Appendix 3-E: Wetland Restoration Creation Plan

Cricket Valley Energy (CVE)

Area W2-A Wetland Restoration/Creation and Adjacent Area Restoration Plan

To compensate for both the future permanent loss of approximately 0.05 acres of jointly regulated NYSDEC and USACE freshwater wetlands and 0.8 acres of NYSDEC-regulated Adjacent Area, as well as temporary disturbance to approximately 1.0 acres of Adjacent Area proximal to Wetland 2 (Tables 1 and 2), Cricket Valley Energy (CVE) proposes this Wetland Restoration/Creation and Adjacent Area Restoration Plan (the Plan). The Plan provides for improvements both within and beyond the limits of Wetland Restoration Work Area W2-A (Sheets 1, 2, and 3; Plates 1, 2 and 3).

Area W2-A as designated for the purpose of this Plan, is a funnel-shaped section of NYSDEC Wetland 2 and comprised of both regulated freshwater wetlands (~0.6-acres) and Adjacent Area (~0.4-acres). Area W2-A is located in the southern portion of Wetland 2 and terminates at the base of the future CVE facility access road. The designation of this specific area represents proposed disturbance resulting from removing slag and debris resulting from the site's prior industrial uses, and not disturbance directly associated with facility construction (Sheet 1).

Wetland Restoration and Creation

The design for Area W2-A envisions restoring a significantly degraded wetland pocket in addition to the surrounding Adjacent Area (Sheet 2). The Adjacent Area surrounding this wetland has a moderate to steep slope comprised primarily of buried and exposed industrial waste materials. The dominant vegetative cover-type within Area W2-A is characterized by sparsely distributed and stunted *P. australis*. The predominant sediment/soil matrix in existing wetland Area W2-A is comprised of what appears to be residual sawdust-like waste product generated by the former on-site industrial operation. As part of future site clean-up activities, industrial waste materials will be removed, effectively lowering existing elevations and, therefore, providing an opportunity to create an open water area, as well as uniformly extending the existing wetland limits to the east and west to create 0.05 acres of emergent zone (Sheets 2 and 3).

Open water habitat is currently limited in Wetland W2 given the expanse of *P. australis*. Open water provides expanded opportunities for other wildlife species and wetland functions not now afforded within Wetland W2. The open water area below contour 420' will be allowed to naturally revegetate as based on existing hydrogeologic conditions within Wetland 2; it is anticipated that this zone will be submerged at depths ranging from 0.5 – 3 feet for the majority of the growing season. In time, the shallow depth of this wetland will encourage rooted, floating and emergent growth. Areas between contour 420'-424' (which will include the created 0.05 acres of emergent zone), are anticipated to experience natural, seasonally fluctuating water levels. This will result in relatively extended periods of exposed saturated substrate during the growing season's warmer/drier months. Therefore, the wetland areas between contour 420'-424' will be broadcast seeded with an appropriate wetland seed mix at a rate of 15 pounds per acre comprised of native herbaceous species to create the emergent area. It is anticipated that over time, an assemblage of plant species adapted to these saturated/flooded conditions will become recruited from the surrounding environment and become established in this wetland. In time, a natural distribution pattern of *P. australis* interspersed with more desirable species should become established at least in some areas. Note that although *P. australis* is not generally viewed as "desirable" from a wildlife standpoint, it does provide important benefits such as sediment retention, water quality treatment, nutrient assimilation, and erosion control. In addition, some species of wading and passerine birds utilize *P. australis* stands for

feeding and cover while aquatic mammals such as muskrat feed on the rhizomes in addition to using the above ground stems to create seasonal dens.

Adjacent Area Restoration

Beyond the limits of Area W2-A, a total of approximately 0.9 acres comprised of additional Adjacent Area (~0.6-acres) and bordering upland area (~0.3-acres) may be temporarily disturbed, or may be immediately adjacent to areas temporarily disturbed, as part of facility and bioretention basin construction (Sheet 3). This 0.9 acre area is characterized by relatively steep to moderate slopes with vegetation consisting of mostly deciduous tree/shrub species at varying densities, as well as isolated specimens/small pockets of evergreens, predominantly red cedar. These disturbed areas will be restored by re-planting; vegetation will predominantly consist of shrub/tree species both within the 100-foot Adjacent Area limit (~0.6-acres) and bordering upland area (~0.3-acres). Some additional areas within a 1.8-acre portion of the Adjacent Area that are not currently wooded will be selectively replanted as shown on the attached Sheets and Plates.

The Plan specifies replanting with native shrubs and/or trees, except where not suitable from a site security and operations standpoint. For example and as shown on Sheet 3, areas immediately proximate to bioretention basin outlets will be stabilized and planted with native grasses and ground cover plants. Plates 1 and 2 illustrate a box culvert design consisting of erosion control matting seeded with a conservation mix and planted with shrubs transitioning to a naturally designed revetment consisting of logs and rootwads (tree trunk with roots attached) to be secured with boulders. In this instance within the Adjacent Area, the culvert outlet area includes a two-foot deep plunge pool that flows through a boulder lined overflow area prior to entering the wetland. The slopes on either side of both the plunge pool and overflow area will be stabilized with erosion control matting and both seeded with a conservation mix and planted with shrubs. Additionally, at the interface of these slopes, a row consisting of a combination of logs, boulders and rootwads will be installed to function as revetment (Plate 2). As illustrated in the design for the box culvert, areas where woody species cannot be planted would be designed for planting with herbaceous species and stabilized with erosion matting and seeded at a rate of 15 pounds per acre. This approach will maximize erosion control and flow attenuation while also preventing the advancement of woody roots which could potentially compromise bioretention basin function or the integrity of the outlet structure.

Although not specifically depicted as part of this Plan, areas where visibility, safety, access and/or overhead clearances necessitate will be planted accordingly with species that are suitable from a height or crown cover perspective. This would include areas immediately proximate to developed areas that could potentially be damaged by advancing roots, broken limbs and fallen trees as well as impede security, maintenance, access/egress and structural function.

Likewise, advancing woody roots similarly could be an impediment to underground piping and electric banks if located too close to such installations. Tree limbs can also be a hindrance if located in the vicinity of plant fencing. Site security issues would include facilitating site access/egress to potential trespassers via tree branches overhanging the fence line, impede maintenance/cleaning outside the perimeter fence thereby reducing line-of-sight to security personnel as well as increase potential damage to fencing itself resulting from fallen limbs and/or toppled trunks. To mitigate potential perimeter fencing

security issues, shrubs and trees would be planted a minimum distance of 15 feet from the fence line. These areas would be planted and stabilized, however, with suitable ground cover species.

Adjacent Areas proximal to the limit of disturbance and located beyond both Area W2-A and temporary construction areas (~1.8 acres), will be targeted for selective re-planting to either mitigate unanticipated impacts resulting from site construction or, introduce new specimens to increase vegetative density (and thus wetlands protection) in areas of relative open canopy (Sheet 3).

