LOCAL FLOOD ANALYSIS

FOR THE

COMMUNITY OF SUNDOWN

This document was prepared for the Town of Denning under the supervision of the Denning Neversink Flood Advisory Committee with funding provided by Sullivan County Soil and Water Conservation District's Stream Management Program through contract with New York City Environmental Protection

Prepared by:
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Syracuse, New York

December 2016

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Engineers • Environmental Scientists • Planners • Landscape Architects

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TABLE OF CONTENTS

APPENDIX

FIGURES

I. Statement of Purpose and Scope

Purpose and Scope

The Town of Denning has experienced severe flooding in recent years. This has led to a heightened awareness of the damage that can occur from flooding. Residents, businesses, and other stakeholders desire to build community resilience and protect community assets from future flood damage. In order to access new funding assistance to meet those goals, a hydraulic analysis of the main population areas of Denning and Neversink is underway. As with Stream Management Planning in the New York City watershed region since 1997, this effort is funded through local County Soil & Water Conservation Districts by NYC Environmental Protection. A Committee of residents, local officials and technical staff from the funders was created to administer the Local Flood Hazard Mitigation Analysis. Those members from Town of Neversink were: Keith Stryker, Code Enforcement Officer, James Stangel, Planning Board Chair. From Denning: David Brooks, Town Supervisor, Greg Vurckio, a Town Council member; and Aaron Bennett from Ulster County Department of Environment.

Staff members of Sullivan County SWCD's Rondout Neversink Stream Program included Brian Brustman, Karen Rauter, Stacie Howell, and Brenden Wagner; from NYC DEP: Mark Vian, and Phil Eskeli. From Barton and Loguidice: Wendell Buckman, P.E. and Shaun McAdams.

The purpose of this Local Flood Hazard Mitigation Analysis (LFA) document is to provide a detailed assessment of the flooding characteristics in the Community of Sundown. This LFA document describes the existing flood hazards within the focus area, identifies existing infrastructure elements in the community that are at risk for flood damage, recognizes potential alternatives aimed at reducing flood impacts, and describes an implementation plan for prioritized alternatives. The analysis is based on an initial flood study completed by FEMA, and is supported by additional field-derived data reflecting current river- and floodplain conditions. This document includes a review of available information pertinent to the hydrologic and

hydraulic functions of the Rondout and Sundown Creeks and engineering analysis required to assess the flooding characteristics within the focus area. In addition, action items relevant to the Sundown Area from Ulster County's most recent All hazards Mitigation Plan were included in the Appendices, as well as General Recommendations from the Rondout Creek Stream Management Plan which provide best management practices for flood hazard mitigation.

The focus area of the analysis starts just upstream of the Denning Town Line on the Rondout Creek and extends approximately 2.25 miles upstream to a point just before the Peekamoose Valley Lower Field Parking Area. On Sundown Creek the focus area begins at the confluenece with the Rondout Creek and extends approximately 0.75 miles upstream along Sundown Creek. This focus area includes the main truss bridge in the Hamlet of Sundown, the Balace Road Bridge, Sheely Road Bridge, and John Brooks Road Bridge.

II. Site Description

County: Ulster County

Village/Town: Town of Denning

USGS Quadrangle Map: Peekamoose Mountain

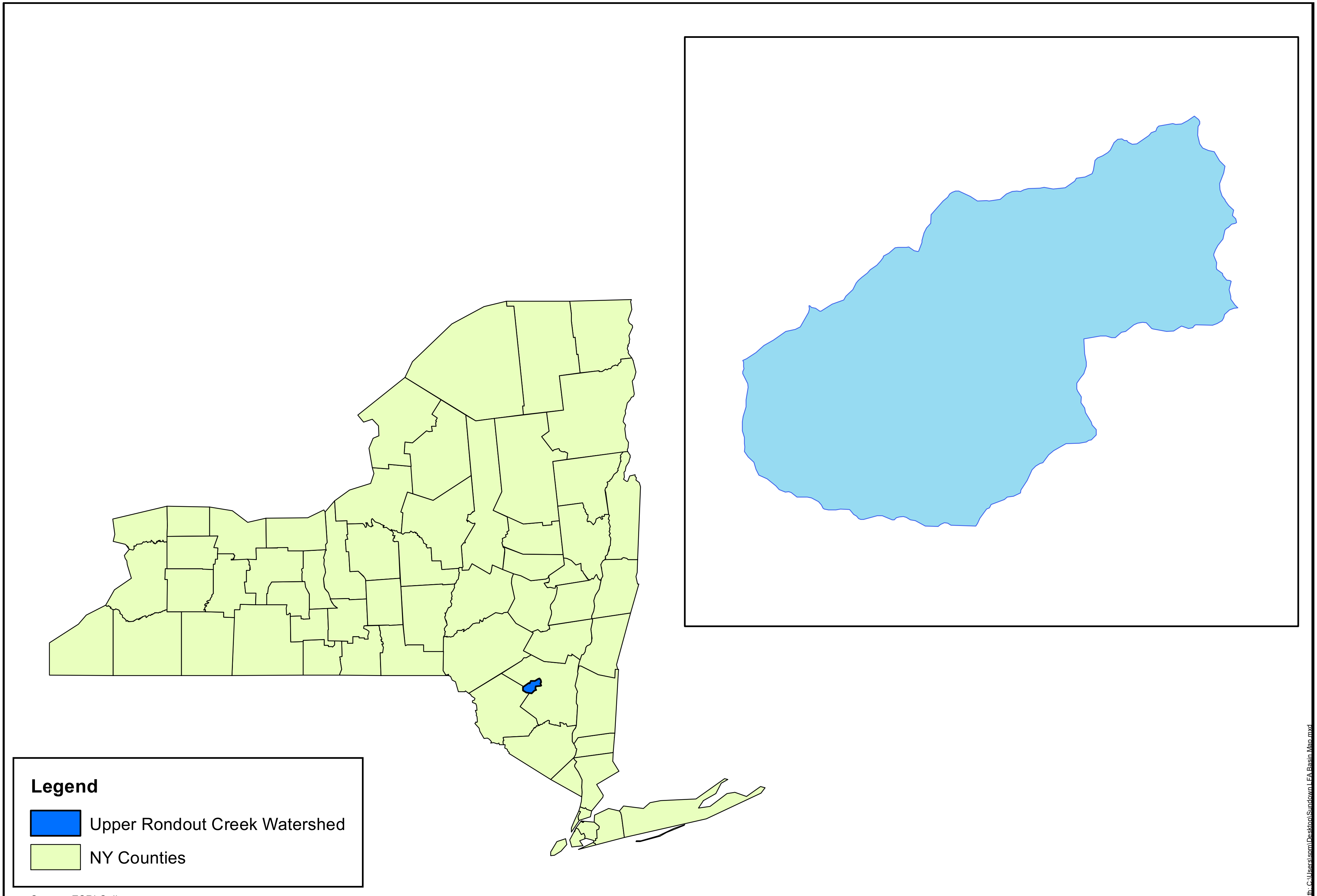
River/stream: Rondout Creek & Sundown Creek

Stream Classification: C with (T) Standards (Rondout)
B with (T) Standards (Sundown)

Focus Area Length: 3.0 miles
(2.25 miles of the Rondout and 0.75 miles of the Sundown)

Drainage area: The drainage area at the downstream limits of the focus area is approximately 33.3 square miles.

Gages: There is one gage station downstream of the focus area on Rondout Creek. The gage is approximately 1.5 miles downstream of the focus area.



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1 inch = 500,000 feet

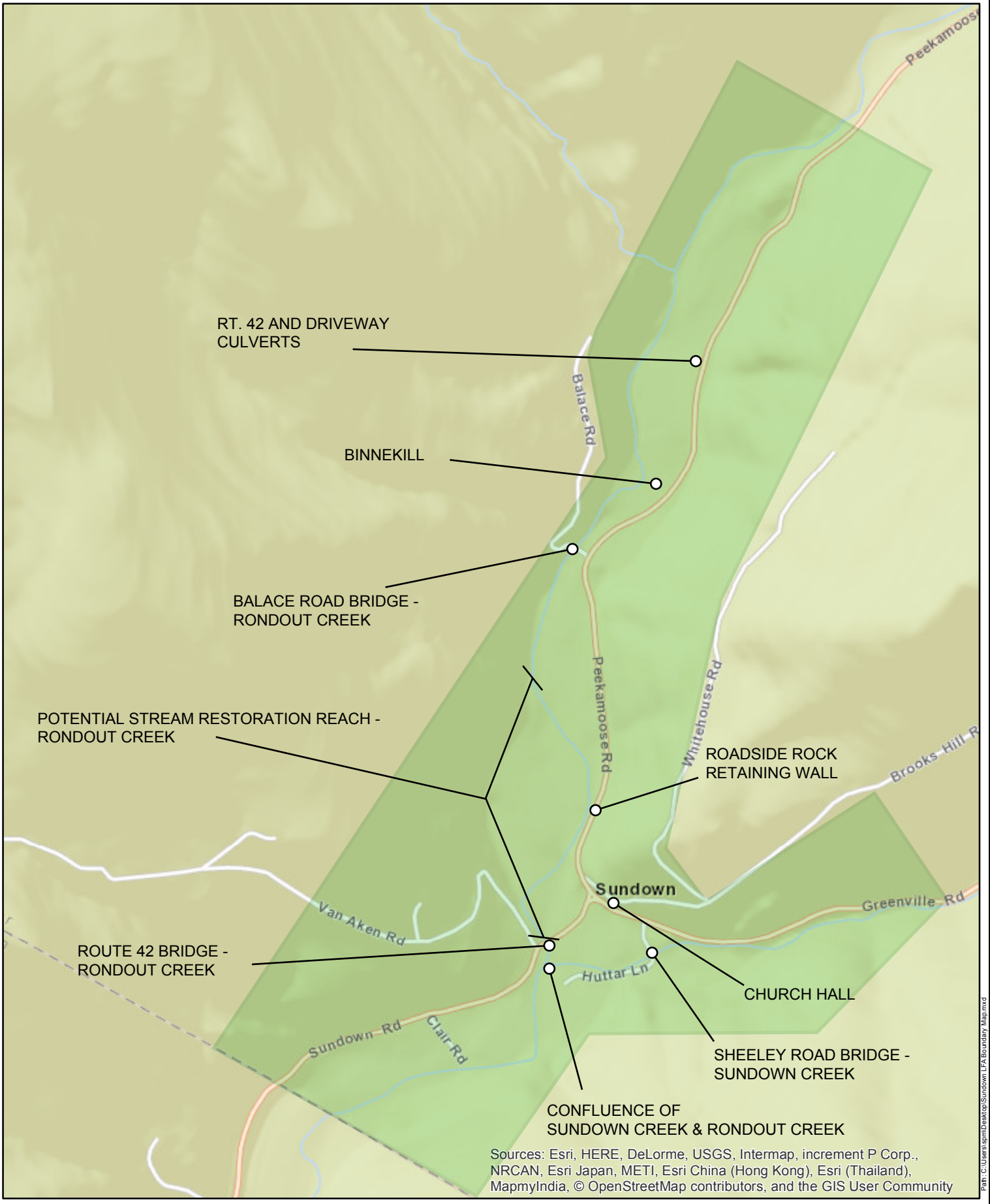
Sullivan County SWCD & Rondout/Neversink Stream Program

Upper Roundout Creek Watershed

Ulster County 11/17/2016 New York

Figure 1

Project No. 1739.001



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1 inch = 1,500 feet

Sullivan County SWCD & Rondout/Neversink Stream Program

Sundown Local Flood Analysis (LFA) Project Area

Ulster County 11/17/2016 New York

Figure 2

Project No. 1739.001

III. Methods

III.A. Approach

An evaluation of flooding in the Rondout and Sundown watersheds was developed from available information, data collected from field reconnaissance, and engineering computations. The basis for the evaluation was FEMA's hydraulic model developed in 2013 to update previous Flood Insurance Studies (FISs). FEMA's Effective Hydraulic Model was performed in the US Army Corps of Engineers' HEC-RAS software. Barton & Loguidice D.P.C. (B&L) reviewed and modified the FEMA Effective Model in order to capture the existing flood regime of the Rondout Creek and Sundown Creek within the defined project area. This adapted model is referred to as the "Duplicate Model."

Using this refined model informed by existing FEMA modeling and corrected by inputs from field data and observations of the stream/floodplain network, B&L modeled a range of flood flows (1.25-, 2-, 10-, 25-, 50-, 100-, and 500-year flood events) within the project area. The outputs of these model runs graphically document flood profiles, identifying water surface (flood) elevations and lateral flood extents (inundation widths) within the project area corresponding to each flood flow. Using Geographic Information Systems (GIS), topographic mapping (supported by LiDAR-derived contour data) and aerial imagery overlays to depict inundation zones, at-risk structural elements (including residential properties, infrastructure elements, etc.) were identified for each flood stage modeled. Defining the inundation limits and affected infrastructure elements corresponding to each modeled flood stage provides the fundamental basis for identifying mitigation alternatives based upon prioritized assessment of the severity and extent of impacts associated with each modeled flood event.

III.A.1 Hydrology

The hydrology for the existing FEMA models was developed utilizing current information from the gage station located on the Rondout Creek near Lowes Corners. The total drainage area at the downstream limits of the project area is approximately 33 square miles. There is one gaging station in proximity to the focus area, approximately 1.5 miles downstream of the focus area on the Rondout Creek.

FEMA utilized a Log Pearson Type III statistical evaluation of historic flood elevations recorded at these gage stations to determine the peak discharges for the 10, 25, 50, 100, & 500 year flood events. Results of this evaluation were reviewed by B&L to confirm that the corresponding discharge values determined by FEMA are consistent with actual, current flood conditions. Using FEMA's analysis of larger floods, B&L was able to determine discharge values corresponding to the 1.25, and 2 year floods directly from the Log Pearson Type III statistical analysis, providing a means for evaluating the river's flood- and sediment transport regimes during these smaller, more frequently-occurring events.

Table 1 - Peak Discharges (cfs)

Location	Recurrence Interval (years)					
	2	10	25	50	100	500
Rondout Creek						
Near the Upstream Limit of Project Area	1,970	4,260	5,670	6,840	8,100	11,400
Immediately Upstream of Sundown Creek	2,360	5,030	6,670	8,020	9,470	13,300
Downstream limits of Project Area	3,210	7,200	9,780	12,000	14,400	21,100
Sundown Creek						
Immediately Upstream of Rondout Creek	538	1,320	1,850	2,320	2,840	4,320

III.A.2 Duplicate Hydraulic Model

The Local Flood Analysis utilizes the development of a hydraulic model (HEC-RAS) to characterize the flood regime within the project area. By incorporating characteristics of the river, its floodplains and its contributing watershed, HEC-RAS can predict floodwater elevations corresponding to a range of flood events of varying intensity. When coupled with mapping of the adjacent landscape, HEC-RAS can identify *inundation zones* (or areas that become flooded at a given floodwater elevation). By incorporating existing features such as buildings, roads, and bridges into this map, we can identify elements that are at-risk (inundated) during a given flood event. As flood intensity increases and floodwater elevations rise, more of the surrounding landscape becomes inundated and more elements are put at-risk of being flooded.

FEMA developed an updated hydraulic analysis utilizing HEC-RAS for the Rondout Creek Watershed in 2013. A detailed evaluation of the duplicate hydraulic model was completed to investigate obstructions, ineffective flows, and verify geometry throughout the model. In addition, as part of the LFA process supplemental survey was acquired for the area immediately upstream of the Sundown Road Bridge over Rondout Creek to a point upstream of the stone wall adjacent to County Route 46. It was determined that this area was critical to the model and further detail was necessary. The geometry entered in HEC-RAS utilizes a series of cross sections. These cross sections reflect the geometry of the channel and floodplains as well as infrastructure such as road and houses. The model then calculates the elevation of the water for each storm event at each discrete cross section. Then utilizing the topography of the area derived from LiDAR, the theoretical inundation limits of each storm can be determined. The final step was to model the inundation limits from Tropical Storm Irene. During our initial public meeting we gathered information regarding what was actually observed during the event and compared this to our model. This provided us a with a real-world calibration of the model. The end result was our existing conditions “Duplicate Effective Model” that was used to compare potential mitigation alternatives.

III.B. Public Outreach

A series of public presentatons were held to gain input and share information with the community members during the process of conducting the analysis. The meetings were structured as follows:

- *Meeting #1* – This meeting was used to inform the community of the LFA process.
- Meeting #2 – This meeting was use d to verify the existing HEC-RAS model. To do this we showed the residents the inundation developed by Irene in our model and compared it to what the public actually experienced during the storm.
- *Meeting #3* – We presented our alternative modeling to the public and the results of modeling and used the opportunity further educate on the functionality of the model and its benefits as a tool for planning.
- *Meeting #4* – This meeting was used to present the results of the BCA and to discuss the limitations they pose to implementing proposed solutions that were modelled.
- *Town Board Meetings* – Once accepted by the Denning Town Board, the Local Flood Analysis will provide residents of Denning and the Town with eligibility for future funding opportunities available in the NYC watershed.

IV. Flood Mitigation

IV.A. General

As shown through the modeling and historic events, the studied project reach surrounding Sundown is susceptible to flooding during large storm events. Projects have previously been identified through the Ulster County All Hazard Mititgation Plan for the Town of Denning. These projects are carried in Appendix D. Alternatives evaluated for mitigation alternatives in the LFA are characterized under the following categories:

- **Property Protection:** These types of alternatives include measures that either provide structural measures to protect existing buildings, residences, and infrastructure elements from flood impacts, such as flood levees, diversions, floodwalls, etc., or to remove them from the flood inundation zone through elevating of relocating structures.
- **Flood Damage Protection and Planning:** These types of alternatives include stream and/or floodplain modifications intended to reduce flood elevations. These approaches are *oftentimes, but not entirely,* most applicable in areas where sufficient lateral area adjacent to the active channel and floodplain are available to implement such measures. In addition to reduction in flood risk and associated hazards, these alternatives, including such measures as floodplain reconnection, installation and protection of streamside buffers, and natural channel restoration, provide a wide range of additional benefits to the community. Benefits include improved aesthetics, recreational opportunities, water quality, and elevated property values. When compared to more structurally-engineered alternatives, these modifications provide greater flood mitigation benefits to the system as a whole by reducing flood velocities, reducing bank erosion and mass failures, and minimizing changes in channel form upstream and downstream by balancing the sediment transport regime. Funding sources such as Rondout Neversink Stream Program and Catskill Watershed Corporation (CWC) are available to support flood mitigation projects that incorporate approaches such as natural channel design.

- **Natural Resource Protection:** These types of alternatives do not directly address flood stages or direct flood impacts, but instead address elements that frequently contribute to or exacerbate flood elevations. They include: managementof bed-load and large wood; bank stabilization; and landslide remediation. These approaches can also include out-of-channel projects intended to restore the natural hydrologic regime through increasing groundwater infiltration, stormwater detention and storage, and reducing flood surges associated with excessive overland runoff. Rondout Neversink Stream Program through Sullivan County SWCD is a potential source for funding these multi-purpose restoration projects.
- **Structural Projects:** These types of alternatives provide structural protection to critical infrastructure elements, such as utilities, bridges, roadway embankments, and culverts. Because of the localized nature of many of these types of projects, these approaches are best implemented in conjunction with one or more additional mitigation alternative approaches, such as replacing, retrofitting, or re-sizing bridges and culverts, etc.
- **Emergency Response and Services:** These types of alternatives do not directly address flood impacts, per se, but establish adequate response measures from Emergency Services agencies to provide affected residents with safety, shelter, and adequate supplies to offset the impacts to health, personal safety, and impacts to quality of life that result from flood events.
- **Community Pollution Prevention:** These types of alternatives identify and secure, either through structural, relocation, or other means, elements within the community that pose potential pollution and/or toxic risks to people, property, and the environment when inundated during a flood.

The alternatives evaluated by the hydraulic model below largely focus on structural and flood damage protection through projects that reduce flood elevations and subsequent impacts to structures and roadways. The alternatives evaluated are presented starting upstream and working downstream through the project area but in no order of importance or priority.

IV.B. Areas of Interest

IV.B.1 Balace Road Bridge over Rondout Creek

The Balace Road Bridge crosses Rondout Creek approximately ¾ of a mile upstream of the main truss bridge in Sundown. This bridge was constructed in 2006 and is owned and maintained by the Town of Denning. The bridge was evaluated to determine if it was undersized and contributing to flooding upstream of the bridge. To evaluate this, the bridge span was increased in the model by 6 and 10 feet to determine the influence on backwater elevations. If this increase in span showed positive results, the span would be further increased to determine a point at which increasing the span offered no substantial benefits. Increasing the span length of the bridge resulted in a water surface elevation decrease of only 3 inches for the 50 and 100-year storms. The 50 and 100-year storms both inundate the low chord of the bridge, but the bridge is not overtopped. It was therefore determined that the existing span of the bridge is adequate to convey peak flows. The bridge does not have any large wood accumulations or scour concerns. The following figures show the inundation limits for the 50-year storm. In New York State, the Department of Transportation generally uses the 50-year storm to size bridge openings.

Results:

- **Opening up bridge has little impact**
- **Bridge opening is appropriately sized**

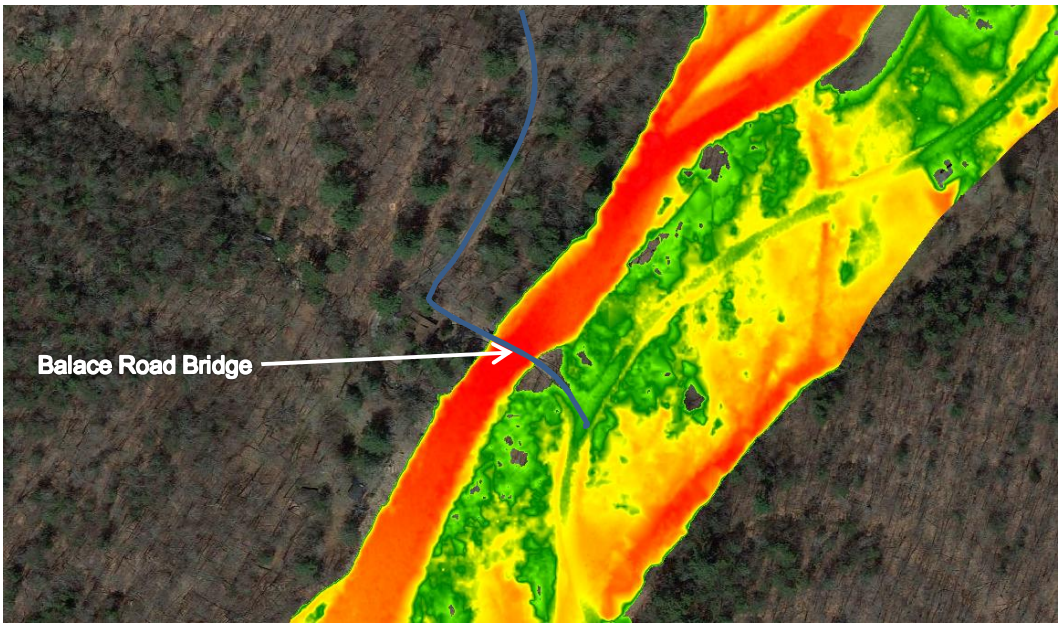


Figure 3 - Inundation Area during a 50 year event – Existing Conditions

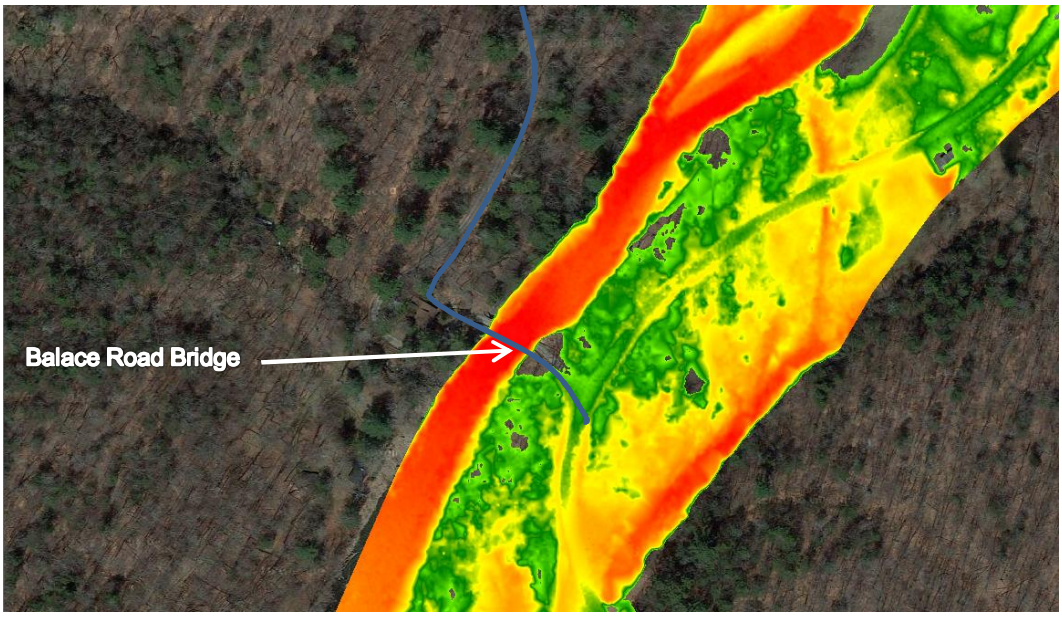
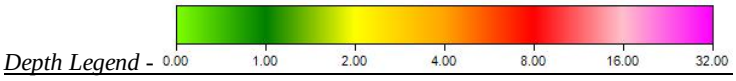


Figure 4 - Inundation Area during a 50 year event – Proposed Conditions (10ft increase in span)



IV.B.2 John Brooks Road over Sundown Creek

The John Brooks Road Bridge crosses Sundown Creek approximately 3/8 of a mile upstream of the confluence with the Rondout Creek. The bridge was constructed in 1956 and is owned an maintained by the Town of Denning. The bridge was evaluated to determine if it was undersized and contributing to flooding upstream of the bridge. To evaluate this, the bridge span was increased in the model by 6 and 10 feet to determine the influence on backwater elevations. If this increase in span showed positive results, the span would be further increased to determine a point at which increasing the span offered no substantial benefits. Increasing the span length of the bridge resulted in a water surface elevation decrease of less than an inch for the 50 and 100-year storms. The 50 and 100-year storms have 2.5 feet and 2.0 feet of freeboard, respectively. The bridge does not have any large wood accumulations or scour concerns. Generally Sundown Creek in this area is deeply entrenched, containing flood flows. It was therefore determined that the existing span of the bridge is adequate to convey peak flows. The following figures show the inundation limits for the 50-year storm. In New York State, the Department of Transportation generally uses the 50-year storm to size bridge openings.

Results:

- **Opening up bridge has little impact**
- **Sundown Creek is channelized**
- **Bridge opening is appropriately sized**

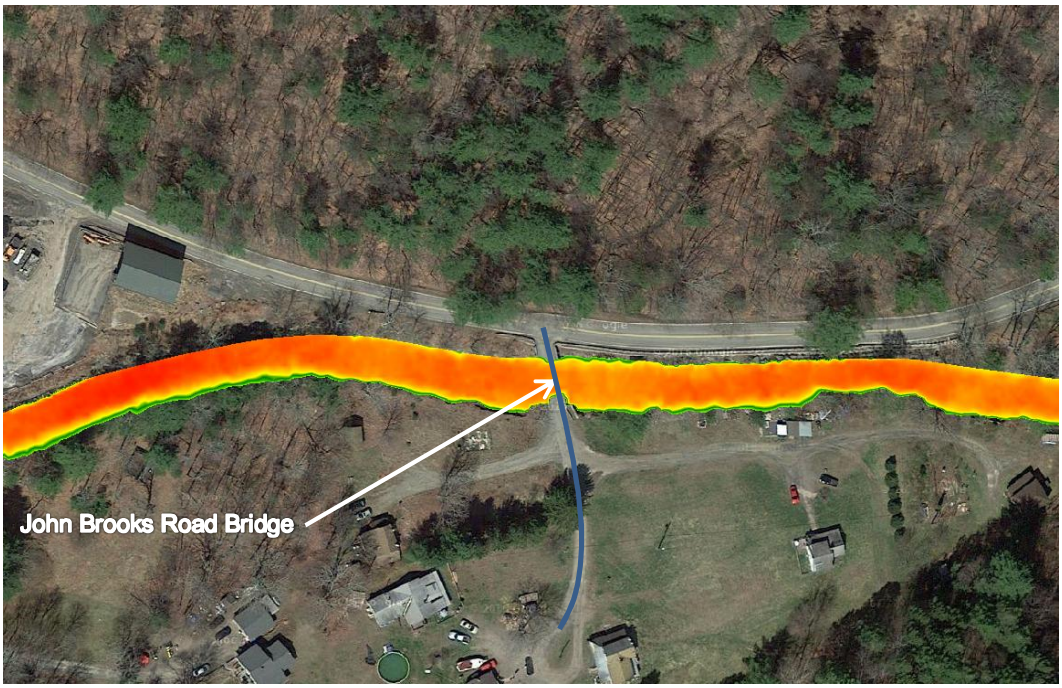


Figure 5 - Inundation Area during a 50 year event – Existing Conditions

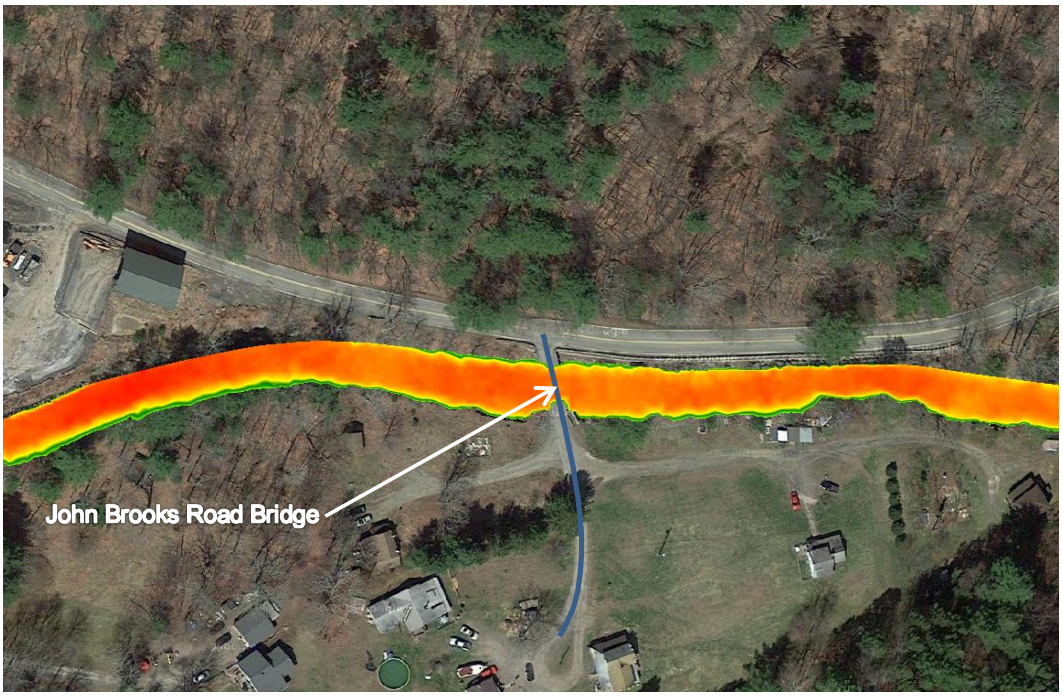
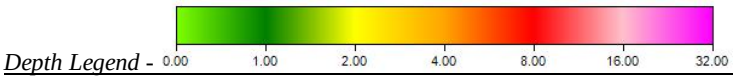


Figure 6 - Inundation Area during a 50 year event – Proposed Conditions (10ft increase in span)



IV.B.3 Sheely Road over Sundown Creek

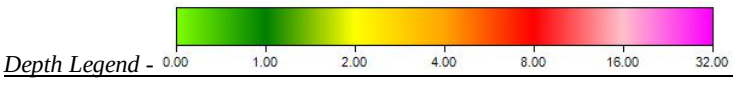
The Sheely Road Bridge crosses Sundown Creek approximately 1/3 of a mile upstream of the confluence with the Rondout Creek. The bridge was evaluated to determine if it was undersized and contributing to flooding upstream of the bridge. To evaluate this, the bridge span was increased in the model by 6 and 10 feet to determine the influence on backwater elevations. If this increase in span showed positive results, the span would be further increased to determine a point at which increasing the span offered no substantial benefits. Increasing the span length of the bridge resulted in a water surface elevation decrease of 2 inches for the 50-year storm and 6 inches for the 100-year storm. The 50 has 2 inches of freeboard and the 100-year storm inundates the bridge, but does not overtop the bridge. The bridge does not have any large wood accumulations or scour concerns. Generally Sundown Creek in this area is deeply entrenched, containing flood flows. It was therefore determined that the existing span of the bridge is adequate to convey peak flows. The following figures show the inundation limits for the 50-year storm. In New York State, the Department of Transportation generally uses the 50-year storm to size bridge openings.

Results:

- **Opening up bridge has little impact**
- **Sundown Creek is channelized**
- **Bridge opening is appropriately sized**

Figure 7 - Inundation Area during a 50 year event – Existing Conditions

Figure 8 - Inundation Area during a 50 year event – Proposed Conditions (10ft increase in span)



IV.B.4 Sundown Road Bridge over Rondout Creek

The Sundown Bridge crosses Rondout Creek in the center of Sundown, immediately upstream of the confluence with Sundown Creek. This bridge, built in 1946, is maintained by Ulster County and is slated for a new superstructure in 2017. The abutments will remain in place. The bridge was evaluated to determine if it was undersized and contributing to flooding upstream of the bridge. To evaluate this, the bridge span was increased in the model by 6 and 10 feet to determine the influence on backwater elevations. If this increase in span showed positive results, the span would be further increased to determine a point at which increasing the span offered no substantial benefits. Increasing the span length of the bridge resulted in a water surface elevation decrease of only 2 inches for the 50 and 100-year storms. The 50 and 100-year storms have 3.8 feet and 2.8 feet of freeboard, respectively. It was therefore determined that the existing span of the bridge is adequate to convey peak flows. There are large wood concerns immediately upstream of the bridge, but not necessarily related to the bridge opening. The bridge does not have any scour concerns. The following figures show the inundation limits for the 50-year storm. In New York State, the Department of Transportation generally uses the 50-year storm to size bridge openings.

