @ 12.13 hrs HW=142.82' (Free Discharge)
├─**1=Orifice/Grate** (Orifice Controls 0.26 cfs @ 1.92 fps)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 10.38 cfs @ 1.62 fps)

Pond FB: Forebay



Stage-Area-Storage for Pond FB: Forebay

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
141.00	600	0
141.05	623	31
141.10	645	62
141.15	668	95
141.20	690	129
141.25	713	164
141.30	735	200
141.35	757	238
141.40	780	276
141.45	802	316
141.50	825	356
141.55	848	398
141.60	870	441
141.65	893	485
141.70	915	530
141.75	938	577
141.80	960	624
141.85	982	673
141.90	1,005	722
141.95	1,027	773
142.00	1,050	825
142.05	1,073	878
142.10	1,095	932
142.15	1,118	988
142.20	1,140	1,044
142.25	1,163	1,102
142.30	1,185	1,160
142.35	1,207	1,220
142.40	1,230	1,281
142.45	1,252	1,343
142.50	1,275	1,406
142.55	1,298	1,471
142.60	1,320	1,536
142.65	1,343	1,603
142.70	1,365	1,670
142.75	1,388	1,739
142.80	1,410	1,809
142.85	1,432	1,880
142.90	1,455	1,952
142.95	1,477	2,026
143.00	1,500	2,100
143.05	1,513	2,175
143.10	1,527	2,251
143.15	1,540	2,328
143.20	1,553	2,405
143.25	1,567	2,483
143.30	1,580	2,562
143.35	1,593	2,641
143.40	1,607	2,721
143.45	1,620	2,802
143.50	1,633	2,883
143.55	1,647	2,965
143.60	1,660	3,048
143.65	1,673	3,131
143.70	1,687	3,215
143.75	1,700	3,300
143.80	1,713	3,385
143.85	1,727	3,471
143.90	1,740	3,558
143.95	1,753	3,645
144.00	1,767	3,733
144.05	1,780	3,822
144.10	1,793	3,911
144.15	1,807	4,001
144.20	1,820	4,092
144.25	1,833	4,183
144.30	1,847	4,275
144.35	1,860	4,368
144.40	1,873	4,461
144.45	1,887	4,555
144.50	**1,900**	**4,650**

Summary for Pond SF: Sand Filter (F-1)

Inflow Area = 2.528 ac, 21.08% Impervious, Inflow Depth = 4.33" for 25 Year event
Inflow = 10.64 cfs @ 12.13 hrs, Volume= 0.913 af
Outflow = 7.01 cfs @ 12.31 hrs, Volume= 0.913 af, Atten= 34%, Lag= 10.8 min
Primary = 7.01 cfs @ 12.31 hrs, Volume= 0.913 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 142.93' @ 12.31 hrs Surf.Area= 5,211 sf Storage= 11,601 cf

Plug-Flow detention time= 156.0 min calculated for 0.913 af (100% of inflow)
Center-of-Mass det. time= 156.1 min (962.8 - 806.7)

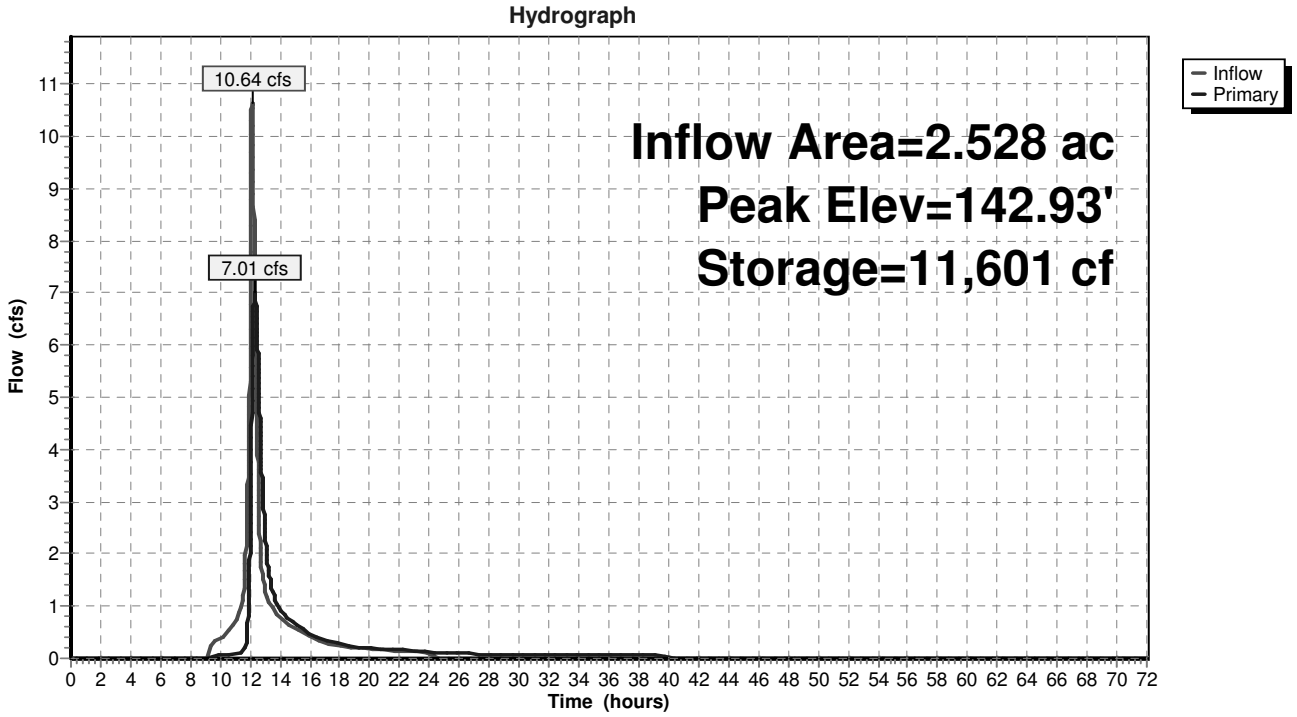
Volume	Invert	Avail.Storage	Storage Description
#1	140.00'	24,050 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
140.00	2,600	0	0
142.00	4,500	7,100	7,100
145.00	6,800	16,950	24,050

Device	Routing	Invert	Outlet Devices
#1	Primary	137.75'	**15.0" Round Culvert** L= 60.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 137.75' / 137.00' S= 0.0125 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	137.75'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Device 2	140.00'	**1.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#4	Device 1	141.30'	**1.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=7.01 cfs @ 12.31 hrs HW=142.93' (Free Discharge)
└─**1=Culvert** (Passes 7.01 cfs of 12.61 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes 0.12 cfs of 2.10 cfs potential flow)
  │ └─**3=Exfiltration** (Exfiltration Controls 0.12 cfs)
  └─**4=Broad-Crested Rectangular Weir** (Weir Controls 6.89 cfs @ 4.23 fps)

Pond SF: Sand Filter (F-1)



Stage-Area-Storage for Pond SF: Sand Filter (F-1)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
140.00	2,600	0
140.05	2,648	131
140.10	2,695	265
140.15	2,743	401
140.20	2,790	539
140.25	2,838	680
140.30	2,885	823
140.35	2,932	968
140.40	2,980	1,116
140.45	3,027	1,266
140.50	3,075	1,419
140.55	3,123	1,574
140.60	3,170	1,731
140.65	3,218	1,891
140.70	3,265	2,053
140.75	3,313	2,217
140.80	3,360	2,384
140.85	3,407	2,553
140.90	3,455	2,725
140.95	3,502	2,899
141.00	3,550	3,075
141.05	3,598	3,254
141.10	3,645	3,435
141.15	3,693	3,618
141.20	3,740	3,804
141.25	3,788	3,992
141.30	3,835	4,183
141.35	3,882	4,376
141.40	3,930	4,571
141.45	3,977	4,769
141.50	4,025	4,969
141.55	4,073	5,171
141.60	4,120	5,376
141.65	4,168	5,583
141.70	4,215	5,793
141.75	4,263	6,005
141.80	4,310	6,219
141.85	4,357	6,436
141.90	4,405	6,655
141.95	4,452	6,876
142.00	4,500	7,100
142.05	4,538	7,326
142.10	4,577	7,554
142.15	4,615	7,784
142.20	4,653	8,015
142.25	4,692	8,249
142.30	4,730	8,485
142.35	4,768	8,722
142.40	4,807	8,961
142.45	4,845	9,203
142.50	4,883	9,446
142.55	4,922	9,691
142.60	4,960	9,938
142.65	4,998	10,187
142.70	5,037	10,438
142.75	5,075	10,691
142.80	5,113	10,945
142.85	5,152	11,202
142.90	5,190	11,461
142.95	5,228	11,721
143.00	5,267	11,983
143.05	5,305	12,248
143.10	5,343	12,514
143.15	5,382	12,782
143.20	5,420	13,052
143.25	5,458	13,324
143.30	5,497	13,598
143.35	5,535	13,874
143.40	5,573	14,151
143.45	5,612	14,431
143.50	5,650	14,713
143.55	5,688	14,996
143.60	5,727	15,281
143.65	5,765	15,569
143.70	5,803	15,858
143.75	5,842	16,149
143.80	5,880	16,442
143.85	5,918	16,737
143.90	5,957	17,034
143.95	5,995	17,333
144.00	6,033	17,633
144.05	6,072	17,936
144.10	6,110	18,240
144.15	6,148	18,547
144.20	6,187	18,855
144.25	6,225	19,166
144.30	6,263	19,478
144.35	6,302	19,792
144.40	6,340	20,108
144.45	6,378	20,426
144.50	6,417	20,746
144.55	6,455	21,068
144.60	6,493	21,391
144.65	6,532	21,717
144.70	6,570	22,044
144.75	6,608	22,374
144.80	6,647	22,705
144.85	6,685	23,039
144.90	6,723	23,374
144.95	6,762	23,711
145.00	**6,800**	**24,050**

Summary for Subcatchment PDA-1: Remaining DP 1

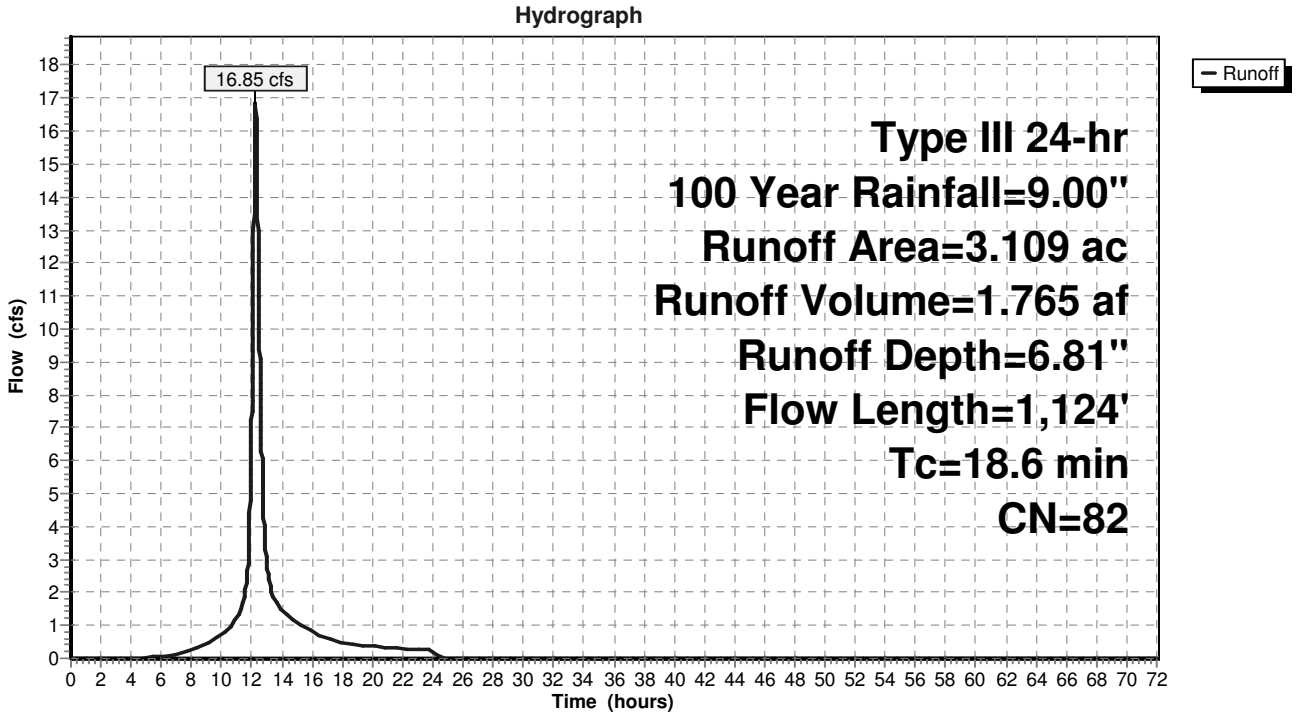
Runoff = 16.85 cfs @ 12.25 hrs, Volume= 1.765 af, Depth= 6.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=9.00"

Area (ac)	CN	Description
1.752	79	50-75% Grass cover, Fair, HSG C
0.791	79	50-75% Grass cover, Fair, HSG C
0.118	89	Gravel roads, HSG C
0.448	98	Paved parking, HSG C
3.109	82	Weighted Average
2.661		85.59% Pervious Area
0.448		14.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0210	0.18		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
3.3	250	0.0320	1.25		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
0.5	141	0.0990	4.72		**Shallow Concentrated Flow, 3 to 4** Grassed Waterway Kv= 15.0 fps
5.6	633	0.0160	1.90		**Shallow Concentrated Flow, 4 to 5** Grassed Waterway Kv= 15.0 fps
18.6	1,124	Total			

Subcatchment PDA-1: Remaining DP 1



Summary for Subcatchment PDA-2A: Remaining DP 2

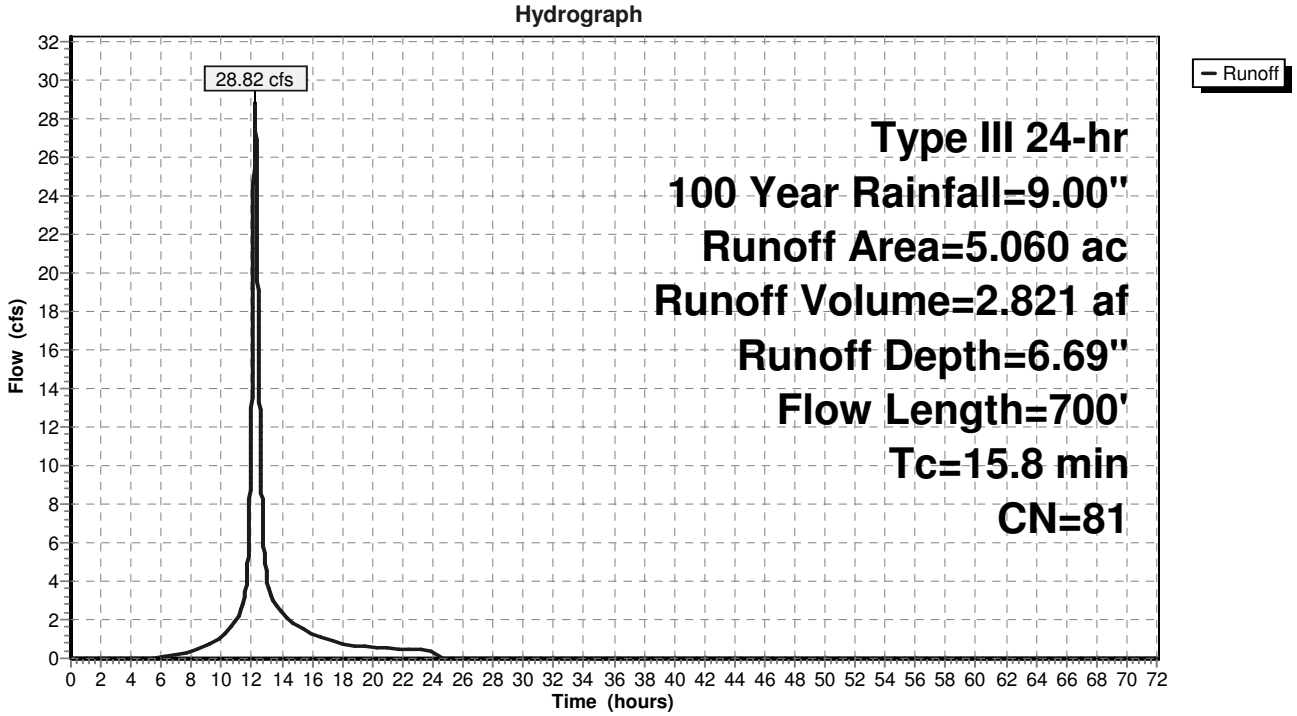
Runoff = 28.82 cfs @ 12.21 hrs, Volume= 2.821 af, Depth= 6.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=9.00"

Area (ac)	CN	Description
0.892	84	50-75% Grass cover, Fair, HSG D
3.971	79	50-75% Grass cover, Fair, HSG C
0.197	98	Paved parking, HSG C
5.060	81	Weighted Average
4.863		96.11% Pervious Area
0.197		3.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	150	0.0330	0.24		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
5.2	550	0.0630	1.76		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
15.8	700	Total			

Subcatchment PDA-2A: Remaining DP 2



Summary for Subcatchment PDA-2B: Forebay Contributing Area

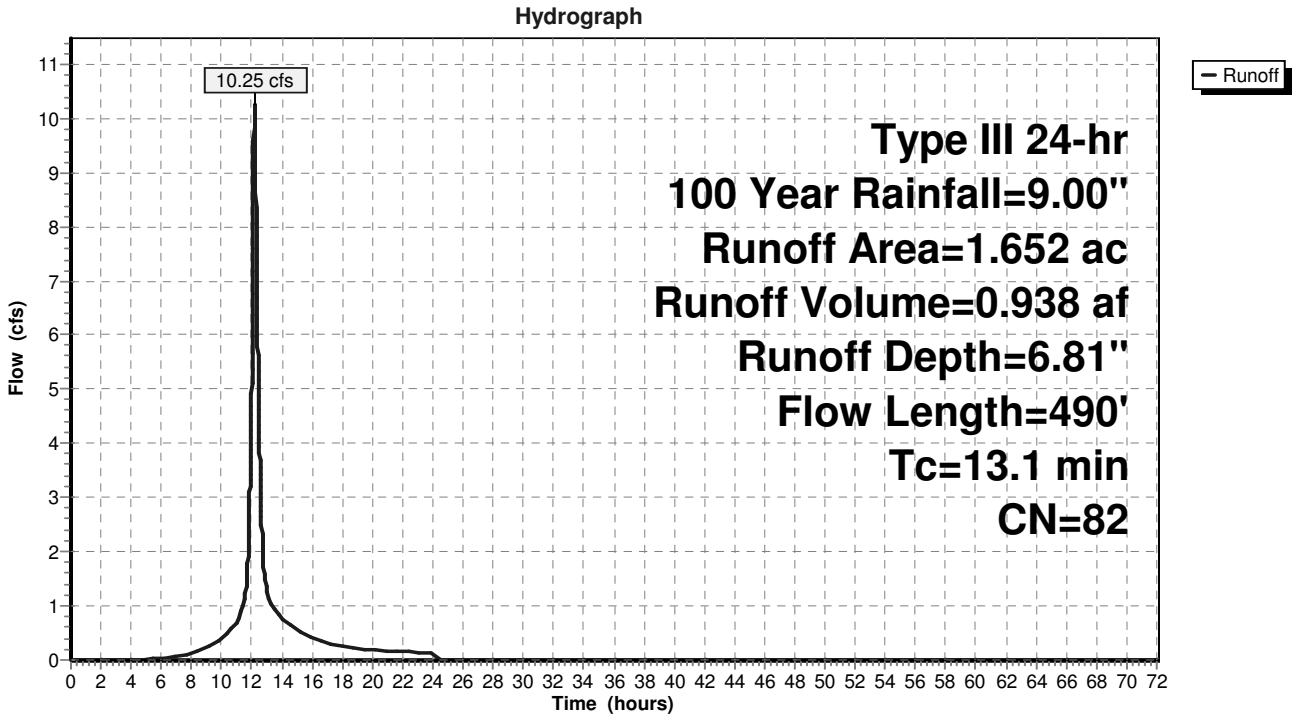
Runoff = 10.25 cfs @ 12.18 hrs, Volume= 0.938 af, Depth= 6.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=9.00"

Area (ac)	CN	Description
0.286	98	Paved parking, HSG C
0.895	74	>75% Grass cover, Good, HSG C
0.471	89	Gravel roads, HSG C
1.652	82	Weighted Average
1.366		82.69% Pervious Area
0.286		17.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0210	0.18		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
2.8	288	0.0600	1.71		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
1.1	102	0.0100	1.50		**Shallow Concentrated Flow, 3 to 4** Grassed Waterway Kv= 15.0 fps
13.1	490	Total			

Subcatchment PDA-2B: Forebay Contributing Area



Summary for Subcatchment PDA-2C: Sand Filter Contributing Area

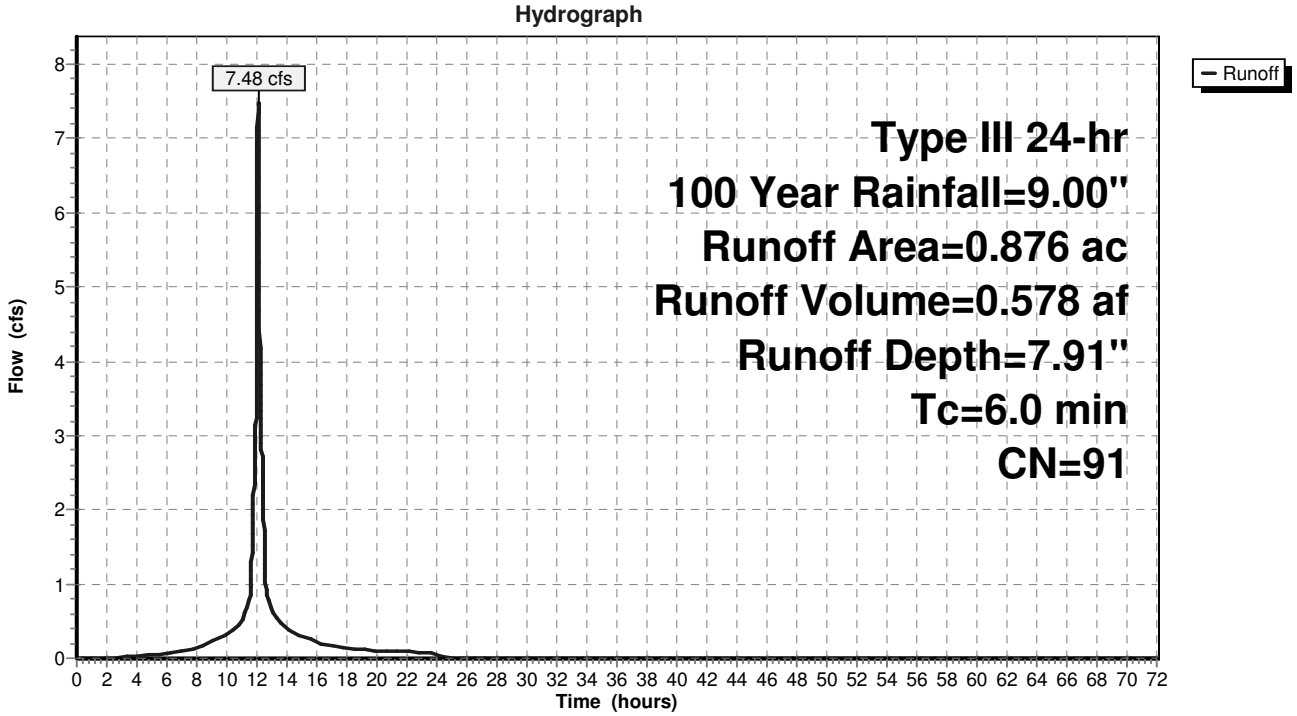
Runoff = 7.48 cfs @ 12.08 hrs, Volume= 0.578 af, Depth= 7.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=9.00"

Area (ac)	CN	Description
0.029	74	>75% Grass cover, Good, HSG C
0.600	89	Gravel roads, HSG C
0.247	98	Paved parking, HSG C
0.876	91	Weighted Average
0.629		71.80% Pervious Area
0.247		28.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PDA-2C: Sand Filter Contributing Area



Summary for Subcatchment PDA-2D: Dry Swale Contributing Area

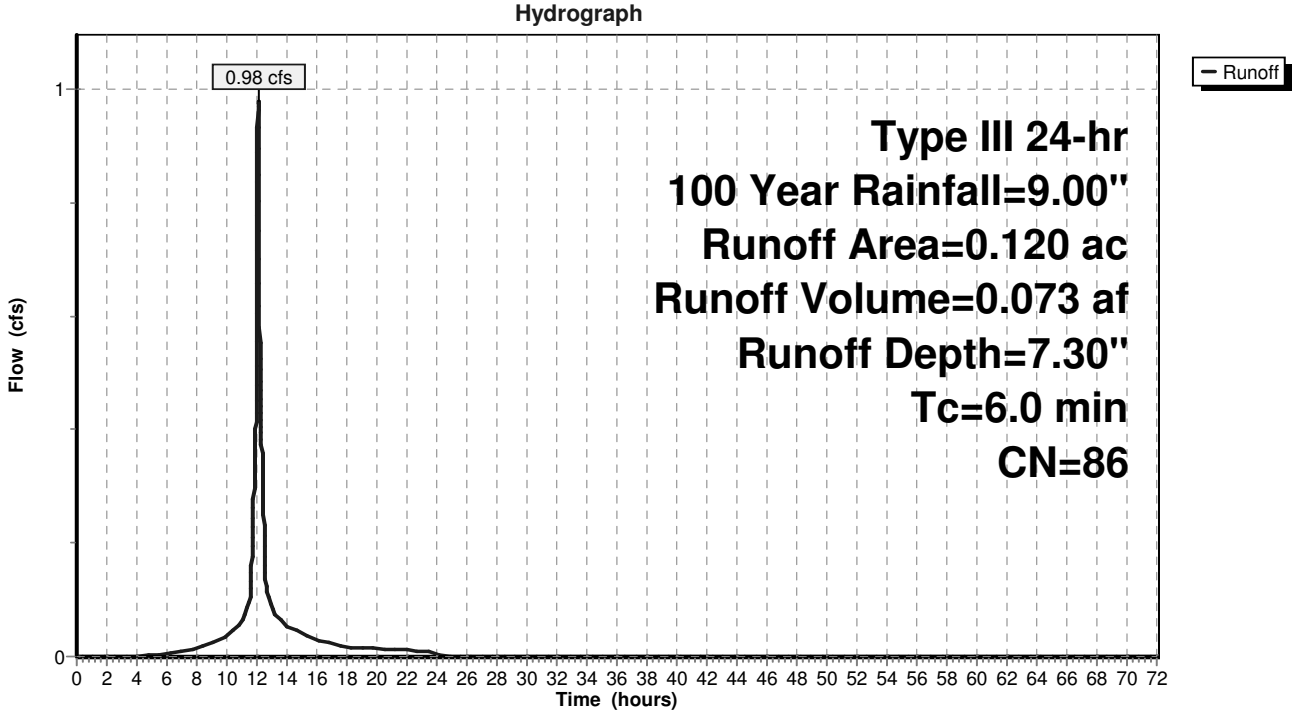
Runoff = 0.98 cfs @ 12.08 hrs, Volume= 0.073 af, Depth= 7.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=9.00"

Area (ac)	CN	Description
0.060	98	Paved parking, HSG C
0.060	74	>75% Grass cover, Good, HSG C
0.120	86	Weighted Average
0.060		50.00% Pervious Area
0.060		50.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct**

Subcatchment PDA-2D: Dry Swale Contributing Area



Summary for Subcatchment PDA-3: Remaining DP 3

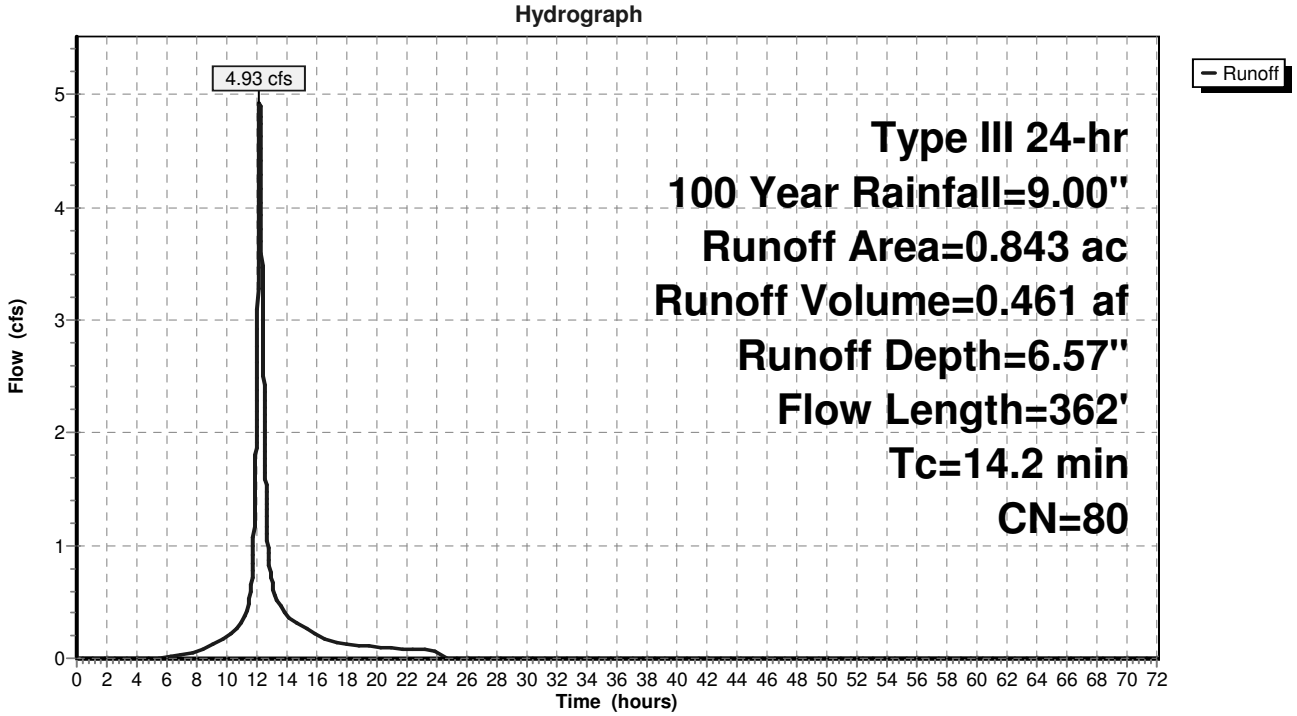
Runoff = 4.93 cfs @ 12.19 hrs, Volume= 0.461 af, Depth= 6.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 Year Rainfall=9.00"

Area (ac)	CN	Description
0.737	79	50-75% Grass cover, Fair, HSG C
0.106	89	Gravel roads, HSG C
0.843	80	Weighted Average
0.843		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	150	0.0266	0.22		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
2.6	212	0.0377	1.36		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
14.2	362	Total			

Subcatchment PDA-3: Remaining DP 3

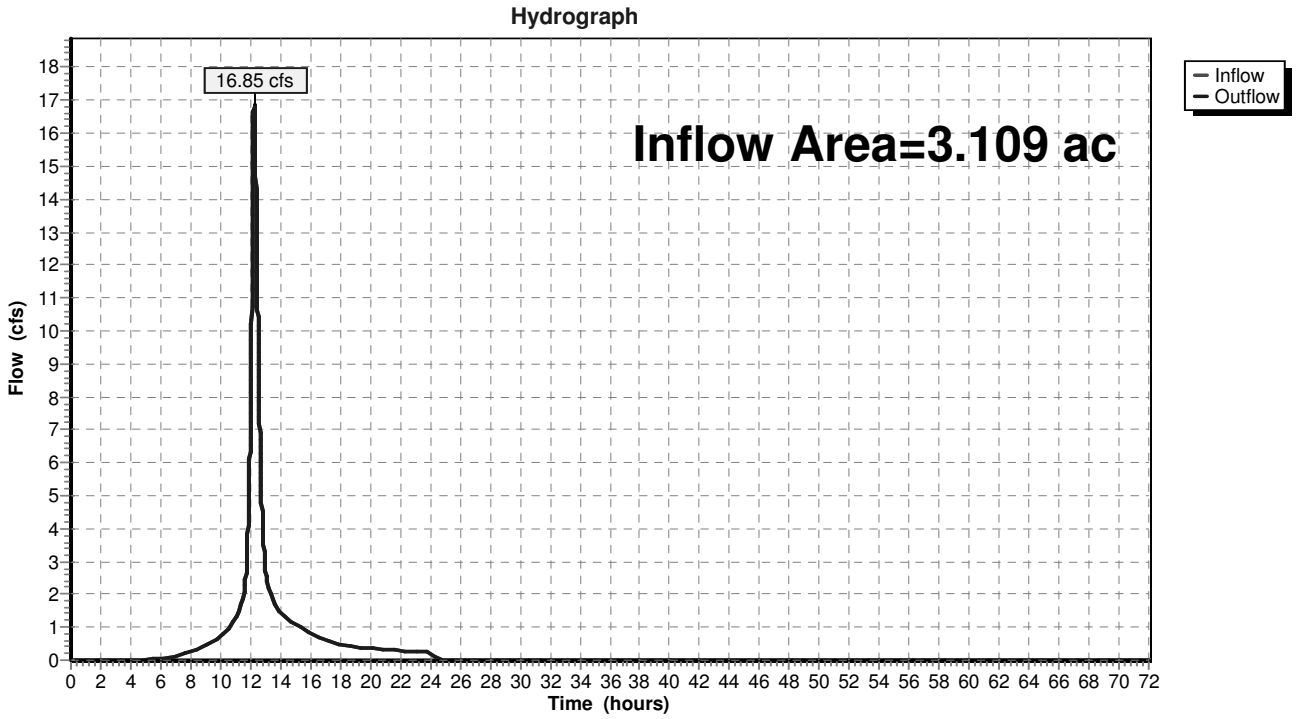


Summary for Reach DP 1:

Inflow Area = 3.109 ac, 14.41% Impervious, Inflow Depth = 6.81" for 100 Year event
Inflow = 16.85 cfs @ 12.25 hrs, Volume= 1.765 af
Outflow = 16.85 cfs @ 12.25 hrs, Volume= 1.765 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 1:

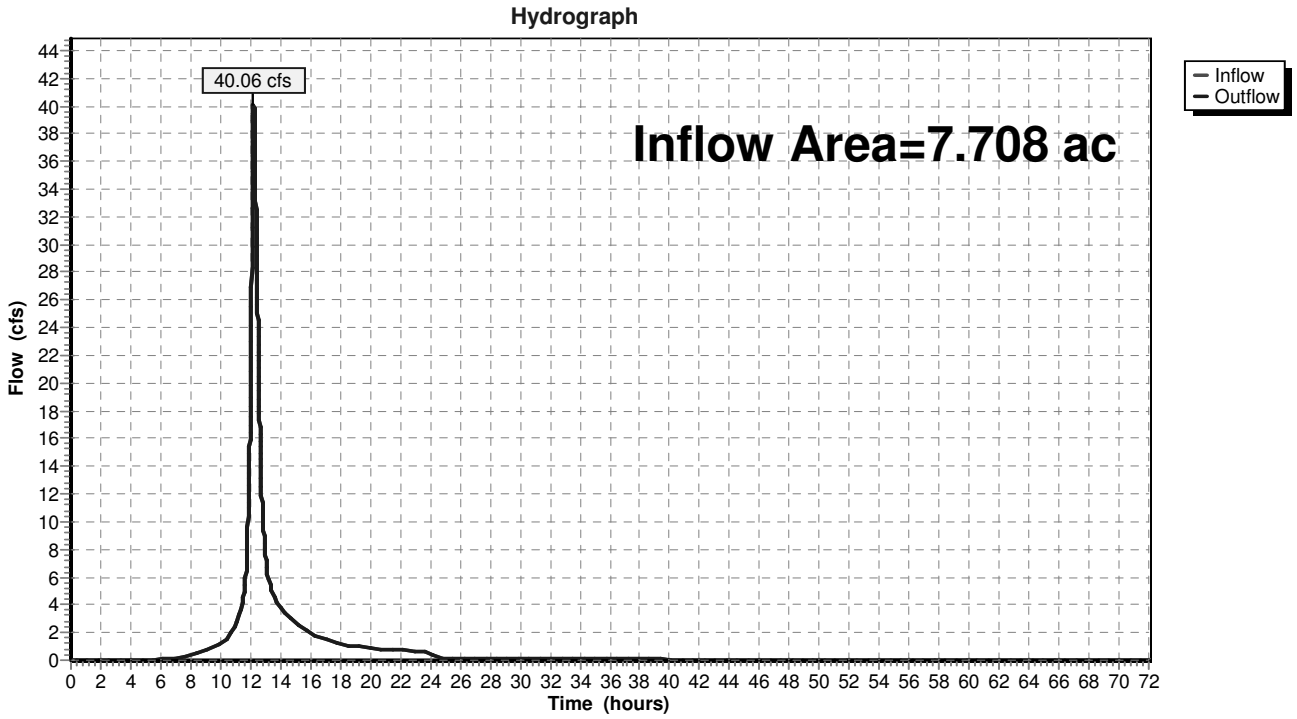


Summary for Reach DP 2:

Inflow Area = 7.708 ac, 10.25% Impervious, Inflow Depth = 6.74" for 100 Year event
Inflow = 40.06 cfs @ 12.22 hrs, Volume= 4.326 af
Outflow = 40.06 cfs @ 12.22 hrs, Volume= 4.326 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 2:

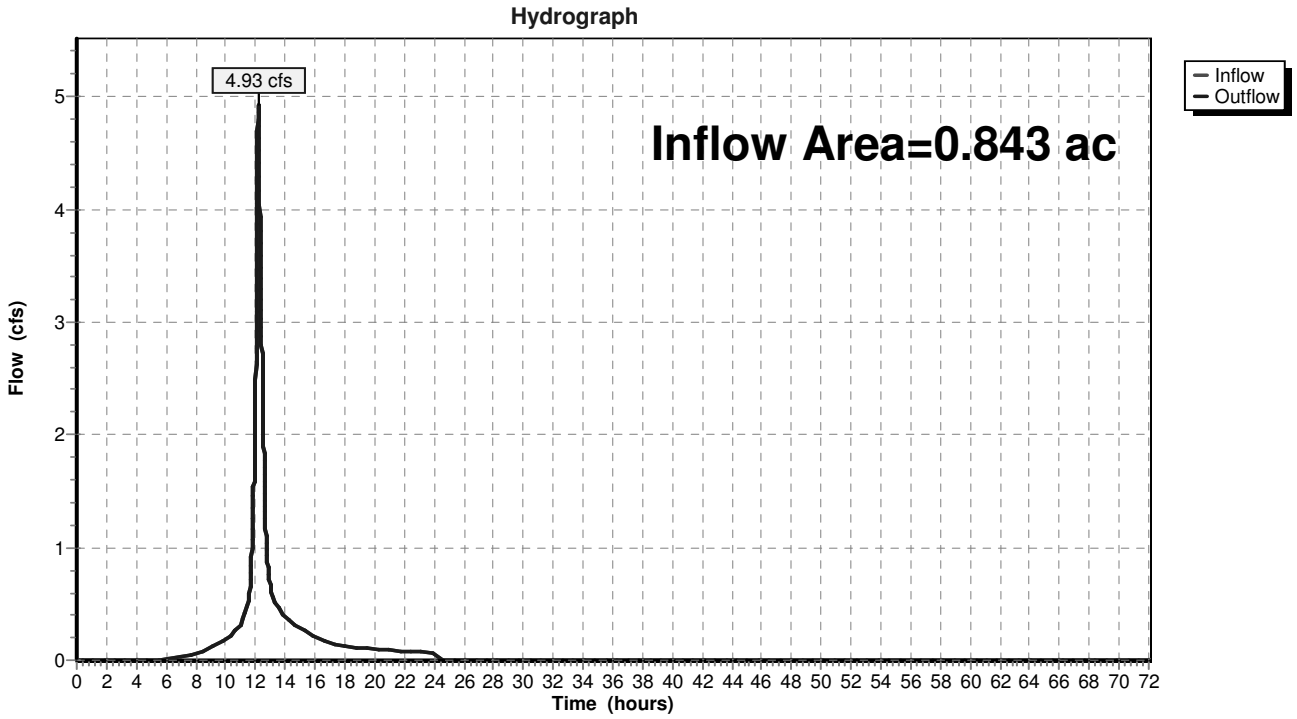


Summary for Reach DP 3:

Inflow Area = 0.843 ac, 0.00% Impervious, Inflow Depth = 6.57" for 100 Year event
Inflow = 4.93 cfs @ 12.19 hrs, Volume= 0.461 af
Outflow = 4.93 cfs @ 12.19 hrs, Volume= 0.461 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 3:



Summary for Pond 3P: Pretreatment

Inflow Area = 0.120 ac, 50.00% Impervious, Inflow Depth = 7.30" for 100 Year event
Inflow = 0.98 cfs @ 12.08 hrs, Volume= 0.073 af
Outflow = 0.98 cfs @ 12.09 hrs, Volume= 0.073 af, Atten= 0%, Lag= 0.1 min
Discarded = 0.00 cfs @ 12.09 hrs, Volume= 0.003 af
Primary = 0.98 cfs @ 12.09 hrs, Volume= 0.070 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 134.72' @ 12.09 hrs Surf.Area= 61 sf Storage= 40 cf

Plug-Flow detention time= 13.6 min calculated for 0.073 af (100% of inflow)
Center-of-Mass det. time= 13.6 min (797.5 - 784.0)

Volume	Invert	Avail.Storage	Storage Description
#1	134.00'	130 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

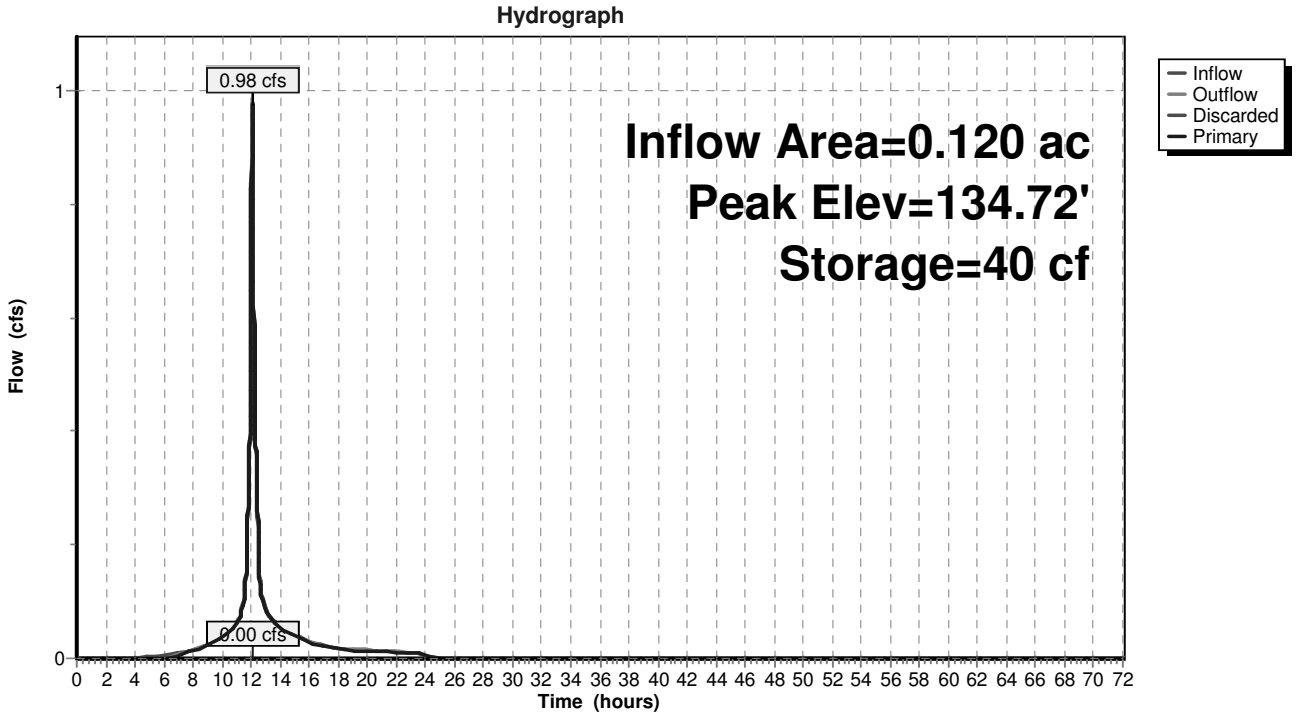
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
134.00	50	0	0
136.00	80	130	130

Device	Routing	Invert	Outlet Devices
#1	Discarded	134.00'	**1.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	134.60'	**8.0' long x 0.5' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00
			Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.00 cfs @ 12.09 hrs HW=134.72' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.97 cfs @ 12.09 hrs HW=134.72' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.97 cfs @ 0.98 fps)

Pond 3P: Pretreatment



Stage-Area-Storage for Pond 3P: Pretreatment

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
134.00	50	0
134.02	50	1
134.04	51	2
134.06	51	3
134.08	51	4
134.10	51	5
134.12	52	6
134.14	52	7
134.16	52	8
134.18	53	9
134.20	53	10
134.22	53	11
134.24	54	12
134.26	54	14
134.28	54	15
134.30	55	16
134.32	55	17
134.34	55	18
134.36	55	19
134.38	56	20
134.40	56	21
134.42	56	22
134.44	57	23
134.46	57	25
134.48	57	26
134.50	58	27
134.52	58	28
134.54	58	29
134.56	58	30
134.58	59	32
134.60	59	33
134.62	59	34
134.64	60	35
134.66	60	36
134.68	60	37
134.70	60	39
134.72	61	40
134.74	61	41
134.76	61	42
134.78	62	44
134.80	62	45
134.82	62	46
134.84	63	47
134.86	63	49
134.88	63	50
134.90	64	51
134.92	64	52
134.94	64	54
134.96	64	55
134.98	65	56
135.00	65	58
135.02	65	59
135.04	66	60
135.06	66	61
135.08	66	63
135.10	66	64
135.12	67	65
135.14	67	67
135.16	67	68
135.18	68	69
135.20	68	71
135.22	68	72
135.24	69	74
135.26	69	75
135.28	69	76
135.30	70	78
135.32	70	79
135.34	70	80
135.36	70	82
135.38	71	83
135.40	71	85
135.42	71	86
135.44	72	88
135.46	72	89
135.48	72	90
135.50	73	92
135.52	73	93
135.54	73	95
135.56	73	96
135.58	74	98
135.60	74	99
135.62	74	101
135.64	75	102
135.66	75	104
135.68	75	105
135.70	75	107
135.72	76	108
135.74	76	110
135.76	76	111
135.78	77	113
135.80	77	114
135.82	77	116
135.84	78	117
135.86	78	119
135.88	78	121
135.90	79	122
135.92	79	124
135.94	79	125
135.96	79	127
135.98	80	128
136.00	**80**	**130**

Summary for Pond DS: Dry Swale (O-1)

Inflow Area = 0.120 ac, 50.00% Impervious, Inflow Depth = 7.00" for 100 Year event
Inflow = 0.98 cfs @ 12.09 hrs, Volume= 0.070 af
Outflow = 0.96 cfs @ 12.10 hrs, Volume= 0.070 af, Atten= 1%, Lag= 0.8 min
Primary = 0.96 cfs @ 12.10 hrs, Volume= 0.070 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 135.12' @ 12.10 hrs Surf.Area= 544 sf Storage= 620 cf

Plug-Flow detention time= 225.1 min calculated for 0.070 af (100% of inflow)
Center-of-Mass det. time= 225.2 min (1,011.7 - 786.4)

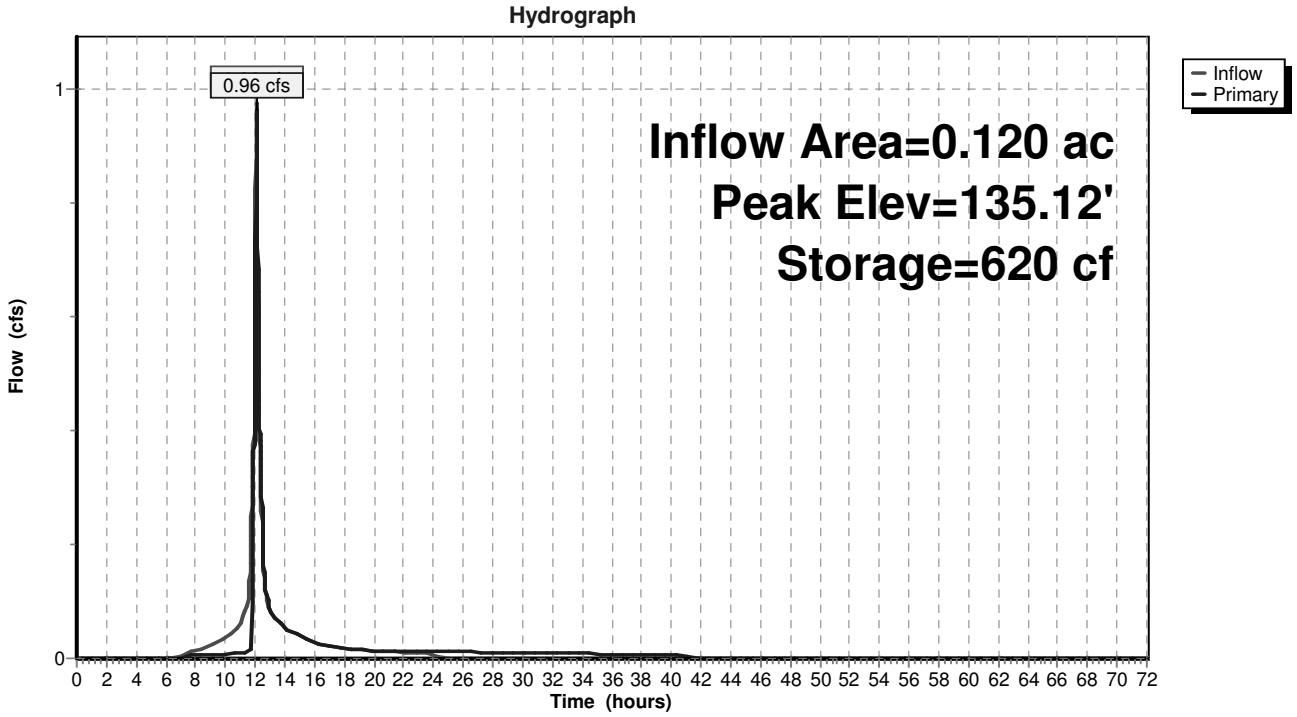
Volume	Invert	Avail.Storage	Storage Description
#1	133.50'	1,175 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
133.50	220	0	0
136.00	720	1,175	1,175

Device	Routing	Invert	Outlet Devices
#1	Primary	130.50'	**4.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 130.50' / 130.30' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#2	Device 1	133.50'	**1.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#3	Primary	135.00'	**8.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.96 cfs @ 12.10 hrs HW=135.12' (Free Discharge)
- **1=Culvert** (Passes 0.01 cfs of 0.70 cfs potential flow)
  - **2=Exfiltration** (Exfiltration Controls 0.01 cfs)
- **3=Broad-Crested Rectangular Weir** (Weir Controls 0.95 cfs @ 0.98 fps)

Pond DS: Dry Swale (O-1)



Stage-Area-Storage for Pond DS: Dry Swale (O-1)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
133.50	220	0
133.55	230	11
133.60	240	23
133.65	250	35
133.70	260	48
133.75	270	61
133.80	280	75
133.85	290	89
133.90	300	104
133.95	310	119
134.00	320	135
134.05	330	151
134.10	340	168
134.15	350	185
134.20	360	203
134.25	370	221
134.30	380	240
134.35	390	259
134.40	400	279
134.45	410	299
134.50	420	320
134.55	430	341
134.60	440	363
134.65	450	385
134.70	460	408
134.75	470	431
134.80	480	455
134.85	490	479
134.90	500	504
134.95	510	529
135.00	520	555
135.05	530	581
135.10	540	608
135.15	550	635
135.20	560	663
135.25	570	691
135.30	580	720
135.35	590	749
135.40	600	779
135.45	610	809
135.50	620	840
135.55	630	871
135.60	640	903
135.65	650	935
135.70	660	968
135.75	670	1,001
135.80	680	1,035
135.85	690	1,069
135.90	700	1,104
135.95	710	1,139
136.00	**720**	**1,175**

Summary for Pond FB: Forebay

Inflow Area = 2.528 ac, 21.08% Impervious, Inflow Depth = 7.19" for 100 Year event
Inflow = 16.07 cfs @ 12.12 hrs, Volume= 1.516 af
Outflow = 16.04 cfs @ 12.13 hrs, Volume= 1.516 af, Atten= 0%, Lag= 0.4 min
Discarded = 0.03 cfs @ 12.13 hrs, Volume= 0.081 af
Primary = 16.01 cfs @ 12.13 hrs, Volume= 1.435 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 142.91' @ 12.13 hrs Surf.Area= 1,461 sf Storage= 1,973 cf

Plug-Flow detention time= 33.7 min calculated for 1.515 af (100% of inflow)
Center-of-Mass det. time= 33.9 min (822.5 - 788.6)

Volume	Invert	Avail.Storage	Storage Description
#1	141.00'	4,650 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

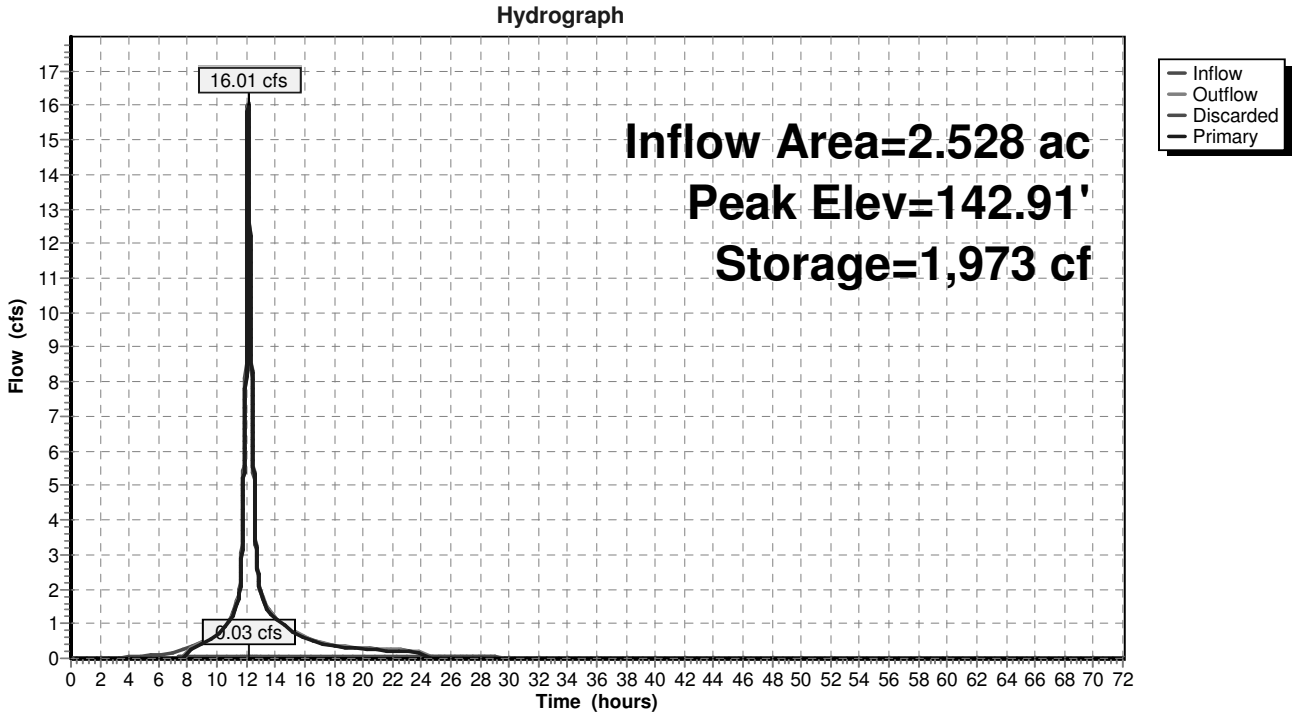
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
141.00	600	0	0
143.00	1,500	2,100	2,100
144.50	1,900	2,550	4,650

Device	Routing	Invert	Outlet Devices
#1	Primary	142.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#2	Discarded	141.00'	**1.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#3	Primary	142.50'	**20.0' long x 0.5' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00
			Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.03 cfs @ 12.13 hrs HW=142.91' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=15.99 cfs @ 12.13 hrs HW=142.91' (Free Discharge)
├─**1=Orifice/Grate** (Orifice Controls 0.38 cfs @ 2.19 fps)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 15.61 cfs @ 1.89 fps)

Pond FB: Forebay



Stage-Area-Storage for Pond FB: Forebay

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
141.00	600	0
141.05	623	31
141.10	645	62
141.15	668	95
141.20	690	129
141.25	713	164
141.30	735	200
141.35	757	238
141.40	780	276
141.45	802	316
141.50	825	356
141.55	848	398
141.60	870	441
141.65	893	485
141.70	915	530
141.75	938	577
141.80	960	624
141.85	982	673
141.90	1,005	722
141.95	1,027	773
142.00	1,050	825
142.05	1,073	878
142.10	1,095	932
142.15	1,118	988
142.20	1,140	1,044
142.25	1,163	1,102
142.30	1,185	1,160
142.35	1,207	1,220
142.40	1,230	1,281
142.45	1,252	1,343
142.50	1,275	1,406
142.55	1,298	1,471
142.60	1,320	1,536
142.65	1,343	1,603
142.70	1,365	1,670
142.75	1,388	1,739
142.80	1,410	1,809
142.85	1,432	1,880
142.90	1,455	1,952
142.95	1,477	2,026
143.00	1,500	2,100
143.05	1,513	2,175
143.10	1,527	2,251
143.15	1,540	2,328
143.20	1,553	2,405
143.25	1,567	2,483
143.30	1,580	2,562
143.35	1,593	2,641
143.40	1,607	2,721
143.45	1,620	2,802
143.50	1,633	2,883
143.55	1,647	2,965
143.60	1,660	3,048
143.65	1,673	3,131
143.70	1,687	3,215
143.75	1,700	3,300
143.80	1,713	3,385
143.85	1,727	3,471
143.90	1,740	3,558
143.95	1,753	3,645
144.00	1,767	3,733
144.05	1,780	3,822
144.10	1,793	3,911
144.15	1,807	4,001
144.20	1,820	4,092
144.25	1,833	4,183
144.30	1,847	4,275
144.35	1,860	4,368
144.40	1,873	4,461
144.45	1,887	4,555
144.50	**1,900**	**4,650**

Summary for Pond SF: Sand Filter (F-1)

Inflow Area = 2.528 ac, 21.08% Impervious, Inflow Depth = 6.81" for 100 Year event
Inflow = 16.01 cfs @ 12.13 hrs, Volume= 1.435 af
Outflow = 11.21 cfs @ 12.29 hrs, Volume= 1.435 af, Atten= 30%, Lag= 9.5 min
Primary = 11.21 cfs @ 12.29 hrs, Volume= 1.435 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 143.53' @ 12.29 hrs Surf.Area= 5,675 sf Storage= 14,901 cf

Plug-Flow detention time= 113.5 min calculated for 1.435 af (100% of inflow)
Center-of-Mass det. time= 113.6 min (909.4 - 795.8)

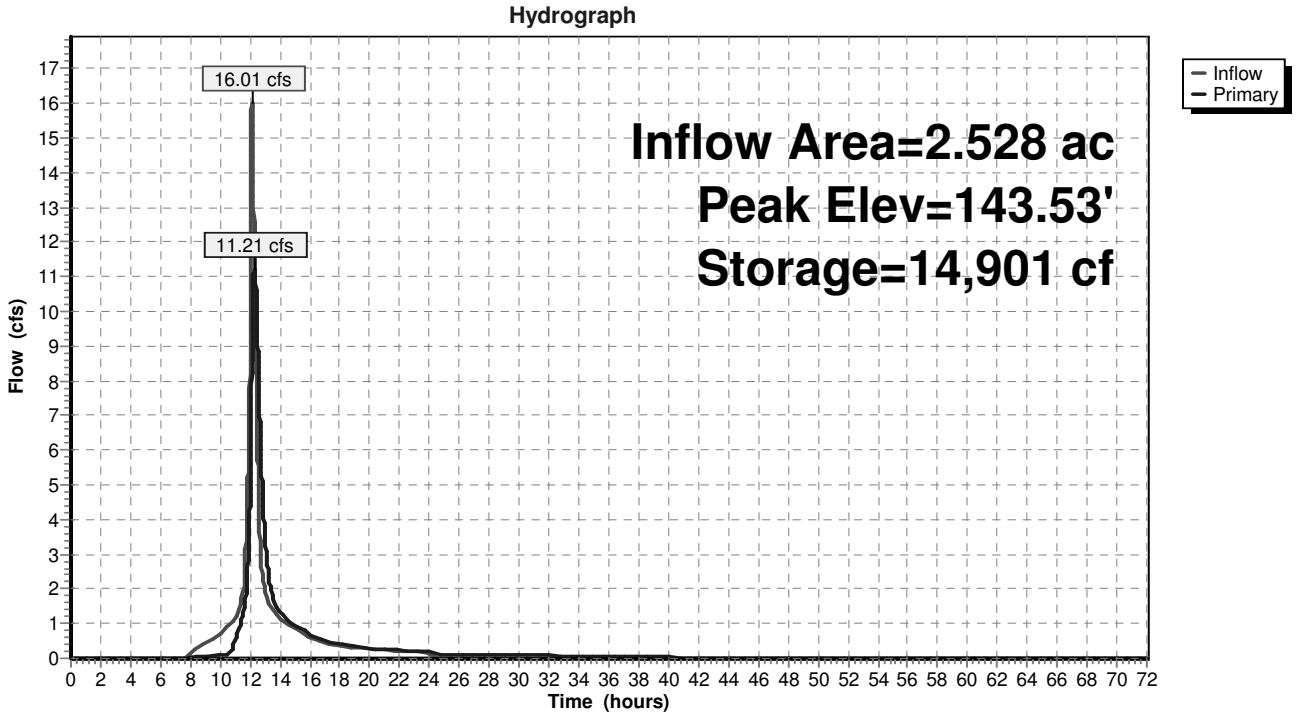
Volume	Invert	Avail.Storage	Storage Description
#1	140.00'	24,050 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
140.00	2,600	0	0
142.00	4,500	7,100	7,100
145.00	6,800	16,950	24,050

Device	Routing	Invert	Outlet Devices
#1	Primary	137.75'	**15.0" Round Culvert** L= 60.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 137.75' / 137.00' S= 0.0125 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	137.75'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Device 2	140.00'	**1.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#4	Device 1	141.30'	**1.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=11.21 cfs @ 12.29 hrs HW=143.53' (Free Discharge)
└─**1=Culvert** (Passes 11.21 cfs of 13.42 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes 0.13 cfs of 2.22 cfs potential flow)
  │ └─**3=Exfiltration** (Exfiltration Controls 0.13 cfs)
  └─**4=Broad-Crested Rectangular Weir** (Weir Controls 11.08 cfs @ 4.96 fps)

Pond SF: Sand Filter (F-1)