For areas between the limits of development and non-jurisdictional Wetland 1, restoration will mimic that specified for Wetland 2. Similar to Wetland Restoration Work Area W2-A, grading of soils will be followed by application of an appropriate wetland seed mix at a rate of 15 pounds per acre to restore emergent area with native herbaceous species.

Planting Details – Species Types and Densities

Native tree/shrub species will be installed in the Adjacent Areas and bordering upland areas as designated at a density of 436 specimens per acre (Sheet 3). Achieving this density will be the result of spacing specimens proposed for planting within 10-feet of each other and orienting them on center. Table 3 summarizes candidate tree/shrub species proposed for planting. Others can be proposed if available and suitable for local site conditions or, to introduce additional diversity and wildlife values. To stabilize soil and promote native vegetative growth between specimens, areas will be broadcast seeded with an upland seed mix at a rate of 15 pounds per acre comprised of native herbaceous species.

It should be noted that species shown in Table 3 represent an example of specimens that could potentially be planted and by no means represents an exhaustive list of candidate shrub and trees to be included in the final planting plan. Although these species are commonly available in the native plant nursery market, circumstances beyond the control of the contractor performing this work could potentially exclude the selection of a particular species for restoration planting. Examples of such circumstances include, but are not limited to:

- Particular species out of regional stock from multiple nursery suppliers
- Particular species is in stock but plants are not of the size specified for planting
- Particular species is in stock but plants are not free of disease (e.g. cedar-apple rust afflicting red cedar) and, therefore, need to be rejected
- Planting work occurs in the fall and therefore precludes the use of Fall Transplant Hazard species (i.e., red cedar, white pine and gray birch).

Therefore, prior to completion of construction and in advance of initiating the planting component of restoration work, the list of species in Table 3, if necessary, can be expanded to replace species not accommodated by the scheduled planting season and/or if for whatever reason healthy specimens are not available from regional nursery supplier(s).

Table 1 Total Wetland Impacts							
(a)	**(b)**	**(c)**	**(d)**	**(e)**	**(f)**	**(g)**	**(h)**
Wetland Number and Jurisdictional Status	**Jurisdictional Status**	**Total Wetland Area (acres)**	**Wetland Area Temporarily Disturbed and Restored (acres)**	**Wetland Area Permanently Altered (acres)**	**Wetland Area Permanently Lost (acres)**	**New Wetland Area Created (acres)**	**Total Wetland Net Loss (acres) (f) + (g)**
Wetland 1	Non-jurisdictional	1.7	0.0	1.5	-0.20	0.0	N/A[1]
Wetland 2	Federal and State	8.7	0.6	0.0	-0.05	0.05	0.0
Wetland 3A	Non-jurisdictional	0.6	-	-	-	-	-
Wetland 3B	Federal	.41	-	-	-	-	-
Drainage Swale (Intermittent Stream)	Federal	.04	.001	.003 (rip rap within stream)[2]	-	-	-

Table 2 Total Adjacent Area Impacts (see Wetland Restoration/Creation Plan Sheets 1 through 3)					
(a)	**(b)**	**(c)**	**(d)**	**(e)**	**(f)**
NYSDEC-Regulated Resource	**Adjacent Area Temporarily Disturbed/Restored Due to Facility Construction and Bioretention Areas[3]**	**Adjacent Area Temporarily Disturbed /Restored due to Waste Excavation[4]**	**Total Adjacent Area Temporary Disturbance/ Restoration (b)+(c)**	**Adjacent Area Permanently Lost (due to facility construction)[5]**	**Adjacent Area selectively replanted outside of proposed limits of construction[6]**
Adjacent Area to Wetland 2	0.6	0.4	1.0	0.8	1.8

[1] Earthen areas surrounding non-jurisdictional Wetland 1 adjacent to permanent development will be planted with native species similar to that proposed for Wetland 2.

[2] See Plate 3 – Conceptual Subsurface Sewage Disposal System and Stormwater Management Plan.

[3] See Wetland Restoration/Creation Plans Sheet 3, Note 4.

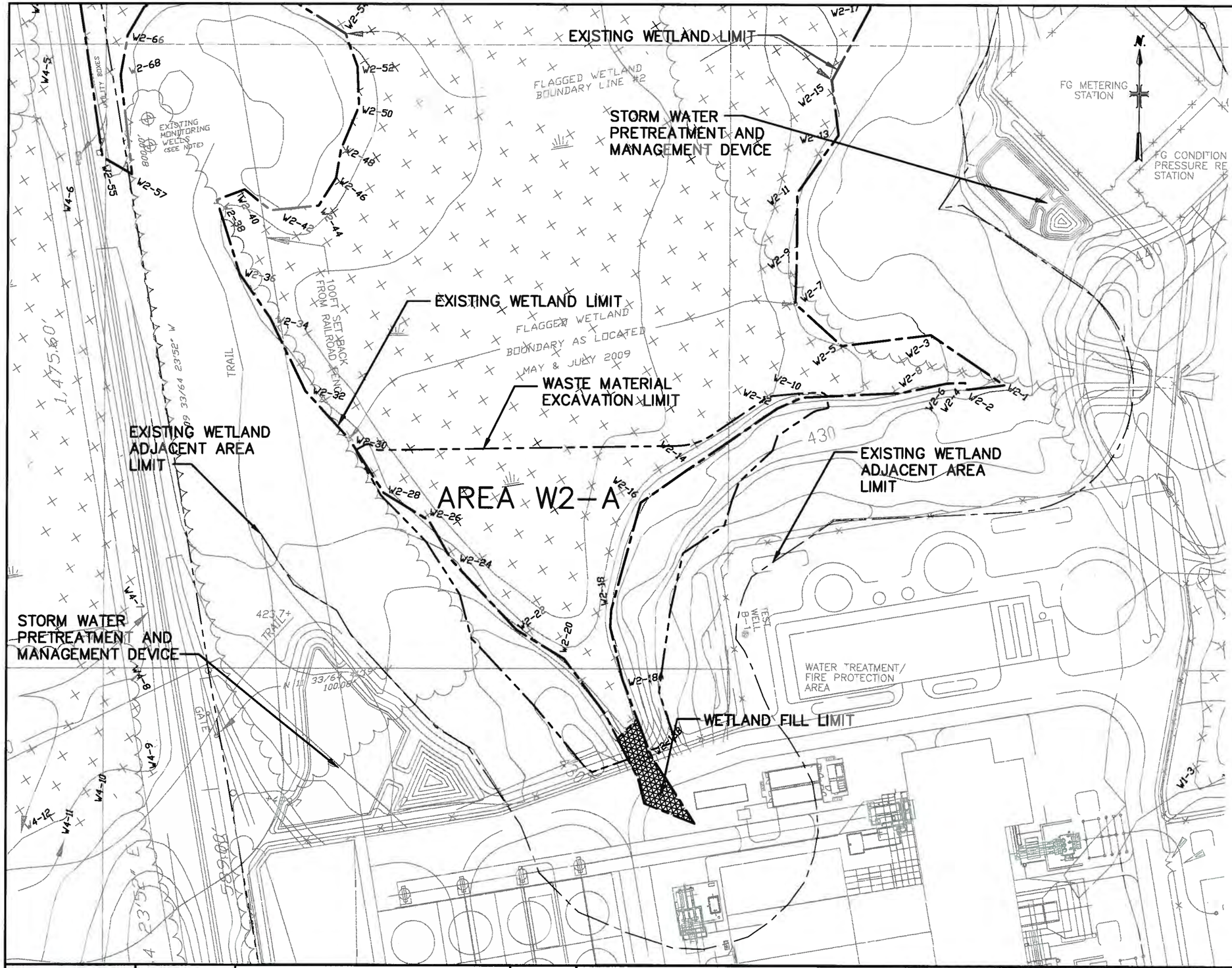
[4] See Wetland Restoration Creation Plan Sheet 3, Note 5.