Results:

- **Opening up bridge has little impact**
- **Bridge opening is appropriately sized**

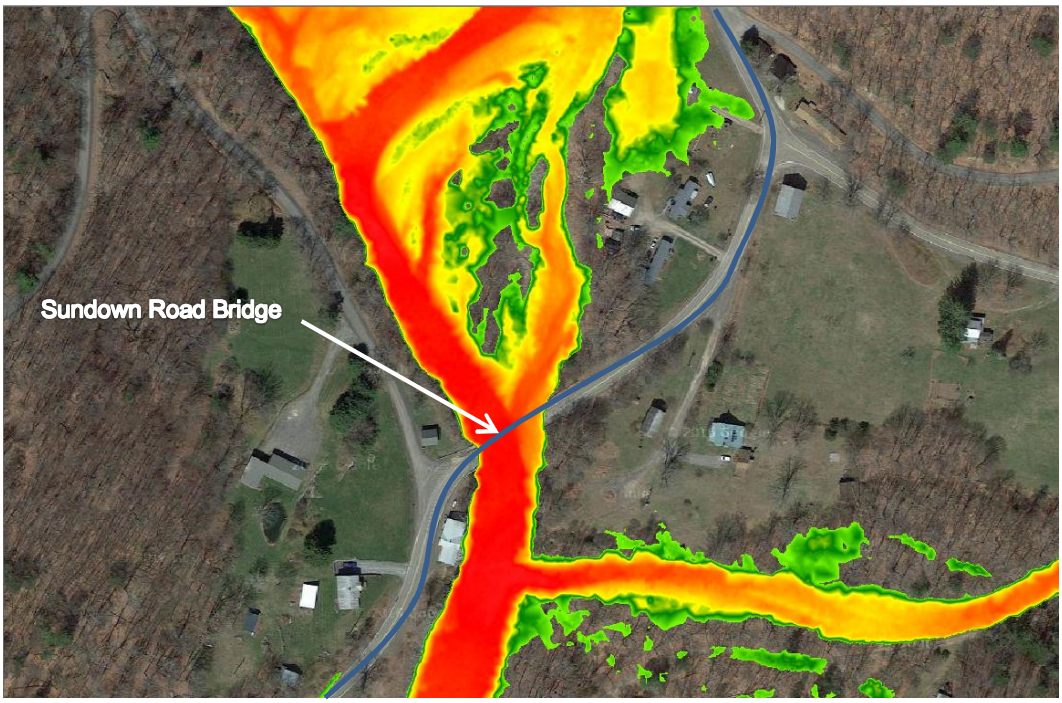


Figure 9 - Inundation Area during a 50 year event – Existing Conditions

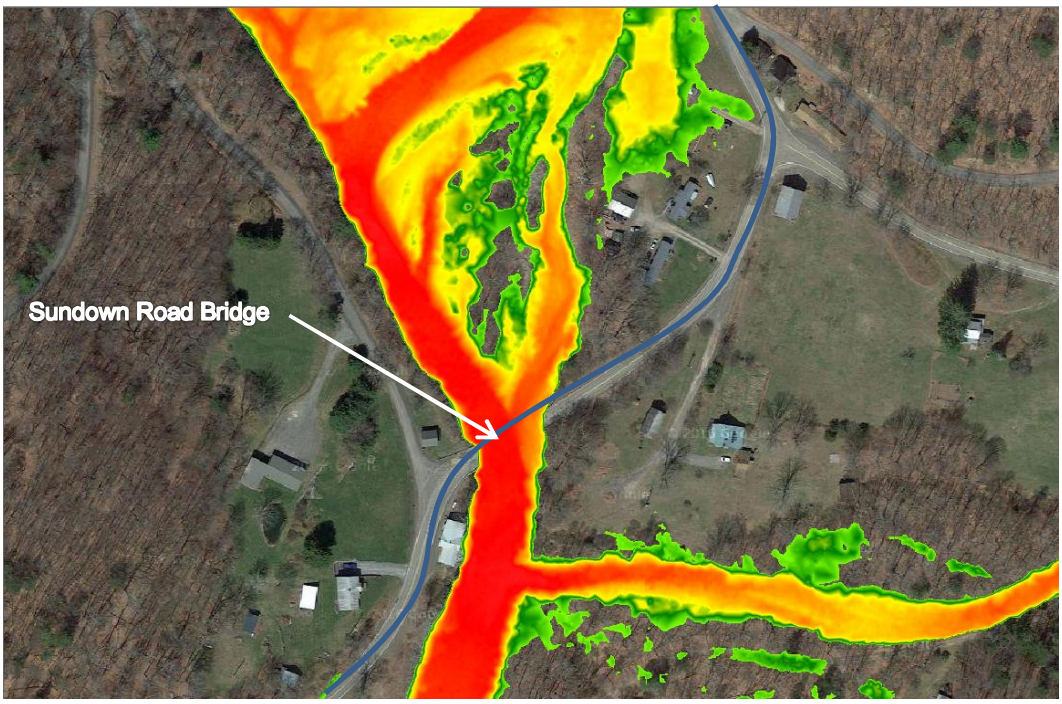
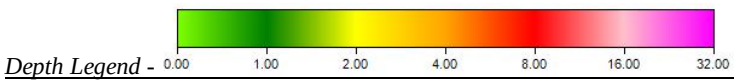


Figure 10- Inundation Area during a 50 year event – Proposed Conditions (10ft increase in span)



IV.B.5 Rondout Restoration

The area of concern is a 1800 foot length of stream beginning just upstream of the Sundown Road Bridge in the center of Sundown ("truss bridge") and continuing upstream. This portion of the stream has several areas of concern. At the upstream end, the stream alignment currently is directed at a stacked stone wall running along CR 42, see photo 1 below. The stream currently runs along the face of the wall with scour pockets developing along the toe. The concern is the stability of the wall. With the energy of the stream flowing directly at and along the stone wall, it is highly susceptible to failure during a high water event. Failure of the wall would lead to closure of the road, cutting off egress into and out of Sundown using this route. This effects responsiveness of emergency services as well as evacuation of residents during an emergency. In addition, the wall supports several utility poles. If the wall were to wash out, it would likely create a power outage for a large area. This further exacerbates problems during an emergency.

Downstream of the wall the stream cuts across the valley against the stone valley wall before turning and flowing under the bridge. The inefficiency of this turn in the stream results in higher backwaters and a poor alignment with the truss bridge. As observed during our walkover and confirmed through conversations with the residents, the stream alignment previously flowed in a now abandoned channel, see photo 4 to the east with a more direct alignment through the bridge. This alignment would be a more efficient way to convey the flow. It is likely that debris built up in this channel during a storm event forcing water into what is now the active channel. The increased backwater upstream of the bridge directly impacts the houses along Sundown Road near the main intersction in Sundown.

The proposed alternative for this site include realignment of the stream away from the stacked stone wall, back to the previous active channel and through the bridge. It would engage a portion of the farm field to the west as floodplain to help reduce backwater elevations. Shifting the thalweg of the stream (deepest part of the channel) away from the wall would reduce the velocities and shear force against the wall making it more resistant to high water events. The alternative evaluated at this site would reestablish the

channel dimensions of the stream utilizing the data collected through a sediment transport model and the principles of natural channel design. By establishing the correct channel dimensions, there are three primary benefits. 1) The stream's ability to transport the gravel is brought into balance with what is delivered from upstream. This prevents the large scale aggradation of material that is currently observed at this location. 2) By establishing a channel form that is in balance, the stream becomes more stable. This means that the large migrations of the stream from one bank to the other will be less likely to occur. There will be floodplain area between the stacked stone wall and the stream. This floodplain area will provide conveyance during larger storms reducing the impact to properties and stabilizing the toe in front of the wall. 3) The development of a natural channel section and improved stream slope results in the reduction of water surface elevations in this reach. The benefits of this project help meet multiple objectives. By stabilizing the stream, not only can a decrease in water surface elevations be achieved, but the volatility of the stream in this stretch is reduced leading to a more sustainable solution than traditional dredging and bank stabilization approaches. Refer to Appendix A for the reduction in water surface elevations at each of the houses impacted.

Results:

- **Stream reshaping reduces inundation area and depth**
- **Approximate restoration modeled, a more detail design is anticipated to provide more benefits**
- **Restoration pulls stream away from retaining wall along road**

Rondout Creek flows against the stone wall supporting Peekamoose Road (Photo 1)

Excessive force of Rondout Creek led to erosion of bank near Peekamoose Road. Bank Repair made by the Town during the study period. (Photo 2)

Rondout Creek Channel splits creating erosion of left and right banks. (Photo 3)

Abandoned Channel of Rondout Creek above Sundown Bridge (Photo 4)

Figure 11 - Proposed stream alignment – restoration alternative

= Photo Location

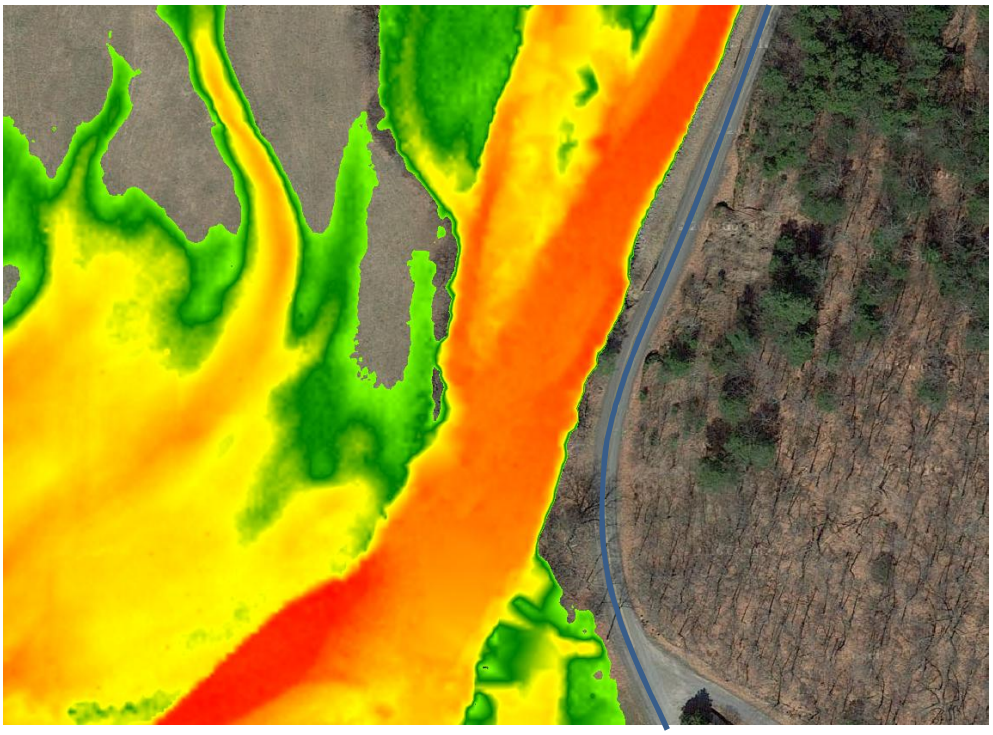
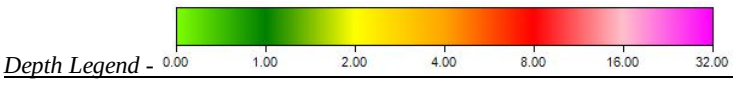


Figure 12 - Inundation Area along stone wall during a 50 year event – Existing Conditions

Figure 13 - Inundation Area along stone wall during a 50 year event – Proposed Conditions



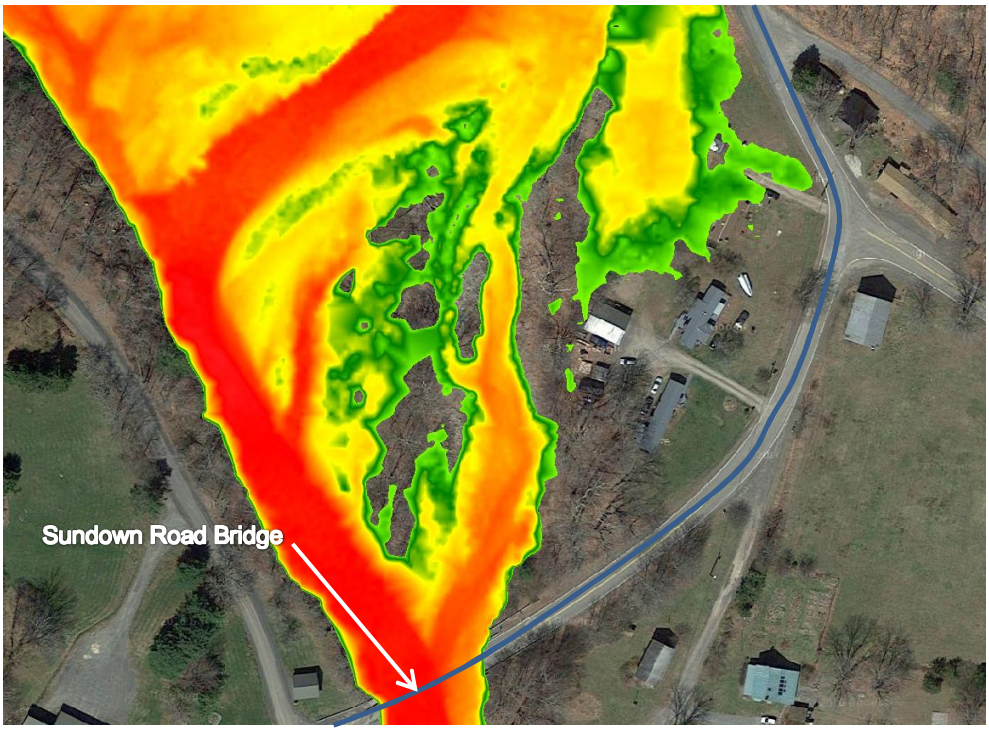


Figure 14 - Inundation Area upstream of bridge during a 50 year event – Existing Conditions

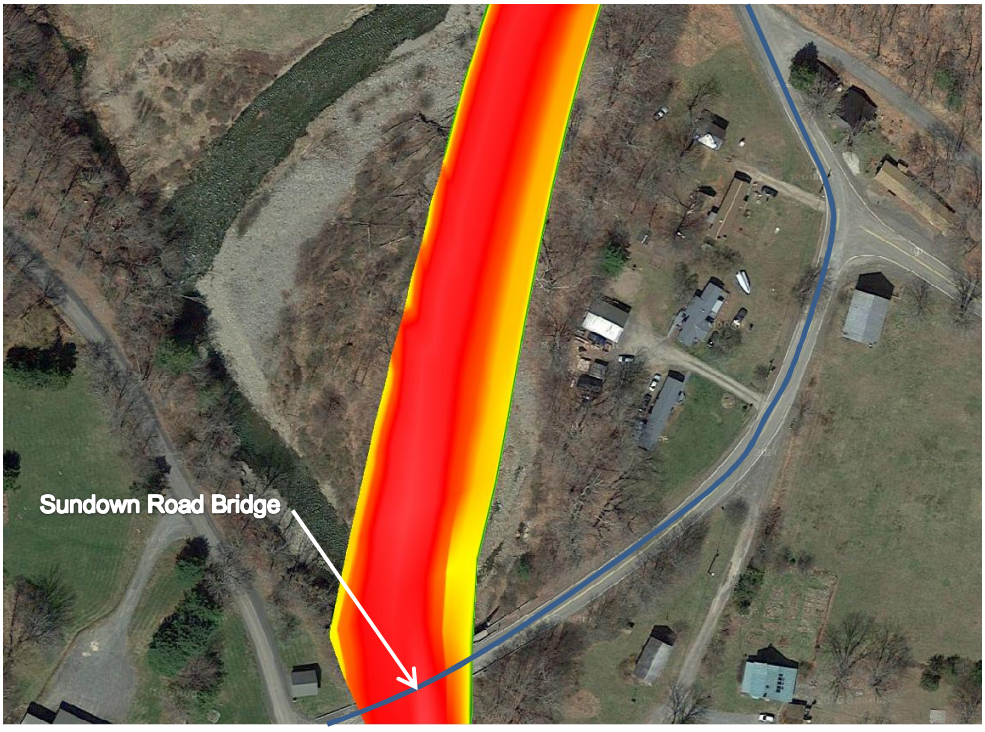
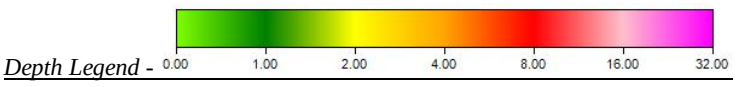


Figure 15 - Inundation Area upstream of bridge during a 50 year event – Proposed Conditions



IV.B.6 Binnekill/Driveway Culverts

Flooding has been observed by the community approximately 1 mile north of intersection with Sundown Road along Peekamoose Road (CR 42). The cause of the flooding appears to be caused by a Binnekill coming off of the valley to the east, under Peekamoose Road and subsequently flowing through two driveway culverts. The private driveway culverts are undersized and restrict the flow, backing up water onto Peekamoose Road. By comparison, the culvert that carries Peekamoose Road is a 3'6" by 16'0" concrete box culvert compared to a 3'0" diameter pipe for the driveways. Both structures have to convey the same flow, so it becomes apparent that the driveway culverts are undersized. To validate this a HEC-RAS model was run for the Binnekill and confirmed that the size of the culverts is indadequate. Replacement of the culverts with larger adequately sized culverts would reduce the frequency that Peekamoose Road floods.

Results:

- **Route 42 culvert sized adequately**
- **Downstream culverts impede flow**
- **Increasing driveway culvert size would reduce roadway flooding**

Figure 16 – Location Map – Binnekill/Driveway Culverts

V. Benefit-Cost Analysis

A benefit-cost analysis (BCA) was completed on two of the six areas of interest mentioned above. The four bridge crossings provided no improvement, so a BCA was not completed. For each of the areas, a project cost was developed and compared to the benefits of the project. The benefits include maintenance of emergency facilities, reduction in flooding at residences, property damage, and loss of life. Each of the Alternatives is summarized below.

- Benefit-Cost Analysis (BCA) - BCA is the method by which the future benefits for a mitigation project are estimated and compared to its cost. The end result is a Benefit-Cost Ratio (BCR)
- Benefit-Cost Ratio (BCR) - The BCR is a numerical expression of the cost effectiveness of a project. A project is considered cost effective when the BCR is 1.0 or greater.

V.B.1 Rondout Restoration

The Rondout Restoration provides benefits to the residences in the center of Sundown, but also would protect the stone wall which currently carries Peekamoose Road north out of Sundown. Protecting the wall provides benefits in the form of emergency services, providing utilities, and an evacuation route. The BCR for this project is 0.66.

Summary

Total Project Cost	$615,000
Service Life	50 years
Total Benefits	$408,378
BCR	0.66

V.B.2 Binnekill/Driveway Culverts

The project proposed addresses the driveway culverts that cross the Binnekill approximately 1 mile north of the center of Sundown. The proposed project includes replacing the two existing culverts with adequately sized concrete box culverts. The benefits would include reducing flooding of the road and the impacts that has on emergency services. The BCR for this project is 0.51.

Summary

Total Project Cost	$150,000
Service Life	50 years
Total Benefits	$77,216
BCR	0.51

VI. Additional Recommendations

These recommendations are provided to the Denning Neversink Flood Advisory Committee for further consideration.

- Developing an early warning system through a reverse 911 system or similar could be investigated to provide more advanced notice to residents in the event of a flood.
- Fuel tanks throughout the Towns can be elevated above flood stage and anchored to prevent movement or spilling during a flood.
- An advanced warning system for areas of the road system that flood could be pursued to warn motorists of locally flooded road conditions.
- Investigate the development a Town-wide database of storm damage that could be updated after every storm. This would provide useful data when determining which future projects to pursue; and help in gathering data for grant applications that require Benefit Cost Ratios. The database should include Base Flood elevations at each residence to accompany damage values.
- Implement a program to fund stabilization materials (rock of various sizes, sections of corrugated culvert) to be used for roadway protection during emergency response immediately following a flood.
- Further Investigation of large wood and sediment sources upstream of Sundown should be identified. Where feasible these sources should be stabilized to prevent large wood and sediment from obstructing flow during future events.
- Further survey of First Floor Elevations of homes in the SFHA to guide decisions on potentially elevating structures that can benefit from this flood mitigation practice.
- Assess the ulster County Hazard mitigation Plan items relevant to reducing flood issues in Sundown to see if the model can help guide prioritization, decision-making and/or provide evidence for grant application to make improvements.

VII. Summary of Findings

The LFA process provides Sundown and the residents throughout the project area with a valuable tool to make informed decisions within the watershed moving forward. This document is a useful tool that will continue to evolve as projects are completed or as future projects arise. The HEC-RAS model developed for this study is available for future use to evaluate any potential project. The stream restoration proposed in this study is a large capital project that doesn't produce enough benefit to offset its large capital investment using the FEMA BCA toolkit software. Only inundation hazards were evaluated as part of this study; where additional flood hazards due to bank erosion have created costs to infrastructure and/or have produced significant negative water quality impacts, these more expensive projects may rise to a priority level that warrants their progression in the future. None of the projects were identified as having BCR ratios above 1.0. This does not disqualify them from being funded. A review of proposed costs in relation to funds available will be conducted in early 2017, and ongoing as other potential funding is identified.

Project Description	Capital Cost	BCR
Stream Restoration	$615,000	0.66
Binnekill Driveway Culverts	$150,000	0.51

BCAs for the individual mitigation projects evaluated in this study could change as a result of accumulating damages from future floods, as additional knowledge of historical damages comes to light, or as the result of adjustments in the estimated cost of projects. Furthermore, where additional benefits of potential mitigation projects are identified, funding sources other than those dedicated solely to mitigation of inundation risks to public and private property may be identified that make some of these projects feasible.

In addition to the two projects highlighted above, the Denning Neversink Flood Advisory Committee can pursue other forms of advance warning systems to alert residents and motorists during a flood. Fuel tanks can be secured and other sources of water pollution relocated or reinforced to prevent spills during a flood event.

Action Items:

- ***Promote securing of fuel tanks through CWC Program***
- ***Review Town Building Codes/Floodplain Management***
- ***Investigate further the stream restoration project***
- ***Identify/Prioritize sediment sources upstream***
- ***Increase documentation of damage and flood elevations during flood events***
- ***Hold educational "How To" session on Elevating Homes***
- ***Survey First Floor Elevations of homes in SFHA. Explore whether this can be funded by CWC as a feasibility study.***
- ***Increase size of the driveway culverts crossing the Binnekill***
- ***Implement flooded road warning signs where appropriate***

While not limited to this list, the following homes were identified as potentially having the first floor elevation below the Base Flood Elevation (BFE). These properties are therefore candidates to have an Elevation Survey completed to determine the first floor elevation in relation to the BFE.

Address		SBL
143	Peekamoose Road	51.3-1-35
139	Peekamoose Road	51.3-1-34
131	Peekamoose Road	51.3-1-33
90	Peekamoose Road	51.3-1-16.2
87	Peekamoose Road	51.3-1-16.12
85	Peekamoose Road	51.3-1-30
71	Peekamoose Road	51.3-1-29
65	Peekamoose Road	51.3-1-26
749	Sundown Road	51.18-3-1
684	Sundown Road	58.1-1-15.1
628	Sundown Road	58.1-1-24

APPENDIX A

BCA Summary

Recommendation #	Project	Action	Benefit	Cost	Existing Property value	BCR
V.B.1	Stream restoration	Design and construction	$408,378.00	$615,000.00		0.66
	741-745 Sundown - Residential	No action			$150,000.00	
	Total		$408,378.00	$615,000.00		0.66
V.B.2	Culvert Replacement	Design and Construction	$77,216.00	$150,000.00		0.51
	Total		$77,216.00	$150,000.00		0.51

Total Benefits: **$408,378** Total Costs: **$615,000** BCR: **0.66**

Project Number: Disaster #: Program: Agency:

State: Point of Contact: Analyst: W Buckman

Project Summary:

Project Number: Disaster #:

Program: Agency:

Analyst: W Buckman

Point of Contact: Phone Number:

Address:

Email:

Comments:

Structure Summary For:

741-745 Sundown, 741-745 Sundown, New York, , Ulster

Structure Type: Building Historic Building: No Contact:

Benefits: $408,378 Costs: $615,000 BCR: 0.66

Mitigation	Hazard	BCR	Benefits	Costs
TBD	Damage-Frequency Assessment	0.66	$408,378	$615,000

Total Benefits: **$408,378** Total Costs: **$615,000** BCR: **0.66**

Project Number: Disaster #: Program: Agency:

State: Point of Contact: Analyst: W Buckman

Structure and Mitigation Details For: 741-745 Sundown, 741-745 Sundown, New York, , Ulster

Benefits: $408,378 Costs: $615,000 BCR: .66

Hazard: **Damage-Frequency Assessment - TBD**

Mitigation Option:

Latitude: Longitude: Project Useful Life: 50

Mitigation Information

Basis of Damages: Historical Damages

Number of Estimated Damage Events: 5

Number of Events with Know Recurrence Intervals:

Utilities

Type of Service: Electrical

Other:

Number of Customers: Served: 100

Value per Unit of Service: 131.00

Total Value of Service per Day: $13,100

Facility Description:

Total Benefits: **$408,378** Total Costs: **$615,000** BCR: **0.66**

Project Number: Disaster #: Program: Agency:

State: Point of Contact: Analyst: W Buckman

Roads And Bridges

Estimated Number of One-Way Traffic Trips Per Day: 400

Additional Time per One-Way Trip: 1:15

Number of Additional Miles: 50.0

Federal Rate: 0.575

Economic Loss Per Day of Loss of Function: $26,315

Facility Description:

Building

Fire Station:

Number of People Served by this Fire Station:	100
Type of Area Served by this Fire Station:	Rural
Distance in miles between this fire station and the fire station that would provide fire protection for the geographical area normally served by this fire station:	30.00
Fire Station Provide Emergency Medical Services (EMS)?	Yes
Distance in miles between this fire station and the fire station that would provide EMS for the geographical area normally served by this fire station?	30.00

Total Benefits: **$408,378** Total Costs: **$615,000** BCR: **0.66**

Project Number: Disaster #: Program: Agency:

State: Point of Contact: Analyst: W Buckman

Historic Damages Before and After Mitigation

Analysis Year: 2016 Analysis Duration: Utilities ($/day): $13,100.00

Year Built: User Input Analysis Duration: Buildings ($/day): $331.05

Roads/Bridges ($/day): $26,315.00

Damages Before Mitigation

Damage Year:
RI: 10.00
Are Damages In Current Dollars? Yes
Buildings (Days): 1.0
Utilities (Days): 1.0
Roads (Days): 1.0

Total	$39,746
Total Inflated	

Damages After Mitigation

RI: 10.00
Are Damages In Current Dollars? Yes
Buildings (Days): 0.0
Utilities (Days): 0.0
Roads (Days): 0.0

Total	$0

Volunteers Cost

Number of Volunteers Required:
Cost of Volunteers Time ($/Hour/Person):
Per-Person Cost of Lodging for a Volunteer:
Number of Hours Volunteered/Person:
Number of Days Lodging/Volunteer:
Cost of Volunteers:

RI: 25.00
Are Damages In Current Dollars? Yes
Buildings (Days): 1.0
Utilities (Days): 1.0
Roads (Days): 1.0

Total	$39,746

RI: 50.00
Are Damages In Current Dollars? Yes
Buildings (Days): 1.0
Utilities (Days): 1.0
Roads (Days): 1.0

Total	$39,746

Total Benefits: **$408,378** Total Costs: **$615,000** BCR: **0.66**

Project Number: Disaster #: Program: Agency:

State: Point of Contact: Analyst: W Buckman

Damage Year:
RI: 25.00
Are Damages In Current Dollars? Yes

Buildings (Days): 14.0
Utilities (Days): 14.0
Roads (Days): 14.0

Total	$556,445
Total Inflated	

RI: 100.00
Are Damages In Current Dollars? Yes

Buildings (Days): 1.0
Utilities (Days): 1.0
Roads (Days): 1.0

Total	$39,746

Volunteers Cost

Number of Volunteers Required:
Cost of Volunteers Time ($/Hour/Person):
Per-Person Cost of Lodging for a Volunteer:
Number of Hours Volunteered/Person:
Number of Days Lodging/Volunteer:
Cost of Volunteers:

Damage Year:
RI: 50.00
Are Damages In Current Dollars? Yes

Buildings (Days): 14.0
Utilities (Days): 14.0
Roads (Days): 14.0

Total	$556,445
Total Inflated	

Volunteers Cost

Number of Volunteers Required:
Cost of Volunteers Time ($/Hour/Person):
Per-Person Cost of Lodging for a Volunteer:
Number of Hours Volunteered/Person:
Number of Days Lodging/Volunteer:
Cost of Volunteers:

Total Benefits: **$408,378** Total Costs: **$615,000** BCR: **0.66**

Project Number: Disaster #: Program: Agency:

State: Point of Contact: Analyst: W Buckman

Damage Year:
RI: 100.00
Are Damages In Current Dollars? Yes

Buildings (Days): 14.0
Utilities (Days): 14.0
Roads (Days): 14.0

Total	$556,445
Total Inflated	

Volunteers Cost

Number of Volunteers Required:
Cost of Volunteers Time ($/Hour/Person):
Per-Person Cost of Lodging for a Volunteer:
Number of Hours Volunteered/Person:
Number of Days Lodging/Volunteer:
Cost of Volunteers:

Damage Year:
RI:
Are Damages In Current Dollars? Yes

Buildings (Days): 14.0
Utilities (Days): 14.0
Roads (Days): 14.0

Total	$556,445
Total Inflated	

Volunteers Cost

Number of Volunteers Required:
Cost of Volunteers Time ($/Hour/Person):
Per-Person Cost of Lodging for a Volunteer:
Number of Hours Volunteered/Person:
Number of Days Lodging/Volunteer:
Cost of Volunteers:

Summary Of Benefits

Expected Annual Damages Before Mitigation	Expected Annual Damages After Mitigation	Expected Avoided Damages After Mitigation (Benefits)

Total Benefits: **$408,378** Total Costs: **$615,000** BCR: **0.66**

Project Number: Disaster #: Program: Agency:

State: Point of Contact: Analyst: W Buckman

Annual:	$31,180	Annual:	$1,589	Annual:	$29,591
Present Value:	$430,307	Present Value:	$21,929	Present Value:	$408,378

Mitigation Benefits:	$408,378	Mitigation Costs:	$615,000
Benefits Minus Costs:	($206,622)	Benefit-Cost Ratio:	0.66

Cost Estimate

Project Useful Life (years):	50	Construction Type:	
Mitigation Project Cost:	$615,000	Detailed Scope of Work:	Yes
Annual Project Maintenance Cost:	$0	Detailed Estimate for Entire Project:	Yes
Final Mitigation Project Cost:	$615,000	Years of Maintenance:	50
Cost Basis Year:		Present Worth of Annual Maintenance Costs:	$0
Construction Start Year:		Estimate Reflects Current Prices:	Yes
Construction End Year:		Project Escalation:	

Total Benefits: **$408,378** Total Costs: **$615,000** BCR: **0.66**

Project Number: Disaster #: Program: Agency:

State: Point of Contact: Analyst: W Buckman

Justification/Attachments

Field	Description	Attachments

Total Benefits: **$77,216** Total Costs: **$150,000** BCR: **0.51**

Project Number: Disaster #: Program: Agency:

State: Point of Contact: Analyst: W Buckman

Project Summary:

Project Number: Disaster #:

Program: Agency:

Analyst: W Buckman

Point of Contact: Phone Number:

Address:

Email:

Comments:

Structure Summary For:

Binnekill, New York, , Ulster

Structure Type: Other Historic Building: No Contact:

Benefits: $77,216 Costs: $150,000 BCR: 0.51

Mitigation	Hazard	BCR	Benefits	Costs
TBD	Damage-Frequency Assessment	0.51	$77,216	$150,000

Total Benefits: **$77,216** Total Costs: **$150,000** BCR: **0.51**

Project Number: Disaster #: Program: Agency:

State: Point of Contact: Analyst: W Buckman

Structure and Mitigation Details For: Binnekill, New York, , Ulster

Benefits: $77,216 Costs: $150,000 BCR: .51

Hazard: **Damage-Frequency Assessment - TBD**

Mitigation Option:

Latitude: Longitude: Project Useful Life: 50

Mitigation Information

Basis of Damages: Historical Damages

Number of Estimated Damage Events: 3

Number of Events with Know Recurrence Intervals:

Total Benefits: **$77,216** Total Costs: **$150,000** BCR: **0.51**

Project Number: Disaster #: Program: Agency:

State: Point of Contact: Analyst: W Buckman

Roads And Bridges

Estimated Number of One-Way Traffic Trips Per Day: 400

Additional Time per One-Way Trip: 1:15

Number of Additional Miles: 50.0

Federal Rate: 0.575

Economic Loss Per Day of Loss of Function: $26,315

Facility Description:

Building

Fire Station:

Number of People Served by this Fire Station:	100
Type of Area Served by this Fire Station:	Rural
Distance in miles between this fire station and the fire station that would provide fire protection for the geographical area normally served by this fire station:	30.00
Fire Station Provide Emergency Medical Services (EMS)?	Yes
Distance in miles between this fire station and the fire station that would provide EMS for the geographical area normally served by this fire station?	30.00

Total Benefits: **$77,216** Total Costs: **$150,000** BCR: **0.51**

Project Number: Disaster #: Program: Agency:

State: Point of Contact: Analyst: W Buckman

Historic Damages Before and After Mitigation

Analysis Year: 2016 Analysis Duration: Utilities ($/day):

Year Built: User Input Analysis Duration: Buildings ($/day): $331.05

Roads/Bridges ($/day): $26,315.00

Damages Before Mitigation

Damage Year:
RI: 25.00
Are Damages In Current Dollars? Yes
Buildings (Days): 7.0
Utilities (Days): 0.0
Roads (Days): 7.0

Total	$186,522
Total Inflated	

Damages After Mitigation

RI: 100.00
Are Damages In Current Dollars? Yes
Buildings (Days): 7.0
Utilities (Days): 0.0
Roads (Days): 7.0