Stage-Area-Storage for Pond SF: Sand Filter (F-1)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
140.00	2,600	0
140.05	2,648	131
140.10	2,695	265
140.15	2,743	401
140.20	2,790	539
140.25	2,838	680
140.30	2,885	823
140.35	2,932	968
140.40	2,980	1,116
140.45	3,027	1,266
140.50	3,075	1,419
140.55	3,123	1,574
140.60	3,170	1,731
140.65	3,218	1,891
140.70	3,265	2,053
140.75	3,313	2,217
140.80	3,360	2,384
140.85	3,407	2,553
140.90	3,455	2,725
140.95	3,502	2,899
141.00	3,550	3,075
141.05	3,598	3,254
141.10	3,645	3,435
141.15	3,693	3,618
141.20	3,740	3,804
141.25	3,788	3,992
141.30	3,835	4,183
141.35	3,882	4,376
141.40	3,930	4,571
141.45	3,977	4,769
141.50	4,025	4,969
141.55	4,073	5,171
141.60	4,120	5,376
141.65	4,168	5,583
141.70	4,215	5,793
141.75	4,263	6,005
141.80	4,310	6,219
141.85	4,357	6,436
141.90	4,405	6,655
141.95	4,452	6,876
142.00	4,500	7,100
142.05	4,538	7,326
142.10	4,577	7,554
142.15	4,615	7,784
142.20	4,653	8,015
142.25	4,692	8,249
142.30	4,730	8,485
142.35	4,768	8,722
142.40	4,807	8,961
142.45	4,845	9,203
142.50	4,883	9,446
142.55	4,922	9,691
142.60	4,960	9,938
142.65	4,998	10,187
142.70	5,037	10,438
142.75	5,075	10,691
142.80	5,113	10,945
142.85	5,152	11,202
142.90	5,190	11,461
142.95	5,228	11,721
143.00	5,267	11,983
143.05	5,305	12,248
143.10	5,343	12,514
143.15	5,382	12,782
143.20	5,420	13,052
143.25	5,458	13,324
143.30	5,497	13,598
143.35	5,535	13,874
143.40	5,573	14,151
143.45	5,612	14,431
143.50	5,650	14,713
143.55	5,688	14,996
143.60	5,727	15,281
143.65	5,765	15,569
143.70	5,803	15,858
143.75	5,842	16,149
143.80	5,880	16,442
143.85	5,918	16,737
143.90	5,957	17,034
143.95	5,995	17,333
144.00	6,033	17,633
144.05	6,072	17,936
144.10	6,110	18,240
144.15	6,148	18,547
144.20	6,187	18,855
144.25	6,225	19,166
144.30	6,263	19,478
144.35	6,302	19,792
144.40	6,340	20,108
144.45	6,378	20,426
144.50	6,417	20,746
144.55	6,455	21,068
144.60	6,493	21,391
144.65	6,532	21,717
144.70	6,570	22,044
144.75	6,608	22,374
144.80	6,647	22,705
144.85	6,685	23,039
144.90	6,723	23,374
144.95	6,762	23,711
145.00	**6,800**	**24,050**

Summary for Subcatchment PDA-1: Remaining DP 1

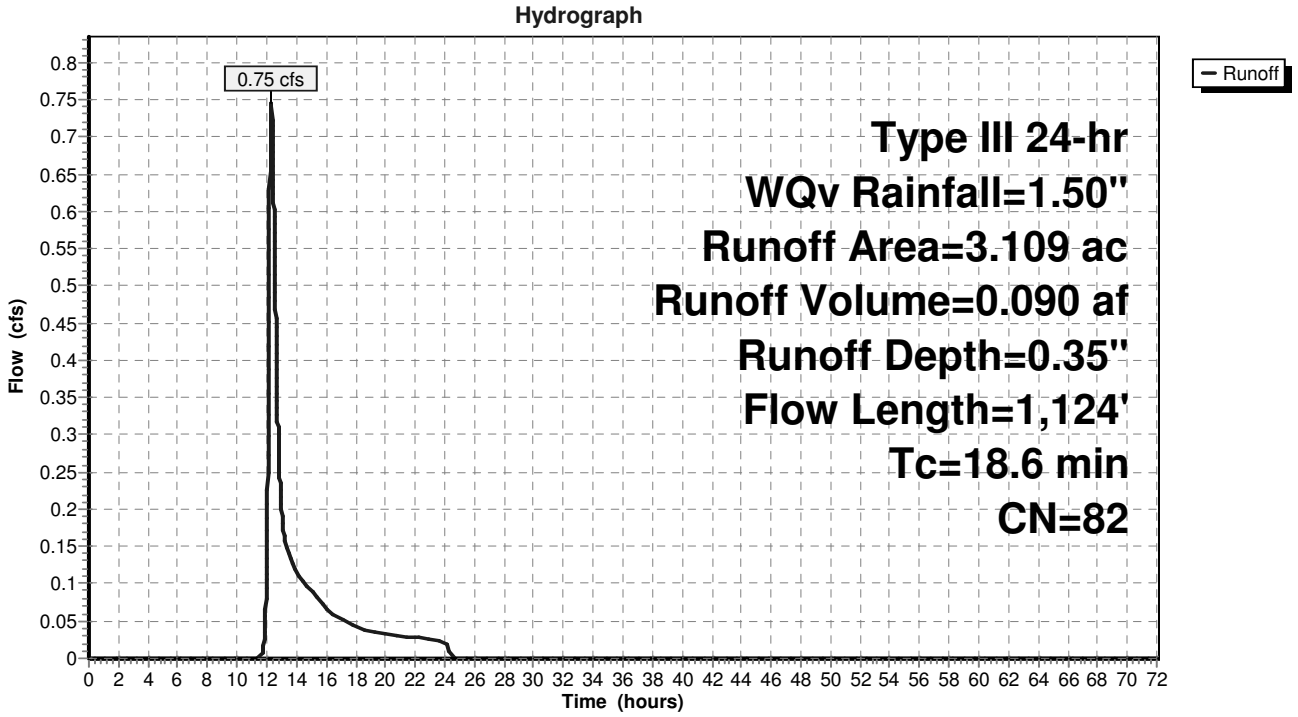
Runoff = 0.75 cfs @ 12.30 hrs, Volume= 0.090 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr WQv Rainfall=1.50"

Area (ac)	CN	Description
1.752	79	50-75% Grass cover, Fair, HSG C
0.791	79	50-75% Grass cover, Fair, HSG C
0.118	89	Gravel roads, HSG C
0.448	98	Paved parking, HSG C
3.109	82	Weighted Average
2.661		85.59% Pervious Area
0.448		14.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0210	0.18		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
3.3	250	0.0320	1.25		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
0.5	141	0.0990	4.72		**Shallow Concentrated Flow, 3 to 4** Grassed Waterway Kv= 15.0 fps
5.6	633	0.0160	1.90		**Shallow Concentrated Flow, 4 to 5** Grassed Waterway Kv= 15.0 fps
18.6	1,124	Total			

Subcatchment PDA-1: Remaining DP 1



Summary for Subcatchment PDA-2A: Remaining DP 2

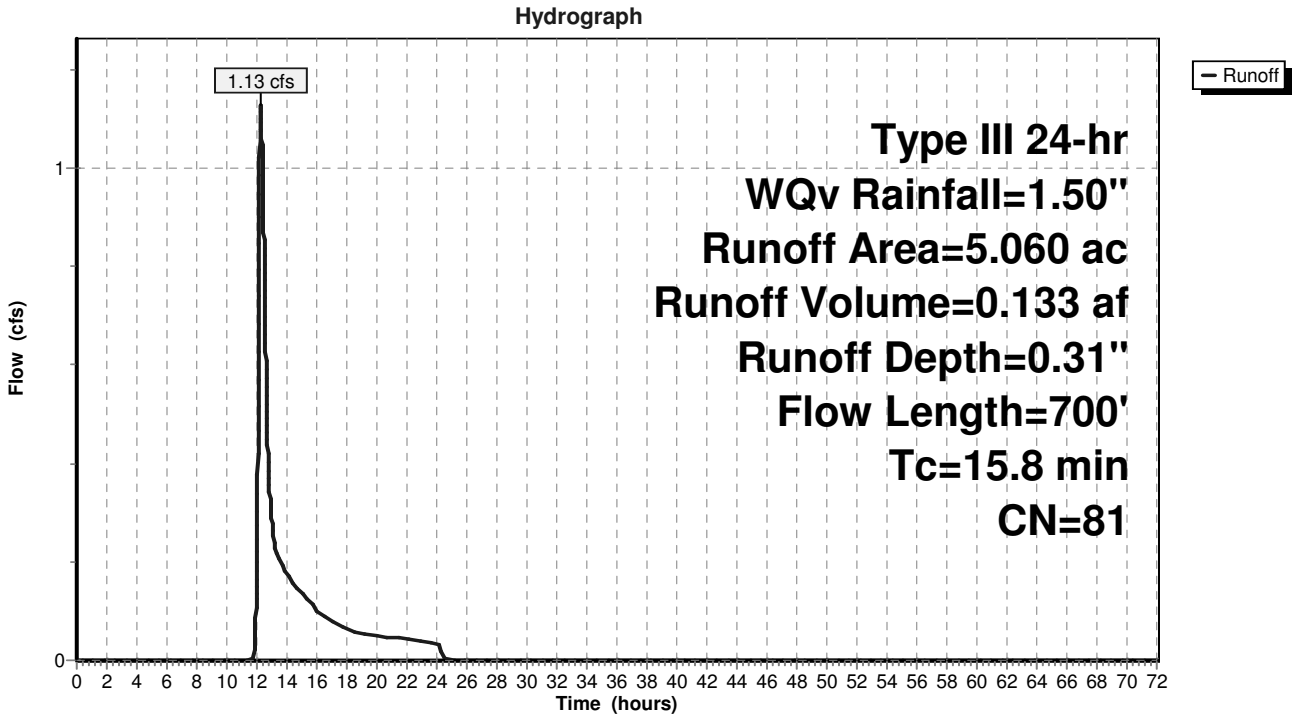
Runoff = 1.13 cfs @ 12.26 hrs, Volume= 0.133 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr WQv Rainfall=1.50"

Area (ac)	CN	Description
0.892	84	50-75% Grass cover, Fair, HSG D
3.971	79	50-75% Grass cover, Fair, HSG C
0.197	98	Paved parking, HSG C
5.060	81	Weighted Average
4.863		96.11% Pervious Area
0.197		3.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	150	0.0330	0.24		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
5.2	550	0.0630	1.76		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
15.8	700	Total			

Subcatchment PDA-2A: Remaining DP 2



Summary for Subcatchment PDA-2B: Forebay Contributing Area

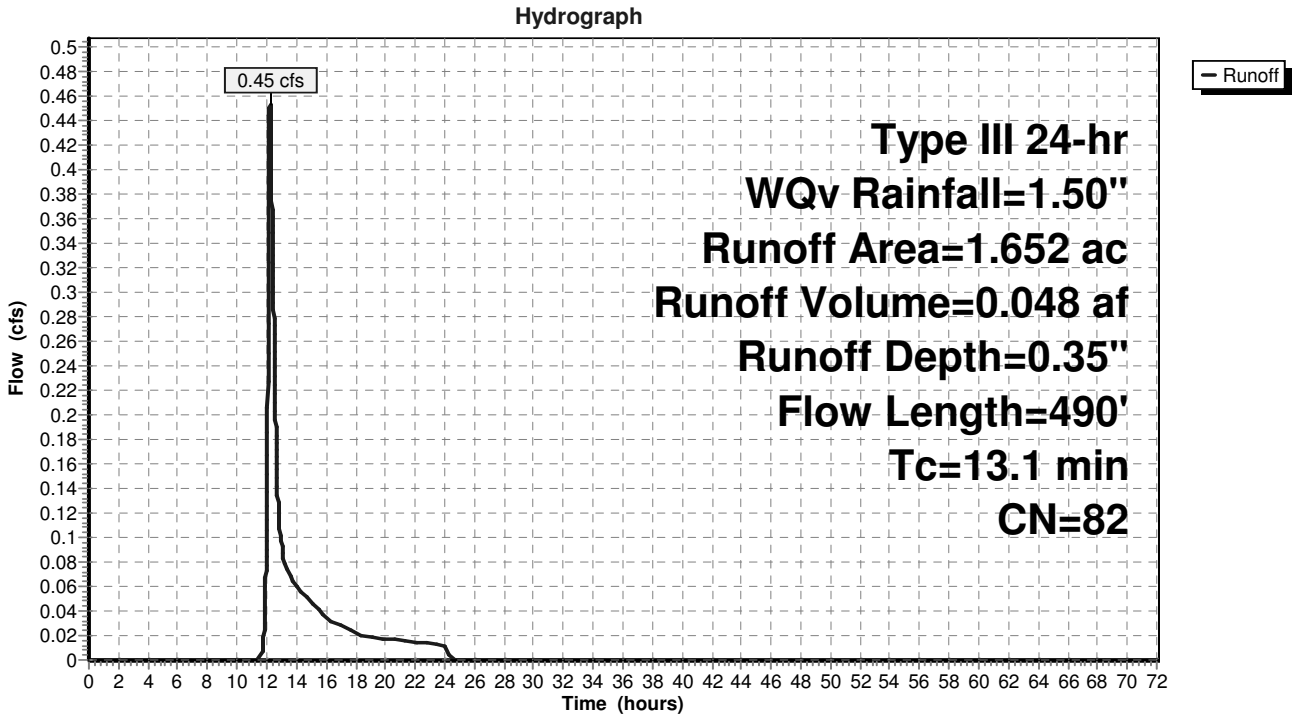
Runoff = 0.45 cfs @ 12.21 hrs, Volume= 0.048 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr WQv Rainfall=1.50"

Area (ac)	CN	Description
0.286	98	Paved parking, HSG C
0.895	74	>75% Grass cover, Good, HSG C
0.471	89	Gravel roads, HSG C
1.652	82	Weighted Average
1.366		82.69% Pervious Area
0.286		17.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	100	0.0210	0.18		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
2.8	288	0.0600	1.71		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
1.1	102	0.0100	1.50		**Shallow Concentrated Flow, 3 to 4** Grassed Waterway Kv= 15.0 fps
13.1	490	Total			

Subcatchment PDA-2B: Forebay Contributing Area



Summary for Subcatchment PDA-2C: Sand Filter Contributing Area

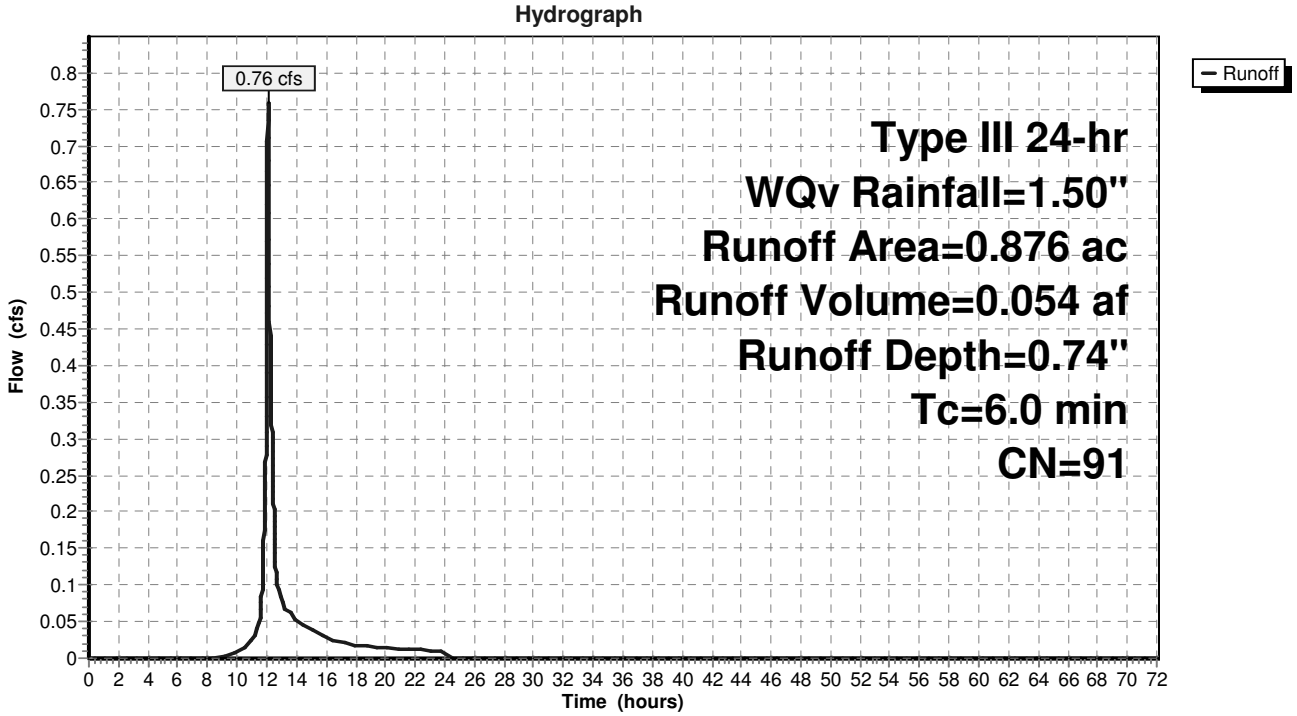
Runoff = 0.76 cfs @ 12.09 hrs, Volume= 0.054 af, Depth= 0.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr WQv Rainfall=1.50"

Area (ac)	CN	Description
0.029	74	>75% Grass cover, Good, HSG C
0.600	89	Gravel roads, HSG C
0.247	98	Paved parking, HSG C
0.876	91	Weighted Average
0.629		71.80% Pervious Area
0.247		28.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PDA-2C: Sand Filter Contributing Area



Summary for Subcatchment PDA-2D: Dry Swale Contributing Area

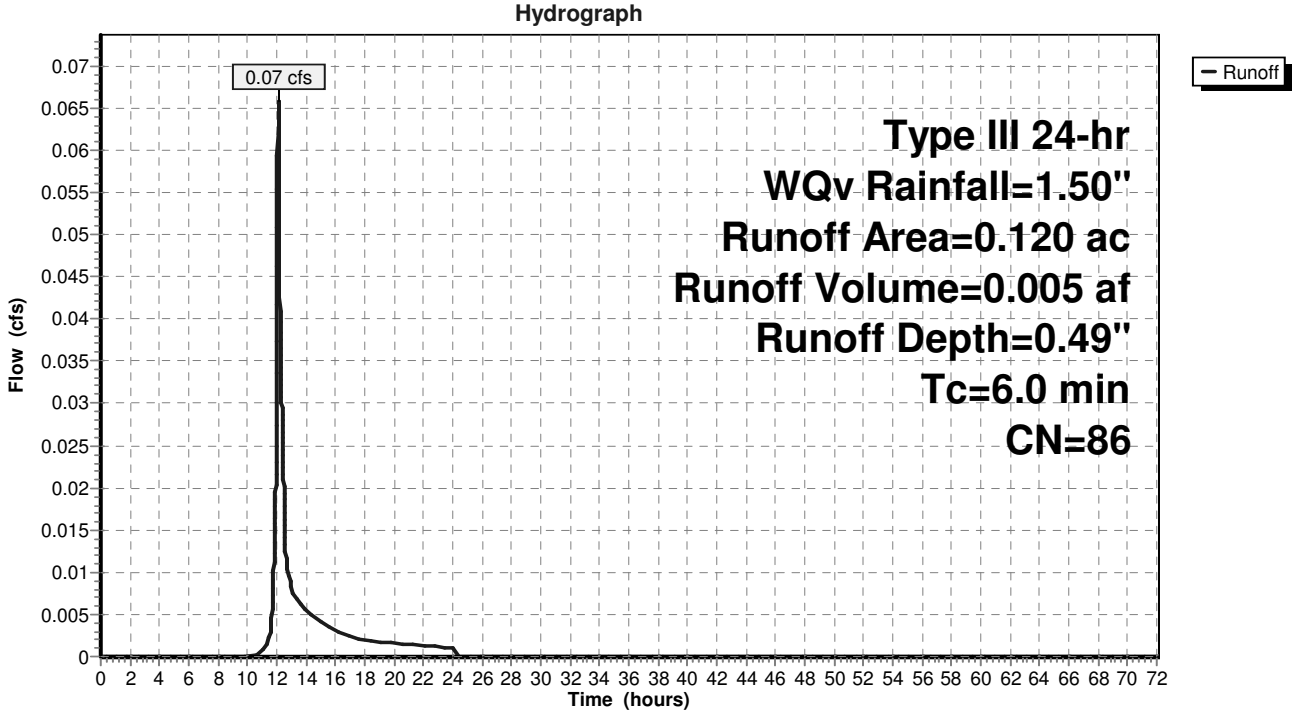
Runoff = 0.07 cfs @ 12.10 hrs, Volume= 0.005 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr WQv Rainfall=1.50"

Area (ac)	CN	Description
0.060	98	Paved parking, HSG C
0.060	74	>75% Grass cover, Good, HSG C
0.120	86	Weighted Average
0.060		50.00% Pervious Area
0.060		50.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct**

Subcatchment PDA-2D: Dry Swale Contributing Area



Summary for Subcatchment PDA-3: Remaining DP 3

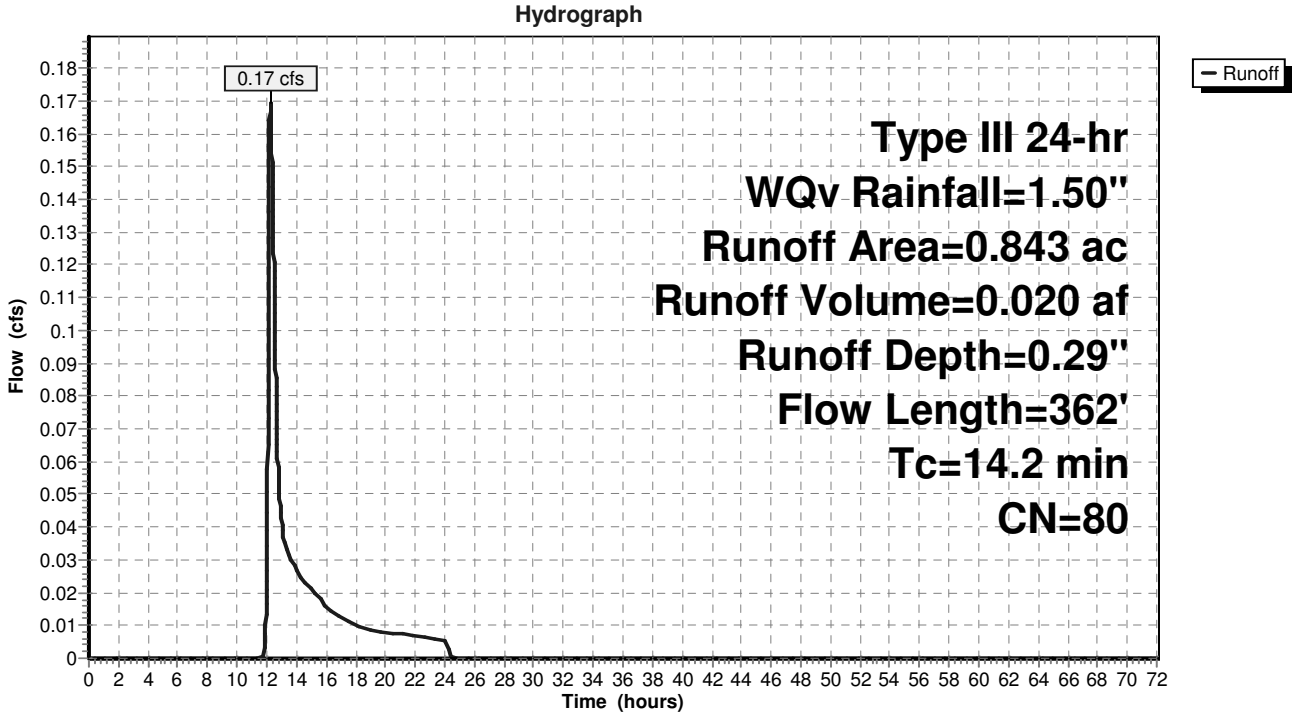
Runoff = 0.17 cfs @ 12.23 hrs, Volume= 0.020 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr WQv Rainfall=1.50"

Area (ac)	CN	Description
0.737	79	50-75% Grass cover, Fair, HSG C
0.106	89	Gravel roads, HSG C
0.843	80	Weighted Average
0.843		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	150	0.0266	0.22		**Sheet Flow, 1 to 2** Grass: Short n= 0.150 P2= 3.50"
2.6	212	0.0377	1.36		**Shallow Concentrated Flow, 2 to 3** Short Grass Pasture Kv= 7.0 fps
14.2	362	Total			

Subcatchment PDA-3: Remaining DP 3

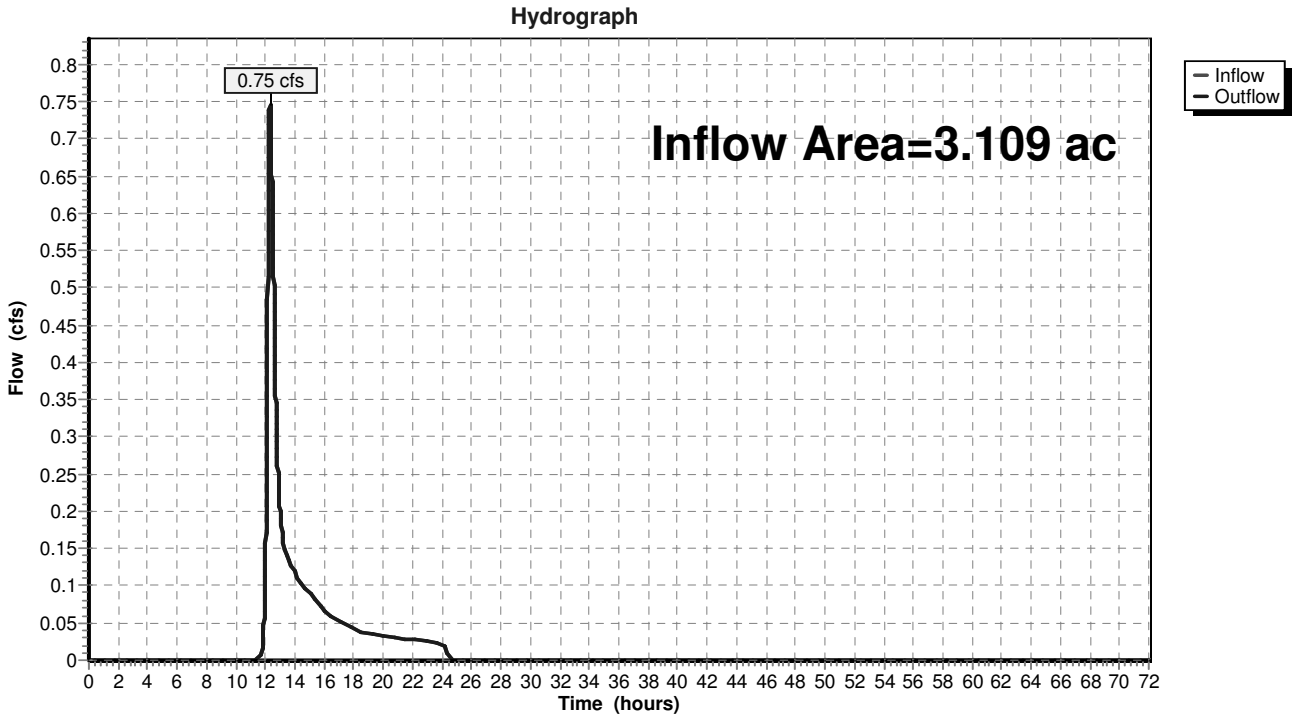


Summary for Reach DP 1:

Inflow Area = 3.109 ac, 14.41% Impervious, Inflow Depth = 0.35" for WQv event
Inflow = 0.75 cfs @ 12.30 hrs, Volume= 0.090 af
Outflow = 0.75 cfs @ 12.30 hrs, Volume= 0.090 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 1:

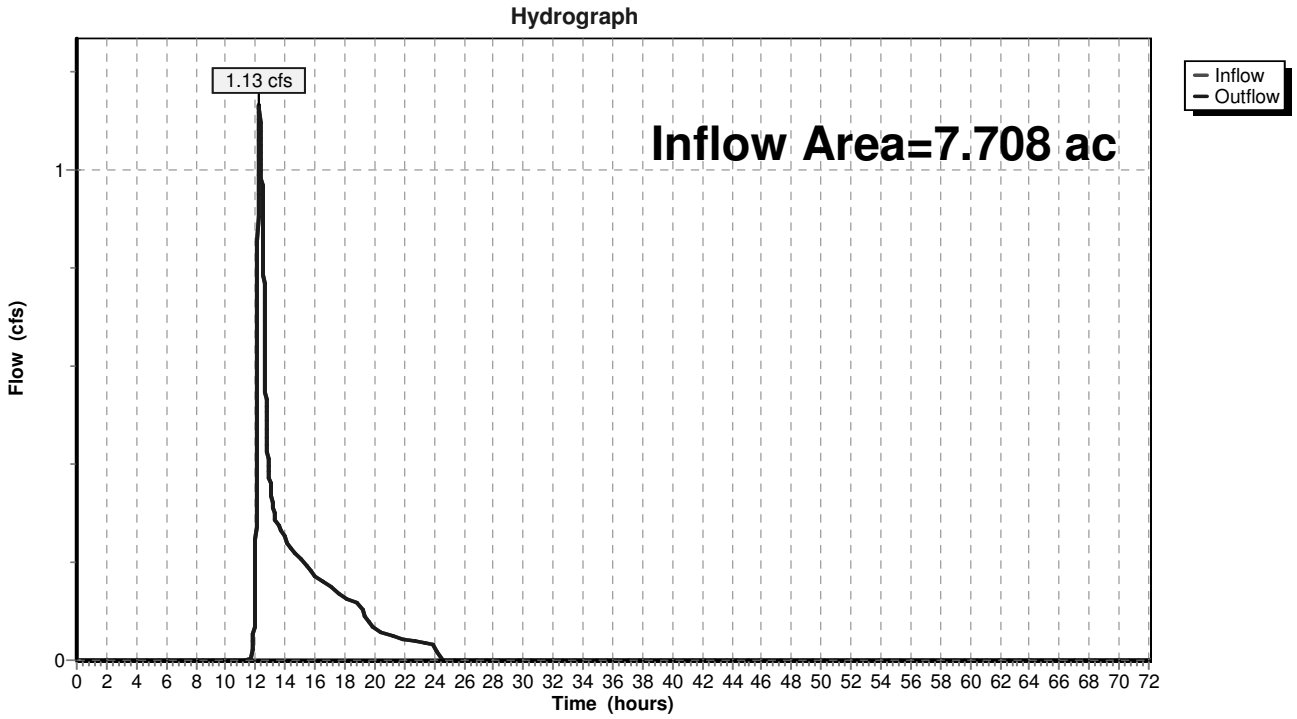


Summary for Reach DP 2:

Inflow Area = 7.708 ac, 10.25% Impervious, Inflow Depth = 0.27" for WQv event
Inflow = 1.13 cfs @ 12.26 hrs, Volume= 0.174 af
Outflow = 1.13 cfs @ 12.26 hrs, Volume= 0.174 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 2:

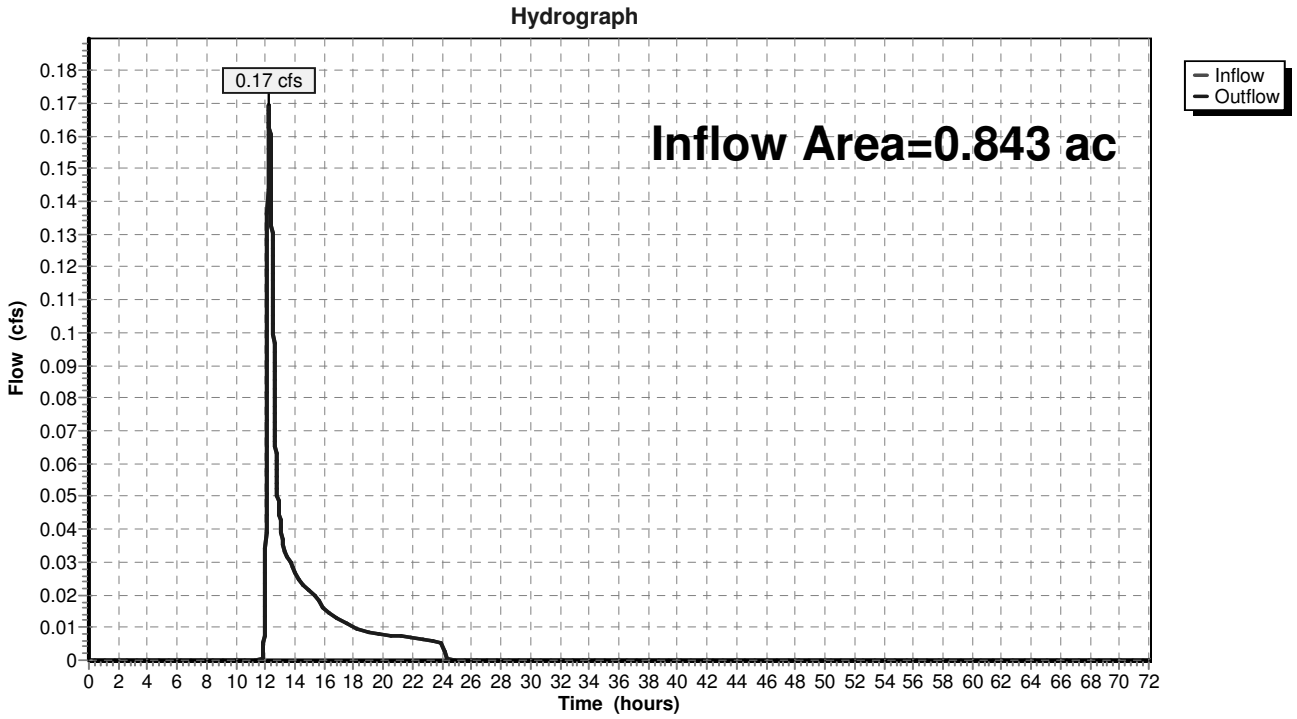


Summary for Reach DP 3:

Inflow Area = 0.843 ac, 0.00% Impervious, Inflow Depth = 0.29" for WQv event
Inflow = 0.17 cfs @ 12.23 hrs, Volume= 0.020 af
Outflow = 0.17 cfs @ 12.23 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach DP 3:



Summary for Pond 3P: Pretreatment

Inflow Area = 0.120 ac, 50.00% Impervious, Inflow Depth = 0.49" for WQv event
Inflow = 0.07 cfs @ 12.10 hrs, Volume= 0.005 af
Outflow = 0.07 cfs @ 12.10 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.3 min
Discarded = 0.00 cfs @ 12.10 hrs, Volume= 0.002 af
Primary = 0.06 cfs @ 12.10 hrs, Volume= 0.003 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 134.62' @ 12.10 hrs Surf.Area= 59 sf Storage= 34 cf

Plug-Flow detention time= 140.3 min calculated for 0.005 af (100% of inflow)
Center-of-Mass det. time= 140.3 min (1,001.6 - 861.3)

Volume	Invert	Avail.Storage	Storage Description
#1	134.00'	130 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

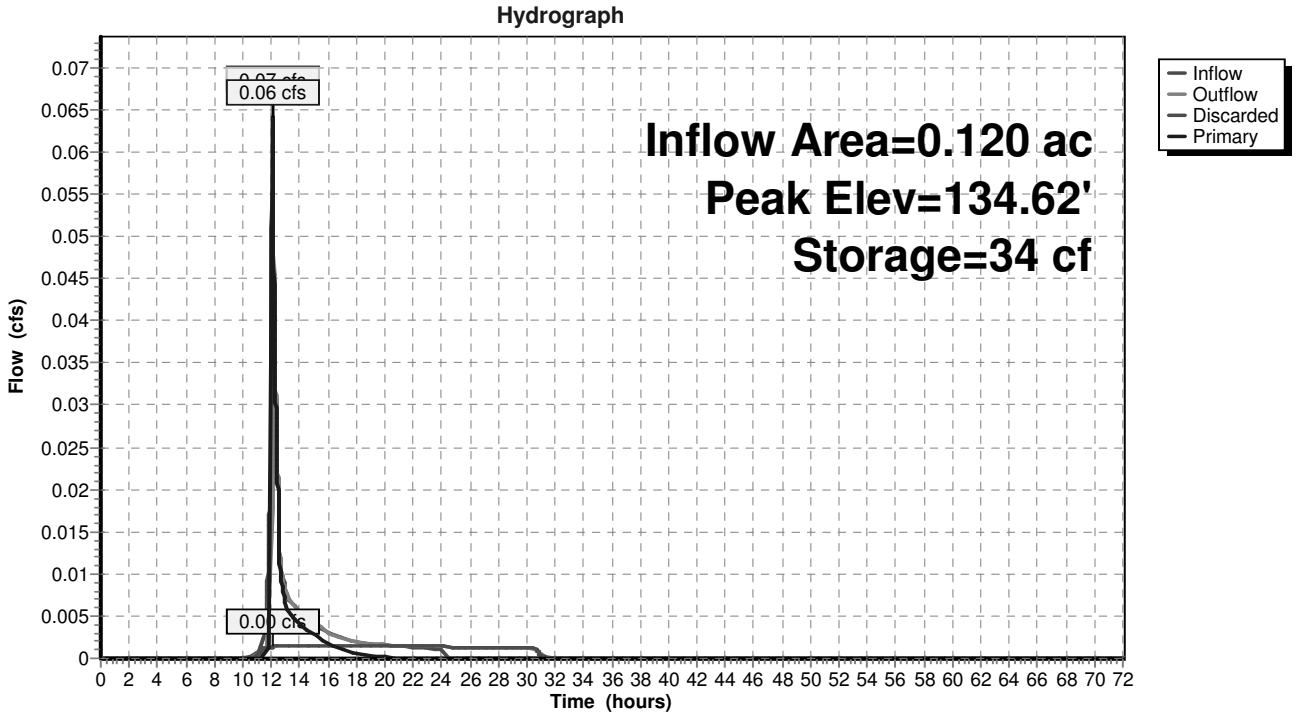
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
134.00	50	0	0
136.00	80	130	130

Device	Routing	Invert	Outlet Devices
#1	Discarded	134.00'	**1.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	134.60'	**8.0' long x 0.5' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00
			Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.00 cfs @ 12.10 hrs HW=134.62' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.06 cfs @ 12.10 hrs HW=134.62' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.06 cfs @ 0.40 fps)

Pond 3P: Pretreatment



Stage-Area-Storage for Pond 3P: Pretreatment

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
134.00	50	0
134.02	50	1
134.04	51	2
134.06	51	3
134.08	51	4
134.10	51	5
134.12	52	6
134.14	52	7
134.16	52	8
134.18	53	9
134.20	53	10
134.22	53	11
134.24	54	12
134.26	54	14
134.28	54	15
134.30	55	16
134.32	55	17
134.34	55	18
134.36	55	19
134.38	56	20
134.40	56	21
134.42	56	22
134.44	57	23
134.46	57	25
134.48	57	26
134.50	58	27
134.52	58	28
134.54	58	29
134.56	58	30
134.58	59	32
134.60	59	33
134.62	59	34
134.64	60	35
134.66	60	36
134.68	60	37
134.70	60	39
134.72	61	40
134.74	61	41
134.76	61	42
134.78	62	44
134.80	62	45
134.82	62	46
134.84	63	47
134.86	63	49
134.88	63	50
134.90	64	51
134.92	64	52
134.94	64	54
134.96	64	55
134.98	65	56
135.00	65	58
135.02	65	59
135.04	66	60
135.06	66	61
135.08	66	63
135.10	66	64
135.12	67	65
135.14	67	67
135.16	67	68
135.18	68	69
135.20	68	71
135.22	68	72
135.24	69	74
135.26	69	75
135.28	69	76
135.30	70	78
135.32	70	79
135.34	70	80
135.36	70	82
135.38	71	83
135.40	71	85
135.42	71	86
135.44	72	88
135.46	72	89
135.48	72	90
135.50	73	92
135.52	73	93
135.54	73	95
135.56	73	96
135.58	74	98
135.60	74	99
135.62	74	101
135.64	75	102
135.66	75	104
135.68	75	105
135.70	75	107
135.72	76	108
135.74	76	110
135.76	76	111
135.78	77	113
135.80	77	114
135.82	77	116
135.84	78	117
135.86	78	119
135.88	78	121
135.90	79	122
135.92	79	124
135.94	79	125
135.96	79	127
135.98	80	128
136.00	**80**	**130**

Summary for Pond DS: Dry Swale (O-1)

Inflow Area = 0.120 ac, 50.00% Impervious, Inflow Depth = 0.28" for WQv event
Inflow = 0.06 cfs @ 12.10 hrs, Volume= 0.003 af
Outflow = 0.01 cfs @ 13.09 hrs, Volume= 0.003 af, Atten= 91%, Lag= 59.3 min
Primary = 0.01 cfs @ 13.09 hrs, Volume= 0.003 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 133.71' @ 13.09 hrs Surf.Area= 263 sf Storage= 52 cf

Plug-Flow detention time= 94.9 min calculated for 0.003 af (100% of inflow)
Center-of-Mass det. time= 94.9 min (899.2 - 804.3)

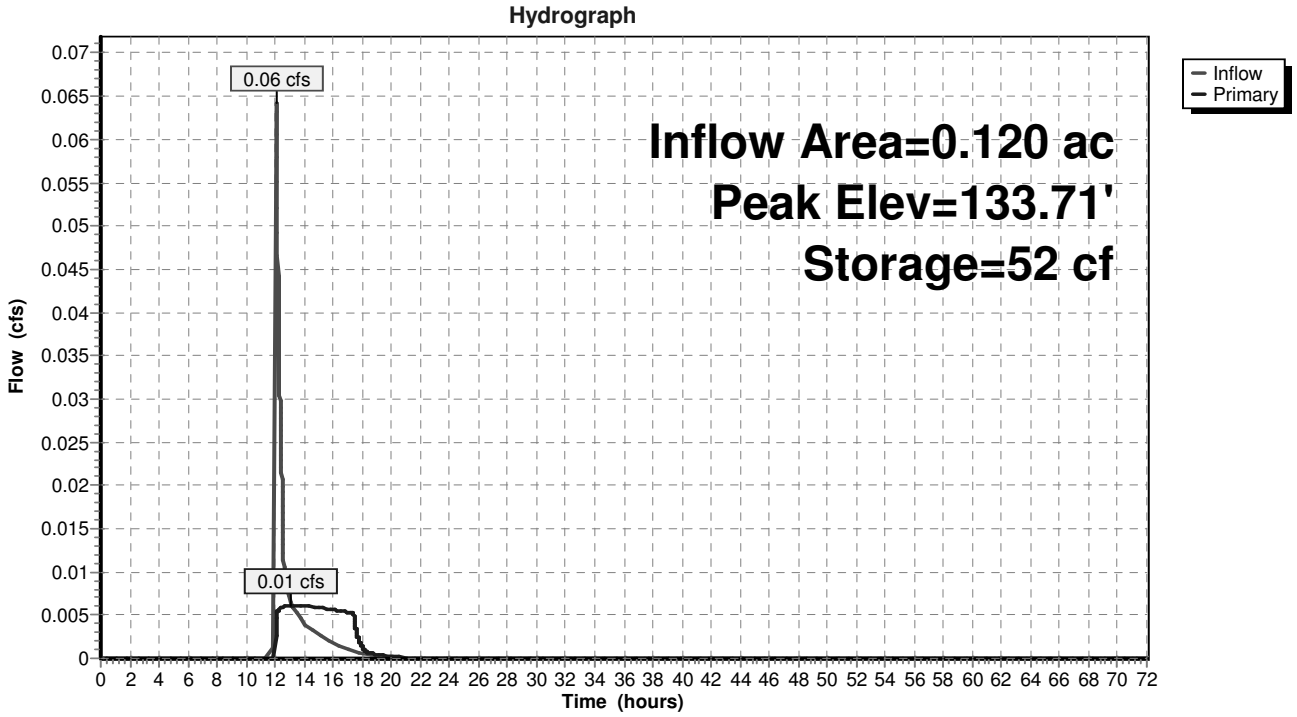
Volume	Invert	Avail.Storage	Storage Description
#1	133.50'	1,175 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
133.50	220	0	0
136.00	720	1,175	1,175

Device	Routing	Invert	Outlet Devices
#1	Primary	130.50'	**4.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 130.50' / 130.30' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#2	Device 1	133.50'	**1.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#3	Primary	135.00'	**8.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.01 cfs @ 13.09 hrs HW=133.71' (Free Discharge)
- **1=Culvert** (Passes 0.01 cfs of 0.58 cfs potential flow)
  - **2=Exfiltration** (Exfiltration Controls 0.01 cfs)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond DS: Dry Swale (O-1)



Stage-Area-Storage for Pond DS: Dry Swale (O-1)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
133.50	220	0
133.55	230	11
133.60	240	23
133.65	250	35
133.70	260	48
133.75	270	61
133.80	280	75
133.85	290	89
133.90	300	104
133.95	310	119
134.00	320	135
134.05	330	151
134.10	340	168
134.15	350	185
134.20	360	203
134.25	370	221
134.30	380	240
134.35	390	259
134.40	400	279
134.45	410	299
134.50	420	320
134.55	430	341
134.60	440	363
134.65	450	385
134.70	460	408
134.75	470	431
134.80	480	455
134.85	490	479
134.90	500	504
134.95	510	529
135.00	520	555
135.05	530	581
135.10	540	608
135.15	550	635
135.20	560	663
135.25	570	691
135.30	580	720
135.35	590	749
135.40	600	779
135.45	610	809
135.50	620	840
135.55	630	871
135.60	640	903
135.65	650	935
135.70	660	968
135.75	670	1,001
135.80	680	1,035
135.85	690	1,069
135.90	700	1,104
135.95	710	1,139
136.00	**720**	**1,175**

Summary for Pond FB: Forebay

Inflow Area =	2.528 ac, 21.08% Impervious, Inflow Depth = 0.48" for WQv event				
Inflow =	1.06 cfs @	12.11 hrs,	Volume=	0.102 af	
Outflow =	0.57 cfs @	12.42 hrs,	Volume=	0.102 af,	Atten= 46%, Lag= 18.3 min
Discarded =	0.03 cfs @	12.42 hrs,	Volume=	0.063 af	
Primary =	0.54 cfs @	12.42 hrs,	Volume=	0.039 af	

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 142.54' @ 12.42 hrs Surf.Area= 1,295 sf Storage= 1,463 cf

Plug-Flow detention time= 373.0 min calculated for 0.102 af (100% of inflow)
Center-of-Mass det. time= 373.1 min (1,233.2 - 860.1)

Volume	Invert	Avail.Storage	Storage Description
#1	141.00'	4,650 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

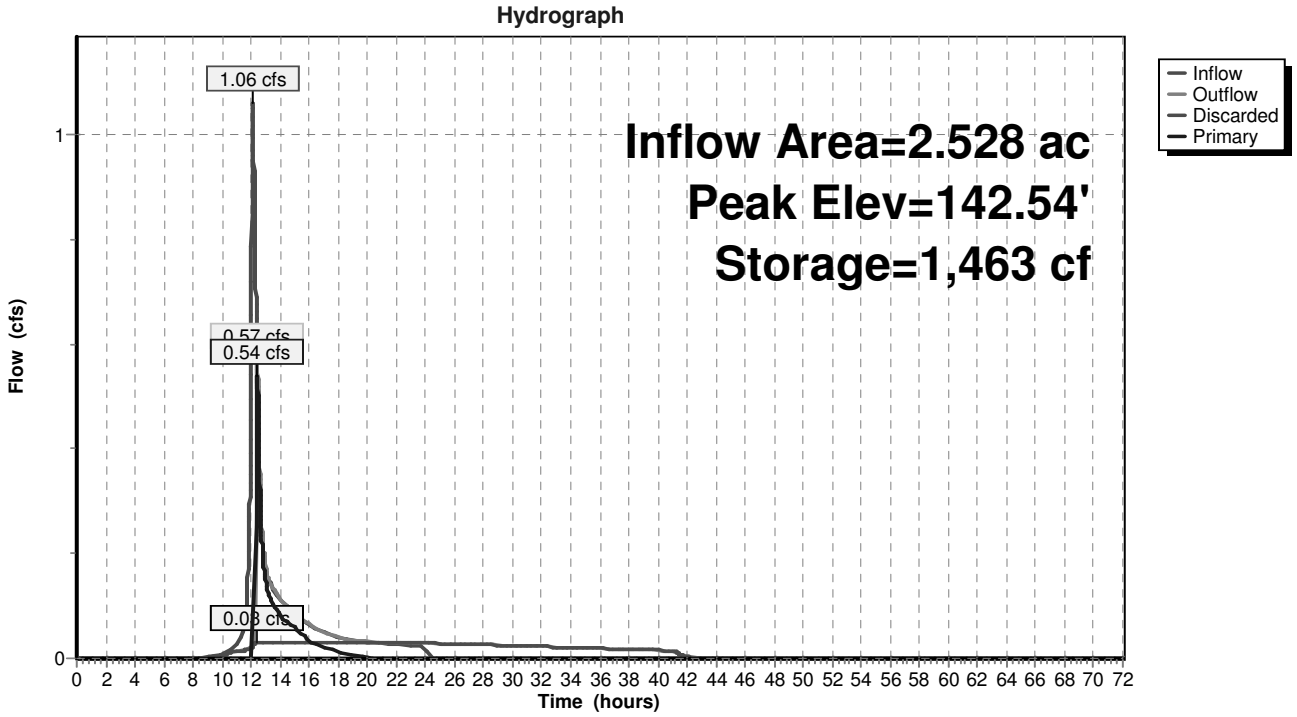
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
141.00	600	0	0
143.00	1,500	2,100	2,100
144.50	1,900	2,550	4,650

Device	Routing	Invert	Outlet Devices
#1	Primary	142.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#2	Discarded	141.00'	**1.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#3	Primary	142.50'	**20.0' long x 0.5' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00
			Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.03 cfs @ 12.42 hrs HW=142.54' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.53 cfs @ 12.42 hrs HW=142.54' (Free Discharge)
├─**1=Orifice/Grate** (Orifice Controls 0.01 cfs @ 0.72 fps)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 0.52 cfs @ 0.59 fps)

Pond FB: Forebay



Stage-Area-Storage for Pond FB: Forebay

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
141.00	600	0
141.05	623	31
141.10	645	62
141.15	668	95
141.20	690	129
141.25	713	164
141.30	735	200
141.35	757	238
141.40	780	276
141.45	802	316
141.50	825	356
141.55	848	398
141.60	870	441
141.65	893	485
141.70	915	530
141.75	938	577
141.80	960	624
141.85	982	673
141.90	1,005	722
141.95	1,027	773
142.00	1,050	825
142.05	1,073	878
142.10	1,095	932
142.15	1,118	988
142.20	1,140	1,044
142.25	1,163	1,102
142.30	1,185	1,160
142.35	1,207	1,220
142.40	1,230	1,281
142.45	1,252	1,343
142.50	1,275	1,406
142.55	1,298	1,471
142.60	1,320	1,536
142.65	1,343	1,603
142.70	1,365	1,670
142.75	1,388	1,739
142.80	1,410	1,809
142.85	1,432	1,880
142.90	1,455	1,952
142.95	1,477	2,026
143.00	1,500	2,100
143.05	1,513	2,175
143.10	1,527	2,251
143.15	1,540	2,328
143.20	1,553	2,405
143.25	1,567	2,483
143.30	1,580	2,562
143.35	1,593	2,641
143.40	1,607	2,721
143.45	1,620	2,802
143.50	1,633	2,883
143.55	1,647	2,965
143.60	1,660	3,048
143.65	1,673	3,131
143.70	1,687	3,215
143.75	1,700	3,300
143.80	1,713	3,385
143.85	1,727	3,471
143.90	1,740	3,558
143.95	1,753	3,645
144.00	1,767	3,733
144.05	1,780	3,822
144.10	1,793	3,911
144.15	1,807	4,001
144.20	1,820	4,092
144.25	1,833	4,183
144.30	1,847	4,275
144.35	1,860	4,368
144.40	1,873	4,461
144.45	1,887	4,555
144.50	**1,900**	**4,650**

Summary for Pond SF: Sand Filter (F-1)

Inflow Area = 2.528 ac, 21.08% Impervious, Inflow Depth = 0.18" for WQv event
Inflow = 0.54 cfs @ 12.42 hrs, Volume= 0.039 af
Outflow = 0.07 cfs @ 14.62 hrs, Volume= 0.039 af, Atten= 88%, Lag= 132.1 min
Primary = 0.07 cfs @ 14.62 hrs, Volume= 0.039 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 140.26' @ 14.62 hrs Surf.Area= 2,850 sf Storage= 716 cf

Plug-Flow detention time= 127.7 min calculated for 0.039 af (100% of inflow)
Center-of-Mass det. time= 127.7 min (961.8 - 834.1)

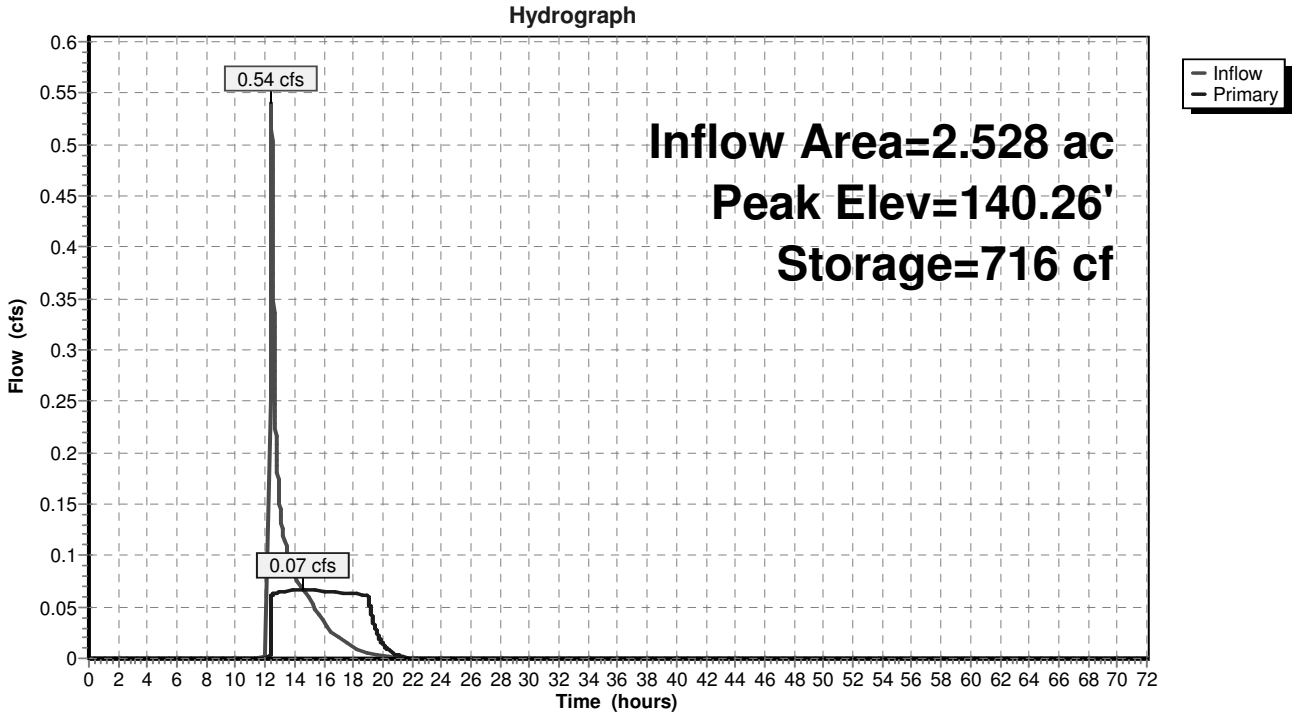
Volume	Invert	Avail.Storage	Storage Description
#1	140.00'	24,050 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
140.00	2,600	0	0
142.00	4,500	7,100	7,100
145.00	6,800	16,950	24,050

Device	Routing	Invert	Outlet Devices
#1	Primary	137.75'	**15.0" Round Culvert** L= 60.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 137.75' / 137.00' S= 0.0125 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	137.75'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Device 2	140.00'	**1.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#4	Device 1	141.30'	**1.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.07 cfs @ 14.62 hrs HW=140.26' (Free Discharge)
└─**1=Culvert** (Passes 0.07 cfs of 8.12 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes 0.07 cfs of 1.42 cfs potential flow)
  │ └─**3=Exfiltration** (Exfiltration Controls 0.07 cfs)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond SF: Sand Filter (F-1)



Stage-Area-Storage for Pond SF: Sand Filter (F-1)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
140.00	2,600	0
140.05	2,648	131
140.10	2,695	265
140.15	2,743	401
140.20	2,790	539
140.25	2,838	680
140.30	2,885	823
140.35	2,932	968
140.40	2,980	1,116
140.45	3,027	1,266
140.50	3,075	1,419
140.55	3,123	1,574
140.60	3,170	1,731
140.65	3,218	1,891
140.70	3,265	2,053
140.75	3,313	2,217
140.80	3,360	2,384
140.85	3,407	2,553
140.90	3,455	2,725
140.95	3,502	2,899
141.00	3,550	3,075
141.05	3,598	3,254
141.10	3,645	3,435
141.15	3,693	3,618
141.20	3,740	3,804
141.25	3,788	3,992
141.30	3,835	4,183
141.35	3,882	4,376
141.40	3,930	4,571
141.45	3,977	4,769
141.50	4,025	4,969
141.55	4,073	5,171
141.60	4,120	5,376
141.65	4,168	5,583
141.70	4,215	5,793
141.75	4,263	6,005
141.80	4,310	6,219
141.85	4,357	6,436
141.90	4,405	6,655
141.95	4,452	6,876
142.00	4,500	7,100
142.05	4,538	7,326
142.10	4,577	7,554
142.15	4,615	7,784
142.20	4,653	8,015
142.25	4,692	8,249
142.30	4,730	8,485
142.35	4,768	8,722
142.40	4,807	8,961
142.45	4,845	9,203
142.50	4,883	9,446
142.55	4,922	9,691
142.60	4,960	9,938
142.65	4,998	10,187
142.70	5,037	10,438
142.75	5,075	10,691
142.80	5,113	10,945
142.85	5,152	11,202
142.90	5,190	11,461
142.95	5,228	11,721
143.00	5,267	11,983
143.05	5,305	12,248
143.10	5,343	12,514
143.15	5,382	12,782
143.20	5,420	13,052
143.25	5,458	13,324
143.30	5,497	13,598
143.35	5,535	13,874
143.40	5,573	14,151
143.45	5,612	14,431
143.50	5,650	14,713
143.55	5,688	14,996
143.60	5,727	15,281
143.65	5,765	15,569
143.70	5,803	15,858
143.75	5,842	16,149
143.80	5,880	16,442
143.85	5,918	16,737
143.90	5,957	17,034
143.95	5,995	17,333
144.00	6,033	17,633
144.05	6,072	17,936
144.10	6,110	18,240
144.15	6,148	18,547
144.20	6,187	18,855
144.25	6,225	19,166
144.30	6,263	19,478
144.35	6,302	19,792
144.40	6,340	20,108
144.45	6,378	20,426
144.50	6,417	20,746
144.55	6,455	21,068
144.60	6,493	21,391
144.65	6,532	21,717
144.70	6,570	22,044
144.75	6,608	22,374
144.80	6,647	22,705
144.85	6,685	23,039
144.90	6,723	23,374
144.95	6,762	23,711
145.00	**6,800**	**24,050**

SECTION 7

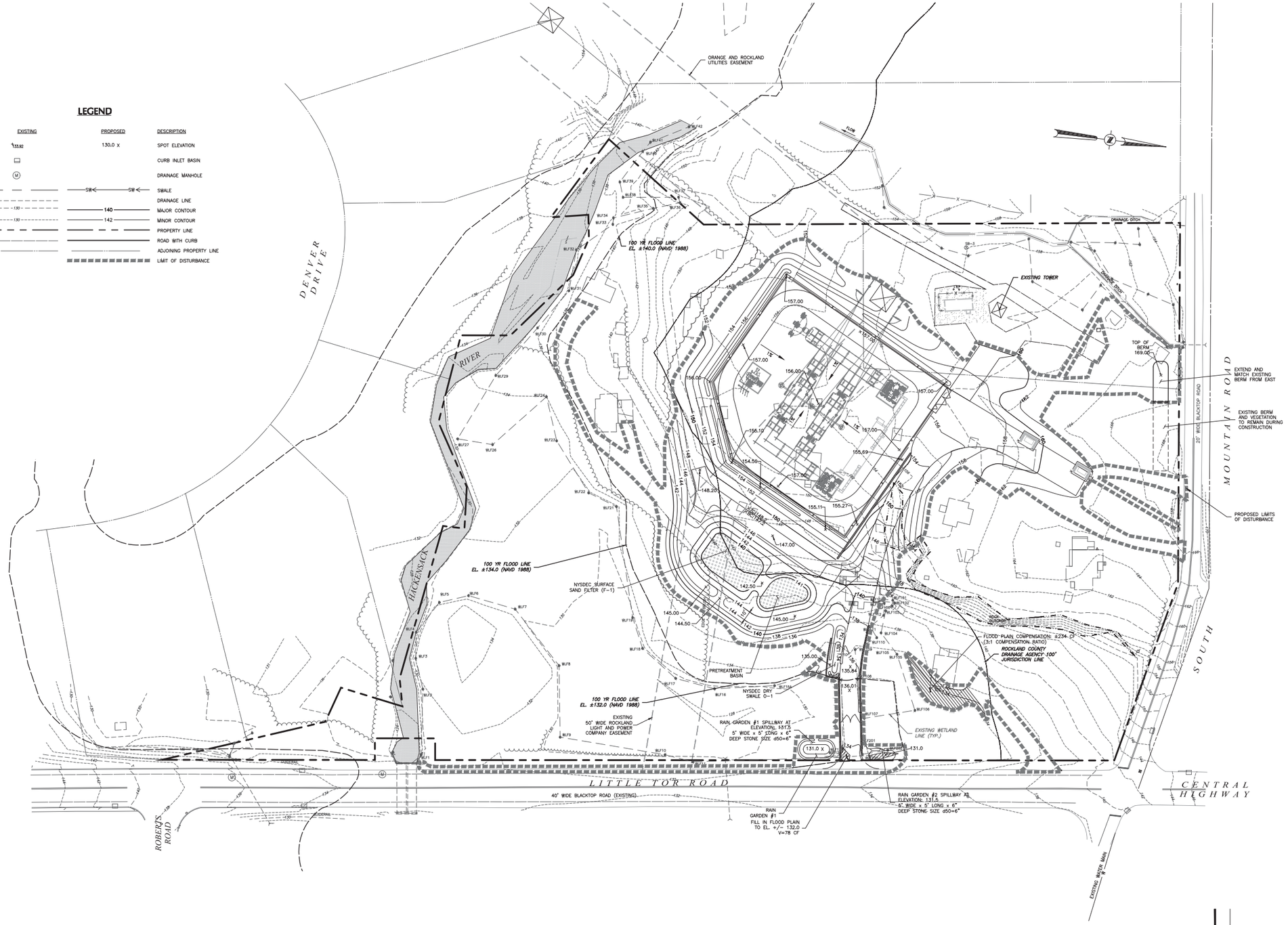
GRADING AND EROSION AND SEDIMENT CONTROL PLAN

SECTION 8

DETAILS

LEGEND

EXISTING	PROPOSED	DESCRIPTION
155.92	130.0 x	SPOT ELEVATION
		CURB INLET BASIN
		DRAINAGE MANHOLE
SW	SW	SWALE
		DRAINAGE LINE
130	140	MAJOR CONTOUR
130	142	MINOR CONTOUR
		PROPERTY LINE
		ROAD WITH CURB
		ADJOINING PROPERTY LINE
		LIMIT OF DISTURBANCE



REV	REVISION	DWN	DES	CHKD	DATE
B	FEIS COMMENTS	EK	EK	CU	10/22/14

ORANGE AND ROCKLAND UTILITIES, INC.
PEARL RIVER NEW YORK

ENGINEERING REVIEW		
DEPT.	SIGNATURE	DATE
CIVIL/SURVEY		
TELECOM/MET.		
TRANS & SUB.		
RELAY		
DWN MF	DES MF	CHKD
DESIGN REVIEW		DATE

APPROVED
DATE
☐ PERMIT
☐ BID
☐ CONSTRUCTION
☐ RECORD
☐

LITTLE TOR SUBSTATION

GRADING PLAN

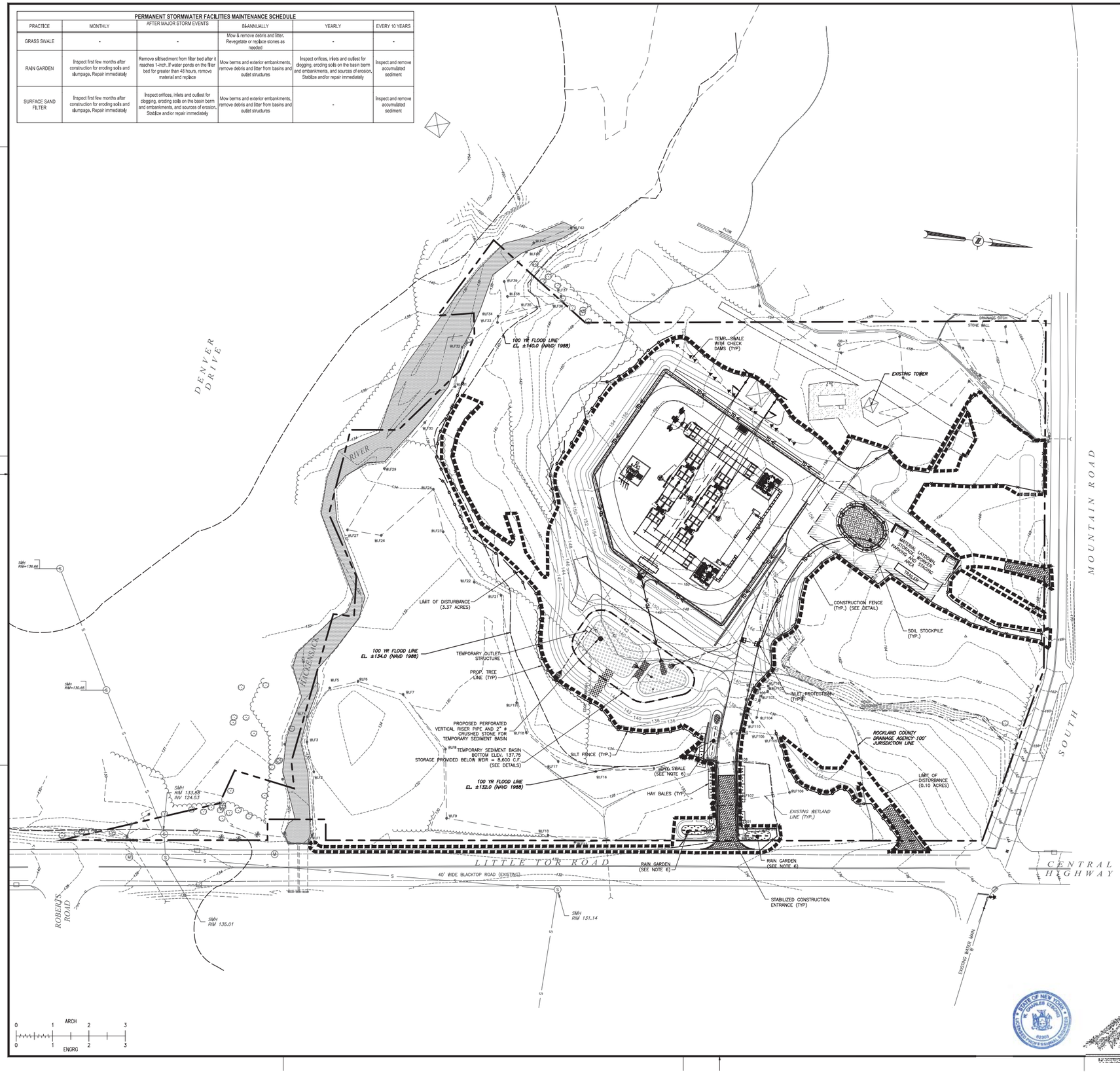
SCALE	STATION NO.	DRAWING NUMBER			SHEET	REV.
1" = 40'		N	F	9325	6 OF 10	B

ARCH 0 1 2 3
ENGRG 0 1 2 3

STATE OF NEW YORK · MICHAEL CHARLES TROPP · 62303 · LICENSED PROFESSIONAL ENGINEER

PERMANENT STORMWATER FACILITIES MAINTENANCE SCHEDULE

PRACTICE	MONTHLY	AFTER MAJOR STORM EVENTS	BI-ANNUALLY	YEARLY	EVERY 10 YEARS
GRASS SWALE	-	-	Mow & remove debris and litter. Revegetate or replace stones as needed	-	-
RAIN GARDEN	Inspect first few months after construction for eroding soils and slumpage. Repair immediately	Remove silt/sediment from filter bed after it reaches 1-inch. If water ponds on the filter bed for greater than 48 hours, remove material and replace	Mow berms and exterior embankments, remove debris and litter from basins and outlet structures	Inspect orifices, inlets and outlest for clogging, eroding soils on the basin berm and embankments, and sources of erosion. Stabilize and/or repair immediately	Inspect and remove accumulated sediment
SURFACE SAND FILTER	Inspect first few months after construction for eroding soils and slumpage. Repair immediately	Inspect orifices, inlets and outlest for clogging, eroding soils on the basin berm and embankments, and sources of erosion. Stabilize and/or repair immediately	Mow berms and exterior embankments, remove debris and litter from basins and outlet structures	-	Inspect and remove accumulated sediment



LEGEND

EXISTING	PROPOSED	DESCRIPTION
		CURB INLET BASIN
M	M	DRAINAGE MANHOLE
		FLARED END SECTION
		HAYBALES
		INLET PROTECTION
		PROPERTY LINE
		LIMIT OF DISTURBANCE
		ROAD WITH CURB
		CONSTRUCTION FENCE
130	140	MAJOR CONTOUR
132	142	MINOR CONTOUR
		REINFORCED CONCRETE WALL
		DRAINAGE LINE
		SILT FENCE
	TD	TEMPORARY DIKE
	SW	SWALE
		UNDER DRAIN
		CHECK DAM

EROSION CONTROL NOTES

1. PRIOR TO THE START OF CONSTRUCTION ALL EROSION CONTROL DEVICES DOWN SLOPE OF THE WORK AREA SHALL BE IN PLACE AS SHOWN ON THESE PLANS.
2. FINAL GRADES SHALL BE ESTABLISHED AS SOON AS POSSIBLE AND TOP SOILED AND SEEDED TO PROVIDE A TURF, WHICH WILL STABILIZE SLOPES AND PREVENT EROSION.
3. SLOPES TO REMAIN OPEN FOR MORE THAN THREE WEEKS SHALL BE PROTECTED WITH TEMPORARY SEEDING OR STAKED NETTING.
4. SOIL STOCKPILES SHALL BE PLACED IN THE AREAS SHOWN.
5. ALL EROSION CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH NEW YORK STATE BEST MANAGEMENT PRACTICES MANUAL FOR EROSION AND SEDIMENT CONTROL.
6. THE DRY SWALE AND RAIN GARDENS SHALL BE GRADED AND PROTECTED WITH SILT FENCE AND/OR CONSTRUCTION FENCING DURING CONSTRUCTION. ONCE CONSTRUCTION ACTIVITIES HAVE CEASED AND ALL CONTRIBUTING AREAS HAVE BEEN STABILIZED, FINALIZE THE DRY SWALE AND RAIN GARDENS CONSTRUCTION AND INSTALL ALL REQUIRED PLANTINGS IN ACCORDANCE WITH THE PROJECT PLANS.