[5] Area within existing Adjacent Area that will be filled due to plant construction.

[6] See Wetland Restoration Creation Plan Sheet 3, Note 3.

Table 3
Candidate Tree/Shrub Species

Contour (feet)	Latin Name	Common Name	Regional Ind. Status	National Ind. Status	Vegetative Layer
424-438	*Betula populifolia*	gray birch	FAC	FAC	Tree
424-438	*Juniperus virginiana*	eastern red cedar	FACU	FACU-;FACU	Tree
424-438	*Prunus serotina*	black cherry	FACU	FACU	Tree
424-438	*Rhus typhina*	staghorn sumac	UPL	NI	Shrub
424-438	*Pinus strobus*	white pine	FACU	FACU	Tree
424-438	*Acer negundo*	box elder	FAC+	FAC, FACW	Tree
424-438	*Populus tremula*	quaking aspen	FACU	FACU, FAC+	Tree
424-438	*Acer rubrum*	red maple	FAC	FAC	Tree
424-438	*Gleditsia triacanthos*	honey locust	FAC-	FACU, FAC	Tree



Total Wetland Impacts

(a) Wetland Number and Jurisdictional Status	(b) Jurisdictional Status	(c) Total Wetland Area (acres)	(d) Wetland Area Temporarily Disturbed and Restored (acres)	(e) Wetland Area Permanently Altered (acres)	(f) Wetland Area Permanently Lost (acres)	(g) New Wetland Area Created (acres)	(h) Total Wetland Net Loss (f) + (g)
Wetland 1	Non-jurisdictional	1.7	0.0	1.5	-0.20	0.0	N/A[1]
Wetland 2	Federal and State	8.7	0.6	0.0	-0.05	0.05	0.0
Wetland 3A	Non-jurisdictional	0.6	-	-	-	-	-
Wetland 3B	Federal	.41	-	-	-	-	-
Drainage Swale (Intermittent Stream)	Federal	.04	.001	.003 (rip rap within stream)[6]	-	-	-

Total Adjacent Area Impacts (see Wetland Restoration/Creation Plan Sheets 1 through 3)

(a) NYSDEC-Regulated Resource	(b) Adjacent Area Restored Area Temporarily Disturbed/Restored Due to Facility Construction and Bioretention Areas[3]	(c) Adjacent Area Temporarily Disturbed /Restored due to Waste Excavation[4]	(d) Total Adjacent Area Temporary Disturbance/ Restoration (b)+(c)	(e) Adjacent Area Permanently Lost (due to facility construction)[5]	(f) Adjacent Area selectively replanted outside of proposed limits of construction[6]
Adjacent Area to Wetland 2	0.6	0.4	1.0	0.8	1.8

[1] Earthen areas surrounding non-jurisdictional Wetland 1 adjacent to permanent development will be planted with native species similar to that proposed for Wetland 2.
[2] See Detail Drawing SP2 – Conceptual Subsurface Sewage Disposal System and Stormwater Management Plan.
[3] See Wetland Restoration/Creation Plans Sheet 3 of 3, Note 4.
[4] See Wetland Restoration Creation Plan Sheet 3 of 3, Note 5.
[5] Area within existing Adjacent Area that will be filled due to plant construction.
[6] See Wetland Restoration Creation Plan Sheet 3 of 3, Note 3.

NOTES:

1. BACKGROUND INFORMATION TAKEN FROM DRAWING TITLE "OVERALL GRADING PLAN", DRAWING NO. C140 DATED 10-06-09 WITH REVISION D DATED JULY 2010, PREPARED BY BURNS AND ROE ENTERPRISES, INC., ORADELL, NJ FOR CRICKET VALLEY ENERGY, LLC, TOWN OF DOVER DUTCHESS COUNTY, NEW YORK.