Total	$186,522

Volunteers Cost

Number of Volunteers Required:
Cost of Volunteers Time ($/Hour/Person):
Per-Person Cost of Lodging for a Volunteer:
Number of Hours Volunteered/Person:
Number of Days Lodging/Volunteer:
Cost of Volunteers:

Total Benefits: **$77,216** Total Costs: **$150,000** BCR: **0.51**

Project Number: Disaster #: Program: Agency:

State: Point of Contact: Analyst: W Buckman

Damage Year:
RI: 50.00
Are Damages In Current Dollars? Yes

Buildings (Days): 7.0
Utilities (Days): 0.0
Roads (Days): 7.0

Total	$186,522
Total Inflated	

Volunteers Cost

Number of Volunteers Required:
Cost of Volunteers Time ($/Hour/Person):
Per-Person Cost of Lodging for a Volunteer:
Number of Hours Volunteered/Person:
Number of Days Lodging/Volunteer:
Cost of Volunteers:

Damage Year:
RI: 100.00
Are Damages In Current Dollars? Yes

Buildings (Days): 7.0
Utilities (Days): 0.0
Roads (Days): 7.0

Total	$186,522
Total Inflated	

Volunteers Cost

Number of Volunteers Required:
Cost of Volunteers Time ($/Hour/Person):
Per-Person Cost of Lodging for a Volunteer:
Number of Hours Volunteered/Person:
Number of Days Lodging/Volunteer:
Cost of Volunteers:

Summary Of Benefits

Expected Annual Damages Before Mitigation	Expected Annual Damages After Mitigation	Expected Avoided Damages After Mitigation (Benefits)

Total Benefits: **$77,216** Total Costs: **$150,000** BCR: **0.51**

Project Number: Disaster #: Program: Agency:

State: Point of Contact: Analyst: W Buckman

Annual:	$7,460	Annual:	$1,865	Annual:	$5,595
Present Value:	$102,954	Present Value:	$25,738	Present Value:	$77,216

Mitigation Benefits:	$77,216	Mitigation Costs:	$150,000
Benefits Minus Costs:	($72,784)	Benefit-Cost Ratio:	0.51

Cost Estimate

Project Useful Life (years):	50	Construction Type:	
Mitigation Project Cost:	$150,000	Detailed Scope of Work:	Yes
Annual Project Maintenance Cost:	$0	Detailed Estimate for Entire Project:	Yes
Final Mitigation Project Cost:	$150,000	Years of Maintenance:	50
Cost Basis Year:		Present Worth of Annual Maintenance Costs:	$0
Construction Start Year:		Estimate Reflects Current Prices:	Yes
Construction End Year:		Project Escalation:	

Total Benefits: **$77,216** Total Costs: **$150,000** BCR: **0.51**

Project Number: Disaster #: Program: Agency:

State: Point of Contact: Analyst: W Buckman

Justification/Attachments

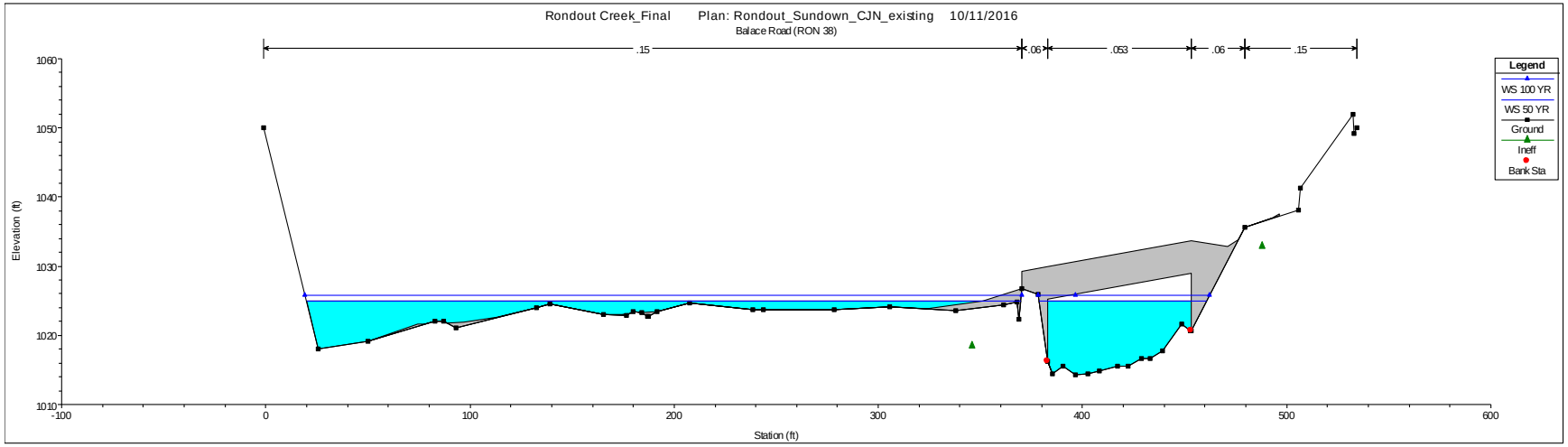
Field	Description	Attachments

APPENDIX B

HEC-RAS Results

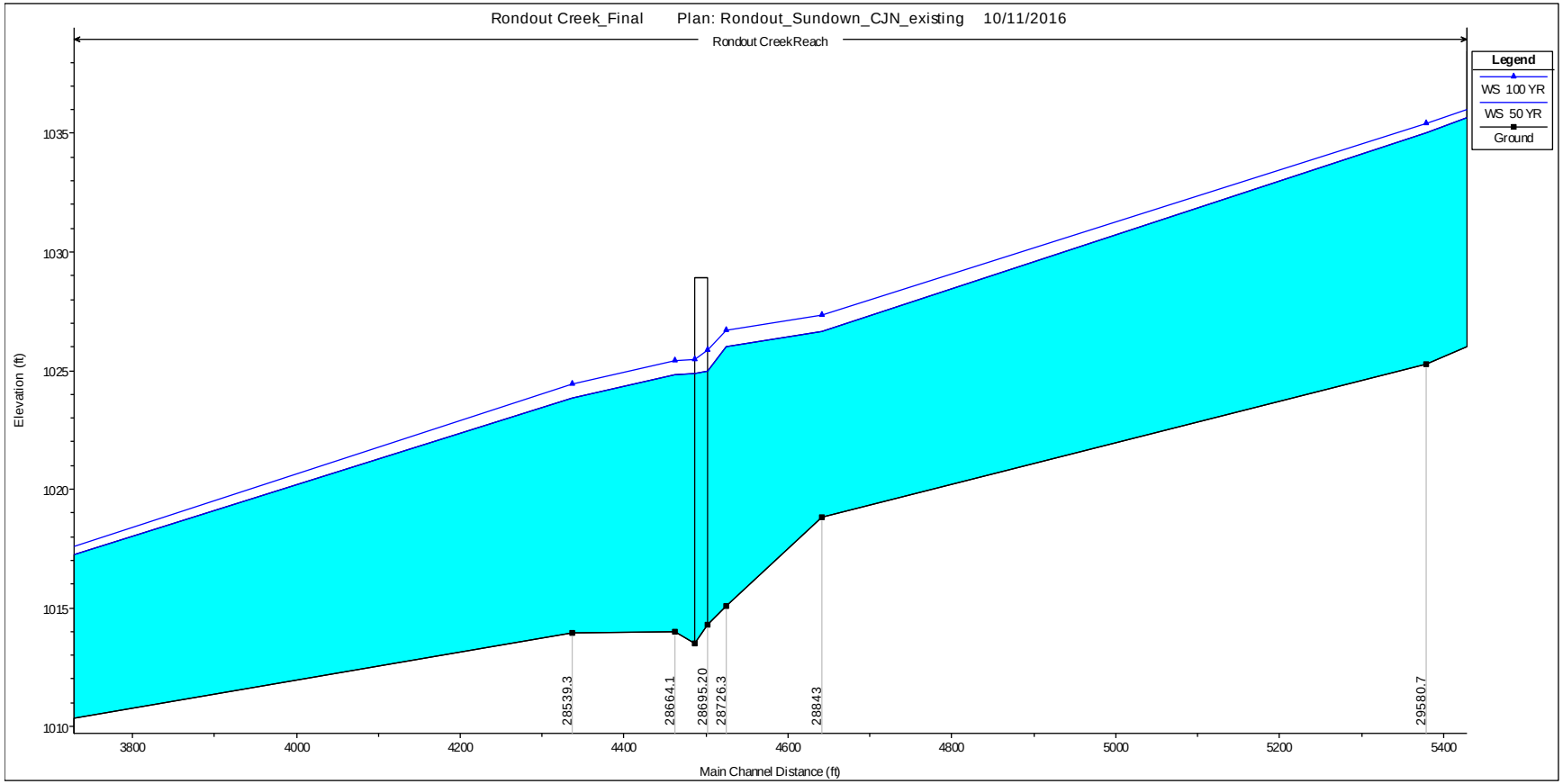
Balace Road Bridge

Existing Upstream Cross Section (50 & 100-year storm)



Balace Road Bridge

Existing Profile (50 & 100-year storm)



Balace Road - 100 Year Event

HEC-RAS Profile: 100 YR

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Sundown Creek	Reach	14784 XS SUN_30X	100 YR	Existing Conditions	385.00	1615.28	1619.00	1619.00	1620.20	0.042174	8.80	45.10	21.02	0.97
Sundown Creek	Reach	14784 XS SUN_30X	100 YR	Balace 10'	385.00	1615.28	1619.00	1619.00	1620.20	0.042174	8.80	45.10	21.02	0.97
Sundown Creek	Reach	14479.08 XS SUN_36X	100 YR	Existing Conditions	385.00	1601.47	1604.81	1604.81	1605.87	0.042311	8.29	48.26	79.83	0.97
Sundown Creek	Reach	14479.08 XS SUN_36X	100 YR	Balace 10'	385.00	1601.47	1604.81	1604.81	1605.87	0.042311	8.29	48.26	79.83	0.97
Sundown Creek	Reach	14226.26 XS SUN_35X	100 YR	Existing Conditions	385.00	1588.21	1591.35	1591.35	1591.80	0.024809	6.62	108.29	107.25	0.75
Sundown Creek	Reach	14226.26 XS SUN_35X	100 YR	Balace 10'	385.00	1588.21	1591.35	1591.35	1591.80	0.024809	6.62	108.29	107.25	0.75
Sundown Creek	Reach	13701.46 XS SUN_29X	100 YR	Existing Conditions	385.00	1559.00	1562.55	1562.55	1563.47	0.046608	7.75	51.22	29.23	0.98
Sundown Creek	Reach	13701.46 XS SUN_29X	100 YR	Balace 10'	385.00	1559.00	1562.55	1562.55	1563.47	0.046608	7.75	51.22	29.23	0.98
Sundown Creek	Reach	13267.4 XS SUN_28X	100 YR	Existing Conditions	816.00	1539.96	1545.07	1545.07	1546.53	0.035310	9.84	89.89	153.24	0.94
Sundown Creek	Reach	13267.4 XS SUN_28X	100 YR	Balace 10'	816.00	1539.96	1545.07	1545.07	1546.53	0.035310	9.84	89.89	153.24	0.94
Sundown Creek	Reach	12500.49 XS SUN_27X	100 YR	Existing Conditions	816.00	1507.02	1511.77	1511.40	1512.93	0.028338	8.66	95.27	30.95	0.84
Sundown Creek	Reach	12500.49 XS SUN_27X	100 YR	Balace 10'	816.00	1507.02	1511.77	1511.40	1512.93	0.028338	8.66	95.27	30.95	0.84
Sundown Creek	Reach	12004.32 XS SUN_34X	100 YR	Existing Conditions	816.00	1490.77	1494.23	1494.23	1495.17	0.046806	9.23	130.08	82.35	1.04
Sundown Creek	Reach	12004.32 XS SUN_34X	100 YR	Balace 10'	816.00	1490.77	1494.23	1494.23	1495.17	0.046806	9.23	130.08	82.35	1.04
Sundown Creek	Reach	11756.8 XS SUN_26X	100 YR	Existing Conditions	816.00	1478.76	1483.30	1482.92	1484.00	0.024352	6.96	140.67	79.55	0.72
Sundown Creek	Reach	11756.8 XS SUN_26X	100 YR	Balace 10'	816.00	1478.76	1483.30	1482.92	1484.00	0.024352	6.96	140.67	79.55	0.72
Sundown Creek	Reach	11611.19 XS SUN_33X	100 YR	Existing Conditions	816.00	1476.69	1479.75	1479.30	1480.06	0.028036	5.30	201.21	135.86	0.75
Sundown Creek	Reach	11611.19 XS SUN_33X	100 YR	Balace 10'	816.00	1476.69	1479.75	1479.30	1480.06	0.028036	5.30	201.21	135.86	0.75
Sundown Creek	Reach	11360.01 XS SUN_47X	100 YR	Existing Conditions	816.00	1465.80	1470.48	1470.48	1471.86	0.039032	9.48	91.27	37.04	0.97
Sundown Creek	Reach	11360.01 XS SUN_47X	100 YR	Balace 10'	816.00	1465.80	1470.48	1470.48	1471.86	0.039032	9.48	91.27	37.04	0.97
Sundown Creek	Reach	11333.12 Bridge			Bridge									
Sundown Creek	Reach	11306.22 BR SUN_25B	100 YR	Existing Conditions	816.00	1462.42	1470.14	1466.98	1470.43	0.003968	4.42	220.92	72.80	0.33
Sundown Creek	Reach	11306.22 BR SUN_25B	100 YR	Balace 10'	816.00	1462.42	1470.14	1466.98	1470.43	0.003968	4.42	220.92	72.80	0.33
Sundown Creek	Reach	11280.27 BR SUN_25A	100 YR	Existing Conditions	816.00	1462.51	1470.12		1470.30	0.002023	3.42	260.86	57.83	0.24
Sundown Creek	Reach	11280.27 BR SUN_25A	100 YR	Balace 10'	816.00	1462.51	1470.12		1470.30	0.002023	3.42	260.86	57.83	0.24
Sundown Creek	Reach	11258 XS SUN_23X	100 YR	Existing Conditions	816.00	1464.48	1468.53	1468.53	1470.05	0.039630	9.93	86.65	34.25	0.99
Sundown Creek	Reach	11258 XS SUN_23X	100 YR	Balace 10'	816.00	1464.48	1468.53	1468.53	1470.05	0.039630	9.93	86.65	34.25	0.99
Sundown Creek	Reach	10956.28 XS SUN_22X	100 YR	Existing Conditions	816.00	1450.30	1454.02	1453.75	1454.97	0.029401	7.86	107.51	46.03	0.84
Sundown Creek	Reach	10956.28 XS SUN_22X	100 YR	Balace 10'	816.00	1450.30	1454.02	1453.75	1454.97	0.029401	7.86	107.51	46.03	0.84
Sundown Creek	Reach	10285.9 XS SUN_21XA	100 YR	Existing Conditions	816.00	1425.36	1429.38	1429.38	1431.05	0.043970	10.35	78.96	24.35	1.00
Sundown Creek	Reach	10285.9 XS SUN_21XA	100 YR	Balace 10'	816.00	1425.36	1429.38	1429.38	1431.05	0.043970	10.35	78.96	24.35	1.00
Sundown Creek	Reach	9888.424 XS SUN_21X	100 YR	Existing Conditions	816.00	1325.67	1329.55	1329.55	1331.18	0.037513	10.33	85.49	29.14	0.99
Sundown Creek	Reach	9888.424 XS SUN_21X	100 YR	Balace 10'	816.00	1325.67	1329.55	1329.55	1331.18	0.037513	10.33	85.49	29.14	0.99
Sundown Creek	Reach	9563.817 XS SUN_20X	100 YR	Existing Conditions	816.00	1309.30	1313.08	1313.08	1314.53	0.041465	9.67	85.33	31.26	0.99
Sundown Creek	Reach	9563.817 XS SUN_20X	100 YR	Balace 10'	816.00	1309.30	1313.08	1313.08	1314.53	0.041465	9.67	85.33	31.26	0.99
Sundown Creek	Reach	9120.165 XS SUN_44X	100 YR	Existing Conditions	816.00	1294.98	1298.06	1297.81	1298.62	0.029488	5.98	140.50	85.16	0.79
Sundown Creek	Reach	9120.165 XS SUN_44X	100 YR	Balace 10'	816.00	1294.98	1298.06	1297.81	1298.62	0.029488	5.98	140.50	85.16	0.79
Sundown Creek	Reach	8865.03 XS SUN_19X	100 YR	Existing Conditions	816.00	1286.27	1290.50		1291.52	0.025925	8.11	104.76	38.06	0.81
Sundown Creek	Reach	8865.03 XS SUN_19X	100 YR	Balace 10'	816.00	1286.27	1290.50		1291.52	0.025925	8.11	104.76	38.06	0.81
Sundown Creek	Reach	8701.974 XS SUN_18X	100 YR	Existing Conditions	2150.00	1277.94	1284.11	1284.11	1286.30	0.033756	11.92	191.65	49.61	0.98
Sundown Creek	Reach	8701.974 XS SUN_18X	100 YR	Balace 10'	2150.00	1277.94	1284.11	1284.11	1286.30	0.033756	11.92	191.65	49.61	0.98
Sundown Creek	Reach	8529.396 XS SUN_43X	100 YR	Existing Conditions	2150.00	1273.15	1278.41	1278.41	1280.47	0.029013	11.80	222.77	81.82	0.93
Sundown Creek	Reach	8529.396 XS SUN_43X	100 YR	Balace 10'	2150.00	1273.15	1278.41	1278.41	1280.47	0.029013	11.80	222.77	81.82	0.93
Sundown Creek	Reach	8169.187 XS SUN_42X	100 YR	Existing Conditions	2150.00	1260.30	1266.79	1266.79	1268.73	0.035270	13.63	296.35	79.07	1.03
Sundown Creek	Reach	8169.187 XS SUN_42X	100 YR	Balace 10'	2150.00	1260.30	1266.79	1266.79	1268.73	0.035270	13.63	296.35	79.07	1.03
Sundown Creek	Reach	7911.303 XS SUN_41X	100 YR	Existing Conditions	2150.00	1251.09	1256.60	1256.60	1258.76	0.032454	11.99	206.22	56.21	0.97
Sundown Creek	Reach	7911.303 XS SUN_41X	100 YR	Balace 10'	2150.00	1251.09	1256.60	1256.60	1258.76	0.032454	11.99	206.22	56.21	0.97
Sundown Creek	Reach	7734.417 XS SUN_17X	100 YR	Existing Conditions	2150.00	1243.99	1250.49	1250.35	1252.21	0.026851	10.78	242.70	79.71	0.86
Sundown Creek	Reach	7734.417 XS SUN_17X	100 YR	Balace 10'	2150.00	1243.99	1250.49	1250.35	1252.21	0.026851	10.78	242.70	79.71	0.86
Sundown Creek	Reach	7022.902 XS SUN_16X	100 YR	Existing Conditions	2150.00	1224.22	1229.83	1229.83	1231.96	0.030107	12.33	230.06	60.92	0.96
Sundown Creek	Reach	7022.902 XS SUN_16X	100 YR	Balace 10'	2150.00	1224.22	1229.83	1229.83	1231.96	0.030107	12.33	230.06	60.92	0.96
Sundown Creek	Reach	6426.67 XS SUN_40X	100 YR	Existing Conditions	2150.00	1203.03	1208.59	1208.59	1210.57	0.034048	11.38	203.52	56.80	0.98
Sundown Creek	Reach	6426.67 XS SUN_40X	100 YR	Balace 10'	2150.00	1203.03	1208.59	1208.59	1210.57	0.034048	11.38	203.52	56.80	0.98
Sundown Creek	Reach	5885.625 XS SUN_48X	100 YR	Existing Conditions	2150.00	1188.30	1193.61		1194.20	0.011244	5.79	361.54	119.85	0.52
Sundown Creek	Reach	5885.625 XS SUN_48X	100 YR	Balace 10'	2150.00	1188.30	1193.61		1194.20	0.011244	5.79	361.54	119.85	0.52
Sundown Creek	Reach	5846.653 BR SUN_15D	100 YR	Existing Conditions	2150.00	1183.83	1193.44	1191.93	1193.87	0.004211	5.86	459.73	117.39	0.37
Sundown Creek	Reach	5846.653 BR SUN_15D	100 YR	Balace 10'	2150.00	1183.83	1193.44	1191.93	1193.87	0.004211	5.86	459.73	117.39	0.37
Sundown Creek	Reach	5821.221 Bridge			Bridge									
Sundown Creek	Reach	5800.354 BR SUN_15C	100 YR	Existing Conditions	2150.00	1182.68	1191.86	1191.52	1192.75	0.011314	8.18	315.78	113.20	0.55
Sundown Creek	Reach	5800.354 BR SUN_15C	100 YR	Balace 10'	2150.00	1182.68	1191.86	1191.52	1192.75	0.011314	8.18	315.78	113.20	0.55
Sundown Creek	Reach	5775.103 BR SUN_15A	100 YR	Existing Conditions	2150.00	1181.72	1191.77		1192.36	0.008152	6.40	360.92	109.05	0.45
Sundown Creek	Reach	5775.103 BR SUN_15A	100 YR	Balace 10'	2150.00	1181.72	1191.77		1192.36	0.008152	6.40	360.92	109.05	0.45
Sundown Creek	Reach	5688.313 XS SUN_49X	100 YR	Existing Conditions	2150.00	1182.81	1190.05	1190.05	1191.31	0.017625	9.73	282.44	95.82	0.73
Sundown Creek	Reach	5688.313 XS SUN_49X	100 YR	Balace 10'	2150.00	1182.81	1190.05	1190.05	1191.31	0.017625	9.73	282.44	95.82	0.73
Sundown Creek	Reach	5356.54 XS SUN_32X	100 YR	Existing Conditions	2150.00	1164.83	1171.25	1171.25	1173.79	0.033660	12.93	182.88	40.75	0.98
Sundown Creek	Reach	5356.54 XS SUN_32X	100 YR	Balace 10'	2150.00	1164.83	1171.25	1171.25	1173.79	0.033660	12.93	182.88	40.75	0.98
Sundown Creek	Reach	4929.002 XS SUN_31X	100 YR	Existing Conditions	2150.00	1135.12	1140.88	1140.88	1143.48	0.035841	12.98	171.84	36.60	0.99

HEC-RAS Profile: 100 YR (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Sundown Creek	Reach	4929.002 XS SUN_31X	100 YR	Balace 10'	2150.00	1135.12	1140.88	1140.88	1143.48	0.035841	12.98	171.84	36.60	0.99
Sundown Creek	Reach	4792.939 XS SUN_14X	100 YR	Existing Conditions	2150.00	1118.46	1126.38		1126.90	0.005582	5.80	371.39	62.57	0.40
Sundown Creek	Reach	4792.939 XS SUN_14X	100 YR	Balace 10'	2150.00	1118.46	1126.38		1126.90	0.005582	5.80	371.39	62.57	0.40
Sundown Creek	Reach	4469.083 XS SUN_45X	100 YR	Existing Conditions	2150.00	1113.38	1120.67	1120.67	1123.15	0.030804	12.94	196.02	46.49	0.97
Sundown Creek	Reach	4469.083 XS SUN_45X	100 YR	Balace 10'	2150.00	1113.38	1120.67	1120.67	1123.15	0.030804	12.94	196.02	46.49	0.97
Sundown Creek	Reach	3643.11 XS SUN_13X	100 YR	Existing Conditions	2840.00	1080.11	1086.58	1086.14	1088.53	0.026537	11.23	259.49	53.73	0.87
Sundown Creek	Reach	3643.11 XS SUN_13X	100 YR	Balace 10'	2840.00	1080.11	1086.58	1086.14	1088.53	0.026537	11.23	259.49	53.73	0.87
Sundown Creek	Reach	3431.445 XS SUN_39X	100 YR	Existing Conditions	2840.00	1073.46	1080.73	1080.73	1083.06	0.024812	12.86	311.06	86.12	0.89
Sundown Creek	Reach	3431.445 XS SUN_39X	100 YR	Balace 10'	2840.00	1073.46	1080.73	1080.73	1083.06	0.024812	12.86	311.06	86.12	0.89
Sundown Creek	Reach	3050.617 XS SUN_38X	100 YR	Existing Conditions	2840.00	1064.51	1070.57	1070.40	1072.58	0.026184	11.95	317.13	83.98	0.90
Sundown Creek	Reach	3050.617 XS SUN_38X	100 YR	Balace 10'	2840.00	1064.51	1070.57	1070.40	1072.58	0.026184	11.95	317.13	83.98	0.90
Sundown Creek	Reach	2828.606 XS SUN_37X	100 YR	Existing Conditions	2840.00	1058.75	1064.00	1064.00	1065.97	0.034122	11.49	278.51	75.38	0.98
Sundown Creek	Reach	2828.606 XS SUN_37X	100 YR	Balace 10'	2840.00	1058.75	1064.00	1064.00	1065.97	0.034122	11.49	278.51	75.38	0.98
Sundown Creek	Reach	2533.334 XS SUN_12X	100 YR	Existing Conditions	2840.00	1046.13	1053.50	1053.12	1055.76	0.029930	12.07	235.92	43.77	0.90
Sundown Creek	Reach	2533.334 XS SUN_12X	100 YR	Balace 10'	2840.00	1046.13	1053.50	1053.12	1055.76	0.029930	12.07	235.92	43.77	0.90
Sundown Creek	Reach	1689.646 XS SUN_11X	100 YR	Existing Conditions	2840.00	1017.07	1024.52	1024.52	1027.33	0.038081	13.43	212.34	39.77	1.00
Sundown Creek	Reach	1689.646 XS SUN_11X	100 YR	Balace 10'	2840.00	1017.07	1024.52	1024.52	1027.33	0.038081	13.43	212.34	39.77	1.00
Sundown Creek	Reach	1587.831 BR SUN_10D	100 YR	Existing Conditions	2840.00	1014.72	1022.56	1021.43	1024.01	0.018691	9.66	293.96	52.91	0.72
Sundown Creek	Reach	1587.831 BR SUN_10D	100 YR	Balace 10'	2840.00	1014.72	1022.56	1021.43	1024.01	0.018691	9.66	293.96	52.91	0.72
Sundown Creek	Reach	1559.583 Bridge			Bridge									
Sundown Creek	Reach	1512.841 BR SUN_10A	100 YR	Existing Conditions	2840.00	1013.17	1020.32	1019.43	1022.12	0.019547	10.85	273.38	51.09	0.78
Sundown Creek	Reach	1512.841 BR SUN_10A	100 YR	Balace 10'	2840.00	1013.17	1020.32	1019.43	1022.12	0.019547	10.85	273.38	51.09	0.78
Sundown Creek	Reach	1410.457 XS SUN_07X	100 YR	Existing Conditions	2840.00	1009.83	1016.58	1016.58	1019.32	0.032050	13.36	221.99	43.76	0.98
Sundown Creek	Reach	1410.457 XS SUN_07X	100 YR	Balace 10'	2840.00	1009.83	1016.58	1016.58	1019.32	0.032050	13.36	221.99	43.76	0.98
Sundown Creek	Reach	1144.503 XS SUN_06X	100 YR	Existing Conditions	2840.00	1002.51	1011.39	1009.72	1013.05	0.015577	10.37	283.76	44.08	0.67
Sundown Creek	Reach	1144.503 XS SUN_06X	100 YR	Balace 10'	2840.00	1002.51	1011.39	1009.72	1013.05	0.015577	10.37	283.76	44.08	0.67
Sundown Creek	Reach	1026.719 BR SUN_05D	100 YR	Existing Conditions	2840.00	1000.10	1010.31	1007.08	1011.43	0.008803	8.50	343.11	132.78	0.50
Sundown Creek	Reach	1026.719 BR SUN_05D	100 YR	Balace 10'	2840.00	1000.10	1010.31	1007.08	1011.43	0.008803	8.50	343.11	132.78	0.50
Sundown Creek	Reach	993.8764 Bridge			Bridge									
Sundown Creek	Reach	962.1789 BR SUN_05A	100 YR	Existing Conditions	2840.00	998.71	1006.73	1005.71	1008.56	0.021396	10.86	261.85	95.01	0.77
Sundown Creek	Reach	962.1789 BR SUN_05A	100 YR	Balace 10'	2840.00	998.71	1006.73	1005.71	1008.56	0.021396	10.86	261.85	95.01	0.77
Sundown Creek	Reach	837.2104 XS SUN_03X	100 YR	Existing Conditions	2840.00	995.92	1003.23	1002.76	1005.53	0.025108	12.21	242.98	89.87	0.88
Sundown Creek	Reach	837.2104 XS SUN_03X	100 YR	Balace 10'	2840.00	995.92	1003.23	1002.76	1005.53	0.025108	12.21	242.98	89.87	0.88
Sundown Creek	Reach	467.9756 XS SUN_02X	100 YR	Existing Conditions	2840.00	988.37	993.51	993.51	995.20	0.030326	10.64	351.90	255.32	0.90
Sundown Creek	Reach	467.9756 XS SUN_02X	100 YR	Balace 10'	2840.00	988.37	993.51	993.51	995.20	0.030326	10.64	351.90	255.32	0.90
Sundown Creek	Reach	181.3982 XS SUN_01X	100 YR	Existing Conditions	2840.00	978.20	985.73	985.73	987.35	0.023753	10.59	378.83	326.06	0.82
Sundown Creek	Reach	181.3982 XS SUN_01X	100 YR	Balace 10'	2840.00	978.20	985.73	985.73	987.35	0.023753	10.59	378.83	326.06	0.82
Sundown Creek	Reach	50.00015 XS SUN_46X	100 YR	Existing Conditions	2840.00	975.97	982.09	982.09	983.28	0.027826	10.16	416.08	225.76	0.87
Sundown Creek	Reach	50.00015 XS SUN_46X	100 YR	Balace 10'	2840.00	975.97	982.09	982.09	983.28	0.027826	10.16	416.08	225.76	0.87
Rondout Creek	Reach	36559.8 Rondout_XS_63	100 YR	Existing Conditions	8100.00	1110.01	1120.51		1121.22	0.005891	7.11	1528.11	310.62	0.46
Rondout Creek	Reach	36559.8 Rondout_XS_63	100 YR	Balace 10'	8100.00	1110.01	1120.51		1121.22	0.005891	7.11	1528.11	310.62	0.46
Rondout Creek	Reach	36437.5 Rondout_XS_62	100 YR	Existing Conditions	8100.00	1109.07	1120.12		1120.58	0.003828	5.80	1983.43	366.45	0.37
Rondout Creek	Reach	36437.5 Rondout_XS_62	100 YR	Balace 10'	8100.00	1109.07	1120.12		1120.58	0.003828	5.80	1983.43	366.45	0.37
Rondout Creek	Reach	35949 Rondout_XS_61	100 YR	Existing Conditions	8100.00	1105.35	1114.45	1114.45	1116.42	0.030839	13.91	1196.24	362.27	0.98
Rondout Creek	Reach	35949 Rondout_XS_61	100 YR	Balace 10'	8100.00	1105.35	1114.45	1114.45	1116.42	0.030839	13.91	1196.24	362.27	0.98
Rondout Creek	Reach	35517.78 Rondout_XS_73	100 YR	Existing Conditions	8100.00	1095.53	1108.83		1109.05	0.001388	4.71	3513.14	454.07	0.24
Rondout Creek	Reach	35517.78 Rondout_XS_73	100 YR	Balace 10'	8100.00	1095.53	1108.83		1109.05	0.001388	4.71	3513.14	454.07	0.24
Rondout Creek	Reach	35484 Rondout_XS_60	100 YR	Existing Conditions	8100.00	1094.42	1107.42	1104.98	1108.83	0.010231	10.10	1329.12	430.44	0.58
Rondout Creek	Reach	35484 Rondout_XS_60	100 YR	Balace 10'	8100.00	1094.42	1107.42	1104.98	1108.83	0.010231	10.10	1329.12	430.44	0.58
Rondout Creek	Reach	35260 Rondout_XS_59	100 YR	Existing Conditions	8100.00	1091.61	1106.42	1103.11	1106.85	0.006514	6.26	2223.08	427.33	0.33
Rondout Creek	Reach	35260 Rondout_XS_59	100 YR	Balace 10'	8100.00	1091.61	1106.42	1103.11	1106.85	0.006514	6.26	2223.08	427.33	0.33
Rondout Creek	Reach	35226.02			Bridge									
Rondout Creek	Reach	35192 Rondout_XS_56	100 YR	Existing Conditions	8100.00	1092.23	1102.27	1101.87	1104.28	0.015507	11.98	1076.49	351.29	0.74
Rondout Creek	Reach	35192 Rondout_XS_56	100 YR	Balace 10'	8100.00	1092.23	1102.27	1101.87	1104.28	0.015507	11.98	1076.49	351.29	0.74
Rondout Creek	Reach	35114 Rondout_XS_55	100 YR	Existing Conditions	8100.00	1092.03	1101.59		1102.89	0.011282	10.22	1435.73	368.49	0.63
Rondout Creek	Reach	35114 Rondout_XS_55	100 YR	Balace 10'	8100.00	1092.03	1101.59		1102.89	0.011282	10.22	1435.73	368.49	0.63
Rondout Creek	Reach	34544.4 Rondout_XS_54	100 YR	Existing Conditions	8100.00	1084.87	1096.37		1097.37	0.008419	9.07	1495.91	281.50	0.56
Rondout Creek	Reach	34544.4 Rondout_XS_54	100 YR	Balace 10'	8100.00	1084.87	1096.37		1097.37	0.008419	9.07	1495.91	281.50	0.56
Rondout Creek	Reach	33437.5 Rondout_XS_53	100 YR	Existing Conditions	8100.00	1072.93	1082.31	1081.89	1084.05	0.019044	10.91	952.17	273.82	0.79
Rondout Creek	Reach	33437.5 Rondout_XS_53	100 YR	Balace 10'	8100.00	1072.93	1082.31	1081.89	1084.05	0.019044	10.91	952.17	273.82	0.79
Rondout Creek	Reach	32259.3 Rondout_XS_52	100 YR	Existing Conditions	8100.00	1056.05	1066.51	1064.34	1068.00	0.010188	9.91	957.36	647.77	0.61
Rondout Creek	Reach	32259.3 Rondout_XS_52	100 YR	Balace 10'	8100.00	1056.05	1066.51	1064.34	1068.00	0.010188	9.91	957.36	647.77	0.61
Rondout Creek	Reach	31637.7 Rondout_XS_51	100 YR	Existing Conditions	8100.00	1049.72	1060.71	1057.85	1062.23	0.008471	10.09	988.24	651.43	0.56
Rondout Creek	Reach	31637.7 Rondout_XS_51	100 YR	Balace 10'	8100.00	1049.72	1060.71	1057.85	1062.23	0.008471	10.09	988.24	651.43	0.56
Rondout Creek	Reach	31417.9 Rondout_XS_50	100 YR	Existing Conditions	8100.00	1044.82	1056.82	1055.80	1059.47	0.018579	13.08	652.72	523.17	0.81
Rondout Creek	Reach	31417.9 Rondout_XS_50	100 YR	Balace 10'	8100.00	1044.82	1056.82	1055.80	1059.47	0.018579	13.08	652.72	523.17	0.81