REV	REVISION	DWN	DES	CHKD	DATE
B	FEIS COMMENTS	EK	EK	CJ	10/22/14

ORANGE AND ROCKLAND UTILITIES, INC.
PEARL RIVER NEW YORK

ENGINEERING REVIEW		
DEPT.	SIGNATURE	DATE
CIVIL/SURVEY		
TELECOM/MET.		
TRANS & SUB.		
RELAY		

APPROVED
DATE
☐ PERMIT
☐ BID
☐ CONSTRUCTION
☐ RECORD
☐

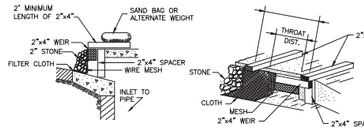
LITTLE TOR SUBSTATION

EROSION AND SEDIMENT CONTROL PLAN

DWN	DES	CHKD
MF	MF	
DESIGN REVIEW		DATE

SCALE	STATION NO.	DRAWING NUMBER			SHEET	REV.
1" = 40'		N	F	9325	7 OF 10	B

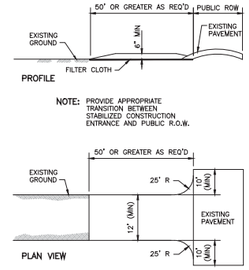
STATE OF NEW YORK · MICHAEL CHARLES LYONS · 82303 · LICENSED PROFESSIONAL ENGINEER



CURB INLET CONSTRUCTION SPECIFICATIONS

1. FILTER FABRIC SHALL HAVE AN EOS OF 40-85.
2. WOODEN FRAME SHALL BE CONSTRUCTED OF 2"x4" CONSTRUCTION GRADE LUMBER.
3. WIRE MESH ACROSS THROAT SHALL BE A CONTINUOUS PIECE 30" MINIMUM WIDTH WITH A LENGTH 4 FEET LONGER THAN THE THROAT. IT SHALL BE SHAPED AND SECURELY NAILED TO A 2"x4" WEIR.
4. THE WEIR SHALL BE SECURELY NAILED TO 2"x4" SPACERS 9" LONG SPACED NO MORE THAN 6 FT APART.
5. THE ASSEMBLY SHALL BE PLACED AGAINST THE INLET AND SECURED BY 2"x4" ANCHORS 2 FEET LONG EXTENDING ACROSS THE TOP OF THE INLET AND HELD IN PLACE BY SANDBAGS OR ALTERNATE WEIGHTS.
6. MAXIMUM DRAINAGE AREA IS 1 ACRE.

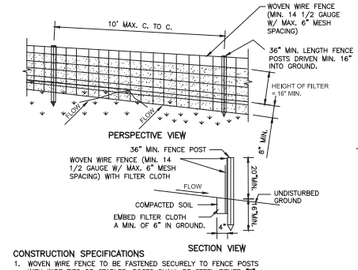
INLET PROTECTION
NTS



CONSTRUCTION SPECIFICATIONS

1. STONE SIZE – USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH – NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
3. THICKNESS – NOT LESS THAN SIX (6) INCHES.
4. WIDTH – TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SIGHT.
5. FILTER CLOTH – WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER – ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED
7. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACTED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON A AREA STABILISED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

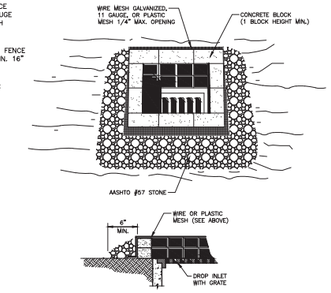
STABILIZED CONSTRUCTION ENTRANCE
NTS



CONSTRUCTION SPECIFICATIONS

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. FILTER CLOTH TO BE TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 12 1/2 GAUGE, 6" MAXIMUM MESH OPENING.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
4. PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUIVALENT.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

SILT FENCE INSTALLATION DETAIL
NTS



MAXIMUM DRAINAGE AREA = 1 ACRE.

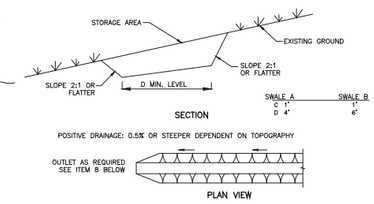
INLET PROTECTION IS NOT REQUIRED FOR INLET TRIBUTARY TO SEDIMENT BASIN OR TRAP. BERMS REQUIRED FOR ALL INSTALLATIONS. EARTHEN BERM IN ROADWAY SHALL BE MAINTAINED UNTIL ROADWAY IS STONED. ROAD SUBBASE BERM ON ROADWAY SHALL BE MAINTAINED UNTIL ROADWAY IS PAVED.

EARTHERN BERM IN CHANNEL SHALL BE MAINTAINED UNTIL PERMANENT STABILIZATION IS COMPACTED OR TO REMAIN PERMANENTLY.

DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

STANDARD CONSTRUCTION DETAIL #29

STONE & CONCRETE BLOCK INLET PROTECTION CHANNEL OR ROADSIDE SWALE
NTS

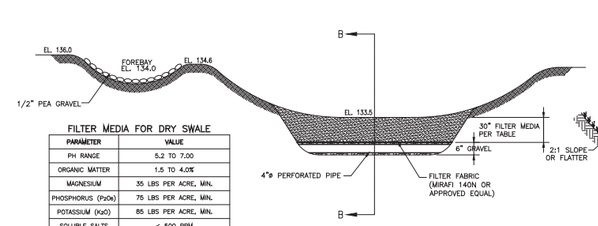


CONSTRUCTION SPECIFICATIONS

1. ALL TEMPORARY SWALES SHALL HAVE UNINTERRUPTED POSITIVE GRADE TO AN OUTLET.
2. DIVERTED RUNOFF FROM A DISTURBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.
3. DIVERTED RUNOFF FROM AN UNDISTURBED AREA SHALL OUTLET DIRECTLY INTO AN UNDISTURBED STABILIZED AREA AT NON-EROSIVE VELOCITY.
4. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE SWALE.
5. THE SWALE SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE, AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED HEREIN AND BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
6. FILLS SHALL BE COMPACTED BY EARTH MOVING EQUIPMENT.
7. ALL EARTH REMOVED AND NOT NEEDED FOR CONSTRUCTION SHALL BE PLACED SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE SWALE.
8. PERIODIC INSPECTION AND REQUIRED MAINTENANCE MUST BE PROVIDED AFTER EACH RAIN EVENT.
9. STABILIZATION SHALL BE AS PER THE FLOW CHANNEL STABILIZATION CHART BELOW.

TYPE OF TREATMENT	CHANNEL GRADE	A(5 AC. OR LESS)	B(5 AC. -10AC)
1	0.5%-3.0%	SEED AND STRAW MULCH	SEED AND STRAW MULCH
2	3.1%-6.0%	SEED AND STRAW MULCH	SEED USING JUTE OR EXCELSIOR
3	6.1%-8.0%	SEED WITH JUTE OR EXCELSIOR SOD	LINED WITH 4-8" RIPRAP OR RECYCLED CONCRETE EQUIVALENT ENGINEERED DESIGN
4	8.1%-20%	LINED WITH 4-8" RIPRAP	

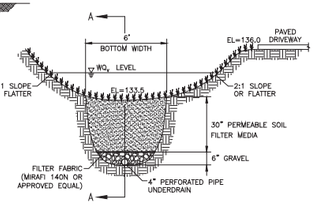
TEMPORARY SWALE
NTS



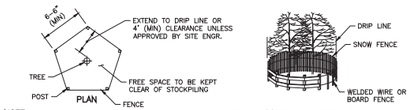
FILTER MEDIA FOR DRY SWALE

PARAMETER	VALUE
PH RANGE	5.2 TO 7.00
ORGANIC MATTER	1.5 TO 4.0%
MAGNESIUM	35 LBS PER ACRE, MIN.
PHOSPHORUS (P2O5)	75 LBS PER ACRE, MIN.
POTASSIUM (K2O)	85 LBS PER ACRE, MIN.
SOLUBLE SALTS	≤ 500 PPM
CLAY	10 TO 25%
SILT	30 TO 55%
SAND	35 TO 60%

NYS DEC DRY SWALE SECTION A-A
NTS



NYS DEC DRY SWALE 0-1 DETAIL (B-B)
NTS



NOTE

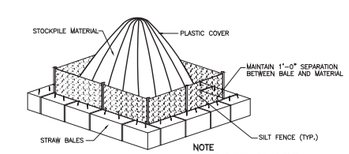
THE TREE PROTECTION SHOULD BE INSTALLED PRIOR TO ANY WORK IN AREA, AND REMAIN UNTIL END OF ALL WORK.

CORRECT METHOD OF TREE FENCING

NOTE

1. THE COMPOSITION OF THE SOIL MEDIA SHOULD CONSIST OF 50%-70% SAND WITH LESS THAN 5% CLAY CONTENT, 50-30% TOPSOIL WITH AN AVERAGE OF 5 ORGANIC MATERIAL. THE DEPTH OF THE AMENDED SOIL SHOULD BE APPROXIMATELY 4 INCHES BELOW THE BOTTOM OF THE DEEPEST ROOT BALL. AFTER SEEDING, SHREDDED HARDWOOD MULCH SHOULD BE APPLIED UP TO 2" TO HELP KEEP SOIL IN PLACE.
2. PLANT LIST TO BE PROVIDED BY LANDSCAPE ARCHITECT

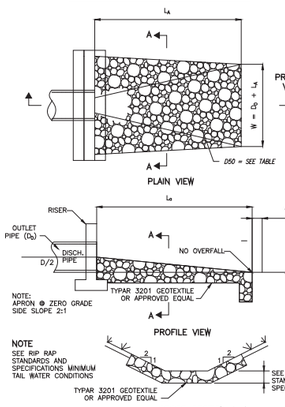
RAIN GARDEN DETAIL
NTS



NOTE

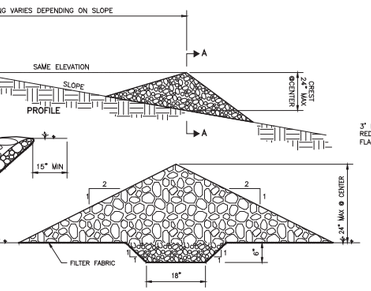
STOCKPILE SHALL BE COVERED ENTIRELY BY AN ANCHORED PLASTIC COVER

STOCKPILE CONTROL DETAIL
NTS



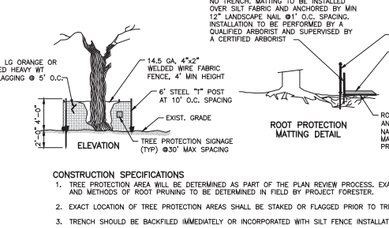
END STRUCTURE NAME	OUTLET PIPE DIAMETER (D_o)	RIP RAP SIZE (D_{50})	MAX. RIP RAP SIZE (d_{max})	MIN. RIP RAP BLANKET THICKNESS	L_a (MIN.)
CP-1	15"	6"	9"	14"	5 FT.
ES-1	6"	4"	6"	9"	3 FT.
ES-2	12"	6"	9"	14"	5 FT.
ES-3	15"	6"	9"	14"	10 FT.
ES-4	12"	6"	9"	14"	15 FT.
ES-5	4"	4"	6"	9"	3 FT.

RIP RAP OUTLET PROTECTION
NTS



CONSTRUCTION SPECIFICATIONS

1. TREE PROTECTION AREA WILL BE DETERMINED AS PART OF THE PLAN REVIEW PROCESS. EXACT LOCATION, DEPTH AND METHODS OF ROOT PRUNING TO BE DETERMINED IN FIELD BY PROJECT FORESTER.
2. EXACT LOCATION OF TREE PROTECTION AREAS SHALL BE STAKED OR FLAGGED PRIOR TO TRENCHING.
3. TRENCH SHOULD BE BACKFILLED IMMEDIATELY OR INCORPORATED WITH SILT FENCE INSTALLATION.
4. ROOTS SHOULD BE SEVERED BY TRENCHER, VIBRATORY PLOW OR APPROVED EQUIVALENT. ROOTS OVER 1.5" DIAMETER SHOULD BE CLEANLY CUT BY HAND. ROOT PRUNING ADJACENT TO SPECIMEN TREES MAY REQUIRE SOIL REMOVAL BY SUPERSONIC AIR TOOL TO MINIMIZE TREE AND ROOT IMPACTS.

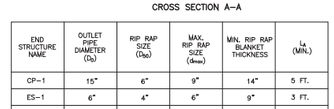


SILTFENCE TO INSTALLED ON GRADE WITH NO TRENCH. MATTING TO BE INSTALLED OVER SILT FABRIC AND ANCHORED BY MIN 12" LANDSCAPE NAIL @1' O.C. SPACING. INSTALLATION TO BE PERFORMED BY A QUALIFIED ARBORIST AND SUPERVISED BY A CERTIFIED ARBORIST

ROOT PROTECTION MATTING DETAIL

TREE/VEGETATION PROTECTION BARRIER
NTS

RAIN GARDEN PLANT SCHEDULE						
ZONE	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	AREA
RAIN GARDEN 2-3						
(PLANT IN GROUPS) (USE LAWN SEED OUTSIDE RAIN GARDENS WITHIN THE DISTURBANCE LIMITS)	45	OSMUNDA CINNAMOMEA	CINNAMON FERN	2" PLUG	18" O.C.	524 SQ. FT.
	45	RUDBECKIA LACINIATA	CUTLEAF CONEFLOWER			
	45	SCIRPUS CYPERINUS	WOOL GRASS			
	45	ASTER NOVAE-ANGLIAE	NEW ENGLAND ASTER			
	45	CAREX VULPINOIDEA	FOX SEDGE			
	45	EUPATORIUM MACULATUM	SPOTTED JOE-PYE WEED			
	45	PANICUM VIRGATUM	SWITCH GRASS			
	45	LOBELIA SIPHATICA	GREAT BLUE LOBELIA			
	45	MONARDA FISTULOSA	WILD BERGAMOT			
	45	ASCLEPIAS INCARNATE	RED MILKWEED			



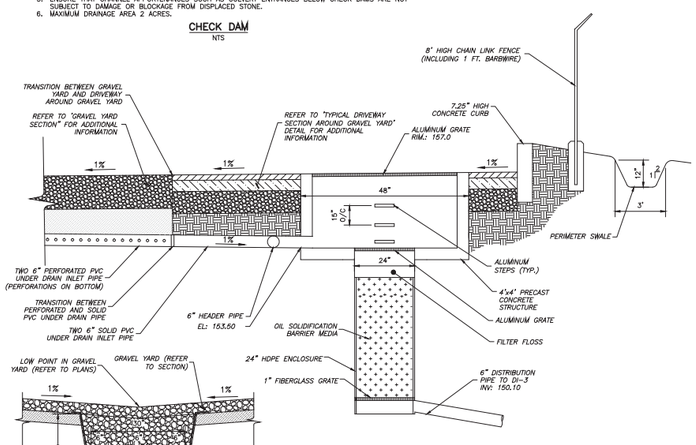
SLOPE MAXIMUM

STEEPNESS	% SLOPE	LENGTH (FT.)
2:1	50	25
3:1	33	50
4:1	25	75

CONSTRUCTION SPECIFICATIONS

1. BALES SHALL BE PLACED AT THE TOE OF A SLOPE OR ON THE CONTOUR AND IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
2. EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF (4) INCHES, AND PLACED SO THE BINDINGS ARE HORIZONTAL.
3. BALES SHALL BE SECURELY ANCHORED IN PLACE BY EITHER TWO STAKES OR RE-BARS DRIVEN THROUGH THE BALE. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE AT AN ANGLE TO FORCE THE BALES TOGETHER. STAKES SHALL BE DRIVEN FLUSH WITH THE BALE.
4. INSPECTION SHALL BE FREQUENT AND REPAIR REPLACEMENT SHALL BE MADE PROMTLY AS NEEDED.
5. BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULLNESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

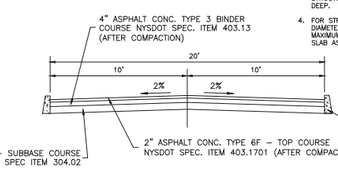
STRAWBALE SEDIMENT BARRIERS
NTS



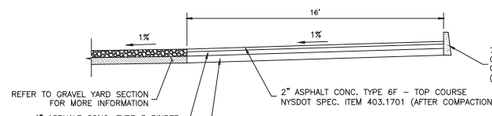
OIL SOLIDIFICATION STRUCTURE
N.T.S.

GRAVEL YARD UNDER DRAIN SECTION
NTS

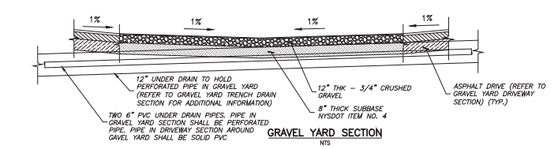
TERTIARY CONTAINMENT AREA



TYPICAL ACCESS DRIVEWAY SECTION
NTS



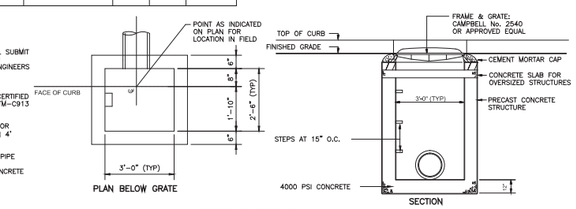
TYPICAL DRIVEWAY SECTION AROUND GRAVEL YARD
NTS



GRAVEL YARD SECTION
NTS

NOTES

1. THE CONTRACTOR SHALL SUBMIT SHOP DWGS. FOR EACH STRUCTURE FOR THE ENGINEERS APPROVAL PRIOR TO FABRICATION.
2. STRUCTURE SHALL BE CERTIFIED AS CONFORMING TO ASTM-C913 LATEST REVISION.
3. STEPS NOT REQUIRED FOR STRUCTURES LESS THAN 4' DEEP.
4. FOR STRUCTURES WITH PIPE DIAMETERS EXCEEDING MAXIMUMS, PROVIDE CONCRETE SLAB AS NOTED.



DRAIN INLET (DI)
NTS

GENERAL NOTES

1. AFTER FINAL GRADES ARE ESTABLISHED, DISTURBED AREAS SHALL BE COVERED WITH FOUR INCHES OF TOPSOIL AND PLANTED AS SHOWN ON THE PLAN.
2. TREES, ROOT SYSTEMS AND OTHER VEGETATION REMOVED FOR CONSTRUCTION PURPOSES SHALL BE CHIPPED OR REMOVED FROM SITE. NO ON-SITE BURIAL OR BURNING SHALL BE PERMITTED.
3. THE CONTRACTOR OR CONSTRUCTION MANAGER SHALL CONTACT THE OWNERS OF ALL UTILITIES AFFECTING THE SITE PRIOR TO THE START OF CONSTRUCTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ASCERTAIN THE EXACT LOCATION OF UTILITIES FROM THE OWNERS PRIOR TO CONSTRUCTION. UNDERGROUND UTILITIES CALL CENTER OF NEW YORK (800-245-2828).
4. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO TAKE THOSE STEPS NECESSARY TO PREVENT ILLEGAL DUMPING TO TAKE PLACE ON THE SITE. ANY MATERIAL FOUND UNSATISFACTORY TO THE ENGINEER WILL BE REMOVED FROM THE SITE AT THE CONTRACTOR'S EXPENSE.
5. FOR ADDITIONAL DETAILS ON HARDSCAPE SEE LANDSCAPING DRAWINGS.
6. NO MOTOR VEHICLE IS ALLOWED TO IDLE FOR MAN THAN THREE (3) CONSECUTIVE MINUTES WHEN THE VEHICLE IS NOT IN MOTION. THIS APPLIES TO HEAVY CONSTRUCTION EQUIPMENT AND TRUCKS DURING ALL PHASES OF THE PROJECT.

EROSION CONTROL NOTES

1. PRIOR TO THE START OF CONSTRUCTION ALL EROSION CONTROL DEVICES DOWN SLOPE OF THE WORK AREA SHALL BE IN PLACE AS SHOWN ON THESE PLANS.
2. FINAL GRADES SHALL BE ESTABLISHED AS SOON AS POSSIBLE AND TOP SOILED AND SEEDED TO PROVIDE A TURF, WHICH WILL STABILIZE SLOPES AND PREVENT EROSION.
3. SLOPES TO REMAIN OPEN FOR MORE THAN THREE WEEKS SHALL BE PROTECTED WITH TEMPORARY SEEDING OR STAKED NETTING.
4. SOIL STOCKPILES SHALL BE PLACED IN THE AREAS SHOWN.
5. EROSION CONTROL DEVICES SHALL BE INSPECTED AFTER EACH RAINFALL AND SHALL BE CLEANED, REPAIRED OR REPLACED AS NECESSARY.
6. ALL EROSION CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH NEW YORK STATE BEST MANAGEMENT PRACTICES MANUAL FOR EROSION AND SEDIMENT CONTROL.

STATE OF NEW YORK · W. CHARLES UTSCHIG · LICENSED PROFESSIONAL ENGINEER · 075303

3	FEIS COMMENTS	EK	EK	CU	10/9/14
	REVISION	DWN	DES	CHKD	DATE

ORANGE AND ROCKLAND UTILITIES, INC.
PEARL RIVER NEW YORK

ENGINEERING REVIEW		
DEPT.	SIGNATURE	DATE
CIVIL/SURVEY		
TELECOM/MET.		
TRANS & SUB.		
RELAY		
DWN MF	DES MF	CHKD
DESIGN REVIEW		DATE

APPROVED / DATE
- ☐ PERMIT
- ☐ BID
- ☐ CONSTRUCTION
- ☐ RECORD
- ☐ ——

LITTLE TOR SUBSTATION

DETAILS (SHEET 1 OF 2)

SCALE	STATION NO.	DRAWING NUMBER	SHEET	REV.
NOT TO SCALE		N F 9325	9 OF 10	B

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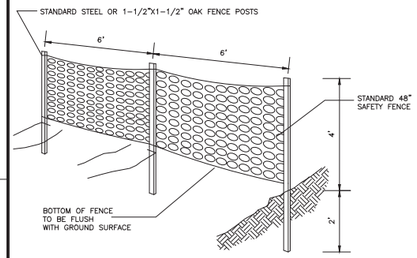
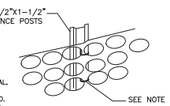


NOTES:

1. SPACE SUPPORT FENCE POSTS AT 6 FOOT INTERVALS.
2. DRIVE SUPPORT POSTS 2 FEET INTO GROUND.
3. FIRMLY FASTEN FENCE MATERIAL IN PLACE BY WIRING TO FENCE POST WHILE MAINTAINING TENSION ACROSS FULL HEIGHT OF FENCE. WIRING SHALL BE DONE IN A MANNER THAT WILL PREVENT SAGGING OF FENCE MATERIAL.
4. PROVIDE PERIODIC INSPECTION AND MAINTENANCE OF FENCE INCLUDING REPAIRS AS NECESSARY AND REQUIRED.
5. PLASTIC FENCE SHALL BE INTERNATIONAL ORANGE COLOR, AS MANUFACTURED BY ADPI ENTERPRISES, INC. OR APPROVED EQUAL.



CONSTRUCTION FENCE

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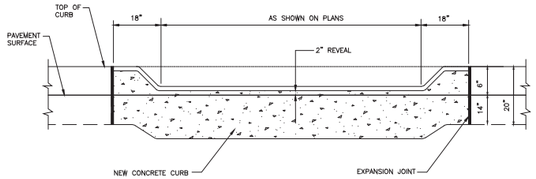
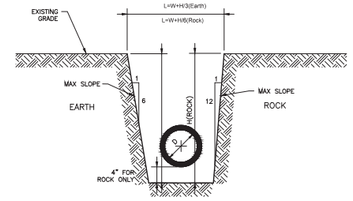


DEPRESSED CONCRETE CURB ELEVATION

NTS

NOTES

1. SEDIMENT BASINS TO BE CONSTRUCTED AS PERMANENT POOLS WITH MODIFICATIONS.
   A. CONSTRUCT TEMPORARY PERFORATED RISER AS SHOWN.
   B. PROTECT RISER WITH TRASH RACK.
   C. PERFORATIONS MUST NOT BE MADE ANY LOWER THAN 6" ABOVE TOP OF THE HORIZONTAL OUTFALL BARREL.
2. PERIODIC MAINTENANCE OF REMOVING SEDIMENT FROM BASIN WILL BE ANNUAL. OR AS NECESSARY WHEN SEDIMENT REACHES CLEANOUT LEVEL INDICATED BELOW.
3. UPON COMPLETION OF SITE CONSTRUCTION AND STABILIZATION OF TOPSOIL, TEMPORARY SEDIMENT BASIN OUTLET CONTROL STRUCTURE IS TO BE REMOVED AND PERMANENT OUTLET STRUCTURE INSTALLED.
   A. REMOVE TEMPORARY RISER STRUCTURE.
   B. REMOVE SEDIMENT, INSTALL POND LINER WHERE NEEDED, FINAL GRADE THE DETENTION BASIN AND STABILIZE.
   C. CUT BARREL TO FINAL LENGTH FOR PERMANENT OUTLET STRUCTURE (SEE UTILITY PLANS).
   D. INSTALL PERMANENT OUTLET STRUCTURE.
   E. INSTALL RIP-RAP OUTLET PROTECTION AS PER UTILITY PLANS.



TRENCH EXCAVATION

NTS

PIPE EMBEDMENT ZONE WIDTH SCHEDULE FOR PIPE MATERIAL OTHER THAN HDPE

INSIDE DIA. OF PIPE (D)	6" or less	8"	10"–12"	14"–18"	20"–30"	36"	42"
EMBEDMENT ZONE WIDTH (W)	2'– 0"	2'–6"	3'– 0"	3'– 6"	4'– 0"	4'–6"	5'–6"

INSIDE DIA. OF PIPE (D)	48"	54"	60"	66"	72"	78"	84"	90"
EMBEDMENT ZONE WIDTH (W)	6'–0"	6'–6"	7'–0"	7'–6"	8'–0"	9'–0"	9'–6"	10'–0"

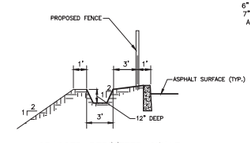
TRENCH EXCAVATION AND BACKFILL NOTES

1. THE MAXIMUM DRY DENSITIES SHALL BE DETERMINED IN ACCORDANCE WITH ASTM DESIGNATION D1557. THE MINIMUM PERCENTAGE OF COMPACTION TO BE ACHIEVED BY THE CONTRACTOR IN THE VARIOUS ZONES IS AS FOLLOWS:

	PIPE MATERIAL	LOCATION	INITIAL COMPACTION
SURFACE ZONE	ALL	ALL	95%
TRENCH BACKFILL ZONE			90%
PIPE EMBEDMENT ZONE			95%

THE MINIMUM COMPACTION IN EMBANKMENTS SHALL BE 90%

2. THE PIPE EMBEDMENT ZONE WIDTH AND THE MAXIMUM TRENCH WIDTH SHALL NOT EXCEED THE PERMISSIBLE WIDTHS SHOWN. IF THE PERMISSIBLE WIDTH IS EXCEEDED, THE PIPE SHALL BE INSTALLED IN A HIGHER CLASS BEDDING THAN SHOWN ON THIS DRAWING OR THE SPECIFIED PIPE SHALL BE REPLACED WITH PIPE OF GREATER CRUSHING STRENGTH OR BOTH, TO ACHIEVE SUITABLE CONDITIONS.
3. SUITABLE MATERIAL FROM EXCAVATION SHALL BE FREE FROM OBJECTIONABLE QUANTITIES OF ORGANIC MATTER, CLAY, TREES, STUMPS, FROZEN MATERIAL, RUBBLE, CINDERS, ROCKS, AND OTHER MATERIALS CONSIDERED DELETERIOUS BY THE ENGINEER AND SHALL NOT HAVE FINES IN EXCESS OF 10 PERCENT PASSING THE NO. 200 SIEVE NOR STONE OR GRAVEL LARGER THAN 2 INCHES.



GRASSED PERIMETER SWALE

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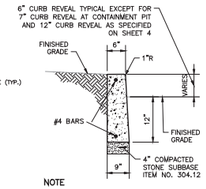
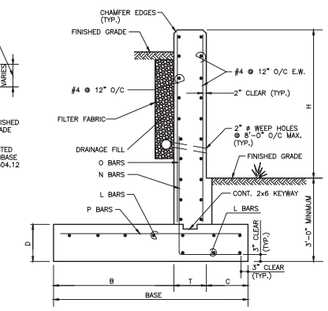


NOTE

1. CONCRETE SHALL BE 4,000 PSI.

CONCRETE CURB

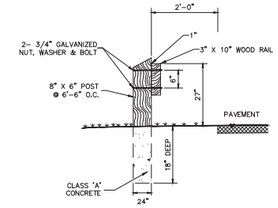
NTS



BASE	B	T	C	D	H	L BARS	P BARS	O BARS	N BARS
9' – 10"	7' – 4"	12"	1' – 6"	1'– 10"	< 13' – 0"	#4 @ 12"	#7 @ 12"	#6 @ 12"	#9 @ 12"
7' – 10"	5' – 6"	12"	1' – 4"	1' – 6"	< 11' – 0"	#4 @ 12"	#7 @ 12"	#5 @ 12"	#8 @ 12"
7' – 0"	5' – 0"	12"	1' – 0"	1' – 2"	< 10' – 0"	#4 @ 12"	#7 @ 12"	#5 @ 12"	#7 @ 12"
5' – 6"	3' – 6"	12"	1' – 0"	1' – 0"	< 8' – 0"	#4 @ 12"	#6 @ 12"	#4 @ 12"	#6 @ 12"
4' – 6"	2' – 6"	12"	1' – 0"	1' – 0"	< 7' – 0"	#4 @ 12"	#6 @ 16"	#4 @ 16"	#6 @ 16"
4' – 0"	2' – 0"	12"	1' – 0"	1' – 0"	< 6' – 0"	#4 @ 12"	#5 @ 16"	#4 @ 16"	#5 @ 16"

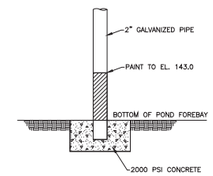
REINFORCED CONCRETE RETAINING WALL

NTS



WOODEN GUARD RAIL

NOT TO SCALE



SEDIMENT MARKER

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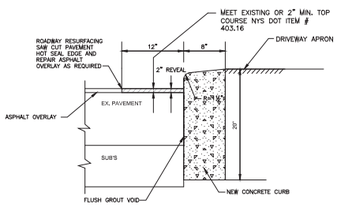
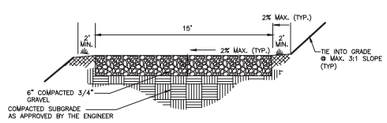


DEPRESSED CONCRETE CURB SECTION ALONG DRIVEWAY

NTS

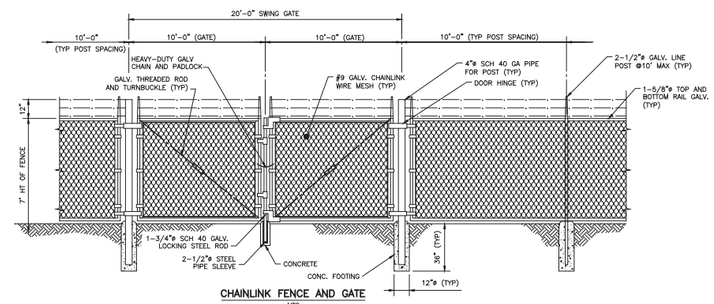


NOTES
ALL PATHS LAYOUT TO BE CONFIRMED IN FIELD BY RESIDENT ENGINEER AND TOWN ENGINEER

CONTRACTOR SHALL PROVIDE SAMPLES OF MATERIALS, AGGREGATE & STABILIZER PRIOR TO PURCHASE & INSTALLATION.

STORM WATER BASIN ACCESS ROAD

NTS



CHAINLINK FENCE AND GATE

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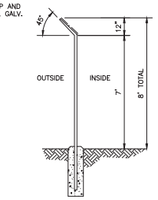
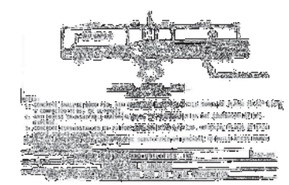
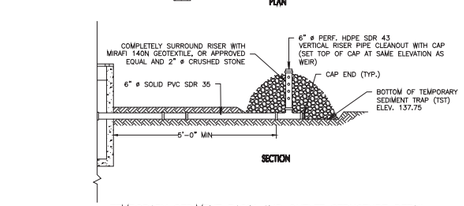


SIDE VIEW



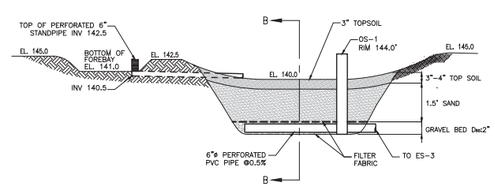
CONCRETE APRON AT ENTRANCE OF SUBSTATION

NTS



TEMPORARY SEDIMENT BASIN AND OUTLET STRUCTURE DETAIL

NTS



NYSDEC SURFACE SAND FILTER SECTION A–A

NTS

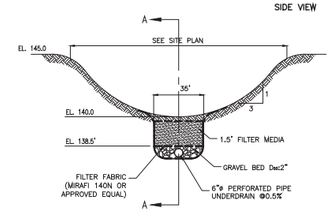
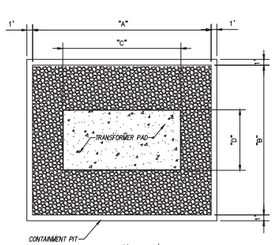


TABLE C–1 MATERIAL SPECIFICATIONS FOR SAND FILTERS

PARAMETER	SPECIFICATIONS	SIZE	NOTES
SAND	CLEAN AASHTO–M–6 OR ASTM–C–33 CONCRETE SAND	0.02" TO 0.04"	SAND SUBSTITUTIONS SUCH AS DIABASE AND GRAYSTONE NO. 10 ARE NOT ACCEPTABLE. NO CALCIUM CARBONATED OR DOLOMITIC SAND SUBSTITUTIONS ARE ACCEPTABLE. NO "ROCK DUST" CAN BE USED FOR SAND.
UNDERDRAIN GRAVEL	AASHTO–M–43 NO.67	0.25" TO 0.75"	
GEOTEXTILE FABRIC	ASTM–D–751 (PUNCTURE STENGTH – 125 LB.) ASTM–D–1117 (MULLEN BURST STRENGTH –	0.08" THICK EQUIVALENT OPENING SIZE OF NO. 80 SIEVE	MUST MAINTAIN 125 GPM PER SQ. FT. FLOW RATE. NOTE: A 4" PEA GRAVEL LAYER MAY BE SUBSTITUTED FOR GEOTEXTILES MEANT TO "SEPARATE" SAND FILTER LAYERS.

NYSDEC SURFACE SAND FILTER SECTION B–B

NTS

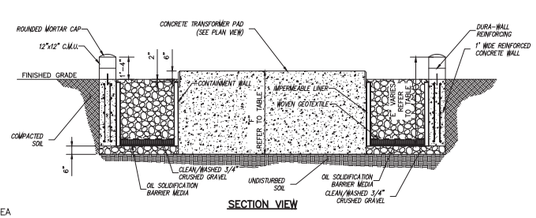


PLAN VIEW

TRANSFOMER DIMENSIONS AND VOLUMES

		TRANSFORMERS 1 & 2	TRANSFORMERS 3
DIMENSIONS	A	26.75'	23.50'
	B	21.42'	22.75'
	C	17.00'	13.00'
	D	8.00'	6.00'
	E	5.58'	5.33'
	F	5.25'	3.50'
VOLUMES (GAL.)	110% Oil Containment	8,422	4,851
	Rain Water 25–Year Storm (6.4" Rainfall)	2,285	2,133
	Volume Required	10,707	6,984
	Volume Provided	10,758	10,501

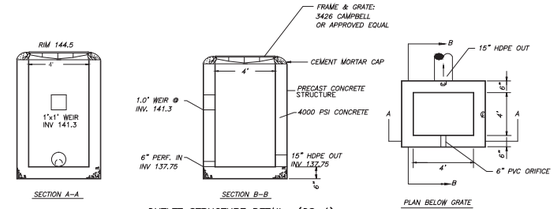
NOTES:
1. STONE FILLED SECTION OF CONTAINED AREA CONSIDERED TO HAD 40% OF VOLUME VOID SPACE



SECTION VIEW

SECONDARY CONTAINMENT AREA – CONTAINMENT PIT AND TRANSFORMER PAD DETAIL

NTS



OUTLET STRUCTURE DETAIL (OS–1)

N.T.S.

ARCH 0 1 2 3
ENGRG 0 1 2 3

3	FEIS COMMENTS	EK	EK	CU	10/9/14
	REVISION	DWN	DES	CHKD	DATE

ORANGE AND ROCKLAND UTILITIES, INC.
PEARL RIVER NEW YORK

ENGINEERING REVIEW		
DEPT.	SIGNATURE	DATE
CIVIL/SURVEY		
TELECOM/MET.		
TRANS & SUB.		
RELAY		
DWN MF	DES MF	CHKD
DESIGN REVIEW		DATE

APPROVED
DATE
☐ PERMIT
☐ BID
☐ CONSTRUCTION
☐ RECORD
☐

LITTLE TOR SUBSTATION

DETAILS (SHEET 2 OF 2)

SCALE	STATION NO.	DRAWING NUMBER	SHEET	REV.
NOT TO SCALE		N F 9325	10 OF 10	B

Filename: \\longan.com\data\wp\data6\190011601\Cadd Data – 190011601\SheetFiles\FEIS Submission\190011601-CS501-0101.dwg Date: 11/4/2014 Time: 17:14 User: vchang Style Table: ---- Layout: DETAILS 2 OF 2

SECTION 9

MISCELLANEOUS CALCULATION

SECTION 9A

AREAS

LANGAN

Re: Little Tor Substation/ SWPPP AREAS

Date: 10/15/2014

Total Area	507,909.60 S.F.	11.660 AC.

PRE-DEVELOPMENT						
	Impervious Area			Pervious Area		
		S.F.	AC.		S.F.	AC.
Subarea 1	Buildings/concrete	30,492.00	0.700	Grass	133,293.60	3.06
			0.000		0.00	0.000
			0.000		0.00	0.000
163,785.60 sf		0.00	0.000		0.00	0.000
3.760 AC.		0.00	0.000		0.00	0.000
Totals:		**30,492.00**	**0.700**		**133,293.60**	**3.060**
	Impervious Area			Pervious Area		
		S.F.	AC.		S.F.	AC.
Subarea 2	Buildings/concrete	27,007.20	0.620	Grass	280,526.40	6.44
			0.000		0.00	0.000
			0.000		0.00	0.000
307,533.60 sf		0.00	0.000		0.00	0.000
7.060 AC.		0.00	0.000		0.00	0.000
Totals:		**27,007.20**	**0.620**		**280,526.40**	**6.440**
	Impervious Area			Pervious Area		
		S.F.	AC.		S.F.	AC.
Subarea 3	Buildings/concrete	0.00	0.106	Grass	31,973.04	0.734
			0.000		0.00	0.000
		0.00	0.000		0.00	0.000
36,590.40 sf		0.00	0.000		0.00	0.000
0.840 AC.		0.00	0.000		0.00	0.000
Totals:		**0.00**	**0.106**		**31,973.04**	**0.734**

POST-DEVELOPMENT						
	Impervious Area			Pervious Area		
		S.F.	AC.		S.F.	AC.
Subarea 1	Buildings/concrete	19,514.88	0.448	Grass	110,773.08	2.543
	Gravel Road	5,140.08	0.118			0.000
			0.000		0.00	0.000
135,428.04 sf		0.00	0.000		0.00	0.000
3.109 AC.		0.00	0.000		0.00	0.000
Totals:		**24,654.96**	**0.566**		**110,773.08**	**2.543**
	Impervious Area			Pervious Area		
		S.F.	AC.		S.F.	AC.
Subarea 2A	Paved driveway	8,581.32	0.197	Grass	211,832.28	4.863
			0.000			0.000
			0.000		0.00	0.000
220,413.60 sf		0.00	0.000		0.00	0.000
5.060 AC.					0.00	0.000
Totals:		**8,581.32**	**0.197**		**211,832.28**	**4.863**
	Impervious Area			Pervious Area		
		S.F.	AC.		S.F.	AC.
Subarea 2B	Gravel Road/areas	20,516.76	0.471	Grass	38,986.20	0.895
	Paved driveway	12,458.16	0.286		0.00	0.000
			0.000		0.00	0.000
71,961.12 sf			0.000		0.00	0.000
1.652 AC.		0.00	0.000		0.00	0.000
Totals:		**32,974.92**	**0.757**		**38,986.20**	**0.895**
	Impervious Area			Pervious Area		
		S.F.	AC.		S.F.	AC.
Subarea 2C	Gravel Road/areas	26,136.00	0.600	Grass	1,263.24	0.029
	Paved driveway	10,759.32	0.247		0.00	0.000
		0.00	0.000		0.00	0.000
38,158.56 sf		0.00	0.000		0.00	0.000
0.876 AC.		0.00	0.000		0.00	0.000
Totals:		**36,895.32**	**0.847**		**1,263.24**	**0.029**
	Impervious Area			Pervious Area		
		S.F.	AC.		S.F.	AC.
Subarea 2D	Paved driveway	2,613.60	0.060	Grass	2,613.60	0.06
			0.000		0.00	0.000
		0.00	0.000		0.00	0.000
5,227.20 sf		0.00	0.000		0.00	0.000
0.120 AC.		0.00	0.000		0.00	0.000
Totals:		**2,613.60**	**0.060**		**2,613.60**	**0.060**
	Impervious Area			Pervious Area		
		S.F.	AC.		S.F.	AC.
Subarea 3	Gravel Road	4,617.36	0.106	Grass	32,103.72	0.737
			0.000		0.00	0.000
		0.00	0.000		0.00	0.000
36,721.08 sf		0.00	0.000		0.00	0.000
0.843 AC.		0.00	0.000		0.00	0.000
Totals:		**4,617.36**	**0.106**		**32,103.72**	**0.737**

SECTION 9B

SURFACE SAND FILTER CALCULATION

LANGAN

Surface Sand Filter Design (NYSDEC F-1)

Data: Litte Tor Substation (Subarea PDA-2B &PDA-2C)

Size Surface Sand Filter:

From Darcy's Law: Af=WQv(df)/[k(hf+df)(tf)}

WQv (Taken from HyrdoCAD)			=	4,443.00 cf
k (coefficient of permiability)	Sand	*	=	3.50 ft/day
hf (Aver. Height of water above filter bed)	**		=	0.50 ft
tf (design filter drain time)			=	1.67 days
Filter depth (df)			=	4.00 ft
Af (Surface area of filter bed)			=	**675.68 sf**
Af provided			=	**2,600.00 sf**

** NYS Design Manual Page 6-52*

*** Half of water quality elevation (WQv EL)*

Size Sedimentation Basin (As) for pretreatment:

Based on percent Imperviousness (I)			=	45.82 %
As (for I ≤ 75% >)	=	0.066* WQv	=	**293.24 sf**
As (for I > 75%)	=	0.0081 WQv	=	**NA**
Pretreatment chamber provided			=	**600.00 sf**

Underdrain Capacity:

Pipe Diameter		=	6.00"
Area (sf)		=	0.196 sf
Hyd. R		=	0.125
Slope		=	0.05
n	(PVC)	=	0.011
Underdrain design flow			0.15 cfs
WQv (release in	1.67 days)	=	0.03 cfs
Pipe Capacity:		=	**OK**

SECTION 9C

CHANNEL PROTECTION VOLUME CALCULATION

LANGAN

CHANNEL PROTECTION STORAGE VOLUME COMPUTATIONS (Cp_v).

Little Tor Substation

P(1yr):	Rockland County	2.8	in.
Total Area	(Subarea 2B)	1.652	ac

RUNOFF SUMMARY			
Post development Area	CN	T_c	Runoff Depth (Q_a)*
			1 yr storm
		Hours	in.
Subarea 2	82	0.240	1.22

*NOTE: Computed utilizing Tr-55 Analysis where $Q_a = (P-I_a)^2/[(P-I_a)+(1000/CN-10)]$

Dev. I_a = (200/CN) - 2 = 0.439

Channel Protection(Cp_v):

Determine Watershed Classification:

The extended detention time is 24 hrs.

T: 24 hr

Dev. I_a/P (1yr.): 0.157

T_c: 0.240 hr

Using Figure D.11.1 SCS Graphical Method of determining peak discharge (q_u) in csm/in for 24-Hour Type III Storm Distribution with the above I_a/p and T_c, a q_u is determined.

q_u = 625 csm/in

Using Figure D.11.2 Detention Time versus Discharge Ratios with the above q_u and T, a (q_o/q_i) is determined.

q_o/q_i = 0.030

Compute V_s/V_r for type III rainfall distribution with q_o/q_i.

$V_s/V_r = 0.682 - 1.43(q_o/q_i) + 1.64(q_o/q_i)^2 - 0.804(q_o/q_i)^3$ = 0.641

Cpv (required) V_s = Cpv = (V_s/V_r)(Q_a dev.)(A)/12 = **0.108 ac-ft**

Cpv (proposed) **0.166 ac-ft** @ **143.00**

COMPUTE ED ORIFICE **POND 1**

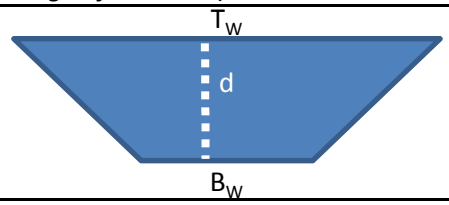
Cpv		=	0.166 ac.ft	
Average Release rate of Cpv (24 hrs)		=	0.084 cfs	
Average $Q_{WQv\text{-}ED}$		=	0.000 cfs	
Cpv_ED		=	0.084 cfs	
Cpv. EL. @	**(0.166 ac ft)**	=	143.00 ft	
Invert for orifice "EL. at WQv" @	**(0.10 ac.ft)**	=	140.75 ft	
Average head (h) "ft"		=	1.13 ft	
Orifice Coefficient		=	0.6	
Orifice Area "sf" A=Q/[C(2gh)^0.5)]		=	0.016 sf	
Orifice diameter "in"		=	1.74"	**USE** NONE

NOTE: No CPv is needed if orifice is less than 3"

SECTION 9D

DRY SWALE CALCULATION

Dry Swale Worksheet

Design Point:	1						
Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
1	0.12	0.06	0.47	0.47	307.10	1.50	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	47%	0.47	307	<<WQv after adjusting for Disconnected Rooftops	
Pretreatment Provided					**Pretreatment Technique**		
Pretreatment (10% of WQv)			31	*ft^3*			
Calculate Available Storage Capacity							
Bottom Width	6	*ft*	Design with a bottom width no greater than eight feet to avoid potential gullying and channel braiding, but no less than two feet				
Side Slope (X:1)	2	*Okay*	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope				
Longitudinal Slope	2%	*Okay*	*Maximum longitudinal slope shall be 4%*				
Flow Depth	1	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*				
Top Width	10	*ft*					
Area	8.00	*sf*					
Minimum Length	35	*ft*					
Actual Length	36	*ft*					
End Point Depth check	1.50	*Okay*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*				
Storage Capacity	319	*ft^3*					
Soil Group (HSG)			C				
Runoff Reduction							
Is the Dry Swale contributing flow to another practice?			No	Select Practice			
RRv	**64**	***ft^3***	**Runnoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**				
Volume Treated	243	*ft^3*	This is the difference between the WQv calculated and the runoff reduction achieved in the swale				
Volume Directed	0	*ft^3*	This volume is directed another practice				
Volume √	*Okay*		Check to be sure that channel is long enough to store WQv				

SECTION 9E

RAIN GARDEN CALCULATION

LANGAN

Rain Garden #1
Litte Tor Substation

Calculate Required Water Quality Volume

$$WQv = \frac{(P)\ (Rv)\ (A)}{12}$$

P = 90 % rainfall number	=	1.5 in.
Rv = 0.05 + 0.009 (I) = 0.05 + 0.009 (100)	=	0.95
I = Percentage impervious area draining to site	=	100%
A = Area draining to practice (treamtment area)	=	878.00 sf
WQv Required	**=**	**104.26 cf**

Solve for Drainage Layer and Soil Media Storage Volume

Vsm = Arg x Dsm x Psm
Vdl = Arg x Ddl x Pdl
where:

Arg = proposed rain garden surface area	=	258.00 sf
Dsm = depth soil media	=	1.00 ft
Ddl = depth drainage layer	=	0.50 ft
Psm = porosity of soil media	=	0.20
Pdl = porosity of drainage layer	=	0.40
Vsm	**=**	**51.60 cf**
Vdl	**=**	**51.60 cf**

Calculate Proposed

Dp = ponding depth	=	0.25 ft
WQv ≤ Vsm + Vdl + (Dp x Arg)	=	**167.70 cf**
	=	**OK**

LANGAN

Rain Garden #2
Litte Tor Substation

Calculate Required Water Quality Volume

$$WQv = \frac{(P)\ (Rv)\ (A)}{12}$$

P = 90 % rainfall number	=	1.5 in.
Rv = 0.05 + 0.009 (I) = 0.05 + 0.009 (100)	=	0.95
I = Percentage impervious area draining to site	=	100%
A = Area draining to practice (treamtment area)	=	949.00 sf
WQv Required	**=**	**112.69 cf**

Solve for Drainage Layer and Soil Media Storage Volume

Vsm = Arg x Dsm x Psm
Vdl = Arg x Ddl x Pdl
where:

Arg = proposed rain garden surface area	=	258.00 sf
Dsm = depth soil media	=	1.00 ft
Ddl = depth drainage layer	=	0.50 ft
Psm = porosity of soil media	=	0.20
Pdl = porosity of drainage layer	=	0.40
Vsm	**=**	**51.60 cf**
Vdl	**=**	**51.60 cf**

Calculate Proposed

Dp = ponding depth	=	0.25 ft
WQv ≤ Vsm + Vdl + (Dp x Arg)	=	**167.70 cf**
	=	**OK**

SECTION 9F

PIPE CALCULATIONS

LANGAN

Pipe Calculations

Little TOR

Date: October 21, 2014

Design Storm: 25-Year

STRUCTURE		IMPERVIOUS AREA			PERVIOUS AREA			CA	PIPE										
									TIME OF CONC. (min.)			I	Q (cfs)		PIPE DESIGN				
FROM	TO	A (ac.)	C	CA	A (ac.)	C	CA		INLET	PIPE	TOTAL		DESIGN	CAP.	V(ft/s)	n	s (%)	L (ft)	DIA (in)
*CP-1	CP-1	**0.20**	0.9	0.18	**1.65**	0.3	0.50	0.68	**16**	-	16	**9.0**	6.1	9.6	8.3	**0.012**	**1.9**	**26**	**15**
CB-1	CB-2	**0.16**	0.9	0.14	**0.81**	0.3	0.24	0.39	**12**	-	12	**6.4**	2.5	3.0	4.3	**0.012**	**0.6**	**17**	**12**
CB-2	ES-2	**0.07**	0.9	0.07	**0.07**	0.3	0.02	0.47	**6**	-	6	**6.4**	3.0	3.9	5.4	**0.012**	**1.0**	**78**	**12**
DI-3	DMH-2	**0.87**	0.9	0.78	**0.05**	0.3	0.02	0.80	**6**	-	6	**6.4**	5.1	14.4	16.8	**0.012**	**14.0**	**45**	**12**
DMH-2	ES-4	**0.00**	0.9	0.00	**0.00**	0.3	0.00	0.80	**6**	-	6	**6.4**	5.1	9.8	12.7	**0.012**	**6.5**	**49**	**12**

*100-Year Rainfall Intensity was used for CP-1 to CP-1

SECTION 9G

ROCK OUTLET PROTECTION COMPUTATIONS

STANDARD AND SPECIFICATIONS FOR ROCK OUTLET PROTECTION

Definition

A section of rock protection placed at the outlet end of the culverts, conduits, or channels.

Purpose

The purpose of the rock outlet protection is to reduce the depth, velocity, and energy of water, such that the flow will not erode the receiving downstream reach.

Scope

This standard applies to the planning, design, and construction of rock riprap and gabions for protection of downstream areas. It does not apply to rock lining of channels or streams.

Conditions Where Practice Applies

This practice applies where discharge velocities and energies at the outlets of culverts, conduits, or channels are sufficient to erode the next downstream reach. This applies to:

1. Culvert outlets of all types.

2. Pipe conduits from all sediment basins, dry storm water ponds, and permanent type ponds.

3. New channels constructed as outlets for culverts and conduits.

Design Criteria

The design of rock outlet protection depends entirely on the location. Pipe outlet at the top of cuts or on slopes steeper than 10 percent, cannot be protected by rock aprons or riprap sections due to re-concentration of flows and high velocities encountered after the flow leaves the apron.

Many counties and state agencies have regulations and design procedures already established for dimensions, type and size of materials, and locations where outlet protection is required. Where these requirements exist, they shall be followed.

Tailwater Depth

The depth of tailwater immediately below the pipe outlet must be determined for the design capacity of the pipe. If the tailwater depth is less than half the diameter of the outlet pipe, and the receiving stream is wide enough to accept divergence of the flow, it shall be classified as a Minimum Tailwater Condition; see Figure 5B.12 on page 5B.25 as an example. If the tailwater depth is greater than half the pipe diameter and the receiving stream will continue to confine the flow, it shall be classified as a Maximum Tailwater Condition; see Figure 5B.13 on page 5B.26 as an example. Pipes which outlet onto flat areas with no defined channel may be assumed to have a Minimum Tailwater Condition; see Figure 5B.12 on page 5B.25 as an example.

Apron Size

The apron length and width shall be determined from the curves according to the tailwater conditions:

Minimum Tailwater – Use Figure 5B.12 on page 5B.25
Maximum Tailwater – Use Figure 5B.13 on page 5B.26

If the pipe discharges directly into a well defined channel, the apron shall extend across the channel bottom and up the channel banks to an elevation one foot above the maximum tailwater depth or to the top of the bank, whichever is less.

The upstream end of the apron, adjacent to the pipe, shall have a width two (2) times the diameter of the outlet pipe, or conform to pipe end section if used.

Bottom Grade

The outlet protection apron shall be constructed with no slope along its length. There shall be no overfall at the end of the apron. The elevation of the downstream end of the apron shall be equal to the elevation of the receiving channel or adjacent ground.

Alignment

The outlet protection apron shall be located so that there are no bends in the horizontal alignment.

Materials

The outlet protection may be done using rock riprap, grouted riprap, or gabions.

Riprap shall be composed of a well-graded mixture of stone size so that 50 percent of the pieces, by weight, shall be larger than the d_{50} size determined by using the charts. A well-graded mixture, as used herein, is defined as a mixture composed primarily of larger stone sizes, but with a sufficient mixture of other sizes to fill the smaller voids between the stones. The diameter of the largest stone size in such a mixture shall be 1.5 times the d_{50} size.

Thickness

The minimum thickness of the riprap layer shall be 1.5 times the maximum stone diameter for d_{50} of 15 inches or less; and 1.2 times the maximum stone size for d_{50} greater than 15 inches. The following chart lists some examples:

D_{50} (inches)	d_{max} (inches)	Minimum Blanket Thickness (inches)
4	6	9
6	9	14
9	14	20
12	18	27
15	22	32
18	27	32
21	32	38
24	36	43

Stone Quality

Stone for riprap shall consist of field stone or rough unhewn quarry stone. The stone shall be hard and angular and of a quality that will not disintegrate on exposure to water or weathering. The specific gravity of the individual stones shall be at least 2.5.

Recycled concrete equivalent may be used provided it has a density of at least 150 pounds per cubic foot, and does not have any exposed steel or reinforcing bars.

Filter

A filter is a layer of material placed between the riprap and the underlying soil surface to prevent soil movement into and through the riprap. Riprap shall have a filter placed under it in all cases.

A filter can be of two general forms: a gravel layer or a plastic filter cloth. The plastic filter cloth can be woven or non-woven monofilament yarns, and shall meet these base requirements: thickness 20-60 mils, grab strength 90-120 lbs; and shall conform to ASTM D-1777 and ASTM D-1682.

Gravel filter blanket, when used, shall be designed by comparing particle sizes of the overlying material and the base material. Design criteria are available in Standard and Specification for Riprap Slope Protection on page 5B.57.

Gabions

Gabions shall be made of hexagonal triple twist mesh with heavily galvanized steel wire. The maximum linear dimension of the mesh opening shall not exceed 4 ½ inches and the area of the mesh opening shall not exceed 10 square inches.

Gabions shall be fabricated in such a manner that the sides, ends, and lid can be assembled at the construction site into a rectangular basket of the specified sizes. Gabions shall be of single unit construction and shall be installed according to manufacturers recommendations.

The area on which the gabion is to be installed shall be graded as shown on the drawings. Foundation conditions shall be the same as for placing rock riprap, and filter cloth shall be placed under all gabions. Where necessary, key, or tie, the structure into the bank to prevent undermining of the main gabion structure.

Maintenance

Once a riprap outlet has been installed, the maintenance needs are very low. It should be inspected after high flows for evidence of scour beneath the riprap or for dislodged stones. Repairs should be made immediately.

Design Procedure

1. Investigate the downstream channel to assure that nonerosive velocities can be maintained.

2. Determine the tailwater condition at the outlet to establish which curve to use.
3. Enter the appropriate chart with the design discharge to

determine the riprap size and apron length required. It is noted that references to pipe diameters in the charts are based on full flow. For other than full pipe flow, the parameters of depth of flow and velocity must be used to adjust the design discharges.

4. Calculate apron width at the downstream end if a flare section is to be employed.

Examples

Example 1: Pipe Flow (full) with discharge to unconfined section.

Given: A circular conduit flowing full.

Q = 280 cfs, diam. = 66 in., tailwater (surface) is 2 ft. above pipe invert (minimum tailwater condition).

Find: Read d_{50} = 1.2 and apron length (L_a) = 38 ft.

Apron width = diam. + L_a = 5.5 + 38 = 43.5 ft.

Use: d_{50} = 15", d_{max} = 22", blanket thickness = 32"

Example 2: Box Flow (partial) with high tailwater

Given: A box conduit discharging under partial flow conditions. A concrete box 5.5 ft. x 10 ft. flowing 5.0 ft. deep,

Q = 600 cfs and tailwater surface is 5 ft. above invert (max. tailwater condition).