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NO.	BY	DATE	REMARKS

DES AMR
DWN CS
CKD DC

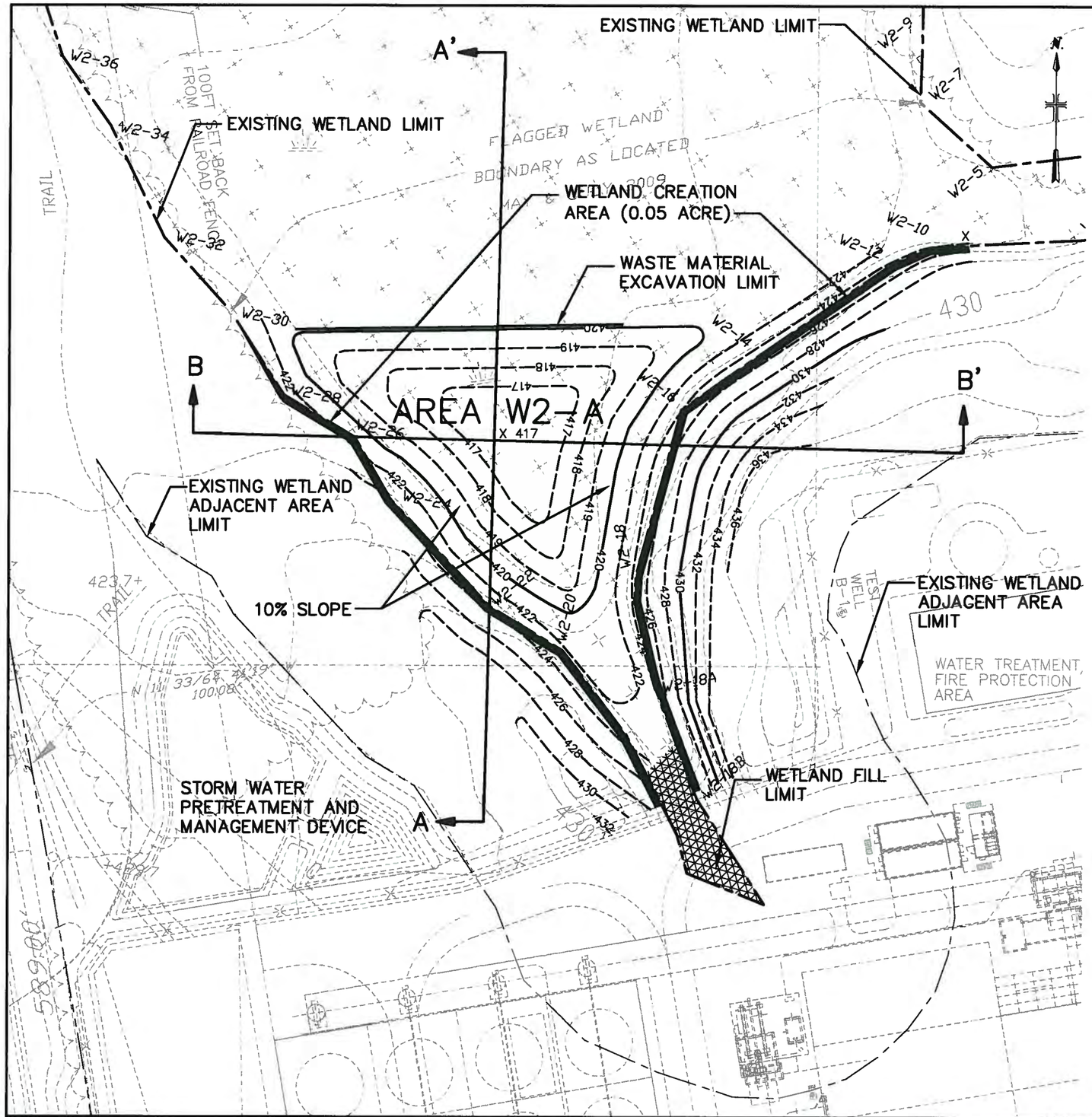
CRICKET VALLEY ENERGY, LLC
TOWN OF DOVER, DUTCHESS COUNTY, NEW YORK

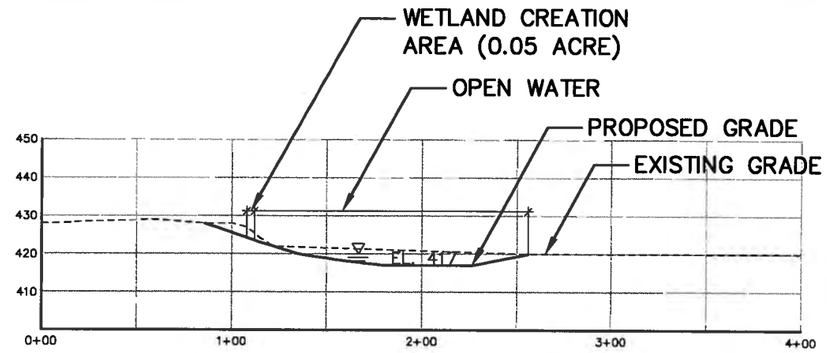
CRICKET VALLEY ENERGY

EXISTING WETLAND AND FUTURE WORK LIMITS

SCALE: 1" = 40'

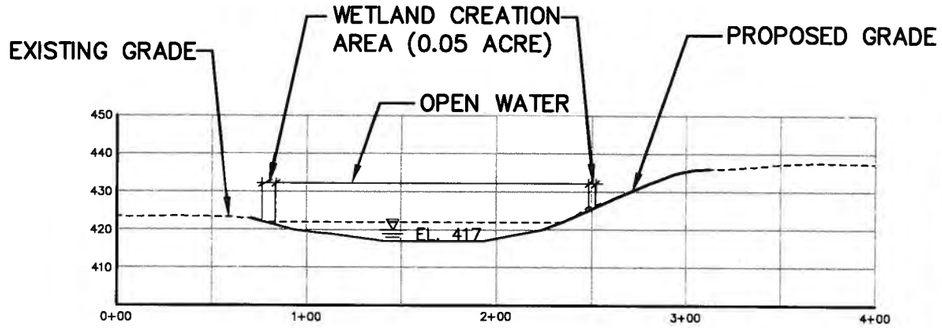
DATE APRIL 2011
SHEET 1 OF 3
CAD REF. NO.





SECTION A–A'

SCALE: HORI. 1" = 40'
VERT. 1" = 20'



SECTION B–B'

SCALE: HORI. 1" = 40'
VERT. 1" = 20'

LEGEND:

X 417	PROPOSED SPOT ELEVATION
———	PROPOSED 10' CONTOUR
– – – –	PROPOSED 1' AND 2' CONTOUR
———	EXISTING AND FUTURE FEATURES
— – —	EXISTING WETLAND LIMIT

NOTES:

1. BACKGROUND INFORMATION TAKEN FROM DRAWING TITLE "OVERALL GRADING PLAN", DRAWING NO. C140 DATED 10-06-09 WITH REVISION D DATED JULY 2010, PREPARED BY BURNS AND ROE ENTERPRISES, INC., ORADELL, NJ FOR CRICKET VALLEY ENERGY, LLC, TOWN OF DOVER DUTCHESS COUNTY, NEW YORK.