HEC-RAS Profile: 100 YR (Continued)

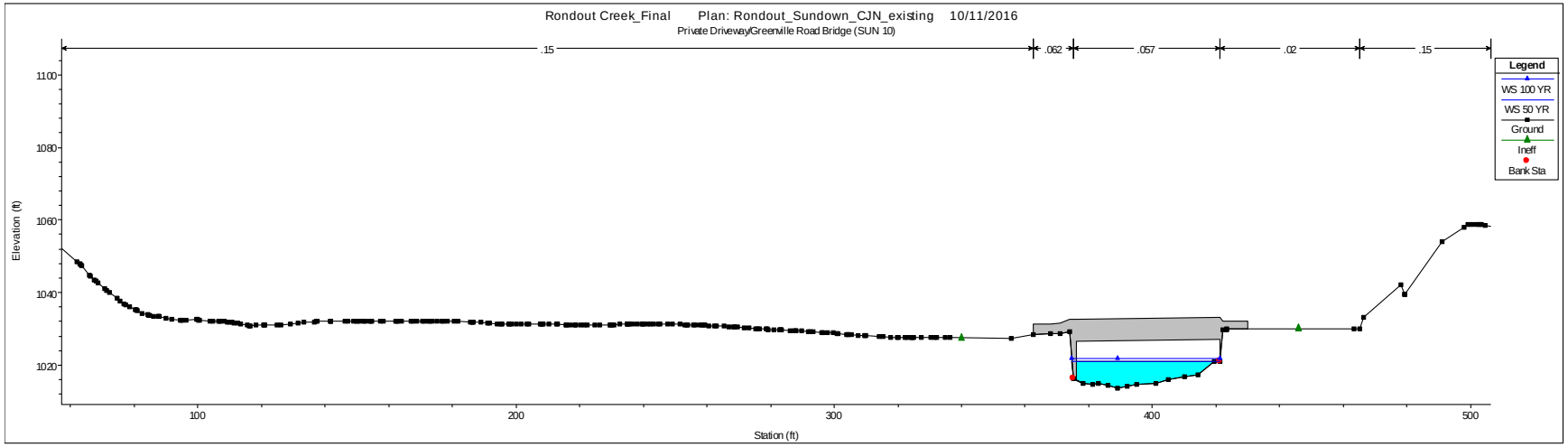
River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Rondout Creek	Reach	30913.9 Rondout_XS_49	100 YR	Existing Conditions	8100.00	1045.49	1051.68		1052.13	0.009721	6.88	1996.26	610.36	0.56
Rondout Creek	Reach	30913.9 Rondout_XS_49	100 YR	Balace 10'	8100.00	1045.49	1051.68		1052.13	0.009721	6.88	1996.26	610.36	0.56
Rondout Creek	Reach	29580.7 Rondout_XS_48	100 YR	Existing Conditions	8100.00	1025.25	1035.42	1035.42	1036.67	0.014974	10.02	1324.84	548.93	0.71
Rondout Creek	Reach	29580.7 Rondout_XS_48	100 YR	Balace 10'	8100.00	1025.25	1035.42	1035.42	1036.67	0.014974	10.02	1324.84	548.93	0.71
Rondout Creek	Reach	28843 Rondout_XS_47	100 YR	Existing Conditions	8100.00	1018.80	1027.32		1028.00	0.008063	7.93	1943.43	445.14	0.53
Rondout Creek	Reach	28843 Rondout_XS_47	100 YR	Balace 10'	8100.00	1018.80	1027.10		1027.86	0.009240	8.31	1847.28	444.37	0.56
Rondout Creek	Reach	28726.3 Rondout_XS_46	100 YR	Existing Conditions	8100.00	1015.06	1026.71	1023.56	1027.29	0.004654	7.01	2163.13	443.38	0.41
Rondout Creek	Reach	28726.3 Rondout_XS_46	100 YR	Balace 10'	8100.00	1015.06	1026.38	1023.56	1027.04	0.005538	7.45	2014.00	442.52	0.45
Rondout Creek	Reach	28695.20		Bridge										
Rondout Creek	Reach	28664.1 Rondout_XS_43	100 YR	Existing Conditions	8100.00	1014.00	1025.41	1023.72	1026.46	0.008452	9.42	1707.95	423.84	0.55
Rondout Creek	Reach	28664.1 Rondout_XS_43	100 YR	Balace 10'	8100.00	1014.00	1025.40	1023.72	1026.46	0.008484	9.43	1704.69	423.39	0.56
Rondout Creek	Reach	28539.3 Rondout_XS_42	100 YR	Existing Conditions	8100.00	1013.94	1024.44		1025.06	0.010982	7.56	1897.75	440.25	0.46
Rondout Creek	Reach	28539.3 Rondout_XS_42	100 YR	Balace 10'	8100.00	1013.94	1024.43		1025.05	0.011093	7.59	1890.34	440.22	0.46
Rondout Creek	Reach	27901.6 Rondout_XS_41	100 YR	Existing Conditions	8100.00	1010.19	1017.26		1017.67	0.013651	6.53	2191.06	607.37	0.46
Rondout Creek	Reach	27901.6 Rondout_XS_41	100 YR	Balace 10'	8100.00	1010.19	1017.29		1017.69	0.013389	6.49	2206.22	607.42	0.45
Rondout Creek	Reach	26788.23 Rondout_XS_70	100 YR	Existing Conditions	8100.00	996.90	1004.50		1005.15	0.010314	8.12	2413.44	904.53	0.58
Rondout Creek	Reach	26788.23 Rondout_XS_70	100 YR	Balace 10'	8100.00	996.90	1004.48		1005.13	0.010538	8.18	2391.33	902.46	0.59
Rondout Creek	Reach	26509.47	100 YR	Existing Conditions	8100.00	994.51	1003.33		1003.65	0.005274	5.16	2220.35	506.74	0.41
Rondout Creek	Reach	26509.47	100 YR	Balace 10'	8100.00	994.51	1003.23		1003.58	0.005626	5.26	2173.86	506.74	0.42
Rondout Creek	Reach	26230.71	100 YR	Existing Conditions	8100.00	985.84	996.50	996.50	998.45	0.041104	12.32	939.10	240.25	0.86
Rondout Creek	Reach	26230.71	100 YR	Balace 10'	8100.00	985.84	996.86		998.49	0.032729	11.37	1025.18	240.36	0.78
Rondout Creek	Reach	25673.2 Rondout_XS_40	100 YR	Existing Conditions	8100.00	983.66	992.62		992.83	0.003267	4.88	2872.84	752.24	0.34
Rondout Creek	Reach	25673.2 Rondout_XS_40	100 YR	Balace 10'	8100.00	983.66	991.92		992.26	0.005929	6.10	2345.79	750.56	0.44
Rondout Creek	Reach	25383.8 Rondout_XS_39	100 YR	Existing Conditions	8100.00	980.80	989.86	989.86	990.99	0.016074	9.88	1395.09	677.83	0.73
Rondout Creek	Reach	25383.8 Rondout_XS_39	100 YR	Balace 10'	8100.00	980.80	987.91	987.91	988.96	0.032116	10.60	1310.07	594.13	0.96
Rondout Creek	Reach	25071.05	100 YR	Existing Conditions	8100.00	973.91	986.06	979.66	986.16	0.000795	2.57	3687.52	690.99	0.17
Rondout Creek	Reach	25071.05	100 YR	Balace 10'	8100.00	973.91	986.04		986.12	0.000742	2.48	4037.93	690.88	0.16
Rondout Creek	Reach	24758.3	100 YR	Existing Conditions	8100.00	973.68	984.79	980.60	985.38	0.003690	6.19	1318.75	219.22	0.37
Rondout Creek	Reach	24758.3	100 YR	Balace 10'	8100.00	973.68	984.79	980.60	985.38	0.003690	6.19	1318.75	219.22	0.37
Rondout Creek	Reach	24670.86		Bridge										
Rondout Creek	Reach	24637.7 Rondout_XS_34	100 YR	Existing Conditions	8100.00	970.89	982.66	980.36	984.08	0.012300	9.58	850.98	114.76	0.60
Rondout Creek	Reach	24637.7 Rondout_XS_34	100 YR	Balace 10'	8100.00	970.89	982.66	980.36	984.08	0.012300	9.58	850.98	114.76	0.60
Rondout Creek	Reach	24591.1 Rondout_XS_33	100 YR	Existing Conditions	8100.00	970.22	982.02		983.55	0.009560	9.92	823.87	104.43	0.59
Rondout Creek	Reach	24591.1 Rondout_XS_33	100 YR	Balace 10'	8100.00	970.22	982.02		983.55	0.009560	9.92	823.87	104.43	0.59
Lower Rondout Cr	Lower RC	24383.59 Rondout_XS_32	100 YR	Existing Conditions	9470.00	968.68	979.83		981.34	0.011696	9.88	985.14	139.19	0.60
Lower Rondout Cr	Lower RC	24383.59 Rondout_XS_32	100 YR	Balace 10'	9470.00	968.68	979.83		981.34	0.011696	9.88	985.14	139.19	0.60
Lower Rondout Cr	Lower RC	24015.74	100 YR	Existing Conditions	9470.00	968.54	976.30		977.18	0.010114	8.41	1570.69	379.98	0.59
Lower Rondout Cr	Lower RC	24015.74	100 YR	Balace 10'	9470.00	968.54	976.30		977.18	0.010114	8.41	1570.69	379.98	0.59
Lower Rondout Cr	Lower RC	23647.9 Rondout_XS_31	100 YR	Existing Conditions	9470.00	962.10	971.99		972.79	0.008342	7.31	1461.24	471.54	0.53
Lower Rondout Cr	Lower RC	23647.9 Rondout_XS_31	100 YR	Balace 10'	9470.00	962.10	971.99		972.79	0.008342	7.31	1461.24	471.54	0.53
Lower Rondout Cr	Lower RC	23116.5 Rondout_XS_30	100 YR	Existing Conditions	9470.00	958.99	966.91		968.04	0.008869	8.57	1145.34	250.08	0.57
Lower Rondout Cr	Lower RC	23116.5 Rondout_XS_30	100 YR	Balace 10'	9470.00	958.99	966.91		968.04	0.008869	8.57	1145.34	250.08	0.57
Lower Rondout Cr	Lower RC	22632.9 Rondout_XS_29	100 YR	Existing Conditions	9470.00	954.22	962.33		963.44	0.010093	8.82	1525.93	474.49	0.60
Lower Rondout Cr	Lower RC	22632.9 Rondout_XS_29	100 YR	Balace 10'	9470.00	954.22	962.33		963.44	0.010093	8.82	1525.93	474.49	0.60
Lower Rondout Cr	Lower RC	22528.2 Rondout_XS_28	100 YR	Existing Conditions	9470.00	953.91	960.86	959.90	962.17	0.014176	9.61	1422.80	482.03	0.70
Lower Rondout Cr	Lower RC	22528.2 Rondout_XS_28	100 YR	Balace 10'	9470.00	953.91	960.86	959.90	962.17	0.014176	9.61	1422.80	482.03	0.70
Lower Rondout Cr	Lower RC	22398.9 Rondout_XS_27	100 YR	Existing Conditions	9470.00	950.79	959.29	958.07	960.45	0.012055	8.85	1384.04	447.46	0.64
Lower Rondout Cr	Lower RC	22398.9 Rondout_XS_27	100 YR	Balace 10'	9470.00	950.79	959.29	958.07	960.45	0.012055	8.85	1384.04	447.46	0.64
Lower Rondout Cr	Lower RC	21902.2 Rondout_XS_26	100 YR	Existing Conditions	9470.00	946.14	953.66		954.45	0.010329	8.73	1773.98	470.48	0.62
Lower Rondout Cr	Lower RC	21902.2 Rondout_XS_26	100 YR	Balace 10'	9470.00	946.14	953.66		954.45	0.010329	8.73	1773.98	470.48	0.62
Lower Rondout Cr	Lower RC	21146.4 Rondout_XS_25	100 YR	Existing Conditions	9550.00	938.49	945.98		946.28	0.008140	5.52	2541.05	710.00	0.50
Lower Rondout Cr	Lower RC	21146.4 Rondout_XS_25	100 YR	Balace 10'	9550.00	938.49	945.98		946.28	0.008140	5.52	2541.05	710.00	0.50
Lower Rondout Cr	Lower RC	19655.9 Rondout_XS_24	100 YR	Existing Conditions	9550.00	921.51	930.29		931.23	0.014932	9.49	1455.42	443.29	0.66
Lower Rondout Cr	Lower RC	19655.9 Rondout_XS_24	100 YR	Balace 10'	9550.00	921.51	930.29		931.23	0.014932	9.49	1455.42	443.29	0.66
Lower Rondout Cr	Lower RC	18891.26 Rondout_XS_69	100 YR	Existing Conditions	9550.00	914.40	924.62		925.26	0.004862	7.17	1770.14	388.32	0.44
Lower Rondout Cr	Lower RC	18891.26 Rondout_XS_69	100 YR	Balace 10'	9550.00	914.40	924.62		925.26	0.004862	7.17	1770.14	388.32	0.44
Lower Rondout Cr	Lower RC	18391.26 Rondout_XS_68	100 YR	Existing Conditions	10242.00	909.80	921.08	919.19	922.08	0.008284	8.46	1684.25	673.87	0.56
Lower Rondout Cr	Lower RC	18391.26 Rondout_XS_68	100 YR	Balace 10'	10242.00	909.80	921.08	919.19	922.08	0.008284	8.46	1684.25	673.87	0.56
Lower Rondout Cr	Lower RC	17891.26 Rondout_XS_67	100 YR	Existing Conditions	10242.00	905.20	915.29		916.53	0.015563	9.05	1191.51	332.95	0.73
Lower Rondout Cr	Lower RC	17891.26 Rondout_XS_67	100 YR	Balace 10'	10242.00	905.20	915.29		916.53	0.015563	9.05	1191.51	332.95	0.73
Lower Rondout Cr	Lower RC	17391.26 Rondout_XS_66	100 YR	Existing Conditions	10242.00	900.50	910.53		911.22	0.007333	9.17	2554.78	755.09	0.54
Lower Rondout Cr	Lower RC	17391.26 Rondout_XS_66	100 YR	Balace 10'	10242.00	900.50	910.53		911.22	0.007333	9.17	2554.78	755.09	0.54
Lower Rondout Cr	Lower RC	16891.26 Rondout_XS_65	100 YR	Existing Conditions	10242.00	895.90	905.39	905.19	906.60	0.014474	10.36	1616.37	533.76	0.72
Lower Rondout Cr	Lower RC	16891.26 Rondout_XS_65	100 YR	Balace 10'	10242.00	895.90	905.39	905.19	906.60	0.014474	10.36	1616.37	533.76	0.72
Lower Rondout Cr	Lower RC	16391.26 Rondout_XS_64	100 YR	Existing Conditions	10242.00	891.30	902.20		902.65	0.005078	7.75	2429.07	550.52	0.44
Lower Rondout Cr	Lower RC	16391.26 Rondout_XS_64	100 YR	Balace 10'	10242.00	891.30	902.20		902.65	0.005078	7.75	2429.07	550.52	0.44
Lower Rondout Cr	Lower RC	15893.2 Rondout_XS_23	100 YR	Existing Conditions	10242.00	886.66	898.41	897.16	899.30	0.008821	8.21	1825.54	642.93	0.57

HEC-RAS Profile: 100 YR (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Lower Rondout Cr	Lower RC	15893.2 Rondout_XS_23	100 YR	Balace 10'	10242.00	886.66	898.41	897.16	899.30	0.008821	8.21	1825.54	642.93	0.57
Lower Rondout Cr	Lower RC	14802.9 Rondout_XS_22	100 YR	Existing Conditions	10242.00	883.91	892.70		892.97	0.003993	6.14	3151.31	573.14	0.39
Lower Rondout Cr	Lower RC	14802.9 Rondout_XS_22	100 YR	Balace 10'	10242.00	883.91	892.70		892.97	0.003993	6.14	3151.31	573.14	0.39
Lower Rondout Cr	Lower RC	14056.2 Rondout_XS_21	100 YR	Existing Conditions	10242.00	875.61	888.94		889.83	0.004239	7.63	1428.60	199.05	0.42
Lower Rondout Cr	Lower RC	14056.2 Rondout_XS_21	100 YR	Balace 10'	10242.00	875.61	888.94		889.83	0.004239	7.63	1428.60	199.05	0.42
Lower Rondout Cr	Lower RC	13460.4 Rondout_XS_20	100 YR	Existing Conditions	10900.00	872.48	884.97		886.49	0.007313	10.11	1243.06	267.47	0.55
Lower Rondout Cr	Lower RC	13460.4 Rondout_XS_20	100 YR	Balace 10'	10900.00	872.48	884.97		886.49	0.007313	10.11	1243.06	267.47	0.55
Lower Rondout Cr	Lower RC	13307.4 Rondout_XS_19	100 YR	Existing Conditions	10900.00	871.14	884.24	880.86	885.17	0.006138	7.96	1603.81	580.50	0.46
Lower Rondout Cr	Lower RC	13307.4 Rondout_XS_19	100 YR	Balace 10'	10900.00	871.14	884.24	880.86	885.17	0.006138	7.96	1603.81	580.50	0.46
Lower Rondout Cr	Lower RC	13273.6			Bridge									
Lower Rondout Cr	Lower RC	13239.8 Rondout_XS_16	100 YR	Existing Conditions	10900.00	871.24	882.94	880.74	884.36	0.012110	9.90	1297.61	562.19	0.59
Lower Rondout Cr	Lower RC	13239.8 Rondout_XS_16	100 YR	Balace 10'	10900.00	871.24	882.94	880.74	884.36	0.012110	9.90	1297.61	562.19	0.59
Lower Rondout Cr	Lower RC	13074.2 Rondout_XS_15	100 YR	Existing Conditions	10900.00	872.81	882.34		882.80	0.004120	6.57	2748.50	741.04	0.41
Lower Rondout Cr	Lower RC	13074.2 Rondout_XS_15	100 YR	Balace 10'	10900.00	872.81	882.34		882.80	0.004120	6.57	2748.50	741.04	0.41
Lower Rondout Cr	Lower RC	12617.2 Rondout_XS_14	100 YR	Existing Conditions	10900.00	865.06	879.51		880.42	0.007518	8.73	1999.71	616.04	0.53
Lower Rondout Cr	Lower RC	12617.2 Rondout_XS_14	100 YR	Balace 10'	10900.00	865.06	879.51		880.42	0.007518	8.73	1999.71	616.04	0.53
Lower Rondout Cr	Lower RC	11752 Rondout_XS_13	100 YR	Existing Conditions	10900.00	866.34	873.21		873.53	0.008390	7.51	3297.22	718.17	0.55
Lower Rondout Cr	Lower RC	11752 Rondout_XS_13	100 YR	Balace 10'	10900.00	866.34	873.21		873.53	0.008390	7.51	3297.22	718.17	0.55
Lower Rondout Cr	Lower RC	10329.3 Rondout_XS_12	100 YR	Existing Conditions	10900.00	850.12	862.67	860.39	863.92	0.006501	9.70	1760.33	601.11	0.52
Lower Rondout Cr	Lower RC	10329.3 Rondout_XS_12	100 YR	Balace 10'	10900.00	850.12	862.67	860.39	863.92	0.006501	9.70	1760.33	601.11	0.52
Lower Rondout Cr	Lower RC	9057.6 Rondout_XS_11	100 YR	Existing Conditions	10900.00	846.37	855.03		855.66	0.006124	7.69	3014.98	743.67	0.49
Lower Rondout Cr	Lower RC	9057.6 Rondout_XS_11	100 YR	Balace 10'	10900.00	846.37	855.03		855.66	0.006124	7.69	3014.98	743.67	0.49
Lower Rondout Cr	Lower RC	8315.75 Rondout_XS_10	100 YR	Existing Conditions	10900.00	840.65	852.07		852.34	0.003083	5.36	3354.68	679.48	0.31
Lower Rondout Cr	Lower RC	8315.75 Rondout_XS_10	100 YR	Balace 10'	10900.00	840.65	852.07		852.34	0.003083	5.36	3354.68	679.48	0.31
Lower Rondout Cr	Lower RC	7738.59 Rondout_XS_09	100 YR	Existing Conditions	10900.00	833.81	849.97		850.55	0.002673	7.40	3102.16	437.19	0.35
Lower Rondout Cr	Lower RC	7738.59 Rondout_XS_09	100 YR	Balace 10'	10900.00	833.81	849.97		850.55	0.002673	7.40	3102.16	437.19	0.35
Lower Rondout Cr	Lower RC	7549.99 Rondout_XS_08	100 YR	Existing Conditions	14400.00	833.18	847.78		849.53	0.007111	11.57	2150.08	354.86	0.57
Lower Rondout Cr	Lower RC	7549.99 Rondout_XS_08	100 YR	Balace 10'	14400.00	833.18	847.78		849.53	0.007111	11.57	2150.08	354.86	0.57
Lower Rondout Cr	Lower RC	6944.8 Rondout_XS_07	100 YR	Existing Conditions	14400.00	832.35	846.27		846.87	0.002484	7.00	3929.93	624.10	0.36
Lower Rondout Cr	Lower RC	6944.8 Rondout_XS_07	100 YR	Balace 10'	14400.00	832.35	846.27		846.87	0.002484	7.00	3929.93	624.10	0.36
Lower Rondout Cr	Lower RC	6473.574 Rondout_XS_06	100 YR	Existing Conditions	14400.00	830.76	845.67	838.91	846.01	0.001220	4.97	3291.92	847.60	0.25
Lower Rondout Cr	Lower RC	6473.574 Rondout_XS_06	100 YR	Balace 10'	14400.00	830.76	845.67	838.91	846.01	0.001220	4.97	3291.92	847.60	0.25
Lower Rondout Cr	Lower RC	6383.863 Rondout_XS_05	100 YR	Existing Conditions	14400.00	825.81	845.49	836.21	845.90	0.000982	5.15	2915.32	819.16	0.23
Lower Rondout Cr	Lower RC	6383.863 Rondout_XS_05	100 YR	Balace 10'	14400.00	825.81	845.49	836.21	845.90	0.000982	5.15	2915.32	819.16	0.23
Lower Rondout Cr	Lower RC	6330.35			Bridge									
Lower Rondout Cr	Lower RC	6282.384 Rondout_XS_02	100 YR	Existing Conditions	14400.00	826.11	833.54	831.85	834.92	0.009741	9.42	1528.66	288.55	0.64
Lower Rondout Cr	Lower RC	6282.384 Rondout_XS_02	100 YR	Balace 10'	14400.00	826.11	833.54	831.85	834.92	0.009741	9.42	1528.66	288.55	0.64
Lower Rondout Cr	Lower RC	6134.63 Rondout_XS_01	100 YR	Existing Conditions	14400.00	821.72	832.45	830.44	833.54	0.007207	8.59	1842.84	378.02	0.56
Lower Rondout Cr	Lower RC	6134.63 Rondout_XS_01	100 YR	Balace 10'	14400.00	821.72	832.45	830.44	833.54	0.007207	8.59	1842.84	378.02	0.56

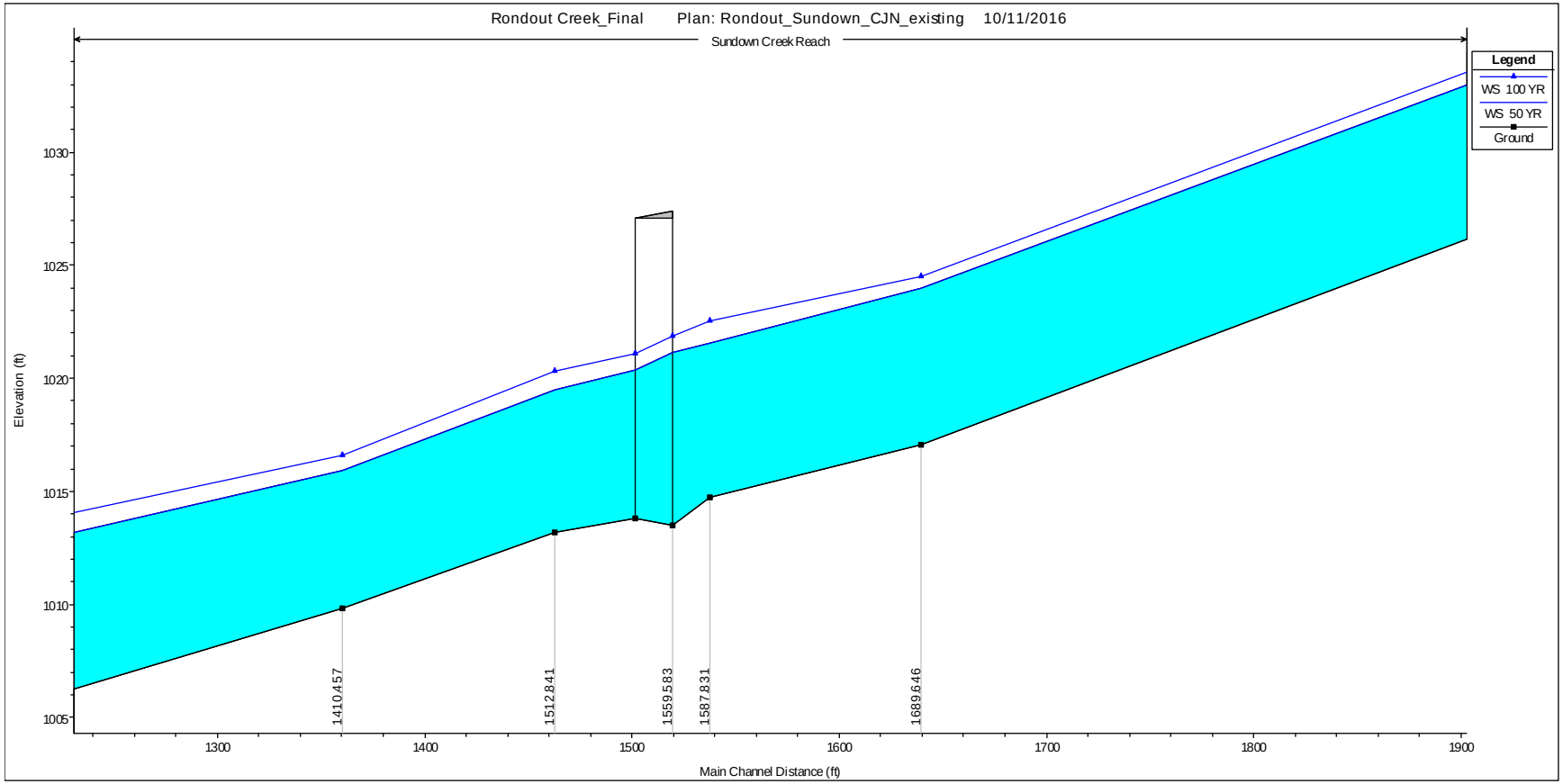
John Brooks Road Bridge

Existing Upstream Cross Section (50 & 100-year storm)



John Brooks Road Bridge

Existing Profile (50 & 100-year storm)