Since this is not full pipe and does not directly fit the nomograph assumptions of Figure 7B.13 substitute depth as the diameter, to find a discharge equal to full pipe flow for that diameter, in this case 60 inches.

Since, Q = AV and $A = \frac{\pi D^2}{4}$

First, compute velocity:

V = (Q/A) = (600/(5) (10)) = 12 fps

Then substituting:

$$Q = \frac{\pi D^2}{4} \times V = \frac{3.14\,(5\text{ ft})^2}{4} \times 12\text{ fps} = 236\text{ cfs}$$

At the intersection of the curve d = 60 in. and Q = 236 cfs, read d_{50} = 0.4 ft.

Then reading the d = 60 in. curve, read apron length (L_a) = 40 ft.

Apron width, W = conduit width + (6.4)(L_a) = 10 + (0.4) (40) = 26 ft.

Example 3: Open Channel Flow with Discharge to Unconfined Section

Given: A trapezoidal concrete channel 5 ft. wide with 2:1 side slopes is flowing 2 ft. deep, Q = 180 cfs (velocity = 10 fps) and the tailwater surface downstream is 0.8 ft. (minimum tailwater condition).

Find: Using similar principles as Example 2, compute equivalent discharge for a 2 foot, using depth as a diameter, circular pipe flowing full at 10 feet per second.

Velocity:

$$Q = \frac{\pi\,(2\text{ft})^2}{4} \times 10\text{ fps} = 31.4\text{ cfs}$$

At intersection of the curve, d = 24 in. and Q = 32 cfs, read d_{50} = 0.6 ft.

Then reading the d = 24 in. curve, read apron length (L_a) = 20 ft.

Apron width, W = bottom width of channel + L_a = 5 + 20 = 25 ft.

Example 4: Pipe flow (partial) with discharge to a confined section

Given: A 48 in. pipe is discharging with a depth of 3 ft. Q = 100 cfs, and discharge velocity of 10 fps (established from partial flow analysis) to a confined trapezoidal channel with a 2 ft. bottom, 2:1 side slopes, n = .04, and grade of 0.6%.

Calculation of the downstream channel (by Manning's Equation) indicates a normal depth of 3.1 ft. and normal velocity of 3.9 fps.

Since the receiving channel is confined, the maximum tailwater condition controls.

Find: discharge using previous principles:

$$Q = \frac{\pi\,(3\text{ft})^2}{4} \times 10\text{ fps} = 71\text{ cfs}$$

At the intersection of d = 36 in. and Q = 71 cfs, read d_{50} = 0.3 ft.

Reading the d = 36" curve, read apron length (L_a) = 30 ft.

Since the maximum flow depth in this reach is 3.1 ft., that is the minimum depth of riprap to be maintained for the entire length.

Construction Specifications

1. The subgrade for the filter, riprap, or gabion shall be prepared to the required lines and grades. Any fill required in the subgrade shall be compacted to a density of approximately that of the surrounding undisturbed material.

2. The rock or gravel shall conform to the specified grading limits when installed respectively in the riprap or filter.

3. Filter cloth shall be protected from punching, cutting, or tearing. Any damage other than an occasional small hole shall be repaired by placing another piece of cloth over the damaged part or by completely replacing the cloth. All overlaps, whether for repairs or for joining two pieces of cloth shall be a minimum of one foot.

4. Stone for the riprap or gabion outlets may be placed by equipment. Both shall each be constructed to the full course thickness in one operation and in such a manner as to avoid displacement of underlying materials. The stone for riprap or gabion outlets shall be delivered and placed in a manner that will ensure that it is reasonably homogenous with the smaller stones and spalls filling the voids between the larger stones. Riprap shall be placed in a manner to prevent damage to the filter blanket or filter cloth. Hand placement will be required to the extent necessary to prevent damage to the permanent works.

Figure 5B.13
Outlet Protection Design—Maximum Tailwater Condition
(Design of Outlet Protection from a Round Pipe Flowing Full, Maximum Tailwater Condition: $T_w \geq 0.5D_o$) (USDA - NRCS)

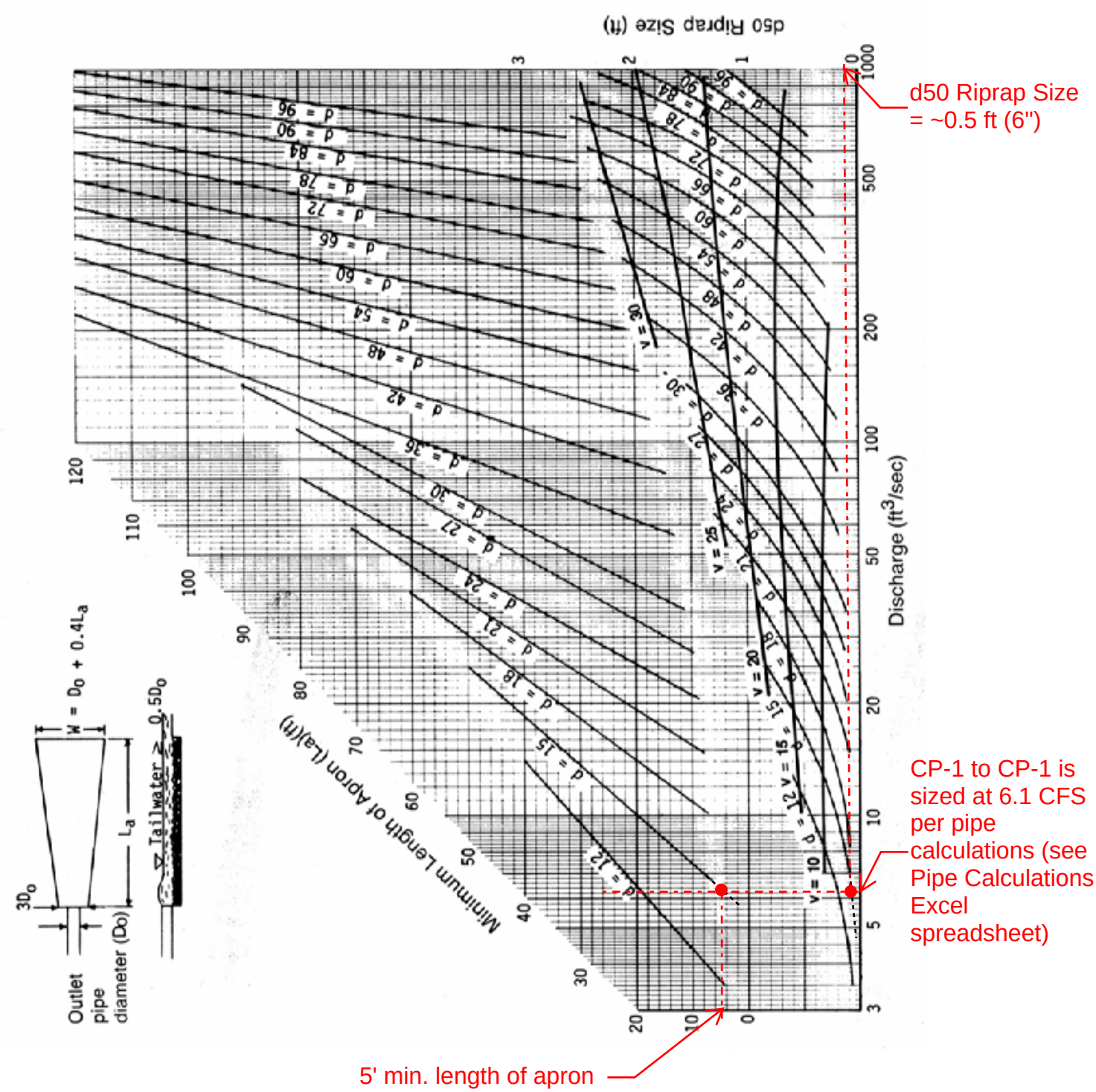
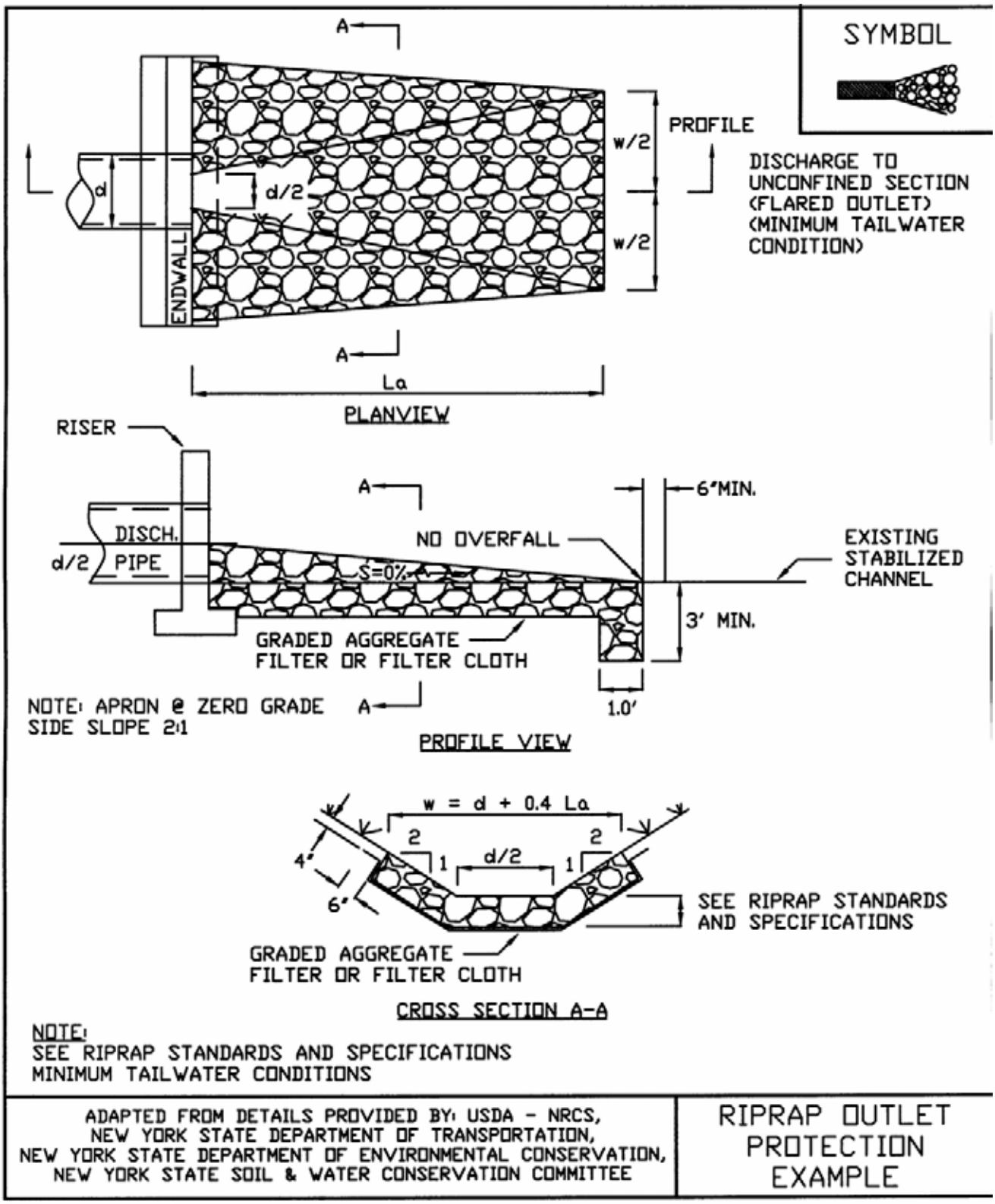


Figure 5B.14
Riprap Outlet Protection Detail (1)



SECTION 10

NYSDEC MAINTENANCE AND INSPECTION CHECKLIST

STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM
FOR CONSTRUCTION ACTIVITIES

CONSTRUCTION SITE LOG BOOK

Table of Contents

I. Pre-Construction Meeting Documents.

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a.

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a. Directions

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III. Monthly Summary Reports

IV. Monitoring, Reporting, and Three-Month Status Reports

a. Operator's Compliance Response Form

a

Properly completing forms such as those contained in this document meet the inspection requirement of NYSDEC SPDES GP for Construction Activities. Completed forms shall be kept on site at all times and made available to authorities upon request.

I. PRE-CONSTRUCTION MEETING DOCUMENTS

Project Name _____

Permit No. _____**Date of Authorization**_____

Name of Operator _____

Prime Contractor _____

a. Preamble to Site Assessment and Inspections -The Following Information To Be Read By All Person's Involved in The Construction of Stormwater Related Activities:

The Operator agrees to have a qualified professional[1] conduct an assessment of the site prior to the commencement of construction[2] and certify in this inspection report that the appropriate erosion and sediment controls described in the SWPPP have been adequately installed or implemented to ensure overall preparedness of the site for the commencement of construction.

Prior to the commencement of construction, the Operator shall certify in this site logbook that the SWPPP has been prepared in accordance with the State's standards and meets all Federal, State and local erosion and sediment control requirements.

When construction starts, site inspections shall be conducted by the qualified professional at least every 7 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater (Construction Duration Inspections). The Operator shall maintain a record of all inspection reports in this site logbook. The site logbook shall be maintained on site and be made available to the permitting authorities upon request. The Operator shall post at the site, in a publicly accessible location, a summary of the site inspection activities on a monthly basis (Monthly Summary Report).

The operator shall also prepare a written summary of compliance with this general permit at a minimum frequency of every three months (Operator's Compliance Response Form), while coverage exists. The summary should address the status of achieving each component of the SWPPP.

Prior to filing the Notice of Termination or the end of permit term, the Operator shall have a qualified professional perform a final site inspection. The qualified professional shall certify that the site has undergone final stabilization[3] using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls (such as silt fencing) not needed for long-term erosion control have been removed. In addition, the Operator must identify and certify that all permanent structures described in the SWPPP have been constructed and provide the owner(s) with an operation and maintenance plan that ensures the structure(s) continuously functions as designed.

1 "Qualified Professional means a person knowledgeable in the principles and practice of erosion and sediment controls, such as a Certified Professional in Erosion and Sediment Control (CPESC), soil scientist, licensed engineer or someone working under the direction and supervision of a licensed engineer (person must have experience in the principles and practices of erosion and sediment control).

2 "Commencement of construction" means the initial removal of vegetation and disturbance of soils associated with clearing, grading or excavating activities or other construction activities.

3 "Final stabilization" means that all soil-disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of eighty (80) percent has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures.

b. Operators Certification

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. Further, I hereby certify that the SWPPP meets all Federal, State, and local erosion and sediment control requirements. I am aware that false statements made herein are punishable as a class A misdemeanor pursuant to Section 210.45 of the Penal Law. "

Name (please print):_____

Title _____**Date:**_____

Address: _____

Phone: _____ **Email:**_____

Signature:_____

c. Qualified Professional's Credentials & Certification

" I hereby certify that I meet the criteria set forth in the General Permit to conduct site inspections for this project and that the appropriate erosion and sediment controls described in the SWPPP and as described in the following Pre-construction Site Assessment Checklist have been adequately installed or implemented, ensuring the overall preparedness of this site for the commencement of construction."

Name (please print):_____

Title _____**Date:**_____

Address: _____

Phone: _____ **Email:**_____

Signature:_____

d. Pre-construction Site Assessment Checklist (NOTE: Provide comments below as necessary)

1. Notice of Intent, SWPPP, and Contractors Certification:

Yes No NA

[ ] [ ] [ ] Has a Notice of Intent been filed with the NYS Department of Conservation?
[ ] [ ] [ ] Is the SWPPP on-site? Where?_____
[ ] [ ] [ ] Is the Plan current? What is the latest revision date?_____
[ ] [ ] [ ] Is a copy of the NOI (with brief description) onsite? Where?_____
[ ] [ ] [ ] Have all contractors involved with stormwater related activities signed a contractor's certification?

Pre-construction Site Assessment Checklist (continued)

2. Resource Protection

Yes No NA

[ ] [ ] [ ] Are construction limits clearly flagged or fenced?

[ ] [ ] [ ] Important trees and associated rooting zones, on-site septic system absorption fields, existing vegetated areas suitable for filter strips, especially in perimeter areas, have been flagged for protection.

[ ] [ ] [ ] Creek crossings installed prior to land-disturbing activity, including clearing and blasting.

3. Surface Water Protection

Yes No NA

[ ] [ ] [ ] Clean stormwater runoff has been diverted from areas to be disturbed.

[ ] [ ] [ ] Bodies of water located either on site or in the vicinity of the site have been identified and protected.

[ ] [ ] [ ] Appropriate practices to protect on-site or downstream surface water are installed.

[ ] [ ] [ ] Are clearing and grading operations divided into areas <5 acres?

4. Stabilized Construction Entrance

Yes No NA

[ ] [ ] [ ] A temporary construction entrance to capture mud and debris from construction vehicles before they enter the public highway has been installed.

[ ] [ ] [ ] Other access areas (entrances, construction routes, equipment parking areas) are stabilized immediately as work takes place with gravel or other cover.

[ ] [ ] [ ] Sediment tracked onto public streets is removed or cleaned on a regular basis.

5. Perimeter Sediment Controls

Yes No NA

[ ] [ ] [ ] Silt fence material and installation comply with the standard drawing and specifications.

[ ] [ ] [ ] Silt fences are installed at appropriate spacing intervals

[ ] [ ] [ ] Sediment/detention basin was installed as first land disturbing activity.

[ ] [ ] [ ] Sediment traps and barriers are installed.

6. Pollution Prevention for Waste and Hazardous Materials

Yes No NA

[ ] [ ] [ ] The Operator or designated representative has been assigned to implement the spill prevention avoidance and response plan.

[ ] [ ] [ ] The plan is contained in the SWPPP on page _____

[ ] [ ] [ ] Appropriate materials to control spills are onsite. Where? _____

II. CONSTRUCTION DURATION INSPECTIONS

a. Directions:
Inspection Forms will be filled out during the entire construction phase of the project.
Required Elements:

(1) On a site map, indicate the extent of all disturbed site areas and drainage pathways. Indicate site areas that are expected to undergo initial disturbance or significant site work within the next 14-day period;

(2) Indicate on a site map all areas of the site that have undergone temporary or permanent stabilization;

(3) Indicate all disturbed site areas that have not undergone active site work during the previous 14-day period;

Inspect all sediment control practices and record the approximate degree of sediment accumulation as a percentage of sediment storage volume (for example, 10 percent, 20 percent, 50 percent);

(5) Inspect all erosion and sediment control practices and record all maintenance requirements such as verifying the integrity of barrier or diversion systems (earthen berms or silt fencing) and containment systems (sediment basins and sediment traps). Identify any evidence of rill or gully erosion occurring on slopes and any loss of stabilizing vegetation or seeding/mulching. Document any excessive deposition of sediment or ponding water along barrier or diversion systems. Record the depth of sediment within containment structures, any erosion near outlet and overflow structures, and verify the ability of rock filters around perforated riser pipes to pass water; and

(6) Immediately report to the Operator any deficiencies that are identified with the implementation of the SWPPP.

SITE PLAN/SKETCH

_____ _____
Inspector (print name) **Date of Inspection**

_____ _____
Qualified Professional (print name) **Qualified Professional Signature**

The above signed acknowledges that, to the best of his/her knowledge, all information provided on the forms is accurate and complete.

Maintaining Water Quality

Yes No NA

[ ] [ ] [ ] Is there an increase in turbidity causing a substantial visible contrast to natural conditions?

[ ] [ ] [ ] Is there residue from oil and floating substances, visible oil film, or globules or grease?

[ ] [ ] [ ] All disturbance is within the limits of the approved plans.

[ ] [ ] [ ] Have receiving lake/bay, stream, and/or wetland been impacted by silt from project?

Housekeeping

1. General Site Conditions

Yes No NA

[ ] [ ] [ ] Is construction site litter and debris appropriately managed?

[ ] [ ] [ ] Are facilities and equipment necessary for implementation of erosion and sediment control in working order and/or properly maintained?

[ ] [ ] [ ] Is construction impacting the adjacent property?

[ ] [ ] [ ] Is dust adequately controlled?

2. Temporary Stream Crossing

Yes No NA

[ ] [ ] [ ] Maximum diameter pipes necessary to span creek without dredging are installed.

[ ] [ ] [ ] Installed non-woven geotextile fabric beneath approaches.

[ ] [ ] [ ] Is fill composed of aggregate (no earth or soil)?

[ ] [ ] [ ] Rock on approaches is clean enough to remove mud from vehicles & prevent sediment from entering stream during high flow.

Runoff Control Practices

1. Excavation Dewatering

Yes No NA

[ ] [ ] [ ] Upstream and downstream berms (sandbags, inflatable dams, etc.) are installed per plan.

[ ] [ ] [ ] Clean water from upstream pool is being pumped to the downstream pool.

[ ] [ ] [ ] Sediment laden water from work area is being discharged to a silt-trapping device.

[ ] [ ] [ ] Constructed upstream berm with one-foot minimum freeboard.

2. Level Spreader

Yes No NA

[ ] [ ] [ ] Installed per plan.

[ ] [ ] [ ] Constructed on undisturbed soil, not on fill, receiving only clear, non-sediment laden flow.

[ ] [ ] [ ] Flow sheets out of level spreader without erosion on downstream edge.

3. Interceptor Dikes and Swales

Yes No NA

[ ] [ ] [ ] Installed per plan with minimum side slopes 2H:1V or flatter.

[ ] [ ] [ ] Stabilized by geotextile fabric, seed, or mulch with no erosion occurring.

[ ] [ ] [ ] Sediment-laden runoff directed to sediment trapping structure

Runoff Control Practices (continued)

4. Stone Check Dam

Yes No NA

[ ] [ ] [ ] Is channel stable? (flow is not eroding soil underneath or around the structure).
[ ] [ ] [ ] Check is in good condition (rocks in place and no permanent pools behind the structure).
[ ] [ ] [ ] Has accumulated sediment been removed?.

5. Rock Outlet Protection

Yes No NA

[ ] [ ] [ ] Installed per plan.
[ ] [ ] [ ] Installed concurrently with pipe installation.

Soil Stabilization

1. Topsoil and Spoil Stockpiles

Yes No NA

[ ] [ ] [ ] Stockpiles are stabilized with vegetation and/or mulch.
[ ] [ ] [ ] Sediment control is installed at the toe of the slope.

2. Revegetation

Yes No NA

[ ] [ ] [ ] Temporary seedings and mulch have been applied to idle areas.
[ ] [ ] [ ] 4 inches minimum of topsoil has been applied under permanent seedings

Sediment Control

1. Stabilized Construction Entrance

Yes No NA

[ ] [ ] [ ] Stone is clean enough to effectively remove mud from vehicles.
[ ] [ ] [ ] Installed per standards and specifications?
[ ] [ ] [ ] Does all traffic use the stabilized entrance to enter and leave site?
[ ] [ ] [ ] Is adequate drainage provided to prevent ponding at entrance?

2. Silt Fence

Yes No NA

[ ] [ ] [ ] Installed on Contour, 10 feet from toe of slope (not across conveyance channels).
[ ] [ ] [ ] Joints constructed by wrapping the two ends together for continuous support.
[ ] [ ] [ ] Fabric buried 6 inches minimum.
[ ] [ ] [ ] Posts are stable, fabric is tight and without rips or frayed areas.

Sediment accumulation is ___% of design capacity.

Sediment Control (continued)

3. Storm Drain Inlet Protection (Use for Stone & Block; Filter Fabric; Curb; or, Excavated practices)

Yes No NA

[ ] [ ] [ ] Installed concrete blocks lengthwise so open ends face outward, not upward.
[ ] [ ] [ ] Placed wire screen between No. 3 crushed stone and concrete blocks.
[ ] [ ] [ ] Drainage area is 1acre or less.
[ ] [ ] [ ] Excavated area is 900 cubic feet.
[ ] [ ] [ ] Excavated side slopes should be 2:1.
[ ] [ ] [ ] 2" x 4" frame is constructed and structurally sound.
[ ] [ ] [ ] Posts 3-foot maximum spacing between posts.
[ ] [ ] [ ] Fabric is embedded 1 to 1.5 feet below ground and secured to frame/posts with staples at max 8-inch spacing.
[ ] [ ] [ ] Posts are stable, fabric is tight and without rips or frayed areas.

Sediment accumulation ___% of design capacity.

4. Temporary Sediment Trap

Yes No NA

[ ] [ ] [ ] Outlet structure is constructed per the approved plan or drawing.
[ ] [ ] [ ] Geotextile fabric has been placed beneath rock fill.

Sediment accumulation is ___% of design capacity.

5. Temporary Sediment Basin

Yes No NA

[ ] [ ] [ ] Basin and outlet structure constructed per the approved plan.
[ ] [ ] [ ] Basin side slopes are stabilized with seed/mulch.
[ ] [ ] [ ] Drainage structure flushed and basin surface restored upon removal of sediment basin facility.

Sediment accumulation is ___% of design capacity.

Note: Not all erosion and sediment control practices are included in this listing. Add additional pages to this list as required by site specific design.
Construction inspection checklists for post-development stormwater management practices can be found in Appendix F of the New York Stormwater Management Design Manual.

CONSTRUCTION DURATION INSPECTIONS
b. Modifications to the SWPPP (To be completed as described below)

The Operator shall amend the SWPPP whenever:
1. There is a significant change in design, construction, operation, or maintenance which may have a significant effect on the potential for the discharge of pollutants to the waters of the United States and which has not otherwise been addressed in the SWPPP; or
2. The SWPPP proves to be ineffective in:
a. Eliminating or significantly minimizing pollutants from sources identified in the SWPPP and as required by this permit; or
b. Achieving the general objectives of controlling pollutants in stormwater discharges from permitted construction activity; and
3. Additionally, the SWPPP shall be amended to identify any new contractor or subcontractor that will implement any measure of the SWPPP.

Modification & Reason:

III. Monthly Summary of Site Inspection Activities

Name of Permitted Facility:	**Today's Date:**	**Reporting Month:**
Location:	**Permit Identification #:**	
Name and Telephone Number of Site Inspector:		

Date of Inspection	Regular / Rainfall based Inspection	Name of Inspector	Items of Concern

Owner/Operator Certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that false statements made herein are punishable as a class A misdemeanor pursuant to Section 210.45 of the Penal Law."

_____ _____

Signature of Permittee or Duly Authorized Representative Name of Permittee or Duly Authorized Representative date

Duly authorized representatives must have written authorization, submitted to DEC, to sign any permit documents.

APPENDIX L-
REAL ESTATE VALUATION REPORT

RESIDENTIAL PROPERTY VALUE AND IMPACT STUDY OF PROPOSED O&R ELECTRIC TRANSMISSION AND GAS REGULATOR SUBSTATIONS AT THE INTERSECTION OF LITTLE TOR ROAD AND SOUTH MOUNTAIN ROAD

Prepared For

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EXECUTIVE SUMMARY

Orange and Rockland Property, Little Tor Road, New City, NY

We have been requested to offer our opinion as to the potential impact on the value of nearby properties to the proposed Little Tor Road / South Mountain Road electric utility substation and a gas regulator substation. We are a general appraisal firm specializing in valuations in the lower Hudson Valley with its location in Rockland County and with a very significant expertise in the valuation of Rockland County properties. Our practice relies on not only typical appraisal techniques and experience but also the use of computer aided technology. In reviewing the assignment we realized that we would be employing a significantly large set of data, single family residential sales each of which was delineated by the significant attributes of the property sold. Accordingly, we have utilized a geographic information system (GIS) as well as multiple regression analysis, a statistical tool using computer aided software that enables an appraiser to employ a larger amount of data and variables than typical.

The proposed substation (the subject property) is situate at the south westerly intersection of Little Tor and South Mountain Roads. South Mountain Road is typically

developed with older homes on densely wooded lots. As the name implies it traverses hilly terrain. The Little Tor Road neighborhood is also a residential neighborhood with generally level topography. The subject property proposed substation is to be situate on a lot of 10.18± acres and is proposed to be suitably screened from neighborhood properties. Substantial side yards are proposed, all greater than required in the "R-40" zoning district.

The subject property is currently improved with high tension wires, lines 53 and 54, that generally run diagonally away from Little Tor Road generally in a north-east, south-westerly direction. Power lines 53 and 54 also cross South Mountain. There is an additional existing electric power line that runs from the subject property across Little Tor Road in a generally easterly direction. There is a gas regulator onsite that is proposed to be moved to the interior of the property. Prior on-site improvements include a switching station (1926), two transformers that were installed between 1952 and 1956. The transformers were removed from the property in 1982 and the switching station removed in 1983.

We determined, therefore, to assist in estimating potential property value impacts on residential property values in sub-markets that are in close proximity to existing substations and are also impacted by proximity to power lines, and analyze the sales of single-family homes both proximate and removed from the area of the substations and high tension wires to determine if there was a discernable impact on those residences in close proximity. If not, we would expect no adverse impact from the proposed improvements as the nearby properties would be exposed to similar conditions.

We located two substations that were in reasonably similar sub-markets, although not identical in locational attributes to the subject property proposed substation, the New Hempstead Road/ New City substation and the Congers substation. The New City substation and its attendant high tension wires is located at the southbound exit/entry to the Palisades Parkway Exit 11. New Hempstead Road is a busy two-lane road that is the primary east-west link to and from New City. The New Hempstead substation sub-market is highly residential, although it is somewhat intermixed with a variety of religious uses. It is within the East Ramapo Central School District. There is a small strip center, also, in this area which we do not consider a significant influence on neighborhood values. We deemed this site substantially and reasonably similar in many market/locational attributes. The other substation that is also within a similar residential sub-market area is the Congers substation located off Gilchrest Avenue along the railway line west of Congers Lake and Route 303. With respect to both locations of our chosen substations we annex area maps wherein single-family residential parcels are indicated in yellow.

With the technological advances in computer hardware and software, and the increased availability of large quantities of real estate sales and property description data, it is possible to incorporate statistical methods of valuation for use in appraisal assignments.

For purposes of this report we are using a well-recognized statistical method, a Multiple Regression Analysis (MRA) technique, which involves the (linear) correlation of value-influencing attributes to changes in sales prices. We also developed a

geographic related database or geographic information system which we employed to identify residential sales.

After applying our analyses we found no likely loss of value by reason of the proximity of a residence to the Congers substation. With respect to the New Hempstead - New City substation we also found no evidence that proximity to a sub-station is likely to reduce property values.

We have also reviewed the literature in the field that discusses the influence of the presence of power lines on adjacent and nearby properties.[1,2] There are no such articles with respect to substations; however, there are many aspects of high tension wires that are similar to electrical or gas substations, although with greater visibility. These studies consistently find that to the extent that there is any value diminishing influence of the presence of power lines that the greater the distance from the line the less the value influences. Further, they find that over time this negative influence on value diminishes. The literature, therefore, is consistent with our studies as both the New Hempstead Road – New City substation and the Congers substation have been present for a very long time. Simply put, people got used to them and did not find over time that they reduced the value of their houses upon sale.

We consider that the subject property proposed substation site is an already existing impacted site, as described above. It is similar to the sub-markets we studied. Further, the existing gas regulator is proposed to be moved from its current site to one further removed from adjacent properties. We also apply our experience as appraisers

[1] "Power Lines and Property Values Revisited", by Pitts and Jackson that appeared in the Appraisal Journal, Fall 2007
[2] "High-Voltage Transmission lines: Proximity, Visibility, and Encumbrance Effects" by Charlmers and Voorvaart, Appraisal Journal, Summer 2009.

from which we know that with respect to an already impacted site the addition of a potential negative externality has a limited probability of decreasing nearby property values. We also know that if a site is large, is well protected by visual barriers such as trees and other vegetation so that there is limited visibility to adjacent or nearby property owners, that the potential to produce lower property values is diminished. Accordingly, we conclude that the subject proposed substation is unlikely to reduce nearby property values.

Our detailed report and statistical analyses and regressions are contained in the following sections of our report.

RESIDENTIAL PROPERTY VALUE AND IMPACT STUDY OF PROPOSED O&R ELECTRIC TRANSMISSION AND GAS REGULATOR SUBSTATIONS

PROPOSED ELECTRIC TRANSMISSION AND GAS REGULATOR SUBSTATIONS

Orange and Rockland Property, Little Tor Road, New City, NY

INTRODUCTION

Beckmann Appraisals has been asked to opine as to the potential impact on the value of nearby properties to the proposed Little Tor Road / South Mountain Road electric utility substation and a gas regulator substation. Beckmann Appraisals is a general appraisal firm specializing in valuations in the lower Hudson Valley with its location in Rockland County and with a very significant expertise in the valuation of Rockland County properties. Our practice relies not only on typical appraisal techniques and experience but also the use of computer aided technology. The analysis in this report is based on the specification and estimation of regression models. These models allow the appraiser to utilize a larger sample of transactions, and most importantly, to control for a large number of value-impacting variables. The regression models are used to determine whether proximity to substations has an impact on values, and if so, the magnitude of that impact. We analyzed residential property values in two locations comparable to the Little Tor/South Mountain sub-market, and that already have existing substations and power lines.

The conclusion from our analysis is that there is no statistically significant evidence of negative impacts on the values of residential properties proximate to the substations in the comparable areas, and that it is reasonable to suggest that the proposed Little Tor/Mountain Road substations will have a similar lack of impact.

Our report is divided into four parts, as follows: 1) an introduction to regression modeling, 2) the study areas and data set, 3) model specification, 4) model estimates (results) and conclusions.

1. Introduction to regression modeling

The use of regression modeling to assess the potential impact of various externalities is a widely accepted approach. The strength of regression models is that they are able to utilize large samples, and most importantly, they are able to control for the large number of variables that affect property values.

The modeling process begins with a clear statement and description of the research question to be answered. That question is the basis for both "specifying" and "estimating" the model. Specification includes the selection of variables to be used in the model. For the purpose of measuring the impact on property values with respect to proximity to substations, the variables selected should be those thought to be most important in explaining differences in the selling prices of properties. Estimation of the regression model includes the selection and description of the data set and the regression estimates that result. The production of credible estimates is a function of how well the model is specified, and how appropriate the data are with respect to answering the research question. Regression estimates include a number of diagnostic statistics that can help in arriving at judgments about model performance.

In the analysis of real estate markets, the most common applications of regression models are to explain and predict the selling prices (or values) of single family properties based on an array of property characteristics (variables) that experience and prior

research suggest are important in explaining differences in prices. These include familiar characteristics such as house and lot size, location, design elements, the presence (or absence) of property characteristics such as a garage, or air conditioning, etc. When used specifically to address the question of proximity impacts, the variable list will include such things as distance to the potentially offending structure. The strength of regression modeling is the ability to "unbundle" the various factors affecting the price by including each of them as variables in the model. This reduces the potential problem of improperly attributing the actual impact of one characteristic to a different characteristic. To arrive at credible regression estimates, it is essential that the list of variables used in a regression model be as complete as possible. Put differently, the model must be properly specified to answer the research question.

2. The study areas and data set

The proposed substation (the subject property) is at the south westerly intersection of Little Tor and South Mountain Roads. South Mountain Road is developed largely with older homes on densely wooded lots. It traverses hilly terrain. The Little Tor Road neighborhood is also a residential neighborhood though with generally level topography. The proposed substation will be sited on a lot approximately 10.18± acres, and is proposed to be suitably screened from neighborhood properties. Substantial side yards are proposed, all greater than required in the "R-40" zoning district. The substation improvements will be enclosed within a fenced in area covering only approximately 7% of the total lot.

The subject property is currently traversed by high tension wires, lines 53 and 54, that generally run diagonally away from Little Tor Road generally in a north-east, south-westerly direction. Power lines 53 and 54 also cross South Mountain. There is an additional existing electric power line that runs from the subject property across Little Tor Road in a generally easterly direction. Both South Mountain and Little Tor Roads in the area of the subject property, and to the east and west, have above ground utilities on typical utility poles with multiple lines at several levels of elevation from the street.

To gauge any potential impacts on the value of residential properties proximate to the proposed Little Tor/South Mountain substation, we measured the impact on property values in two comparable sub-markets with existing substations and which are also in close proximity to existing power lines. These two substation markets were selected after reviewing the properties surrounding all of the Orange and Rockland substations in Rockland County. These two substation markets were selected after reviewing the location attributes surrounding all Orange and Rockland (Con Edison) substations in Rockland County. Most of the substations are not in or adjacent to residential areas. However, two substations were identified that were in locations reasonably similar, although not identical, to the Little Tor/South Mountain location. These are New Hempstead Road/ New City substation and the Congers substation. The New Hempstead Road/ New City substation is at the southbound exit/entry to the Palisades Parkway Exit 11 and situated within the East Ramapo Central School District. The existing substation is on a lot of approximately 7.37 acres on which the substation improvements occupy some 1.8 acres or almost 25% of the land area.

The Congers substation adjoins a residential area. It is located off Gilchrest Avenue along the railway line west of Congers Lake and Route 303. It is within the Clarkstown Central School District. Maps of the New Hempstead Road/New City and Congers sub-markets are appended, with single-family properties indicated in yellow. The substation is on approximately 2.1 acres of land. The substation improvements are contained on approximately 0.8 acres of the site, and occupy about 38% of the land area.

The data set used to estimate proximity impacts in the New Hempstead/New City sub-markets included all residential sales within 2500 feet of that substation, and which occurred between January 2005- September 2009 within the New City – East Ramapo CSD area. Arc View software was used to develop a Geographic Information System (GIS) that identified the residential sales in the study area during the study period. The data from the sales were then obtained from either the Greater Hudson Valley Multiple Listing Service (MLS) or the Real Property Services data collected by the town assessor. There were 136 sales during the study time period. Of these, a relatively large number had missing information, or clearly incorrect information with respect to one or more of the variables necessary to estimate the regression models. Many, for example, did not contain information about important characteristics such as improvement size, room count, or date of construction/renovation of the improvements. In addition, initial model estimates identified some sales that were of properties that were outliers in terms of characteristics and/or resulting value estimates. One example was the elimination of sales along New Hempstead road, as their location attributes differed substantially from the sales in the rest of the data set as they abutted a busy road and were subject to traffic

and noise conditions. After eliminating sales of outliers and those with missing or incorrect information, the final data set for New Hempstead/New City included 56 sales.

For the Congers analysis, the same procedure was used to collect and clean the sales data from the Congers – Clarkstown CSD area. The number of sales during 2005 – 2009 within 2500 feet of the substation totaled 106, of which 62 remained after eliminating outliers and those with missing or incorrect information, a substantial number of sales. Similar to the case of New Hempstead/New City, an example of eliminated sales were those that ran along Route 303, as again, the characteristics of those properties differed substantially from the characteristics of the properties in the rest of the data set by reason of heavy traffic and related noise.

3. Model specification

Model specification includes the selection of independent variables (in this case housing, location, and market characteristics) that the appraiser has reason to believe will explain differences in the selling prices of properties in the data sets. As noted in Part 1, it is important that the specification be as complete as possible, so that the value impacts of other variables are not improperly attributed to the proximity of the property to the substation. Put differently, it is important to control for the value impacts of as many of the variables that may logically have significant impacts on the selling prices of the properties in the data set.

In the case of modeling housing markets, the main characteristics that must be included as independent variables are well-known. The initial specification of our models included the following independent variables: Date of sale (measured as number

of months since the sale), square feet of living area, lot size (in acres), total number of baths (including lavatories.), whether or not there is a garage, whether or not there is central air conditioning the number of bedrooms, whether or not the house has a basement, a set of variables indicating the architectural style of the house, whether or not the property is adjacent to an existing power line, and finally, whether or not the property is within 500 feet of the substation property line. The distance variable is the one of most interest in this study, as it is designed to capture any impacts of proximity to the substation(s). Because the distance variable is a yes/no (or qualitative) variable, this specification will produce an estimate of any difference in selling prices between properties inside and outside of 500 feet from the substation(s), while controlling for the price impact of the other variables in the model. Inspection of the list of variables in the model suggests it mirrors those variables typically considered in determining the value of residential properties, and which are typical of adjustments that are considered when doing a traditional sales comparison approach.

The expected impacts on the value of the model's other variables are all positive, with the exception of the variable that measures the relationship between selling prices and proximity to power lines and the variable that measures the relationship between selling prices and distance from the substation site. The direction, statistical strength, and magnitude of any proximity impacts are the empirical questions this research seeks answers to, and the answers are therefore not known prior to making the regression estimates.

The regression model described above was estimated independently for the New Hempstead/New City and the Congers areas. The model was then estimated a third time

using the combined data sets of the two study areas. For this estimation, an additional independent variable was added to the model to control the overall location differences between the two areas. Because selling prices in the Congers area tend to be about 15% higher than in the New Hempstead/New City area, the coefficient on the location variable (which is specified to reflect the difference between Congers and New Hempstead), is expected to be positive. Some portion of the location variable is attributable to the different school districts within which the two properties lie. The Congers area is within the highly regarded Clarkstown Central School District while the New Hempstead substation is within the less highly regarded East Ramapo Central School District.

4. Model estimates (results)

As described in Part 1, an integral part of producing credible regression model results is to use the diagnostic statistics produced by the estimates to make judgments about how well the model performed. In response, often the model specification is changed, and/or outliers in the dataset identified and discarded. Our initial regression estimates included the full set of variables described in Part 3. The overall performance of the models in these initial specifications was very strong, but some of the individual independent variables were found to have no statistically significant association with selling prices; that is, they were not contributing to the model's ability to explain differences in the selling prices. Specifically, the presence of a basement and all of the architectural design variables except colonial were found insignificant, and they were therefore omitted from the final model specification.

The final regression results are appended to the report, along with descriptive statistics of the samples. Inspection of the results and the accompanying diagnostic statistics leads to the conclusion that the model did extremely well, in determining the differences in selling prices.

The average residual —the difference between the actual selling prices and the prices predicted by the model—is about 6.9% across the three estimations. This is well within common guidelines for acceptable valuation accuracy.

The R^2 statistics, which are among the most widely cited diagnostic statistics, are very high. The R^2 is a measure of the overall performance of the model, and will range from -0- (a model that explains nothing) to 1.0 (a perfect model). When modeling real estate markets, R^2's of 1.0 are never achieved, as those markets are simply too complex and imperfect to be modeled perfectly. While there is no discrete number that must be achieved for an R^2 to be considered acceptable, a review of the real estate literature suggests that when attempting to explain residential prices as in this case, it is not unusual to attain R^2's of .70 -.80. R^2's above .80 are seen less frequently. The three estimations in our study produced R^2's of .91 (New Hempstead/New City), .88 (Congers), and .88 (combined). These numbers suggest a model very well specified to answer the research question.

A second commonly cited diagnostic statistic is the F statistic and its accompanying significance level. The F is also a measure of how the model as a whole has performed. Unlike the R^2 however, the construction of the F statistic allows a calculation of its significance level. The level of significance is a measure that reveals the probability that there is, in fact, no relationship between the independent variables in

the model and the dependent variable. In this case, the significance level tells us that the independent variables really don't explain the differences in selling prices (i.e., proximity to a substation did not affect value). For example a significance level of .05 means there is a 5% chance the model does not explain selling prices, while .01 means there is a 1% chance the model does not explain selling prices. Thus a lower significance level is better than a higher significance level. Those who work regularly with this kind of modeling, or who use the results of this kind of modeling, often refer to significance levels above .10 as insignificant, those between .05 and .10 as weakly significant, and those below .05 as strongly significant.

The significance levels of the F statistic from our three results are 4.5 E -21 (New Hempstead/New City), 7.8 E -21 (Congers), and 8.4 E -45 (combined). The algebraic notation E followed by a negative number means the decimal is a certain number of places to the left. For example, the 7.8 E -21 for Congers means the decimal is 21 places to the left. The resulting number is effectively zero, meaning there is virtually no probability the model results are the result of chance. Put differently, there is virtually a 100% probability the results can be trusted. This applies to the significance of the F statistic in all three estimations.

As described, the R^2 and F statistics measure the overall performance of the model. Of equal or even greater importance is the performance of the individual independent variables. This is because while a model as a whole may be doing a good job of explaining the dependent variable, that does not mean all of the independent variables are contributing to the same extent, and it may be that some have no statistically significant association with the dependent variable.

The performance of an individual independent variable is measured and judged the same way the overall model is judged, which is by statistical significance. The level of significance for each independent variable is shown as its 'P' value. Inspection of the 'P' values for the independent variables in the three estimates shows that with a few isolated exceptions, all of the independent variables are at significance levels of .10 or lower (most are significant at well below .01 except the two proximity variables: adjacent to power lines or RR, and the variable of primary interest in this study, a location within 500 feet of the substation site. **The conclusions from this are, 1) the variables in the model were well chosen; and 2) most important, that there is no statistically significant association between proximity to a substation and residential property values.** *Note that this result is consistent across all three estimations and importantly, the lack of association between proximity to a substation and property value was found consistently across all of the many model specifications tested prior to arriving at the final specifications.*

Our results are also consistent with the results that have been obtained in studies of similar circumstances. While there are no articles specifically regarding prior research on proximity impacts of substations, there are results with reference to high tension wires.[3,4] These studies consistently find 1) if there is a negative impact it tends to be quite small, 2) that if there is a negative impact it tends to be restricted to a very narrow distance zone adjacent to the power lines, and 3) if there is a small negative impact immediately after a power line is built, over time that impact diminishes. These studies

[3] "Power Lines and Property Values Revisited", by Pitts and Jackson that appeared in the Appraisal Journal, Fall 2007
[4] "High-Voltage Transmission lines: Proximity, Visibility, and Encumbrance Effects" by Charlmers and Voorvaart, Appraisal Journal, Summer 2009.

are consistent with our results, which found no statistically significant association between property values and proximity to either power lines or substations.

The finding from the power line literature, that if there is a small, temporary negative impact of new power lines it is restricted to properties that are effectively adjacent to the line is also interesting with respect to our expectations about the impact of a new substation. Because the proposed substation will be sited on ten acres of landscaped and visibility screened land, with the substation itself covering less than one acre, there will be a substantial distance from the fenced substation facilities to the edge of the substation site in addition to the distance from the edge of the substation site to the property lines of surrounding residences. Both of the comparable substations were situate on significantly smaller lots with a greater percentage of the lot area developed with the substation facilities than proposed for the subject property. This, combined with the existing high tension wires and services that already traverse the neighborhood reinforces our conclusion that the results of the analysis demonstrate a less significant probability of impact at the subject property in comparison to the two comparable substation areas. In conclusion, when we combine what we can learn from the power line literature with the extremely strong evidence produced by our studies of New Hempstead/New City and Congers substation areas, as well as the comparative physical sizes of the existing substations and the proposed substation and the vegetation screening to be provided, there is a persuasive evidence that the proposed substation will have little or no impact on residential property values.

CERTIFICATE OF THE APPRAISER

November 16, 2009

I, William R. Beckmann, certify that to the best of my knowledge and belief:

That the statements of fact contained in this report are true and correct.

That the reported analyses, opinions and conclusions are limited only to the reported assumptions and limiting conditions, and are my personal, impartial, and unbiased professional analyses, opinions, and conclusions.

That I have no present or prospective interest in the property that is the subject of this report, and I have no personal interest with respect to the parties involved.

That my engagement in this assignment was not contingent upon developing or reporting predetermined results.

That compensation for completing this assignment is not contingent upon the developing or reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value opinion, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this appraisal.

That my analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the Uniform Standards of Professional Appraisal Practice of the Appraisal Foundation and the Code of Professional Ethics and the Standards of Professional Appraisal Practice of the Appraisal Institute.

I have made a personal inspection of the property that is the subject of this report.

My analysis, opinions, and conclusions were developed, and this report has been prepared, in conformity with the Code of Professional Ethics of the Appraisal Institute and Standards of Professional Appraisal Practice of The Appraisal Foundation.

I have made a personal inspection of the property that is the subject of this report.

Ann Marie Mulholland and Kenneth M. Lusht, Ph.D, MAI, SRA have provided significant professional assistance to the person signing this report.

That the use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives.

As of the date of this report, I have completed the requirements under the continuing education program of the Appraisal Institute.

BECKMANN APPRAISALS, INC.

By: William Beckmann

William R. Beckmann, MAI, CRE
Certificate Number 8417
New York State General Certified Appraiser

GLOSSARY

Multiple Regression – Regression analysis using two or more

Dependent variable – The variable on the left side of a regression equation. Variations in the dependent variable are generally assumed to be caused by the independent variables.

Independent variable – One of the variables on the right side of a regression equation that are assumed to explain differences in the dependent variable.

R-Squared (R^2) – The basic measure of goodness of fit used in regression analysis. It is the ratio of explained variation (RSS) in the dependent variable to total variation (TSS) in the dependent variable.

Adjusted R^2 – The coefficient of determination adjusted for the number of independent variables. Adjusted R^2 tests whether the independent variable is useful. If R^2 and adjusted R^2 are far apart there are probably redundant variables in the model.

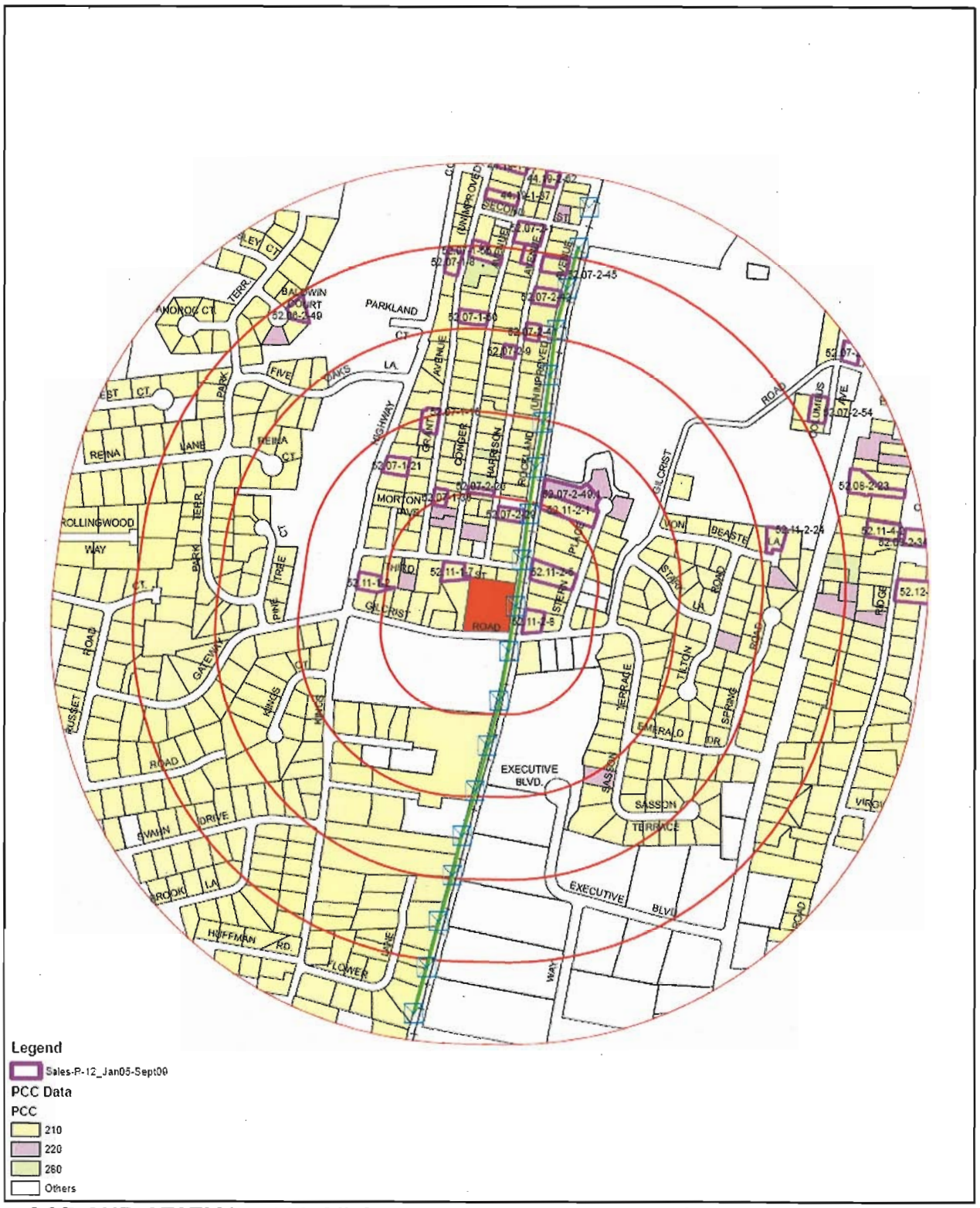
F-statistic – A statistic that measures the overall significance of the regression equation.

T-statistic – (coefficient / standard error) measures the relationship between the mean (coefficient) and its standard error)

P-Value – The statistical probability of the occurrence of a given finding by chance alone in comparison with the known distribution of possible findings. The reciprocal of the significance of the t-statistic and provides the chance or probability that the independent variable is not significantly related to the dependent variable. Generally the lower the P value, the less likely the finding would occur by chance alone.

Intercept – The Y-intercept of the regression equation (b_0). It is sometimes interpreted as the average effect of all omitted variables.

CONGERS SUBSTATION
(Clarkstown Central School District)



O&R SUB-STATION - 14A Gilchrest Road, Congers, NY 10920 (52.11-1-11)

0 500 1,000 1,500 Feet

OBS#	MI Number	Area/Location	School Disctrict	Address	Style	Sale Price	# Mos from Sale	Colonial	Sq.Ft Approx	Acres	Bath.Lav Total	Gar Y/N	AC	Adj to PwrLine/RR	Zone 1 (0 - 500')
1	390951	R-CONGERS	CLARKSTOWN	138 S CONGERS AV	RANCH	$372,500	39	0	1360	0.21	1.1	1	0	0	0
2	390571	R-CONGERS	CLARKSTOWN	146 S CONGER AV	RANCH	$375,000	40	0	952	0.27	1.0	1	1	0	0
3	461270	R-CONGERS	CLARKSTOWN	144 S HARRISON AV	RANCH	$200,000	4	0	1030	0.18	1.1	1	0	0	0
4	462678	R-CONGERS	CLARKSTOWN	12 COLUMBUS AV	SRMK	$407,500	4	0	1404	0.37	1.1	1	1	0	0
5	436939	R-CONGERS	CLARKSTOWN	41 RIDGE RD	RANCH	$360,000	19	0	1368	0.31	1.0	0	0	0	0
6	370808	R-CONGERS	CLARKSTOWN	36 RIDGE RD	COLONIAL	$565,000	46	1	2184	0.46	1.1	0	1	0	0
7	399824	R-CONGERS	CLARKSTOWN	171 S HARRISON AV	RANCH	$350,000	35	0	1000	0.37	1.0	1	0	1	0
8	422847	R-CONGERS	CLARKSTOWN	163 S HARRISON AV	RANCH	$375,000	26	0	860	0.37	1.0	1	1	1	0
9	391996	R-CONGERS	CLARKSTOWN	6 BALDWIN CT	BLVLHRNCH	$527,400	33	0	2120	0.30	2.1	1	0	0	0
10	402203	R-CONGERS	CLARKSTOWN	159 KINGS HY	CONTEMP	$492,000	34	1	1907	0.27	2.1	1	1	0	0
11	397811	R-CONGERS	CLARKSTOWN	176 S CONGER AVE	SPLITLEVEL	$550,000	33	0	2200	0.32	2.1	1	1	0	0
12	426687	R-CONGERS	CLARKSTOWN	176 S CONGER AVE	SPLITLEVEL	$450,000	16	0	2200	0.32	2.1	1	1	0	0
13	375944	R-CONGERS	CLARKSTOWN	160 S CONGER AV	COLONIAL	$740,000	47	1	2996	0.40	2.2	1	1	0	0
14	380193	R-CONGERS	CLARKSTOWN	162 S HARRISON AV	SPLITLEVEL	$530,000	46	0	1664	0.24	2.1	1	1	0	0
15	432747	R-CONGERS	CLARKSTOWN	177 S HARRISON AV	RANCH	$410,000	16	0	960	0.00	2.0	0	1	0	0
16	379684	R-CONGERS	CLARKSTOWN	23 VON BEASTE LN	RANCH	$456,000	30	0	1104	0.35	1.1	1	0	0	0
17	421584	R-CONGERS	CLARKSTOWN	180 S HARRISON AV	RANCH	$330,000	27	0	992	0.14	1.0	0	0	0	0
18	461758	R-CONGERS	CLARKSTOWN	17 STERN PL	BLVLHRNCH	$600,000	1	0	2600	0.79	3.0	1	1	1	0
19	443893	R-CONGERS	CLARKSTOWN	15 STERN PL	BLVLHRNCH	$660,000	13	0	2500	0.79	3.0	1	1	1	0
20	387913	R-CONGERS	CLARKSTOWN	223 KINGS HIGHWAY	RANCH	$454,000	39	0	1268	0.35	2.1	1	0	0	0
21	364687	R-CONGERS	CLARKSTOWN	223 S GRANT AV	BLVLHRNCH	$490,000	51	0	1717	0.18	2.0	1	1	0	0
22	350375	R-CONGERS	CLARKSTOWN	219 S CONGER AV	RANCH	$345,000	55	0	789	0.12	1.0	0	0	0	0
23	438048	R-CONGERS	CLARKSTOWN	245 KINGS HY	RANCH	$385,000	16	0	1120	0.35	1.0	1	1	0	0
24	368237	R-CONGERS	CLARKSTOWN	229 S Harrison AV	CAPECOD	$449,999	47	0	1707	0.27	2.0	0	0	1	1
25	400610	R-CONGERS	CLARKSTOWN	2 VON BEASTE LN	BLVLHRNCH	$440,000	28	0	1828	0.35	2.0	1	1	1	1
26	452411	R-CONGERS	CLARKSTOWN	14 GILCHREST RD	BLVLHRNCH	$495,000	7	0	2500	0.36	3.0	1	1	1	1
27	415361	R-CONGERS	CLARKSTOWN	15 THIRD ST	BLVLHRNCH	$470,000	25	0	2070	0.37	2.1	1	1	0	1
28	364824	R-CONGERS	CLARKSTOWN	29 N ROCKLAND AV	BLVLHRNCH	$495,000	52	0	2534	0.24	3.0	1	1	1	0
29	363019	R-CONGERS	CLARKSTOWN	LOT 21 WATERSEDGE	COLONIAL	$919,900	43	1	3400	1.25	3.0	1	1	0	0
30	377310	R-CONGERS	CLARKSTOWN	LOT #1 STERN PL	BLVLHRNCH	$649,900	35	0	2400	0.27	3.0	1	1	0	0
31	377313	R-CONGERS	CLARKSTOWN	LOT #2 STERN PL	BLVLHRNCH	$609,900	41	0	2400	0.25	3.0	1	1	0	0
32	377314	R-CONGERS	CLARKSTOWN	LOT #5 STERN PL	COLONIAL	$639,900	35	1	2400	0.46	2.1	1	1	0	0
33	377316	R-CONGERS	CLARKSTOWN	LOT #7 STERN PL	BLVLHRNCH	$649,900	34	0	2400	0.70	3.0	1	1	0	0
34	377317	R-CONGERS	CLARKSTOWN	LOT #8 STERN PL	BLVLHRNCH	$629,900	37	0	2400	0.37	3.0	1	1	0	0
35	377322	R-CONGERS	CLARKSTOWN	LOT 11 STERN PL	BLVLHRNCH	$629,900	36	0	2400	0.00	3.0	1	1	0	0
36	377334	R-CONGERS	CLARKSTOWN	LOT 12 GILCHREST RD	COLONIAL	$639,900	34	1	2400	0.33	2.1	1	1	0	0
37	377328	R-CONGERS	CLARKSTOWN	LOT 13 STERN PL	BLVLHRNCH	$639,900	38	0	2400	0.75	3.0	1	1	0	0
38	377323	R-CONGERS	CLARKSTOWN	LOT 12 STERN PL	BLVLHRNCH	$629,900	40	0	2400	0.37	3.0	1	1	0	0
39	365464	R-CONGERS	CLARKSTOWN	1 NELSON LN	COLONIAL	$660,000	51	1	2502	0.52	2.1	1	1	0	0
40	370056	R-CONGERS	CLARKSTOWN	267 OLD HAVERSTRAW RD	RANCH	$410,000	49	0	1603	0.33	2.0	0	1	0	0
41	365864	R-CONGERS	CLARKSTOWN	225 OLD HAVERSTRAW RD	BLVLHRNCH	$590,000	49	0	1900	0.31	3.0	1	1	0	0
42	387019	R-CONGERS	CLARKSTOWN	130 SLEEPY HOLLOW LN	BLVLHRNCH	$550,000	38	0	1852	0.36	2.1	1	1	0	0
43	365243	R-CONGERS	CLARKSTOWN	48 LAKELAND AV	BLVLHRNCH	$550,000	51	0	2652	0.34	3.0	0	0	0	0
44	378439	R-CONGERS	CLARKSTOWN	11 AMANDA LN	BLVLHRNCH	$605,000	41	0	2534	0.43	3.0	1	1	0	0
45	392048	R-CONGERS	CLARKSTOWN	132 CONGERS RD	RANCH	$523,600	39	0	2900	0.59	2.0	0	1	0	0
46	379289	R-CONGERS	CLARKSTOWN	15 PARK AV	COLONIAL	$690,000	43	1	2584	0.35	3.0	1	1	0	0
47	394172	R-CONGERS	CLARKSTOWN	7 PARK AV	BLVLHRNCH	$500,000	37	0	1608	0.34	2.0	1	1	0	0
48	384864	R-CONGERS	CLARKSTOWN	10 HUGHES ST	RAISRANCH	$420,000	40	0	2112	0.49	2.0	0	0	0	0
49	391298	R-CONGERS	CLARKSTOWN	WELLS	BLVLHRNCH	$480,000	38	0	1666	0.26	2.0	1	0	0	0
50	372320	R-CONGERS	CLARKSTOWN	27 HILLTOP RD	RANCH	$620,000	48	0	2397	0.49	2.1	1	1	0	0
51	393352	R-CONGERS	CLARKSTOWN	3 BEECHWOOD DR	BLVLHRNCH	$582,000	39	0	2300	0.22	2.0	1	1	0	0
52	380935	R-CONGERS	CLARKSTOWN	9 Sherman AV	BLVLHRNCH	$615,000	41	0	3060	0.29	3.0	0	0	0	0
53	402464	R-CONGERS	CLARKSTOWN	119 WATERS EDGE	RANCH	$587,500	36	0	2248	0.38	2.0	1	1	0	0
54	368689	R-CONGERS	CLARKSTOWN	27 BLUEBIRD DR	BLVLHRNCH	$575,000	47	0	2479	0.43	2.1	1	0	0	0
55	380396	R-CONGERS	CLARKSTOWN	136 S HARRISON AV	CAPECOD	$432,500	38	0	1260	0.14	3.0	1	0	0	0
56	364906	R-CONGERS	CLARKSTOWN	105 S CONGER AV	COLONIAL	$590,000	45	1	2045	0.25	2.1	1	1	0	0
57	398957	R-CONGERS	CLARKSTOWN	76 HIGHWAY AV	BLVLHRNCH	$490,000	35	0	1890	0.23	2.0	1	1	0	0
58	361972	R-CONGERS	CLARKSTOWN	53 VERMONT AV	BLVLHRNCH	$515,000	50	0	2093	0.23	3.0	1	1	0	0
59	387546	R-CONGERS	CLARKSTOWN	76 New York AV	COLONIAL	$515,000	41	1	1368	0.34	1.1	0	1	0	0
60	361992	R-CONGERS	CLARKSTOWN	19 BEAUREGARD TE	CONTEMP	$670,000	53	0	2218	0.56	3.0	1	1	0	0
61	372207	R-CONGERS	CLARKSTOWN	11 CAESAR CT	COLONIAL	$625,000	45	1	2650	0.40	2.1	1	1	0	0
62	367304	R-CONGERS	CLARKSTOWN	200 MASSACHUSETTS AV	COLONIAL	$573,000	49	1	2192	0.46	1.1	0	0	0	0

SUMMARY OUTPUT CONGERS SUBSTATION

Regression Statistics	
Multiple R	0.938039587
R Square	0.879918266
Adjusted R Square	0.859134889
Standard Error	45109.63652
Observations	62