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CKD DC

CRICKET VALLEY ENERGY, LLC
TOWN OF DOVER, DUTCHESS COUNTY, NEW YORK

CRICKET VALLEY ENERGY

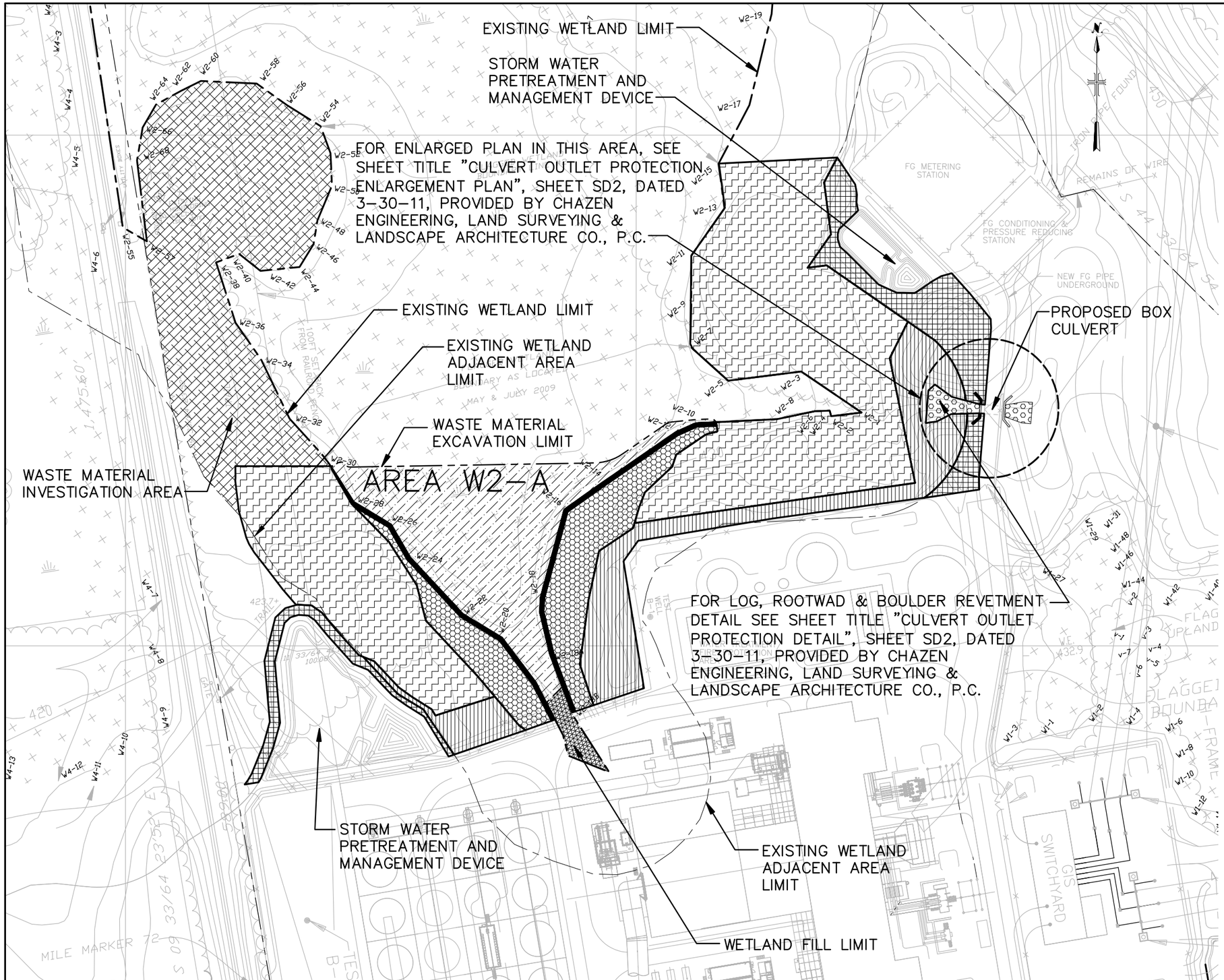
WETLAND AREA W2–A RESTORATION PLAN

SCALE: 1" = 30'

DATE APRIL 2011

SHEET 2 OF 3

CAD REF. NO.



LEGEND

- OPEN WATER (SEE NOTE 1)
- WETLAND CREATION AREA (SEE NOTE 2)
- WETLANDS ADJACENT AREA TO BE EVALUATED FOR SELECTIVE RESTORATION/REPLANTING (SEE NOTE 3)
- WETLANDS ADJACENT AREA TO BE RESTORED/REPLANTED (SEE NOTE 4)
- WETLANDS ADJACENT AREA TO BE RESTORED/REPLANTED DUE TO WASTE EXCAVATION (SEE NOTE 5)
- WETLAND FILL AREA
- BORDERING UPLAND AREA (SEE NOTE 4)
- WASTE MATERIAL INVESTIGATION AREA (SEE NOTE 6)

NOTES:

1. **Open Water (Refer to Sheet 2 of 3 for Cross-Section) : Open Water area to be created within Area W2-A by excavation of non-native sediment, approximately 0.6 acres in size. From approximately contour 420' - 424', area to be broadcast seeded with an appropriate wetland seed mix at a rate of 15 pounds per acre. Open Water area allowed to naturally revegetate.**
2. **Wetland Creation Area: Total of 0.05 acres of emergent zone created along the perimeter of Area W2-A (from approximate Flag W2-10 to Flag W2-30) to be broadcast seeded with an appropriate wetland seed mix at a rate of 15 pounds per acre.**
3. **Wetlands Adjacent Area to be evaluated for Selective Restoration/Replanting : Areas of existing shrub/tree cover on moderate slopes outside the proposed limits of construction ground disturbance (approximately 1.8 acres). Areas not currently densely vegetated will be selectively planted with appropriate tree/shrub species. Re-vegetation with appropriately sized native tree/shrub species would be completed at the rate of 436 specimens per acre (10' x 10' on center).**
4. **Wetlands Adjacent Area to be Restored/Replanted Due to Facility Construction: Represents approximately 0.9 acres of both wetland Adjacent Area (0.6 acres) and bordering upland area (0.3 acres) immediately adjacent to areas proposed to be disturbed by facility construction as well as around proposed bioretention basins to be replanted/restored with native tree/shrub species at a rate of 436 specimens per acre (10' x 10' on center). Area within/around swales/outlet structures to be stabilized and seeded at a rate of 15 pounds per acre.**
5. **Wetlands Adjacent Area to be Restored/Replanted Due to Waste Excavation: Represents approximately 0.4 acres of wetland Adjacent Area proposed to be restored by waste debris removal and excavation; to be replanted/restored with native tree/shrub species at a rate of 436 specimens per acre (10' x 10' on center).**
6. **WASTE MATERIAL INVESTIGATION AREA:**

   Represents existing area of suspected industrial material within the wetland adjacent area subject to future characterization.

NOTE:

1. BACKGROUND INFORMATION TAKEN FROM DRAWING TITLE "OVERALL GRADING PLAN", DRAWING NO. C140 DATED 10-06-09 WITH REVISION D DATED JULY 2010, PREPARED BY BURNS AND ROE ENTERPRISES, INC., ORADELL, NJ FOR CRICKET VALLEY ENERGY, LLC, TOWN OF DOVER DUTCHESS COUNTY, NEW YORK.

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CRICKET VALLEY ENERGY, LLC
TOWN OF DOVER, DUTCHESS COUNTY, NEW YORK

CRICKET VALLEY ENERGY

PLANTING AREA PLAN

SCALE: 1" = 50'

DATE APRIL 2011

SHEET 3 OF 3

CAD REF. NO.

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CONSERVATION SEED MIX ALONG SLOPES & EROSION CONTROL MATTING

2 ROWS OF BOULDERS FOR PLUNGE POOL OVERFLOW AREA WITH ELEVATION=431.5

2-FOOT DEEP PLUNGE POOL LINED WITH COBBLE STONES WITH BOTTOM ELEVATION=429.5

CONCRETE HEADWALL (TYP BOTH SIDES)

INV=432.50

ALL COBBLE STONE AREAS SHALL BE INSTALLED WITH A CONSTRUCTION FABRIC AMOCO STYLE 4545 OR APPROVED EQUIVALENT LINER BELOW (TYP)

INV=433.00

25'Lx30"Hx105"W CONCRETE BOX CULVERT @ 2.00%

BOULDERS, 24"-36" IN SIZE. RANDOM PLACEMENT TO DIVERT FLOW THROUGH WETLAND AREA

LOG, ROOTWAD & BOULDER REVETMENT (TYP FOR 10)

LIVE CUTTING CLUSTERS (TYP FOR 10)

EROSION MATTING ON SIDE SLOPES (STREAM BANK)

LAYOUT AND LANDSCAPING LEGEND:

- LOG, ROOTWAD & BOULDER REVETMENT
- CONTAINERIZED SHRUBS
- CONSERVATION SEED MIX & EROSION CONTROL MATTING
- MIX OF 8-10" COBBLE STONE

PLATE 1

CHAZEN ENGINEERING, LAND SURVEYING & LANDSCAPE ARCHITECTURE CO., P.C.