John Brooks Road - 100 Year Event

HEC-RAS Profile: 100 YR

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Sundown Creek	Reach	14784 XS SUN_30X	100 YR	Existing Conditions	385.00	1615.28	1619.00	1619.00	1620.20	0.042174	8.80	45.10	21.02	0.97
Sundown Creek	Reach	14784 XS SUN_30X	100 YR	John Brooks 10	385.00	1615.28	1619.00	1619.00	1620.20	0.042174	8.80	45.10	21.02	0.97
Sundown Creek	Reach	14479.08 XS SUN_36X	100 YR	Existing Conditions	385.00	1601.47	1604.81	1604.81	1605.87	0.042311	8.29	48.26	79.83	0.97
Sundown Creek	Reach	14479.08 XS SUN_36X	100 YR	John Brooks 10	385.00	1601.47	1604.81	1604.81	1605.87	0.042311	8.29	48.26	79.83	0.97
Sundown Creek	Reach	14226.26 XS SUN_35X	100 YR	Existing Conditions	385.00	1588.21	1591.35	1591.35	1591.80	0.024809	6.62	108.29	107.25	0.75
Sundown Creek	Reach	14226.26 XS SUN_35X	100 YR	John Brooks 10	385.00	1588.21	1591.35	1591.35	1591.80	0.024809	6.62	108.29	107.25	0.75
Sundown Creek	Reach	13701.46 XS SUN_29X	100 YR	Existing Conditions	385.00	1559.00	1562.55	1562.55	1563.47	0.046608	7.75	51.22	29.23	0.98
Sundown Creek	Reach	13701.46 XS SUN_29X	100 YR	John Brooks 10	385.00	1559.00	1562.55	1562.55	1563.47	0.046608	7.75	51.22	29.23	0.98
Sundown Creek	Reach	13267.4 XS SUN_28X	100 YR	Existing Conditions	816.00	1539.96	1545.07	1545.07	1546.53	0.035310	9.84	89.89	153.24	0.94
Sundown Creek	Reach	13267.4 XS SUN_28X	100 YR	John Brooks 10	816.00	1539.96	1545.07	1545.07	1546.53	0.035310	9.84	89.89	153.24	0.94
Sundown Creek	Reach	12500.49 XS SUN_27X	100 YR	Existing Conditions	816.00	1507.02	1511.77	1511.40	1512.93	0.028338	8.66	95.27	30.95	0.84
Sundown Creek	Reach	12500.49 XS SUN_27X	100 YR	John Brooks 10	816.00	1507.02	1511.77	1511.40	1512.93	0.028338	8.66	95.27	30.95	0.84
Sundown Creek	Reach	12004.32 XS SUN_34X	100 YR	Existing Conditions	816.00	1490.77	1494.23	1494.23	1495.17	0.046806	9.23	130.08	82.35	1.04
Sundown Creek	Reach	12004.32 XS SUN_34X	100 YR	John Brooks 10	816.00	1490.77	1494.23	1494.23	1495.17	0.046806	9.23	130.08	82.35	1.04
Sundown Creek	Reach	11756.8 XS SUN_26X	100 YR	Existing Conditions	816.00	1478.76	1483.30	1482.92	1484.00	0.024352	6.96	140.67	79.55	0.72
Sundown Creek	Reach	11756.8 XS SUN_26X	100 YR	John Brooks 10	816.00	1478.76	1483.30	1482.92	1484.00	0.024352	6.96	140.67	79.55	0.72
Sundown Creek	Reach	11611.19 XS SUN_33X	100 YR	Existing Conditions	816.00	1476.69	1479.75	1479.30	1480.06	0.028036	5.30	201.21	135.86	0.75
Sundown Creek	Reach	11611.19 XS SUN_33X	100 YR	John Brooks 10	816.00	1476.69	1479.75	1479.30	1480.06	0.028036	5.30	201.21	135.86	0.75
Sundown Creek	Reach	11360.01 XS SUN_47X	100 YR	Existing Conditions	816.00	1465.80	1470.48	1470.48	1471.86	0.039032	9.48	91.27	37.04	0.97
Sundown Creek	Reach	11360.01 XS SUN_47X	100 YR	John Brooks 10	816.00	1465.80	1470.48	1470.48	1471.86	0.039032	9.48	91.27	37.04	0.97
Sundown Creek	Reach	11333.12 Bridge			Bridge									
Sundown Creek	Reach	11306.22 BR SUN_25B	100 YR	Existing Conditions	816.00	1462.42	1470.14	1466.98	1470.43	0.003968	4.42	220.92	72.80	0.33
Sundown Creek	Reach	11306.22 BR SUN_25B	100 YR	John Brooks 10	816.00	1462.42	1470.14	1466.98	1470.43	0.003968	4.42	220.92	72.80	0.33
Sundown Creek	Reach	11280.27 BR SUN_25A	100 YR	Existing Conditions	816.00	1462.51	1470.12		1470.30	0.002023	3.42	260.86	57.83	0.24
Sundown Creek	Reach	11280.27 BR SUN_25A	100 YR	John Brooks 10	816.00	1462.51	1470.12		1470.30	0.002023	3.42	260.86	57.83	0.24
Sundown Creek	Reach	11258 XS SUN_23X	100 YR	Existing Conditions	816.00	1464.48	1468.53	1468.53	1470.05	0.039630	9.93	86.65	34.25	0.99
Sundown Creek	Reach	11258 XS SUN_23X	100 YR	John Brooks 10	816.00	1464.48	1468.53	1468.53	1470.05	0.039630	9.93	86.65	34.25	0.99
Sundown Creek	Reach	10956.28 XS SUN_22X	100 YR	Existing Conditions	816.00	1450.30	1454.02	1453.75	1454.97	0.029401	7.86	107.51	46.03	0.84
Sundown Creek	Reach	10956.28 XS SUN_22X	100 YR	John Brooks 10	816.00	1450.30	1454.02	1453.75	1454.97	0.029401	7.86	107.51	46.03	0.84
Sundown Creek	Reach	10285.9 XS SUN_21XA	100 YR	Existing Conditions	816.00	1425.36	1429.38	1429.38	1431.05	0.043970	10.35	78.96	24.35	1.00
Sundown Creek	Reach	10285.9 XS SUN_21XA	100 YR	John Brooks 10	816.00	1425.36	1429.38	1429.38	1431.05	0.043970	10.35	78.96	24.35	1.00
Sundown Creek	Reach	9888.424 XS SUN_21X	100 YR	Existing Conditions	816.00	1325.67	1329.55	1329.55	1331.18	0.037513	10.33	85.49	29.14	0.99
Sundown Creek	Reach	9888.424 XS SUN_21X	100 YR	John Brooks 10	816.00	1325.67	1329.55	1329.55	1331.18	0.037513	10.33	85.49	29.14	0.99
Sundown Creek	Reach	9563.817 XS SUN_20X	100 YR	Existing Conditions	816.00	1309.30	1313.08	1313.08	1314.53	0.041465	9.67	85.33	31.26	0.99
Sundown Creek	Reach	9563.817 XS SUN_20X	100 YR	John Brooks 10	816.00	1309.30	1313.08	1313.08	1314.53	0.041465	9.67	85.33	31.26	0.99
Sundown Creek	Reach	9120.165 XS SUN_44X	100 YR	Existing Conditions	816.00	1294.98	1298.06	1297.81	1298.62	0.029488	5.98	140.50	85.16	0.79
Sundown Creek	Reach	9120.165 XS SUN_44X	100 YR	John Brooks 10	816.00	1294.98	1298.06	1297.81	1298.62	0.029488	5.98	140.50	85.16	0.79
Sundown Creek	Reach	8865.03 XS SUN_19X	100 YR	Existing Conditions	816.00	1286.27	1290.50		1291.52	0.025925	8.11	104.76	38.06	0.81
Sundown Creek	Reach	8865.03 XS SUN_19X	100 YR	John Brooks 10	816.00	1286.27	1290.50		1291.52	0.025925	8.11	104.76	38.06	0.81
Sundown Creek	Reach	8701.974 XS SUN_18X	100 YR	Existing Conditions	2150.00	1277.94	1284.11	1284.11	1286.30	0.033756	11.92	191.65	49.61	0.98
Sundown Creek	Reach	8701.974 XS SUN_18X	100 YR	John Brooks 10	2150.00	1277.94	1284.11	1284.11	1286.30	0.033756	11.92	191.65	49.61	0.98
Sundown Creek	Reach	8529.396 XS SUN_43X	100 YR	Existing Conditions	2150.00	1273.15	1278.41	1278.41	1280.47	0.029013	11.80	222.77	81.82	0.93
Sundown Creek	Reach	8529.396 XS SUN_43X	100 YR	John Brooks 10	2150.00	1273.15	1278.41	1278.41	1280.47	0.029013	11.80	222.77	81.82	0.93
Sundown Creek	Reach	8169.187 XS SUN_42X	100 YR	Existing Conditions	2150.00	1260.30	1266.79	1266.79	1268.73	0.035270	13.63	296.35	79.07	1.03
Sundown Creek	Reach	8169.187 XS SUN_42X	100 YR	John Brooks 10	2150.00	1260.30	1266.79	1266.79	1268.73	0.035270	13.63	296.35	79.07	1.03
Sundown Creek	Reach	7911.303 XS SUN_41X	100 YR	Existing Conditions	2150.00	1251.09	1256.60	1256.60	1258.76	0.032454	11.99	206.22	56.21	0.97
Sundown Creek	Reach	7911.303 XS SUN_41X	100 YR	John Brooks 10	2150.00	1251.09	1256.60	1256.60	1258.76	0.032454	11.99	206.22	56.21	0.97
Sundown Creek	Reach	7734.417 XS SUN_17X	100 YR	Existing Conditions	2150.00	1243.99	1250.49	1250.35	1252.21	0.026851	10.78	242.70	79.71	0.86
Sundown Creek	Reach	7734.417 XS SUN_17X	100 YR	John Brooks 10	2150.00	1243.99	1250.49	1250.35	1252.21	0.026851	10.78	242.70	79.71	0.86
Sundown Creek	Reach	7022.902 XS SUN_16X	100 YR	Existing Conditions	2150.00	1224.22	1229.83	1229.83	1231.96	0.030107	12.33	230.06	60.92	0.96
Sundown Creek	Reach	7022.902 XS SUN_16X	100 YR	John Brooks 10	2150.00	1224.22	1229.83	1229.83	1231.96	0.030107	12.33	230.06	60.92	0.96
Sundown Creek	Reach	6426.67 XS SUN_40X	100 YR	Existing Conditions	2150.00	1203.03	1208.59	1208.59	1210.57	0.034048	11.38	203.52	56.80	0.98
Sundown Creek	Reach	6426.67 XS SUN_40X	100 YR	John Brooks 10	2150.00	1203.03	1208.59	1208.59	1210.57	0.034048	11.38	203.52	56.80	0.98
Sundown Creek	Reach	5885.625 XS SUN_48X	100 YR	Existing Conditions	2150.00	1188.30	1193.61		1194.20	0.011244	5.79	361.54	119.85	0.52
Sundown Creek	Reach	5885.625 XS SUN_48X	100 YR	John Brooks 10	2150.00	1188.30	1193.61		1194.20	0.011244	5.79	361.54	119.85	0.52
Sundown Creek	Reach	5846.653 BR SUN_15D	100 YR	Existing Conditions	2150.00	1183.83	1193.44	1191.93	1193.87	0.004211	5.86	459.73	117.39	0.37
Sundown Creek	Reach	5846.653 BR SUN_15D	100 YR	John Brooks 10	2150.00	1183.83	1193.44	1191.93	1193.87	0.004211	5.86	459.73	117.39	0.37
Sundown Creek	Reach	5821.221 Bridge			Bridge									
Sundown Creek	Reach	5800.354 BR SUN_15C	100 YR	Existing Conditions	2150.00	1182.68	1191.86	1191.52	1192.75	0.011314	8.18	315.78	113.20	0.55
Sundown Creek	Reach	5800.354 BR SUN_15C	100 YR	John Brooks 10	2150.00	1182.68	1191.86	1191.52	1192.75	0.011314	8.18	315.78	113.20	0.55
Sundown Creek	Reach	5775.103 BR SUN_15A	100 YR	Existing Conditions	2150.00	1181.72	1191.77		1192.36	0.008152	6.40	360.92	109.05	0.45
Sundown Creek	Reach	5775.103 BR SUN_15A	100 YR	John Brooks 10	2150.00	1181.72	1191.77		1192.36	0.008152	6.40	360.92	109.05	0.45
Sundown Creek	Reach	5688.313 XS SUN_49X	100 YR	Existing Conditions	2150.00	1182.81	1190.05	1190.05	1191.31	0.017625	9.73	282.44	95.82	0.73
Sundown Creek	Reach	5688.313 XS SUN_49X	100 YR	John Brooks 10	2150.00	1182.81	1190.05	1190.05	1191.31	0.017625	9.73	282.44	95.82	0.73
Sundown Creek	Reach	5356.54 XS SUN_32X	100 YR	Existing Conditions	2150.00	1164.83	1171.25	1171.25	1173.79	0.033660	12.93	182.88	40.75	0.98
Sundown Creek	Reach	5356.54 XS SUN_32X	100 YR	John Brooks 10	2150.00	1164.83	1171.25	1171.25	1173.79	0.033660	12.93	182.88	40.75	0.98
Sundown Creek	Reach	4929.002 XS SUN_31X	100 YR	Existing Conditions	2150.00	1135.12	1140.88	1140.88	1143.48	0.035841	12.98	171.84	36.60	0.99

HEC-RAS Profile: 100 YR (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Sundown Creek	Reach	4929.002 XS SUN_31X	100 YR	John Brooks 10	2150.00	1135.12	1140.88	1140.88	1143.48	0.035841	12.98	171.84	36.60	0.99
Sundown Creek	Reach	4792.939 XS SUN_14X	100 YR	Existing Conditions	2150.00	1118.46	1126.38		1126.90	0.005582	5.80	371.39	62.57	0.40
Sundown Creek	Reach	4792.939 XS SUN_14X	100 YR	John Brooks 10	2150.00	1118.46	1126.38		1126.90	0.005582	5.80	371.39	62.57	0.40
Sundown Creek	Reach	4469.083 XS SUN_45X	100 YR	Existing Conditions	2150.00	1113.38	1120.67	1120.67	1123.15	0.030804	12.94	196.02	46.49	0.97
Sundown Creek	Reach	4469.083 XS SUN_45X	100 YR	John Brooks 10	2150.00	1113.38	1120.67	1120.67	1123.15	0.030804	12.94	196.02	46.49	0.97
Sundown Creek	Reach	3643.11 XS SUN_13X	100 YR	Existing Conditions	2840.00	1080.11	1086.58	1086.14	1088.53	0.026537	11.23	259.49	53.73	0.87
Sundown Creek	Reach	3643.11 XS SUN_13X	100 YR	John Brooks 10	2840.00	1080.11	1086.58	1086.14	1088.53	0.026537	11.23	259.49	53.73	0.87
Sundown Creek	Reach	3431.445 XS SUN_39X	100 YR	Existing Conditions	2840.00	1073.46	1080.73	1080.73	1083.06	0.024812	12.86	311.06	86.12	0.89
Sundown Creek	Reach	3431.445 XS SUN_39X	100 YR	John Brooks 10	2840.00	1073.46	1080.73	1080.73	1083.06	0.024812	12.86	311.06	86.12	0.89
Sundown Creek	Reach	3050.617 XS SUN_38X	100 YR	Existing Conditions	2840.00	1064.51	1070.57	1070.40	1072.58	0.026184	11.95	317.13	83.98	0.90
Sundown Creek	Reach	3050.617 XS SUN_38X	100 YR	John Brooks 10	2840.00	1064.51	1070.57	1070.40	1072.58	0.026184	11.95	317.13	83.98	0.90
Sundown Creek	Reach	2828.606 XS SUN_37X	100 YR	Existing Conditions	2840.00	1058.75	1064.00	1064.00	1065.97	0.034122	11.49	278.51	75.38	0.98
Sundown Creek	Reach	2828.606 XS SUN_37X	100 YR	John Brooks 10	2840.00	1058.75	1064.00	1064.00	1065.97	0.034122	11.49	278.51	75.38	0.98
Sundown Creek	Reach	2533.334 XS SUN_12X	100 YR	Existing Conditions	2840.00	1046.13	1053.50	1053.12	1055.76	0.029930	12.07	235.92	43.77	0.90
Sundown Creek	Reach	2533.334 XS SUN_12X	100 YR	John Brooks 10	2840.00	1046.13	1053.48	1053.12	1055.76	0.030235	12.11	235.18	43.57	0.90
Sundown Creek	Reach	1689.646 XS SUN_11X	100 YR	Existing Conditions	2840.00	1017.07	1024.52	1024.52	1027.33	0.038081	13.43	212.34	39.77	1.00
Sundown Creek	Reach	1689.646 XS SUN_11X	100 YR	John Brooks 10	2840.00	1017.07	1024.54	1024.54	1027.33	0.037678	13.38	213.04	39.80	1.00
Sundown Creek	Reach	1587.831 BR SUN_10D	100 YR	Existing Conditions	2840.00	1014.72	1022.56	1021.43	1024.01	0.018691	9.66	293.96	52.91	0.72
Sundown Creek	Reach	1587.831 BR SUN_10D	100 YR	John Brooks 10	2840.00	1014.72	1023.36	1021.31	1024.38	0.011739	8.10	350.77	59.42	0.58
Sundown Creek	Reach	1559.583 Bridge			Bridge									
Sundown Creek	Reach	1512.841 BR SUN_10A	100 YR	Existing Conditions	2840.00	1013.17	1020.32	1019.43	1022.12	0.019547	10.85	273.38	51.09	0.78
Sundown Creek	Reach	1512.841 BR SUN_10A	100 YR	John Brooks 10	2840.00	1013.17	1020.78	1019.28	1022.02	0.015968	8.91	321.67	56.52	0.65
Sundown Creek	Reach	1410.457 XS SUN_07X	100 YR	Existing Conditions	2840.00	1009.83	1016.58	1016.58	1019.32	0.032050	13.36	221.99	43.76	0.98
Sundown Creek	Reach	1410.457 XS SUN_07X	100 YR	John Brooks 10	2840.00	1009.83	1016.58	1016.58	1019.32	0.032050	13.36	221.99	43.76	0.98
Sundown Creek	Reach	1144.503 XS SUN_06X	100 YR	Existing Conditions	2840.00	1002.51	1011.39	1009.72	1013.05	0.015577	10.37	283.76	44.08	0.67
Sundown Creek	Reach	1144.503 XS SUN_06X	100 YR	John Brooks 10	2840.00	1002.51	1011.39	1009.72	1013.05	0.015577	10.37	283.76	44.08	0.67
Sundown Creek	Reach	1026.719 BR SUN_05D	100 YR	Existing Conditions	2840.00	1000.10	1010.31	1007.08	1011.43	0.008803	8.50	343.11	132.78	0.50
Sundown Creek	Reach	1026.719 BR SUN_05D	100 YR	John Brooks 10	2840.00	1000.10	1010.31	1007.08	1011.43	0.008803	8.50	343.11	132.78	0.50
Sundown Creek	Reach	993.8764 Bridge			Bridge									
Sundown Creek	Reach	962.1789 BR SUN_05A	100 YR	Existing Conditions	2840.00	998.71	1006.73	1005.71	1008.56	0.021396	10.86	261.85	95.01	0.77
Sundown Creek	Reach	962.1789 BR SUN_05A	100 YR	John Brooks 10	2840.00	998.71	1006.73	1005.71	1008.56	0.021396	10.86	261.85	95.01	0.77
Sundown Creek	Reach	837.2104 XS SUN_03X	100 YR	Existing Conditions	2840.00	995.92	1003.23	1002.76	1005.53	0.025108	12.21	242.98	89.87	0.88
Sundown Creek	Reach	837.2104 XS SUN_03X	100 YR	John Brooks 10	2840.00	995.92	1003.23	1002.76	1005.53	0.025108	12.21	242.98	89.87	0.88
Sundown Creek	Reach	467.9756 XS SUN_02X	100 YR	Existing Conditions	2840.00	988.37	993.51	993.51	995.20	0.030326	10.64	351.90	255.32	0.90
Sundown Creek	Reach	467.9756 XS SUN_02X	100 YR	John Brooks 10	2840.00	988.37	993.51	993.51	995.20	0.030326	10.64	351.90	255.32	0.90
Sundown Creek	Reach	181.3982 XS SUN_01X	100 YR	Existing Conditions	2840.00	978.20	985.73	985.73	987.35	0.023753	10.59	378.83	326.06	0.82
Sundown Creek	Reach	181.3982 XS SUN_01X	100 YR	John Brooks 10	2840.00	978.20	985.73	985.73	987.35	0.023753	10.59	378.83	326.06	0.82
Sundown Creek	Reach	50.00015 XS SUN_46X	100 YR	Existing Conditions	2840.00	975.97	982.09	982.09	983.28	0.027826	10.16	416.08	225.76	0.87
Sundown Creek	Reach	50.00015 XS SUN_46X	100 YR	John Brooks 10	2840.00	975.97	982.09	982.09	983.28	0.027826	10.16	416.08	225.76	0.87
Rondout Creek	Reach	36559.8 Rondout_XS_63	100 YR	Existing Conditions	8100.00	1110.01	1120.51		1121.22	0.005891	7.11	1528.11	310.62	0.46
Rondout Creek	Reach	36559.8 Rondout_XS_63	100 YR	John Brooks 10	8100.00	1110.01	1120.51		1121.22	0.005891	7.11	1528.11	310.62	0.46
Rondout Creek	Reach	36437.5 Rondout_XS_62	100 YR	Existing Conditions	8100.00	1109.07	1120.12		1120.58	0.003828	5.80	1983.43	366.45	0.37
Rondout Creek	Reach	36437.5 Rondout_XS_62	100 YR	John Brooks 10	8100.00	1109.07	1120.12		1120.58	0.003828	5.80	1983.43	366.45	0.37
Rondout Creek	Reach	35949 Rondout_XS_61	100 YR	Existing Conditions	8100.00	1105.35	1114.45	1114.45	1116.42	0.030839	13.91	1196.24	362.27	0.98
Rondout Creek	Reach	35949 Rondout_XS_61	100 YR	John Brooks 10	8100.00	1105.35	1114.45	1114.45	1116.42	0.030839	13.91	1196.24	362.27	0.98
Rondout Creek	Reach	35517.78 Rondout_XS_73	100 YR	Existing Conditions	8100.00	1095.53	1108.83		1109.05	0.001388	4.71	3513.14	454.07	0.24
Rondout Creek	Reach	35517.78 Rondout_XS_73	100 YR	John Brooks 10	8100.00	1095.53	1108.83		1109.05	0.001388	4.71	3513.14	454.07	0.24
Rondout Creek	Reach	35484 Rondout_XS_60	100 YR	Existing Conditions	8100.00	1094.42	1107.42	1104.98	1108.83	0.010231	10.10	1329.12	430.44	0.58
Rondout Creek	Reach	35484 Rondout_XS_60	100 YR	John Brooks 10	8100.00	1094.42	1107.42	1104.98	1108.83	0.010231	10.10	1329.12	430.44	0.58
Rondout Creek	Reach	35260 Rondout_XS_59	100 YR	Existing Conditions	8100.00	1091.61	1106.42	1103.11	1106.85	0.006514	6.26	2223.08	427.33	0.33
Rondout Creek	Reach	35260 Rondout_XS_59	100 YR	John Brooks 10	8100.00	1091.61	1106.42	1103.11	1106.85	0.006514	6.26	2223.08	427.33	0.33
Rondout Creek	Reach	35226.02			Bridge									
Rondout Creek	Reach	35192 Rondout_XS_56	100 YR	Existing Conditions	8100.00	1092.23	1102.27	1101.87	1104.28	0.015507	11.98	1076.49	351.29	0.74
Rondout Creek	Reach	35192 Rondout_XS_56	100 YR	John Brooks 10	8100.00	1092.23	1102.27	1101.87	1104.28	0.015507	11.98	1076.49	351.29	0.74
Rondout Creek	Reach	35114 Rondout_XS_55	100 YR	Existing Conditions	8100.00	1092.03	1101.59		1102.89	0.011282	10.22	1435.73	368.49	0.63
Rondout Creek	Reach	35114 Rondout_XS_55	100 YR	John Brooks 10	8100.00	1092.03	1101.59		1102.89	0.011282	10.22	1435.73	368.49	0.63
Rondout Creek	Reach	34544.4 Rondout_XS_54	100 YR	Existing Conditions	8100.00	1084.87	1096.37		1097.37	0.008419	9.07	1495.91	281.50	0.56
Rondout Creek	Reach	34544.4 Rondout_XS_54	100 YR	John Brooks 10	8100.00	1084.87	1096.37		1097.37	0.008419	9.07	1495.91	281.50	0.56
Rondout Creek	Reach	33437.5 Rondout_XS_53	100 YR	Existing Conditions	8100.00	1072.93	1082.31	1081.89	1084.05	0.019044	10.91	952.17	273.82	0.79
Rondout Creek	Reach	33437.5 Rondout_XS_53	100 YR	John Brooks 10	8100.00	1072.93	1082.31	1081.89	1084.05	0.019044	10.91	952.17	273.82	0.79
Rondout Creek	Reach	32259.3 Rondout_XS_52	100 YR	Existing Conditions	8100.00	1056.05	1066.51	1064.34	1068.00	0.010188	9.91	957.36	647.77	0.61
Rondout Creek	Reach	32259.3 Rondout_XS_52	100 YR	John Brooks 10	8100.00	1056.05	1066.51	1064.34	1068.00	0.010188	9.91	957.36	647.77	0.61
Rondout Creek	Reach	31637.7 Rondout_XS_51	100 YR	Existing Conditions	8100.00	1049.72	1060.71	1057.85	1062.23	0.008471	10.09	988.24	651.43	0.56
Rondout Creek	Reach	31637.7 Rondout_XS_51	100 YR	John Brooks 10	8100.00	1049.72	1060.71	1057.85	1062.23	0.008471	10.09	988.24	651.43	0.56
Rondout Creek	Reach	31417.9 Rondout_XS_50	100 YR	Existing Conditions	8100.00	1044.82	1056.82	1055.80	1059.47	0.018579	13.08	652.72	523.17	0.81
Rondout Creek	Reach	31417.9 Rondout_XS_50	100 YR	John Brooks 10	8100.00	1044.82	1056.82	1055.80	1059.47	0.018579	13.08	652.72	523.17	0.81

HEC-RAS Profile: 100 YR (Continued)

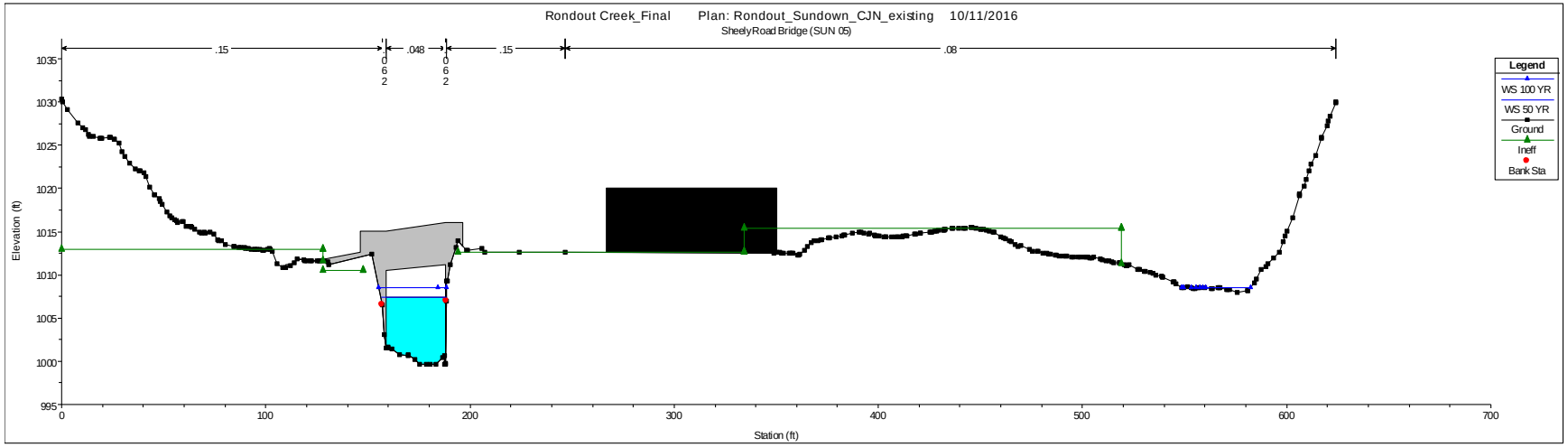
River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Rondout Creek	Reach	30913.9 Rondout_XS_49	100 YR	Existing Conditions	8100.00	1045.49	1051.68		1052.13	0.009721	6.88	1996.26	610.36	0.56
Rondout Creek	Reach	30913.9 Rondout_XS_49	100 YR	John Brooks 10	8100.00	1045.49	1051.68		1052.13	0.009721	6.88	1996.26	610.36	0.56
Rondout Creek	Reach	29580.7 Rondout_XS_48	100 YR	Existing Conditions	8100.00	1025.25	1035.42	1035.42	1036.67	0.014974	10.02	1324.84	548.93	0.71
Rondout Creek	Reach	29580.7 Rondout_XS_48	100 YR	John Brooks 10	8100.00	1025.25	1035.42	1035.42	1036.67	0.014974	10.02	1324.84	548.93	0.71
Rondout Creek	Reach	28843 Rondout_XS_47	100 YR	Existing Conditions	8100.00	1018.80	1027.32		1028.00	0.008063	7.93	1943.43	445.14	0.53
Rondout Creek	Reach	28843 Rondout_XS_47	100 YR	John Brooks 10	8100.00	1018.80	1027.32		1028.00	0.008067	7.93	1943.05	445.14	0.53
Rondout Creek	Reach	28726.3 Rondout_XS_46	100 YR	Existing Conditions	8100.00	1015.06	1026.71	1023.56	1027.29	0.004654	7.01	2163.13	443.38	0.41
Rondout Creek	Reach	28726.3 Rondout_XS_46	100 YR	John Brooks 10	8100.00	1015.06	1026.71	1023.56	1027.29	0.004657	7.01	2162.48	443.38	0.41
Rondout Creek	Reach	28695.20			Bridge									
Rondout Creek	Reach	28664.1 Rondout_XS_43	100 YR	Existing Conditions	8100.00	1014.00	1025.41	1023.72	1026.46	0.008452	9.42	1707.95	423.84	0.55
Rondout Creek	Reach	28664.1 Rondout_XS_43	100 YR	John Brooks 10	8100.00	1014.00	1025.40	1023.72	1026.46	0.008484	9.43	1704.69	423.39	0.56
Rondout Creek	Reach	28539.3 Rondout_XS_42	100 YR	Existing Conditions	8100.00	1013.94	1024.44		1025.06	0.010982	7.56	1897.75	440.25	0.46
Rondout Creek	Reach	28539.3 Rondout_XS_42	100 YR	John Brooks 10	8100.00	1013.94	1024.43		1025.05	0.011093	7.59	1890.34	440.22	0.46
Rondout Creek	Reach	27901.6 Rondout_XS_41	100 YR	Existing Conditions	8100.00	1010.19	1017.26		1017.67	0.013651	6.53	2191.06	607.37	0.46
Rondout Creek	Reach	27901.6 Rondout_XS_41	100 YR	John Brooks 10	8100.00	1010.19	1017.29		1017.69	0.013389	6.49	2206.22	607.42	0.45
Rondout Creek	Reach	26788.23 Rondout_XS_70	100 YR	Existing Conditions	8100.00	996.90	1004.50		1005.15	0.010314	8.12	2413.44	904.53	0.58
Rondout Creek	Reach	26788.23 Rondout_XS_70	100 YR	John Brooks 10	8100.00	996.90	1004.48		1005.13	0.010538	8.18	2391.33	902.46	0.59
Rondout Creek	Reach	26509.47	100 YR	Existing Conditions	8100.00	994.51	1003.33		1003.65	0.005274	5.16	2220.35	506.74	0.41
Rondout Creek	Reach	26509.47	100 YR	John Brooks 10	8100.00	994.51	1003.23		1003.58	0.005626	5.26	2173.86	506.74	0.42
Rondout Creek	Reach	26230.71	100 YR	Existing Conditions	8100.00	985.84	996.50	996.50	998.45	0.041104	12.32	939.10	240.25	0.86
Rondout Creek	Reach	26230.71	100 YR	John Brooks 10	8100.00	985.84	996.86		998.49	0.032729	11.37	1025.18	240.36	0.78
Rondout Creek	Reach	25673.2 Rondout_XS_40	100 YR	Existing Conditions	8100.00	983.66	992.62		992.83	0.003267	4.88	2872.84	752.24	0.34
Rondout Creek	Reach	25673.2 Rondout_XS_40	100 YR	John Brooks 10	8100.00	983.66	991.92		992.26	0.005929	6.10	2345.79	750.56	0.44
Rondout Creek	Reach	25383.8 Rondout_XS_39	100 YR	Existing Conditions	8100.00	980.80	989.86	989.86	990.99	0.016074	9.88	1395.09	677.83	0.73
Rondout Creek	Reach	25383.8 Rondout_XS_39	100 YR	John Brooks 10	8100.00	980.80	987.91	987.91	988.96	0.032116	10.60	1310.07	594.13	0.96
Rondout Creek	Reach	25071.05	100 YR	Existing Conditions	8100.00	973.91	986.06	979.66	986.16	0.000795	2.57	3687.52	690.99	0.17
Rondout Creek	Reach	25071.05	100 YR	John Brooks 10	8100.00	973.91	986.06	979.66	986.16	0.000795	2.57	3687.52	690.99	0.17
Rondout Creek	Reach	24758.3	100 YR	Existing Conditions	8100.00	973.68	984.79	980.60	985.38	0.003690	6.19	1318.75	219.22	0.37
Rondout Creek	Reach	24758.3	100 YR	John Brooks 10	8100.00	973.68	984.79	980.60	985.38	0.003690	6.19	1318.75	219.22	0.37
Rondout Creek	Reach	24670.86			Bridge									
Rondout Creek	Reach	24637.7 Rondout_XS_34	100 YR	Existing Conditions	8100.00	970.89	982.66	980.36	984.08	0.012300	9.58	850.98	114.76	0.60
Rondout Creek	Reach	24637.7 Rondout_XS_34	100 YR	John Brooks 10	8100.00	970.89	982.66	980.36	984.08	0.012300	9.58	850.98	114.76	0.60
Rondout Creek	Reach	24591.1 Rondout_XS_33	100 YR	Existing Conditions	8100.00	970.22	982.02		983.55	0.009560	9.92	823.87	104.43	0.59
Rondout Creek	Reach	24591.1 Rondout_XS_33	100 YR	John Brooks 10	8100.00	970.22	982.02		983.55	0.009560	9.92	823.87	104.43	0.59
Lower Rondout Cr	Lower RC	24383.59 Rondout_XS_32	100 YR	Existing Conditions	9470.00	968.68	979.83		981.34	0.011696	9.88	985.14	139.19	0.60
Lower Rondout Cr	Lower RC	24383.59 Rondout_XS_32	100 YR	John Brooks 10	9470.00	968.68	979.83		981.34	0.011696	9.88	985.14	139.19	0.60
Lower Rondout Cr	Lower RC	24015.74	100 YR	Existing Conditions	9470.00	968.54	976.30		977.18	0.010114	8.41	1570.69	379.98	0.59
Lower Rondout Cr	Lower RC	24015.74	100 YR	John Brooks 10	9470.00	968.54	976.30		977.18	0.010114	8.41	1570.69	379.98	0.59
Lower Rondout Cr	Lower RC	23647.9 Rondout_XS_31	100 YR	Existing Conditions	9470.00	962.10	971.99		972.79	0.008342	7.31	1461.24	471.54	0.53
Lower Rondout Cr	Lower RC	23647.9 Rondout_XS_31	100 YR	John Brooks 10	9470.00	962.10	971.99		972.79	0.008342	7.31	1461.24	471.54	0.53
Lower Rondout Cr	Lower RC	23116.5 Rondout_XS_30	100 YR	Existing Conditions	9470.00	958.99	966.91		968.04	0.008869	8.57	1145.34	250.08	0.57
Lower Rondout Cr	Lower RC	23116.5 Rondout_XS_30	100 YR	John Brooks 10	9470.00	958.99	966.91		968.04	0.008869	8.57	1145.34	250.08	0.57
Lower Rondout Cr	Lower RC	22632.9 Rondout_XS_29	100 YR	Existing Conditions	9470.00	954.22	962.33		963.44	0.010093	8.82	1525.93	474.49	0.60
Lower Rondout Cr	Lower RC	22632.9 Rondout_XS_29	100 YR	John Brooks 10	9470.00	954.22	962.33		963.44	0.010093	8.82	1525.93	474.49	0.60
Lower Rondout Cr	Lower RC	22528.2 Rondout_XS_28	100 YR	Existing Conditions	9470.00	953.91	960.86	959.90	962.17	0.014176	9.61	1422.80	482.03	0.70
Lower Rondout Cr	Lower RC	22528.2 Rondout_XS_28	100 YR	John Brooks 10	9470.00	953.91	960.86	959.90	962.17	0.014176	9.61	1422.80	482.03	0.70
Lower Rondout Cr	Lower RC	22398.9 Rondout_XS_27	100 YR	Existing Conditions	9470.00	950.79	959.29	958.07	960.45	0.012055	8.85	1384.04	447.46	0.64
Lower Rondout Cr	Lower RC	22398.9 Rondout_XS_27	100 YR	John Brooks 10	9470.00	950.79	959.29	958.07	960.45	0.012055	8.85	1384.04	447.46	0.64
Lower Rondout Cr	Lower RC	21902.2 Rondout_XS_26	100 YR	Existing Conditions	9470.00	946.14	953.66		954.45	0.010329	8.73	1773.98	470.48	0.62
Lower Rondout Cr	Lower RC	21902.2 Rondout_XS_26	100 YR	John Brooks 10	9470.00	946.14	953.66		954.45	0.010329	8.73	1773.98	470.48	0.62
Lower Rondout Cr	Lower RC	21146.4 Rondout_XS_25	100 YR	Existing Conditions	9550.00	938.49	945.98		946.28	0.008140	5.52	2541.05	710.00	0.50
Lower Rondout Cr	Lower RC	21146.4 Rondout_XS_25	100 YR	John Brooks 10	9550.00	938.49	945.98		946.28	0.008140	5.52	2541.05	710.00	0.50
Lower Rondout Cr	Lower RC	19655.9 Rondout_XS_24	100 YR	Existing Conditions	9550.00	921.51	930.29		931.23	0.014932	9.49	1455.42	443.29	0.66
Lower Rondout Cr	Lower RC	19655.9 Rondout_XS_24	100 YR	John Brooks 10	9550.00	921.51	930.29		931.23	0.014932	9.49	1455.42	443.29	0.66
Lower Rondout Cr	Lower RC	18891.26 Rondout_XS_69	100 YR	Existing Conditions	9550.00	914.40	924.62		925.26	0.004862	7.17	1770.14	388.32	0.44
Lower Rondout Cr	Lower RC	18891.26 Rondout_XS_69	100 YR	John Brooks 10	9550.00	914.40	924.62		925.26	0.004862	7.17	1770.14	388.32	0.44
Lower Rondout Cr	Lower RC	18391.26 Rondout_XS_68	100 YR	Existing Conditions	10242.00	909.80	921.08	919.19	922.08	0.008284	8.46	1684.25	673.87	0.56
Lower Rondout Cr	Lower RC	18391.26 Rondout_XS_68	100 YR	John Brooks 10	10242.00	909.80	921.08	919.19	922.08	0.008284	8.46	1684.25	673.87	0.56
Lower Rondout Cr	Lower RC	17891.26 Rondout_XS_67	100 YR	Existing Conditions	10242.00	905.20	915.29		916.53	0.015563	9.05	1191.51	332.95	0.73
Lower Rondout Cr	Lower RC	17891.26 Rondout_XS_67	100 YR	John Brooks 10	10242.00	905.20	915.29		916.53	0.015563	9.05	1191.51	332.95	0.73
Lower Rondout Cr	Lower RC	17391.26 Rondout_XS_66	100 YR	Existing Conditions	10242.00	900.50	910.53		911.22	0.007333	9.17	2554.78	755.09	0.54
Lower Rondout Cr	Lower RC	17391.26 Rondout_XS_66	100 YR	John Brooks 10	10242.00	900.50	910.53		911.22	0.007333	9.17	2554.78	755.09	0.54
Lower Rondout Cr	Lower RC	16891.26 Rondout_XS_65	100 YR	Existing Conditions	10242.00	895.90	905.39	905.19	906.60	0.014474	10.36	1616.37	533.76	0.72
Lower Rondout Cr	Lower RC	16891.26 Rondout_XS_65	100 YR	John Brooks 10	10242.00	895.90	905.39	905.19	906.60	0.014474	10.36	1616.37	533.76	0.72
Lower Rondout Cr	Lower RC	16391.26 Rondout_XS_64	100 YR	Existing Conditions	10242.00	891.30	902.20		902.65	0.005078	7.75	2429.07	550.52	0.44
Lower Rondout Cr	Lower RC	16391.26 Rondout_XS_64	100 YR	John Brooks 10	10242.00	891.30	902.20		902.65	0.005078	7.75	2429.07	550.52	0.44
Lower Rondout Cr	Lower RC	15893.2 Rondout_XS_23	100 YR	Existing Conditions	10242.00	886.66	898.41	897.16	899.30	0.008821	8.21	1825.54	642.93	0.57