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	9	7.75367E+11	86151902724	42.33759833	7.79263E-21
Residual	52	1.05814E+11	2034879307		
Total	61	8.81181E+11			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	128160.946	27240.50515	4.704793296	1.91671E-05	73498.87461	182823.0175	73498.87461	182823.0175
# Mos from Sale	1455.90477	518.0011359	2.810620806	0.006954777	416.459469	2495.350072	416.459469	2495.350072
Colonial	67100.60721	18202.72035	3.686295561	0.000543814	30574.17739	103627.037	30574.17739	103627.037
Sq.Ft Approx	71.40869151	17.80711563	4.010121179	0.000194795	35.67610062	107.1412824	35.67610062	107.1412824
Acres	148465.8095	37835.81567	3.923948959	0.000256967	72542.69257	224388.9265	72542.69257	224388.9265
Bath.Lav Total	46545.30409	13721.49195	3.392146003	0.001332431	19011.11671	74079.49147	19011.11671	74079.49147
Gar Y/N	30182.60138	16189.37286	1.864346547	0.067922163	-2303.751222	62668.95398	-2303.751222	62668.95398
AC	27916.10915	15196.56507	1.837001257	0.071927641	-2578.028934	58410.24723	-2578.028934	58410.24723
Adj to PwrLine/RR	-29927.70288	21058.73101	-1.421154146	0.161241454	-72185.13725	12329.73148	-72185.13725	12329.73148
Zone 1 (0 - 500')	-25040.40864	27395.88205	-0.914020895	0.364924681	-80014.26662	29933.44934	-80014.26662	29933.44934

DESCRIPTIVE STATISTICS

Sale Price	
Mean	528741.9194
Standard Error	15264.11968
Median	528700
Mode	550000
Standard Deviation	120189.7986
Sample Variance	14445587680
Kurtosis	1.012674393
Skewness	0.114940009
Range	719900
Minimum	200000
Maximum	919900
Sum	32781999
Count	62

# Mos from Sale	
Mean	36.20597908
Standard Error	1.633039031
Median	38.45265589
Mode	39.92081821
Standard Deviation	12.85856219
Sample Variance	165.3426216
Kurtosis	0.816388765
Skewness	-1.097571277
Range	54.23952491
Minimum	1.055757176
Maximum	55.29528209
Sum	2244.770703
Count	62

Acres	
Mean	0.363548387
Standard Error	0.024633857
Median	0.345
Mode	0.37
Standard Deviation	0.193967183
Sample Variance	0.037623268
Kurtosis	6.723276588
Skewness	1.877895114
Range	1.25
Minimum	0
Maximum	1.25
Sum	22.54
Count	62

Sq.Ft Approx	
Mean	2000.758065
Standard Error	77.79188458
Median	2152
Mode	2400
Standard Deviation	612.5339117
Sample Variance	375197.793
Kurtosis	-0.621180629
Skewness	-0.281693688
Range	2611
Minimum	789
Maximum	3400
Sum	124047
Count	62

Bath.Lav Total	
Mean	2.135483871
Standard Error	0.091583888
Median	2.1
Mode	3
Standard Deviation	0.721132255
Sample Variance	0.520031729
Kurtosis	-1.089264705
Skewness	-0.231623051
Range	2
Minimum	1
Maximum	3
Sum	132.4
Count	62

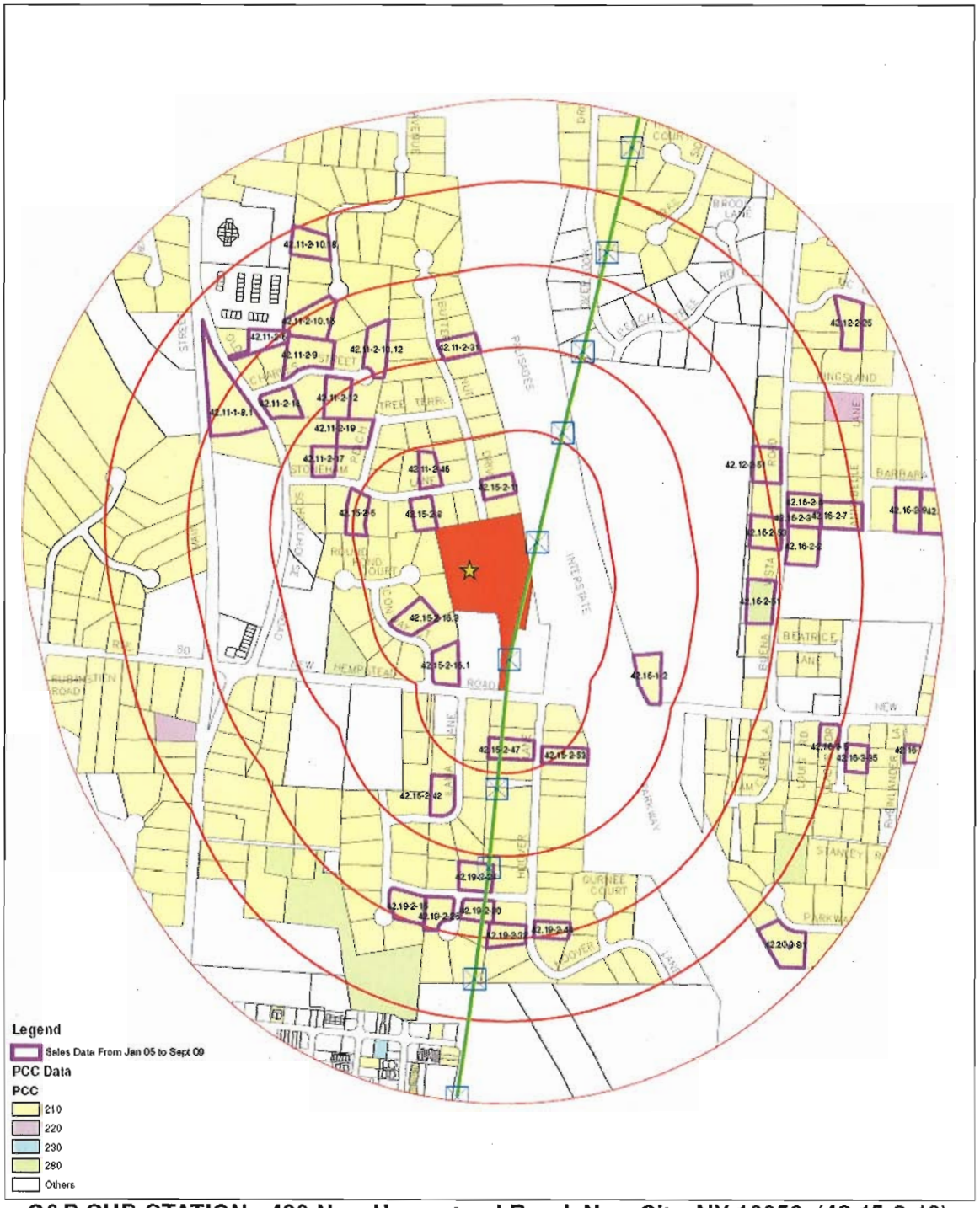
Gar Y/N	
Mean	0.790322581
Standard Error	0.052121044
Median	1
Mode	1
Standard Deviation	0.410401514
Sample Variance	0.168429402
Kurtosis	0.140882846
Skewness	-1.461982912
Range	1
Minimum	0
Maximum	1
Sum	49
Count	62

AC	
Mean	0.725806452
Standard Error	0.057118147
Median	1
Mode	1
Standard Deviation	0.44974874
Sample Variance	0.202273929
Kurtosis	-0.955240944
Skewness	-1.037616396
Range	1
Minimum	0
Maximum	1
Sum	45
Count	62

Adj to PwrLine/RR	
Mean	0.129032258
Standard Error	0.042922525
Median	0
Mode	0
Standard Deviation	0.337972303
Sample Variance	0.114225278
Kurtosis	3.249599812
Skewness	2.268430459
Range	1
Minimum	0
Maximum	1
Sum	8
Count	62

Zone 1 (0 - 500')	
Mean	0.064516129
Standard Error	0.031454833
Median	0
Mode	0
Standard Deviation	0.247675604
Sample Variance	0.061343205
Kurtosis	11.57698714
Skewness	3.63378543
Range	1
Minimum	0
Maximum	1
Sum	4
Count	62

NEW HEMPSTEAD ROAD – NEW CITY SUBSTATION
(East Ramapo Central School District)



O&R SUB-STATION - 430 New Hempstead Road, New City, NY 10956 (42.15-2-13)

0 500 1,000 1,500 Feet

OBS#	MI Number	Area/Location	School Disctrict	Address	Style	Sale Price	# Mos from Sale	Colonial	Sq.Ft Approx	Acres	Bath.Lav Total	Gar Y/N	AC	Adj to PwrLine/RR	Zone 1 (0 - 500')
1	448699	R-NEW.CITY	E.RAMAPO	19 WAGON WHEEL DR	COLONIAL	$525,000	6	1	3039	0.8800	2.1	1	1	1	0
2	405737	R-NEW.CITY	E.RAMAPO	7 TRAILSIDE PL	CONTEMP	$570,000	31	0	2777	0.8000	3.1	1	1	0	0
3	403685	R-NEW.CITY	E.RAMAPO	14 DOOLIN RD	COLONIAL	$640,000	32	1	2620	1.3400	2.1	1	1	0	0
4	425894	R-NEW.CITY	E.RAMAPO	6 PARK AV	RANCH	$360,000	19	0	1715	0.5800	2.0	1	1	0	0
5	400327	R-NEW.CITY	E.RAMAPO	42 S MOUNTAIN RD	COLONIAL	$1,125,000	25	1	4863	7.2900	3.1	1	1	0	0
6	455722	R-NEW.CITY	E.RAMAPO	54 S MOUNTAIN RD	RANCH	$606,000	5	0	2900	1.9300	2.2	1	0	0	0
7	426151	R-NEW.CITY	E.RAMAPO	22 ZABELLA DR	BLVLHRNCH	$435,000	21	0	1865	0.3500	1.2	1	1	0	0
8	443761	R-NEW.CITY	E.RAMAPO	14 ZABELLA DR	BLVLHRNCH	$427,000	14	0	2386	0.3800	2.1	1	1	0	0
9	395608	R-NEW.CITY	E.RAMAPO	6 ELLEN ST	COLONIAL	$460,000	31	1	1813	0.3500	2.1	1	1	0	0
10	402787	R-NEW.CITY	E.RAMAPO	6 FORBES RD	COLONIAL	$470,000	29	1	2128	0.3500	2.1	1	1	0	0
11	464751	R-NEW.CITY	E.RAMAPO	305 W CLARKSTOWN RD	RAISRANCH	$315,000	3	0	1865	0.3600	2.1	1	1	0	0
12	442865	R-NEW.CITY	E.RAMAPO	18 GREAT OAKS DR	COLONIAL	$378,000	14	1	2246	0.3500	2.1	1	0	0	0
13	433045	R-NEW.CITY	E.RAMAPO	5 Inland RD	BLVLHRNCH	$400,000	12	0	1894	0.3500	2.1	1	1	0	0
14	454464	R-NEW.CITY	E.RAMAPO	3 PAULA LN	COLONIAL	$427,700	10	1	2192	0.3500	2.1	1	1	0	0
15	414844	R-NEW.CITY	E.RAMAPO	30 GREAT OAKS DR	BLVLHRNCH	$390,000	15	0	2124	0.3400	2.0	1	1	0	0
16	459840	R-NEW.CITY	E.RAMAPO	57 W BURDA PL	COLONIAL	$275,000	1	1	1504	0.5100	2.0	0	0	0	0
17	395542	R-NEW.CITY	E.RAMAPO	63 W BURDA PL	BLVLHRNCH	$410,000	31	0	2004	0.3500	2.1	1	1	0	0
18	433190	R-NEW.CITY	E.RAMAPO	11 CORINTHIAN RD	BLVLHRNCH	$418,500	20	0	2052	0.3500	2.1	1	0	0	0
19	463762	R-NEW.CITY	E.RAMAPO	16 GLADE CT	BLVLHRNCH	$383,000	2	0	2136	0.4600	2.1	1	1	0	0
20	462931	R-NEW.CITY	E.RAMAPO	31 MURDOCK LN	BLVLHRNCH	$370,000	3	0	2244	0.5200	3.0	1	0	0	0
21	400679	R-NEW.CITY	E.RAMAPO	3 CARNABY CT	BLVLHRNCH	$430,000	31	0	2058	0.4600	2.1	1	0	0	0
22	414155	R-NEW.CITY	E.RAMAPO	168 W CLARKSTOWN RD	CAPECOD	$380,000	23	0	1882	0.3700	3.0	1	0	0	0
23	416597	R-NEW.CITY	E.RAMAPO	6 HALLMARK DR	COLONIAL	$570,000	28	1	2870	0.3500	2.1	1	1	0	0
24	412675	R-NEW.CITY	E.RAMAPO	1 FEATHERLY CT	BLVLHRNCH	$510,000	29	0	1866	0.9200	3.0	1	1	0	0
25	431537	R-NEW.CITY	E.RAMAPO	5 GRAND ST	CAPECOD	$315,000	22	0	1728	0.5700	2.0	0	0	0	0
26	416083	R-NEW.CITY	E.RAMAPO	7 GRAND ST	CAPECOD	$418,000	27	0	1512	0.5400	2.0	0	0	0	0
27	430741	R-NEW.CITY	E.RAMAPO	7 SYCAMORE DR	CAPECOD	$340,000	19	0	1296	0.3800	1.1	1	0	0	0
28	462520	R-NEW.CITY	E.RAMAPO	8 BARBARA RD	BLVLHRNCH	$357,500	4	0	2028	0.9200	2.1	1	1	0	0
29	464857	R-NEW.CITY	E.RAMAPO	199 BUENA VISTA RD	CAPECOD	$300,000	2	0	1700	1.0000	1.1	1	0	0	0
30	427652	R-NEW.CITY	E.RAMAPO	12 CANDLELIGHT CR	COLONIAL	$725,000	23	1	3917	1.5200	4.1	1	1	0	0
31	417481	R-NEW.CITY	E.RAMAPO	3 CANDLELIGHT CR	CONTEMP	$475,000	16	0	2668	0.6100	2.2	1	1	0	0
32	405379	R-NEW.CITY	E.RAMAPO	2 SUMMIT DR	CONTEMP	$680,000	33	0	3081	1.4000	3.0	1	1	0	0
33	462533	R-NEW.CITY	E.RAMAPO	303 BUENA VISTA RD	CAPECOD	$315,000	1	0	1293	2.5000	1.0	0	0	1	0
34	458430	R-NEW.CITY	E.RAMAPO	371 BUENA VISTA RD	RANCH	$350,000	6	0	1216	1.9000	1.0	0	0	0	0
35	423211	R-NEW.CITY	E.RAMAPO	371 BUENA VISTA RD	RANCH	$380,000	25	0	1216	1.9000	1.0	0	0	0	0
36	456601	R-NEW.CITY	E.RAMAPO	6 RED ROCK RD	SPLITLEVEL	$350,000	9	0	1924	1.2000	1.2	0	1	0	0
37	395012	R-NEW.CITY	E.RAMAPO	6 RED ROCK RD	SPLITLEVEL	$401,700	33	0	1925	1.2000	1.1	0	1	0	0
38	418869	R-NEW.CITY	E.RAMAPO	54 BUENA VISTA RD	RANCH	$405,000	27	0	884	0.4600	1.1	1	0	0	0
39	457499	R-NEW.CITY	E.RAMAPO	50 BUENA VISTA RD	RANCH	$350,000	3	0	1190	0.4600	1.0	1	0	0	0
40	400279	R-NEW.CITY	E.RAMAPO	18 BUTTERNUT DR	SPLITLEVEL	$442,500	35	0	1610	0.6400	2.0	1	0	1	0
41	370479	R-NEW.CITY	E.RAMAPO	28 HOOVER LN	COLONIAL	$565,000	46	1	2646	0.6300	3.1	1	1	1	0
42	403995	R-NEW.CITY	E.RAMAPO	1 BURROWS CT	BLVLHRNCH	$455,000	34	0	2267	0.5300	2.1	1	1	1	0
43	380872	R-NEW.CITY	E.RAMAPO	4 HOWELL RD	COLONIAL	$730,000	40	1	2562	0.7900	3.1	1	1	1	0
44	419165	R-NEW.CITY	E.RAMAPO	2 BURROWS CT	CONTEMP	$455,000	19	0	2229	0.5900	2.1	1	1	1	0
45	414604	R-NEW.CITY	E.RAMAPO	45 BUENA VISTA RD	RANCH	$400,000	16	0	1450	0.9300	2.1	1	1	0	0
46	399162	R-NEW.CITY	E.RAMAPO	29 BUENA VISTA RD	RANCH	$510,000	32	0	1854	1.2000	3.1	1	1	0	0
47	394453	R-NEW.CITY	E.RAMAPO	398 NEW HEMPSTEAD RD	COLONIAL	$498,200	39	1	1884	0.7800	2.0	1	0	1	0
48	366686	R-NEW.CITY	E.RAMAPO	5 HOOVER LN	RANCH	$545,000	49	0	2622	0.6200	3.0	1	1	1	0
49	412276	R-NEW.CITY	E.RAMAPO	3 PEACH TREE TE	SPLITLEVEL	$379,000	31	0	1610	0.7800	1.1	1	1	1	0
50	446787	R-NEW.CITY	E.RAMAPO	6 CHARLES ST	SPLITLEVEL	$572,500	13	0	2691	0.8600	4.0	1	1	1	0
51	429925	R-NEW.CITY	E.RAMAPO	4 BUTTERNUT DR	SPLITLEVEL	$410,000	10	0	1710	0.5700	1.1	1	1	1	1
52	429925	R-NEW.CITY	E.RAMAPO	4 BUTTERNUT DR	SPLITLEVEL	$410,000	10	0	1710	0.5700	1.1	1	1	1	1
53	395854	R-NEW.CITY	E.RAMAPO	4 HOOVER LN	RAISRANCH	$450,000	29	0	2400	0.8000	2.0	1	1	1	1
54	395854	R-NEW.CITY	E.RAMAPO	4 HOOVER LN	RAISRANCH	$450,000	29	0	2400	0.8000	2.0	1	1	1	1
55	427679	R-NEW.CITY	E.RAMAPO	12 STONEHAM LN	SPLITLEVEL	$425,000	24	0	2635	0.5800	1.2	0	1	0	1
56	444739	R-NEW.CITY	E.RAMAPO	13 STONEHAM LN	SPLITLEVEL	$450,000	13	0	2300	0.5900	2.1	1	0	0	1

SUMMARY OUTPUT NEW CITY SUBSTATION

Regression Statistics	
Multiple R	0.953930199
R Square	0.909982826
Adjusted R Square	0.89237077
Standard Error	44727.35067
Observations	56

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	9	9.30276E+11	1.03364E+11	51.66817728	4.50333E-21
Residual	46	92024651300	2000535898		
Total	55	1.0223E+12			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	71893.0473	23490.18819	3.060556463	0.003680626	24609.75161	119176.343	24609.75161	119176.343
# Mos from Sale	3002.818425	547.2879915	5.486724488	1.68938E-06	1901.184853	4104.451997	1901.184853	4104.451997
Colonial	35984.39655	16385.40828	2.196124499	0.033162873	3002.280857	68966.51224	3002.280857	68966.51224
Sq.Ft Approx	74.41761137	17.84831418	4.169447635	0.000133529	38.49081886	110.3444039	38.49081886	110.3444039
Acres	63937.90911	8212.829128	7.785125943	6.14402E-10	47406.34176	80469.47645	47406.34176	80469.47645
Bath.Lav Total	21430.34744	12561.65883	1.706012535	0.094749961	-3854.95995	46715.65482	-3854.95995	46715.65482
Gar Y/N	62024.07278	19107.16138	3.24611655	0.002185165	23563.35234	100484.7932	23563.35234	100484.7932
AC	6336.333346	15081.5439	0.420138242	0.676340549	-24021.23952	36693.90621	-24021.23952	36693.90621
Adj to PwrLine/RR	-5547.063815	15246.72578	-0.363820003	0.717659325	-36237.13055	25143.00292	-36237.13055	25143.00292
Zone 1 (0 - 500')	11416.27165	23182.69907	0.492447908	0.624745038	-35248.08054	58080.62384	-35248.08054	58080.62384

DESCRIPTIVE STATISTICS

Sale Price	
Mean	456867.8571
Standard Error	18218.55984
Median	426000
Mode	315000
Standard Deviation	136335.218
Sample Variance	18587291675
Kurtosis	9.673856153
Skewness	2.496517819
Range	850000
Minimum	275000
Maximum	1125000
Sum	25584600
Count	56

# Mos from Sale	
Mean	20.54661356
Standard Error	1.641466518
Median	21.18112834
Mode	30.81491257
Standard Deviation	12.28361064
Sample Variance	150.8870904
Kurtosis	-0.78249712
Skewness	0.083642964
Range	48.00395909
Minimum	1.286704058
Maximum	49.29066315
Sum	1150.61036
Count	56

Acres	
Mean	0.876964286
Standard Error	0.132556511
Median	0.59
Mode	0.35
Standard Deviation	0.991962095
Sample Variance	0.983988799
Kurtosis	32.50455508
Skewness	5.200987934
Range	6.95
Minimum	0.34
Maximum	7.29
Sum	49.11
Count	56

Sq.Ft Approx	
Mean	2128.589286
Standard Error	89.88421042
Median	2040
Mode	1865
Standard Deviation	672.6318398
Sample Variance	452433.5919
Kurtosis	4.293567201
Skewness	1.417614395
Range	3979
Minimum	884
Maximum	4863
Sum	119201
Count	56

Bath.Lav Total	
Mean	2.075
Standard Error	0.10033224
Median	2.1
Mode	2.1
Standard Deviation	0.750817736
Sample Variance	0.563727273
Kurtosis	0.220883833
Skewness	0.503937878
Range	3.1
Minimum	1
Maximum	4.1
Sum	116.2
Count	56

Gar Y/N	
Mean	0.839285714
Standard Error	0.049522301
Median	1
Mode	1
Standard Deviation	0.370590964
Sample Variance	0.137337662
Kurtosis	1.663866462
Skewness	-1.89886903
Range	1
Minimum	0
Maximum	1
Sum	47
Count	56

AC	
Mean	0.660714286
Standard Error	0.063842266
Median	1
Mode	1
Standard Deviation	0.477751769
Sample Variance	0.228246753
Kurtosis	-1.570627231
Skewness	-0.697712399
Range	1
Minimum	0
Maximum	1
Sum	37
Count	56

Adj to PwrLine/RR	
Mean	0.267857143
Standard Error	0.059712903
Median	0
Mode	0
Standard Deviation	0.44685045
Sample Variance	0.199675325
Kurtosis	-0.871435633
Skewness	1.077500272
Range	1
Minimum	0
Maximum	1
Sum	15
Count	56

Zone 1 (0 - 500')	
Mean	0.107142857
Standard Error	0.041705301
Median	0
Mode	0
Standard Deviation	0.312093892
Sample Variance	0.097402597
Kurtosis	4.993431167
Skewness	2.610800262
Range	1
Minimum	0
Maximum	1
Sum	6
Count	56

REGRESSION ANALYSIS OF COMBINED DATA SETS

(Congers – Clarkstown CSD & New City – East Ramapo CSD)

OBS#	MI Number	Area/Location	School Disctrict	Address	Style	Ranch/Split	Cape	Bilevel/Raised	Sale Price	# Mos from Sale	Location	Colonial	Sq.Ft Approx	Acres	Bath.Lav Total	Gar Y/N	AC	Adj to PwrLine/RR	Zone 1 (0 - 500')
1	448699	R-NEW.CITY	E.RAMAPO	19 WAGON WHEEL DR	COLONIAL	0	0	0	$525,000	6	1	1	3039	0.8800	2.1	1	1	1	0
2	405737	R-NEW.CITY	E.RAMAPO	7 TRAILSIDE PL	CONTEMP	1	0	0	$570,000	31	1	0	2777	0.8000	3.1	1	1	0	0
3	403685	R-NEW.CITY	E.RAMAPO	14 DOOLIN RD	COLONIAL	0	0	0	$640,000	32	1	1	2620	1.3400	2.1	1	1	0	0
4	425894	R-NEW.CITY	E.RAMAPO	6 PARK AV	RANCH	1	0	0	$360,000	19	1	0	1715	0.5800	2.0	1	1	0	0
5	400327	R-NEW.CITY	E.RAMAPO	42 S MOUNTAIN RD	COLONIAL	0	0	0	$1,125,000	25	1	1	4863	7.2900	3.1	1	1	0	0
6	455722	R-NEW.CITY	E.RAMAPO	54 S MOUNTAIN RD	RANCH	1	0	0	$606,000	5	1	0	2900	1.9300	2.2	1	0	0	0
7	426151	R-NEW.CITY	E.RAMAPO	22 ZABELLA DR	BLVLHRNCH	0	0	1	$435,000	21	1	0	1865	0.3500	1.2	1	1	0	0
8	443761	R-NEW.CITY	E.RAMAPO	14 ZABELLA DR	BLVLHRNCH	4	0	1	$427,000	14	1	0	2386	0.3800	2.1	1	1	0	0
9	395608	R-NEW.CITY	E.RAMAPO	6 ELLEN ST	COLONIAL	0	0	0	$460,000	31	1	1	1813	0.3500	2.1	1	1	0	0
10	402787	R-NEW.CITY	E.RAMAPO	6 FORBES RD	COLONIAL	0	0	0	$470,000	29	1	1	2128	0.3500	2.1	1	1	0	0
11	464751	R-NEW.CITY	E.RAMAPO	305 W CLARKSTOWN RD	RAISRANCH	0	0	1	$315,000	3	1	0	1865	0.3600	2.1	1	1	0	0
12	442865	R-NEW.CITY	E.RAMAPO	18 GREAT OAKS DR	COLONIAL	0	0	0	$378,000	14	1	1	2246	0.3500	2.1	1	0	0	0
13	433045	R-NEW.CITY	E.RAMAPO	5 Inland RD	BLVLHRNCH	0	0	1	$400,000	12	1	0	1894	0.3500	2.1	1	1	0	0
14	454464	R-NEW.CITY	E.RAMAPO	3 PAULA LN	COLONIAL	0	0	0	$427,700	10	1	1	2192	0.3500	2.1	1	1	0	0
15	414844	R-NEW.CITY	E.RAMAPO	30 GREAT OAKS DR	BLVLHRNCH	0	0	1	$390,000	15	1	0	2124	0.3400	2.0	1	1	0	0
16	459840	R-NEW.CITY	E.RAMAPO	57 W BURDA PL	COLONIAL	0	0	0	$275,000	1	1	1	1504	0.5100	2.0	0	0	0	0
17	395542	R-NEW.CITY	E.RAMAPO	63 W BURDA PL	BLVLHRNCH	0	0	1	$410,000	31	1	0	2004	0.3500	2.1	1	1	0	0
18	433190	R-NEW.CITY	E.RAMAPO	11 CORINTHIAN RD	BLVLHRNCH	0	0	1	$418,500	20	1	0	2052	0.3500	2.1	1	0	0	0
19	463762	R-NEW.CITY	E.RAMAPO	16 GLADE CT	BLVLHRNCH	0	0	1	$383,000	2	1	0	2136	0.4600	2.1	1	1	0	0
20	462931	R-NEW.CITY	E.RAMAPO	31 MURDOCK LN	BLVLHRNCH	0	0	1	$370,000	3	1	0	2244	0.5200	3.0	1	0	0	0
21	400679	R-NEW.CITY	E.RAMAPO	3 CARNABY CT	BLVLHRNCH	0	0	1	$430,000	31	1	0	2058	0.4600	2.1	1	0	0	0
22	414155	R-NEW.CITY	E.RAMAPO	168 W CLARKSTOWN RD	CAPECOD	0	1	0	$380,000	23	1	0	1882	0.3700	3.0	1	0	0	0
23	416597	R-NEW.CITY	E.RAMAPO	6 HALLMARK DR	COLONIAL	0	0	0	$570,000	28	1	1	2870	0.3500	2.1	1	1	0	0
24	412675	R-NEW.CITY	E.RAMAPO	1 FEATHERLY CT	BLVLHRNCH	0	0	1	$510,000	29	1	0	1866	0.9200	3.0	1	1	0	0
25	431537	R-NEW.CITY	E.RAMAPO	5 GRAND ST	CAPECOD	0	1	0	$315,000	22	1	0	1728	0.5700	2.0	0	0	0	0
26	416083	R-NEW.CITY	E.RAMAPO	7 GRAND ST	CAPECOD	0	1	0	$418,000	27	1	0	1512	0.5400	2.0	0	0	0	0
27	430741	R-NEW.CITY	E.RAMAPO	7 SYCAMORE DR	CAPECOD	0	1	0	$340,000	19	1	0	1296	0.3800	1.1	1	0	0	0
28	462520	R-NEW.CITY	E.RAMAPO	8 BARBARA RD	BLVLHRNCH	0	0	1	$357,500	4	1	0	2028	0.9200	2.1	1	1	0	0
29	464857	R-NEW.CITY	E.RAMAPO	199 BUENA VISTA RD	CAPECOD	0	1	0	$300,000	2	1	0	1700	1.0000	1.1	1	0	0	0
30	427652	R-NEW.CITY	E.RAMAPO	12 CANDLELIGHT CR	COLONIAL	0	0	0	$725,000	23	1	1	3917	1.5200	4.1	1	1	0	0
31	417481	R-NEW.CITY	E.RAMAPO	3 CANDLELIGHT CR	CONTEMP	1	0	0	$475,000	16	1	0	2668	0.6100	2.2	1	1	0	0
32	405379	R-NEW.CITY	E.RAMAPO	2 SUMMIT DR	CONTEMP	1	0	0	$680,000	33	1	0	3081	1.4000	3.0	1	1	0	0
33	462533	R-NEW.CITY	E.RAMAPO	303 BUENA VISTA RD	CAPECOD	0	1	0	$315,000	1	1	0	1293	2.5000	1.0	0	0	1	0
34	458430	R-NEW.CITY	E.RAMAPO	371 BUENA VISTA RD	RANCH	1	0	0	$350,000	6	1	0	1216	1.9000	1.0	0	0	0	0
35	423211	R-NEW.CITY	E.RAMAPO	371 BUENA VISTA RD	RANCH	1	0	0	$380,000	25	1	0	1216	1.9000	1.0	0	0	0	0
36	456601	R-NEW.CITY	E.RAMAPO	6 RED ROCK RD	SPLITLEVEL	1	0	0	$350,000	9	1	0	1924	1.2000	1.2	0	1	0	0
37	395012	R-NEW.CITY	E.RAMAPO	6 RED ROCK RD	SPLITLEVEL	1	0	0	$401,700	33	1	0	1925	1.2000	1.1	0	1	0	0
38	418869	R-NEW.CITY	E.RAMAPO	54 BUENA VISTA RD	RANCH	1	0	0	$405,000	27	1	0	884	0.4600	1.1	1	0	0	0
39	457499	R-NEW.CITY	E.RAMAPO	50 BUENA VISTA RD	RANCH	1	0	0	$350,000	3	1	0	1190	0.4600	1.0	1	0	0	0
40	400279	R-NEW.CITY	E.RAMAPO	18 BUTTERNUT DR	SPLITLEVEL	1	0	0	$442,500	35	1	0	1610	0.6400	2.0	1	0	1	0
41	370479	R-NEW.CITY	E.RAMAPO	28 HOOVER LN	COLONIAL	0	0	0	$565,000	46	1	1	2646	0.6300	3.1	1	1	1	0
42	403995	R-NEW.CITY	E.RAMAPO	1 BURROWS CT	BLVLHRNCH	0	0	1	$455,000	34	1	0	2267	0.5300	2.1	1	1	1	0
43	380872	R-NEW.CITY	E.RAMAPO	4 HOWELL RD	COLONIAL	0	0	0	$730,000	40	1	1	2562	0.7900	3.1	1	1	1	0
44	419165	R-NEW.CITY	E.RAMAPO	2 BURROWS CT	CONTEMP	0	0	1	$455,000	19	1	0	2229	0.5900	2.1	1	1	1	0
45	414604	R-NEW.CITY	E.RAMAPO	45 BUENA VISTA RD	RANCH	1	0	0	$400,000	16	1	0	1450	0.9300	2.1	1	1	0	0
46	399162	R-NEW.CITY	E.RAMAPO	29 BUENA VISTA RD	RANCH	1	0	0	$510,000	32	1	0	1854	1.2000	3.1	1	1	0	0
47	394453	R-NEW.CITY	E.RAMAPO	398 NEW HEMPSTEAD RD	COLONIAL	0	0	0	$498,200	39	1	1	1884	0.7800	2.0	1	0	1	0
48	366686	R-NEW.CITY	E.RAMAPO	5 HOOVER LN	RANCH	1	0	0	$545,000	49	1	0	2622	0.6200	3.0	1	1	1	0
49	412276	R-NEW.CITY	E.RAMAPO	3 PEACH TREE TE	SPLITLEVEL	1	0	0	$379,000	31	1	0	1610	0.7800	1.1	1	1	1	0
50	446787	R-NEW.CITY	E.RAMAPO	6 CHARLES ST	SPLITLEVEL	1	0	0	$572,500	13	1	0	2691	0.8600	4.0	1	1	1	0
51	429925	R-NEW.CITY	E.RAMAPO	4 BUTTERNUT DR	SPLITLEVEL	1	0	0	$410,000	10	1	0	1710	0.5700	1.1	1	1	1	1
52	429925	R-NEW.CITY	E.RAMAPO	4 BUTTERNUT DR	SPLITLEVEL	1	0	0	$410,000	10	1	0	1710	0.5700	1.1	1	1	1	1
53	395854	R-NEW.CITY	E.RAMAPO	4 HOOVER LN	RAISRANCH	0	0	1	$450,000	29	1	0	2400	0.8000	2.0	1	1	1	1
54	395854	R-NEW.CITY	E.RAMAPO	4 HOOVER LN	RAISRANCH	0	0	1	$450,000	29	1	0	2400	0.8000	2.0	1	1	1	1
55	427679	R-NEW.CITY	E.RAMAPO	12 STONEHAM LN	SPLITLEVEL	1	0	0	$425,000	24	1	0	2635	0.5800	1.2	0	1	0	1
56	444739	R-NEW.CITY	E.RAMAPO	13 STONEHAM LN	SPLITLEVEL	1	0	0	$450,000	13	1	0	2300	0.5900	2.1	1	0	0	1
57	390951	R-CONGERS	CLARKSTOWN	138 S CONGERS AV	RANCH	1	0	0	$372,500	39	0	0	1360	0.21	1.1	1	0	0	0
58	390571	R-CONGERS	CLARKSTOWN	146 S CONGER AV	RANCH	1	0	0	$375,000	40	0	0	952	0.27	1.0	1	1	0	0

OBS#	MI Number	Area/Location	School Disctrict	Address	Style	Ranch/Split	Cape	Bilevel/Raised	Sale Price	# Mos from Sale	Location	Colonial	Sq.Ft Approx	Acres	Bath.Lav Total	Gar Y/N	AC	Adj to PwrLine/RR	Zone 1 (0 - 500')
59	461270	R-CONGERS	CLARKSTOWN	144 S HARRISON AV	RANCH	1	0	0	$200,000	4	0	0	1030	0.18	1.1	1	0	0	0
60	462678	R-CONGERS	CLARKSTOWN	12 COLUMBUS AV	SRMK	0	0	0	$407,500	4	0	0	1404	0.37	1.1	1	1	0	0
61	436939	R-CONGERS	CLARKSTOWN	41 RIDGE RD	RANCH	1	0	0	$360,000	19	0	0	1368	0.31	1.0	0	0	0	0
62	370808	R-CONGERS	CLARKSTOWN	36 RIDGE RD	COLONIAL	0	0	0	$565,000	46	0	1	2184	0.46	1.1	0	1	0	0
63	399824	R-CONGERS	CLARKSTOWN	171 S HARRISON AV	RANCH	1	0	0	$350,000	35	0	0	1000	0.37	1.0	1	0	1	0
64	422847	R-CONGERS	CLARKSTOWN	163 S HARRISON AV	RANCH	1	0	0	$375,000	26	0	0	860	0.37	1.0	1	1	1	0
65	391996	R-CONGERS	CLARKSTOWN	6 BALDWIN CT	BLVLHRNCH	0	0	1	$527,400	33	0	0	2120	0.30	2.1	1	0	0	0
66	402203	R-CONGERS	CLARKSTOWN	159 KINGS HY	CONTEMP	0	0	0	$492,000	34	0	1	1907	0.27	2.1	1	1	0	0
67	397811	R-CONGERS	CLARKSTOWN	176 S CONGER AVE	SPLITLEVEL	1	0	0	$550,000	33	0	0	2200	0.32	2.1	1	1	0	0
68	426687	R-CONGERS	CLARKSTOWN	176 S CONGER AVE	SPLITLEVEL	1	0	0	$450,000	16	0	0	2200	0.32	2.1	1	1	0	0
69	375944	R-CONGERS	CLARKSTOWN	160 S CONGER AV	COLONIAL	0	0	0	$740,000	47	0	1	2996	0.40	2.2	1	1	0	0
70	380193	R-CONGERS	CLARKSTOWN	162 S HARRISON AV	SPLITLEVEL	1	0	0	$530,000	46	0	0	1664	0.24	2.1	1	1	0	0
71	432747	R-CONGERS	CLARKSTOWN	177 S HARRISON AV	RANCH	1	0	0	$410,000	16	0	0	960	0.00	2.0	0	1	0	0
72	379684	R-CONGERS	CLARKSTOWN	23 VON BEASTE LN	RANCH	1	0	0	$456,000	30	0	0	1104	0.35	1.1	1	0	0	0
73	421584	R-CONGERS	CLARKSTOWN	180 S HARRISON AV	RANCH	1	0	0	$330,000	27	0	0	992	0.14	1.0	0	0	0	0
74	461758	R-CONGERS	CLARKSTOWN	17 STERN PL	BLVLHRNCH	0	0	1	$600,000	1	0	0	2600	0.79	3.0	1	1	1	0
75	443893	R-CONGERS	CLARKSTOWN	15 STERN PL	BLVLHRNCH	0	0	1	$660,000	13	0	0	2500	0.79	3.0	1	1	1	0
76	387913	R-CONGERS	CLARKSTOWN	223 KINGS HIGHWAY	RANCH	1	0	0	$454,000	39	0	0	1268	0.35	2.1	1	0	0	0
77	364687	R-CONGERS	CLARKSTOWN	223 S GRANT AV	BLVLHRNCH	0	0	1	$490,000	51	0	0	1717	0.18	2.0	1	1	0	0
78	350375	R-CONGERS	CLARKSTOWN	219 S CONGER AV	RANCH	1	0	0	$345,000	55	0	0	789	0.12	1.0	0	0	0	0
79	438048	R-CONGERS	CLARKSTOWN	245 KINGS HY	RANCH	1	0	0	$385,000	16	0	0	1120	0.35	1.0	1	1	0	0
80	368237	R-CONGERS	CLARKSTOWN	229 S Harrison AV	CAPECOD	0	1	0	$449,999	47	0	0	1707	0.27	2.0	0	0	1	1
81	400610	R-CONGERS	CLARKSTOWN	2 VON BEASTE LN	BLVLHRNCH	0	0	1	$440,000	28	0	0	1828	0.35	2.0	1	1	1	1
82	452411	R-CONGERS	CLARKSTOWN	14 GILCHREST RD	BLVLHRNCH	0	0	1	$495,000	7	0	0	2500	0.36	3.0	1	1	1	1
83	415361	R-CONGERS	CLARKSTOWN	15 THIRD ST	BLVLHRNCH	0	0	1	$470,000	25	0	0	2070	0.37	2.1	1	1	0	1
84	364824	R-CONGERS	CLARKSTOWN	29 N ROCKLAND AV	BLVLHRNCH	0	0	1	$495,000	52	0	0	2534	0.24	3.0	1	1	1	0
85	363019	R-CONGERS	CLARKSTOWN	LOT 21 WATERSEDGE	COLONIAL	0	0	0	$919,900	43	0	1	3400	1.25	3.0	1	1	0	0
86	377310	R-CONGERS	CLARKSTOWN	LOT #1 STERN PL	BLVLHRNCH	0	0	1	$649,900	35	0	0	2400	0.27	3.0	1	1	0	0
87	377313	R-CONGERS	CLARKSTOWN	LOT #2 STERN PL	BLVLHRNCH	0	0	1	$609,900	41	0	0	2400	0.25	3.0	1	1	0	0
88	377314	R-CONGERS	CLARKSTOWN	LOT #5 STERN PL	COLONIAL	0	0	0	$639,900	35	0	1	2400	0.46	2.1	1	1	0	0
89	377316	R-CONGERS	CLARKSTOWN	LOT #7 STERN PL	BLVLHRNCH	0	0	1	$649,900	34	0	0	2400	0.70	3.0	1	1	0	0
90	377317	R-CONGERS	CLARKSTOWN	LOT #8 STERN PL	BLVLHRNCH	0	0	1	$629,900	37	0	0	2400	0.37	3.0	1	1	0	0
91	377322	R-CONGERS	CLARKSTOWN	LOT 11 STERN PL	BLVLHRNCH	0	0	1	$629,900	36	0	0	2400	0.00	3.0	1	1	0	0
92	377334	R-CONGERS	CLARKSTOWN	LOT 12 GILCHREST RD	COLONIAL	0	0	0	$639,900	34	0	1	2400	0.33	2.1	1	1	0	0
93	377328	R-CONGERS	CLARKSTOWN	LOT 13 STERN PL	BLVLHRNCH	0	0	1	$639,900	38	0	0	2400	0.75	3.0	1	1	0	0
94	377323	R-CONGERS	CLARKSTOWN	LOT 12 STERN PL	BLVLHRNCH	0	0	1	$629,900	40	0	0	2400	0.37	3.0	1	1	0	0
95	365464	R-CONGERS	CLARKSTOWN	1 NELSON LN	COLONIAL	0	0	0	$660,000	51	0	1	2502	0.52	2.1	1	1	0	0
96	370056	R-CONGERS	CLARKSTOWN	267 OLD HAVERSTRAW RD	RANCH	1	0	0	$410,000	49	0	0	1603	0.33	2.0	0	1	0	0
97	365864	R-CONGERS	CLARKSTOWN	225 OLD HAVERSTRAW RD	BLVLHRNCH	0	0	1	$590,000	49	0	0	1900	0.31	3.0	1	1	0	0
98	387019	R-CONGERS	CLARKSTOWN	130 SLEEPY HOLLOW LN	BLVLHRNCH	0	0	1	$550,000	38	0	0	1852	0.36	2.1	1	1	0	0
99	365243	R-CONGERS	CLARKSTOWN	48 LAKELAND AV	BLVLHRNCH	0	0	1	$550,000	51	0	0	2652	0.34	3.0	0	0	0	0
100	378439	R-CONGERS	CLARKSTOWN	11 AMANDA LN	BLVLHRNCH	0	0	1	$605,000	41	0	0	2534	0.43	3.0	1	1	0	0
101	392048	R-CONGERS	CLARKSTOWN	132 CONGERS RD	RANCH	1	0	0	$523,600	39	0	0	2900	0.59	2.0	0	1	0	0
102	379289	R-CONGERS	CLARKSTOWN	15 PARK AV	COLONIAL	0	0	0	$690,000	43	0	1	2584	0.35	3.0	1	1	0	0
103	394172	R-CONGERS	CLARKSTOWN	7 PARK AV	BLVLHRNCH	0	0	1	$500,000	37	0	0	1608	0.34	2.0	1	1	0	0
104	384864	R-CONGERS	CLARKSTOWN	10 HUGHES ST	RAISRANCH	0	0	1	$420,000	40	0	0	2112	0.49	2.0	0	0	0	0
105	391298	R-CONGERS	CLARKSTOWN	WELLS	BLVLHRNCH	0	0	1	$480,000	38	0	0	1666	0.26	2.0	1	0	0	0
106	372320	R-CONGERS	CLARKSTOWN	27 HILLTOP RD	RANCH	1	0	0	$620,000	48	0	0	2397	0.49	2.1	1	1	0	0
107	393352	R-CONGERS	CLARKSTOWN	3 BEECHWOOD DR	BLVLHRNCH	0	0	1	$582,000	39	0	0	2300	0.22	2.0	1	1	0	0
108	380935	R-CONGERS	CLARKSTOWN	9 Sherman AV	BLVLHRNCH	0	0	1	$615,000	41	0	0	3060	0.29	3.0	0	0	0	0
109	402464	R-CONGERS	CLARKSTOWN	119 WATERS EDGE	RANCH	1	0	0	$587,500	36	0	0	2248	0.38	2.0	1	1	0	0
110	368689	R-CONGERS	CLARKSTOWN	27 BLUEBIRD DR	BLVLHRNCH	0	0	1	$575,000	47	0	0	2479	0.43	2.1	1	0	0	0
111	380396	R-CONGERS	CLARKSTOWN	136 S HARRISON AV	CAPECOD	0	1	0	$432,500	38	0	0	1260	0.14	3.0	1	0	0	0
112	364906	R-CONGERS	CLARKSTOWN	105 S CONGER AV	COLONIAL	0	0	0	$590,000	45	0	1	2045	0.25	2.1	1	1	0	0
113	398957	R-CONGERS	CLARKSTOWN	76 HIGHWAY AV	BLVLHRNCH	0	0	1	$490,000	35	0	0	1890	0.23	2.0	1	1	0	0
114	361972	R-CONGERS	CLARKSTOWN	53 VERMONT AV	BLVLHRNCH	0	0	1	$515,000	50	0	0	2093	0.23	3.0	1	1	0	0
115	387546	R-CONGERS	CLARKSTOWN	76 New York AV	COLONIAL	0	0	0	$515,000	41	0	1	1368	0.34	1.1	0	1	0	0
116	361992	R-CONGERS	CLARKSTOWN	19 BEAUREGARD TE	CONTEMP	1	0	0	$670,000	53	0	0	2218	0.56	3.0	1	1	0	0
117	372207	R-CONGERS	CLARKSTOWN	11 CAESAR CT	COLONIAL	0	0	0	$625,000	45	0	1	2650	0.40	2.1	1	1	0	0
118	367304	R-CONGERS	CLARKSTOWN	200 MASSACHUSETTS AV	COLONIAL	0	0	0	$573,000	49	0	1	2192	0.46	1.1	0	0	0	0

SUMMARY OUTPUT COMBINED SUBSTATION ANALYSIS

Regression Statistics	
Multiple R	0.938649972
R Square	0.88106377
Adjusted R Square	0.869948235
Standard Error	47799.34734
Observations	118

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	10	1.81101E+12	1.81101E+11	79.26417687	8.43033E-45
Residual	107	2.44471E+11	2284777606		
Total	117	2.05548E+12			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	136150.7825	19988.12262	6.811584314	5.85958E-10	96526.66177	175774.9032	96526.66177	175774.9032
# Mos from Sale	2207.014472	377.2761829	5.849864295	5.42985E-08	1459.108463	2954.920481	1459.108463	2954.920481
Location	-79144.17713	11130.929	-7.110293953	1.36213E-10	-101209.945	-57078.40924	-101209.945	-57078.40924
Colonial	48125.96225	12404.84631	3.879609713	0.0001811	23534.80193	72717.12257	23534.80193	72717.12257
Sq.Ft Approx	85.86685587	12.36974072	6.941685989	3.11188E-10	61.34528829	110.3884235	61.34528829	110.3884235
Acres	60654.23948	7520.997331	8.08465377	1.1407E-12	45744.73988	75563.73907	45744.73988	75563.73907
Bath.Lav Total	27490.2715	9299.357991	2.956147244	0.003832835	9055.379405	45925.16359	9055.379405	45925.16359
Gar Y/N	46237.29289	12853.6135	3.597221349	0.000488512	20756.50399	71718.08178	20756.50399	71718.08178
AC	21619.47042	11038.94839	1.958471917	0.052777558	-263.9566541	43502.89749	-263.9566541	43502.89749
Adj to PwrLine/RR	-7474.352241	12461.15131	-0.599812333	0.549899425	-32177.13064	17228.42615	-32177.13064	17228.42615
Zone 1 (0 - 500')	-7048.891199	18254.13804	-0.386153057	0.70015008	-43235.58982	29137.80742	-43235.58982	29137.80742

DESCRIPTIVE STATISTICS

Sale Price	
Mean	494632.1949
Standard Error	12201.77009
Median	470000
Mode	410000
Standard Deviation	132545.1501
Sample Variance	17568216811
Kurtosis	3.711076285
Skewness	1.198921335
Range	925000
Minimum	200000
Maximum	1125000
Sum	58366599
Count	118

# Mos from Sale	
Mean	28.77441578
Standard Error	1.361710493
Median	31.12834048
Mode	30.81491257
Standard Deviation	14.79196218
Sample Variance	218.8021451
Kurtosis	-0.922138198
Skewness	-0.309616337
Range	54.23952491
Minimum	1.055757176
Maximum	55.29528209
Sum	3395.381062
Count	118

Location	
Mean	0.474576271
Standard Error	0.046165221
Median	0
Mode	0
Standard Deviation	0.501482663
Sample Variance	0.251484862
Kurtosis	-2.023960802
Skewness	0.103142425
Range	1
Minimum	0
Maximum	1
Sum	56
Count	118

Acres	
Mean	0.60720339
Standard Error	0.06817629
Median	0.39
Mode	0.35
Standard Deviation	0.740584068
Sample Variance	0.548464762
Kurtosis	57.30242544
Skewness	6.686314087
Range	7.29
Minimum	0
Maximum	7.29
Sum	71.65
Count	118

Sq.Ft Approx	
Mean	2061.423729
Standard Error	59.11837236
Median	2102.5
Mode	2400
Standard Deviation	642.189902
Sample Variance	412407.8702
Kurtosis	2.386386451
Skewness	0.65361717
Range	4074
Minimum	789
Maximum	4863
Sum	243248
Count	118

Bath.Lav Total	
Mean	2.106779661
Standard Error	0.067462963
Median	2.1
Mode	2.1
Standard Deviation	0.732835357
Sample Variance	0.53704766
Kurtosis	-0.510294545
Skewness	0.13166281
Range	3.1
Minimum	1
Maximum	4.1
Sum	248.6
Count	118

Gar Y/N	
Mean	0.813559322
Standard Error	0.036005763
Median	1
Mode	1
Standard Deviation	0.3911227
Sample Variance	0.152976967
Kurtosis	0.671334077
Skewness	-1.631025339
Range	1
Minimum	0
Maximum	1
Sum	96
Count	118

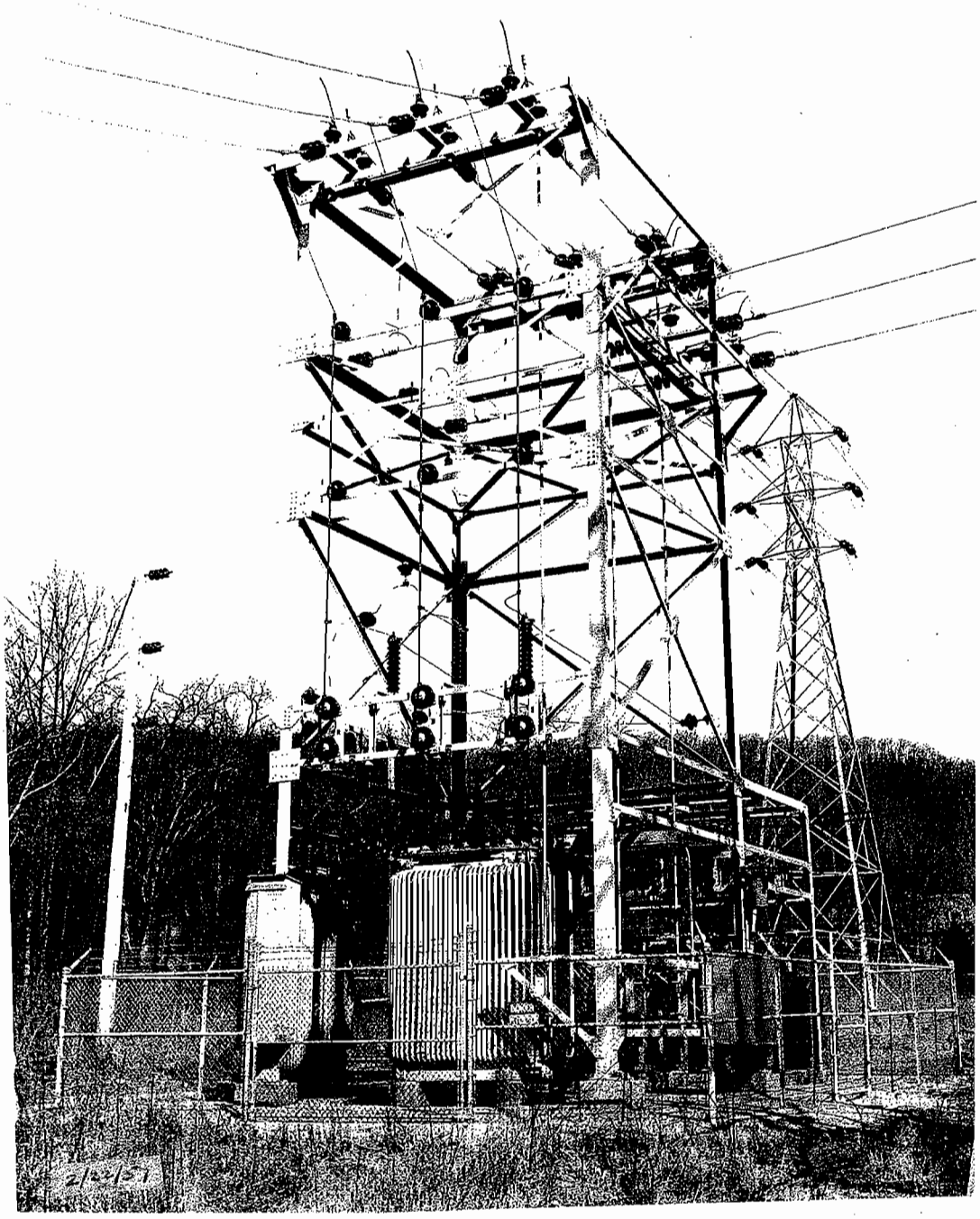
AC	
Mean	0.694915254
Standard Error	0.042567999
Median	1
Mode	1
Standard Deviation	0.462406832
Sample Variance	0.213820078
Kurtosis	-1.286653929
Skewness	-0.857581888
Range	1
Minimum	0
Maximum	1
Sum	82
Count	118

Adj to PwrLine/RR	
Mean	0.194915254
Standard Error	0.036622736
Median	0
Mode	0
Standard Deviation	0.397824739
Sample Variance	0.158264523
Kurtosis	0.441444907
Skewness	1.560208793
Range	1
Minimum	0
Maximum	1
Sum	23
Count	118

Zone 1 (0 - 500')	
Mean	0.084745763
Standard Error	0.025747611
Median	0
Mode	0
Standard Deviation	0.279690647
Sample Variance	0.078226858
Kurtosis	7.246444278
Skewness	3.020578614
Range	1
Minimum	0
Maximum	1
Sum	10
Count	118

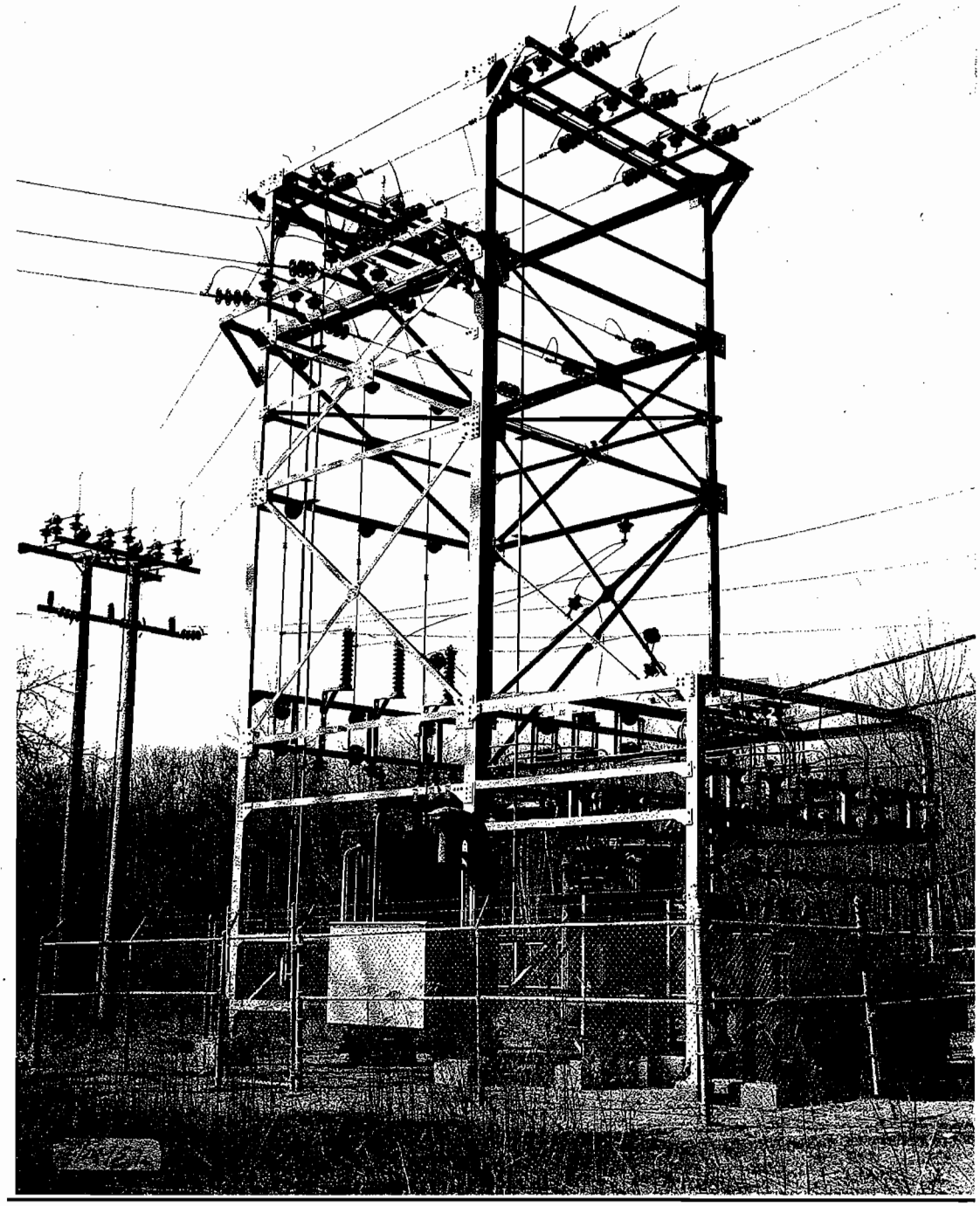
FORMER GIBBONS SUBSTATION

Photo Date: 2/22/1957



FORMER GIBBONS SUBSTATION

Photo Date: 2/22/1957



WILLIAM R. BECKMANN, MAI, CRE

Resident and native of Rockland County, New York
bill@beckmannappraisals.com

PROFESSIONAL DESIGNATIONS

IAO 1989 Member, Institute of Assessing Officers
MAI 1990 Member, Appraisal Institute
CRE 2000 Member, Counselors of Real Estate
FRICS 2006 Member, Royal Institute of Chartered Surveyors

LICENSED

Certified General Real Estate Appraiser, New York State
Certified General Real Estate Appraiser, New Jersey
Approved Real Estate Appraiser Instructor, New York State
Approved Real Estate Instructor, New York State
Real Estate Broker, New York State
Real Estate Broker, New Jersey
Notary Public, New York State

NEW YORK STATE ASSESSOR (Office of Real Property Tax Services)

State Certified Assessor (7-17-89)
State Certified Assessor (Advanced) (9-15-89)
State Certified Assessor (Professional) (9-15-89)
State Certified Assessor (National) (3-28-90)

EMPLOYMENT

1996 to Present Beckmann Appraisals, Inc., Tappan, New York
1982 to 2001 Assessor - Village of Spring Valley, New York
1979 to 1995 Beckmann Realty, Inc., Tappan, New York
1976 to 1979 Real Estate Salesman, Pearl River, New York

AREAS OF EXPERTISE

- Real Property Assessments and Taxation
- Approved Fee Appraiser, New York State Department of Transportation
- All aspects of General Appraising including:

Right-of-way	Condemnation	Estate
Commercial and Industrial	Residential	Mortgage
Hotels and Motels	Certiorari Feasibility	Feasibility

- Geographic Information Systems
  Developed GIS system for:
  Suffolk County: Half Hollows Central School District
  Middle Country Central School District

Rockland County: Town of Clarkstown
South Orangetown Central School District
Town of Orangetown
Town of Orangetown Highway Department
Rockland County Solid Waste Management Authority
Rockland County Sewer District No. 1

EDUCATION

- Pace University, BBA Finance, 1980
- Appraisal Institute (American Institute of Real Estate Appraisers):
  - Standards of Professional Practice
  - Real Estate Appraisal Principle
  - Basic Valuation
  - Residential Valuation
  - Capitalization, Theory & Techniques
  - Case Studies in Real Estate Valuation
  - Valuation Analysis & Report Writing
  - Rates, Ratios & Relationships
  - Hotels/Motels Appraisals
  - Regression Analysis in Appraisal Practice
  - Appraisal Issues…in the Millennium
  - What's it Worth? Valuation of Real Property in Litigation
  - Case Studies in Commercial Highest & Best Use
  - Advanced Applications
  - Attacking & Defending an Appraisal Litigation
  - HUD Rent Comparability Studies
  - Case Studies in Ltd. Partnership & Common Tenancy Valuation
  - Appraisal Consulting: A solutions Approach for Professionals
  - Subdivision Valuation: A Comprehensive Guide to Valuing Improved Subdivisions
  - Analyzing Commercial Lease Clauses – Implications for Property Value and Marketability
- New York State Department of Equalization and Assessment:
  - Assessor's Basic Phase I
  - Assessor's Basic Phase II
  - Forestry Appraisal
  - Fundamentals of Equalization
  - Income Approach I
  - Income Approach II
  - Industrial Valuation
  - Mass Appraisal(Education cont.)

- Other: Business, Faith & Ethics, CRE
  Electric Asset Valuation, CBI
  Taxation in the Deregulated Electric Industry, CBI
  Annual Legal Seminar, IAAO
  Advanced Income Approach, NYS Assessor's Association
  FIRREA Overview and Practical Application
  Passport I & II, Orange County Association of Realtors
  Northeast Arc Users Group Conference, NEARC
  NYS Geographic Information Systems Conference SUNY College of ESF

TEACHING

Taxes and Assessments
Ethics and Standards (E & S)
Appraisal Methods (G1)
Appraisal Applications (G3)
Taxes and Assessments
Real Property Taxes and Assessments
Real Estate Appraisal, Cornell University, Dominican College
Rockland County Board of Realtors, Rockland Community College
Real Estate Fundamentals, Principals and Practices of Real Estate
Income Approach to Valuation, New York State Association of Towns
Elementary Income and Capitalization Methods & Techniques (R4)
Valuation of Cell Towers & Sites

Construction Home Inspection
Appraisal Report Writing (R3)
Income Capitalization (G2)
Appraisal Basics (R1)
Single Family Appraisal (R2)

EXPERT TESTIMONY

Supreme Court State of New York:
Counties of Orange, Rockland, Westchester, Dutchess, Putnam, Schoharie, Columbia, Putnam, Sullivan, and Ulster

County Legislature:
County of Rockland

Authorities:
Metropolitan Transit Authority
Metro North Transit
Rockland County Solid Waste Management Authority

United States Bankruptcy Court:
Eastern District of New York
Southern District of New York

Zoning Board of Appeals:
Towns of Clarkstown, Orangetown, Ramapo Villages of Nyack, Piermont, South Nyack, Spring Valley, Upper Nyack

Planning Boards:

Towns of Clarkstown, Orangetown, Ramapo
Villages of Piermont, South Nyack, Spring Valley, Upper Nyack
Airmont, Montebello

Town Boards:
Towns of Clarkstown, Orangetown, Ramapo, Stony Point

Village Boards:
Villages of Nyack, Piermont, South Nyack, Spring Valley
Airmont, Montebello

BROKERAGE AND APPRAISAL

State of New York:

Albany County
Dutchess County
Erie County
Madison County
Putnam County
Saratoga County
Schenectady County
Sullivan County
Westchester County
New York City, all 5 Boroughs
Columbia County
Delaware County
Herkimer County
Orange County
Rockland County
Schoharie County
Suffolk County
Ulster County
Nassau County
Greene County

State of New Jersey:
Bergen County
Ocean County
Passaic County
Hudson County

State of Connecticut:
Fairfield County

MEMBERSHIPS

International Association of Assessing Officers
The Appraisal Institute
The Counselors of Real Estate
National Association of Realtors
New York State Association of Realtors
New York State Assessors Association
Rockland County Multiple Listing System
United Real Estate Brokers of Rockland
Rockland County Society of Real Estate Appraisers, Inc.
Rockland County Assessors Association - past President
Rockland County Board of Realtors - past President
Greater Hudson Valley MLS
Royal Institute of Chartered Surveyors

SAMPLE REFERENCE SUBSCRIPTIONS

Valuation Insights and Perspectives
Assessment Journal Westchester County Business Journal
Fairfield County Business Journal Hudson Valley Business Source
National Economic Trends
Monetary Trends
The Appraiser News
Bureau of Labor Statistics
The Federal Reserve Bank of New York
The Federal Reserve Bank of St. Louis
Marshall Valuation Service
Real Property Tax Administration Reporter
Korpacz Real Estate Investor Survey PKF Consulting Trends in the Hotel Industry
BOMA Experience Exchange Report
The ULI Dollars & Cents of Shopping Centers
US Census
Uniform Standards of Professional Appraisal Practice

BECKMANN APPRAISALS, Inc.

