

**REFERENCE REACH** FIELD FORM  
**STREAM CHANNEL CLASSIFICATION LEVEL II**

**STREAM TYPE:** \*E3 grading to DA3

STREAM NAME: Oatka Creek DRAINAGE AREA: 27 sq. miles BASIN NAME: Oatka

OBSERVERS: J. Hauber, F. Reese, J. MacKecknie, R. May, D. Reckahn DATE: 10/8/04

Arkport very fine sandy loam, 25- 40% slope	0.28
Tioga silt loam	0.37
Varysburg gravelly loam, 2- 8% slope	0.24
Chenango channery silt loam, fans, 3- 8% slope	0.24
Scio silt loam, 0- 3% slope	0.49
Collamer silt loam, 3-8% slope	0.49

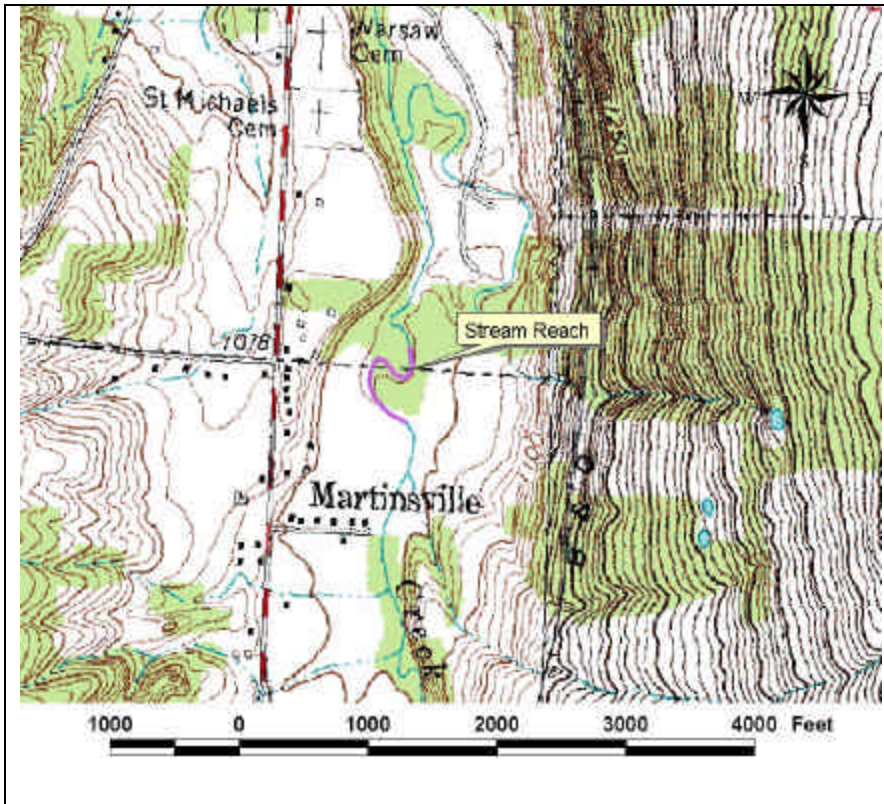
LOCATION: Oatka Creek, beginning at the Kennedy family  
driveway, approximately 600 feet north of Martinsville  
Road, extending north to limit of Kennedy property,  
approximately 2000-3000 feet