HEC-RAS Profile: 100 YR (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Lower Rondout Cr	Lower RC	15893.2 Rondout_XS_23	100 YR	John Brooks 10	10242.00	886.66	898.41	897.16	899.30	0.008821	8.21	1825.54	642.93	0.57
Lower Rondout Cr	Lower RC	14802.9 Rondout_XS_22	100 YR	Existing Conditions	10242.00	883.91	892.70		892.97	0.003993	6.14	3151.31	573.14	0.39
Lower Rondout Cr	Lower RC	14802.9 Rondout_XS_22	100 YR	John Brooks 10	10242.00	883.91	892.70		892.97	0.003993	6.14	3151.31	573.14	0.39
Lower Rondout Cr	Lower RC	14056.2 Rondout_XS_21	100 YR	Existing Conditions	10242.00	875.61	888.94		889.83	0.004239	7.63	1428.60	199.05	0.42
Lower Rondout Cr	Lower RC	14056.2 Rondout_XS_21	100 YR	John Brooks 10	10242.00	875.61	888.94		889.83	0.004239	7.63	1428.60	199.05	0.42
Lower Rondout Cr	Lower RC	13460.4 Rondout_XS_20	100 YR	Existing Conditions	10900.00	872.48	884.97		886.49	0.007313	10.11	1243.06	267.47	0.55
Lower Rondout Cr	Lower RC	13460.4 Rondout_XS_20	100 YR	John Brooks 10	10900.00	872.48	884.97		886.49	0.007313	10.11	1243.06	267.47	0.55
Lower Rondout Cr	Lower RC	13307.4 Rondout_XS_19	100 YR	Existing Conditions	10900.00	871.14	884.24	880.86	885.17	0.006138	7.96	1603.81	580.50	0.46
Lower Rondout Cr	Lower RC	13307.4 Rondout_XS_19	100 YR	John Brooks 10	10900.00	871.14	884.24	880.86	885.17	0.006138	7.96	1603.81	580.50	0.46
Lower Rondout Cr	Lower RC	13273.6			Bridge									
Lower Rondout Cr	Lower RC	13239.8 Rondout_XS_16	100 YR	Existing Conditions	10900.00	871.24	882.94	880.74	884.36	0.012110	9.90	1297.61	562.19	0.59
Lower Rondout Cr	Lower RC	13239.8 Rondout_XS_16	100 YR	John Brooks 10	10900.00	871.24	882.94	880.74	884.36	0.012110	9.90	1297.61	562.19	0.59
Lower Rondout Cr	Lower RC	13074.2 Rondout_XS_15	100 YR	Existing Conditions	10900.00	872.81	882.34		882.80	0.004120	6.57	2748.50	741.04	0.41
Lower Rondout Cr	Lower RC	13074.2 Rondout_XS_15	100 YR	John Brooks 10	10900.00	872.81	882.34		882.80	0.004120	6.57	2748.50	741.04	0.41
Lower Rondout Cr	Lower RC	12617.2 Rondout_XS_14	100 YR	Existing Conditions	10900.00	865.06	879.51		880.42	0.007518	8.73	1999.71	616.04	0.53
Lower Rondout Cr	Lower RC	12617.2 Rondout_XS_14	100 YR	John Brooks 10	10900.00	865.06	879.51		880.42	0.007518	8.73	1999.71	616.04	0.53
Lower Rondout Cr	Lower RC	11752 Rondout_XS_13	100 YR	Existing Conditions	10900.00	866.34	873.21		873.53	0.008390	7.51	3297.22	718.17	0.55
Lower Rondout Cr	Lower RC	11752 Rondout_XS_13	100 YR	John Brooks 10	10900.00	866.34	873.21		873.53	0.008390	7.51	3297.22	718.17	0.55
Lower Rondout Cr	Lower RC	10329.3 Rondout_XS_12	100 YR	Existing Conditions	10900.00	850.12	862.67	860.39	863.92	0.006501	9.70	1760.33	601.11	0.52
Lower Rondout Cr	Lower RC	10329.3 Rondout_XS_12	100 YR	John Brooks 10	10900.00	850.12	862.67	860.39	863.92	0.006501	9.70	1760.33	601.11	0.52
Lower Rondout Cr	Lower RC	9057.6 Rondout_XS_11	100 YR	Existing Conditions	10900.00	846.37	855.03		855.66	0.006124	7.69	3014.98	743.67	0.49
Lower Rondout Cr	Lower RC	9057.6 Rondout_XS_11	100 YR	John Brooks 10	10900.00	846.37	855.03		855.66	0.006124	7.69	3014.98	743.67	0.49
Lower Rondout Cr	Lower RC	8315.75 Rondout_XS_10	100 YR	Existing Conditions	10900.00	840.65	852.07		852.34	0.003083	5.36	3354.68	679.48	0.31
Lower Rondout Cr	Lower RC	8315.75 Rondout_XS_10	100 YR	John Brooks 10	10900.00	840.65	852.07		852.34	0.003083	5.36	3354.68	679.48	0.31
Lower Rondout Cr	Lower RC	7738.59 Rondout_XS_09	100 YR	Existing Conditions	10900.00	833.81	849.97		850.55	0.002673	7.40	3102.16	437.19	0.35
Lower Rondout Cr	Lower RC	7738.59 Rondout_XS_09	100 YR	John Brooks 10	10900.00	833.81	849.97		850.55	0.002673	7.40	3102.16	437.19	0.35
Lower Rondout Cr	Lower RC	7549.99 Rondout_XS_08	100 YR	Existing Conditions	14400.00	833.18	847.78		849.53	0.007111	11.57	2150.08	354.86	0.57
Lower Rondout Cr	Lower RC	7549.99 Rondout_XS_08	100 YR	John Brooks 10	14400.00	833.18	847.78		849.53	0.007111	11.57	2150.08	354.86	0.57
Lower Rondout Cr	Lower RC	6944.8 Rondout_XS_07	100 YR	Existing Conditions	14400.00	832.35	846.27		846.87	0.002484	7.00	3929.93	624.10	0.36
Lower Rondout Cr	Lower RC	6944.8 Rondout_XS_07	100 YR	John Brooks 10	14400.00	832.35	846.27		846.87	0.002484	7.00	3929.93	624.10	0.36
Lower Rondout Cr	Lower RC	6473.574 Rondout_XS_06	100 YR	Existing Conditions	14400.00	830.76	845.67	838.91	846.01	0.001220	4.97	3291.92	847.60	0.25
Lower Rondout Cr	Lower RC	6473.574 Rondout_XS_06	100 YR	John Brooks 10	14400.00	830.76	845.67	838.91	846.01	0.001220	4.97	3291.92	847.60	0.25
Lower Rondout Cr	Lower RC	6383.863 Rondout_XS_05	100 YR	Existing Conditions	14400.00	825.81	845.49	836.21	845.90	0.000982	5.15	2915.32	819.16	0.23
Lower Rondout Cr	Lower RC	6383.863 Rondout_XS_05	100 YR	John Brooks 10	14400.00	825.81	845.49	836.21	845.90	0.000982	5.15	2915.32	819.16	0.23
Lower Rondout Cr	Lower RC	6330.35			Bridge									
Lower Rondout Cr	Lower RC	6282.384 Rondout_XS_02	100 YR	Existing Conditions	14400.00	826.11	833.54	831.85	834.92	0.009741	9.42	1528.66	288.55	0.64
Lower Rondout Cr	Lower RC	6282.384 Rondout_XS_02	100 YR	John Brooks 10	14400.00	826.11	833.54	831.85	834.92	0.009741	9.42	1528.66	288.55	0.64
Lower Rondout Cr	Lower RC	6134.63 Rondout_XS_01	100 YR	Existing Conditions	14400.00	821.72	832.45	830.44	833.54	0.007207	8.59	1842.84	378.02	0.56
Lower Rondout Cr	Lower RC	6134.63 Rondout_XS_01	100 YR	John Brooks 10	14400.00	821.72	832.45	830.44	833.54	0.007207	8.59	1842.84	378.02	0.56

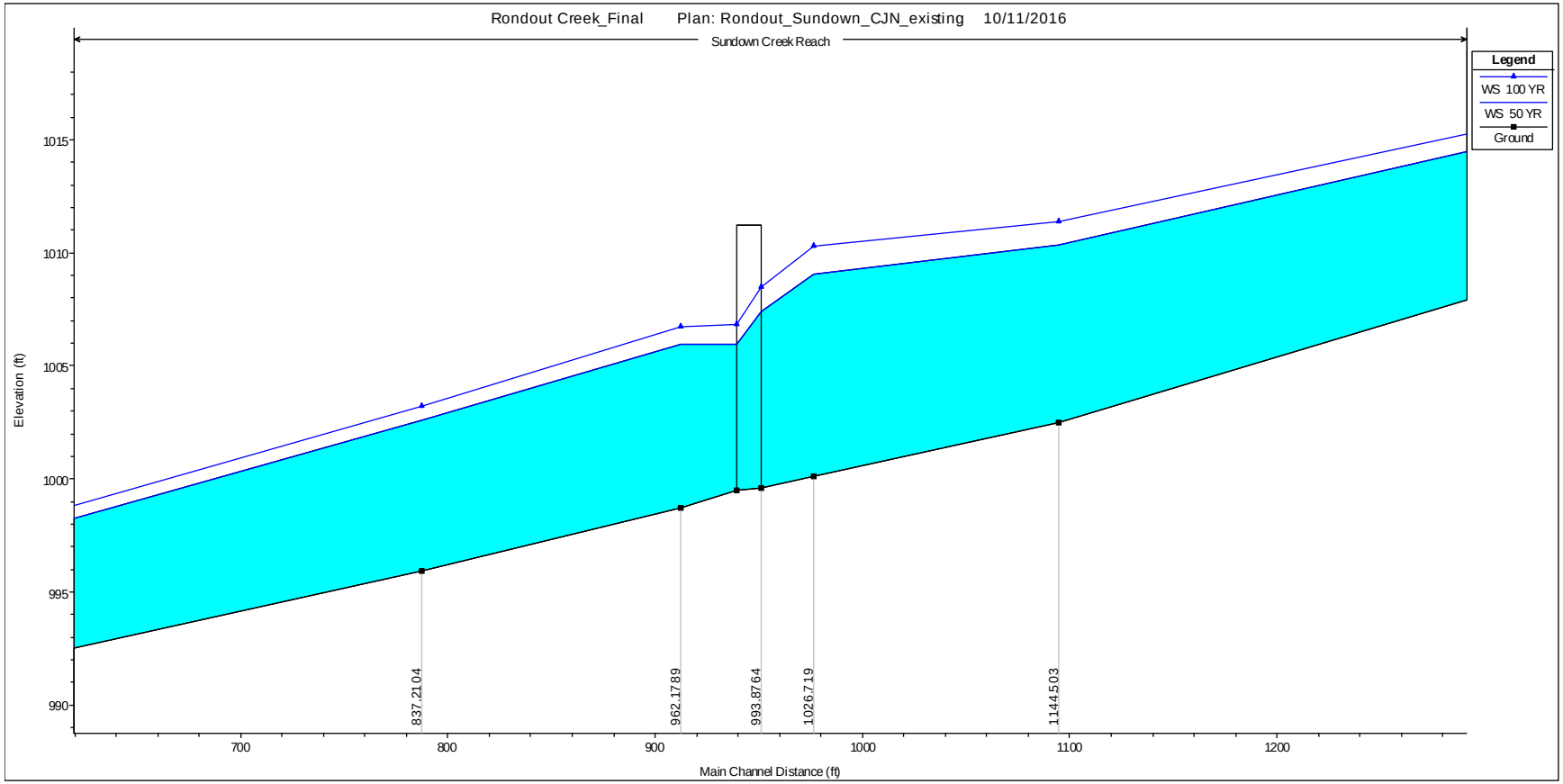
Sheeley Road Bridge

Existing Upstream Cross Section (50 & 100-year storm)



Sheeley Road Bridge

Existing Profile (50 & 100-year storm)



Sheeley Road - 100 Year Event

HEC-RAS Profile: 100 YR

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Sundown Creek	Reach	14784 XS SUN_30X	100 YR	Existing Conditions	385.00	1615.28	1619.00	1619.00	1620.20	0.042174	8.80	45.10	21.02	0.97
Sundown Creek	Reach	14784 XS SUN_30X	100 YR	Sheeley 10'	385.00	1615.28	1619.00	1619.00	1620.20	0.042174	8.80	45.10	21.02	0.97
Sundown Creek	Reach	14479.08 XS SUN_36X	100 YR	Existing Conditions	385.00	1601.47	1604.81	1604.81	1605.87	0.042311	8.29	48.26	79.83	0.97
Sundown Creek	Reach	14479.08 XS SUN_36X	100 YR	Sheeley 10'	385.00	1601.47	1604.81	1604.81	1605.87	0.042311	8.29	48.26	79.83	0.97
Sundown Creek	Reach	14226.26 XS SUN_35X	100 YR	Existing Conditions	385.00	1588.21	1591.35	1591.35	1591.80	0.024809	6.62	108.29	107.25	0.75
Sundown Creek	Reach	14226.26 XS SUN_35X	100 YR	Sheeley 10'	385.00	1588.21	1591.35	1591.35	1591.80	0.024809	6.62	108.29	107.25	0.75
Sundown Creek	Reach	13701.46 XS SUN_29X	100 YR	Existing Conditions	385.00	1559.00	1562.55	1562.55	1563.47	0.046608	7.75	51.22	29.23	0.98
Sundown Creek	Reach	13701.46 XS SUN_29X	100 YR	Sheeley 10'	385.00	1559.00	1562.55	1562.55	1563.47	0.046608	7.75	51.22	29.23	0.98
Sundown Creek	Reach	13267.4 XS SUN_28X	100 YR	Existing Conditions	816.00	1539.96	1545.07	1545.07	1546.53	0.035310	9.84	89.89	153.24	0.94
Sundown Creek	Reach	13267.4 XS SUN_28X	100 YR	Sheeley 10'	816.00	1539.96	1545.07	1545.07	1546.53	0.035310	9.84	89.89	153.24	0.94
Sundown Creek	Reach	12500.49 XS SUN_27X	100 YR	Existing Conditions	816.00	1507.02	1511.77	1511.40	1512.93	0.028338	8.66	95.27	30.95	0.84
Sundown Creek	Reach	12500.49 XS SUN_27X	100 YR	Sheeley 10'	816.00	1507.02	1511.77	1511.40	1512.93	0.028338	8.66	95.27	30.95	0.84
Sundown Creek	Reach	12004.32 XS SUN_34X	100 YR	Existing Conditions	816.00	1490.77	1494.23	1494.23	1495.17	0.046806	9.23	130.08	82.35	1.04
Sundown Creek	Reach	12004.32 XS SUN_34X	100 YR	Sheeley 10'	816.00	1490.77	1494.23	1494.23	1495.17	0.046806	9.23	130.08	82.35	1.04
Sundown Creek	Reach	11756.8 XS SUN_26X	100 YR	Existing Conditions	816.00	1478.76	1483.30	1482.92	1484.00	0.024352	6.96	140.67	79.55	0.72
Sundown Creek	Reach	11756.8 XS SUN_26X	100 YR	Sheeley 10'	816.00	1478.76	1483.30	1482.92	1484.00	0.024352	6.96	140.67	79.55	0.72
Sundown Creek	Reach	11611.19 XS SUN_33X	100 YR	Existing Conditions	816.00	1476.69	1479.75	1479.30	1480.06	0.028036	5.30	201.21	135.86	0.75
Sundown Creek	Reach	11611.19 XS SUN_33X	100 YR	Sheeley 10'	816.00	1476.69	1479.75	1479.30	1480.06	0.028036	5.30	201.21	135.86	0.75
Sundown Creek	Reach	11360.01 XS SUN_47X	100 YR	Existing Conditions	816.00	1465.80	1470.48	1470.48	1471.86	0.039032	9.48	91.27	37.04	0.97
Sundown Creek	Reach	11360.01 XS SUN_47X	100 YR	Sheeley 10'	816.00	1465.80	1470.48	1470.48	1471.86	0.039032	9.48	91.27	37.04	0.97
Sundown Creek	Reach	11333.12 Bridge			Bridge									
Sundown Creek	Reach	11306.22 BR SUN_25B	100 YR	Existing Conditions	816.00	1462.42	1470.14	1466.98	1470.43	0.003968	4.42	220.92	72.80	0.33
Sundown Creek	Reach	11306.22 BR SUN_25B	100 YR	Sheeley 10'	816.00	1462.42	1470.14	1466.98	1470.43	0.003968	4.42	220.92	72.80	0.33
Sundown Creek	Reach	11280.27 BR SUN_25A	100 YR	Existing Conditions	816.00	1462.51	1470.12		1470.30	0.002023	3.42	260.86	57.83	0.24
Sundown Creek	Reach	11280.27 BR SUN_25A	100 YR	Sheeley 10'	816.00	1462.51	1470.12		1470.30	0.002023	3.42	260.86	57.83	0.24
Sundown Creek	Reach	11258 XS SUN_23X	100 YR	Existing Conditions	816.00	1464.48	1468.53	1468.53	1470.05	0.039630	9.93	86.65	34.25	0.99
Sundown Creek	Reach	11258 XS SUN_23X	100 YR	Sheeley 10'	816.00	1464.48	1468.53	1468.53	1470.05	0.039630	9.93	86.65	34.25	0.99
Sundown Creek	Reach	10956.28 XS SUN_22X	100 YR	Existing Conditions	816.00	1450.30	1454.02	1453.75	1454.97	0.029401	7.86	107.51	46.03	0.84
Sundown Creek	Reach	10956.28 XS SUN_22X	100 YR	Sheeley 10'	816.00	1450.30	1454.02	1453.75	1454.97	0.029401	7.86	107.51	46.03	0.84
Sundown Creek	Reach	10285.9 XS SUN_21XA	100 YR	Existing Conditions	816.00	1425.36	1429.38	1429.38	1431.05	0.043970	10.35	78.96	24.35	1.00
Sundown Creek	Reach	10285.9 XS SUN_21XA	100 YR	Sheeley 10'	816.00	1425.36	1429.38	1429.38	1431.05	0.043970	10.35	78.96	24.35	1.00
Sundown Creek	Reach	9888.424 XS SUN_21X	100 YR	Existing Conditions	816.00	1325.67	1329.55	1329.55	1331.18	0.037513	10.33	85.49	29.14	0.99
Sundown Creek	Reach	9888.424 XS SUN_21X	100 YR	Sheeley 10'	816.00	1325.67	1329.55	1329.55	1331.18	0.037513	10.33	85.49	29.14	0.99
Sundown Creek	Reach	9563.817 XS SUN_20X	100 YR	Existing Conditions	816.00	1309.30	1313.08	1313.08	1314.53	0.041465	9.67	85.33	31.26	0.99
Sundown Creek	Reach	9563.817 XS SUN_20X	100 YR	Sheeley 10'	816.00	1309.30	1313.08	1313.08	1314.53	0.041465	9.67	85.33	31.26	0.99
Sundown Creek	Reach	9120.165 XS SUN_44X	100 YR	Existing Conditions	816.00	1294.98	1298.06	1297.81	1298.62	0.029488	5.98	140.50	85.16	0.79
Sundown Creek	Reach	9120.165 XS SUN_44X	100 YR	Sheeley 10'	816.00	1294.98	1298.06	1297.81	1298.62	0.029488	5.98	140.50	85.16	0.79
Sundown Creek	Reach	8865.03 XS SUN_19X	100 YR	Existing Conditions	816.00	1286.27	1290.50		1291.52	0.025925	8.11	104.76	38.06	0.81
Sundown Creek	Reach	8865.03 XS SUN_19X	100 YR	Sheeley 10'	816.00	1286.27	1290.50		1291.52	0.025925	8.11	104.76	38.06	0.81
Sundown Creek	Reach	8701.974 XS SUN_18X	100 YR	Existing Conditions	2150.00	1277.94	1284.11	1284.11	1286.30	0.033756	11.92	191.65	49.61	0.98
Sundown Creek	Reach	8701.974 XS SUN_18X	100 YR	Sheeley 10'	2150.00	1277.94	1284.11	1284.11	1286.30	0.033756	11.92	191.65	49.61	0.98
Sundown Creek	Reach	8529.396 XS SUN_43X	100 YR	Existing Conditions	2150.00	1273.15	1278.41	1278.41	1280.47	0.029013	11.80	222.77	81.82	0.93
Sundown Creek	Reach	8529.396 XS SUN_43X	100 YR	Sheeley 10'	2150.00	1273.15	1278.41	1278.41	1280.47	0.029013	11.80	222.77	81.82	0.93
Sundown Creek	Reach	8169.187 XS SUN_42X	100 YR	Existing Conditions	2150.00	1260.30	1266.79	1266.79	1268.73	0.035270	13.63	296.35	79.07	1.03
Sundown Creek	Reach	8169.187 XS SUN_42X	100 YR	Sheeley 10'	2150.00	1260.30	1266.79	1266.79	1268.73	0.035270	13.63	296.35	79.07	1.03
Sundown Creek	Reach	7911.303 XS SUN_41X	100 YR	Existing Conditions	2150.00	1251.09	1256.60	1256.60	1258.76	0.032454	11.99	206.22	56.21	0.97
Sundown Creek	Reach	7911.303 XS SUN_41X	100 YR	Sheeley 10'	2150.00	1251.09	1256.60	1256.60	1258.76	0.032454	11.99	206.22	56.21	0.97
Sundown Creek	Reach	7734.417 XS SUN_17X	100 YR	Existing Conditions	2150.00	1243.99	1250.49	1250.35	1252.21	0.026851	10.78	242.70	79.71	0.86
Sundown Creek	Reach	7734.417 XS SUN_17X	100 YR	Sheeley 10'	2150.00	1243.99	1250.49	1250.35	1252.21	0.026851	10.78	242.70	79.71	0.86
Sundown Creek	Reach	7022.902 XS SUN_16X	100 YR	Existing Conditions	2150.00	1224.22	1229.83	1229.83	1231.96	0.030107	12.33	230.06	60.92	0.96
Sundown Creek	Reach	7022.902 XS SUN_16X	100 YR	Sheeley 10'	2150.00	1224.22	1229.83	1229.83	1231.96	0.030107	12.33	230.06	60.92	0.96
Sundown Creek	Reach	6426.67 XS SUN_40X	100 YR	Existing Conditions	2150.00	1203.03	1208.59	1208.59	1210.57	0.034048	11.38	203.52	56.80	0.98
Sundown Creek	Reach	6426.67 XS SUN_40X	100 YR	Sheeley 10'	2150.00	1203.03	1208.59	1208.59	1210.57	0.034048	11.38	203.52	56.80	0.98
Sundown Creek	Reach	5885.625 XS SUN_48X	100 YR	Existing Conditions	2150.00	1188.30	1193.61		1194.20	0.011244	5.79	361.54	119.85	0.52
Sundown Creek	Reach	5885.625 XS SUN_48X	100 YR	Sheeley 10'	2150.00	1188.30	1193.61		1194.20	0.011244	5.79	361.54	119.85	0.52
Sundown Creek	Reach	5846.653 BR SUN_15D	100 YR	Existing Conditions	2150.00	1183.83	1193.44	1191.93	1193.87	0.004211	5.86	459.73	117.39	0.37
Sundown Creek	Reach	5846.653 BR SUN_15D	100 YR	Sheeley 10'	2150.00	1183.83	1193.44	1191.93	1193.87	0.004211	5.86	459.73	117.39	0.37
Sundown Creek	Reach	5821.221 Bridge			Bridge									
Sundown Creek	Reach	5800.354 BR SUN_15C	100 YR	Existing Conditions	2150.00	1182.68	1191.86	1191.52	1192.75	0.011314	8.18	315.78	113.20	0.55
Sundown Creek	Reach	5800.354 BR SUN_15C	100 YR	Sheeley 10'	2150.00	1182.68	1191.86	1191.52	1192.75	0.011314	8.18	315.78	113.20	0.55
Sundown Creek	Reach	5775.103 BR SUN_15A	100 YR	Existing Conditions	2150.00	1181.72	1191.77		1192.36	0.008152	6.40	360.92	109.05	0.45
Sundown Creek	Reach	5775.103 BR SUN_15A	100 YR	Sheeley 10'	2150.00	1181.72	1191.77		1192.36	0.008152	6.40	360.92	109.05	0.45
Sundown Creek	Reach	5688.313 XS SUN_49X	100 YR	Existing Conditions	2150.00	1182.81	1190.05	1190.05	1191.31	0.017625	9.73	282.44	95.82	0.73
Sundown Creek	Reach	5688.313 XS SUN_49X	100 YR	Sheeley 10'	2150.00	1182.81	1190.05	1190.05	1191.31	0.017625	9.73	282.44	95.82	0.73
Sundown Creek	Reach	5356.54 XS SUN_32X	100 YR	Existing Conditions	2150.00	1164.83	1171.25	1171.25	1173.79	0.033660	12.93	182.88	40.75	0.98
Sundown Creek	Reach	5356.54 XS SUN_32X	100 YR	Sheeley 10'	2150.00	1164.83	1171.25	1171.25	1173.79	0.033660	12.93	182.88	40.75	0.98
Sundown Creek	Reach	4929.002 XS SUN_31X	100 YR	Existing Conditions	2150.00	1135.12	1140.88	1140.88	1143.48	0.035841	12.98	171.84	36.60	0.99

HEC-RAS Profile: 100 YR (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Sundown Creek	Reach	4929.002 XS SUN_31X	100 YR	Sheeley 10'	2150.00	1135.12	1140.88	1140.88	1143.48	0.035841	12.98	171.84	36.60	0.99
Sundown Creek	Reach	4792.939 XS SUN_14X	100 YR	Existing Conditions	2150.00	1118.46	1126.38		1126.90	0.005582	5.80	371.39	62.57	0.40
Sundown Creek	Reach	4792.939 XS SUN_14X	100 YR	Sheeley 10'	2150.00	1118.46	1126.38		1126.90	0.005582	5.80	371.39	62.57	0.40
Sundown Creek	Reach	4469.083 XS SUN_45X	100 YR	Existing Conditions	2150.00	1113.38	1120.67	1120.67	1123.15	0.030804	12.94	196.02	46.49	0.97
Sundown Creek	Reach	4469.083 XS SUN_45X	100 YR	Sheeley 10'	2150.00	1113.38	1120.67	1120.67	1123.15	0.030804	12.94	196.02	46.49	0.97
Sundown Creek	Reach	3643.11 XS SUN_13X	100 YR	Existing Conditions	2840.00	1080.11	1086.58	1086.14	1088.53	0.026537	11.23	259.49	53.73	0.87
Sundown Creek	Reach	3643.11 XS SUN_13X	100 YR	Sheeley 10'	2840.00	1080.11	1086.58	1086.14	1088.53	0.026537	11.23	259.49	53.73	0.87
Sundown Creek	Reach	3431.445 XS SUN_39X	100 YR	Existing Conditions	2840.00	1073.46	1080.73	1080.73	1083.06	0.024812	12.86	311.06	86.12	0.89
Sundown Creek	Reach	3431.445 XS SUN_39X	100 YR	Sheeley 10'	2840.00	1073.46	1080.73	1080.73	1083.06	0.024812	12.86	311.06	86.12	0.89
Sundown Creek	Reach	3050.617 XS SUN_38X	100 YR	Existing Conditions	2840.00	1064.51	1070.57	1070.40	1072.58	0.026184	11.95	317.13	83.98	0.90
Sundown Creek	Reach	3050.617 XS SUN_38X	100 YR	Sheeley 10'	2840.00	1064.51	1070.57	1070.40	1072.58	0.026184	11.95	317.13	83.98	0.90
Sundown Creek	Reach	2828.606 XS SUN_37X	100 YR	Existing Conditions	2840.00	1058.75	1064.00	1064.00	1065.97	0.034122	11.49	278.51	75.38	0.98
Sundown Creek	Reach	2828.606 XS SUN_37X	100 YR	Sheeley 10'	2840.00	1058.75	1064.00	1064.00	1065.97	0.034122	11.49	278.51	75.38	0.98
Sundown Creek	Reach	2533.334 XS SUN_12X	100 YR	Existing Conditions	2840.00	1046.13	1053.50	1053.12	1055.76	0.029930	12.07	235.92	43.77	0.90
Sundown Creek	Reach	2533.334 XS SUN_12X	100 YR	Sheeley 10'	2840.00	1046.13	1053.50	1053.12	1055.76	0.029930	12.07	235.92	43.77	0.90
Sundown Creek	Reach	1689.646 XS SUN_11X	100 YR	Existing Conditions	2840.00	1017.07	1024.52	1024.52	1027.33	0.038081	13.43	212.34	39.77	1.00
Sundown Creek	Reach	1689.646 XS SUN_11X	100 YR	Sheeley 10'	2840.00	1017.07	1024.53	1024.53	1027.33	0.038075	13.43	212.35	39.77	1.00
Sundown Creek	Reach	1587.831 BR SUN_10D	100 YR	Existing Conditions	2840.00	1014.72	1022.56	1021.43	1024.01	0.018691	9.66	293.96	52.91	0.72
Sundown Creek	Reach	1587.831 BR SUN_10D	100 YR	Sheeley 10'	2840.00	1014.72	1022.57	1021.43	1024.02	0.018574	9.64	294.57	52.92	0.72
Sundown Creek	Reach	1559.583 Bridge			Bridge									
Sundown Creek	Reach	1512.841 BR SUN_10A	100 YR	Existing Conditions	2840.00	1013.17	1020.32	1019.43	1022.12	0.019547	10.85	273.38	51.09	0.78
Sundown Creek	Reach	1512.841 BR SUN_10A	100 YR	Sheeley 10'	2840.00	1013.17	1020.18	1019.43	1022.08	0.021111	11.11	266.52	50.80	0.81
Sundown Creek	Reach	1410.457 XS SUN_07X	100 YR	Existing Conditions	2840.00	1009.83	1016.58	1016.58	1019.32	0.032050	13.36	221.99	43.76	0.98
Sundown Creek	Reach	1410.457 XS SUN_07X	100 YR	Sheeley 10'	2840.00	1009.83	1016.71	1016.57	1019.32	0.029563	13.04	228.04	44.06	0.95
Sundown Creek	Reach	1144.503 XS SUN_06X	100 YR	Existing Conditions	2840.00	1002.51	1011.39	1009.72	1013.05	0.015577	10.37	283.76	44.08	0.67
Sundown Creek	Reach	1144.503 XS SUN_06X	100 YR	Sheeley 10'	2840.00	1002.51	1010.94	1009.72	1012.83	0.019295	11.06	264.03	43.25	0.74
Sundown Creek	Reach	1026.719 BR SUN_05D	100 YR	Existing Conditions	2840.00	1000.10	1010.31	1007.08	1011.43	0.008803	8.50	343.11	132.78	0.50
Sundown Creek	Reach	1026.719 BR SUN_05D	100 YR	Sheeley 10'	2840.00	1000.10	1007.70	1007.08	1009.98	0.028442	12.10	234.77	38.32	0.86
Sundown Creek	Reach	993.8764 Bridge			Bridge									
Sundown Creek	Reach	962.1789 BR SUN_05A	100 YR	Existing Conditions	2840.00	998.71	1006.73	1005.71	1008.56	0.021396	10.86	261.85	95.01	0.77
Sundown Creek	Reach	962.1789 BR SUN_05A	100 YR	Sheeley 10'	2840.00	998.71	1006.73	1005.71	1008.56	0.021397	10.86	261.96	95.01	0.77
Sundown Creek	Reach	837.2104 XS SUN_03X	100 YR	Existing Conditions	2840.00	995.92	1003.23	1002.76	1005.53	0.025108	12.21	242.98	89.87	0.88
Sundown Creek	Reach	837.2104 XS SUN_03X	100 YR	Sheeley 10'	2840.00	995.92	1003.23	1002.76	1005.53	0.025108	12.21	242.98	89.87	0.88
Sundown Creek	Reach	467.9756 XS SUN_02X	100 YR	Existing Conditions	2840.00	988.37	993.51	993.51	995.20	0.030326	10.64	351.90	255.32	0.90
Sundown Creek	Reach	467.9756 XS SUN_02X	100 YR	Sheeley 10'	2840.00	988.37	993.51	993.51	995.20	0.030326	10.64	351.90	255.32	0.90
Sundown Creek	Reach	181.3982 XS SUN_01X	100 YR	Existing Conditions	2840.00	978.20	985.73	985.73	987.35	0.023753	10.59	378.83	326.06	0.82
Sundown Creek	Reach	181.3982 XS SUN_01X	100 YR	Sheeley 10'	2840.00	978.20	985.73	985.73	987.35	0.023753	10.59	378.83	326.06	0.82
Sundown Creek	Reach	50.00015 XS SUN_46X	100 YR	Existing Conditions	2840.00	975.97	982.09	982.09	983.28	0.027826	10.16	416.08	225.76	0.87
Sundown Creek	Reach	50.00015 XS SUN_46X	100 YR	Sheeley 10'	2840.00	975.97	982.09	982.09	983.28	0.027826	10.16	416.08	225.76	0.87
Rondout Creek	Reach	36559.8 Rondout_XS_63	100 YR	Existing Conditions	8100.00	1110.01	1120.51		1121.22	0.005891	7.11	1528.11	310.62	0.46
Rondout Creek	Reach	36559.8 Rondout_XS_63	100 YR	Sheeley 10'	8100.00	1110.01	1120.51		1121.22	0.005891	7.11	1528.11	310.62	0.46
Rondout Creek	Reach	36437.5 Rondout_XS_62	100 YR	Existing Conditions	8100.00	1109.07	1120.12		1120.58	0.003828	5.80	1983.43	366.45	0.37
Rondout Creek	Reach	36437.5 Rondout_XS_62	100 YR	Sheeley 10'	8100.00	1109.07	1120.12		1120.58	0.003828	5.80	1983.43	366.45	0.37
Rondout Creek	Reach	35949 Rondout_XS_61	100 YR	Existing Conditions	8100.00	1105.35	1114.45	1114.45	1116.42	0.030839	13.91	1196.24	362.27	0.98
Rondout Creek	Reach	35949 Rondout_XS_61	100 YR	Sheeley 10'	8100.00	1105.35	1114.45	1114.45	1116.42	0.030839	13.91	1196.24	362.27	0.98
Rondout Creek	Reach	35517.78 Rondout_XS_73	100 YR	Existing Conditions	8100.00	1095.53	1108.83		1109.05	0.001388	4.71	3513.14	454.07	0.24
Rondout Creek	Reach	35517.78 Rondout_XS_73	100 YR	Sheeley 10'	8100.00	1095.53	1108.83		1109.05	0.001388	4.71	3513.14	454.07	0.24
Rondout Creek	Reach	35484 Rondout_XS_60	100 YR	Existing Conditions	8100.00	1094.42	1107.42	1104.98	1108.83	0.010231	10.10	1329.12	430.44	0.58
Rondout Creek	Reach	35484 Rondout_XS_60	100 YR	Sheeley 10'	8100.00	1094.42	1107.42	1104.98	1108.83	0.010231	10.10	1329.12	430.44	0.58
Rondout Creek	Reach	35260 Rondout_XS_59	100 YR	Existing Conditions	8100.00	1091.61	1106.42	1103.11	1106.85	0.006514	6.26	2223.08	427.33	0.33
Rondout Creek	Reach	35260 Rondout_XS_59	100 YR	Sheeley 10'	8100.00	1091.61	1106.42	1103.11	1106.85	0.006514	6.26	2223.08	427.33	0.33
Rondout Creek	Reach	35226.02			Bridge									
Rondout Creek	Reach	35192 Rondout_XS_56	100 YR	Existing Conditions	8100.00	1092.23	1102.27	1101.87	1104.28	0.015507	11.98	1076.49	351.29	0.74
Rondout Creek	Reach	35192 Rondout_XS_56	100 YR	Sheeley 10'	8100.00	1092.23	1102.27	1101.87	1104.28	0.015507	11.98	1076.49	351.29	0.74
Rondout Creek	Reach	35114 Rondout_XS_55	100 YR	Existing Conditions	8100.00	1092.03	1101.59		1102.89	0.011282	10.22	1435.73	368.49	0.63
Rondout Creek	Reach	35114 Rondout_XS_55	100 YR	Sheeley 10'	8100.00	1092.03	1101.59		1102.89	0.011282	10.22	1435.73	368.49	0.63
Rondout Creek	Reach	34544.4 Rondout_XS_54	100 YR	Existing Conditions	8100.00	1084.87	1096.37		1097.37	0.008419	9.07	1495.91	281.50	0.56
Rondout Creek	Reach	34544.4 Rondout_XS_54	100 YR	Sheeley 10'	8100.00	1084.87	1096.37		1097.37	0.008419	9.07	1495.91	281.50	0.56
Rondout Creek	Reach	33437.5 Rondout_XS_53	100 YR	Existing Conditions	8100.00	1072.93	1082.31	1081.89	1084.05	0.019044	10.91	952.17	273.82	0.79
Rondout Creek	Reach	33437.5 Rondout_XS_53	100 YR	Sheeley 10'	8100.00	1072.93	1082.31	1081.89	1084.05	0.019044	10.91	952.17	273.82	0.79
Rondout Creek	Reach	32259.3 Rondout_XS_52	100 YR	Existing Conditions	8100.00	1056.05	1066.51	1064.34	1068.00	0.010188	9.91	957.36	647.77	0.61
Rondout Creek	Reach	32259.3 Rondout_XS_52	100 YR	Sheeley 10'	8100.00	1056.05	1066.51	1064.34	1068.00	0.010188	9.91	957.36	647.77	0.61
Rondout Creek	Reach	31637.7 Rondout_XS_51	100 YR	Existing Conditions	8100.00	1049.72	1060.71	1057.85	1062.23	0.008471	10.09	988.24	651.43	0.56
Rondout Creek	Reach	31637.7 Rondout_XS_51	100 YR	Sheeley 10'	8100.00	1049.72	1060.71	1057.85	1062.23	0.008471	10.09	988.24	651.43	0.56
Rondout Creek	Reach	31417.9 Rondout_XS_50	100 YR	Existing Conditions	8100.00	1044.82	1056.82	1055.80	1059.47	0.018579	13.08	652.72	523.17	0.81
Rondout Creek	Reach	31417.9 Rondout_XS_50	100 YR	Sheeley 10'	8100.00	1044.82	1056.82	1055.80	1059.47	0.018579	13.08	652.72	523.17	0.81