67 MAIN STREET
TAPPAN, NEW YORK 10983
REAL PROPERTY APPRAISERS, ANALYSTS AND CONSULTANTS

William R. Beckmann, MAI, IAO, CRE, Certified General Real Estate Appraiser
Mona Parker, Certified General Real Estate Appraiser
Ann Marie Mulholland, Certified General Real Estate Appraiser
Poh Sim Lim Png, Certified General Real Estate Appraiser
Marie Capasso-Spruck, Real Estate Assistant Appraiser

(845) 359-0070
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April 6, 2011

Anthony Montalbano, Esq.
Montalbano, Condon & Frank, P.C.
67 N Main Street
New City, New York 10956

Re: Orange and Rockland Property, Little Tor Road, New City, NY
Little Tor Road Transfer Substations

Dear Mr. Montalbano:

We have prepared a report with respect to residential property value and impact with respect to the subject substations as of November 16, 2009. At that time, we considered sales of residential properties through September 2009.

You have requested us to consider whether an updated analysis, including residential sales through the 1st Quarter of 2011 would change our opinion or analysis.

As you know, by reason of the recession and its aftermath there have been relatively few sales of real estate compared to the volume of sales that was analyzed that included the period Jan 2005 through Sept. 2009, particularly within the area of our previous studies that encompassed some 117 sales out of the several hundred that we originally analyzed. Further, by virtue of the statistical analyses we undertook, the relatively few sales within the area of the study would not significantly affect our analysis. Accordingly, the opinion set forth in our report dated November 16, 2009 continues to be our opinion as of March 31, 2011.

You may append this letter to our report and consider it a "supplement" to our prior report and study.

Very truly yours,

William R. Beckmann, MAI, CRE
/am

Coyle & Coyle, Inc.

REAL ESTATE APPRAISER
& CONSULTANTS

40 South Main Street, New City, NY 10956

Via E-Mail: J.Simoes@clarkstown.org

September 19, 2011

Mr. Joe Simoes
Town Planner
Town of Clarkstown
10 Maple Avenue
New City, NY 10956

Re: Review of Residential Property Value and Impact Study of Proposed O & R Electric Transmission and Gas Regulator Substations at the Intersection of Little Tor Road and South Mountain Road

Dear Mr. Simoes:

At your request, we have reviewed the captioned report which was prepared on November 16, 2009 by Beckmann Appraisals Inc. To begin, we will briefly summarize the purpose of the Beckmann Appraisals report.

As depicted on page 1 of the Beckmann report, in its Executive Summary, it states the following:

> *"We have been requested to offer our opinion as to the potential impact on the value of nearby properties to the proposed Little Tor Road/South Mountain Road electric utility substation and a gas regulator substation. ... In reviewing the assignment we realized that we would be employing a significantly large set of data, single family residential sales each of which was delineated by the significant attributes of the property sold. Accordingly, we have utilized a*

geographic information system (GIS) as well as multiple regression analysis, a statistical tool using computer aided software that enables an appraiser to employ a larger amount of data and variables than typical.

We located two substations that were in reasonably sub-markets, although not identical in locational attributes to the subject property proposed substation, the New Hempstead Road/New City substation and the Congers substation. The New City substation and its attendant high tension wires are located at the southbound exit/entry to the Palisades Parkway Exit 11. New Hempstead Road is a busy two lane road that is the primary east-west link to and from New City. The New Hempstead substation sub-market is highly residential, although it is somewhat intermixed with a variety of religious uses. It is within the East Ramapo Central School District. There is a small strip center, also, in this area which we do not consider a significant influence on neighborhood values. We deemed this site substantially and reasonably similar in many market/locational attributes. The other substation that is also within a similar residential sub-market area is the Congers substation located off Gilchrest Avenue along the railway line west of Congers Lake and Route 303...

For purposes of this report we are using a well-recognized statistical method, a Multiple Regression Analysis (MRA) technique, which involves the (linear) correlation of value-influencing attributes to changes in sales prices...

We have also reviewed the literature in the field that discusses the influence of the presence of power lines on adjacent and nearby properties. There are no such articles with respect to substations; however, there are many aspects of high tension wires that are similar to electrical or gas substations, although with greater visibility. The studies consistently find that to the extent that there is any value diminishing influence of the presence of power lines that the greater the distance from the line the less the value influences. Further, they find that over time this negative influence on value diminishes. The literature, therefore, is consistent with our studies as both the New Hempstead Road – New City substation and the Congers substation have been present for a very long time. Simply put, people got used to them and did not find over time that they reduced the value of their houses upon sale.

We consider that the subject proposed substation site is an already existing impacted site, as described above. It is similar to the sub-markets we studied. Further, the existing gas regulator is proposed to be moved from its current site to one further removed from adjacent properties. We also apply our experience as appraisers from which we know that with respect to an already impacted site the addition of a potential negative externality has a limited probability of decreasing nearby property values. We also know that if a site is large, is well protected by visual barriers such as trees and other vegetation

so that there is limited visibility to adjacent or nearby property owners, that the potential to reduce lower property values is diminished. Accordingly, we conclude that the subject proposed substation is unlikely to reduce nearby property values."

To summarize the Beckmann report, the subject property is already impacted by high tension wires which are adjacent to the subject property. In addition, there is a gas regulator on site. To determine if there is any impact by the proposed improvements to the subject site, the Beckmann report provided a multiple regression analysis. Two other substation locations in Clarkstown were found and identified. One was located in the New Hempstead Road / New City area and the second one was located on Gilchrest Road in Congers.

For each of these substation locations, the Beckmann report identified residential sales which occurred within 2500 linear feet of the substation. The sales were studied from January 2005 through September 2009. For the New Hempstead Road / New City substation, 56 sales were identified within 2500 feet. For the Congers Substation, the same time period of residential sales and distances was used and 62 residential sales were identified. Some sales in each data set were removed if they lacked certain information or located along a busy road such as New Hempstead Road or Route 303. The key comparison factors for the multiple regression analysis are as follows:

1. Date of sale
2. Square feet of living area
3. Lot size
4. Number of baths
5. Whether or not there is a garage
6. Whether or not there is central air conditioning
7. Number of bedrooms
8. Whether or not the house has a basement
9. Architectural style of house
10. Whether or not the property is adjacent to existing powerlines
11. **Whether or not the property is within 500 feet of the substation property line**

As noted on page 13 of the Beckman report, the following is stated:

"The distance variable is the one of most interest in this study, as it is designed to capture any impacts of proximity to the substation (S). Because the distant variable is a yes/no (or qualitative) variable, this specification will produce an estimate of any difference in selling prices between properties inside and outside of 500 feet from the substation (S), while controlling for the price impact of the other variables in the model."

By having this study of 56 and 62 residential sales within 2500 feet of an existing substation, the Beckman report specifically concentrates on sales that are within 500 feet of the substation and how this particular factor affects values through the multiple regression analysis. After performing this analysis, the Beckman report finds that the sampling of sales does not show any discernable impact on value for those properties near a substation.

The following are our comments and concerns for each of the Beckmann study areas, beginning with the New Hempstead Road / New City data.

1. As depicted on page 30 of the Beckmann report, 56 residential sales were utilized that were within 2500 feet of the substation. Of these 56 sales, 6 sales (Sales 51 through 56) are within 500 feet of the substation. However, Sales 52 and 54 are repeats of the same sale. Therefore, only 4 sales are within 500 feet of the substation. In our opinion, 4 sales within 500 feet of a substation does not appear to be a large enough set of data to provide any substantial results.

2. In the Beckmann report, the qualifying distance is that the property is within 500 feet of a substation. As noted in the Appraisal Journal article for the Summer of 2009, it states the following:

   "where effects are found, they decay rapidly as distance to the lines increases and usually disappear at about 200 feet to 300 feet. (61 meters to 91 meters)."

   The 2nd study cited by the Beckmann report is the Appraisal Journal, Fall of 2007, which states a similar distance impact factor which is as follows:

   "these impacts (referring to high tension power lines) *diminish as distance from the line increases and disappear at a distance of 200 feet from the lines."*

   In the case of the subject, the substations can only be seen from a very limited distance. Since the Beckmann report uses 500 feet as the qualifying distance, the results might be skewed by the greater distance. It may be better to revisit substation sales and confine the distance of the sales to within 300.

3. The Beckmann report cites residential sales from January 2005 through September 2009. This was a highly volatile timeframe in regards to changing property values. We're not sure how changing values over time are handled by the Beckmann report.

4. 4 Hoover, which is within 500 feet of a substation, is somewhat mischaracterized by the long access driveway of the substation. The New Hempstead Road / New City substation has a long and narrow access road from New Hempstead Road. This access road is over 400 feet in length. This sale is over 500 feet from the substation improvement, but within 500 feet of its road access. (Refer to the distance map attached.) We are not sure that this measurement including the access road properly accounts for the real location of this substation.

The following are our comments regarding the Congers substation analysis:

1. Like the New Hempstead Road / New City analysis, there were a total of 62 sales with 4 within 500 feet of the substation. Again, having 4 sales within 500 feet of the substation may not be a large enough sampling to properly identify value changes during the 2005 to 2009 timeframe.

2. The Congers substation is directly adjacent to an active railroad line. All of the sales within 2500 feet of the substation are also affected by the presence of the railroad tracks. Two of the 4 sales within 500 feet of the substation (229 South Harrison Avenue and 14 Gilchrest Road) are directly adjacent to the railroad tracks. Our concern is that any value effects due to the substation may be overshadowed by the effects on value for this entire area by the active railroad tracks.

3. As noted on page 23 of the Beckmann of the report, Sales 24 through 27 are within 500 feet of the substation. However, upon visiting each of these 4 sales, we note that Sale 25 at 2 Von Beaste Lane is more than 500 feet from the substation. (As the crow flies, it's over 800 feet from the substation. Refer to the distance map attached.) Further, the sales price for 2 Von Beaste Lane is depicted as $440,000 in the Beckmann report. However, the actual recorded Deed price is $452,410. The difference between the two numbers should be clarified.

Final Conclusion

In conclusion, there are very few sales (7 sales) within 500 feet of a substation. Further, 4 of the 7 sales may be overshadowed by the presence of the active railroad line near the Congress substation. As previously mentioned, the Congers substation set of data may be misinterpreted due to the presence of an active railroad track. For the New Hempstead Road / New City set of data, only 4 sales (at best) are within 500 feet. The small number of sales may limit the reliability of performing a multiple regression analysis with only 4 (at best) controlled sales.

On the other hand, a multiple regression analysis is the most objective approach and is the only approach to give explicit measures of reliability.

Based on the review of the Beckmann report as well as other published literature within the appraisal field, it appears that the proposed substation for the subject property would likely have little impact on value for many of the surrounding properties. However, the appraisal literature does cite that properties may be impacted if they are within 200 to 300 feet. Further than 300 feet from the negative influence, the literature as well as the multiple regression analysis performed by Beckman indicates little to no lasting diminution in value.

Respectfully submitted,

Gregg Manzione, MAI

James Coyle, Pres.

GM/ac
Attachments

ADDENDA

1. **Map – showing the distance of 2 Bon Beaste to the substation**

Distance from 2 Von Beaste to Substation
Base Map

Map Source: Rockland County Department of Planning.

52 11

2. Deed for 2 Von Beaste Lane

Paul Piperato, County Clerk
1 South Main St Ste 100
New City, NY 10956
(845) 638-5221

Rockland County Clerk Recording Cover Sheet

Received From :
DIVERSIFIED LAND SERVICES LTD
369 SOUTH MAIN ST
NEW CITY, NY 10956

Return To :
MARK B LICKER ESQ
369 S MAIN ST
NEW CITY, NY 10956

First GRANTOR
CALABRESE, PETER A JR

First GRANTEE
TABACCO, CINDY

Index Type : Land Records

Instr Number : 2007-00033637

Book : **Page :**

Type of Instrument : Deed
Type of Transaction : Deed

Recording Fee : $123.00

Recording Pages : 6

The Property affected by this instrument is situated in Clarkstown, in the County of Rockland, New York

Real Estate Transfer Tax

RETT # :	5791
Deed Amount :	$452,410.00
RETT Amount :	$1,810.00
Total Fees :	$1,933.00

State of New York
County of Rockland
I hereby certify that the within and foregoing was recorded in the Clerk's office for Rockland County, New York

On (Recorded Date) : 07/03/2007
At (Recorded Time) : 5:05:10 PM

Doc ID - 017508860006

Paul Piperato, County Clerk

UNOFFICIAL COPY

This sheet constitutes the Clerks endorsement required by Section 319 of Real Property Law of the State of New York

Entered By: NAM Printed On : 07/09/2007 At : 9:04:23AM

BARGAIN AND SALE DEED WITH COVENANTS AGAINST GRANTOR'S ACTS

THIS INDENTURE, made the 22ND day of JUNE, two thousand and seven

BETWEEN, PETER A. CALABRESE, JR. and JODY CALABRESE, F/K/A JODY ANN BOZDECH, husband and wife, residing at 6 Friend Court, Congers, NY 10920

party of the first part, and CINDY TABACCO and KERRY ENEA, residing at 6 Ridge Road, Congers, NY 10920 as Joint Tenants With Rights of Survivorship

party of the second part,

WITNESSETH, that the party of the first part, in consideration of TEN ($10.00) AND 00/100----------DOLLARS,

lawful money of the United States, and other good and valuable consideration paid

by the party of the second part, does hereby grant and release unto the party of the second part, the heirs or successors and assigns of the party of the second part forever,

ALL that certain plot, piece or parcel of land with the buildings and improvements thereon erected, situate, lying and being in the Town of Clarkstown, County of Rockland and State of New York as more particularly described on Schedule "A" attached hereto and made a part hereof.

Being and intended to be same premises as conveyed to the grantors herein by deed dated August 14, 2001 and recorded in the Rockland County Clerk's Office on August 23, 2001 as Instrument No. 2001-41419.

Premises shown and designated on the Town of Clarkstown Tax Map as
Section 52.11
Block 2
Lot 50.

Premises also known as 2 Von Beaste Lane, Congers, NY 10920.

UNOFFICIAL COPY

Title No. ULS3452-07
Policy No.

SCHEDULE A

ALL that certain plot, piece or parcel of land situate, lying and being in the Town of Clarkstown, County of Rockland and State of New York known and designated as Lot No. 1 in Block B on a certain map entitled "Survey of Property for Congers Lake Homes, Inc. Town of Clarkstown, Rockland County, New York", dated June 3, 1963, and filed in the Office of the Clerk of the County of Rockland on July 29, 1964 in Book 68 at Page 57 as Map No. 3257; more particularly bounded and described as follows:

BEGINNING at a point on the southeasterly side of Gilchrist Road distant 49.66 feet easterly from the extreme northeasterly part of a curve formed by the intersection of the easterly side of Stark Lane and the southerly side of Gilchrist Road; running thence

North 55 degrees 59' 40" East along the southerly side of Gilchrist Road 70.70 feet to a point; thence

North 33 degrees 37' 50" East 5.97 feet to a point; thence

Northeasterly along a curve bearing to the right, having a radius of 25 feet, a distance of 36 feet to a point thence

South 63 degrees 52' 10" East along the southerly side of Von Beaste Lane 82.75 feet to a point; thence

Continuing along the southerly side of Von Beaste Lane South 70 degrees 56' 40" East 30.90 feet to a point; thence

South 19 degrees 03' 20" West 107.72 feet to a point; thence

North 59 degrees 24' 40" West 187.97 feet to the point or place of BEGINNING.

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TOGETHER with all right, title and interest, if any of the party of the first part in and to any streets and roads abutting the above described premises to the center lines thereof,

TOGETHER with the appurtenances and all the estate and rights of the party of the first part in and to said premises,

TO HAVE AND TO HOLD the premises herein granted unto the party of the second part, the heirs or successors and assigns of the party of the second part forever.

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AND the party of the first part covenants that the party of the first part have not done or suffered anything whereby the said premises have been incumbered in any way whatever, except as aforesaid.

AND the party of the first part, in compliance with Section 13 of the Lien Law, covenants that the party of the first part will receive the consideration for this conveyance and will hold the right to receive such consideration as a trust fund to be applied first for the purpose of paying the cost of the improvement and will apply the same first to the payment of the cost of the improvement before using any part of the total of the same for any other purpose.

The word "party" shall be construed as if it read "parties" whenever the sense of this indenture so requires.

IN WITNESS WHEREOF, the party of the first part has duly executed this deed the day and year first above written:

IN PRESENCE OF:

Peter A. Calabrese, Jr.

Jody Calabrese f/k/a Jody Ann Bozdech

STATE OF NEW YORK, COUNTY OF ROCKLAND }ss.:

On the 22nd day of June in the year 2007, before me, the undersigned, personally appeared Peter A. Calabrese, Jr. and Jody Calabrese f/k/a Jody Ann Bozdech
personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name(s) is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies) and that by his/her/their signature(s) on the instrument, the individual(s) or the person upon behalf of which the individual(s) acted, executed the instrument.

Notary Public

JAMES S. KOBB
Notary Public, State of New York
No. 02KO4842322
Qualified in New York County
Commission Expires November 30, 2009

STATE OF NEW YORK, COUNTY OF }ss.:

On the day of in the year 2007, before me, the undersigned, personally appeared

personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name(s) is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s) or the person upon behalf of which the individual(s) acted, executed the instrument.

Notary Public

UNOFFICIAL COPY

DLS 345207

RECORD AND RETURN TO:
Mark B. Licker, Esq.
369 South Main Street
New City, NY 10956

SECTION: 52.11
BLOCK 2
LOT: 50
COUNTY OR TOWN:
Rockland/Clarkstown

PLEASE TYPE OR PRESS FIRMLY WHEN WRITING ON FORM
INSTRUCTIONS: http:// www.orps.state.ny.us or PHONE (518) 473-7222

FOR COUNTY USE ONLY
C1. SWIS Code 392089
C2. Date Deed Recorded 7 / 3 / 07 (Month / Day / Year)
C3. Book 2007 C4. Page 33637

REAL PROPERTY TRANSFER REPORT

STATE OF NEW YORK
STATE BOARD OF REAL PROPERTY SERVICES

RP - 5217

RP-5217 Rev. 5/97

PROPERTY INFORMATION

1. Property Location: 2 (Street Number) Von Beaste Lane (Street Name)
Clarkstown (City or Town) (Village) 10920 (Zip Code)

2. Buyer Name: Tabacco (Last Name / Company) Cindy (First Name)
Enco (Last Name / Company) Kerry (First Name)

3. Tax Billing Address: Indicate where future Tax Bills are to be sent. If other than buyer address (at bottom of form) (Last Name / Company) (First Name)
(Street Number and Street Name) (City or Town) (State) (Zip Code)

4. Indicate the number of Assessment Roll parcels transferred on the deed: 1 # of Parcels Off ☐ Part of a Parcel
(Only if Part of a Parcel Check as they apply:
4A. Parcel Part of an Subdivision Authority Exists ☐
4B. Subdivision Approval was Required for Transfer ☐
4C. Parcel Approved for Subdivision with Map Provided ☐

5. Deed Property Size: (Depth Feet) x (Width) or Less than an acre 0.35 (Acres)

6. Seller Name: Calabrese (Last Name / Company) Peter A., Jr. (First Name)
Calabrese (Last Name / Company) Jody, f/k/a Jody Ann Bendach (First Name)

7. Check the box below which most accurately describes the use of the property at the time of sale:
A [X] One Family Residential
B [ ] 2 or 3 Family Residential
C [ ] Residential Vacant Land
D [ ] Non Residential Vacant Land
E [ ] Agricultural
F [ ] Commercial
G [ ] Apartment
H [ ] Entertainment / Amusement
I [ ] Community Service
J [ ] Industrial
K [ ] Public Service
L [ ] Vacant

Check the boxes below as they apply:
8. Ownership Type is Condominium ☐
9. New Construction on Vacant Land ☐
10A. Property Located within an Agricultural District ☐
10B. Buyer received a disclosure notice indicating that the property is in an Agricultural District ☐

SALE INFORMATION

11. Sale Contract Date: 5 / 8 / 2007 (Month / Day / Year)

12. Date of Sale / Transfer: 6 / 22 / 2007 (Month / Day / Year)

13. Full Sale Price: 4 5 4 4 1 0 0 0
(Full Sale Price is the total amount paid for the property including personal property. This payment may be in the form of cash, other property or goods, or the assumption of mortgages or other obligations. Please round to the nearest whole dollar amount.)

14. Indicate the value of personal property included in the sale: -0- 0 0

15. Check one or more of these conditions as applicable to transfer:
A [ ] Sale Between Relatives or Former Relatives
B [ ] Sale Between Related Companies or Partners in Business
C [ ] One of the Buyers is also a Seller
D [ ] Buyer or Seller is Government Agency or Lending Institution
E [ ] Deed Type not Warranty or Bargain and Sale (Specify Below)
F [ ] Sale of Fractional or Less than Fee Interest (Specify Below)
G [ ] Significant Change in Property Between Taxable Status and Sale Dates
H [ ] Sale of Business is Included in Sale Price
I [ ] Other Unusual Factor - Affecting Sale Price (Specify Below)
J [X] None

ASSESSMENT INFORMATION - Data should reflect the latest Final Assessment Roll and Tax Bill

16. Year of Assessment Roll from which information taken: 06
17. Total Assessed Value (of all parcels in transfer): 1 0 6 6 0 0

18. Property Class: 220 - 1
19. School District Name: Clarkstown

20. Tax Map Identifier(s) / Roll Identifier(s) (If more than four, attach sheet with additional identifiers):
Section 52.11, Block 2, Lot 50

CERTIFICATION

I certify that all of the items of information entered on this form are true and correct to the best of my knowledge and belief and I understand that the making of any willful false statement of material fact herein will subject me to the provisions of the penal law relative to the making and filing of false instruments.

BUYER
Cindy Tabacco
Cindy Tabacco
Kerry Enco 6/22/07
Kerry Enco (First Name) (Date)
2 Von Beaste Lane (Street Number) (Street Name and Unit)
Congers NY 10920 (City or Town) (State) (Zip Code)

BUYER'S ATTORNEY
Licker Mark B. (Last Name) (First Name)
845 638-0800 (Area Code) (Telephone Number)

SELLER
Peter A. Calabrese 6/22/07
Peter A. Calabrese, Jr. (Seller Name) (Date)

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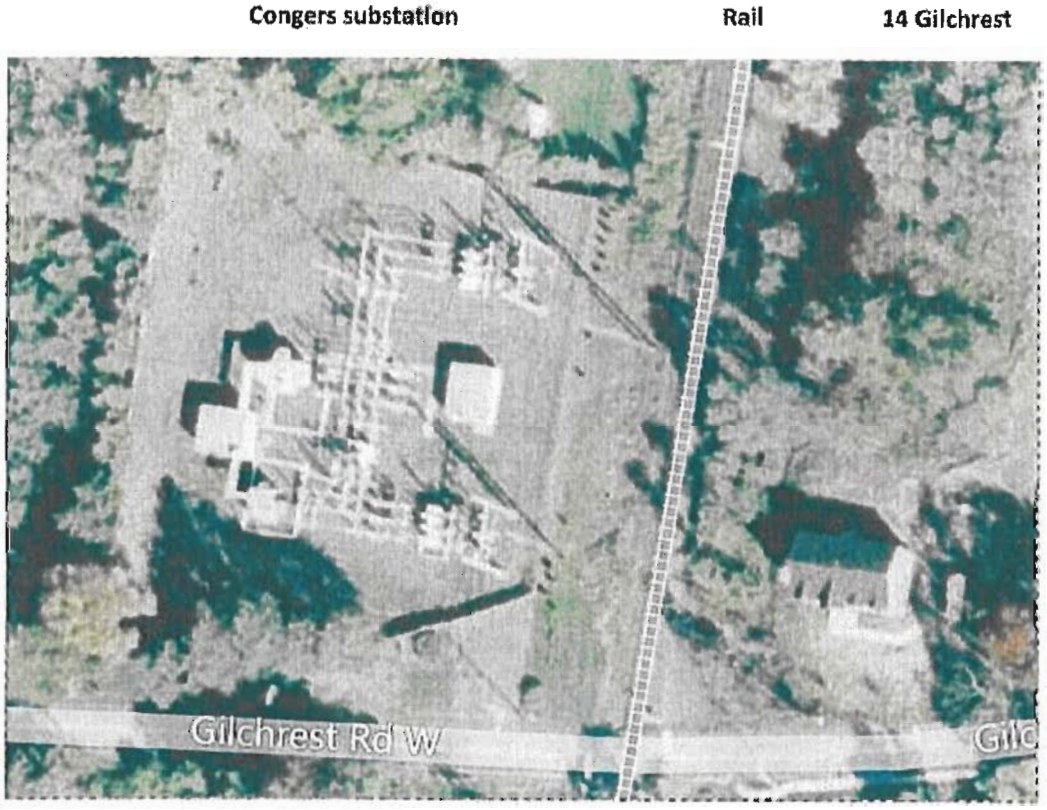
3. **Photograph of 14 Gilchrest showing the proximity of the house to the railroad tracks and the substation**



4. **Map – Showing the distance of 4 Hoover to substation improvements**

Distance from 4 Hoover to Substation
Base Map

Map Source: Rockland County Department of Planning.

5. Appraisal Journal Fall 2007 Article

Power Lines and Property Values Revisited

by Jennifer M. Pitts and Thomas O. Jackson, PhD, MAI

This edition of "Environment and the Appraiser" revisits an issue that has been extensively studied but has recently received little attention. While issues concerning the health effects of electromagnetic fields are beyond the scope of this column, the effects of power lines and perceptions of health risks that can influence residential property values in some situations are summarized here.

There are a number of intervening factors that make generalizations about such influences difficult. Below is a summary of research findings from past studies as well as some recent research, consisting of market interviews focused on residential developments in the central California area. As will be discussed, impacts are varied as are market perceptions. The referenced literature is available from the Appraisal Institute's Y. T. and Louise Lee Lum Library.

Research

Over the years, the impact of high-voltage transmission lines (HVTL) on the value of residential property has been studied extensively. These impacts are not easily measurable. Research shows that the effects of HVTL on residential properties are varied and are determined by five interplaying factors: proximity to towers and lines; the view of towers and lines; the type and size of HVTL structures; the appearance of easement landscaping; and surrounding topography. Many studies indicate that the HVTL have no significant effect on residential property values.[1] More recently, however, an increasing number of studies do show a small diminution in value attributable to the close proximity of these lines.

When negative impacts are evident, studies report an average discount of between 1% and 10% of property value.[2] This diminution in value is attributable to the visual unattractiveness of the lines, potential health hazards, disturbing sounds, and safety concerns.[3] These impacts diminish as distance from the line increases and disappear at a distance of 200 feet from the lines. Where views of the lines and towers are completely unobstructed, negative impacts can extend up to a quarter of a mile. If the HVTL structures are at least partially screened from view by trees, landscaping, or topography, any negative effects are reduced considerably. Value diminution attributable to tower line proximity is temporary and usually decreases over time, disappearing entirely in 4 to 10 years.[4]

Research also has found that the negative impacts on lots adjacent to or with a direct view of a tower or pylon may be slightly greater than impacts on lots further from the tower. This is most likely

1. J. R. Cowger, Steven C. Bottemiller, and James M. Cahill, "Transmission Line Impact on Residential Property Values, A Study of Three Pacific Northwest Metropolitan Areas," *Right of Way* (Sept/Oct 1996): 13–17; William N. Kinnard, "Tower Lines and Residential Property Values," *The Appraisal Journal* (April 1967): 269–284; Hsiang-te Kung and Charles F. Seagle, "Impact of Power Transmission Lines on Property Values: A Case Study," *The Appraisal Journal* (July 1992): 413–418; and Marvin L. Wolverton and Steven C. Bottemiller, "Further Analysis of Transmission Line Impact on Residential Property Values," *The Appraisal Journal* (July 2003): 244–252.
2. Peter F. Colwell and Kenneth W. Foley, "Electric Transmission Lines and the Selling Price of Residential Property," *The Appraisal Journal* (October 1979): 490–499; Charles J. Delaney and Douglas Timmons, "High Voltage Power Lines: Do They Affect Residential Property Value?" *Journal of Real Estate Research* 7, no. 3 (1992): 315–329; William N. Kinnard and Sue Ann Dickey, "A Primer on Proximity Impact Research: Residential Property Values Near High Voltage Transmission Lines," *Real Estate Issues* (April 1995): 23–29; and William N. Kinnard and Sue Ann Dickey, *High Voltage Transmission Lines and Residential Property Values: New Findings About Unobstructed Views and Tower Construction* (Real Estate Counseling Group of Connecticut, Inc., 2000).
3. Delaney and Timmons
4. Kinnard and Dickey, "A Primer on Proximity Impact Research."

because the visual obstruction from a tower is more substantial than that from the lines themselves. The value diminution on lots adjacent to or with direct views on a tower may not decrease with time.[5]

A slower absorption rate and extended marketing period for residential properties adjacent to a tower line right-of-way are observed in some studies. However, when the nearby lots are attractively developed, the lots abutting a right-of-way will sell more quickly.[6] It has also been found that higher-end custom homes are generally more sensitive to the negative impacts of HVTL than lower-end homes.[7]

While most research indicates that HVTL have no significant impact or a slight negative impact on residential properties, some studies have shown that lots adjacent to or with views of an HVTL right-of-way actually sell for a premium over more distant lots. This premium is most likely due to improved visual clearance, increased privacy, and larger lot sizes.[8]

Recent Market Interviews

While academic and professional literature provide a broad background of findings on the price effects of HVTL, brokers and appraisers can provide additional perspective into current market conditions. In early 2007, interviews were conducted of local realtors and appraisers in several central California communities: Discovery Bay near Brentwood, Summer Lake near Oakley, and Sierra View in Roseville. HVTL right-of-ways run through or near these residential developments. Each realtor or appraiser was asked a series of questions about their background, market knowledge, and opinions on the effects of these high-voltage power lines.[9]

Approximately half of the realtors and appraisers interviewed said they had not observed negative impacts on either residential sale prices or days on market due to the presence of the power lines. According to these realtors and appraisers, major factors affecting sale price and marketability of residential properties include: location, the general economy, interest rates, inventory, and neighborhood amenities. A local appraiser in Discovery Bay commented that the presence of power lines "has not deterred residential development in Discovery Bay and surrounding areas." A realtor in Oakley agreed, stating that "buyers are building and selling homes near power lines in many areas of California, and the power lines don't seem to deter buyers."

The remaining realtors and appraisers interviewed had observed negative impacts on homes directly adjacent to a power line right-of-way. They said that on average, the indicated price discounts ranged between 2% and 7% for adjacent homes. For homes not directly adjacent but with a view of the power lines, average price impacts were estimated between 0% and 5%, depending on the view and proximity to the lines. On average, homes adjacent to or with a view of the lines could anticipate an increase of 0 to 60 days on the market. None of the realtors or appraisers interviewed had observed any negative impacts on residential properties in close proximity to the lines, but without a direct view.

Many realtors and appraisers indicated that price and marketability effects of HVTL depend on the market conditions at the time of sale. The presence of power lines can be viewed as a negative externality. *Externalities*, as defined in the Appraisal Institute's *The Appraisal of Real Estate*, 12th edition, are "the use or physical attributes of properties located near the subject property, or the economic conditions that affect the market in which the subject property competes."[10]

According to a broker active in Discovery Bay, "the negative effects from the power line (and from other negative externalities) are evident in a slow market. When demand is strong, these effects diminish. The price effects depend on property characteristics and market conditions." Another realtor in Roseville agreed, stating, "In a slow market, homes adjacent to a power line are harder to sell. These homes are great investment opportunities in a slow market, because any price effects diminish and may disappear when the market picks up."

5. Peter F. Colwell, "Power Lines and Land Value," *Journal of Real Estate Research* 5, no. 1 (1990): 117–127.
6. Louis Reese, "The Puzzle of the Power Line," *The Appraisal Journal* (October 1967): 565–580.
7. Francois Des Rosiers, "Power Lines, Visual Encumbrance and Home Values: A Microspatial Approach to Impact Measurement," *Journal of Real Estate Research* vol. 23, no. 3 (2002).
8. Delaney and Timmons; and Des Rosiers.
9. Interviews conducted by Real Property Analytics, Inc., January 2007. For methodology, see Thomas O. Jackson, "Surveys, Market Interviews, and Environmental Stigma," *The Appraisal Journal* (Fall 2004): 300–310.
10. Appraisal Institute, *The Appraisal of Real Estate*, 12th ed. (Chicago: Appraisal Institute, 2001), 42.

The impact of the power lines on residential property values may also be influenced by a buyer's personal preference. Several realtors and appraisers indicated that there might not be a market consensus on the impacts of power lines because some buyers may consider these power lines a nuisance and an eyesore, while other buyers do not. A broker in Discovery Bay stated, "personal preference may cause some buyers to locate further from the power lines, but the lines have caused no observable negative impacts for the market in general." Another Discovery Bay realtor stated, "external factors such as power lines have less of an effect on lower-end homes than on luxury properties."

Conclusion

Both the market interviews and academic literature show that the impacts of power lines on residential properties are varied and difficult to measure. The impacts from the power lines, as well as other negative externalities, depend on many factors, including market condition, location, and personal preference.

Jennifer M. Pitts researches environmental issues and their effects on real estate markets for Real Property Analytics, Inc. She received her master's degree in land economics and real estate from Texas A&M University. Pitts also has a bachelor's degree, *summa cum laude*, in finance from the Mays Business School at Texas A&M. **Contact: T 254-780-0847; E-mail: jennifer@real-analytics.com**

Thomas O. Jackson, PhD, MAI, CRE, is a clinical associate professor in the Department of Finance of the Mays Business School at Texas A&M University, where he teaches real property valuation in the Land Economics and Real Estate Program. In addition, he is the president of Real Property Analytics, Inc., based in College Station, Texas, where he specializes in analyzing the effects of environmental contamination on real property. **Contact: T 979-690-1755; E-mail: tomjackson@real-analytics.com; Web site: www.real-analytics.com**

6. Appraisal Journal 2009 Article

FEATURES

High-Voltage Transmission Lines: Proximity, Visibility, and Encumbrance Effects

by James A. Chalmers, PhD, and Frank A. Voorvaart, PhD

In this study, over 1,200 home sales in 1998–2007 are aggregated into four study areas with a 345-kV transmission line. Field data are collected on the sale properties relative to proximity to and visibility of transmission line towers, and the extent of encumbrance by a transmission line easement. A multiple regression model is used to test whether the sale prices are affected by line proximity, tower visibility, or property encumbrance. In both continuous distance and distance zone models, the proximity and visibility variables typically fail to be statistically significant. The only variable that appears to have any systematic effect is the encumbrance variable; however, its magnitude is generally small.

There will be a significant expansion of the 345-kV transmission grid in New England over the next decade; this has raised issues on the potential effects of transmission lines on the value of nearby properties.[1] As will be reviewed briefly, the professional literature on the impact of high-voltage transmission lines (HVTLs) on residential real estate values is extensive. While the literature creates a relevant foundation for addressing the potential effects of new 345-kV transmission lines on property values, the current research is designed to investigate three outstanding issues.

First, most of the literature is somewhat dated. Of the most important studies (those that examined large numbers of sales using statistical procedures), only one study analyzes data from a period subsequent to 2000.[2] Since attitudes, behaviors, and their reflection in the market can change over time, it is important to have contemporary evidence on the question of possible property value effects.

Second, the construction that motivates this study is specific to 345-kV lines (which are mostly on 150-foot steel poles), while the historical research has no such focus and only occasionally has dealt with this corridor configuration.

Third, a careful analysis has to look at the interaction of three interrelated variables—proximity, visibility, and the extent to which an adjoining property is actually encumbered by the transmission line right-of-way easement. Since proximity and encumbrance are highly correlated, the effects of one could be

1. This research was carried out under contract to Northeast Utilities over the period April 2008–October 2006 High-voltage transmission lines carry currents of 138 kilovolts (kV) up to 765 kV; see Energy Information Administration, "The U.S. Electric Power Industry Infrastructure: Functions and Components," in *The Changing Structure of the Electric Power Industry 2000: An Update* (Washington, DC: U.S. Department of Energy, 2000), available at http://www.eia.doe.gov/cneaf/electricity/chg_stru_update/chapter3.html.
2. These studies will be referenced and summarized in the next section.

attributed to the other if both are not adequately accounted for. Similarly, the effects of visibility and proximity must be considered in tandem if the effect of each is to be properly measured.

In the course of this research, three additional questions were investigated: (1) are higher-valued properties more vulnerable to HVTL effects than lower-valued properties? (2) are properties in general more vulnerable to HVTL effects in a down housing market? and (3) since much of the proposed expansion of the grid will take place in existing utility corridors, how can the incremental effect of these expansions be measured?

Summary of the Literature

Methodology

Reliable evidence of the effect of HVTLs on the value of adjacent or nearby residential property must rely on actual, arm's-length sales of property that lie in close proximity to an existing line. These sales are then compared to other selected transactions involving properties located outside of the potential area of influence.[3] The three most common approaches for performing this comparison are paired data analysis, retrospective appraisal, and multiple regression analysis.

Paired Data Analysis. The paired data approach attempts to match the characteristics of a subject property sold within a claimed area of impact (the subject area) with individual sales of similar properties sold outside the claimed area of impact (the control area). The issues here center on the availability of sales and the ability to identify sales that can be considered a match to the subject property.[4]

Retrospective Appraisal Based on Control Properties. The retrospective appraisal approach recognizes that a perfect match is unlikely and relies on standard residential appraisal sales comparison methodology. A subject property is selected that has been sold, and it is then appraised retrospectively, i.e., at the date of its historical sale. The appraised value based on control area comparables can then be compared to the actual sale price to see if the HVTL had any effect on the sale price of the subject property. This is obviously an improvement over the paired data analysis, but still suffers from the fact that, as discussed later, the effects under investigation are likely to be small, and may well be within the error range of standard appraisal methodology.

Multiple Regression Analysis of Large Numbers of Subject and Control Area Sales. The third approach, multiple regression analysis, uses statistical tools to try to isolate the effects of the HVTL from all of the other determinants of value. This is only possible with a relatively large number of subject area and control area sales. If the sales, property, and neighborhood data exist to carry out this approach, it is ideally suited to identifying the independent effect of the transmission line, holding the other value-determining factors constant.[5] In addition, it is the least subjective of the three potential approaches and is the only approach to give explicit measures of reliability, which helps the user determine what weight to give the results.

Conclusions from the Literature

While the literature on the effect of HVTLs on property values is extensive, it is of uneven quality, ranging from anecdotal reports to large, rigorously conducted statistical studies. Several hundred articles were reviewed as part of the current study, and thirty-eight had direct relevance to either the methodological or empirical questions at issue here. These are referenced in footnotes or in the Additional Reading section at the end of this article.

Over the past twenty-five years, the literature has increasingly recognized multiple regression analysis as the most reliable technique to investigate whether HVTLs impact property values and, if so, to quantify the effect. As mentioned, multiple regression has the significant advantage of not relying on the subjective judgment of the appraiser. Rather, it represents an objective reflection of the data together with measures of reliability that attach to the results. A large number of studies have been undertaken since the 1980s using large databases and statistical

3. Analysis of trends, days on market, or turnover rates can be suggestive of the existence of effects, but are not useful in quantifying the magnitude of the effect. Surveys of market participants can also be misleading as to how these effects are perceived, but are no substitute for analysis of how these effects actually manifest themselves in the market.

4. The problem with this approach is evident by a review of residential appraisals: despite best efforts to find comparables, it is very rare to see a comparison sale to which no adjustments are made.

5. For a general discussion of the methodological issues associated with multiple regression, see Thomas O. Jackson, "Evaluating Environmental Stigma with Multiple Regression Analysis," *The Appraisal Journal* (Fall 2005): 363–369

tools to investigate the effect of transmission lines on property values. Sixteen of these studies form the core of the professional literature and are widely quoted and cross-referenced one to the other.[6] The results of these studies can be generally summarized as follows:

- Over time, there is a consistent pattern with about half of the studies finding negative property value effects and half finding none.
- When effects have been found, they tend to be small; almost always less than 10% and usually in the range of 5%–6%.
- Where effects are found, they decay rapidly as distance to the lines increases and usually disappear at about 200 feet to 300 feet (61 meters to 91 meters).
- Two studies investigating the behavior of the effect over time find that, where there are effects, they tended to dissipate over time.
- There does not appear to have been any change in the reaction of markets to high-voltage transmission line proximity after the results of two widely publicized Swedish health-effects studies were preliminarily released in 1992.[7]

These general conclusions have characterized the appraisal and economic literature throughout the last twenty-five years, and there do not appear to be any new or different trends in the research. It is during this period that most of the medical studies on electromagnetic field (EMF) exposure were published, including the oft-referenced Swedish studies. One of the questions, therefore, is the apparent inconsistency between these statistical results and the intensity of opposition that new transmission line corridors generate. How can it be that if people are so intensely adverse to HVTLs, we do not see more of a market effect? This inconsistency is seen clearly when residents along existing HVTLs are interviewed.

The basic thrust of survey questioning is whether home purchasers were aware of the transmission lines prior to their purchases and, if so, whether their purchase decisions or the prices they paid were affected by the lines.[8] Like the statistical analyses of sales, the results of these survey studies are quite consistent with one another. Their findings can be summarized as follows:

- A high proportion of the residents were aware of the lines at the time of purchase.

6. The sixteen referenced articles are the following: Judith Callanan and R.V. Hargreaves, "The Effect of Transmission Lines on Property Values: A Statistical Analysis," *New Zealand Valuers Journal* (June 1996): 35–38; Peter F. Colwell, "Power Lines and Land Values," *Journal of Real Estate Research* 5, no. 1 (Spring 1990): 117–127; Peter F. Colwell and Kenneth W. Foley, "Electric Transmission Lines and the Selling Price of Residential Property," *The Appraisal Journal* (October 1979): 490–499; J. R. Cowger, Steven C. Bottemiller, and James M. Cahill, "Transmission Line Impact on Residential Property Values: A Study of Three Pacific Northwest Metropolitan Areas," *Right of Way* (September/October 1996): 13–17; François Des Rosiers, "Power Lines, Visual Encumbrance and House Values: A Microspatial Approach to Impact Measurement," *Journal of Real Estate Research* 23, no. 3 (2002): 275–301; Murtaza Haider, "Influence of Power Lines on Freehold Property Values in the Greater Toronto Area" (Series in Spatial Econometrics, University of Toronto, January 2000); S. W. Hamilton and Cameron Carruthers, "The Effects of Transmission Lines on Property Values in Residential Areas" (University of British Columbia, Vancouver, April 1993); Stanley W. Hamilton and Gregory M. Schwenn, "Do High Voltage Electric Transmission Lines Affect Property Value?" *Land Economics* 71, no. 4 (November 1995): 436–444; Patrice C. Ignelzi and Thomas Priestley, *A Statistical Analysis of Transmission Line Impacts on Residential Property Values in Six Neighborhoods* (Southern California Edison Environmental Affairs Division, 1991); William N. Kinnard, Jr., Mary Beth Geckler, and Jake W. DeLottie, *Post-1992 Evidence of EMF Impacts on Nearby Residential Property Values (Nevada)* (Storrs, CT: Real Estate Counseling Group of Connecticut, Inc., April 1997); William N. Kinnard, Jr., Mary Beth Geckler, and Jake W. DeLottie, *Post-1992 Evidence of EMF Impacts on Nearby Residential Property Values (Missouri)* (Storrs, CT: Real Estate Counseling Group of Connecticut, Inc., April 1997); William N. Kinnard, Jr., Phillip S. Mitchell, and James R. Webb, "The Impact of High-Voltage Overhead Transmission Lines on the Value of Real Property" (paper presented at Fifth Annual American Real Estate Society Conference, Arlington, VA, April 1989); William N. Kinnard, Jr., Mary Beth Geckler, and Phillip S. Mitchell, *Effects of Proximity to High-Voltage Electric Transmission Lines on Sales Prices and Market Values of Vacant Land and Single-Family Residential Property: January 1976–June 1988* (Storrs, CT: Real Estate Counseling Group of Connecticut, Inc., 1988); William N. Kinnard, Jr., Mary Beth Geckler, and Phillip S. Mitchell, *An Analysis of the Impact of High Voltage Electric Transmission Lines on Residential Property Values in Orange County, New York* (Storrs, CT: Real Estate Counseling Group of Connecticut, Inc., 1984); Philip S. Mitchell and William N. Kinnard, Jr., "Statistical Analysis of High-Voltage Overhead Transmission Line Construction on the Value of Vacant Land," *Valuation* (June 1996): 23–29; and Marvin L. Wolverton and Steven C. Bottemiller, "Further Analysis of Transmission Line Impact on Residential Property Values," *The Appraisal Journal* (July 2003): 244–252.

7. The two studies are Maria Feychting and Anders Ahlbom, "Magnetic Fields and Cancer in Children Residing Near Swedish High-Voltage Power Lines," *American Journal of Epidemiology* 138, no. 9 (1993): 467–481; and Birgitta Roderuie et al., "Occupational Exposure to Electromagnetic Fields in Relation to Leukemia and Brain Tumors: A Case-Control Study in Sweden," *Cancer Causes Control* 4 (1993): 465–476. The results of these two studies were released preliminarily in 1992 by Susan Kolare, "Power Lines Increase Cancer Risk for Children," *Forskning & Praktik* (Solna, Sweden: National Institute of Occupational Health) (July 1992): 357–368; and Lars Gronkvist, "Cancers Related to Strong Electromagnetic Fields," *Forskning & Praktik* (Solna, Sweden: National Institute of Occupational Health) (July 1992): 383–385.

8. Five studies are prominent in the literature: William N. Kinnard, Jr., "Power Lines and Residential Property Values," *The Appraisal Journal* (April 1967): 259–264; Thomas Priestley and Gary Evans, *Perceptions of a Transmission Line in a Residential Neighborhood: Results of a Case Study in Vallejo, California*, Southern California Edison Environmental Affairs Division, December 1990; Hsiangte Kung and Charles F. Seagle, "Impact of Power Transmission Lines on Property Values: A Case Study," *The Appraisal Journal* (July 1992): 413–418; Sandy G. Bond, "The Impact of Transmission Lines on Property Values" (paper presented at Twelfth Annual American Real Estate Society Conference, South Lake Tahoe, CA, March 1996); and Cheryl Mitteness and Steve Mooney, "Power Line Perceptions: Their Impact on Value and Market Time" (College of Business, St. Cloud State University, 1998).

- Between one-half and three-fourths of the respondents have negative feelings about the lines.
- The negative feelings center on fear of health effects, aesthetics, and property-value effects.
- Of those who have negative feelings about the lines, the vast majority (67%–80%) report that the purchase decision and the price they offered to pay were not affected by the lines.

In summary, the relatively small effects on property value attributed to HVTL proximity in the literature does not mean that the direction of the effect of transmission lines on property values is not negative. The general interpretation is that, even though transmission line issues have been a prominent concern in most of the communities studied, and even though the direction of effect on real estate value is generally negative, the presence of transmission lines is apparently not given sufficient weight by buyers and sellers of real estate to have had any consistent, material effect on property values.

Connecticut and Massachusetts 2008 Case Study

Study Area Selection

Given the anticipated expansion of the 345-kV transmission grid in New England over the next decade, this study focused on Connecticut and Massachusetts. The objective was to find both rural residential and suburban residential developments along existing 345-kV corridors where the effects of the lines could be studied. The study called for at least 10 years of sales data (1998–2007). The criteria for study area selection were (1) the existing transmission corridor had to contain a 345-kV line, preferably on 150-foot steel poles; (2) the line had to have been built by 1997; and (3) the development patterns along the corridor had to produce a sufficient number of sales to make statistical analysis feasible.

Based upon a combination of field inspection, review of aerial photography, and review of maps of the existing electric transmission grid, nine areas were selected for the study.[9] Table 1 describes the location, configuration of transmission lines, and number of records for each area for the 10-year period analyzed in this study; maps of the specific locations are shown in the Appendix 1.

Database Development

Once the study areas had been selected, local appraisers were retained to assist in the data collection process.[10] A download from the Warren Group identified all sales within a set of street addresses that had been developed to describe an area that approximated 2,000 feet on either side of the transmission line corridor. Using this information, appraisers collected the assessors' record and the multiple listing service (MLS) "sold record" for each of the transactions in the data set. A sales database containing the information shown in Table 2 was then populated for each sale transaction.

Next, the sales database record for each property was returned to the appraisers together with a hard copy of the assessors' record and the MLS sheet. The appraisers were then asked to visit each property and record its location coordinates with a GPS device at the street curb opposite the front door. When obtaining the location information, they were also asked to verify the data entry to the sales database and to opine as to whether, in their judgment, the sale appeared to be an arm's-length transaction.

Next, the appraisers recorded the extent to which the transmission line structures were visible from the property.[11] For each property, the appraisers were given an aerial photograph that showed and labeled all structures in the vicinity of the property. Since the field observations were taken in July and August, it was important for the appraisers to know where structures might potentially be seen. Standing at the street curb, they made three observations and took photos of each; one from the right edge of the property, one from the left edge of the property, and one from the point on the street curb opposite the front door. These views were then coded for up to three of the most visible structures (or structure combinations) from each of the three locations.[12] Visibility was rated as follows:

- Highly Visible—At least one arm holding a conductor is fully visible and not obscured by trees or foliage.

9. When this research began, the number of sales that occurred in each area over the 10-year period was unknown. It was anticipated that some of the areas could be aggregated in the final analysis.

10. Race Appraisal Services, LLC, was retained for the four Massachusetts study areas, Giles & Jerram, Inc., for the three western Connecticut areas, and Archambault & Murray Appraisal Group for the two northcentral Connecticut areas.

11. Structures would include steel poles, steel lattice towers, and wood H-frame towers.

12. In instances where a 345-kV structure was collocated with a 115 kV line or another 345 kV line, visibility ratings to both structures were recorded.

Table 1 Study Area Locations and Transmission Line Configurations

Area	Location	Transmission Line Configuration	Total Records Considered
Study Area 1			
Subarea 1.1 (South-Central MA)	Located in Ludlow, Hampton County, MA, approx. 5 miles east of I-291 and bordered by I-90 to the north.	345-kV line supported by steel poles and 115-kV line supported by H-frame structures.	71
Subarea 1.2 (South-Central MA)	Located on the CT and MA border in East Longmeadow, Hampton County, MA, approx. 7 miles east of I-91.	345-kV line supported by steel poles and 115-kV line supported by H-frame structures.	35
Subarea 1.3 (North-Central CT)	Located in Bloomfield, Hartford County, CT, approx. 3.5 miles west of I-95 and east of CT 189.	345-kV line supported by steel poles and 115-kV line supported by H-frame structures.	80
Subarea 1.4 (North-Central CT)	Located in Windsor and Bloomfield, Hartford County, CT, immediately west of I-91 and north of CT 218.	345-kV line supported by steel poles and 115-kV line supported by H-frame structures.	445
Study Area 2			
Subarea 2.1 (West CT)	Located in New Milford, Litchfield County, CT, approx. 13 miles north of I-84 along Route 202.	345-kV line supported by H-frame structures and 115-kV line supported by H-frame structures.	77
Subarea 2.2 (West CT)	Located in New Milford, Litchfield County, CT, approx. 10 miles north of I-84 along Route 202.	345-kV line supported by steel poles.	85
Subarea 2.3 (West CT)	Located in Brookfield, Litchfield County, MA, approx. 5 miles north of I-84 along Route 202.	345-kV line supported by steel poles.	237
Study Area 3 (East MA)	Located in Stoughton, Norfolk County approx. 4 miles south of I-93 and east of State Hwy 138.	Two 345-kV lines supported by steel lattice towers.	206
Study Area 4 (East MA)	Located in Randolph, Norfolk County approx. 4 miles south of I-93 and east of State Hwy 24.	Two 345-kV lines supported by steel lattice towers.	418
All Areas			**1,654**

- Somewhat Visible–Some portion of the structure is visible independent of trees or foliage, but not a full arm holding a conductor.
- Barely Visible–The entire structure is mostly obscured by trees or foliage, but can be recognized, especially in winter.

Given that the appraisers knew where to look, the ratings reflect the distinction between Barely Visible and not visible as they would be recorded in the winter. That is not an issue with the first two categories as the structure elements are visible independent of trees or foliage. A larger issue is that visibility is being measured as of the summer of 2008 and not as of the date of the sale transaction. Thus, visibility of the structures is being underestimated, especially for sales early in the study period.[13] Another issue is the visibility of the conductors them-

13. Perhaps a forestry PhD candidate could develop a height and density foliage model that could be used to make visibility adjustments over time.

Table 2 Sale and Property Characteristic Data

Variable	Description
Sale Price	Transaction sale price
Liveable Area	Liveable area in square feet
Lot Size	Lot size in acres
A/C	Value of 1 if property has central A/C; zero otherwise
Age (at the time of sale)	Age of property at time of transaction (sale year minus year built)
Total Bathrooms	Sum of full, half, and three-fourths baths (full = 1; half = 0.5; three-fourths = 0.75)
Basement Area	Basement area in square feet
Deck-Small	Value of 1 if the property's deck size is less than or equal to the median deck size of the area; zero otherwise
Deck-Large	Value of 1 if the property's deck size is greater than the median deck size of the area; zero otherwise
Garage-Small	Value of 1 if the property's garage size is less than or equal to the median garage size of the area; zero otherwise
Garage-Large	Value of 1 if the property's garage size is greater than the median garage size of the area; zero otherwise
Patio-Small	Value of 1 if the property's patio size is less than or equal to the median patio size of the area; zero otherwise
Patio-Large	Value of 1 if the property's patio size is greater than the median patio size of the area; zero otherwise
Porch-Small	Value of 1 if the property's porch size is less than or equal to the median porch size of the area; zero otherwise
Porch-Large	Value of 1 if the property's porch size is greater than the median porch size of the area; zero otherwise
Sale Year 1999	Value of 1 if transaction occurred in 1999; zero otherwise
Sale Year 2000	Value of 1 if transaction occurred in 2000; zero otherwise
Sale Year 2001	Value of 1 if transaction occurred in 2001; zero otherwise
Sale Year 2002	Value of 1 if transaction occurred in 2002; zero otherwise
Sale Year 2003	Value of 1 if transaction occurred in 2003; zero otherwise
Sale Year 2004	Value of 1 if transaction occurred in 2004; zero otherwise
Sale Year 2005	Value of 1 if transaction occurred in 2005; zero otherwise
Sale Year 2006	Value of 1 if transaction occurred in 2006; zero otherwise
Sale Year 2007	Value of 1 if transaction occurred in 2007; zero otherwise
Subarea 1.1	Value of 1 if property is located in Subarea 1.1; zero otherwise
Subarea 1.2	Value of 1 if property is located in Subarea 1.2; zero otherwise
Subarea 1.3	Value of 1 if property is located in Subarea 1.3; zero otherwise
Subarea 2.1	Value of 1 if property is located in Subarea 2.1; zero otherwise
Subarea 2.2	Value of 1 if property is located in Subarea 2.2; zero otherwise

selves. It was observed that conductors were seldom noticeable without a structure or structures being visible and that structure visibility was the defining characteristic of the visibility of the conductor/structure combination.

The final field task carried out by the appraisers was to review assessor maps for all properties adjacent to the transmission line corridor to determine if each property was encumbered with an easement associated with the HVTL. If so, the size of the encumbrance was estimated from assessor maps.

Once the field data had been collected, the final step was to construct the proximity and visibility variables to be used in the analysis. Since the location coordinates of all the structures were known, the distance could be calculated from the street curb opposite the front door of each property to any structure coded as visible by the appraisers. The perpendicular distance was also calculated, from the street curb opposite the front door to the centerline of the transmission line corridor. Using all the collected information, six variables were constructed designed to test for proximity, visibility, and encumbrance effects: Continuous Distance; Zone 0–75 Meters; Zone 75+–150 Meters; Number of Structures Visible; Weighted Number of Structures Visible; and Encumbrance. Table 3 describes these six variables.

Aggregation of the Data

Based on the data on geographic proximity, sale prices, and sale prices per square foot, the nine initial areas were aggregated to four large study areas. Study Area 1 (A1) is an aggregated area consisting of the two South-Central Massachusetts areas (Subareas 1.1 and 1.2) and the two North-Central Connecticut areas (Subareas 1.3 and 1.4). Study Area 2 (A2) is an aggregated area consisting of the three West Connecticut areas (Subareas 2.1, 2.2, and 2.3). The two East Massachusetts areas continue to be treated independently as Study Area 3 (A3) and Study Area 4 (A4), respectively, due to the significant difference in their sale price per square foot and the practical consideration that both have large enough numbers of sales to support independent analysis.

The total number of sale transactions considered for each of the four areas is shown in Table 4. Of the initial 1,654 records, 308 records were discarded because they did not meet the arm's-length criterion in the opinion of the appraisers (or the sale transactions could not be confirmed). The two most common reasons given were (1) an institution was identified as one of the parties to the sale, or (2) only a single party was indentified in the transaction. There were also sales in which the buying and selling parties had the same last names or cases where the reported consideration was zero. For 38 transactions, the appraisers were not able to complete all required data fields for the analysis, the transaction appeared to be a duplicate transaction, or the transaction was otherwise sufficiently unrepresentative of the general study area as to be discarded.[14]

Finally, a relatively small number (22) of additional sales were eliminated to improve the fit of the regression model. A base model was estimated for each area and observations with residuals of more than ± 2.5 standard deviations were excluded from subsequent regression runs. Overall, this filter improved the fit of the regression models by several percentage points, but only eliminated 1.7% of the usable transactions. The residual filter did not impact the sign of the estimated coefficients, but generally improved the significance of the studied variables, i.e., if an estimated coefficient was negative and borderline significant before applying the residual filter, it

Table 3 HVTL Variables

Variable	Description
Continuous Distance	Shortest distance from the street curb opposite the front door of the property to the centerline of the transmission line
Zone 0–75 Meters	Value of 1 if the property is less than or equal to 75 meters away from the centerline of the transmission line; zero otherwise
Zone 75'–150 Meters	Value of 1 if the property is greater than 75 or less than or equal to 150 meters away from the centerline of the transmission line; zero otherwise
Number of Structures Visible	Number of unique structures visible from the property
Weighted Number of Structures Visible	Sum of the numeric value of the rating assigned to each tower visible from the property: Highly Visible = 4, Somewhat Visible = 2, Barely Visible = 1
Encumbrance	Square feet encumbered by the easement

Table 4 Number of Records Considered

	Study Area				
	A1	A2	A3	A4	Total
Total Records Considered	631	399	206	418	1,654
Less Non-Arm's-Length Transactions	142	37	48	81	308
Less Incomplete, Duplicate, or Otherwise Not Usable Transactions	8	12	1	17	38
Less Outliers Filtered by Residual Filter	6	6	4	6	22
Transactions Used in Regression Models	475	344	153	314	1,286

14. Nine transactions were excluded that were not representative of the general study areas. For example, we excluded a transaction with a sale price of $800,000 in a neighborhood with average home values of $192,611, a property (which sold twice during our study time period) that contained a 130 acre lake, and a property that appeared to be a lot sale only.

stayed negative, but typically became more significant after applying the residual filter. Appendix 2 contains descriptive statistics of the four Study Areas.

The Base Model

Before working with the transmission line–related variables, a base model was estimated for each of the four study areas; the results are shown in Table 5. Various functional formats were explored during the model specification stage. Based upon guidance provided in the published literature and an evaluation of alternative specifications, the natural log of the sale price was used as the dependent variable. Three of the independent variables (*Liveable Area*, *Lot Size*, and *Basement Area*) were also entered as natural logs to allow for a nonlinear response of the sale price to increases in size.

Data for the total number of bedrooms was available, but it was not included in the model because it did not add statistical explanatory power after liveable area and number of bathrooms were accounted for. Data on square feet of finished basement was available for most sales, but it also did not add any explanatory power once total basement size was in the model, so it was dropped as well.[15] For deck, garage, and porch square footage, the dummy variables of small and large were used, depending on whether the feature was above or below the median size.[16] A regional home price deflator was not used to adjust sale prices, since there were plenty of observations and the annual dummy variable for year of sale (1998 is the excluded year) seemed more reliable. Finally, dummy variables were included for the subareas that were aggregated to form Study Area 1 (A1) and Study Area 2 (A2).[17]

Overall, the base models have very good explanatory power; the independent variables are generally statistically significant with the anticipated sign and are of reasonable magnitudes.[18] Table 6 provides a sample interpretation of the regression coefficients for A2.[19]

Testing for the Effects of Proximity, Visibility, and Encumbrance

Table 7 shows the frequency distribution and the summary statistics of the key transmission line–related variables in the sales database. As expected, encumbered properties are slightly larger than the unencumbered properties.

Out of the 1,286 sales, over 100 properties are within 75 meters of an existing 345-kV transmission line, 78 properties are encumbered with an easement associated with the transmission line, and 527 are of properties from which one or more transmission line structures can be seen.

Tables 8 and 9 summarize the results when the transmission line variables are added to the base model for each of the four study areas. There are two basic approaches to testing for proximity effects: (1) distance as a categorical variable representing distance zones, and (2) distance measured as a continuous variable. Both approaches are investigated, with distance zones shown in Table 8 and continuous distance shown in Table 9. The tables are structured so that distance is examined first by itself (Model 1), the encumbrance variable is then added (Model 2), and then two visibility variables are considered—the number of structures visible (Model 3) and the number of structures visible weighted by the degree of visibility (Model 4).[20]

Proximity. Tables 8 and 9 are striking in that there is no systematic effect of proximity to the transmission

15. Care must be exercised here not to misinterpret the effect of the variables in the base model. Because many of the variables are highly correlated (e.g., liveable area, number of bathrooms, number of bedrooms), the regression may not be able to sort out the independent effect of each. The coefficients on the included variables must, therefore, be interpreted as the joint effect of the included variables and any excluded, highly correlated variable(s).

16. Since for a significant number of transactions, the properties did not have a garage, deck, and/or porch, those variables exhibit a skewed distribution with most of the transactions centered around the '0' value (i.e., these variables do not follow a normal distribution). Therefore, to address the non-normal distribution of the variables these variables were entered as categorical variables (dummy variables). For a categorical variable, one category must be left out of the regression, and the coefficients on the included categories measure the effect on sale price relative to the excluded category. For the garage, deck, and porch dummy variables, the excluded groups are properties that do not have a garage, deck, and/or porch.

17. The excluded subarea for Study Area 1 was Subarea 1.4; for Study Area 2, it was Subarea 2.3.

18. Given that the dependent variable is in natural logs, the interpretation of the coefficients on the independent variables is as follows: (1) the coefficient of an untransformed continuous variable (e.g., number of bathrooms) approximates the percentage change in sale price due to a one-unit change in the underlying variable; (2) the coefficient of a dummy variable approximates the percentage change in the sale price if the value of the dummy variable is 1; and (3) the coefficient of a log transformed continuous variable approximates the percentage change in sale price given a 1% change in the log transformed variable.

19. Property characteristics were assumed that approximate the median values for Study Area 2.

20. Without additional research, the weights attached to the three categories of visibility are necessarily subjective. The results shown in the tables are based on a 4:2:1 scheme, i.e., highly visible carries twice the weight of somewhat visible, which has twice the weight of barely visible. Other schemes were tried, but the results were largely unaffected.