**Latitude** 42-43-27 **Longitude** 78-07-45

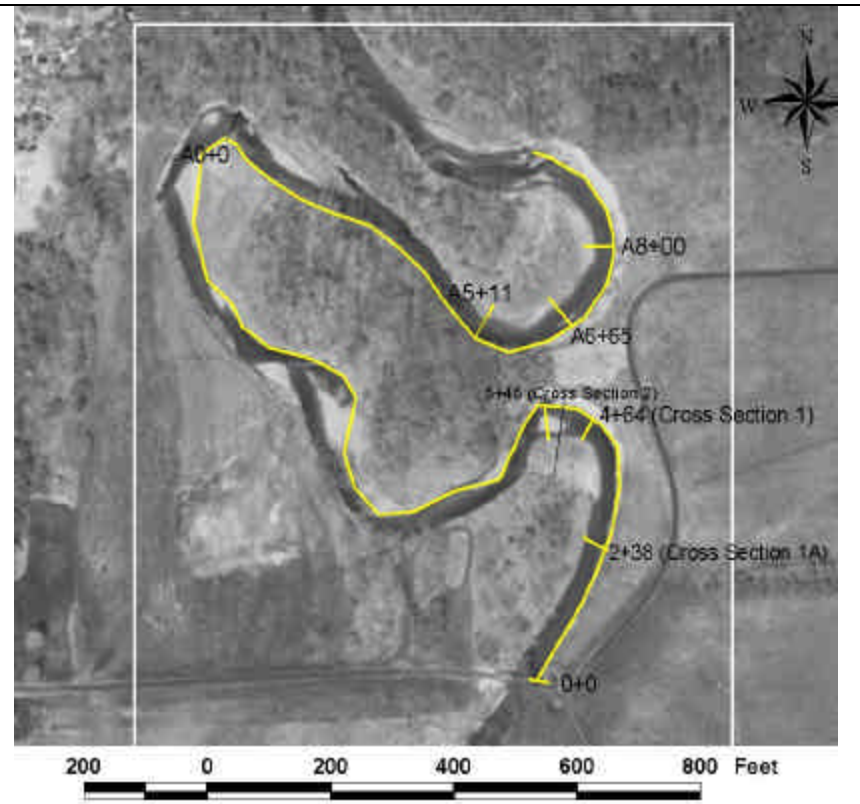
**Mapped Soil Type(s)**

**K Factor**

Bankfull WIDTH	64	Ft.(W <sub>bkf</sub> )	Bankfull MAX>DEPTH	2.2	Ft.(d <sub>max</sub> )	Channel SLOPE	0.0033 (composite)	Ft/Ft		%
Bankfull Mean DEPTH	1.08	Ft.(d <sub>bkf</sub> )	Flood Prone Area WIDTH	200-700	Ft.(W <sub>FP</sub> )	Valley SLOPE		Ft/Ft		%
WIDTH/DEPTH Ratio	59.26		ENTRENCHMENT Ratio	3+		SINUOSITY (Stream Dist/Valley Dist.)		2.8		
Channel MATERIALS: (Pebble Count)			D50	50	mm	D84	126	mm		



Site Location Map for Oatm 9-Kennedy Site, Oatka Creek



2002 Aerial Photograph, Oatm 9-Kennedy Site with Longitudinal Profile Stationing



View of Oatka Creek exposed soil bank near Station 2+38, looking north.



View exposed soil bank at Station 4+38, looking northeast.



View of Oatka Creek exposed soil bank near Station A0+600, looking northwest along channel.



View of exposed soil bank at Station A0+800, looking northeast.

Site Description: The project site consists of a section of Oatka Creek approximately 2769 feet long, beginning about 600 feet north of Martinsville Road, in the Town of Warsaw, Wyoming County. The channel has been preliminarily classified as a Rosgen C3 channel because of its high sinuosity. The width to depth ratio of the channel is atypical of an E3 stream, but this is one of the indicators of instability. The reach is characterized by several sharp meanders in the channel over the length studied. At one point, the meander has nearly doubled back on itself. An overflow channel was cut through in 2003 to relieve pressure on the outside curve, and protect a driveway access to two homes on the property.

The stream channel gradient decreases markedly over the length of the reach, from 0.0065 to 0.0026. The significance of this gradient drop is that the current slows, and particulates tend to settle out in slower-moving stream sections. Several areas with extremely high banks were observed. The linear distances of these exposed soil banks is shown in the aerial photograph. Sloughing and slumping of the banks is common.

Bankfull flows at the site were estimated using channel cross section dimensions and correlated with known bankfull discharges recorded at the Warsaw U.S.G.S. gaging station. It is estimated that flow in the channel at the Kennedy site is approximately equal to 75% of the flow volume as measured at Warsaw, NY, based on measurements completed by Wyoming County SWCD staff. Bankfull flow at Warsaw is estimated at 1200 cfs, based on peak flow data and recurrence interval analysis. Based on the 75% assumption, peak flow at the Kennedy study site would be 900 cfs. Bankfull flow estimates from cross section analysis ranged from 300 to 400 cfs.

Eroded bank heights at the Kennedy site exceeded 20 feet in several locations. Some vegetation (mostly grasses and annuals) is starting to redevelop in the meander above the bypass channel. However, much of this bank remains exposed. Soil types in the project reach appeared to be predominantly gravelly loam.