HEC-RAS Profile: 100 YR (Continued)

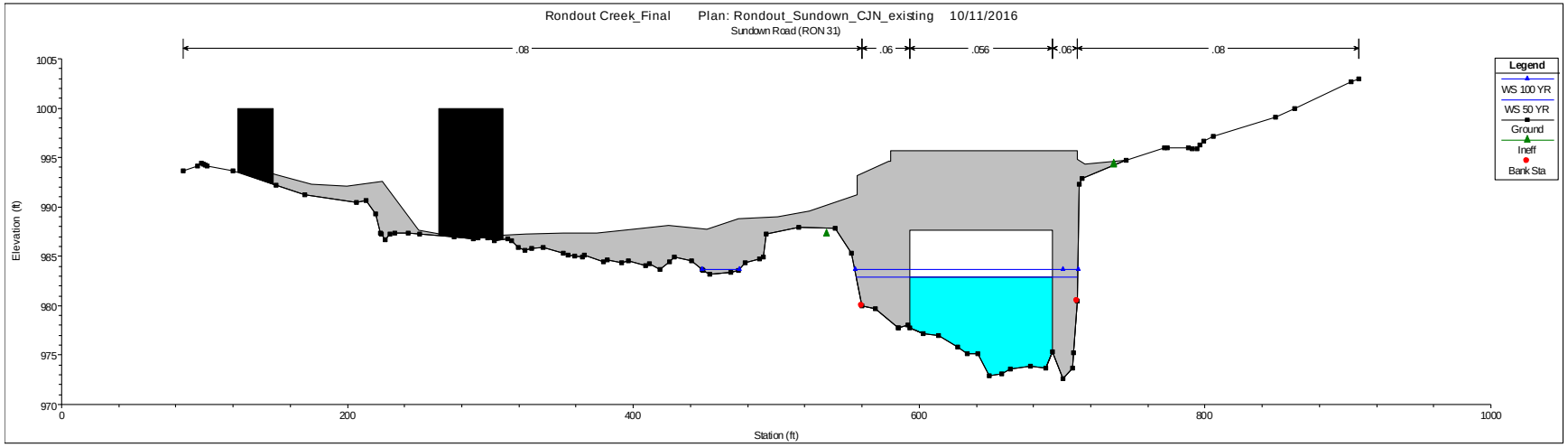
River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Rondout Creek	Reach	30913.9 Rondout_XS_49	100 YR	Existing Conditions	8100.00	1045.49	1051.68		1052.13	0.009721	6.88	1996.26	610.36	0.56
Rondout Creek	Reach	30913.9 Rondout_XS_49	100 YR	Sheeley 10'	8100.00	1045.49	1051.68		1052.13	0.009721	6.88	1996.26	610.36	0.56
Rondout Creek	Reach	29580.7 Rondout_XS_48	100 YR	Existing Conditions	8100.00	1025.25	1035.42	1035.42	1036.67	0.014974	10.02	1324.84	548.93	0.71
Rondout Creek	Reach	29580.7 Rondout_XS_48	100 YR	Sheeley 10'	8100.00	1025.25	1035.42	1035.42	1036.67	0.014974	10.02	1324.84	548.93	0.71
Rondout Creek	Reach	28843 Rondout_XS_47	100 YR	Existing Conditions	8100.00	1018.80	1027.32		1028.00	0.008063	7.93	1943.43	445.14	0.53
Rondout Creek	Reach	28843 Rondout_XS_47	100 YR	Sheeley 10'	8100.00	1018.80	1027.32		1028.00	0.008067	7.93	1943.05	445.14	0.53
Rondout Creek	Reach	28726.3 Rondout_XS_46	100 YR	Existing Conditions	8100.00	1015.06	1026.71	1023.56	1027.29	0.004654	7.01	2163.13	443.38	0.41
Rondout Creek	Reach	28726.3 Rondout_XS_46	100 YR	Sheeley 10'	8100.00	1015.06	1026.71	1023.56	1027.29	0.004657	7.01	2162.48	443.38	0.41
Rondout Creek	Reach	28695.20		Bridge										
Rondout Creek	Reach	28664.1 Rondout_XS_43	100 YR	Existing Conditions	8100.00	1014.00	1025.41	1023.72	1026.46	0.008452	9.42	1707.95	423.84	0.55
Rondout Creek	Reach	28664.1 Rondout_XS_43	100 YR	Sheeley 10'	8100.00	1014.00	1025.40	1023.72	1026.46	0.008484	9.43	1704.69	423.39	0.56
Rondout Creek	Reach	28539.3 Rondout_XS_42	100 YR	Existing Conditions	8100.00	1013.94	1024.44		1025.06	0.010982	7.56	1897.75	440.25	0.46
Rondout Creek	Reach	28539.3 Rondout_XS_42	100 YR	Sheeley 10'	8100.00	1013.94	1024.43		1025.05	0.011093	7.59	1890.34	440.22	0.46
Rondout Creek	Reach	27901.6 Rondout_XS_41	100 YR	Existing Conditions	8100.00	1010.19	1017.26		1017.67	0.013651	6.53	2191.06	607.37	0.46
Rondout Creek	Reach	27901.6 Rondout_XS_41	100 YR	Sheeley 10'	8100.00	1010.19	1017.29		1017.69	0.013389	6.49	2206.22	607.42	0.45
Rondout Creek	Reach	26788.23 Rondout_XS_70	100 YR	Existing Conditions	8100.00	996.90	1004.50		1005.15	0.010314	8.12	2413.44	904.53	0.58
Rondout Creek	Reach	26788.23 Rondout_XS_70	100 YR	Sheeley 10'	8100.00	996.90	1004.48		1005.13	0.010538	8.18	2391.33	902.46	0.59
Rondout Creek	Reach	26509.47	100 YR	Existing Conditions	8100.00	994.51	1003.33		1003.65	0.005274	5.16	2220.35	506.74	0.41
Rondout Creek	Reach	26509.47	100 YR	Sheeley 10'	8100.00	994.51	1003.23		1003.58	0.005626	5.26	2173.86	506.74	0.42
Rondout Creek	Reach	26230.71	100 YR	Existing Conditions	8100.00	985.84	996.50	996.50	998.45	0.041104	12.32	939.10	240.25	0.86
Rondout Creek	Reach	26230.71	100 YR	Sheeley 10'	8100.00	985.84	996.86		998.49	0.032729	11.37	1025.18	240.36	0.78
Rondout Creek	Reach	25673.2 Rondout_XS_40	100 YR	Existing Conditions	8100.00	983.66	992.62		992.83	0.003267	4.88	2872.84	752.24	0.34
Rondout Creek	Reach	25673.2 Rondout_XS_40	100 YR	Sheeley 10'	8100.00	983.66	991.92		992.26	0.005929	6.10	2345.79	750.56	0.44
Rondout Creek	Reach	25383.8 Rondout_XS_39	100 YR	Existing Conditions	8100.00	980.80	989.86	989.86	990.99	0.016074	9.88	1395.09	677.83	0.73
Rondout Creek	Reach	25383.8 Rondout_XS_39	100 YR	Sheeley 10'	8100.00	980.80	987.91	987.91	988.96	0.032116	10.60	1310.07	594.13	0.96
Rondout Creek	Reach	25071.05	100 YR	Existing Conditions	8100.00	973.91	986.06	979.66	986.16	0.000795	2.57	3687.52	690.99	0.17
Rondout Creek	Reach	25071.05	100 YR	Sheeley 10'	8100.00	973.91	986.04		986.12	0.000742	2.48	4037.93	690.88	0.16
Rondout Creek	Reach	24758.3	100 YR	Existing Conditions	8100.00	973.68	984.79	980.60	985.38	0.003690	6.19	1318.75	219.22	0.37
Rondout Creek	Reach	24758.3	100 YR	Sheeley 10'	8100.00	973.68	984.79	980.60	985.38	0.003690	6.19	1318.75	219.22	0.37
Rondout Creek	Reach	24670.86		Bridge										
Rondout Creek	Reach	24637.7 Rondout_XS_34	100 YR	Existing Conditions	8100.00	970.89	982.66	980.36	984.08	0.012300	9.58	850.98	114.76	0.60
Rondout Creek	Reach	24637.7 Rondout_XS_34	100 YR	Sheeley 10'	8100.00	970.89	982.66	980.36	984.08	0.012300	9.58	850.98	114.76	0.60
Rondout Creek	Reach	24591.1 Rondout_XS_33	100 YR	Existing Conditions	8100.00	970.22	982.02		983.55	0.009560	9.92	823.87	104.43	0.59
Rondout Creek	Reach	24591.1 Rondout_XS_33	100 YR	Sheeley 10'	8100.00	970.22	982.02		983.55	0.009560	9.92	823.87	104.43	0.59
Lower Rondout Cr	Lower RC	24383.59 Rondout_XS_32	100 YR	Existing Conditions	9470.00	968.68	979.83		981.34	0.011696	9.88	985.14	139.19	0.60
Lower Rondout Cr	Lower RC	24383.59 Rondout_XS_32	100 YR	Sheeley 10'	9470.00	968.68	979.83		981.34	0.011696	9.88	985.14	139.19	0.60
Lower Rondout Cr	Lower RC	24015.74	100 YR	Existing Conditions	9470.00	968.54	976.30		977.18	0.010114	8.41	1570.69	379.98	0.59
Lower Rondout Cr	Lower RC	24015.74	100 YR	Sheeley 10'	9470.00	968.54	976.30		977.18	0.010114	8.41	1570.69	379.98	0.59
Lower Rondout Cr	Lower RC	23647.9 Rondout_XS_31	100 YR	Existing Conditions	9470.00	962.10	971.99		972.79	0.008342	7.31	1461.24	471.54	0.53
Lower Rondout Cr	Lower RC	23647.9 Rondout_XS_31	100 YR	Sheeley 10'	9470.00	962.10	971.99		972.79	0.008342	7.31	1461.24	471.54	0.53
Lower Rondout Cr	Lower RC	23116.5 Rondout_XS_30	100 YR	Existing Conditions	9470.00	958.99	966.91		968.04	0.008869	8.57	1145.34	250.08	0.57
Lower Rondout Cr	Lower RC	23116.5 Rondout_XS_30	100 YR	Sheeley 10'	9470.00	958.99	966.91		968.04	0.008869	8.57	1145.34	250.08	0.57
Lower Rondout Cr	Lower RC	22632.9 Rondout_XS_29	100 YR	Existing Conditions	9470.00	954.22	962.33		963.44	0.010093	8.82	1525.93	474.49	0.60
Lower Rondout Cr	Lower RC	22632.9 Rondout_XS_29	100 YR	Sheeley 10'	9470.00	954.22	962.33		963.44	0.010093	8.82	1525.93	474.49	0.60
Lower Rondout Cr	Lower RC	22528.2 Rondout_XS_28	100 YR	Existing Conditions	9470.00	953.91	960.86	959.90	962.17	0.014176	9.61	1422.80	482.03	0.70
Lower Rondout Cr	Lower RC	22528.2 Rondout_XS_28	100 YR	Sheeley 10'	9470.00	953.91	960.86	959.90	962.17	0.014176	9.61	1422.80	482.03	0.70
Lower Rondout Cr	Lower RC	22398.9 Rondout_XS_27	100 YR	Existing Conditions	9470.00	950.79	959.29	958.07	960.45	0.012055	8.85	1384.04	447.46	0.64
Lower Rondout Cr	Lower RC	22398.9 Rondout_XS_27	100 YR	Sheeley 10'	9470.00	950.79	959.29	958.07	960.45	0.012055	8.85	1384.04	447.46	0.64
Lower Rondout Cr	Lower RC	21902.2 Rondout_XS_26	100 YR	Existing Conditions	9470.00	946.14	953.66		954.45	0.010329	8.73	1773.98	470.48	0.62
Lower Rondout Cr	Lower RC	21902.2 Rondout_XS_26	100 YR	Sheeley 10'	9470.00	946.14	953.66		954.45	0.010329	8.73	1773.98	470.48	0.62
Lower Rondout Cr	Lower RC	21146.4 Rondout_XS_25	100 YR	Existing Conditions	9550.00	938.49	945.98		946.28	0.008140	5.52	2541.05	710.00	0.50
Lower Rondout Cr	Lower RC	21146.4 Rondout_XS_25	100 YR	Sheeley 10'	9550.00	938.49	945.98		946.28	0.008140	5.52	2541.05	710.00	0.50
Lower Rondout Cr	Lower RC	19655.9 Rondout_XS_24	100 YR	Existing Conditions	9550.00	921.51	930.29		931.23	0.014932	9.49	1455.42	443.29	0.66
Lower Rondout Cr	Lower RC	19655.9 Rondout_XS_24	100 YR	Sheeley 10'	9550.00	921.51	930.29		931.23	0.014932	9.49	1455.42	443.29	0.66
Lower Rondout Cr	Lower RC	18891.26 Rondout_XS_69	100 YR	Existing Conditions	9550.00	914.40	924.62		925.26	0.004862	7.17	1770.14	388.32	0.44
Lower Rondout Cr	Lower RC	18891.26 Rondout_XS_69	100 YR	Sheeley 10'	9550.00	914.40	924.62		925.26	0.004862	7.17	1770.14	388.32	0.44
Lower Rondout Cr	Lower RC	18391.26 Rondout_XS_68	100 YR	Existing Conditions	10242.00	909.80	921.08	919.19	922.08	0.008284	8.46	1684.25	673.87	0.56
Lower Rondout Cr	Lower RC	18391.26 Rondout_XS_68	100 YR	Sheeley 10'	10242.00	909.80	921.08	919.19	922.08	0.008284	8.46	1684.25	673.87	0.56
Lower Rondout Cr	Lower RC	17891.26 Rondout_XS_67	100 YR	Existing Conditions	10242.00	905.20	915.29		916.53	0.015563	9.05	1191.51	332.95	0.73
Lower Rondout Cr	Lower RC	17891.26 Rondout_XS_67	100 YR	Sheeley 10'	10242.00	905.20	915.29		916.53	0.015563	9.05	1191.51	332.95	0.73
Lower Rondout Cr	Lower RC	17391.26 Rondout_XS_66	100 YR	Existing Conditions	10242.00	900.50	910.53		911.22	0.007333	9.17	2554.78	755.09	0.54
Lower Rondout Cr	Lower RC	17391.26 Rondout_XS_66	100 YR	Sheeley 10'	10242.00	900.50	910.53		911.22	0.007333	9.17	2554.78	755.09	0.54
Lower Rondout Cr	Lower RC	16891.26 Rondout_XS_65	100 YR	Existing Conditions	10242.00	895.90	905.39	905.19	906.60	0.014474	10.36	1616.37	533.76	0.72
Lower Rondout Cr	Lower RC	16891.26 Rondout_XS_65	100 YR	Sheeley 10'	10242.00	895.90	905.39	905.19	906.60	0.014474	10.36	1616.37	533.76	0.72
Lower Rondout Cr	Lower RC	16391.26 Rondout_XS_64	100 YR	Existing Conditions	10242.00	891.30	902.20		902.65	0.005078	7.75	2429.07	550.52	0.44
Lower Rondout Cr	Lower RC	16391.26 Rondout_XS_64	100 YR	Sheeley 10'	10242.00	891.30	902.20		902.65	0.005078	7.75	2429.07	550.52	0.44
Lower Rondout Cr	Lower RC	15893.2 Rondout_XS_23	100 YR	Existing Conditions	10242.00	886.66	898.41	897.16	899.30	0.008821	8.21	1825.54	642.93	0.57

HEC-RAS Profile: 100 YR (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Lower Rondout Cr	Lower RC	15893.2 Rondout_XS_23	100 YR	Sheeley 10'	10242.00	886.66	898.41	897.16	899.30	0.008821	8.21	1825.54	642.93	0.57
Lower Rondout Cr	Lower RC	14802.9 Rondout_XS_22	100 YR	Existing Conditions	10242.00	883.91	892.70		892.97	0.003993	6.14	3151.31	573.14	0.39
Lower Rondout Cr	Lower RC	14802.9 Rondout_XS_22	100 YR	Sheeley 10'	10242.00	883.91	892.70		892.97	0.003993	6.14	3151.31	573.14	0.39
Lower Rondout Cr	Lower RC	14056.2 Rondout_XS_21	100 YR	Existing Conditions	10242.00	875.61	888.94		889.83	0.004239	7.63	1428.60	199.05	0.42
Lower Rondout Cr	Lower RC	14056.2 Rondout_XS_21	100 YR	Sheeley 10'	10242.00	875.61	888.94		889.83	0.004239	7.63	1428.60	199.05	0.42
Lower Rondout Cr	Lower RC	13460.4 Rondout_XS_20	100 YR	Existing Conditions	10900.00	872.48	884.97		886.49	0.007313	10.11	1243.06	267.47	0.55
Lower Rondout Cr	Lower RC	13460.4 Rondout_XS_20	100 YR	Sheeley 10'	10900.00	872.48	884.97		886.49	0.007313	10.11	1243.06	267.47	0.55
Lower Rondout Cr	Lower RC	13307.4 Rondout_XS_19	100 YR	Existing Conditions	10900.00	871.14	884.24	880.86	885.17	0.006138	7.96	1603.81	580.50	0.46
Lower Rondout Cr	Lower RC	13307.4 Rondout_XS_19	100 YR	Sheeley 10'	10900.00	871.14	884.24	880.86	885.17	0.006138	7.96	1603.81	580.50	0.46
Lower Rondout Cr	Lower RC	13273.6			Bridge									
Lower Rondout Cr	Lower RC	13239.8 Rondout_XS_16	100 YR	Existing Conditions	10900.00	871.24	882.94	880.74	884.36	0.012110	9.90	1297.61	562.19	0.59
Lower Rondout Cr	Lower RC	13239.8 Rondout_XS_16	100 YR	Sheeley 10'	10900.00	871.24	882.94	880.74	884.36	0.012110	9.90	1297.61	562.19	0.59
Lower Rondout Cr	Lower RC	13074.2 Rondout_XS_15	100 YR	Existing Conditions	10900.00	872.81	882.34		882.80	0.004120	6.57	2748.50	741.04	0.41
Lower Rondout Cr	Lower RC	13074.2 Rondout_XS_15	100 YR	Sheeley 10'	10900.00	872.81	882.34		882.80	0.004120	6.57	2748.50	741.04	0.41
Lower Rondout Cr	Lower RC	12617.2 Rondout_XS_14	100 YR	Existing Conditions	10900.00	865.06	879.51		880.42	0.007518	8.73	1999.71	616.04	0.53
Lower Rondout Cr	Lower RC	12617.2 Rondout_XS_14	100 YR	Sheeley 10'	10900.00	865.06	879.51		880.42	0.007518	8.73	1999.71	616.04	0.53
Lower Rondout Cr	Lower RC	11752 Rondout_XS_13	100 YR	Existing Conditions	10900.00	866.34	873.21		873.53	0.008390	7.51	3297.22	718.17	0.55
Lower Rondout Cr	Lower RC	11752 Rondout_XS_13	100 YR	Sheeley 10'	10900.00	866.34	873.21		873.53	0.008390	7.51	3297.22	718.17	0.55
Lower Rondout Cr	Lower RC	10329.3 Rondout_XS_12	100 YR	Existing Conditions	10900.00	850.12	862.67	860.39	863.92	0.006501	9.70	1760.33	601.11	0.52
Lower Rondout Cr	Lower RC	10329.3 Rondout_XS_12	100 YR	Sheeley 10'	10900.00	850.12	862.67	860.39	863.92	0.006501	9.70	1760.33	601.11	0.52
Lower Rondout Cr	Lower RC	9057.6 Rondout_XS_11	100 YR	Existing Conditions	10900.00	846.37	855.03		855.66	0.006124	7.69	3014.98	743.67	0.49
Lower Rondout Cr	Lower RC	9057.6 Rondout_XS_11	100 YR	Sheeley 10'	10900.00	846.37	855.03		855.66	0.006124	7.69	3014.98	743.67	0.49
Lower Rondout Cr	Lower RC	8315.75 Rondout_XS_10	100 YR	Existing Conditions	10900.00	840.65	852.07		852.34	0.003083	5.36	3354.68	679.48	0.31
Lower Rondout Cr	Lower RC	8315.75 Rondout_XS_10	100 YR	Sheeley 10'	10900.00	840.65	852.07		852.34	0.003083	5.36	3354.68	679.48	0.31
Lower Rondout Cr	Lower RC	7738.59 Rondout_XS_09	100 YR	Existing Conditions	10900.00	833.81	849.97		850.55	0.002673	7.40	3102.16	437.19	0.35
Lower Rondout Cr	Lower RC	7738.59 Rondout_XS_09	100 YR	Sheeley 10'	10900.00	833.81	849.97		850.55	0.002673	7.40	3102.16	437.19	0.35
Lower Rondout Cr	Lower RC	7549.99 Rondout_XS_08	100 YR	Existing Conditions	14400.00	833.18	847.78		849.53	0.007111	11.57	2150.08	354.86	0.57
Lower Rondout Cr	Lower RC	7549.99 Rondout_XS_08	100 YR	Sheeley 10'	14400.00	833.18	847.78		849.53	0.007111	11.57	2150.08	354.86	0.57
Lower Rondout Cr	Lower RC	6944.8 Rondout_XS_07	100 YR	Existing Conditions	14400.00	832.35	846.27		846.87	0.002484	7.00	3929.93	624.10	0.36
Lower Rondout Cr	Lower RC	6944.8 Rondout_XS_07	100 YR	Sheeley 10'	14400.00	832.35	846.27		846.87	0.002484	7.00	3929.93	624.10	0.36
Lower Rondout Cr	Lower RC	6473.574 Rondout_XS_06	100 YR	Existing Conditions	14400.00	830.76	845.67	838.91	846.01	0.001220	4.97	3291.92	847.60	0.25
Lower Rondout Cr	Lower RC	6473.574 Rondout_XS_06	100 YR	Sheeley 10'	14400.00	830.76	845.67	838.91	846.01	0.001220	4.97	3291.92	847.60	0.25
Lower Rondout Cr	Lower RC	6383.863 Rondout_XS_05	100 YR	Existing Conditions	14400.00	825.81	845.49	836.21	845.90	0.000982	5.15	2915.32	819.16	0.23
Lower Rondout Cr	Lower RC	6383.863 Rondout_XS_05	100 YR	Sheeley 10'	14400.00	825.81	845.49	836.21	845.90	0.000982	5.15	2915.32	819.16	0.23
Lower Rondout Cr	Lower RC	6330.35			Bridge									
Lower Rondout Cr	Lower RC	6282.384 Rondout_XS_02	100 YR	Existing Conditions	14400.00	826.11	833.54	831.85	834.92	0.009741	9.42	1528.66	288.55	0.64
Lower Rondout Cr	Lower RC	6282.384 Rondout_XS_02	100 YR	Sheeley 10'	14400.00	826.11	833.54	831.85	834.92	0.009741	9.42	1528.66	288.55	0.64
Lower Rondout Cr	Lower RC	6134.63 Rondout_XS_01	100 YR	Existing Conditions	14400.00	821.72	832.45	830.44	833.54	0.007207	8.59	1842.84	378.02	0.56
Lower Rondout Cr	Lower RC	6134.63 Rondout_XS_01	100 YR	Sheeley 10'	14400.00	821.72	832.45	830.44	833.54	0.007207	8.59	1842.84	378.02	0.56

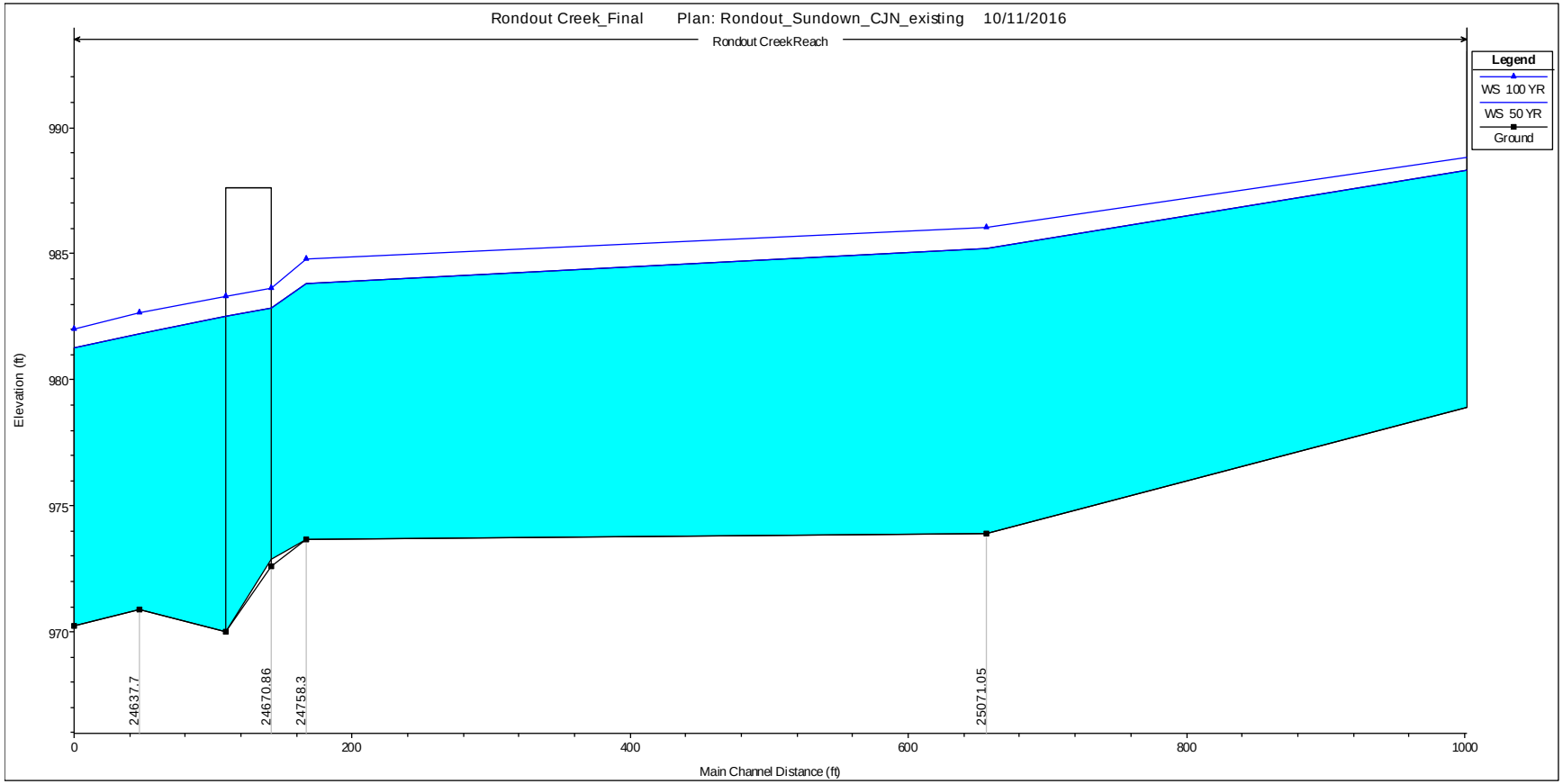
Sundown Road Bridge

Existing Upstream Cross Section (50 & 100-year storm)



Sundown Road Bridge

Existing Profile (50 & 100-year storm)