Table 5 Base Model Estimation Results

	Study Area			
Variable	**A1**	**A2**	**A3**	**A4**
Constant	9.3295**	9.0552**	9.7858**	9.5877**
	(51.3163)	(41.2176)	(33.2529)	(53.7392)
ln*Liveable Area* (in sq. ft.)	0.3018**	0.3700**	0.3149**	0.3032**
	(11.9133)	(11.9432)	(7.6257)	(11.8995)
ln*Lot Size* (in acres)	0.0569**	0.0174	0.0523**	0.0389**
	(4.1087)	(0.9404)	(2.2025)	(2.0536)
A/C (yes/no)	−0.0012	0.0505**	0.0433*	0.0211
	(−0.0773)	(2.7320)	(1.7767)	(1.6144)
Age	−0.0039**	−0.0009**	−0.0049**	−0.0017**
	(−9.2045)	(−3.0085)	(−5.1140)	(−6.0633)
Total Bathrooms	0.0681**	0.0397**	0.0180	0.0762**
	(5.9799)	(2.5000)	(0.9160)	(6.5439)
ln*Basement Area* (in sq. ft.)	0.0139**	0.0313**	0.0126**	0.0159**
	(5.2651)	(4.8848)	(4.0452)	(5.1089)
Deck-Small	0.0160	0.0150	−0.0101	0.0145
	(1.1576)	(0.7761)	(−0.4087)	(1.0105)
Deck-Large	0.0127	0.0248	0.0561**	0.0454**
	(1.0065)	(1.2731)	(2.1352)	(3.0625)
Garage-Small	0.0738**	0.1211**	0.0224	0.0528**
	(4.9800)	(4.1899)	(1.0559)	(3.8013)
Garage-Large	0.1154**	0.1445**	0.0832**	0.0460**
	(7.2675)	(4.7379)	(3.3965)	(2.8108)
Porch-Small	0.0332**	0.0389**	0.0120	0.0163
	(2.6369)	(1.9962)	(0.6302)	(1.1652)
Porch-Large	0.0429**	0.0186	0.0222	0.0236
	(3.2400)	(0.9402)	(1.0357)	(1.5621)
Sale Year 1999	0.0647**	0.0884**	0.0898**	0.1312**
	(2.7723)	(2.2858)	(2.9167)	(5.4847)
Sale Year 2000	0.1355**	0.2296**	0.3423**	0.2746**
	(5.5220)	(5.5944)	(9.3656)	(9.3996)
Sale Year 2001	0.2293**	0.3085**	0.5027**	0.4011**
	(8.8978)	(7.8390)	(14.0765)	(14.7889)
Sale Year 2002	0.2924**	0.4285**	0.5883**	0.5603**
	(12.7420)	(11.4544)	(18.0932)	(23.1608)
Sale Year 2003	0.3676**	0.4953**	0.7308**	0.6712**
	(15.7658)	(14.1213)	(22.1995)	(27.7454)
Sale Year 2004	0.5122**	0.6253**	0.7797**	0.7600**
	(21.5832)	(18.4644)	(22.7246)	(32.6114)
Sale Year 2005	0.6244**	0.7255**	0.8802**	0.8589**
	(28.3895)	(20.6101)	(26.6213)	(34.9250)
Sale Year 2006	0.7059**	0.7261**	0.8612**	0.7999**
	(30.4294)	(20.1332)	(26.1725)	(31.2761)
Sale Year 2007	0.6968**	0.7147**	0.7850**	0.7522**
	(29.1600)	(18.0000)	(22.4262)	(26.6658)
Subarea 1.1	0.0910**			
	(4.4589)			
Subarea 1.2	0.2110**			
	(9.3416)			
Subarea 1.3	−0.0062			
	(−0.3908)			
Subarea 2.1		−0.1789**		
		(−8.8005)		
Subarea 2.2		−0.1773**		
		(−6.8976)		
Adjusted *R*-Squared	88.25%	87.85%	93.52%	92.16%
Mean Sale Price	$172,786	$298,740	$227,927	$258,249
Included Observations	475	344	153	314

t-Statistics provided in parentheses.

* Indicates variable is significant at the 90% level.

** Indicates variable is significant at the 95% level.

Table 6 Sample Calculation of Estimated Sale Price for Study Area 2 (A2)

Variable	Assumed Value	Natural Log Transformed Values	Estimated Coefficient	Estimated Effect
Constant	1		9.05516	9.05516
lnLiveable Area (in sq. ft.)	2,000	7.6009	0.37005	2.81269
lnLot Size (in acres)	0.75	-0.2877	0.01742	-0.00501
A/C (yes/no)	1		0.05048	0.05048
Age	35		-0.00092	-0.03234
Total Bathrooms	2.5		0.03969	0.09922
lnBasement Area (in sq. ft.)	1,000	6.9078	0.03126	0.21595
Deck-Small	1		0.01504	0.01504
Deck-Large	0		0.02480	0
Garage-Small	1		0.12108	0.12108
Garage-Large	0		0.14448	0
Porch-Small	1		0.03894	0.03894
Porch-Large	0		0.01855	0
Study Area 2.1	0		-0.17888	0
Study Area 2.2	0		-0.17732	0
Sale Year 1999	0		0.08843	0
Sale Year 2000	0		0.22960	0
Sale Year 2001	1		0.30849	0.30849
Sale Year 2002	0		0.42848	0
Sale Year 2003	0		0.49534	0
Sale Year 2004	0		0.62529	0
Sale Year 2005	0		0.72548	0
Sale Year 2006	0		0.72609	0
Sale Year 2007	0		0.71470	0
Estimated Natural Log Transformed Value (Sum of Effects)				12.67969
Estimated Value				$321,159

Table 7 Summary of Transmission Line Variables

	Study Area			
	A1	A2	A3	A4
Distance Zones				
Zone 0–75 Meters				
Number of Properties	43	7	20	41
Median Distance	62	62	53	50
Zone 75'–150 Meters				
Number of Properties	63	65	20	55
Median Distance	97	118	103	104
Greater than 150 Meters				
Number of Properties	369	272	113	218
Median Distance	343	371	294	304
Continuous Distance				
Number of Properties	475	344	153	314
Median Distance	275	266	237	228
Encumbrance				
Number of Properties Encumbered	29	32	7	10
Median Sq. Ft. Encumbered	8,527	11,825	7,601	5,707
Median Lot Size of Encumbered Properties	0.50	0.99	0.35	0.33
Median Lot Size of Unencumbered Properties	0.40	0.93	0.21	0.28
Number of Properties with Transmission Structure(s) Visible				
1 Structure Visible	87	69	10	51
2 Structures Visible	71	24	30	61
3 Structures Visible	23	8	13	29
4 Structures Visible	6	0	14	15
More than 4 Structures Visible	2	0	13	1

Table 8 Zone Distance Model

	Study Area			
	A1	A2	A3	A4
Model 1: Distance Zone Model				
Zone 0-75 Meters	-0.0226	-0.0874	0.0131	-0.0055
	(-1.2734)	(-1.6429)	(0.5278)	(-0.3159)
Zone 75'-150 Meters	0.0041	-0.0388*	0.0069	0.0237
	(0.2768)	(-1.9251)	(0.2443)	(1.5212)
Model 2: Distance Zone Model & Encumbrance				
Zone 0-75 Meters	-0.0179	-0.0539	0.0306	0.0050
	(-0.8636)	(-1.0068)	(1.0550)	(0.2711)
Zone 75'-150 Meters	0.0056	0.0012	0.0064	0.0257
	(0.3666)	(0.0492)	(0.2280)	(1.6495)
Encumbrance	-0.0012	-0.0113**	-0.0061	-0.0073*
	(-0.4387)	(-3.1867)	(-1.1684)	(-1.7323)
Model 3: Distance Zone Model & Encumbrance & Number of Structures Visible				
Zone 0-75 Meters	-0.0283	-0.0697	0.0151	-0.0019
	(-1.1314)	(-1.2515)	(0.4562)	(-0.0832)
Zone 75'-150 Meters	-0.0034	-0.0122	-0.0033	0.0206
	(-0.1776)	(-0.4561)	(-0.1120)	(1.1312)
Encumbrance	-0.0014	-0.0113**	-0.0073	-0.0078*
	(-0.5065)	(-3.1996)	(-1.3663)	(-1.8018)
Number of Structures Visible	0.0055	0.0139	0.0069	0.0038
	(0.7434)	(1.0312)	(0.9784)	(0.5519)
Model 4: Distance Zone Model & Encumbrance & Weighted Number of Structures Visible				
Zone 0-75 Meters	-0.0170	-0.0681	0.0218	0.0011
	(-0.6796)	(-1.2174)	(0.6204)	(0.0479)
Zone 75'-150 Meters	0.0062	-0.0117	0.0023	0.0231
	(0.3355)	(-0.4224)	(0.0792)	(1.3250)
Encumbrance	-0.0012	-0.0114**	-0.0068	-0.0076*
	(-0.4281)	(-3.2124)	(-1.2424)	(-1.7606)
Weighted Number of Structures Visible	-0.0001	0.0034	0.0009	0.0006
	(-0.0621)	(0.8760)	(0.4443)	(0.3291)

‡Statistics provided in parentheses; p-values available from authors upon request.

* Indicates variable is significant at the 90% level.

** Indicates variable is significant at the 95% level.

line corridor on sale price. The only exception is A2 in the continuous distance specification. In Models 1, 3, and 4, the distance variable is negative for A2 and statistically significant at either the 95% or 90% level. However, further analysis reveals that the distance variable of Model 1 becomes insignificant once encumbrance is accounted for (in Table 9, see Model 2 for A2). Further, even though both Models 3 and 4 show a significant distance effect, Model 3 also shows an unexpected positive effect of structure visibility. A possible interpretation is that although encumbrance clearly has a negative effect, the combination of greater distance and more structures visible may imply long views and the positive value of the long views may outweigh any negative effects of the HV/TLs. The only other remaining distance variable with a statistically significant value—Zone 75'–150 Meters in Model 1 for A2 (Table 8)—also becomes insignificant once encumbrance is added to the model (Zone 75'–150 Meters in Model 2 for A2).

Encumbrance. The only variable that appears to have any kind of systematic effect is the encumbrance variable, which for A2 and A4 is of the expected sign in both the Zone Distance and Continuous Distance models and is statistically significant at either the 90% or 95% level. However its magnitude is generally small. For example, for A2 the reported coefficient on

Table 9 Continuous Distance Model

	Study Area			
	A1	A2	A3	A4
Model 1: Distance Zone Model				
Continuous Distance	0.0008	0.0351**	-0.0116	-0.0034
	(0.1030)	(2.7181)	(-0.9393)	(-0.4711)
Model 2: Distance Zone Model & Encumbrance				
Continuous Distance	-0.0031	0.0157	-0.0214	-0.0091
	(-0.3772)	(1.0921)	(-1.5094)	(-1.1699)
Encumbrance	-0.0027	-0.0099**	-0.0071	-0.0087**
	(-1.0350)	(-2.9613)	(-1.3956)	(-2.0392)
Model 3: Distance Zone Model & Encumbrance & Number of Structures Visible				
Continuous Distance	-0.0016	0.0327*	-0.0153	-0.0057
	(-0.1378)	(1.8681)	(-0.8046)	(-0.5704)
Encumbrance	-0.0028	-0.0101**	-0.0075	-0.0090**
	(-1.0475)	(-3.0395)	(-1.4443)	(-2.0834)
Number of Structures Visible	0.0014	0.0240*	0.0038	0.0036
	(0.1875)	(1.6896)	(0.4749)	(0.5332)
Model 4: Distance Zone Model & Encumbrance & Weighted Number of Structures Visible				
Continuous Distance	-0.0085	0.0293*	-0.0220	-0.0078
	(-0.7440)	(1.7083)	(-1.1501)	(-0.7928)
Encumbrance	-0.0025	-0.0104**	-0.0070	-0.0088**
	(-0.9308)	(-3.1019)	(-1.3383)	(-2.0471)
Weighted Number of Structures Visible	-0.0014	0.0057	-0.0001	0.0004
	(-0.6849)	(1.4415)	(-0.0500)	(0.2160)

t-Statistics provided in parentheses; *p*-values available from authors upon request.

* Indicates variable is significant at the 90% level.

** Indicates variable is significant at the 95% level.

the encumbrance variable in Continuous Distance Model 2 (Table 9) implies an effect of approximately $3,000 for a property with 12,000 square feet encumbered and a sale price of $300,000.[21]

Visibility. With respect to the impact of visibility of the transmission tower, the results did not indicate any systematic impact with respect to sign or magnitude.[22] As previously discussed, the only time when the visibility variable was statistically significant, the sign of the coefficient was positive.

Other Hypotheses Tested

Two other hypotheses were offered that can be examined with the data collected in this study. First, it was suggested that property values would be particularly vulnerable to HVTL effects in a down market. Second, it was suggested that higher-valued properties would be more vulnerable to HVTL effects than lower-valued properties.

Effect In Market Downturn. Looking back at the coefficients on the sale year variables for 2006 and 2007 in Table 5, the market downturn appears to have affected the four study areas quite differently. Study Area 1 still experienced a significant increase in real estate values in 2006 and experienced a slight drop in 2007. Study Area 2 properties leveled off in 2005 with only a nominal change between 2005 and 2006 and a small drop in 2007. However, the two areas south of Boston, Study Areas 3 and 4, clearly peaked in 2005 with significant drops in values between 2005 and 2007.

Therefore, the study investigated whether there was any evidence that property values were more sensitive to HVTL effects in 2006 and 2007 for Study

21. The coefficient of −0.0099 can be interpreted as the percentage change (i.e., approximately −0.01%) of a 1% change in encumbrance. Therefore, assuming a sale price of $300,000 and an encumbrance of 12,000 square feet, a 1-square-foot change in encumbrance would correspond to a −$0.25 change in sale price (0.25 = $30.00/120).

22. Theory would suggest that the distance and visibility variables should be entered multiplicatively implying the effect of each depends on the value of the other. This was tried but had no effect on the results.

Areas (A3) and Study Area 4 (A4), i.e., the areas which experienced significant market softening. The hypothesis was that the effect of the encumbrance, proximity, and visibility variables would be more pronounced in these two years of falling market values. This was tested by adding interaction terms for sale years 2006 and 2007 with each of the transmission line variables shown in Table 9.[23]

The encumbrance variable and the encumbrance interaction term were both negative for A3, but not statistically significant. Since there were only two encumbered properties that sold in 2006 and 2007 in A3, no reliability can be attached to these results; the same situation existed for A4. The encumbrance variable stayed significant at the 95% level (similar in magnitude as in Table 9). However, the interaction term testing for the down-market effect was insignificant and since there was only one encumbered property transacted in the 2006–2007 period, no reliability can be attached to this result either. The remaining coefficients on the transmission line variables and the interaction variables were not significant at any conventional level of significance. Thus, there is no evidence here to support the hypothesis of greater vulnerability of values to HVTL effects in a down market, but it has to be recognized that the number of observations on the key transmission line variables is small for just two sale years and more observations over a longer period would yield a more definitive result.

Effects on Higher-Valued Properties. The second hypothesis often suggested is that higher-valued properties would be more vulnerable to transmission line effects than lower-valued properties. To investigate this, all of the models shown in Tables 8 and 9 were reestimated based on observations that fell above the median sale price in their sales year. The results showed the same pattern of lack of statistical significance for the HVTL variables as in Tables 8 and 9; this supports the conclusion that the higher-valued properties show no greater sensitivity to HVTL variables than lower-valued properties.

Finally, since almost all of the anticipated 345-kV line construction that motivated this study will take place in existing transmission corridors, a couple of questions remain. First, is it possible to say anything about the incremental effect of a corridor upgrade? Second, and perhaps related, is it possible that there would be short-term proximity and visibility effects but that these would dissipate over time?[24] The first question does not seem relevant here. Since all of the sales studied here are in the vicinity of the corridor configuration that will exist after the upgrade, and since there are no proximity or visibility effects, it is hard to see how there could be upgrade effects.

This study, however, does not eliminate the possibility that the upgrade might induce short-term effects that would dissipate over time. The data represent situations where the existing HVTL corridor has been in place for some time, so, it can be said with some confidence that there are no permanent property value effects of the corridor due to proximity or visibility. However, this does not rule out a temporary effect. Therefore, a useful complement to this study might look at the history of a corridor over a period that includes a pre-upgrade period, an announcement and construction period, and then a post-upgrade period.

Conclusions

The research reported here investigates the effect of existing 345-kV transmission lines in Connecticut and Massachusetts on the value of properties sold over the period 1998–2007. Extra care has been taken in the research to account for encumbrance, proximity, and visibility effects. There are obvious relationships among the three variables, and if each is not considered, the effects of one could be mistakenly attributed to another. In particular, encumbrance effects could be mistakenly interpreted as proximity effects if both are not considered.

In the four study areas examined here, there is no evidence of systematic effects of either proximity or visibility of 345-kV transmission lines on residential real estate values. Encumbrance of the transmission line easement on adjoining properties does appear to have a consistent negative effect on value, although the statistical significance with which it is measured varies. The hypothesis that property values are more vulnerable to transmission line effects in a down market also is considered; although no evidence

23. The down-market hypothesis could not be tested with the zone distance models as there were not a sufficient number of transactions in each of the two distance zones; therefore, the hypothesis was only tested on the continuous distance model.

24. Colwell (1990) in a study in Illinois based on data from the 1970s finds small proximity effects, but also finds that the effects dissipated over the 10 or so years of sales that he studied. The transmission line in question, however, had been in place for several years prior to the study period. Most on point is the study by Ignelzi (1991), which finds small proximity effects following an upgrade, but that the effects disappeared after 4–5 years.

supports that proposition that there are greater effects in a down market, the number of observations in the relevant period is small. Finally, the hypothesis that higher-valued properties are more vulnerable to transmission line effects is considered; again, the data provides no support for that hypothesis.

The professional literature cited, combined with the results reported here, support the position that a presumption of material negative effects of HVTLs on property values is not warranted. An opinion supporting HVTLs effects would have to be based on market data particular to the situation in question and could not be presumed or based on casual, anecdotal observation. It is fair to presume that the direction of the effect would in most circumstances be negative, but the existence of a measureable effect and the magnitude of such an effect can only be determined by empirical analysis of actual market transactions.

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The authors wish to thank Ashley Reed of Analysis Group, who played the major role in the design and implementation of the data collection process for this study; she did an exceptional job in orchestrating a very complex procedure. Thank you also to the local appraisers at Archambault & Murray, Oles & Jerram, and Race Appraisal Services for their timely and diligent contributions to the study.

Additional Reading

Acks, Kenneth. "Valuation of Environmental Damages to Real Estate." http://www.damagevaluation.com/text/html/valredi4.html (January 1995).

Barth, James R., and James T. Bennett. "The Effects of Electric Utility Power Plant Location on Area Property Values." *Land Economics* (February 1974).

Delaney, Charles J., and Douglas Timmons. "High Voltage Power Lines: Do They Affect Residential Property Value?" *Journal of Real Estate Research* 7, no. 3 (June 1992): 315–329.

Delaney, Charles J., and Douglas Timmons. "Valuation Implications for Residential Property Proximate to High Voltage Power Lines: A New Environmental Concern?" Unpublished paper, Department of Real Estate, Baylor University, January 1991.

Dempsey, William E. "The DUPA Technique for Electric Transmission-Line Easement Acquisitions." *The Appraisal Journal* (July 1981): 382–390.

Furby, Lita, Robin Gregory, Paul Slovic, and Baruch Fischoff. "Electric Power Transmission Lines, Property Values, and Compensation." *Journal of Environmental Management* 27 (January 1988): 69–83.

Green, Gordon G. "Easement-to-Fee-Simple Value Ratios for Electric Transmission Line Easements: A Common Approach." *The Appraisal Journal* (July 1992): 399–412.

Gregory, Robin, and Detlof von Winterfeldt. *Proposal for Property Values Feasibility Studies.* Irvine, CA: Decision Insights, Inc., 1999.

Kinnard, William N., Jr. *Patterns of Property Value Impacts from Proximity to High-Voltage Transmission Lines: Analytical Update.* Storr, CT: Real Estate Counseling Group of Connecticut, Inc., 1992.

Kinnard, William N., Jr. "The Impact of High Voltage Transmission Lines on Real Estate Values." *Journal of Property Tax Management* 1, no. 4 (1990): 524–546.

Kinnard, William N., Jr. *Tools and Techniques for Measuring the Effects of Proximity to Radioactive Contamination on Single-Family Residential Sales Prices.* Storr, CT: Real Estate Counseling Group of Connecticut, Inc.

Kinnard, William N., Jr., and Sue Ann Dickey. "A Primer on Impact Research: Residential Property Values Near High-Voltage Transmission Lines." *Real Estate Issues* (April 1995): 23–29.

Kroll, Cynthia A. "Property Valuation: A Primer on Proximity Impact Research." Paper presented at Conference on Electric and Magnetic Fields, February 1994.

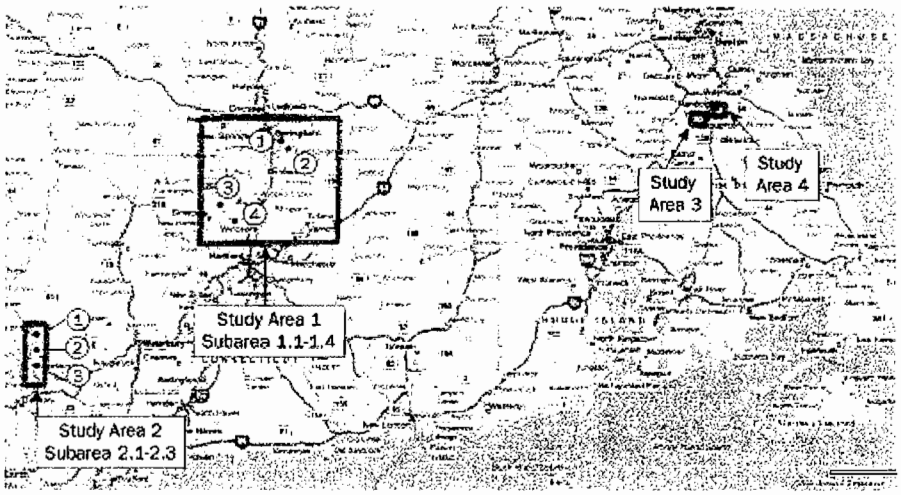
Pitts, Jennifer, and Thomas O. Jackson. "Power Lines and Property Values Revisited." *The Appraisal Journal* (Fall 2007): 323–325.

Priestley, Thomas, and Patrice C. Ignelzi. *A Methodology for Assessing Transmission Line Impacts in Residential Communities.* Washington, DC: Edison Electric Institute, June 1989.

Wilson, Albert R. "Proximity Stigma: Testing the Hypothesis." *The Appraisal Journal* (Summer 2004): 253–262.

Appendix 1

Study Area and Subarea Locations



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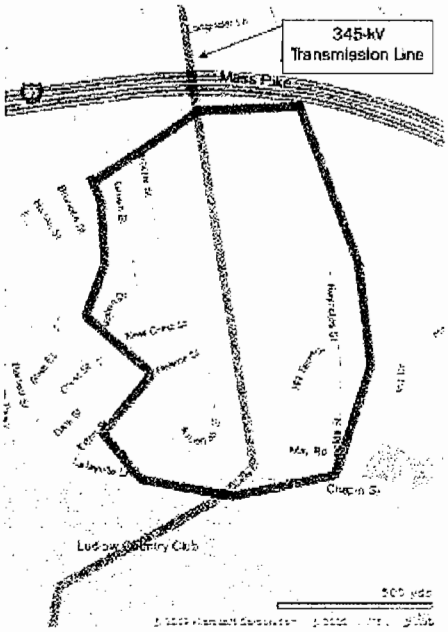

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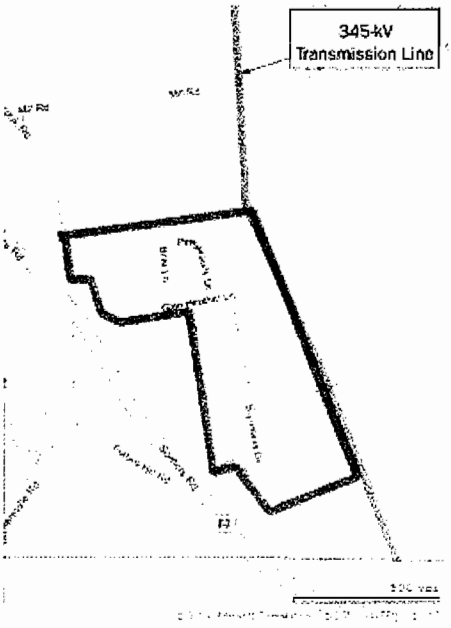

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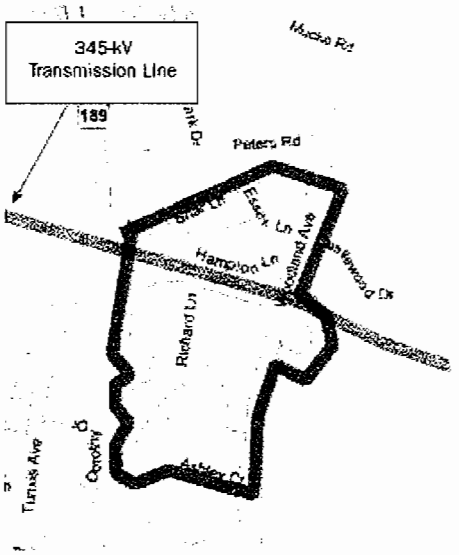

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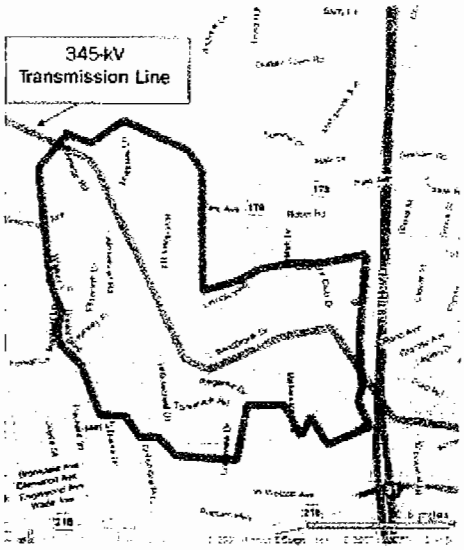

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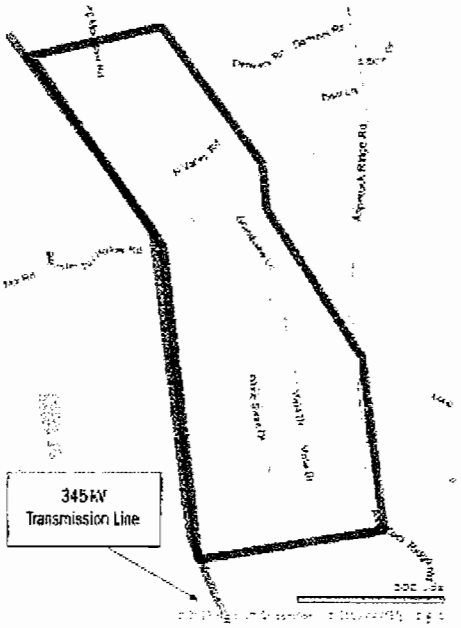

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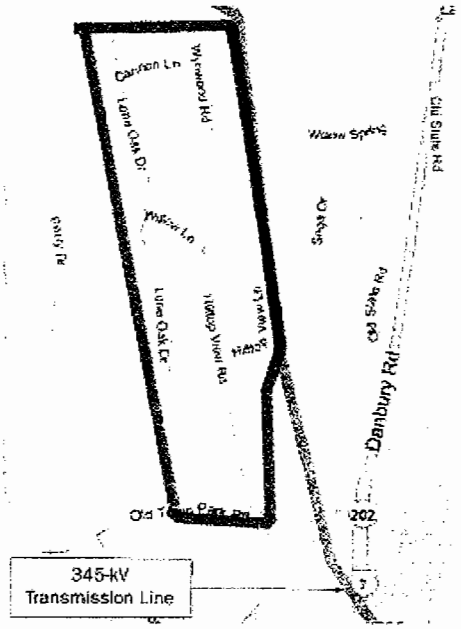

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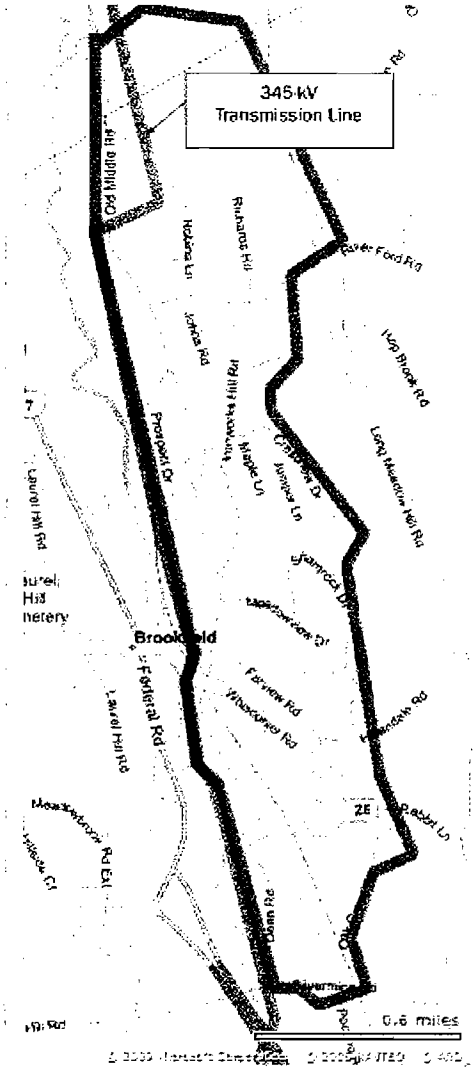

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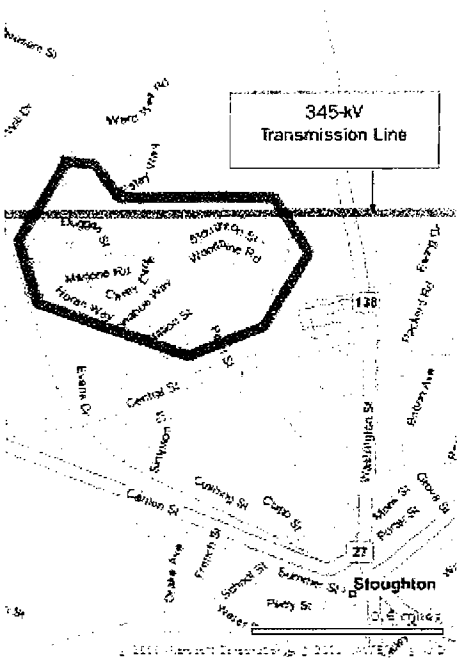

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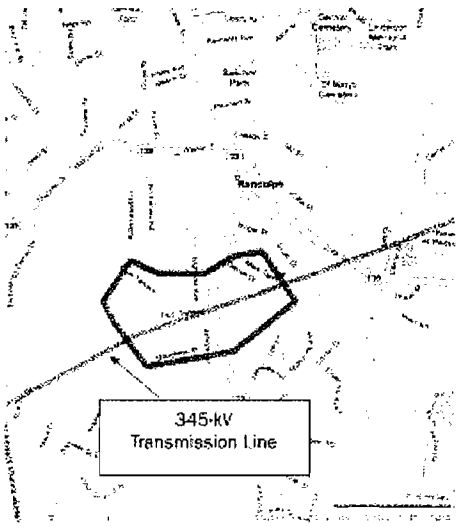

Appendix 2

Descriptive Statistics by Study Area

	Study Area			
Property Characteristic	**A1**	**A2**	**A3**	**A4**
Liveable Area (in sq. ft.)				
Mean	1,386.54	1,696.32	1,205.18	1,448.93
Median	1,288.00	1,500.00	1,144.00	1,346.00
Standard Deviation	363.98	678.62	307.85	478.05
Lot Size (in acres)				
Mean	0.4787	1.0542	0.2684	0.2936
Median	0.4140	0.9300	0.2180	0.2778
Standard Deviation	0.3978	0.9518	0.1476	0.1113
A/C				
Percent of Properties with A/C	25.05%	24.42%	23.53%	35.35%
Age				
Mean	34.20	37.24	50.07	46.78
Median	31.00	34.00	52.00	45.00
Standard Deviation	15.29	3.36	12.23	25.39
Total Bathrooms				
Mean	1.83	1.99	1.36	1.61
Median	2.00	2.00	1.00	1.50
Standard Deviation	0.56	0.76	0.55	0.71
Basement (in sq. ft.)				
Mean	793.85	975.87	384.40	867.82
Median	802.00	943.00	0.00	864.00
Standard Deviation	378.18	403.66	466.59	394.58
Deck (in sq. ft.)				
Number of Properties with Deck	295.00	240.00	43.00	178.00
Mean	204.53	312.21	219.33	168.74
Median	168.00	264.00	210.00	144.00
Standard Deviation	123.23	206.93	118.45	116.41
Garage (in sq. ft.)				
Number of Properties with Garage	393.00	316.00	53.00	170.00
Mean	452.67	470.23	335.72	440.16
Median	484.00	506.00	275.00	511.50
Standard Deviation	136.07	174.18	121.24	136.03
Porch (in sq. ft.)				
Number of Properties with Porch	225.00	152.00	87.00	176.00
Mean	138.12	166.41	128.86	128.98
Median	102.00	134.00	144.00	120.00
Standard Deviation	120.68	152.40	78.16	91.49

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October 13, 2011

Anthony Montalbano, Esq.
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Dear Mr. Montabano:

Re: Residential Property Value Impact Study of Proposed
O & R Substations At Little Tor & South Mountain Road
New City, NY

We have reviewed and analyzed the comments of Coyle & Coyle, Inc dated September 19, 2011 with respect to our report and analysis dated November 16, 2009. In substance, although the report review takes issue with a few details of our analysis it adopts the basic conclusion of our report that there is not a discernable (negative) effect on value of residential properties that are at a greater distance from utility improvements than approximately 200 feet (or 300 feet). It states:

> **Based on the review of the Beckmann report as well as other published literature within the appraisal field, it appears that the proposed substation for the subject property would likely have little impact on value for many of the surrounding properties.**

We have reviewed the proximity of neighborhood properties to determine, in line with the reviewers' comments, whether there are in fact any properties within the 200 or 300 foot radius of the proposed substation equipment as depicted on a certain drawing and entitled … "Google Earth/Presentation.dwg, 9/29/2011". **There are no such residential property improvements within a 200 foot radius.** We annex our proximity analysis employing both a 200 and a 300 foot radius from the perimeter of the proposed substation improvement. The substation is outlined in green and the two radii are depicted in magenta as they extend there from.

We identified only two residential property improvements (houses) partially within the 300 foot radius, approximately 250 feet distant from the proposed improvements. These properties along South Mountain Road are identified on the Town of Clarkstown tax map as 34.05-1-4 and 34.05-1-3. They are heavily wooded that provides natural screening. These properties are pre-existing "impacted properties" as they are both in closer proximity to the existing transmission line, approximately 140 and 185 feet and in similar proximity to the Verizon Utility Building. They are therefore in closer proximity to these utility improvements than to the location of the proposed substation improvements. Moreover, the proposed plan shows that an existing transmission line tower identifies as #46, that is located just south of the Verizon Building will be removed. The removal of the tower will tend to reduce any existing impact of this structure in closest proximity to the residential lot. Although there are three other lots on the north side of Denver Court, that are barely within the 300 foot radius, none of the residences are within the 300 foot zone and the properties are wooded in the area separating the proposed substation and the lots.

Our analysis of the physical and locational facts and attributes of the nearest properties with respect to the proposed sub-station, supported by the literature and the review by Coyle and Coyle confirm the conclusions reached in our report. The reviewers accept the prior studies reported in the appraisal literature and that we noted in our report.

We agree with the statement that it would have been preferable had we undertaken an analysis with a closer immediate proximity than 500 feet. In establishing the parameters for proximity in our report we first posited radii of 100, 200 and 300 feet from the two existing substations. However, as confirmed by the review by Coyle and Coyle there is only a small sample of sales data employing the 500 foot radius contained in our report. The use of a smaller radius would have resulted in a loss of reliable sales. We were therefore limited by the availability of data. We searched broadly and diligently employing various data sources, primarily Multiple Listing Sales and expanding to the New York State Sales Web database.

We accept that of the 118 sales we employed in our combined analysis of the two sample substation areas there may have been two or three instances where the base data may have varied from the research of the reviewer. However, this would not materially impact our analysis and conclusion as the model we employed had such a large number of "good" sales data.

That the time period under study was "volatile", with which we were aware and agree, is handled within the statistical software employed that extracts its own "time" adjustment. This is accounted for in the "# Mos from Sale" which variable shows a high probability by its infinitely small P-value.

We are confident that we captured those sales transactions that had occurred within the time span analyzed and that the analysis is cogent and reliable. This is confirmed by the summary statistical output represented by the high R^2 that measures the "common measure of goodness of fit" for the regression model and the infinitely low Significance F that further confirms the statistical probability that there was very little likelihood that the results were random. As we employed a large universe of sales we continue to be confident in our statistical results and overall analysis. The multiple regression analysis employed is a highly objective technique.

In conclusion, the review appraisers agree with our conclusions. In the employment of our statistical model and the exercise of our appraisal judgment and inspections of the nearby neighborhoods we generally conclude that it is unlikely that the addition of the subject substations improvements will have a negative impact on those properties in proximity to the substations.

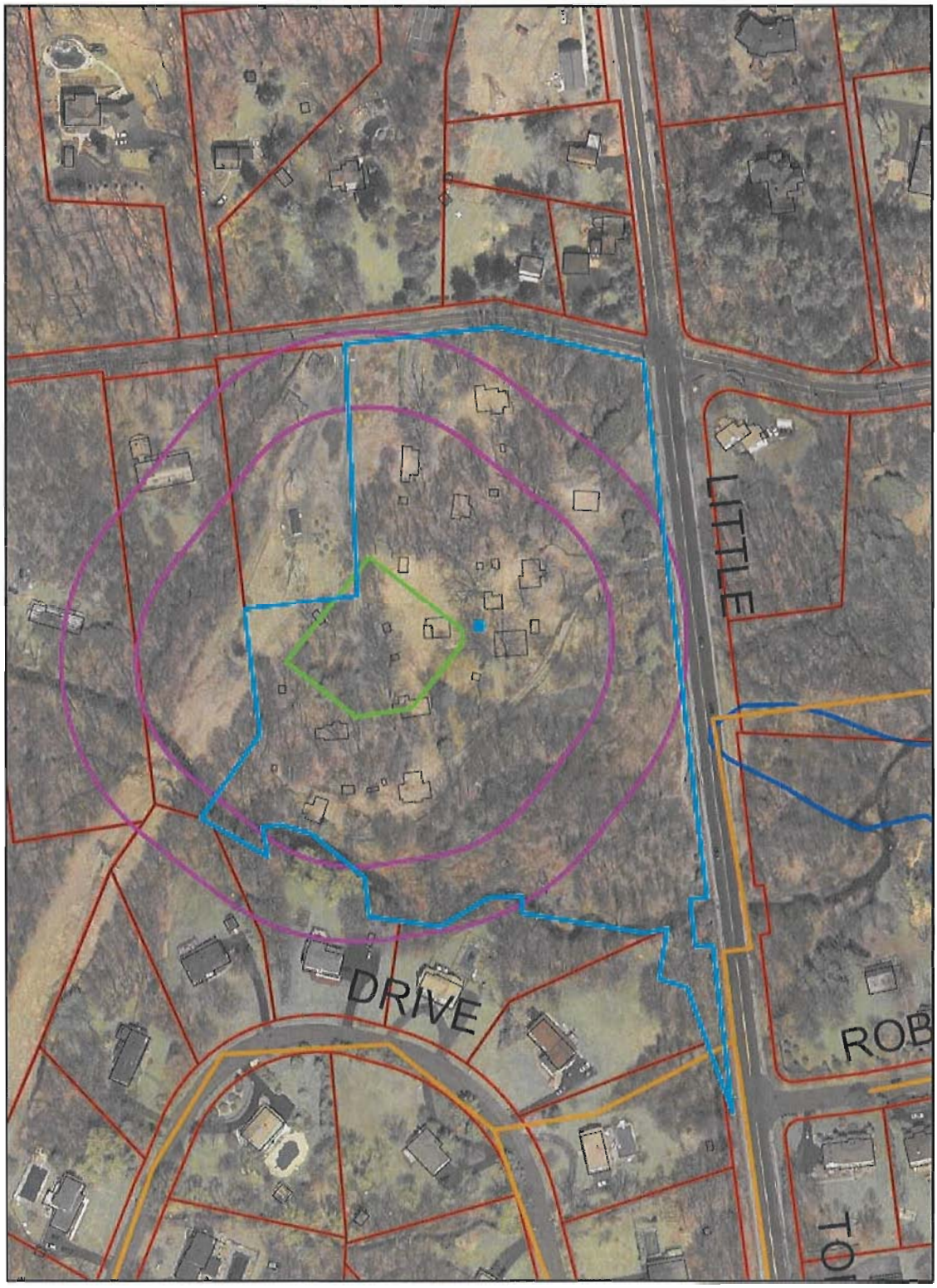
Should you require any additional information or analysis please contact us. We are pleased to be of service to you.

Very truly yours,

Beckmann Appraisals, Inc.

By: William Beckmann
William R. Beckmann, MAI, Pres.
/am

Proximity analysis employing both a 200 and a 300 foot radius from the perimeter of the proposed substation improvement



Ft. Montgomery

REAL ESTATE APPRAISERS & CONSULTANTS

Coyle & Coyle, Inc.

40 South Main Street, New City, NY 10956

November 23, 2011

Town of Clarkstown
Attn: Mr Joe Simoes
10 Maple Avenue
New City, NY 10956

RE: Review of Residential Property Value and Impact Study of Proposed O & R Electric Transmission and Gas Regulator Substations at the Intersection of Little Tor Road and South Mountain Road

Dear Mr. Simoes,

In regards to your recent request, we have no further review comments on the above mentioned report performed by Beckmann Appraisals Inc.

If you have any further questions or concerns, please do not hesitate to contact us.

Thank you for the opportunity to serve you.

Very truly yours,

Gregg Manzione, MAI

James S. Coyle, Pres.

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DEC 30 2011
TOWN PLANNING DEPT.

(TEL) 845-639-2484 (FAX) 845-639-2485

BECKMANN APPRAISALS, Inc.

67 MAIN STREET
TAPPAN, NEW YORK 10983
REAL PROPERTY APPRAISERS, ANALYSTS AND CONSULTANTS

William R. Beckmann, MAI, CRE, FRICS, Certified General Real Estate Appraiser
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(845) 359-0070
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November 13, 2013

Anthony Montalbano, Esq.
Montalbano, Condon & Frank, P.C.
67 N Main Street
New City, New York 10956

Re: Orange and Rockland Property, Little Tor Road, New City, NY
Little Tor Road Transfer Substations

Dear Mr. Montalbano:

We have prepared a report with respect to residential property value and impact with respect to the subject substations as of November 16, 2009. At that time, we considered sales of residential properties between January 2005 to September 2009. Thereafter, in March/April of 2011 we undertook an updated search and analysis of residential home sales within the area of the study that transferred ownership between October 2009 through the 1st Quarter of 2011. As you know, at that time we noted that by reason of the recession and its aftermath there were relatively few sales of real estate compared to the volume of sales that was analyzed previously, and it was our opinion that the opinion set forth in our report dated November 16, 2009 continued to be our opinion as of March 31, 2011.

Once again you have requested us to consider whether an updated analysis, to include residential sales from January 2011 through October 2013 would change our opinion or analysis. We

searched for current sales in and around the study area of both the New City and Congers Road substations. Very few sales were available in the New City location, although there were some 102 sale identified nearby the Congers Road substation location. However, as some of these sales were eliminated from our analysis due to certain physical and/or locational attributes differed substantially from the sales in the rest of the data set resulting in a final data set of 55 sales for the Congers Rd – Clarkstown CSD area, of which 10 sales were identified as being within a 2,500 foot radius of the Congers Road substation.

In undertaking a regression analysis of these sales we attempted to use the same independent variables as were used in our original study: Date of sale (measured as number of months since the sale), square feet of living area, lot size (in acres), total number of baths (including lavatories), whether or not there is a garage, whether or not there is central air conditioning, the number of bedrooms, whether or not the house has a basement, architectural style of the house, whether or not the property is adjacent to the railroad and/or an existing power line, and whether or not the property is within 500 feet of the substation property line. We were able to consider all but one of these variables in our analysis since there were no sales present within a 500' radius of the substation, and only one sale within 1,000 feet. Accordingly, we prepared a regression of these sales using a greater distance to the substation variable (within 1,500 feet and within 2,500 feet). In both instances we note that architectural style, improvement size, lot size and central air conditioning were statistically relevant. In neither instance was the proximity to the substation (within 1,500 feet and within 2,500 feet) or being adjacent to the railroad/overhead power lines considered to be statistically relevant (having a P-value of 0.10 or less).

Upon further review of the sales included in our Congers Rd - Clarkstown CSD market area we acknowledge that sales prices in general have dropped, from an average of $277.33 psf/improvement in our original Nov. 2009 analysis to its current value of $206.29 psf/improvement. This indicates an approximate 25% overall reduction in sales price per square foot since 2009 and is in our opinion attributable to the decline in residential market prices by reason of the economic recession. Beginning in 2006 the Rockland County real estate market began experiencing a slow down, as evidenced by longer exposure periods; seller incentives; and reductions in market prices. Thereafter the residential housing market entered into a period of market correction as evidenced by a decrease in residential sales and sales prices. Since 2012 it appears that the market may be entering a period of stabilization, although residential sales prices and the volume of real estate transactions are still well below those achieved during the pre-recession period. Supporting this conclusion is a similar change in the Residential Assessment Ratio's within the Town of Clarkstown as reported from statistical analyses undertaken by the NYS Office of Real Property and Taxation Services.

Accordingly, our opinion remains the same as that stated in our previous report dated November 16, 2009 and again in our supplemental updated dated April 6, 2011, that the proposed substation will have little or no impact on residential property values.

You may append this letter to our report and consider it a "supplement" to our prior report and study.

Very truly yours,

William R. Beckmann, MAI, CRE
/am

S:\2009 JOBS\Misc\R1487 O&R Little Tor Rd\2013 Update Sales Search\11.11.13 Supplemental Update to the BA Nov. 16 2009 O&R Substation - Little Tor Rd Analysis.doc

CERTIFICATE OF THE APPRAISER

November 13, 2013

I, William R. Beckmann, certify that to the best of my knowledge and belief:

That the statements of fact contained in this report are true and correct.

That the reported analyses, opinions and conclusions are limited only to the reported assumptions and limiting conditions, and are my personal, impartial, and unbiased professional analyses, opinions, and conclusions.

That I have no present or prospective interest in the property that is the subject of this report, and I have no personal interest with respect to the parties involved.

That my engagement in this assignment was not contingent upon developing or reporting predetermined results.

That compensation for completing this assignment is not contingent upon the developing or reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value opinion, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this appraisal.

That my analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the Uniform Standards of Professional Appraisal Practice of the Appraisal Foundation and the Code of Professional Ethics and the Standards of Professional Appraisal Practice of the Appraisal Institute.

I have made a personal inspection of the property that is the subject of this report.

My analysis, opinions, and conclusions were developed, and this report has been prepared, in conformity with the Code of Professional Ethics of the Appraisal Institute and Standards of Professional Appraisal Practice of The Appraisal Foundation.

I have made a personal inspection of the property that is the subject of this report.

Ann Marie Mulholland has provided significant professional assistance to the person signing this report.

That the use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives.

As of the date of this report, I have completed the requirements under the continuing education program of the Appraisal Institute.

BECKMANN APPRAISALS, INC.

By: William Beckmann

William R. Beckmann, MAI, CRE
Certificate Number 8417
New York State General Certified Appraiser

BECKMANN APPRAISALS, Inc.

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November 14, 2013

Brian J. Quinn, Esq.
Anthony Montalbano, Esq.
Montalbano, Condon and Frank, P.C.
67 N Main St
New City, NY 10956

Re: Residential Property Value Impact Study of Proposed
O & R Sub-station at Little Tor Road and South Mountain Road,
New City, NY

Gentlemen:

You have requested that we review and comment on certain questions posed during hearings held before the Clarkstown Planning Board, as provided to us by e-mail dated November 13, 2013. We understand that our responses will be included within the FEIS you are preparing.

Accordingly, annexed we provide our response immediately following each question. If you have any further questions or comments please call or e-mail me.

Very truly yours,

William Beckmann

William R. Beckmann, MAI

BECKMANN RESPONSE TO QUESTIONS OBTAINED WITHIN VARIOUS TRANSCRIPTS OF CLARKSTOWN PLANNING BOARD HEARINGS

1. **"I also looked through the DEIS and noticed the Beckmann report that says there will be really little or no diminution of property values as a result of this substation, and the Coyle review of that report pretty much says the same thing and agreed with them."** ***{Ms. Conner, May 2, 2012, page 17, lines 22-25; page 18, lines 2-5)***

   Yes. Both real estate experts agreed with the conclusion that there would be little or no diminution of property value as a result of this substation. In addition to the multiple regression analyses used to support the Beckmann Appraisals conclusion, our review of the history, location, screening, existing visible power lines and other utility properties was supported by our study.

2. **"Many of the studies I read differed in the values they said would be lost. One said three to seven percent, another 12 percent, another said 10 to 30 percent, another 15 to 34 percent, but most of the things I read said that there will be some negative effect on property values in proximity to the transmission lines and/or substations."** ***{Ms. Conner, May 2, 2012, page 18, lines 14-22)***

   The studies referred to are with respect to sites that were not previously impacted by multiple utility structures. There are times when new utility property is constructed on a previously vacant site that does not have the attributes of the subject property site that there may be an initial value reduction on close neighboring property. Our analysis supports our conclusion under the fact of this addition of a substation that the impact of utility lines and structures has previously been discounted in the neighborhood. The new structure would not affect neighborhood values to any significant extent.

3. **"In one instance in Wisconsin, the power company bought a house for 221,000, erected a power line next to it, fixed up the property, eight to ten thousand dollars worth of new paint, doors, sinks, dishwashers, all the good stuff, put it on the market at 179 and finally sold it ten months later after the initial purchase at a hundred twenty-eight five, 42 percent less than the company paid for it originally. So that's just an illustration of one of the property values being affected by being next to this stuff. Ms.** ***Conner, May 2, 2012, page 19, lines 5-18)***

   We have not been able to locate any information with respect to the referred to Wisconsin site. However, under the facts provided. We agree that there would be a substantial value impact. However, as we set forth above the facts of the subject property is far different than that described on the unidentified Wisconsin site. This does not change our opinion.

4. **"The Beckmann report dealt with comparable properties near the New Hempstead Road substation and Congers, and sales that were from 2005 to 2009. In the Coyle review of that, they pointed out that there were only about four sales within that time next to the New Hempstead project. And the Coyle Report says it does not appear to be a large enough set of data to provide any substantial result. They also point out that in Congers, two of the four sales they used was comparable were next to railroad tracks. So, it may or may not have been a good indication of what the substation does to the value.** ***{Ms. Conner, May 2, 2012, page 19, lines 19-25; page 20, lines 2-14)***

   It is our analysis that the Congers substation in conjunction with the railroad line is a reasonable proxy for a multiple impacted site. Moreover, the Congers utility/railroad improvements are far more visible and can arguably be considered a more highly impacted site than the facts of the subject property. We believe that this supports our reported conclusion.

5. **"The two substations, incidentally, have been there for years, and since the comparable sales only compared from 2005-2009, it may be that the diminution of values had already been taken care of years before in the value of those properties next to the substation."**
   {Ms. Conner, May 2, 2012, page 20, lines 15-211

   We agree that where there has been a substantial period of time since the installation of a substation or transmission lines, as mentioned above, the impacts are discounted in the marketplace over time. It is our opinion that is supported by our analysis that by reason of the large, well screened site that already has multiple previously visible utility improvements that under the facts associated with the proposed Little Tor Road site there will be little or no impacts on neighborhood residential property value. Our further analysis of sales in the Congers substation area shows that the existence of the substation/railroad has not impacted nearby residential property values greater than those found about the town.

6. **"Other than monetary value, just from my experience in the real estate business, there are people who won't even look at a property that's anywhere near a power line or substation. What happens is that that cuts down the number of prospective buyers because a lot of people won't look at the properties." {Ms. Conner, May 2, 2012, page 20, lines 22-25; page 21, lines 2-51**

   There are many neighborhood conditions that may affect the desirability of a residence based on personal choices and attitudes of purchasers. However, our analysis did not show that such an opinion, if there is such an opinion, affected residential values in the neighborhood of our tested sites. We cannot speculate on individual or personal opinions or motivations.

7. **"DEIS should provide information on similar electric substations in residential neighborhoods around the U.S. that are co-located with gas substations and cellular towers since these facilities collectively create more risks than sites with just one of those installations. Projected property value impacts should only be determined using these locations with co-existing thing-a-ma-jigs, not just by using stand-alone substation facilities." Therefore, he finds the DEIS deficient in not doing a proper evaluation." {Letter from Mr. Baum as read by Ms. Thal, June 13, 2012, page 37, lines 2-16)**

   We sought data with respect to substations in similar areas in the Hudson Valley and particularly neighboring Orange County. We were unable to locate those with similar or near similar attributes of the Little Tor Road/South Mountain Road property. It is our opinion that the studies done by others on various properties in the United States makes it unnecessary to make further inquiry. Further, value impact in far distant areas cannot be assumed to be the same or similar to those in our region. We do not believe further research would improve our analysis or change our conclusion.

8. **"The next item I had in the memorandum refers to home values, and we're suggesting that the scope of the real estate valuation be increased to include the entire region, the Hudson Valley or beyond, if necessary, because the sample size that was utilized is very small. That was noted by the real estate expert that the Planning Board used to review their material, and also because some of the substation locations are immediately adjacent to railroad tracks, in the case of the Congers substation, a very active freight line and it may be that the valuations on the part of prospective home purchasers are more influenced by the sound and sight of the trains than they would be by the substations. So we're asking that some additional analysis be done in a broader number of locations." (Mr. Genes/aw, June 6, 2012, page 34, lines 24-25; page 35, lines 2-20)**

   See 7 above.

9. **"As I recall, the Town's consultants indicated the sample size was very small." (Mr. Geneslaw, June 6, 2012, page 37, lines 23-25)**

   The size of our sample was sufficient to perform our analysis and provide reliable results.

10. **"When I wrote to Kathy Conklin who's the assessor for the Town, she said, I really don't have any market data for the difference that you could pay in taxes because I just have no idea and I can't pull a number out of the air, so it's up to you to research that. And it's not up to me to research that, it's up to you to do that research for everybody here to know what happens and what the full impact is because with all the money that you're getting what you should be doing is reassessing all the properties on that land and you should be reassessing everybody's value." (Ms. Walker, May 2, 2012, page 65, lines 14-25; page 66, lines 2-4)**

    We cannot comment on the assessor's comments or conclusions.

11. **"Section 111.P of the DEIS is dedicated to Residential Property Value including a report prepared by the applicant's consultant and reviewed by the Town's consultant. The current property values already reflect the existence of electrical, gas and telecommunications facilities on this site. ORU will review previously submitted material and update and supplement as needed." (Comments from Planning Board)**

    We have updated our report as contained in our November 2013 supplement.

12. **"The FEIS will contain a review of previously submitted data and a supplement, if necessary." (Comments from Planning Board)**

    See 11 above.

13. **"I have attached several documents about underground transmission facilities to demonstrate the feasibility of such projects that significantly reduce EMF exposure and offset aesthetic and property value impacts." (Mr. Baum, via email, June 14, 2012)**

    We cannot comment on technical, engineering issues. However, our report insofar as it addresses impact on residential property values shows no likelihood of real property value diminution.

14. **"Reduced property values. We contested OEtR's statement that properties near the substation would not decrease in value. We cited examples of properties near substations and power lines that had diminished in value." (Ms. Thal, via email, May 20, 2012)**

    See 7 above.

15. **"I also want to mention that I did hear back from the assessment board who decided that the value of my house was decreased 10% (Though I believe that it's more like a 40% decrease). I don't know what tax adjustment is made because of that, but I believe that it should be significant. I believe that the value of my house is at about half of the purchase price. That means that I can't refinance my mortgage, and take advantage of lower mortgage rates. Which, as someone with very good credit, costs me about $650 per month. The value of my house is lower than the mortgage that is left on it. That's not because of the economy, that's because of Con. Ed. Why aren't I being compensated for that? In fact why isn't everyone on South Mountain Road being compensated? If that is the demand, from all of the residents on South Mountain Road, doesn't it become more economically advantageous for Con Ed to bury the lines, and the substation?" (Ms. Walker, via email, June 8, 2012)**

    We cannot comment on assessment or re-assessment issues. We do acknowledge that there has been a nationwide, region-wide, state-wide, county-wide and town-wide general real estate recession that has caused a substantial reduction in residential property values. We have not appraised Ms. Walker's property and cannot comment as to her conclusion as to value of her house.

16. **"I am distressed at the complete DEVASTATION of my property value, which will result from the building of the substation." (Ms. Walker, memo date April 2, 2012)**

    As mentioned multiple times above, we do not anticipate, nor does the data show that one should anticipate any substantial impact on neighborhood residential property values.

17. **"The DEIS has a very limited exploration of the potential impact of electrical substations on the value of neighboring residential properties. It does not explore the combined impact of an electrical substation and related overhead transmission lines plus a gas substation and related gas lines plus a cell tower and related facilities. The DEIS should provide information on similar electrical substations in residential neighborhoods around the U.S. that are co- located with gas substations and cellular towers since these facilities collectively create more risks. Projected property value impacts should only be determined using these locations only, not by using stand-alone electrical substation facilities." (Mr. Baum, memo dated June 13, 2012)**

    See 7 above.

APPENDIX M-
SPCC (Draft)

ORANGE AND ROCKLAND UTILITIES, INC.

Little Tor Substation

SPILL PREVENTION, CONTROL AND COUNTERMEASURE PLAN

Environmental Services
Orange and Rockland Utilities, Inc.
390 West Route 59
Spring Valley, New York

Orange & Rockland

OCTOBER 2014

DRAFT

DVIRKA AND BARTILUCCI CONSULTING ENGINEERS
A DIVISION OF D&B ENGINEERS AND ARCHITECTS, P.C.

3262-07 - SPCC Plan Cover.indd (10/06/14 - 12:41 PM)

ORANGE AND ROCKLAND UTILITIES, INC.

Little Tor Substation

SPILL PREVENTION, CONTROL
AND
COUNTERMEASURE PLAN

Environmental Services
Orange & Rockland Utilities, Inc.
390 West Route 59
Spring Valley, NY 10977

Plan Prepared: July 2012
Plan Revised: October 2014

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Attachment II Certification of Substantial Harm Determination

Attachment III Spill Notification Procedures

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Attachment VI Facility Location Map

Attachment VII Facility Site Plan

Attachment VIII Monthly Substation Inspection Form

Attachment IX Amendment Log

SPILL PREVENTION, CONTROL, AND COUNTERMEASURE PLAN
LITTLE TOR SUBSTATION

1. Introduction and Facility Information

This document constitutes the Spill Prevention, Control, and Countermeasure (SPCC) Plan for the Orange and Rockland Utilities, Inc. (ORU) facility located at 551 North Little Tor Road, New City, NY, as contemplated by the United States Environmental Protection Agency (USEPA) regulations contained in 40 CFR 112 (38 Fed. Reg. 34163, December 11, 1973). A cross reference table for this SPCC Plan is presented in Attachment I. The Facility Location Map is presented as Attachment VI and the Facility Site Plan is presented as Attachment VII.

Non-transportation related facilities are subject to SPCC regulation where the total aboveground storage capacity exceeds 1,320 gallons or the underground storage capacity exceeds 42,000 gallons and where the location of the facility could reasonably result in discharge of regulated substances into or upon the navigable waters of the United States or adjoining shorelines. The Certification of Substantial Harm Determination is presented in Attachment II of this SPCC Plan.

The Little Tor Substation is subject to SPCC regulation because, due to its location near the Hackensack River, recharge basin and nearby wetlands, it has the potential to discharge oil into or upon the navigable waters of the United States, and the total aboveground storage capacity exceeds 1,320 gallons.

This plan is effective immediately upon receipt at the facility and must be submitted to the USEPA Regional Administrator if either of the following occurs:

- The facility discharges more than 1,000 gallons of oil into or upon navigable waters of the United States or adjoining shorelines in a single event.
- The facility discharges oil in harmful quantities (as defined in 40 CFR 110) in two spill events greater than 42 gallons each within any 12-month period.

In the case of either of the two events, the following additional information must also be submitted to the USEPA Regional Administrator within 60 days of the incident (40 CFR 112.4):

- Name of the facility
- Name of the owner/operator
- Location of the facility
- Date/year of initial operation
- Maximum storage capacity
- Description of the facility
- Complete copy of the SPCC Plan
- Cause of the spill with failure analysis
- Corrective action taken
- Additional preventative measures taken to minimize possibility of recurrence

SPCC PLAN FACILITY INFORMATION

A. Name of Facility:	Little Tor Substation
B. Type of Facility:	Electric transmission station
C. Date of Initial Operation:	Expected 2017
D. Location of Facility:	551 North Little Tor Road, New City, NY
E. Name and Address of Owner:	Orange & Rockland Utilities, Inc. 390 West Route 59 Spring Valley, NY 10977
F. Designated Person Responsible For Oil Spill Prevention [40 CFR 112.7(f)(2)]:	Michele Hanebuth, Director - System Operations
G. Nearest Manned Facility:	Spring Valley Operating Center A complete copy of the SPCC Plan is maintained at the Spring Valley Operating Center and by the ORU Environmental Services Department at 390 West Route 59 in Spring Valley, NY and is available to the USEPA Regional Administrator for review during normal business hours.
H. Oil Spill History:	Oil spill incident statements are prepared for all spill events and maintained at the Spring Valley Operating Center by Environmental Services.

2. Certification Information

Engineer's Certification [40 CFR 112.3(d)]

I hereby certify that I (or my designated agent) have examined the facility, and being familiar with the provisions of 40 CFR Part 112, attest that this SPCC Plan is appropriate for this facility and has been prepared in accordance with good engineering practice, including consideration of applicable industry standards and with the requirements of the SPCC rule. To the best of my knowledge, applicable procedures for required inspections and testing have been established.

Name: Brian M. Veith

Signature: _____

Date: _____

New York P.E. License No. 071687

Management Commitment to SPCC Plan [40 CFR 112.7]

This Spill Prevention, Control, and Countermeasure Plan has been prepared in accordance with good engineering practices and has the full approval of management to commit the necessary resources to fully implement this plan. The management of Orange & Rockland Utilities is fully committed to providing sufficient manpower, equipment, and materials required to expeditiously control and remove any harmful quantity of oil discharged.

Name: _____

Michele Hanebuth, Director - System Operations

Date: _____

Five-Year Reviews [40 CFR 112.5(b)]

This plan must be reviewed by a designated representative at least once every five years. If necessary, the SPCC Plan shall be amended for the facility when there is a change in facility design, construction, operation or maintenance that materially affects the potential to discharge oil [40 CFR 112.5(a)]. The SPCC Plan shall also be amended to include more effective technology if such technology will significantly reduce the likelihood of a spill event from the facility [40 CFR 112.5(b)]. The revised plan shall be recertified by a Professional Engineer [40 CFR 112.5(a) and (c)].

I have completed review and evaluation of the SPCC Plan for the Little Tor Substation on, _____ and _____ amend the Plan as a result.
(Date) (Will/will not)

_____
(Signature)

3. Potential Spills – Prediction and Control [40 CFR 112.7(b) and (c)]

Subsection 112.7(b) of the regulations requires that the SPCC Plan identify locations where experience indicates that a reasonable potential for an oil spill to occur exists. The table on the following page lists oil filled equipment at the Little Tor Substation. The table also summarizes appropriate diversionary and/or containment measures in place to prevent discharged oil from reaching a navigable watercourse, along with a prediction of the flow direction, rate of flow, and total quantity of oil that could be discharged from the facility as a result of an oil spill.

In accordance with the Regulations, containment measures such as concrete curbs and diversionary measures such as coarse stone are present at the facility to prevent oil from reaching navigable waters. In the event of an oil leak or spill and failure of these systems, product could flow outside of the fenced substation area. Therefore, in order to prevent oil from reaching navigable waters, it is imperative that sorbent materials are utilized to contain spilled product and that affected surface cover is cleaned or excavated and removed from the facility immediately. Visual observation of all areas must be performed during routine operations to check for leaks and spills from oil-containing equipment at the facility.

Oil filled equipment may be provided with one or more types of protective/warning devices. These devices are designed to prevent or minimize damage to the electrical equipment in the event of a malfunction. Protection of the equipment minimizes the potential for a release of oil. Certain types of devices are remotely alarmed to the Energy Control Center. The devices are described below:

a. Pressure Relief Device – This device releases large amounts of air or gas to prevent a rupture of the equipment as the result of increased internal pressure due to equipment failure.

b. Sudden Pressure Relay – This device senses a rapid buildup of internal pressure within the transformer caused by internal failure. The relay may cause an interruption of the electrical supply to the transformer and remove it from service to prevent rupture of the equipment. Only selected pieces of equipment will trip upon activation of the sudden pressure relay.

c. Oil Level Indicator – This mechanism allows visual monitoring of the oil level in the equipment.

d. Low Oil Level Alarm – This device activates a remote alarm when the oil level in the equipment drops below a set point.