The sharp bends in the stream channel also cause accumulation of woody debris, log jams and ice jams, sometimes creating higher-than-normal water elevations.

Land uses adjacent to the channel are mowed lawn, agricultural pasture land, and deciduous woods. The property owner mows his lawn on the east side of the channel to the top of the bank.

Statement of Problems: Several long lengths of high eroding banks totaling 800-1000 linear feet are located within this reach. It has been estimated that this site alone contributes more than 70 T/year of sediment to the Oatka stream channel. Bank stability is reduced because woody vegetation has been removed from the top of the east bank. The owner has noted a severe loss of property adjacent to his driveway since its construction in the mid-1990's.

Historical air photo review indicates that this reach of Oatka Creek has been subject to meandering, probably due to the drop in gradient. Sharp bends in the channel create log jams. Ice jamming may also scour the exposed banks, uprooting and breaking off

vegetation, and causing unusually high water levels and flooding. Log jams also form when logs are deposited in shallow areas of the stream or get caught on sand bars. Log jams can also deflect currents into sensitive, exposed bank areas, creating additional sloughing and slumping.

The driveway of the Kennedy property is located within 30 feet of the top of bank of one of the meanders.

Proposed Restoration/Remediation Methods:

- Excavate a new channel section approximately 250-300 feet long, beginning at Station 2+00 (assuming the bridge is Station 0+00), and rejoining the existing channel at approximately Station 6+00. New channel dimensions should approximately match a stable reach section of Oatka Creek with the following approximate dimensions:
  - $A_{BKF} = 100$  sq. ft.
  - $D_{BKF} = 2.5$  ft.
  - $W_{BKF} = 40$  ft.

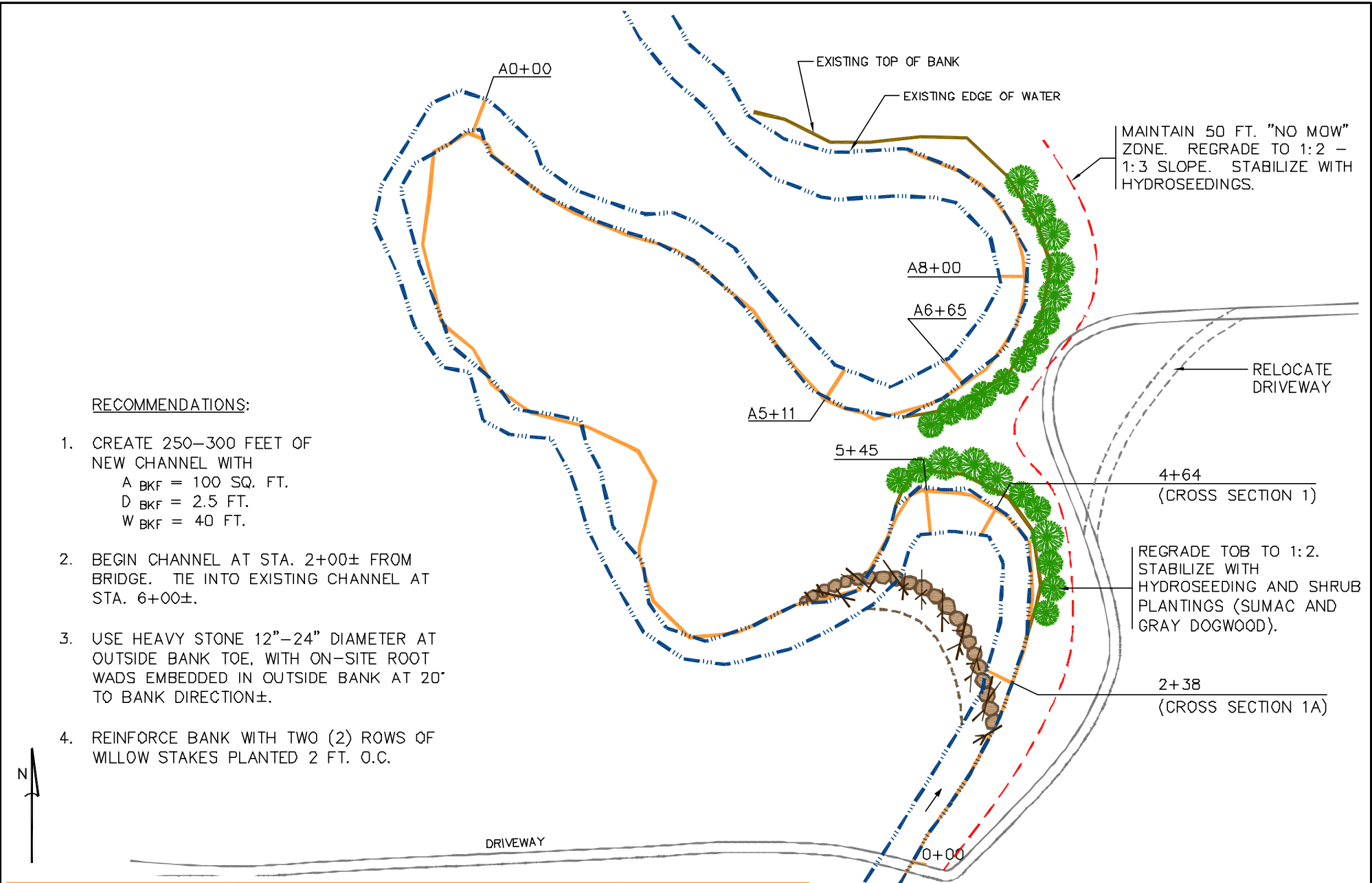
The channel should be capable of passing a bankfull flow of approximately 400 cfs.