Office Locations:

Dutchess County Office:
21 Fox Street
Poughkeepsie, New York 12601
Phone: (845) 454-3980

Capital District Office:
547 River Street
Troy, New York 12180
Phone: (518) 273-0055

North Country Office:
100 Glen Street
Glens Falls, New York 12801
Phone: (518) 812-0513

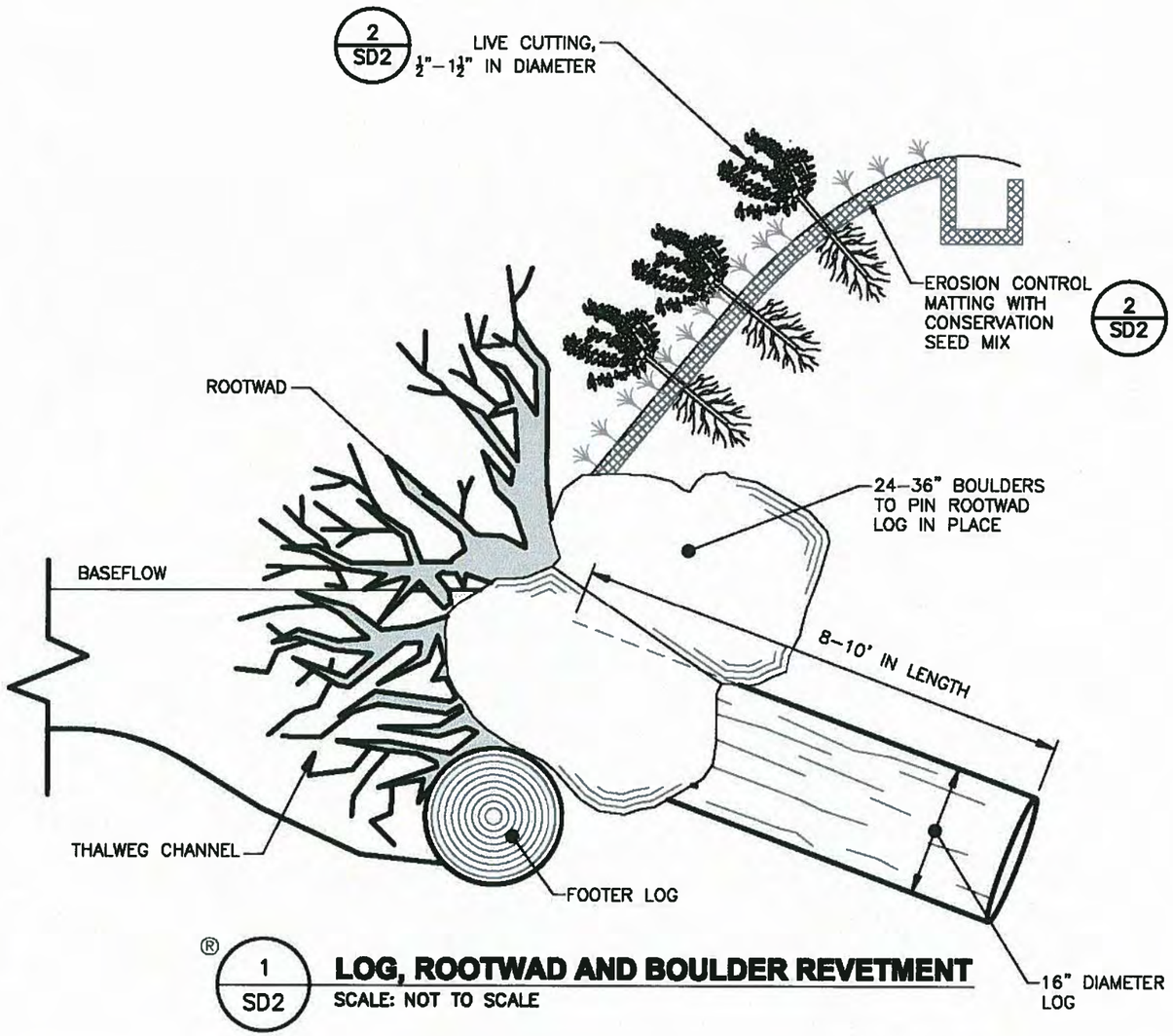
CRICKET VALLEY ENERGY

CULVERT OUTLET PROTECTION ENLARGEMENT PLAN

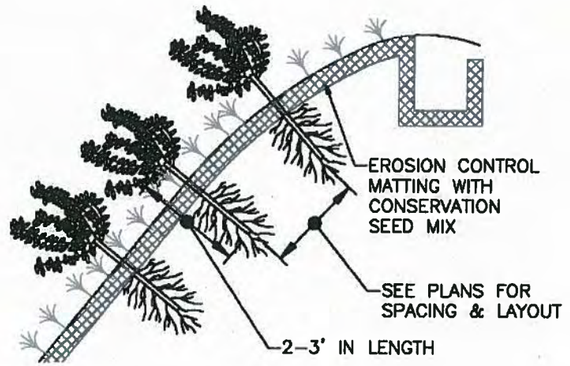
TOWN OF DOVER, DUTCHESS COUNTY, NEW YORK

drawn	checked
MMF	CL
date	scale
3/30/11	1"=20'
project no.	
81001.00	
sheet no.	
SD2	

Date Printed: Mar 31, 2011, 4:28pm



® 1 SD2 **LOG, ROOTWAD AND BOULDER REVETMENT**
SCALE: NOT TO SCALE



® 2 SD2 **LIVE CUTTING & SLOPE STABILIZATION**
SCALE: NOT TO SCALE

PLATE 2

CHAZEN ENGINEERING, LAND SURVEYING & LANDSCAPE ARCHITECTURE CO., P.C.

Office Locations:

Dutchess County Office:
21 Fox Street
Poughkeepsie, New York 12601
Phone: (845) 454–3980

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547 River Street
Troy, New York 12180
Phone: (518) 273–0055

North Country Office:
100 Glen Street
Glens Falls, New York 12801
Phone: (518) 812–0513

CRICKET VALLEY ENERGY

CULVERT OUTLET PROTECTION DETAILS

TOWN OF DOVER, DUTCHESS COUNTY, NEW YORK

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date 3/30/11	scale AS NOTED
project no. 81001.00	
sheet no. SD2	

NEW YORK STATE ROUTE 22

FLAGGED WETLAND BOUNDARY LINE #1 (NON-JURISDICTIONAL WETLAND)

FLAGGED UPLAND ISLAND

WELL B-6

WELL B-5D

4' WIDE EROSION SWALE LINED WITH PERMANENT EROSION CONTROL MATTING, 1.25' DEEP WITH 3 ON 1 SIDE SLOPES.

STORMWATER MANAGEMENT DEVICE – BIORETENTION FACILITY #3

STORMWATER PRETREATMENT FOREBAY #3

3' WIDE GRASS-LINED SWALE.