The devices listed above will be provided on the electric equipment in this substation to either prevent a release or minimize the amount of oil that may be released.

ELECTRIC INSULATING OIL FILLED EQUIPMENT – LITTLE TOR SUBSTATION

SOURCE	POTENTIAL FAILURE	PREDICTED SPILL FLOW RATE (GALLONS PER MIN.)	NO. OF GALLONS	DIRECTION OF FLOW	RATE OF FLOW*	PREVENTATIVE SYSTEM**	ADDITIONAL COMMENTS
Bank 116	Seam failure	<1 to 100 gpm	7,656	Southeast	There is a remote chance oil would reach the nearest surface water due to the failure of the preventative systems implemented at the facility, which prevents a spill or other leakage of oil from spreading beyond the containment area.	i, ii, vi, vii	Preventative system consists of a concrete diked containment area filled with crushed stone with an oil solidification media barrier along the bottom, a 7-inch high concrete curb at the perimeter fence and underground perforated pipes that direct any spilled material to oil solidification vaults. In addition, a recharge and detention basin is located southeast of the facility. Electronic oil level gauge and/or supervisory control system immediately notify ORU ECC of equipment failure and/or loss of oil.
Bank 216	Seam failure	<1 to 100 gpm	7,656	Southeast	There is a remote chance oil would reach the nearest surface water due to the failure of the preventative systems implemented at the facility, which prevents a spill or other leakage of oil from spreading beyond the containment area.	i, ii, vi, vii	Preventative system consists of a concrete diked containment area filled with crushed stone with an oil solidification media barrier along the bottom, a 7-inch high concrete curb at the perimeter fence and underground perforated pipes that direct any spilled material to oil solidification vaults. In addition, a recharge and detention basin is located southeast of the facility. Electronic oil level gauge and/or supervisory control system immediately notify ORU ECC of equipment failure and/or loss of oil.

SOURCE	POTENTIAL FAILURE	PREDICTED SPILL FLOW RATE (GALLONS PER MIN.)	NO. OF GALLONS	DIRECTION OF FLOW	RATE OF FLOW*	PREVENTATIVE SYSTEM**	ADDITIONAL COMMENTS
Bank 316	Seam failure	<1 to 100 gpm	4,440	Southeast	There is a remote chance oil would reach the nearest surface water due to the failure of the preventative systems implemented at the facility, which prevents a spill or other leakage of oil from spreading beyond the containment area.	i, ii, vi, vii	Preventative system consists of a concrete diked containment area filled with crushed stone with an oil solidification media barrier along the bottom, a 7-inch high concrete curb at the perimeter fence and underground perforated pipes that direct any spilled material to oil solidification vaults. In addition, a recharge and detention basin is located southeast of the facility. Electronic oil level gauge and/or supervisory control system immediately notify ORU ECC of equipment failure and/or loss of oil.

The substation may also have equipment containing less than 55 gallons of oil such as potential transformers, reclosers, and/or station service transformers, which do not meet the reporting threshold dictated by the USEPA in 40 CFR Section 112.1(d)(2)(ii). In addition, SF6 circuit breakers, which do not contain oil, may be present at the facility.

*In the event of a significant oil spill and all preventative systems are breached the reasonable estimated time for oil to reach the nearest surface water would be approximately 2 hours (see Attachment IV Oil Spill Response Procedures).

**Preventative Systems for On-shore Facilities:

(i) Dikes, berms or retaining walls sufficiently impervious to contain spilled oil
(ii) Curbing
(iii) Culverts, gutters or other drainage systems
(iv) Weirs, booms or other barriers
(v) Spill diversion ponds
(vi) Retention ponds or pit filled with crushed stone
(vii) Sorbent materials

All oil-containing equipment is constructed of materials which are compatible with the oil materials stored [40 CFR 112.8(c)(i)]. All equipment, unless noted, contains Electric Insulating Oil (also referred to as Transformer Oil or Dielectric Fluid).

Containment Structures [40 CFR 112.7(c)]

Transformer Banks 116, 216 and 316 are surrounded by a concrete diked containment area filled with crushed stone with an oil solidification media barrier along the bottom, and a 7-inch high concrete curb at the perimeter fence. The containment systems are equipped with the oil solidification system which allows water to discharge while retaining oil. Storm water that enters the concrete curbed area is discharged through underground perforated pipes in the middle of the substation to oil solidification vaults along the southeastern portion of the substation. Unimpacted storm water discharges from the vault via underground piping to a recharge and detention basin.

Demonstration of Practicability [40 CFR 112.7(d)]

The management of ORU and a licensed professional engineer (see Section 2.0) have determined that current substation operation and maintenance procedures, combined with the use of containment and/or diversionary measures and immediate notification and response by readily available contracted personnel in the event of a loss of oil, are practical and effective to reduce the risk of an oil spill from oil filled equipment within the Little Tor Substation from reaching navigable waters. ORU realizes the importance of immediate cleanup or excavation and proper disposal of all materials which come into contact with oil in the event of a spill, including coarse stone, asphalt, soil, used sorbent materials (such as spill booms or absorbent material), and vegetation.

In addition to the containment and diversionary measures provided, an effective oil spill contingency plan, including a written commitment of manpower, equipment and materials required to expeditiously control and remove any harmful quantity of oil discharged, has been prepared for this facility [40 CFR 112.7(d)(1) and (2)]. The Spill Notification Procedures are described in Attachment III of this SPCC Plan, while the Oil Spill Response Procedures are presented in Attachment IV.

Additionally, PCB Spill Response Procedures are described in Attachment V. It should be noted that PCB Spill Response Procedures are provided in each of the ORU SPCC Plans.

4. Facility Drainage [40 CFR 112.8(b)]

Nearest Identified Surface Water Potentially Impacted by Spill .....Hackensack River (HR), Recharge Basin (RB), Nearby Wetland (NBW)

Distance.....Approx. 200 feet HR, 90 feet RB, 160 feet NBW

Direction of Flow within Site .....Inwards towards the center of the site

Estimated Flow Time to Nearest Identified Surface Water .....There is a remote chance oil would reach the nearest surface water due to the failure of the preventative systems implemented at the facility, which prevents a spill or other leakage of oil from spreading beyond the containment area.

The general drainage pattern within the facility is discharged to underground perforated pipes in the middle of the substation to oil solidification vaults along the southeastern portion of the substation. Unimpacted storm water discharges from the vault via underground piping to a recharge and detention basin to the southeast, which is approximately 90 feet from the nearest aboveground oil filled equipment over 55 gallons at the facility. The general drainage pattern along the exterior of the facility is off-site via sheet flow that discharges to the Hackensack River to the south and to nearby wetlands to the east-northeast, which is approximately 200 feet and 160 feet, respectively, from the nearest aboveground oil filled equipment over 55 gallons at the facility. The Facility Location Map is provided as Attachment VI.

Undiked Storage Areas

The Regulations stress secondary containment as a preferred method of spill control around oil-containing equipment, tanks, drums, or containers, but other means are available to reduce the chances of an oil spill from running over land toward navigable waters, surface water conveyance systems, storm water drains, or from contacting groundwater that is tributary to surface water bodies. The crushed stone in the station would serve to minimize the spread of oil from this equipment in the event of an oil spill.

Drainage from undiked areas should generally occur inward towards the center of the site, as shown on the Facility Site Plan (Attachment VII). The ground surface within the substation fenced area is crushed stone and/or asphalt. In the event of a spill from oil-containing equipment, oil would partially soak into the crushed stone and soil adjacent to the equipment or run along the surface in a radial direction from the equipment. In addition, sorbent materials to be used for responding to small spills are available on substation trucks.

All other cleanup materials, equipment and manpower would be obtained from the Company's emergency response contractor.

Diked Storage Areas

Lateral drainage from Transformer Banks 116, 216 and 316 are restrained by a concrete containment dike lined with an oil solidification media barrier to prevent a spill or other leakage of oil from spreading beyond the containment area. The containment system is filled with crushed stone and is equipped with an oil solidification system which allows precipitation to pass through the system and drain to the underlying soils. However, if oil is present, the solidification

system will solidify and prevent oil from discharging. In addition, drainage from the site is restrained by a 7-inch high concrete curb at the perimeter fence, and by a underground perforated piping system that leads to oil solidification vaults, which prevents a spill or other leakage of oil from spreading beyond the containment area.

Storm water which accumulates within the containment area will be inspected for indications of oil spills or leaks. If required, the storm water would be drained from a containment area by authorized personnel and managed in accordance with all applicable regulations [40 CFR 112.8(b)].

5. Applicable Guidelines

In addition to the prevention systems outlined previously and the measures identified in the Oil Spill Response Procedures (Attachment IV), the following guidelines are to be followed as effective spill prevention and containment procedures for this location:

Facility Tank Truck Loading/Unloading Rack (On-shore) [40 CFR 112.7(h)]

Loading and unloading procedures would refer to filling or draining of oil-containing equipment during maintenance or repair activities. Loading and unloading are performed using portable steel drums or a tank truck, as appropriate.

1. Prior to the filling or draining of equipment with drums, sorbent pads are placed beneath and/or around the oil filled equipment, drums and pumps and are affixed to hose connections in order to prevent leakage of oil onto the ground. Drum loading and unloading activities are typically performed while the drum remains on the vehicle, in order to minimize the potential for a spill.

2. Prior to the departure of a tank truck, the lowermost drain and all outlets of such vehicles are examined closely for leakage by the vehicle operator. If necessary, outlets will be tightened, adjusted, or replaced by the vehicle operator to prevent liquid leakage while in transit.

Inspections and Records [40 CFR 112.7(e)]

Visual inspection of all facility locations is performed at least once each month and a record of the inspection, including any oil leaks, is made. A qualified person inspects facility locations using the Monthly Substation Inspection Report (Attachment VIII) as a procedure guide. This information is retained by the ORU Substation Department for a period of three (3) years.

Security [40 CFR 112.7(g)]

1. This facility is fenced with a 8-foot chain link fence. Gates are locked at all times.

Personnel, Training, and Spill Prevention Procedures [40 CFR 112.7(f)]

1. The company annually trains its personnel in the operation and maintenance of equipment to prevent the discharge of oil. Additionally, appropriate instruction with regard to applicable pollution control laws, rules, and regulations is provided. The use of applicable spill control equipment and materials are also included in ORU's annual personnel training.

2. Oil spills and leaks are reported to the ORU Control Center. The Control Center is responsible for notifying Environmental Services. Environmental Services or the on-call spill responder will make the required regulatory notifications and notify the Company's emergency response contractor for spill cleanup if necessary.

3. Orientation meetings regarding the SPCC Plan for this location are held to instruct the necessary personnel in oil spill prevention. Upon amendment of this Spill Prevention, Control, and Countermeasure Plan, personnel will be informed of the contents of such amendments via an ORU "Environmental Bulletin" or "Environmental Alert".

4. Sorbent materials will be stored in substation trucks to be used by authorized personnel to collect small spills. Cleaning, excavation, and/or disposal of materials containing oil must be supervised by authorized personnel. All debris shall be disposed of in accordance with all applicable federal, state, and local regulations.

6. PCB Concentration of Equipment

Assume transformers and regulators *are* contaminated according to regulations if not listed below.

It should be noted that tests for PCB concentration will be done on Transformer Banks 116 and 216 when the transformers are received on the project site and that ORU specified that the transformers should be PCB free in the specification to the manufacturer.

	MAIN/TANK #1	SELECTOR/TANK	LTC/TANK
Transformer: Bank 116	--	--	--
Transformer: Bank 216	--	--	--
Transformer: Bank 316	<1.0 ppm/ N.D.	--	--

N.D. = not detected
ppm = parts per million
-- = not established

7. Recommended Improvements

No modifications to the Substation are recommended at this time.

ATTACHMENT I

CROSS REFERENCE TABLE

ATTACHMENT I

CROSS REFERENCE TABLE

Section(s)	Description of Rule	Section(s)
§112.7	General requirements for SPCC Plans for all facilities and all oil types.	1, 2
§112.7(a)	General requirements; discussion of facility's conformance with rule requirements; deviations from Plan requirements; facility characteristics that must be described in the Plan; emergency procedures.	1
§112.7(b)	Fault analysis.	3
§112.7(c)	Secondary containment.	3, 4
§112.7(d)	Contingency planning.	3
§112.7(e)	Inspections, tests, and records.	5
§112.7(f)	Employee training and discharge prevention procedures.	5
§112.7(g)	Security (excluding oil production facilities).	5
§112.7(h)	Loading/unloading (excluding offshore facilities).	5
§112.7(i)	Brittle fracture evaluation requirements.	N/A (1)
§112.7(j)	Conformance with state requirements.	2
§112.8, §112.12	Requirements for onshore facilities (excluding production facilities).	3
§112.8(a), §112.12(a)	General and specific requirements.	2
§112.8(b), §112.12(b)	Facility drainage.	4
§112.8(c), §112.12(c)	Bulk storage containers.	4
§112.8(d), §112.12(d)	Facility transfer operations, pumping, and facility process.	5
§112.9, §112.13	Requirements for onshore production facilities.	N/A
§112.9(a), §112.13(a)	General and specific requirements.	N/A
§112.9(b), §112.13(b)	Oil production facility drainage.	N/A
§112.9(c), §112.13(c)	Oil production facility bulk storage containers.	N/A
§112.9(d), §112.13(d)	Facility transfer operations, oil production facility.	N/A

ATTACHMENT I (continued)

Section(s)	Description of Rule	Section(s)
§112.10, §112.14	Requirements for onshore oil drilling and workover facilities.	N/A
§112.10(a), §112.14(a)	General and specific requirements.	N/A
§112.10(b), §112.14(b)	Mobile facilities.	N/A
§112.10(c), §112.14(c)	Secondary containment – catchment basins or diversion structures.	N/A
§112.10(d), §112.14(d)	Blowout prevention (BOP).	N/A
§112.11, §112.15	Requirements for offshore oil drilling, production, or workover facilities.	N/A
§112.11(a), §112.15(a)	General and specific requirements.	N/A
§112.11(b), §112.15(b)	Facility drainage.	N/A
§112.11(c), §112.15(c)	Sump systems.	N/A
§112.11(d), §112.15(d)	Discharge prevention systems for separators and treaters.	N/A
§112.11(e), §112.15(e)	Atmospheric storage or surge containers; alarms.	N/A
§112.11(f), §112.15(f)	Pressure containers; alarm systems.	N/A
§112.11(g), §112.15(g)	Corrosion protection.	N/A
§112.11(h), §112.15(h)	Pollution prevention system procedures.	N/A
§112.11(i), §112.15(i)	Pollution prevention systems; testing and inspection.	N/A
§112.11(j), §112.15(j)	Surface and subsurface well shut-in valves and devices.	N/A
§112.11(k), §112.15(k)	Blowout prevention.	N/A
§112.11(l), §112.15(l)	Manifolds.	N/A
§112.11(m), §112.15(m)	Flowlines, pressure sensing devices.	N/A
§112.11(n), §112.15(n)	Piping; corrosion protection.	N/A
§112.11(o), §112.15(o)	Submarine piping; environmental stresses.	N/A
§112.11(p), §112.15(p)	Inspections of submarine piping.	N/A

(1) This facility does not have field fabricated aboveground tanks and is exempt from this requirement.

ATTACHMENT II

CERTIFICATION OF SUBSTANTIAL HARM DETERMINATION

Certification of Substantial Harm Determination
40 CFR 112.20(e), 40 CFR 112.20(f)(1)

Facility Name: Orange and Rockland Utilities, Inc. – Little Tor Substation
Facility Address: 551 North Little Tor Road, New City, NY

1. Does the facility transfer oil over water to or from vessels and does the facility have a total oil storage capacity greater than or equal to 42,000 gallons?

Yes __ No _x

2. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and does the facility lack secondary containment that is sufficiently large to contain the capacity of the largest aboveground oil storage tank plus sufficient freeboard to allow for precipitation within any aboveground storage tank area?

Yes __ No _x

3. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula) such that a discharge from the facility could cause injury to fish and wildlife and sensitive environments?

Yes __ No _x

4. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula) such that a discharge from the facility would shut down a public drinking water intake?

Yes __ No _x

5. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and has the facility experienced a reportable oil discharge in an amount greater than or equal to 10,000 gallons within the last 5 years?

Yes __ No _x

Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals responsible for obtaining this information, I believe that the submitted information is true, accurate, and complete.

_____	Senior Specialist
Signature	Title
Gregory Eiband	_____
Name (type or print)	Date

ATTACHMENT III

SPILL NOTIFICATION PROCEDURES

ATTACHMENT III

SPILL NOTIFICATION PROCEDURES

RESPONSIBILITIES

The following agencies must be contacted and notified of spill incidents as outlined below. If a member of the Environmental Services Department cannot be reached immediately, it shall be the responsibility of the Department Supervisor to make the mandatory notifications.

NOTIFICATION INFORMATION

The following information must be provided to the respective agencies when reporting a spill.

1. Your name and phone number.
2. Company name, address and phone number.
3. Name of person who notified you of spill.
4. Date and time of spill.
5. Location - street, town, county.
6. Name of water body involved or affected.
7. Type of oil spilled and quantity.
8. Cause of spill and responsible party.
9. Action taken.
10. Obtain spill number for records.

REGULATORY AGENCIES

A1. **Location - New York State.**

A2. **Spill Type**

1. **Oil (PCB and non-PCB) into a body of water, stream, storm drain, sewer.**

Immediate Notification Required

Agency:

(1) National Response Center Duty Officer
U.S. Coast Guard
All Hours: 800-424-8802

(2) NYSDEC Spill Hotline
All Hours: 800-457-7362

Note: In Rockland County if spill is associated with a Petroleum Bulk Storage tank, the following notification must also be made:

(3) Rockland County Department of Health
A. Ebi Elaahi
Office Hours: (845) 364-2605
After hours: (845) 364-2000
Have operator contact individual on call

Note: In Rockland County if spill enters a sanitary sewer, the following notification must also be made:

(4) County of Rockland Sewer District No. 1
Joan Roth, Compliance Administrator
All Hours: (845) 365-6111

2. **<u>Oil (PCB and non-PCB) onto land surfaces.</u>**

Immediate Notification Required

Agency: (1) NYSDEC Spill Hotline - **Within two hours**
All Hours: 800-457-7362

A3. **Additional Notifications -** The USEPA Regional Office must be notified within 24 hours at (201) 548-8730 if any of the following apply:

1. A PCB spill directly contaminates surface water, sewers, or drinking water supplies.
2. A PCB spill directly contaminates grazing lands or vegetable gardens.
3. A PCB spill exceeds 10 lbs. of PCBs by weight.

B1. **Location - <u>New Jersey.</u>**

B2. **Spill Type**

1. **<u>Oil (PCB and non-PCB) into a body of water, stream, storm drain, sewer.</u>**

Immediate Notification Required

Agency: (1) National Response Center Duty Officer
U.S. Coast Guard
All Hours: 800-424-8802

(2) NJDEP
All Hours: 1-877-927-6337

2. **<u>Oil (PCB and non-PCB) onto land surfaces.</u>**

Immediate Notification Required

Agency: (1) NJDEP
All Hours: 1-877-927-6337

B3. **Additional Notifications -** The USEPA Regional Office must be notified within 24 hours at (201) 548-8730 if any of the following apply:

1. A PCB spill directly contaminates surface water, sewers, or drinking water supplies.
2. A PCB spill directly contaminates grazing lands or vegetable gardens.
3. A PCB spill exceeds 10 lbs. of PCBs by weight.

C1. **Location - <u>Pennsylvania.</u>**

C2. **Spill Type**

1. **<u>Oil (PCB and non-PCB) into a body of water, stream, storm drain, sewer</u>.**

Immediate Notification Required

Agency:

(1) National Response Center Duty Officer
U.S. Coast Guard
All Hours: (800) 424-8802

(2) Department of Environmental Protection
Office Hours: (570) 826-2511
Night/Weekends: (570) 826-2511

2. **<u>Oil (PCB and non-PCB) onto land surfaces.</u>**

Immediate Notification Required

Agency:

(1) Department of Environmental Protection
Office Hours: (570) 826-2511
Night/Weekends: (570) 826-2511

C3. **Additional Notifications -** The USEPA Region III Office must be notified within 24 hours at (732) 321-6656 if any of the following apply:

1. A PCB spill directly contaminates surface water, sewers, or drinking water supplies.
2. A PCB spill directly contaminates grazing lands or vegetable gardens.
3. A PCB spill exceeds 10 lbs. of PCBs by weight.

ORANGE & ROCKLAND PERSONNEL NOTIFICATIONS

ENVIRONMENTAL SERVICES SPILL NOTIFICATION LIST

Environmental Services Department must be notified of all spills and releases.

1. PRIMARY CONTACT:

O&R Control Center
(845) 577-3228/3185

ALTERNATE CONTACTS:

Gregory Eiband
Business (845) 577-3309
Residence (201) 664-9397
Cell-phone (347) 931-2890

Brian Bury
Business (845) 577-3650
Residence (607) 267-9623
Cell-phone (646) 306-2772

Art Barikyan
Business (845) 577-3440
Residence (845) 359-6009
Cell-phone (845) 597-8333

Bobta Kim
Business (845) 577-3577
Residence (845) 480-5626
Cell #1 (845) 558-6644
Cell #2 (845) 656-6119

Charles Franceschini
Business (845) 577-3526
Residence (845) 783-0780
Cell-phone (914) 906-1047

Tom Lennon
Business (845) 577-3895
Residence (973) 852-8112
Cell-phone (845) 608-6033

Mark Impomeni
Business (845) 577-3277
Residence (201) 327-5656
Cell-phone (845) 988-6546

Anthony Lombardo
Business (845) 577-3895
Residence (845) 849-3285
Cell (845) 629-1410

Gwen Keeble
Section Manager
Environmental Services
Business (845) 577-3534
Residence (201) 327-7720
Cell #1 (917) 418-5764
Cell #2 (917) 923-9479

Maribeth McCormick
Technical Manager
Environmental Remediation
Business (845) 783-5534
Residence (845) 360-5004
Cell #1 (914) 557-1361
Cell #2 (845) 521-0913

Mark Travers Section Manager
Safety
Business (845) 342-8952
Reside 1 (845) 856-4220
Reside 2 (845) 858-0643
Cell #1 (914) 447-6918
Cell #2 (845) 521-9817

Terry Foxe
Director – Environmental, Health, & Safety
Business (845) 577-3780
Residence (845) 365-6147
Cell #1 (914) 447-9798

2. ADDITIONAL NOTIFICATIONS:

Sal Muto
Section Manager – Substation Operations
Business (845) 577-3204
Residence (914) 686-2880
Cell (914) 557-1367

Vishal Patel
Manager – Substation Operations
Business (845) 242-5999
Residence (201) 697-2616
Cell (845) 242-5999

Michele Hanebuth
Director – System Operations
Business (845) 577-3824
Residence (845) 359-2990
Cell (646) 483-9140

3. CORPORATE COMMUNICATIONS MUST BE NOTIFIED OF ALL SIGNIFICANT OIL SPILLS OR SPILLS IMPACTING THIRD PARTIES OR OFF-SITE PROPERTIES.

Working Hours: Mike Donovan
Business (845) 577-2430
Cell (914) 329-1999

Nights/Weekends: On-Call Representative
Contact Communications Center

4. CLEANUP CONTRACTORS:

If any spill cannot be handled by O&R personnel, an O&R emergency-response contractor will be assigned to clean-up the spill. To request the contractor to respond to a spill, contact the O&R Communications Center at (845) 577-3185/3228.

ATTACHMENT IV

OIL SPILL RESPONSE PROCEDURES

ATTACHMENT IV

OIL SPILL RESPONSE PROCEDURES

IMMEDIATE ACTION

1. Determine the source of the leak or release.

2. To the extent possible, immediately confine the spilled material and prevent spillage to surface waters, sewers, or storm drains by diking or damming with absorbents, digging diversion ditches or trenches, or constructing barriers from site-specific materials such as soil, wood, and plastic. Response should be in a defensive manner, containing spill from a safe distance and keeping it from spreading further and preventing exposures.

3. Immediately notify the Communications Center, who will be responsible for contacting Environmental Services (see Spill Notification Procedures, Attachment III).

4. Keep the general public and nonessential personnel out of the spill area.

Initial Response

1. Determine the PCB concentration of the spilled oil. For equipment that has not been previously tested, obtain a sample of the oil and screen it with the Clor-n-Oil test kit. For equipment that has been tested for PCB content, initiate cleanup in accordance with the original lab results after confirming the PCB concentration with a Clor-n-Oil test if possible. If the equipment involved in the spill has been involved in a fire, use of the Clor-n-Oil test kit is likely to give positive test results. Therefore, cleanup should be initiated as though the equipment is PCB contaminated (50 to 499 ppm).

2. In all cases, a sample of the oil must be collected for laboratory analysis. If the screening test has indicated that the oil is non-PCB, this sample will be collected by the Waste Coordinator in conjunction with disposal arrangements. If the screening test is positive or the spill is assumed to be PCB-contaminated, a sample of the oil must be collected immediately and sent to the lab on a rush basis for analysis.

3. Provide PCB information to Environmental Services for reporting purposes and coordination of cleanup efforts.

Cleanup Action for Non-PCB Spills

1. Except for small incidental non-PCB spills, spill cleanup activities will be conducted by ORU's spill response contractor.

2. The primary cleanup procedure to be used is the mechanical removal of spilled oil/dielectric fluid. Surfaces should be washed with a detergent solution, taking measures to prevent wash water from entering any drains or bodies of water. Oily soil, stone, and or vegetation must be removed. Absorbents should used for containment and skimming of oil from any impacted water.

Cleanup Action for PCB Spills

See PCB Spill Response Procedures (Attachment V).

AVAILABLE RESOURCES

1. Company and contractor manpower will be committed to spill response and cleanup as required.

2. Equipment - Spill containment materials will be available in each of the divisional rooms. Backhoes and front loaders are available from the Operations Department. Mobile tankers with a capacity of 1,500 gallons each are available from the Substation Department for emergency oil storage. Contractor equipment is available as required.

3. Commercial Cleanup Contractors - A cleanup contractor is available on a 24-hour on-call basis as outlined in the Spill Notification Procedures. Environmental Services and/or the substation supervisor are authorized to call for assistance.

ATTACHMENT V

PCB SPILL RESPONSE PROCEDURES

ATTACHMENT V

PCB SPILL RESPONSE PROCEDURES

SECTION A - CLEANUP OF NEW SPILLS

Procedure Intent

The following procedures have been developed by Orange and Rockland Utilities, Inc. to meet requirements for the cleanup of new spills resulting from the release of materials containing PCBs at concentrations of 50 parts per million (ppm) or greater. Old spills will be cleaned in accordance with the procedures described later in this attachment.

Spill Policy Exclusions

The following spills are subject to notification requirements, but not to the specific cleanup standards of the spill policy as described in the following procedures. However, cleanup of these spills must be initiated as soon as possible to minimize the spread of contamination, while awaiting further instructions from USEPA Region II.

- Spills that result in the direct contamination of surface waters.
- Spills that result in the direct contamination of sewers and sewage treatment plants.
- Spills that result in the direct contamination of private or public sources of drinking water or distribution systems.
- Spills that migrate to and contaminate surface waters, sewers, and drinking water supplies before cleanup has been completed in accordance with the spill policy.
- Spills that contaminate vegetable gardens and animal grazing areas (e.g., horse/cow pastures, zoos, etc.). Cleanup of these areas must be performed in accordance with PCB Spill Response Procedures as appropriate, pending specific instructions from USEPA Region II.

In these situations, USEPA Region II is to determine site-specific cleanup requirements.

PCB Spill Response Procedures

A. **Low Concentration Spills.** Requirements for cleanup of low concentration spills which involve less than 1 lb. of low concentration PCBs (<500 ppm or spills of less than 270 gallons of untested mineral oil).

1. **Immediate Action.**

   a. Contain spill and prevent water contamination by blocking, diking, or diverting oil pathway from water body, storm drain, and/or indoor drains.

   b. Make appropriate notifications as outlined in Spill Notification Procedures (Attachment III).

c. Restrict access to spill area.

2. **Cleanup**.

a. Solid surfaces must be double washed/rinsed after absorbing or wiping all free oil from surfaces with Speedi-Dri or equivalent absorbent and/or rags. A contaminated surface must be scrubbed completely with the detergent and absorbed or wiped from the surface following each cleaning. All cleaning materials must be collected and containerized as PCB spill debris.

b. All soil, gravel, stone, vegetation, grass, etc. within the visible spill area, plus a 1-foot lateral buffer, must be removed from the spill site and placed in approved (17C) drums. The area must be restored to its original configuration with clean soil (less than 1 ppm PCB).

c. Cleanup must be completed within 48 hours unless delayed by emergency operating conditions or extreme weather conditions. Weekend and overtime costs are not acceptable reason to delay response.

3. **Post-Cleanup Sampling.** Not required, but may be needed depending upon spill circumstances.

4. **Recordkeeping**. Cleanup must be documented by completion of the "PCB Spill Cleanup Record and Certification for Low Concentration Spills" form (found at the end of this attachment). These records must be maintained for five years.

B. **High Concentration Spills.** Requirements for cleanup of high concentration spills (>500 ppm; spill involving 1 lb. or more of low concentration PCBs, or 270 gallons or more of untested mineral oil).

1. **Immediate Action**.

a. Contain spill as outlined in Oil Spill Response Procedures (Attachment IV).

b. Make appropriate notifications as outlined in Spill Notification Procedures (Attachment III).

c. Cordon off or otherwise delineate and restrict area encompassing any visible traces of PCB fluid plus a 3-foot buffer. Place clearly visible signs advising persons to avoid the area.

d. Record and document the area of visible contamination, noting the extent of the visible trace areas and the center of the visible trace areas. If visible traces are not evident, this fact must be documented and USEPA contacted for guidance.

2. **Cleanup.** Must be initiated as soon as possible, but not later than 24 hours (or 48 hours for PCB transformers).

a. Visible oil must be absorbed or wiped from solid surfaces with absorbent and/or rags. All absorbents must be placed in approved (17C) drums.

b. All solid surfaces (concrete, wood, metal, etc.) must be double washed/rinsed. All cleanup material must be collected and containerized as PCB spill debris.

c. All oil-soaked soil, gravel, stone, vegetation, grass, etc. must be removed and placed into approved containers.

3. **Post-Cleanup Sampling.** Surfaces must be decontaminated to the following levels as measured by standard wipe tests and soil sampling. Spills in outdoor electrical substations that are located more than 325 feet from residential/commercial areas must be cleaned up as follows:

a. Contaminated solid surfaces must be decontaminated to a PCB concentration of 100 μg/100 cm^2.

b. Soil contaminated by the spill must be removed and cleaned to 25 ppm PCB or to 50 ppm PCBs, provided that a label or notice is visibly placed in the area where soil exceeds 25 ppm.

c. Site should be restored to original configuration.

Spills in restricted access areas other than outdoor electrical substations (i.e., industrial facilities) that are located more than 325 feet (0.1 kilometer) from residential/commercial areas must be cleaned up as follows:

- High contact industrial surfaces must be cleaned to 10 micrograms PCBs/100 cm^2.
- Low contact indoor impervious solid surfaces must be cleaned to 10 micrograms PCBs/100 cm^2.
- Low contact indoor non-impervious solid surfaces must be cleaned to 10 micrograms PCBs/100 cm^2 or, with USEPA's approval, to 100 micrograms PCBs/100 cm^2 and encapsulated.
- Low contact outdoor solid surfaces (both impervious and non-impervious) must be cleaned to 100 micrograms PCBs/100 cm^2.
- Contaminated soil must be cleaned to 25 ppm PCBs.

Spills in non-restricted access areas (i.e., residential and commercial areas) must be cleaned up as follows:

- Easily replaceable household items (e.g., toys, furniture) must be disposed of and replaced.
- Indoor solid surfaces and outdoor high contact residential/commercial surfaces must be cleaned to 10 micrograms PCBs/100 cm^2.
- Indoor vault areas and low contact residential/commercial outdoor impervious surfaces must be cleaned to 10 micrograms PCBs/100 cm^2.

- Low contact, outdoor, non-impervious surfaces must be cleaned to 10 micrograms per 100 cm^2 or, with USEPA's approval, to 100 micrograms per 100 cm^2 and encapsulated (e.g., with epoxy).

- Contaminated soil must be cleaned to 10 ppm PCBs or less, provided: (1) the area is excavated to a minimum depth of 10 inches; (2) the excavated soil is replaced with clean soil (less than 1 ppm PCBs); and (3) the area is returned to its original condition (e.g., turf replacement). USEPA's interpretation of this standard is that for residential and other non-restricted access areas, the recommended soil cleanup level from the ground surface to 10 inches below ground surface is less than 1 ppm PCBs. Therefore, soil may be excavated to less than 10 inches provided that the remaining soil down to 10 inches contains less than 1 ppm PCBs.

4. **Recordkeeping.** Cleanup must be documented with records of decontamination which must be maintained for five years and consist of the following.

   a. Identification of the source of the spill (i.e., type of equipment).

   b. Estimated or actual date and time of spill occurrence.

   c. Date and time of cleanup completion. (If cleanup was delayed by emergency, document nature and duration of the delay.)

   d. Brief description of the spill location and the nature of the materials contaminated.

   e. Description of pre-cleanup sampling data and methodology used to establish spill boundaries if visible traces are insufficient.

   f. Description of the solid surfaces cleaned and cleaning method.

   g. Approximate depth of soil excavation and the amount of soil removed.

   h. Post-cleanup verification sampling data.

   i. Not required, but suggested as useful, estimated cost of cleanup.

SECTION B - CLEANUP OF OLD SPILLS

Applicability

This procedure applies to the cleanup of "old" spills (as defined in the Introduction section below) resulting from the release of materials containing 50 ppm or greater PCBs. The PCB concentration in the material spilled (if known), as opposed to the PCB concentration in the material onto which the PCBs were spilled, governs whether the spill is classified as a PCB spill (i.e., 50 ppm or greater). If the specific source of the spill is unknown, cleanup waste can be managed based on its actual PCB concentration (e.g., as non-PCB, non-hazardous waste if the waste itself contains less than 50 ppm PCBs).

Introduction

Old (or existing) PCB spills are defined as any release of materials containing 50 ppm or greater PCBs that occurred before May 4, 1987. An old spill also includes any PCB release since May 4, 1987 that was not initially thought to be a PCB spill, but new information indicates that 50 ppm or greater PCBs was released, and the time periods for notification to government authorities (if applicable) and for cleanup have expired. No established guidelines (e.g., the USEPA spill cleanup policy for new PCB spills) exist for the cleanup of old spills. Cleanup standards for old spills are established by USEPA and/or NYSDEC on a case-by-case basis. Additional cleanup is not necessarily required for: (1) old spills that have been cleaned up; and (2) spills that occurred before April 18, 1978. Old spills are likely to involve more pervasive PCB contamination than are new spills and are generally more difficult to clean. This procedure discusses how to assess PCB contamination from an old spill, and how to establish site-specific cleanup guidelines with USEPA authorities.

Compliance Requirements

Old PCB spills are excluded form the USEPA PCB spill cleanup policy by the Toxic Substances Control Act (TSCA) for the following reasons:

1. The policy was not intended to require additional cleanup where a cleanup had already been performed in accordance with requirements imposed by the USEPA regional office, nor was the policy intended to interfere with ongoing litigation of enforcement actions concerning PCB spill cleanup.

2. Old spills require a site-by-site evaluation due to the likelihood that an old spill site involves more pervasive PCB contamination and would generally be more difficult to remediate than new spills.

Old spills must be decontaminated in accordance with requirements established at the discretion of USEPA Region II.

Facilities are not required to notify USEPA of the discovery of an old spill. However, if no remedial action has been performed to address an old spill, the USEPA Region II office should be contacted for guidance.

A. **Assessment of PCB Contamination from an Old Spill.** If an old spill area is suspected at an Orange and Rockland facility or field location, the facility or site manager responsible for compliance must ensure that the possible presence of PCBs is determined through PCB sampling and analysis. Grab (not composite) soil samples should be collected and submitted to a commercial laboratory approved by the New York State Department of Health for PCB analysis.

   Solid surfaces must be sampled by a standard wipe test. A 10-centimeter by 10-centimeter surface area is wiped with a gauze pad or glass wool or known size that has been saturated with hexane. It is important that the wipe be performed very quickly before the hexane evaporates. USEPA strongly recommends that the wiping medium be prepared with hexane in the laboratory and placed in a sealed vial or jar prior to use. The wiping medium is then submitted to the laboratory for analysis, and results are reported in micrograms per 100 square centimeters.

If PCBs have soaked into a non-impervious solid surface, such as concrete, the wipe test may reveal a relatively low result. The material may exhibit higher PCB concentrations below the surface. Inadvertently shipping PCB-contaminated concrete to a municipal landfill may result in future environmental liability.

B. **Development of a Cleanup Strategy.** If testing indicates that 1 lb. or more of PCBs was released to the environment (i.e., soil, bluestone, sediment, sewers, or surface of groundwater), then the National Response Center must be notified immediately. NYSDEC and the appropriate local agency must also be notified.

Once it is determined that a cleanup may be required, the USEPA Region II Office of Pesticides and Toxic Substances Branch and NYSDEC should be contacted by the EH & S Representative. The office is located at 2890 Woodbridge Avenue, MS-l05, Edison, NJ 08837.

Note: A cleanup strategy should be developed before contacting USEPA. Environmental Services will coordinate these efforts.

Definitions

A. **Impervious Solid Surfaces**. Solid surfaces that are non-porous and unlikely to absorb spilled PCBs within the short period of time required for spill cleanup under USEPA's spill cleanup policy. Impervious surfaces include, but are not limited to, metals, glass, aluminum siding, and enameled or laminated surfaces.

B. **Non-impervious Solid Surfaces.** Solid surfaces that are porous and more likely to absorb spilled PCBs prior to completion of USEPA's spill cleanup requirements. Non-impervious surfaces include, but are not limited to, wood, concrete, asphalt, and plasterboard.

C. **Soil.** All vegetation, soils, and other ground media, including but not limited to, sand, grass, gravel, and oyster shells. It does not include concrete and asphalt.

PCB SPILL CLEANUP RECORD AND CERTIFICATION FOR LOW CONCENTRATION SPILLS

Date: _____ Time: _____

Equipment Type: _____ S/N(s): _____

Location:
Street: _____

Town: _____ County: _____

Pole #:_____

Spill Description:
Estimated Quantity Spilled: _____

Visible Traces on These Surfaces:
Soil: _____ Vehicles: _____

Roadway: _____ Shrub and Trees: _____

Sidewalk: _____ Gravel, Stone: _____

Grass (lawn): _____ Other Electrical Equipment: _____

Pole: _____ Concrete Pad: _____

Other (explain): _____

_____

Size of Area Affected: _____

Spill Boundaries: _____
(Sketch of spill area and 1-foot lateral buffer)

Depth and Quantity of Soil Excavated:_____

_____

Identify Cleaner Used: _____

Surfaces Double Washed/Rinsed:

Roadway: _____ Other Electrical Equipment: _____

Sidewalk: _____ Concrete Pad: _____

Pole: _____ Vehicles: _____

Other (explain): _____

Cleanup Completion Date: _____ Time: _____

Cleanup Delay Due To (over 48 hours): _____

_____

***** CERTIFICATION STATEMENT *****

I hereby certify as a designated representative of Orange and Rockland Utilities, Inc. that the cleanup requirements outlined in O&R's Spill Response Procedures have been met and the information contained in this report is true to the best of my knowledge.

Name _____

Title: _____

Signature: _____

Optional Information (if available)

Estimated Cost:

Man-hours: _____

Dollars: _____

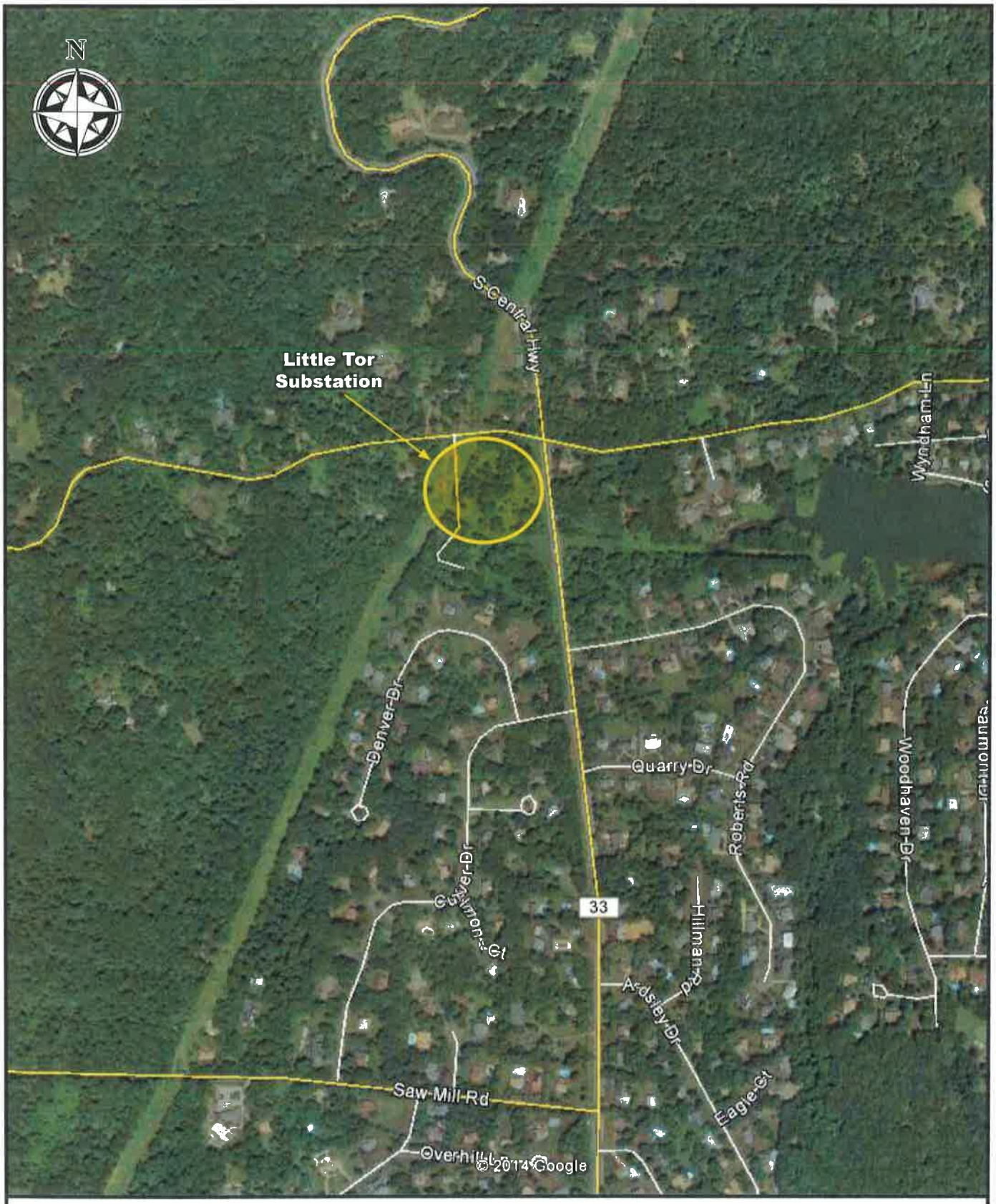
cc: Environmental Services Department

SPILL REPORTING AND CLEANUP REQUIREMENTS

Does the spilled oil/dielectric fluid contain 50 ppm or greater PCBs?	No	PCB spill cleanup policy does not apply.
	Yes	Report the spill as follows: • For 10 lbs. or greater of PCBs spilled, report spill to USEPA Region II as soon as possible but no later than 24 hours after discovery of spill. • For 1 lb. or greater of PCBs spilled to the environment, report spill to NRC immediately.
Did any amount of PCBs contaminate surface water, sewers, drinking water supplies, vegetable gardens or animal grazing areas?	No	
	Yes	Report spill to USEPA Region II as soon as possible after discovery of spill. Obtain site-specific cleanup requirements from USEPA.
Did the spill consist of less than 1 lb. of 50 to 499 ppm PCBs or less than 270 gallons of untested mineral oil?	No	
	Yes	Determine the spill area based on visible traces or: • Double-wash/rinse solid surfaces. <u>Do not hose down the oil spill.</u> • Clean indoor residential surfaces other than vault areas to 10 μg PCBs/100 cm^2. • Excavate all soil within the spill area, and return the area to original grade by backfilling with clean soil (less than 1 ppm PCBs). • Complete cleanup within 48 hours after becoming aware of the spill. Completion of the cleanup may be delayed under special circumstances, but document the reason for any delay.
Did the spill consist of 1 lb. or more of 50 to 499 ppm PCBs, 270 gallons or greater of untested mineral oil, or any amount of 500 ppm or greater PCBs?	No	
	Yes	Initiate cleanup of visible traces of contamination within 24 hours (or 48 hours for spills from PCB transformers) after becoming aware of the spill.*Initiation of the cleanup may be delayed beyond 24 hours under special circumstances, but document reason for any delay. <u>Do not hose down the oil spill</u>. Cordon off all visible traces of the spill as well as at least a 3-foot buffer. Post signs advising persons to avoid the area. Do not use PCB signs in areas accessible to the public. The facility must determine, record, and document the center and the extent of the area of visible contamination. If visible traces are not evident, this fact must be documented, and the USEPA Regional Office must be contacted for guidance. Follow specific cleanup requirements for spills in outdoor electrical substations, other restricted access areas, and non-restricted access areas as appropriate.

ATTACHMENT VI

FACILITY LOCATION MAP



DVIRKA AND BARTILUCCI CONSULTING ENGINEERS
A DIVISION OF D&B ENGINEERS AND ARCHITECTS, PC

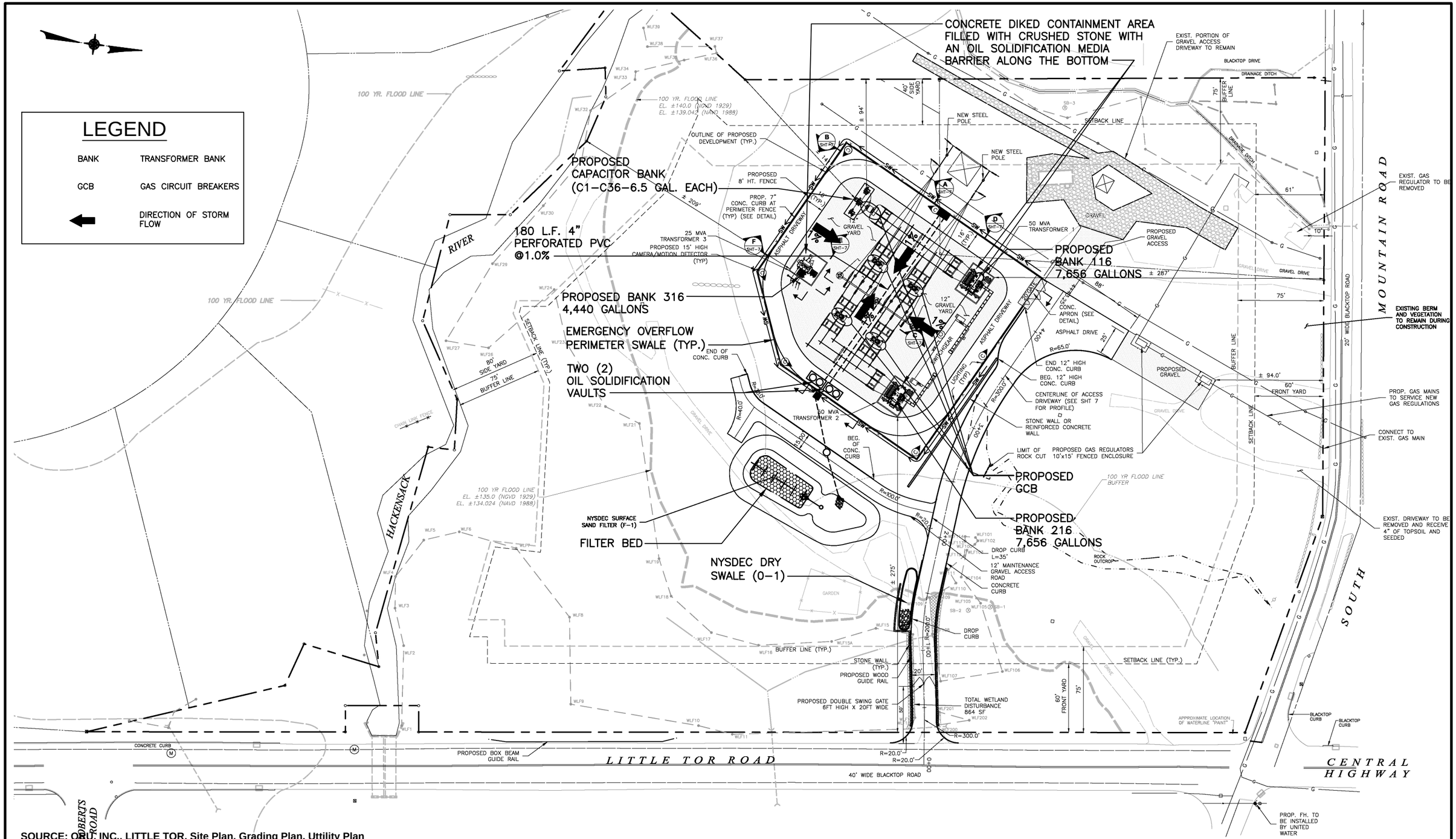
ORANGE AND ROCKLAND UTILITIES INC.
LITTLE TOR SUBSTATION

FACILITY LOCATION MAP
ATTACHMENT VI

3262-15 - Facility Location Map (Little Tor).indd (06/11/14 - 9:42 AM)

ATTACHMENT VII

FACILITY SITE PLAN



DVIRKA AND BARTILUCCI CONSULTING ENGINEERS
A DIVISION OF D&B ENGINEERS AND ARCHITECTS, P.C.

ORANGE AND ROCKLAND UTILITIES, INC.

LITTLE TOR SUBSTATION SPCC PLAN FACILITY
SITE PLAN

SCALE: N.T.S.

ATTACHMENT VII

F:\3262-15\SUB-STATION PLANS\3262-15-ORU-LITTLE TOR.dwg, LITTLE TOR, 10/15/2014 11:16:03 AM, kalesius

ATTACHMENT VIII

MONTHLY SUBSTATION INSPECTION FORM

GRX54 SUBSTATION SX REPORT 2013-05-01
PAGE: 1 WORK REQ: 1304759225
SP RULE: CHILD PROJ: 20415119
"THINK SAFETY *** WORK SAFELY" BUDGET ITEM: 10100709

TAKEN BY: WMS370C ON: 04/03/2013 @ 17.30 STATUS: 50 CO: 1 DIV: 1 JOB SVC: S
SUBST/SVC: 026/E CORPORATE DRIVE LOC: 026 (EQ#000003626)
CREW HDQTR: 0093SV RE HOURS: 0.50 DATE REQD: 05/02/2013
MR CODE: 01-11-0026 SR CODE: M01 #1 INSPECTION

WORK TO BE PERFORMED: #1 INSPECTION - CORPORATE DRIVE

COMMENTS: Complete 5-6-13

DELAY CODE: N/A

DIRECTIONS: OFF OF BLASEDALE RD

OUTAGE REQUEST# : N/A OUTAGE REQUIRED :
REQUEST SUBMITTED: OUTAGE SCHEDULED:
OUTAGE COMPLETED :

WORK ASSIGNMENT: CREW ID: N/A DATE ASSIGNED: @
WORK COMPLETION: CREW ID: N/A DATE ASSIGNED: @

FOLLOW-UP WORK REQD: SX ( ) RELATED WR#:

C/U CODE	DESCRIPTION	QUANT
NMR-.5MANHR	0.5 MAN HOUR FOR MR'S	1

REMARKS:
********** NO REMARKS AVAILABLE **********

** NUMBER OF STEPS ASSOCIATED WITH MR# 01-11-0026: 15
** PLEASE REFER TO THE FOLLOWING PAGES.

** CONTINUED ON NEXT PAGE...

** STEPS AND TASKS **

MR# 01-11-0026: #1 INSPECTION - CORPORATE DRIVE
SUBST/SVC: 026/E CORPORATE DRIVE LOC: 026 (EQ#000003626)
MR NOTES: N/A

MFR: N/A EQ GRP: 009 EQ TYP: 001 STYLE: N/A
VOLTAGE RATE: N/A CUR RATE: 0000
SERIAL NO: N/A QTY BIL KV: 0
EQP NOTES: N/A

STEP 1: GENERAL SUBSTATION INSPECTION

TEST EQUIPMENT: NONE
TEST PROCEDURE: PERFORM VISUAL INSPECTION
TYPE MEASURE: OK
STEP NOTES: N/A

TASK	ANSWER	LOW STANDARD	HIGH STANDARD
1 FIRE PROTECTION	✓	OK	
2 LIGHTING	✓	OK	
3 PANEL INDICATING LIG	✓	OK	
4 RELAY TARGETS	✓	OK	
5 POTHEADS	✓	OK	
6 PORCELAIN CLEANLINES	✓	OK	
7 HEATERS	✓	OK	
8 VENTILATORS	✓	OK	
9 TELEPHONES	✓	OK	
10 WEEDS	✓	OK	
11 YARD SURFACE	✓	OK	
12 TREE CLEARANCES	✓	OK	
13 FENCES	✓	OK	
14 GATES	✓	OK	
15 RODENT EVIDENCE	✓	OK	
16 HOUSEKEEPING	✓	OK	
17 LOCKS	✓	OK	
18 DANGER SIGNS	✓	OK	

TASK COMMENTS:

STEP 2: BUS INSPECTION

TEST EQUIPMENT: NONE
TEST PROCEDURE: PERFORM VISUAL INSPECTION
TYPE MEASURE: OK
STEP NOTES: N/A

TASK	ANSWER	LOW STANDARD	HIGH STANDARD
1 CONNECTIONS-CHECK	✓	OK	

** CONTINUED ON NEXT PAGE...

** STEPS AND TASKS **

2 CHECK INSULATORS	✓	OK
3 CHECK FITTINGS	✓	OK

TASK COMMENTS:

STEP 3: SWITCHES INSPECTION

TEST EQUIPMENT: NONE
TEST PROCEDURE: PERFORM VISUAL INSPECTION
TYPE MEASURE: OK
STEP NOTES: N/A

TASK	ANSWER	LOW STANDARD	HIGH STANDARD
1 CONNECTIONS-CHECK	✓	OK	
2 CHECK INSULATORS	✓	OK	

TASK COMMENTS:

STEP 4: INSTRUMENT TRANSFORMER INSPECTION

TEST EQUIPMENT: NONE
TEST PROCEDURE: PERFORM VISUAL INSPECTION
TYPE MEASURE: OK
STEP NOTES: N/A

TASK	ANSWER	LOW STANDARD	HIGH STANDARD
1 CONNECTIONS-CHECK	✓	OK	

TASK COMMENTS:

STEP 5: LIGHTNING ARRESTER INSPECTION

TEST EQUIPMENT: NONE
TEST PROCEDURE: PERFORM VISUAL INSPECTION
TYPE MEASURE: OK
STEP NOTES: N/A

TASK	ANSWER	LOW STANDARD	HIGH STANDARD
1 CONNECTIONS-CHECK	✓	OK	

** CONTINUED ON NEXT PAGE...

** STEPS AND TASKS **

2 CHECK PORCELAIN ✓ OK

TASK COMMENTS:

STEP 6: EQUIPMENT GROUNDS INSPECTION

TEST EQUIPMENT: NONE
TEST PROCEDURE: PERFORM VISUAL INSPECTION
TYPE MEASURE: OK
STEP NOTES: N/A

TASK	ANSWER	LOW STANDARD	HIGH STANDARD
1 INSTRUMENT TRSFR.	✓	OK	
2 POWER TRSFR.	✓	OK	
3 SWITCHES	✓	OK	
4 BREAKERS	✓	OK	
5 SWITCH HANDLES	✓	OK	
6 STRUCTURE	✓	OK	
7 FENCES	✓	OK	
8 GATES	✓	OK	

TASK COMMENTS:

STEP 7: TAP CHANGER INSPECTION

TEST EQUIPMENT: NONE
TEST PROCEDURE: PERFORM VISUAL INSPECTION
TYPE MEASURE: OK
STEP NOTES: N/A

TASK	ANSWER	LOW STANDARD	HIGH STANDARD
1 CONNECTIONS-CHECK	✓	OK	
2 BUSHINGS	✓	OK	
3 TANKS & RADIATORS	✓	OK	
4 TEMPERATURE	✓	OK	
5 OIL LEVEL	✓	OK	
6 LEAKS	✓	OK	

** CONTINUED ON NEXT PAGE...

** STEPS AND TASKS **

7 DRIVE MECHANISM	✓	OK

TASK COMMENTS:

STEP 8: TRANSFORMER INSPECTION

TEST EQUIPMENT: NONE
TEST PROCEDURE: PERFORM VISUAL INSPECTION
TYPE MEASURE: OK
STEP NOTES: N/A

TASK	ANSWER	LOW STANDARD	HIGH STANDARD
1 CONNECTIONS-CHECK	✓	OK	
2 BUSHINGS	✓	OK	
3 TANKS & RADIATORS	✓	OK	
4 TEMPERATURE	✓	OK	
5 OIL LEVEL	✓	OK	
6 LEAKS	✓	OK	
7 GAUGES	✓	OK	
8 FANS	✓	OK	

TASK COMMENTS:

STEP 9: BREAKER INSPECTION

TEST EQUIPMENT: NONE
TEST PROCEDURE: PERFORM VISUAL INSPECTION
TYPE MEASURE: OK
STEP NOTES: N/A

TASK	ANSWER	LOW STANDARD	HIGH STANDARD
1 CONNECTIONS-CHECK	✓	OK	
2 BUSHINGS	✓	OK	
3 TANKS	✓	OK	
4 LEAKS	✓	OK	
5 SF6 CHECK	✓	OK	

TASK COMMENTS:

STEP 10: BATTERY CHECKS-MONTHLY(130V)

TEST EQUIPMENT: VOLTMETER
TEST PROCEDURE: TAKE REQUIRED READINGS
TYPE MEASURE: VOLTS
STEP NOTES: USE PROPER PERSONAL PROTECTIVE GEAR

TASK	ANSWER	LOW STANDARD	HIGH STANDARD
1 PILOT CELL VOLTAGE	2.19	0000000000002.000000	0000000000002.500000

** STEPS AND TASKS **

2 CHARGING VOLTAGE	132.1	0000000000128.000000	0000000000137.000000
3 CHARGING AMPS	6.03	0000000000000.100000	0000000000025.000000
4 WATER LEVEL	OK	0000000000000.000000	9999999999999.999999

TASK COMMENTS:

STEP 11: NITROGEN CHECK - BK. 126

TEST EQUIPMENT: NONE
TEST PROCEDURE: CHECK GAUGES FOR PROPER PRESSURE
TYPE MEASURE: PSI
STEP NOTES: N/A

TASK	ANSWER	LOW STANDARD	HIGH STANDARD
1 BOTTLE	1800	0000000000400.000000	0000000002200.000000
2 TRANSFORMER	3.5	0000000000000.500000	0000000000006.000000

TASK COMMENTS:

STEP 12: NITROGEN CHECK - BK. 226

TEST EQUIPMENT: NONE
TEST PROCEDURE: CHECK GAUGES FOR PROPER PRESSURE
TYPE MEASURE: PSI
STEP NOTES: N/A

TASK	ANSWER	LOW STANDARD	HIGH STANDARD
1 BOTTLE	700	0000000000400.000000	0000000002200.000000
2 TRANSFORMER	4	0000000000000.500000	0000000000006.000000

TASK COMMENTS:

STEP 13: NITROGEN CHECK - BK. 326

TEST EQUIPMENT: NONE
TEST PROCEDURE: CHECK GAUGES FOR PROPER PRESSURE
TYPE MEASURE: PSI
STEP NOTES: N/A

TASK	ANSWER	LOW STANDARD	HIGH STANDARD
1 BOTTLE	700	0000000000400.000000	0000000002200.000000

** CONTINUED ON NEXT PAGE...

** STEPS AND TASKS **

2 TRANSFORMER	4	0000000000000.500000	0000000000006.000000

TASK COMMENTS:

STEP 14: COUNTER READINGS - CORPORATE DRIVE

TEST EQUIPMENT: N/A
TEST PROCEDURE: AS PER PROCEDURE
TYPE MEASURE: N/A
STEP NOTES: RECORD COUNTER READINGS FOR ALL BREAKERS/TRANSFORMERS

TASK	ANSWER	LOW STANDARD	HIGH STANDARD
1 1-26-2 COUNTERS	56	0000000000000.000000	9999999999999.999999
2 2-26-2 COUNTERS	53	0000000000000.000000	9999999999999.999999
3 3-26-2 COUNTERS	74	0000000000000.000000	9999999999999.999999
4 5-26-2 COUNTERS	68	0000000000000.000000	9999999999999.999999
5 6-26-2 COUNTERS	66	0000000000000.000000	9999999999999.999999
6 BK. 126 COUNTERS	2426	0000000000000.000000	9999999999999.999999
7 BK. 226 COUNTERS	2347	0000000000000.000000	9999999999999.999999
8 BK. 326 COUNTERS	2255	0000000000000.000000	9999999999999.999999
9 126-2B COUNTERS	139	0000000000000.000000	9999999999999.999999
10 26-1-2B COUNTERS	123	0000000000000.000000	9999999999999.999999
11 26-2-2B COUNTERS	134	0000000000000.000000	9999999999999.999999
12 26-3-2B COUNTERS	106	0000000000000.000000	9999999999999.999999
13 26-4-2B COUNTERS	99	0000000000000.000000	9999999999999.999999
14 126T226-2B COUNTERS	164	0000000000000.000000	9999999999999.999999
15 226-2B COUNTERS	127	0000000000000.000000	9999999999999.999999
16 26-5-2B COUNTERS	116	0000000000000.000000	9999999999999.999999
17 26-6-2B COUNTERS	122	0000000000000.000000	9999999999999.999999
18 26-7-2B COUNTERS	101	0000000000000.000000	9999999999999.999999
19 26-8-2B COUNTERS	98	0000000000000.000000	9999999999999.999999
20 226T326-2B COUNTERS	113	0000000000000.000000	9999999999999.999999
21 326-2B COUNTERS	143	0000000000000.000000	9999999999999.999999
22 26-9-2B COUNTERS	167	0000000000000.000000	9999999999999.999999
23 26-10-2B COUNTERS	148	0000000000000.000000	9999999999999.999999
24 26-11-2B COUNTERS	277	0000000000000.000000	9999999999999.999999
25 26-12-2B COUNTERS	87	0000000000000.000000	9999999999999.999999

TASK COMMENTS:

STEP 15: STATION LANDSCAPE INSPECTION

TEST EQUIPMENT: N/A
TEST PROCEDURE: VISUALLY INSPECT TREES/SHRUBS/GRASS ETC.
TYPE MEASURE: OK
STEP NOTES: CHECK TO SEE IF ANY GRASS IS MOWED, CHECK FOR DEAD TREES

TASK	ANSWER	LOW STANDARD	HIGH STANDARD
1 STEP COMPLETE	✓	OK	

ATTACHMENT IX

AMENDMENT LOG

ATTACHMENT IX

AMENDMENT LOG

All technical and/or substantive amendments to the plan, whether undertaken as part of the five-year review or otherwise, must be certified by a Professional Engineer (P.E.). Technical amendments require engineering judgment and occur as a result of changes in facility design, construction, operation, or maintenance that may materially affect the facility's potential to discharge oil. Examples of changes that may require amendment of the Plan include, but are not limited to: commissioning or decommissioning containers; replacement, reconstruction, or movement of containers; reconstruction, replacement, or installation of piping systems; construction or demolition that might alter secondary containment structures; changes of product or service; or new standard operation or maintenance procedures at a facility. An amendment must be prepared within six months, and implemented as soon as possible, but not later than six months following preparation of the amendment. Technical amendments require a P.E. certification and, in such case, the certification of this SPCC Plan must be provided in Section 2 – Certification Information.

Administrative amendments may be made by Orange and Rockland Utilities, Inc. without a P.E. certification. Examples of amendments that are *not* considered technical and thus do not require P.E. certification include changes to names or telephone numbers. Amendments which are incorporated into the body of this Plan shall be recorded below, noting the date of this incorporation and description of the amendment.

SPCC Plan Amendments

P.E. Certification Required (Yes/No)	Date	Responsible Person	Description	Page(s)
Yes	October 2014	Brian M. Veith, P.E.	Updated SPCC Plan	Pages 1-13; Attachment I - IX

P.E. Certification Required (Yes/No)	Date	Responsible Person	Description	Page(s)