- Place approximately 300 LF of heavy stone rip rap (12-24 in. diameter) at the toe of slope of the outside edge of the new channel section to reinforce the channel bank. Utilize on-site materials as rootwads along with the stone at the toe of slope. Rootwads should be placed at an angle of 20-30° out from the outside edge of the bank, with the root end facing into the direction of flow. Root wads should be placed as ordered by engineer.
- Relocate the most vulnerable section of driveway away from the creek channel.
- Regrade the steepest portions of the high banks to a stable slope of 1:2 to 1:3. Hydroseed as needed to establish quick cover.
- Replant approximately 600 LF of top of bank with shrubs.

Cost Estimate:

Item	Units	Unit Cost (\$)	Cost (\$)
New channel excavation (300 LF)	1111 cy	12	13332
Stone rip rap (12-24 in.)	40 cy	46	1840
Turbidity curtain	5 sy	30	150
Hydroseeding (0.75 ac)	L.S.	1200	1200
Shrub plantings	L.S.	4500	4500
Willow stakes	L.S.	2500	2500
On-site supervision	L.S.	3000	3000
Survey	L.S.	5000	5000
Plans and Permits	L.S.	10000	10000
Total Estimated Cost			\$41522

Conceptual Plan Sheets/Standard Details



MAINTAIN 50 FT. "NO MOW" ZONE. REGRADE TO 1:2 - 1:3 SLOPE. STABILIZE WITH HYDROSEEDINGS.

REGRADE TOB TO 1:2. STABILIZE WITH HYDROSEEDING AND SHRUB PLANTINGS (SUMAC AND GRAY DOGWOOD).

**RECOMMENDATIONS:**

1. CREATE 250-300 FEET OF NEW CHANNEL WITH  
     A<sub>BKF</sub> = 100 SQ. FT.  
     D<sub>BKF</sub> = 2.5 FT.  
     W<sub>BKF</sub> = 40 FT.
2. BEGIN CHANNEL AT STA. 2+00± FROM BRIDGE. TIE INTO EXISTING CHANNEL AT STA. 6+00±.
3. USE HEAVY STONE 12"-24" DIAMETER AT OUTSIDE BANK TOE, WITH ON-SITE ROOT WADS EMBEDDED IN OUTSIDE BANK AT 20' TO BANK DIRECTION±.
4. REINFORCE BANK WITH TWO (2) ROWS OF WILLOW STAKES PLANTED 2 FT. O.C.



**LU ENGINEERS**  
Civil and Environmental

2230 FENFELD ROAD  
PENFELD, NEW YORK 14526  
TEL: 585.377.1450  
FAX: 585.377.1266

KENNEDY CONCEPTUAL DESIGN

STREAM RESTORATION STUDY AREAS

P.N. 33802

DATE:	MARCH 2005
APPROX. SCALE:	1" = 150'
DRAWN :	DLS
CHECKED:	FAR