DRIVEWAY CULVERT

25' LONG ALUMINUM BOX CULVERT (8'-9" SPAN x 2'-6" RISE) (SUBJECT TO USACE & NYSDEC APPROVAL)

ROOF RUNOFF FROM THESE BUILDINGS TO BE CAPTURED & PUMPED TO SERVICE FIREWATER STORAGE TANK (TYP OF ALL HEAVY DASHED LINES)

FG CONDITIONING & PRESSURE REDUCING STATION

FG METERING STATION
FIN FL EL 435.0'

100' WETLAND BUFFER

STORMWATER MANAGEMENT DEVICE – BIORETENTION FACILITY #1

STORMWATER PRETREATMENT FOREBAY #1

FLAGGED UPLAND ISLAND

FLAGGED WETLAND BOUNDARY LINE #2 (NYSDEC & USACE JURISDICTIONAL WETLANDS)

STORMWATER PRETREATMENT FOREBAY #2

STORMWATER MANAGEMENT DEVICE – BIORETENTION FACILITY #2

100' WETLAND BUFFER

LIMITS OF DISTURBANCE (TYP)

FLAGGED WETLAND BOUNDARY LINE #4 (NYSDEC JURISDICTIONAL WETLANDS)

FLAGGED WETLAND BOUNDARY LINE #5 (NYSDEC JURISDICTIONAL WETLANDS)

FLAGGED WETLAND BOUNDARY LINE #3A (USACE REGULATED WETLAND)

FLAGGED WETLAND BOUNDARY LINE #3B (NON-JURISDICTIONAL WETLAND)

8,134 SF
FIN FL EL 437.0'
GIS SWITCH YARD BUILDING

ADMINISTRATIVE CONTROL ROOM BUILDING
FIN FL EL 443.0'
8,400 SF

MAINTENANCE (WAREHOUSE) BUILDING

SERVICE FIREWATER STORAGE TANK

WATER TREATMENT BUILDING
10,685 SF
FIN FL EL 436.0'

STEAM TURBINE GENERATOR

GAS TURBINE

GAS TURBINE STEP-UP TRANSFORMER
1,400 SF

GENERATOR STEP-UP TRANSFORMER
672 SF

STEAM TURBINE GENERATOR STEP-UP TRANSFORMER
672 SF

(CURRENT) STEP UP TRANSFORMER
1,395 SF

110,118 SF
FIN FL EL 436.0'

HEAT RECOVERY STEAM GENERATOR
FIN FL EL 436.0'

AUXILIARY BOILER AND EMERGENCY GENERATOR
1,961 SF

BLACKSTART GENERATOR & EMERGENCY DIESEL GENERATOR
480 SF

CONTINUOUS EMISSIONS MONITORING BUILDING

STACK

ACC UNIT 1

ACC UNIT 2

ACC UNIT 3

LAYDOWN AREA

STORMWATER RUNOFF FROM THE CONTAINMENT AREAS FOR ALL STORM EVENTS IS TO BE CURBED, CAPTURED, & DIRECTED TO AN OIL/WATER SEPARATOR FOR USAGE WITHIN THE FACILITY (TYP. OF ALL CLOUDED AREAS)

PROPOSED LOT LINE

PROPOSED SUBSURFACE SEWAGE DISPOSAL SYSTEM 4'-HIGH FILL PAD

LAYDOWN AREA

STORMWATER MANAGEMENT BASIN – WET EXTENDED DETENTION POND (P-3)

SILENCER/ EMMISSION STORAGE TANK & DEMINERALIZER PUMPS
1,021 SF

CLOSED COOLING WATER PUMPS
1,452 SF

FIN FAN COOLERS (3) 3x8 CELL UNITS

PROPOSED DISCHARGE POINT SUBJECT TO USACE & NYSDEC APPROVAL

STORMWATER PRETREATMENT FOREBAY

SOIL RESTORATION NOTES:

IN AREAS WHERE SOIL DISTURBANCE HAS OCCURRED OUTSIDE OF BUILDINGS AND PAVEMENT AREAS, THE DISTURBED SUB-SOILS SHALL BE RETURNED TO ROUGH GRADE AND THE FOLLOWING SOILS RESTORATION STEPS APPLIED:

1) APPLY THREE INCHES OF COMPOST OVER SOIL. COMPOST SHALL BE AGED, FROM PLANT DERIVED MATERIALS, FREE OF VIABLE WEED SEEDS, HAVE NO VISIBLE FREE WATER OR DUST PRODUCED WHEN HANDLING, PASS THROUGH A HALF INCH SCREEN AND HAVE A PH SUITABLE TO GROW DESIRED PLANTS.

2) TILL COMPOST INTO THE SUBSOIL TO A DEPTH OF AT LEAST 12-INCHES USING A CAT-MOUNTED RIPPER, TRACTOR MOUNTED DISC, OR TILLER, MIXING AND CIRCULATING AIR AND COMPOST INTO SUB-SOILS.

3) ROCK-PICK UNTIL UNFIFTED STONE/ROCK MATERIALS OF FOUR INCHES AND LARGER SIZE ARE CLEANED OFF THE SITE.

4) APPLY TOPSOIL TO A DEPTH OF SIX INCHES.

APPROXIMATE USACE'S JURISDICTIONAL WETLAND AREA

STORMWATER MANAGEMENT BASIN OUTLET CONTROL STRUCTURE

STORMWATER MANAGEMENT BASIN EMERGENCY SPILLWAY WEIR

APPROXIMATE CENTERLINE OF EXISTING STREAM

END RIP RAP 10' BEYOND CENTERLINE OF STREAM

LIMIT OF DISTURBANCE

CENTERLINE OF STREAM WITH RIP RAP OUTFALL PROTECTION

CENTERLINE STREAM

4' WIDE AUSACE'S JURISDICTIONAL WETLAND AREA

EXISTING GROUND

EXISTING BOTTOM OF STREAM (UNDISTURBED EARTH/STONE)

CENTERLINE STREAM

INSTALL RIP RAP 10' BEYOND CENTERLINE STREAM

4' WIDE AUSACE'S JURISDICTIONAL WETLAND AREA

6" MIN BEDDING MATERIAL (TYP) NYSDOT SPECIFICATION SECTION 620

CONSTRUCTION FABRIC AMOCO STYLE 4545 OR APPROVED EQUIVALENT

EXISTING UNDISTURBED EARTH

EXCAVATE BOTTOM OF STREAM REPLACED WITH MINIMUM MIN 15" STONE FILLING MEETING NYSDOT SPECIFICATION SECTION 620 LIGHT GRADATION REQUIREMENTS FOR OUTFALL PROTECTION WHILE MAINTAINING EXISTING CENTERLINE STREAM ELEVATIONS AND STREAM FLOW

PLATE 3

NOTE:
CONCEPTUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM AND STORMWATER MANAGEMENT FACILITIES LAYOUT AND GRADING BY THE CHAZEN COMPANIES. ALL OTHER PROPOSED LAYOUT, GRADING AND STRUCTURES BY OTHERS.

SCALE: 1" = 60'

THE Chazen COMPANIES
Engineers/Surveyors
Planners
Environmental Scientists
Landscape Architects

CHAZEN ENGINEERING, LAND SURVEYING & LANDSCAPE ARCHITECTURE CO., P.C.

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Glens Falls, New York 12801 Phone: (518) 812-0513

rev.	date	description

CRICKET VALLEY ENERGY

CONCEPTUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM AND STORMWATER MANAGEMENT PLAN

TOWN OF DOVER, DUTCHESS COUNTY, NEW YORK

drawn	checked
MMF	CL
date	scale
7/16/10	1"=60'
project no.	
81001.00	
sheet no.	
SP2	

Cricket Valley Energy (CVE)

Area W2-A Wetland Restoration/Creation and Adjacent Area Restoration Monitoring and Maintenance Plan

After restoration is complete, the wetland restoration area W2-A and the associated NYSDEC regulated Adjacent Area would be monitored and maintained for three calendar years, covering three growing seasons, to document that the restoration plan for the CVE site has achieved applicable regulatory, landscaping, and contractual requirements. To briefly summarize, the following tasks would be included as part of the Wetland Restoration/Creation and Adjacent Area Monitoring and Maintenance Plan.

- Qualitative Assessment
  - Inspect physical health (e.g., vigor, disease, pests) of vegetation upon arrival to site and prior to planting (*one time upon delivery of stock to site*)
  - Inspect physical health and establishment of planted vegetation
  - Inspect integrity of installed matting and fencing and physical condition of site
  - Photo-documentation
- Quantitative Shrub/Tree Survival
  - Record all dead shrub/trees
  - Record all instances of disease, infestation and significant hebivory
  - Photo-documentation
- Develop Annual Reports
- Recommend and Perform Corrective Actions

Qualitative Assessment

Qualitative assessment events would occur twice a year as follows:

- One event would occur in early spring (April)
- One event would occur in late summer and overlap with the Quantitative Shrub/Tree Survival monitoring event (September)

The spring monitoring event would be conducted to document physical damage such as erosion to slopes as well as plant specimen losses due to uprooting or other physical damage (e.g., heavy ice or snow load). The fall monitoring event would be conducted to document if any structural items need to be secured,

stabilized, repaired or replaced to withstand the upcoming winter. In addition, plants that may have been severely stressed because of drought, insect damage or excessive herbivory over the summer would be identified for replacement with an in-kind or similar specimen. Findings would be photographed and recorded in a dedicated field log book to document the conditions observed and later on, to document whether recommended corrective actions were performed properly by the landscaping/restoration contractor. Location of photographs would be recorded using GPS and shown on the Restoration base plan.

The purpose of the qualitative assessment event is to evaluate the physical health and establishment of planted vegetation as well as the integrity of installed erosion matting, revetments, and hebivory fencing in the restoration area. The following is a list of the likely items that would be inspected, and if applicable, repaired or corrected as necessary by the landscaping/restoration contractor. Note that this is not an exhaustive list and is only meant as a general guideline as to what would be inspected:

- Silt fencing damage as evidenced by tears in the fabric or downed fence posts.
- Erosion control matting not properly anchored or dislodged.
- Integrity of log, rootwad and boulder revetment.
- Evidence of erosion and/or deposition of sediment in the wetland down- gradient of culverts, on steep slopes, and outlets to bioretention basins.
- Herbivory and waterfowl fencing damage as evidenced by fraying or tears in the webbing, holes in the fencing, or downed support posts.
- Planted trees not maintaining an upright growth position as evidenced by falling over, tipping, exposed root balls or damaged stakes and support wires.
- Unauthorized disposal of construction debris and fill in restoration areas.
- Human disturbance (e.g., stealing/uprooting of plants).
- Absence of plants (groundcover, shrubs, trees) and bare areas due to fire, erosion (washout) or potentially attributable to the non-functioning structural items previously listed (not plant dormancy).
- Evidence of herbivory to plants (e.g., deer, rabbit).
- Evidence of physical animal disturbance (e.g., burrowing, trampling).
- Evidence of insect damage.
- Evidence of plant disease (e.g., cedar-apple rust fungus)
- Damage due to water, erosion fire or ice.

Qualitative Assessment Corrective Action/Reporting

For each monitoring event, an assessment for the need of corrective actions/repairs would be based on numerous factors including the integrity of the plantings and whether the corrective action/repair could have a detrimental effect on the vegetation. For all corrective actions/repairs deemed necessary, a schedule would be developed for implementation. Minor repairs, such as re-tying loosened lines, may be completed in the field during the actual monitoring event as long as such corrective actions would not have a detrimental effect on vegetation, and the repairs primary function is to protect plantings from potential physical or biological damage. Some corrective actions that may be recommended could include, but are not limited to:

- Repair and/or replacement of silt fencing.
- Re-anchoring and/or replacement of erosion control matting.
- Repair and/or replacement of herbivory and/or waterfowl fencing.
- Replanting of fallen or tipping trees and/or repair/replacement of stakes and support wires.
- Removal of debris.
- Re-grading of areas if elevations have noticeably changed and appear likely to inhibit plant propagation due to erosion or deposition of soils.
- Re-seeding of bare areas where germination has not occurred following initial seeding, or have been impacted by erosion.

If plant growth and/or propagation appear to be significantly impacted at the time of the qualitative monitoring, some corrective actions (including re-planting and re-seeding) could be recommended for completion prior to conducting the Quantitative Shrub/Tree Survival monitoring.

A letter report would be developed following each qualitative monitoring event for submittal to NYSDEC. The report would include a description of the assessment and findings, a summary and recommendations section, and a proposed schedule for any recommended corrective actions. This report would also include field logs/forms, photo-log documenting findings, and photo locations on a Restoration base plan.

Quantitative Tree Survival

The purpose of the quantitative tree survival monitoring event is to document diseased and/or dead shrub/trees potentially needing to be replaced either in the same, or at a proximal location. Plant survival and overall health can be attributed to a variety of factors that do not include the initial quality of specimens

provided by the nursery and/or the physical handling of individuals by workers during initial planting. Unforeseeable environmental and physical stressors also exist that potentially decrease the probability of survival. These could include a variety of factors that either individually or synergistically contributes to a plants overall health and survivability. Examples of such factors include:

- Adequate precipitation and infiltration to root systems
- Drought
- Roadway salt concentrations in soil
- Frequency of maintenance performed on plant specimens
- Human and/or mechanical harm
- Herbivory

Quantitative Tree Survival Monitoring would occur simultaneously with the late summer Qualitative Monitoring. Shrubs and trees would be recorded as dead if no live stems are observed. Dead shrubs and trees would be photographed and located via GPS and shown on the Restoration base plan. The overall percent survival rate for trees would be calculated by dividing the total number of shrubs and trees planted by the total number of dead shrubs and trees. If the percent survival rate is below 90%, all dead specimens would be removed and replaced with live specimens. In addition, survival rates would also be calculated on a per species planted basis by using the same equation except the total number of both planted and dead specimens would represent only one species. The purpose of this second frequency calculation is to ascertain if a particular species is not suitable or adapted to growing in the Adjacent Area and therefore should be considered for replacement with similar or hardier species documented to have a better survival rate.

After each Quantitative Tree Survival monitoring event, a written report that includes a description and results of the assessments, as well as a summary and recommendation section, would be completed. The report would include field logs/forms, Restoration base plan showing dead shrubs and trees (if any),photo locations, frequency calculations, photolog documenting findings and a summary of recommended corrective actions. Copies of the final report would be submitted to NYSDEC as stipulated in the wetlands permit for the site.