Sundown Road - 100 Year Event

HEC-RAS Profile: 100 YR

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Sundown Creek	Reach	14784 XS SUN_30X	100 YR	Existing Conditions	385.00	1615.28	1619.00	1619.00	1620.20	0.042174	8.80	45.10	21.02	0.97
Sundown Creek	Reach	14784 XS SUN_30X	100 YR	Sundown 10'	385.00	1615.28	1619.00	1619.00	1620.20	0.042174	8.80	45.10	21.02	0.97
Sundown Creek	Reach	14479.08 XS SUN_36X	100 YR	Existing Conditions	385.00	1601.47	1604.81	1604.81	1605.87	0.042311	8.29	48.26	79.83	0.97
Sundown Creek	Reach	14479.08 XS SUN_36X	100 YR	Sundown 10'	385.00	1601.47	1604.81	1604.81	1605.87	0.042311	8.29	48.26	79.83	0.97
Sundown Creek	Reach	14226.26 XS SUN_35X	100 YR	Existing Conditions	385.00	1588.21	1591.35	1591.35	1591.80	0.024809	6.62	108.29	107.25	0.75
Sundown Creek	Reach	14226.26 XS SUN_35X	100 YR	Sundown 10'	385.00	1588.21	1591.35	1591.35	1591.80	0.024809	6.62	108.29	107.25	0.75
Sundown Creek	Reach	13701.46 XS SUN_29X	100 YR	Existing Conditions	385.00	1559.00	1562.55	1562.55	1563.47	0.046608	7.75	51.22	29.23	0.98
Sundown Creek	Reach	13701.46 XS SUN_29X	100 YR	Sundown 10'	385.00	1559.00	1562.55	1562.55	1563.47	0.046608	7.75	51.22	29.23	0.98
Sundown Creek	Reach	13267.4 XS SUN_28X	100 YR	Existing Conditions	816.00	1539.96	1545.07	1545.07	1546.53	0.035310	9.84	89.89	153.24	0.94
Sundown Creek	Reach	13267.4 XS SUN_28X	100 YR	Sundown 10'	816.00	1539.96	1545.07	1545.07	1546.53	0.035310	9.84	89.89	153.24	0.94
Sundown Creek	Reach	12500.49 XS SUN_27X	100 YR	Existing Conditions	816.00	1507.02	1511.77	1511.40	1512.93	0.028338	8.66	95.27	30.95	0.84
Sundown Creek	Reach	12500.49 XS SUN_27X	100 YR	Sundown 10'	816.00	1507.02	1511.77	1511.40	1512.93	0.028338	8.66	95.27	30.95	0.84
Sundown Creek	Reach	12004.32 XS SUN_34X	100 YR	Existing Conditions	816.00	1490.77	1494.23	1494.23	1495.17	0.046806	9.23	130.08	82.35	1.04
Sundown Creek	Reach	12004.32 XS SUN_34X	100 YR	Sundown 10'	816.00	1490.77	1494.23	1494.23	1495.17	0.046806	9.23	130.08	82.35	1.04
Sundown Creek	Reach	11756.8 XS SUN_26X	100 YR	Existing Conditions	816.00	1478.76	1483.30	1482.92	1484.00	0.024352	6.96	140.67	79.55	0.72
Sundown Creek	Reach	11756.8 XS SUN_26X	100 YR	Sundown 10'	816.00	1478.76	1483.30	1482.92	1484.00	0.024352	6.96	140.67	79.55	0.72
Sundown Creek	Reach	11611.19 XS SUN_33X	100 YR	Existing Conditions	816.00	1476.69	1479.75	1479.30	1480.06	0.028036	5.30	201.21	135.86	0.75
Sundown Creek	Reach	11611.19 XS SUN_33X	100 YR	Sundown 10'	816.00	1476.69	1479.75	1479.30	1480.06	0.028036	5.30	201.21	135.86	0.75
Sundown Creek	Reach	11360.01 XS SUN_47X	100 YR	Existing Conditions	816.00	1465.80	1470.48	1470.48	1471.86	0.039032	9.48	91.27	37.04	0.97
Sundown Creek	Reach	11360.01 XS SUN_47X	100 YR	Sundown 10'	816.00	1465.80	1470.48	1470.48	1471.86	0.039032	9.48	91.27	37.04	0.97
Sundown Creek	Reach	11333.12 Bridge			Bridge									
Sundown Creek	Reach	11306.22 BR SUN_25B	100 YR	Existing Conditions	816.00	1462.42	1470.14	1466.98	1470.43	0.003968	4.42	220.92	72.80	0.33
Sundown Creek	Reach	11306.22 BR SUN_25B	100 YR	Sundown 10'	816.00	1462.42	1470.14	1466.98	1470.43	0.003968	4.42	220.92	72.80	0.33
Sundown Creek	Reach	11280.27 BR SUN_25A	100 YR	Existing Conditions	816.00	1462.51	1470.12		1470.30	0.002023	3.42	260.86	57.83	0.24
Sundown Creek	Reach	11280.27 BR SUN_25A	100 YR	Sundown 10'	816.00	1462.51	1470.12		1470.30	0.002023	3.42	260.86	57.83	0.24
Sundown Creek	Reach	11258 XS SUN_23X	100 YR	Existing Conditions	816.00	1464.48	1468.53	1468.53	1470.05	0.039630	9.93	86.65	34.25	0.99
Sundown Creek	Reach	11258 XS SUN_23X	100 YR	Sundown 10'	816.00	1464.48	1468.53	1468.53	1470.05	0.039630	9.93	86.65	34.25	0.99
Sundown Creek	Reach	10956.28 XS SUN_22X	100 YR	Existing Conditions	816.00	1450.30	1454.02	1453.75	1454.97	0.029401	7.86	107.51	46.03	0.84
Sundown Creek	Reach	10956.28 XS SUN_22X	100 YR	Sundown 10'	816.00	1450.30	1454.02	1453.75	1454.97	0.029401	7.86	107.51	46.03	0.84
Sundown Creek	Reach	10285.9 XS SUN_21XA	100 YR	Existing Conditions	816.00	1425.36	1429.38	1429.38	1431.05	0.043970	10.35	78.96	24.35	1.00
Sundown Creek	Reach	10285.9 XS SUN_21XA	100 YR	Sundown 10'	816.00	1425.36	1429.38	1429.38	1431.05	0.043970	10.35	78.96	24.35	1.00
Sundown Creek	Reach	9888.424 XS SUN_21X	100 YR	Existing Conditions	816.00	1325.67	1329.55	1329.55	1331.18	0.037513	10.33	85.49	29.14	0.99
Sundown Creek	Reach	9888.424 XS SUN_21X	100 YR	Sundown 10'	816.00	1325.67	1329.55	1329.55	1331.18	0.037513	10.33	85.49	29.14	0.99
Sundown Creek	Reach	9563.817 XS SUN_20X	100 YR	Existing Conditions	816.00	1309.30	1313.08	1313.08	1314.53	0.041465	9.67	85.33	31.26	0.99
Sundown Creek	Reach	9563.817 XS SUN_20X	100 YR	Sundown 10'	816.00	1309.30	1313.08	1313.08	1314.53	0.041465	9.67	85.33	31.26	0.99
Sundown Creek	Reach	9120.165 XS SUN_44X	100 YR	Existing Conditions	816.00	1294.98	1298.06	1297.81	1298.62	0.029488	5.98	140.50	85.16	0.79
Sundown Creek	Reach	9120.165 XS SUN_44X	100 YR	Sundown 10'	816.00	1294.98	1298.06	1297.81	1298.62	0.029488	5.98	140.50	85.16	0.79
Sundown Creek	Reach	8865.03 XS SUN_19X	100 YR	Existing Conditions	816.00	1286.27	1290.50		1291.52	0.025925	8.11	104.76	38.06	0.81
Sundown Creek	Reach	8865.03 XS SUN_19X	100 YR	Sundown 10'	816.00	1286.27	1290.50		1291.52	0.025925	8.11	104.76	38.06	0.81
Sundown Creek	Reach	8701.974 XS SUN_18X	100 YR	Existing Conditions	2150.00	1277.94	1284.11	1284.11	1286.30	0.033756	11.92	191.65	49.61	0.98
Sundown Creek	Reach	8701.974 XS SUN_18X	100 YR	Sundown 10'	2150.00	1277.94	1284.11	1284.11	1286.30	0.033756	11.92	191.65	49.61	0.98
Sundown Creek	Reach	8529.396 XS SUN_43X	100 YR	Existing Conditions	2150.00	1273.15	1278.41	1278.41	1280.47	0.029013	11.80	222.77	81.82	0.93
Sundown Creek	Reach	8529.396 XS SUN_43X	100 YR	Sundown 10'	2150.00	1273.15	1278.41	1278.41	1280.47	0.029013	11.80	222.77	81.82	0.93
Sundown Creek	Reach	8169.187 XS SUN_42X	100 YR	Existing Conditions	2150.00	1260.30	1266.79	1266.79	1268.73	0.035270	13.63	296.35	79.07	1.03
Sundown Creek	Reach	8169.187 XS SUN_42X	100 YR	Sundown 10'	2150.00	1260.30	1266.79	1266.79	1268.73	0.035270	13.63	296.35	79.07	1.03
Sundown Creek	Reach	7911.303 XS SUN_41X	100 YR	Existing Conditions	2150.00	1251.09	1256.60	1256.60	1258.76	0.032454	11.99	206.22	56.21	0.97
Sundown Creek	Reach	7911.303 XS SUN_41X	100 YR	Sundown 10'	2150.00	1251.09	1256.60	1256.60	1258.76	0.032454	11.99	206.22	56.21	0.97
Sundown Creek	Reach	7734.417 XS SUN_17X	100 YR	Existing Conditions	2150.00	1243.99	1250.49	1250.35	1252.21	0.026851	10.78	242.70	79.71	0.86
Sundown Creek	Reach	7734.417 XS SUN_17X	100 YR	Sundown 10'	2150.00	1243.99	1250.49	1250.35	1252.21	0.026851	10.78	242.70	79.71	0.86
Sundown Creek	Reach	7022.902 XS SUN_16X	100 YR	Existing Conditions	2150.00	1224.22	1229.83	1229.83	1231.96	0.030107	12.33	230.06	60.92	0.96
Sundown Creek	Reach	7022.902 XS SUN_16X	100 YR	Sundown 10'	2150.00	1224.22	1229.83	1229.83	1231.96	0.030107	12.33	230.06	60.92	0.96
Sundown Creek	Reach	6426.67 XS SUN_40X	100 YR	Existing Conditions	2150.00	1203.03	1208.59	1208.59	1210.57	0.034048	11.38	203.52	56.80	0.98
Sundown Creek	Reach	6426.67 XS SUN_40X	100 YR	Sundown 10'	2150.00	1203.03	1208.59	1208.59	1210.57	0.034048	11.38	203.52	56.80	0.98
Sundown Creek	Reach	5885.625 XS SUN_48X	100 YR	Existing Conditions	2150.00	1188.30	1193.61		1194.20	0.011244	5.79	361.54	119.85	0.52
Sundown Creek	Reach	5885.625 XS SUN_48X	100 YR	Sundown 10'	2150.00	1188.30	1193.61		1194.20	0.011244	5.79	361.54	119.85	0.52
Sundown Creek	Reach	5846.653 BR SUN_15D	100 YR	Existing Conditions	2150.00	1183.83	1193.44	1191.93	1193.87	0.004211	5.86	459.73	117.39	0.37
Sundown Creek	Reach	5846.653 BR SUN_15D	100 YR	Sundown 10'	2150.00	1183.83	1193.44	1191.93	1193.87	0.004211	5.86	459.73	117.39	0.37
Sundown Creek	Reach	5821.221 Bridge			Bridge									
Sundown Creek	Reach	5800.354 BR SUN_15C	100 YR	Existing Conditions	2150.00	1182.68	1191.86	1191.52	1192.75	0.011314	8.18	315.78	113.20	0.55
Sundown Creek	Reach	5800.354 BR SUN_15C	100 YR	Sundown 10'	2150.00	1182.68	1191.86	1191.52	1192.75	0.011314	8.18	315.78	113.20	0.55
Sundown Creek	Reach	5775.103 BR SUN_15A	100 YR	Existing Conditions	2150.00	1181.72	1191.77		1192.36	0.008152	6.40	360.92	109.05	0.45
Sundown Creek	Reach	5775.103 BR SUN_15A	100 YR	Sundown 10'	2150.00	1181.72	1191.77		1192.36	0.008152	6.40	360.92	109.05	0.45
Sundown Creek	Reach	5688.313 XS SUN_49X	100 YR	Existing Conditions	2150.00	1182.81	1190.05	1190.05	1191.31	0.017625	9.73	282.44	95.82	0.73
Sundown Creek	Reach	5688.313 XS SUN_49X	100 YR	Sundown 10'	2150.00	1182.81	1190.05	1190.05	1191.31	0.017625	9.73	282.44	95.82	0.73
Sundown Creek	Reach	5356.54 XS SUN_32X	100 YR	Existing Conditions	2150.00	1164.83	1171.25	1171.25	1173.79	0.033660	12.93	182.88	40.75	0.98
Sundown Creek	Reach	5356.54 XS SUN_32X	100 YR	Sundown 10'	2150.00	1164.83	1171.25	1171.25	1173.79	0.033660	12.93	182.88	40.75	0.98
Sundown Creek	Reach	4929.002 XS SUN_31X	100 YR	Existing Conditions	2150.00	1135.12	1140.88	1140.88	1143.48	0.035841	12.98	171.84	36.60	0.99

HEC-RAS Profile: 100 YR (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Sundown Creek	Reach	4929.002 XS SUN_31X	100 YR	Sundown 10'	2150.00	1135.12	1140.88	1140.88	1143.48	0.035841	12.98	171.84	36.60	0.99
Sundown Creek	Reach	4792.939 XS SUN_14X	100 YR	Existing Conditions	2150.00	1118.46	1126.38		1126.90	0.005582	5.80	371.39	62.57	0.40
Sundown Creek	Reach	4792.939 XS SUN_14X	100 YR	Sundown 10'	2150.00	1118.46	1126.38		1126.90	0.005582	5.80	371.39	62.57	0.40
Sundown Creek	Reach	4469.083 XS SUN_45X	100 YR	Existing Conditions	2150.00	1113.38	1120.67	1120.67	1123.15	0.030804	12.94	196.02	46.49	0.97
Sundown Creek	Reach	4469.083 XS SUN_45X	100 YR	Sundown 10'	2150.00	1113.38	1120.67	1120.67	1123.15	0.030804	12.94	196.02	46.49	0.97
Sundown Creek	Reach	3643.11 XS SUN_13X	100 YR	Existing Conditions	2840.00	1080.11	1086.58	1086.14	1088.53	0.026537	11.23	259.49	53.73	0.87
Sundown Creek	Reach	3643.11 XS SUN_13X	100 YR	Sundown 10'	2840.00	1080.11	1086.58	1086.14	1088.53	0.026537	11.23	259.49	53.73	0.87
Sundown Creek	Reach	3431.445 XS SUN_39X	100 YR	Existing Conditions	2840.00	1073.46	1080.73	1080.73	1083.06	0.024812	12.86	311.06	86.12	0.89
Sundown Creek	Reach	3431.445 XS SUN_39X	100 YR	Sundown 10'	2840.00	1073.46	1080.73	1080.73	1083.06	0.024812	12.86	311.06	86.12	0.89
Sundown Creek	Reach	3050.617 XS SUN_38X	100 YR	Existing Conditions	2840.00	1064.51	1070.57	1070.40	1072.58	0.026184	11.95	317.13	83.98	0.90
Sundown Creek	Reach	3050.617 XS SUN_38X	100 YR	Sundown 10'	2840.00	1064.51	1070.57	1070.40	1072.58	0.026184	11.95	317.13	83.98	0.90
Sundown Creek	Reach	2828.606 XS SUN_37X	100 YR	Existing Conditions	2840.00	1058.75	1064.00	1064.00	1065.97	0.034122	11.49	278.51	75.38	0.98
Sundown Creek	Reach	2828.606 XS SUN_37X	100 YR	Sundown 10'	2840.00	1058.75	1064.00	1064.00	1065.97	0.034122	11.49	278.51	75.38	0.98
Sundown Creek	Reach	2533.334 XS SUN_12X	100 YR	Existing Conditions	2840.00	1046.13	1053.50	1053.12	1055.76	0.029930	12.07	235.92	43.77	0.90
Sundown Creek	Reach	2533.334 XS SUN_12X	100 YR	Sundown 10'	2840.00	1046.13	1053.50	1053.12	1055.76	0.029930	12.07	235.92	43.77	0.90
Sundown Creek	Reach	1689.646 XS SUN_11X	100 YR	Existing Conditions	2840.00	1017.07	1024.52	1024.52	1027.33	0.038081	13.43	212.34	39.77	1.00
Sundown Creek	Reach	1689.646 XS SUN_11X	100 YR	Sundown 10'	2840.00	1017.07	1024.52	1024.52	1027.33	0.038081	13.43	212.34	39.77	1.00
Sundown Creek	Reach	1587.831 BR SUN_10D	100 YR	Existing Conditions	2840.00	1014.72	1022.56	1021.43	1024.01	0.018691	9.66	293.96	52.91	0.72
Sundown Creek	Reach	1587.831 BR SUN_10D	100 YR	Sundown 10'	2840.00	1014.72	1022.56	1021.43	1024.01	0.018691	9.66	293.96	52.91	0.72
Sundown Creek	Reach	1559.583 Bridge			Bridge									
Sundown Creek	Reach	1512.841 BR SUN_10A	100 YR	Existing Conditions	2840.00	1013.17	1020.32	1019.43	1022.12	0.019547	10.85	273.38	51.09	0.78
Sundown Creek	Reach	1512.841 BR SUN_10A	100 YR	Sundown 10'	2840.00	1013.17	1020.32	1019.43	1022.12	0.019547	10.85	273.38	51.09	0.78
Sundown Creek	Reach	1410.457 XS SUN_07X	100 YR	Existing Conditions	2840.00	1009.83	1016.58	1016.58	1019.32	0.032050	13.36	221.99	43.76	0.98
Sundown Creek	Reach	1410.457 XS SUN_07X	100 YR	Sundown 10'	2840.00	1009.83	1016.58	1016.58	1019.32	0.032050	13.36	221.99	43.76	0.98
Sundown Creek	Reach	1144.503 XS SUN_06X	100 YR	Existing Conditions	2840.00	1002.51	1011.39	1009.72	1013.05	0.015577	10.37	283.76	44.08	0.67
Sundown Creek	Reach	1144.503 XS SUN_06X	100 YR	Sundown 10'	2840.00	1002.51	1011.39	1009.72	1013.05	0.015577	10.37	283.76	44.08	0.67
Sundown Creek	Reach	1026.719 BR SUN_05D	100 YR	Existing Conditions	2840.00	1000.10	1010.31	1007.08	1011.43	0.008803	8.50	343.11	132.78	0.50
Sundown Creek	Reach	1026.719 BR SUN_05D	100 YR	Sundown 10'	2840.00	1000.10	1010.31	1007.08	1011.43	0.008803	8.50	343.11	132.78	0.50
Sundown Creek	Reach	993.8764 Bridge			Bridge									
Sundown Creek	Reach	962.1789 BR SUN_05A	100 YR	Existing Conditions	2840.00	998.71	1006.73	1005.71	1008.56	0.021396	10.86	261.85	95.01	0.77
Sundown Creek	Reach	962.1789 BR SUN_05A	100 YR	Sundown 10'	2840.00	998.71	1006.73	1005.71	1008.56	0.021396	10.86	261.85	95.01	0.77
Sundown Creek	Reach	837.2104 XS SUN_03X	100 YR	Existing Conditions	2840.00	995.92	1003.23	1002.76	1005.53	0.025108	12.21	242.98	89.87	0.88
Sundown Creek	Reach	837.2104 XS SUN_03X	100 YR	Sundown 10'	2840.00	995.92	1003.23	1002.76	1005.53	0.025108	12.21	242.98	89.87	0.88
Sundown Creek	Reach	467.9756 XS SUN_02X	100 YR	Existing Conditions	2840.00	988.37	993.51	993.51	995.20	0.030326	10.64	351.90	255.32	0.90
Sundown Creek	Reach	467.9756 XS SUN_02X	100 YR	Sundown 10'	2840.00	988.37	993.51	993.51	995.20	0.030326	10.64	351.90	255.32	0.90
Sundown Creek	Reach	181.3982 XS SUN_01X	100 YR	Existing Conditions	2840.00	978.20	985.73	985.73	987.35	0.023753	10.59	378.83	326.06	0.82
Sundown Creek	Reach	181.3982 XS SUN_01X	100 YR	Sundown 10'	2840.00	978.20	985.73	985.73	987.35	0.023753	10.59	378.83	326.06	0.82
Sundown Creek	Reach	50.00015 XS SUN_46X	100 YR	Existing Conditions	2840.00	975.97	982.09	982.09	983.28	0.027826	10.16	416.08	225.76	0.87
Sundown Creek	Reach	50.00015 XS SUN_46X	100 YR	Sundown 10'	2840.00	975.97	982.09	982.09	983.28	0.027826	10.16	416.08	225.76	0.87
Rondout Creek	Reach	36559.8 Rondout_XS_63	100 YR	Existing Conditions	8100.00	1110.01	1120.51		1121.22	0.005891	7.11	1528.11	310.62	0.46
Rondout Creek	Reach	36559.8 Rondout_XS_63	100 YR	Sundown 10'	8100.00	1110.01	1120.51		1121.22	0.005891	7.11	1528.11	310.62	0.46
Rondout Creek	Reach	36437.5 Rondout_XS_62	100 YR	Existing Conditions	8100.00	1109.07	1120.12		1120.58	0.003828	5.80	1983.43	366.45	0.37
Rondout Creek	Reach	36437.5 Rondout_XS_62	100 YR	Sundown 10'	8100.00	1109.07	1120.12		1120.58	0.003828	5.80	1983.43	366.45	0.37
Rondout Creek	Reach	35949 Rondout_XS_61	100 YR	Existing Conditions	8100.00	1105.35	1114.45	1114.45	1116.42	0.030839	13.91	1196.24	362.27	0.98
Rondout Creek	Reach	35949 Rondout_XS_61	100 YR	Sundown 10'	8100.00	1105.35	1114.45	1114.45	1116.42	0.030839	13.91	1196.24	362.27	0.98
Rondout Creek	Reach	35517.78 Rondout_XS_73	100 YR	Existing Conditions	8100.00	1095.53	1108.83		1109.05	0.001388	4.71	3513.14	454.07	0.24
Rondout Creek	Reach	35517.78 Rondout_XS_73	100 YR	Sundown 10'	8100.00	1095.53	1108.83		1109.05	0.001388	4.71	3513.14	454.07	0.24
Rondout Creek	Reach	35484 Rondout_XS_60	100 YR	Existing Conditions	8100.00	1094.42	1107.42	1104.98	1108.83	0.010231	10.10	1329.12	430.44	0.58
Rondout Creek	Reach	35484 Rondout_XS_60	100 YR	Sundown 10'	8100.00	1094.42	1107.42	1104.98	1108.83	0.010231	10.10	1329.12	430.44	0.58
Rondout Creek	Reach	35260 Rondout_XS_59	100 YR	Existing Conditions	8100.00	1091.61	1106.42	1103.11	1106.85	0.006514	6.26	2223.08	427.33	0.33
Rondout Creek	Reach	35260 Rondout_XS_59	100 YR	Sundown 10'	8100.00	1091.61	1106.42	1103.11	1106.85	0.006514	6.26	2223.08	427.33	0.33
Rondout Creek	Reach	35226.02			Bridge									
Rondout Creek	Reach	35192 Rondout_XS_56	100 YR	Existing Conditions	8100.00	1092.23	1102.27	1101.87	1104.28	0.015507	11.98	1076.49	351.29	0.74
Rondout Creek	Reach	35192 Rondout_XS_56	100 YR	Sundown 10'	8100.00	1092.23	1102.27	1101.87	1104.28	0.015507	11.98	1076.49	351.29	0.74
Rondout Creek	Reach	35114 Rondout_XS_55	100 YR	Existing Conditions	8100.00	1092.03	1101.59		1102.89	0.011282	10.22	1435.73	368.49	0.63
Rondout Creek	Reach	35114 Rondout_XS_55	100 YR	Sundown 10'	8100.00	1092.03	1101.59		1102.89	0.011282	10.22	1435.73	368.49	0.63
Rondout Creek	Reach	34544.4 Rondout_XS_54	100 YR	Existing Conditions	8100.00	1084.87	1096.37		1097.37	0.008419	9.07	1495.91	281.50	0.56
Rondout Creek	Reach	34544.4 Rondout_XS_54	100 YR	Sundown 10'	8100.00	1084.87	1096.37		1097.37	0.008419	9.07	1495.91	281.50	0.56
Rondout Creek	Reach	33437.5 Rondout_XS_53	100 YR	Existing Conditions	8100.00	1072.93	1082.31	1081.89	1084.05	0.019044	10.91	952.17	273.82	0.79
Rondout Creek	Reach	33437.5 Rondout_XS_53	100 YR	Sundown 10'	8100.00	1072.93	1082.31	1081.89	1084.05	0.019044	10.91	952.17	273.82	0.79
Rondout Creek	Reach	32259.3 Rondout_XS_52	100 YR	Existing Conditions	8100.00	1056.05	1066.51	1064.34	1068.00	0.010188	9.91	957.36	647.77	0.61
Rondout Creek	Reach	32259.3 Rondout_XS_52	100 YR	Sundown 10'	8100.00	1056.05	1066.51	1064.34	1068.00	0.010188	9.91	957.36	647.77	0.61
Rondout Creek	Reach	31637.7 Rondout_XS_51	100 YR	Existing Conditions	8100.00	1049.72	1060.71	1057.85	1062.23	0.008471	10.09	988.24	651.43	0.56
Rondout Creek	Reach	31637.7 Rondout_XS_51	100 YR	Sundown 10'	8100.00	1049.72	1060.71	1057.85	1062.23	0.008471	10.09	988.24	651.43	0.56
Rondout Creek	Reach	31417.9 Rondout_XS_50	100 YR	Existing Conditions	8100.00	1044.82	1056.82	1055.80	1059.47	0.018579	13.08	652.72	523.17	0.81
Rondout Creek	Reach	31417.9 Rondout_XS_50	100 YR	Sundown 10'	8100.00	1044.82	1056.82	1055.80	1059.47	0.018579	13.08	652.72	523.17	0.81

HEC-RAS Profile: 100 YR (Continued)

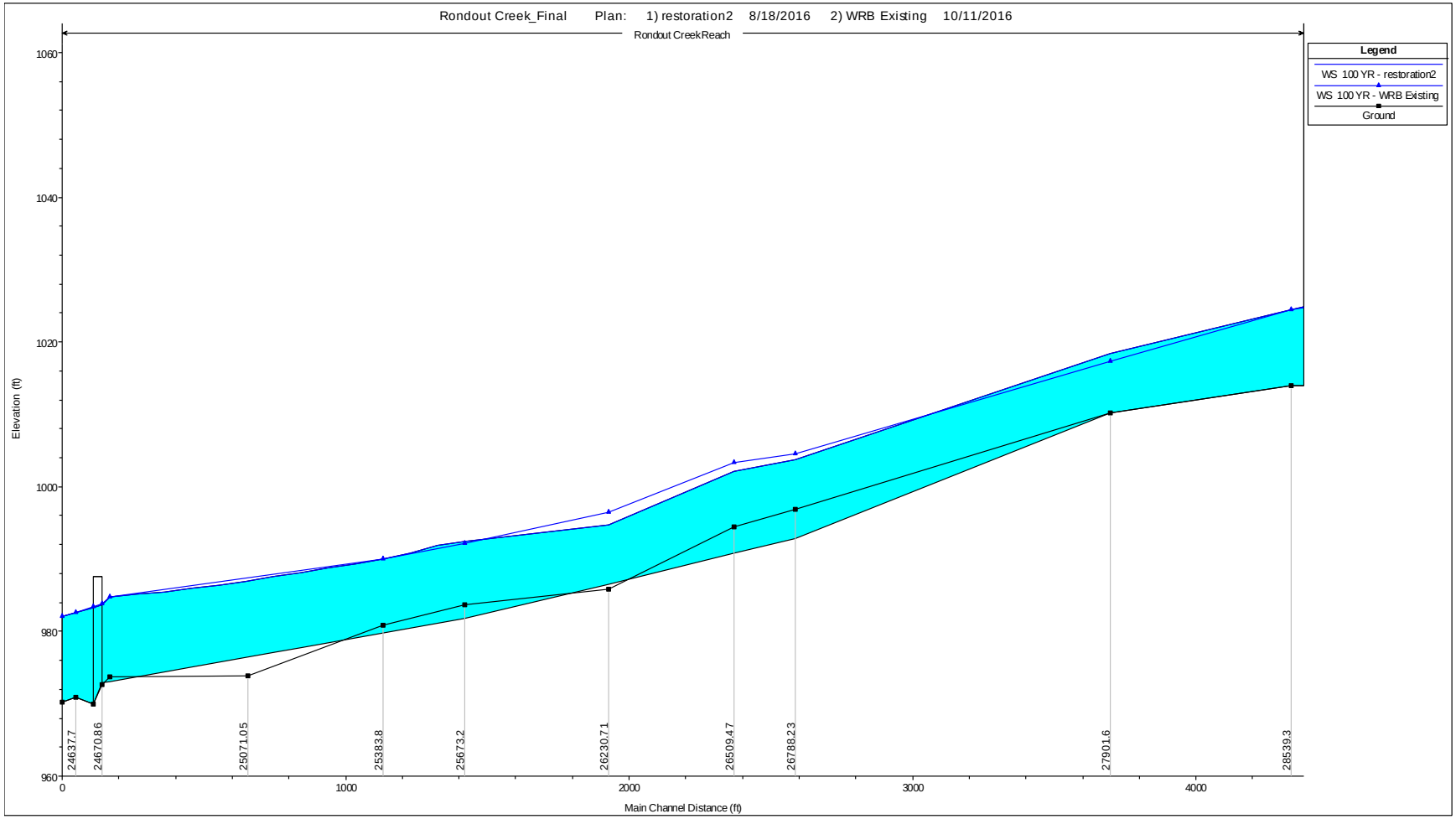
River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Rondout Creek	Reach	30913.9 Rondout_XS_49	100 YR	Existing Conditions	8100.00	1045.49	1051.68		1052.13	0.009721	6.88	1996.26	610.36	0.56
Rondout Creek	Reach	30913.9 Rondout_XS_49	100 YR	Sundown 10'	8100.00	1045.49	1051.68		1052.13	0.009721	6.88	1996.26	610.36	0.56
Rondout Creek	Reach	29580.7 Rondout_XS_48	100 YR	Existing Conditions	8100.00	1025.25	1035.42	1035.42	1036.67	0.014974	10.02	1324.84	548.93	0.71
Rondout Creek	Reach	29580.7 Rondout_XS_48	100 YR	Sundown 10'	8100.00	1025.25	1035.42	1035.42	1036.67	0.014974	10.02	1324.84	548.93	0.71
Rondout Creek	Reach	28843 Rondout_XS_47	100 YR	Existing Conditions	8100.00	1018.80	1027.32		1028.00	0.008063	7.93	1943.43	445.14	0.53
Rondout Creek	Reach	28843 Rondout_XS_47	100 YR	Sundown 10'	8100.00	1018.80	1027.32		1028.00	0.008067	7.93	1943.05	445.14	0.53
Rondout Creek	Reach	28726.3 Rondout_XS_46	100 YR	Existing Conditions	8100.00	1015.06	1026.71	1023.56	1027.29	0.004654	7.01	2163.13	443.38	0.41
Rondout Creek	Reach	28726.3 Rondout_XS_46	100 YR	Sundown 10'	8100.00	1015.06	1026.71	1023.56	1027.29	0.004657	7.01	2162.48	443.38	0.41
Rondout Creek	Reach	28695.20		Bridge										
Rondout Creek	Reach	28664.1 Rondout_XS_43	100 YR	Existing Conditions	8100.00	1014.00	1025.41	1023.72	1026.46	0.008452	9.42	1707.95	423.84	0.55
Rondout Creek	Reach	28664.1 Rondout_XS_43	100 YR	Sundown 10'	8100.00	1014.00	1025.40	1023.72	1026.46	0.008484	9.43	1704.69	423.39	0.56
Rondout Creek	Reach	28539.3 Rondout_XS_42	100 YR	Existing Conditions	8100.00	1013.94	1024.44		1025.06	0.010982	7.56	1897.75	440.25	0.46
Rondout Creek	Reach	28539.3 Rondout_XS_42	100 YR	Sundown 10'	8100.00	1013.94	1024.43		1025.05	0.011093	7.59	1890.34	440.22	0.46
Rondout Creek	Reach	27901.6 Rondout_XS_41	100 YR	Existing Conditions	8100.00	1010.19	1017.26		1017.67	0.013651	6.53	2191.06	607.37	0.46
Rondout Creek	Reach	27901.6 Rondout_XS_41	100 YR	Sundown 10'	8100.00	1010.19	1017.29		1017.69	0.013389	6.49	2206.22	607.42	0.45
Rondout Creek	Reach	26788.23 Rondout_XS_70	100 YR	Existing Conditions	8100.00	996.90	1004.50		1005.15	0.010314	8.12	2413.44	904.53	0.58
Rondout Creek	Reach	26788.23 Rondout_XS_70	100 YR	Sundown 10'	8100.00	996.90	1004.48		1005.13	0.010538	8.18	2391.33	902.46	0.59
Rondout Creek	Reach	26509.47	100 YR	Existing Conditions	8100.00	994.51	1003.33		1003.65	0.005274	5.16	2220.35	506.74	0.41
Rondout Creek	Reach	26509.47	100 YR	Sundown 10'	8100.00	994.51	1003.23		1003.58	0.005626	5.26	2173.86	506.74	0.42
Rondout Creek	Reach	26230.71	100 YR	Existing Conditions	8100.00	985.84	996.50	996.50	998.45	0.041104	12.32	939.10	240.25	0.86
Rondout Creek	Reach	26230.71	100 YR	Sundown 10'	8100.00	985.84	996.86		998.49	0.032729	11.37	1025.18	240.36	0.78
Rondout Creek	Reach	25673.2 Rondout_XS_40	100 YR	Existing Conditions	8100.00	983.66	992.62		992.83	0.003267	4.88	2872.84	752.24	0.34
Rondout Creek	Reach	25673.2 Rondout_XS_40	100 YR	Sundown 10'	8100.00	983.66	991.92		992.26	0.005929	6.10	2345.79	750.56	0.44
Rondout Creek	Reach	25383.8 Rondout_XS_39	100 YR	Existing Conditions	8100.00	980.80	989.86	989.86	990.99	0.016074	9.88	1395.09	677.83	0.73
Rondout Creek	Reach	25383.8 Rondout_XS_39	100 YR	Sundown 10'	8100.00	980.80	987.91	987.91	988.96	0.032116	10.60	1310.07	594.13	0.96
Rondout Creek	Reach	25071.05	100 YR	Existing Conditions	8100.00	973.91	986.06	979.66	986.16	0.000795	2.57	3687.52	690.99	0.17
Rondout Creek	Reach	25071.05	100 YR	Sundown 10'	8100.00	973.91	985.98		986.06	0.000762	2.50	3996.66	686.28	0.17
Rondout Creek	Reach	24758.3	100 YR	Existing Conditions	8100.00	973.68	984.79	980.60	985.38	0.003690	6.19	1318.75	219.22	0.37
Rondout Creek	Reach	24758.3	100 YR	Sundown 10'	8100.00	973.68	984.69	980.60	985.30	0.003830	6.26	1303.76	214.34	0.38
Rondout Creek	Reach	24670.86		Bridge										
Rondout Creek	Reach	24637.7 Rondout_XS_34	100 YR	Existing Conditions	8100.00	970.89	982.66	980.36	984.08	0.012300	9.58	850.98	114.76	0.60
Rondout Creek	Reach	24637.7 Rondout_XS_34	100 YR	Sundown 10'	8100.00	970.89	982.66	980.36	984.08	0.012300	9.58	850.98	114.76	0.60
Rondout Creek	Reach	24591.1 Rondout_XS_33	100 YR	Existing Conditions	8100.00	970.22	982.02		983.55	0.009560	9.92	823.87	104.43	0.59
Rondout Creek	Reach	24591.1 Rondout_XS_33	100 YR	Sundown 10'	8100.00	970.22	982.02		983.55	0.009560	9.92	823.87	104.43	0.59
Lower Rondout Cr	Lower RC	24383.59 Rondout_XS_32	100 YR	Existing Conditions	9470.00	968.68	979.83		981.34	0.011696	9.88	985.14	139.19	0.60
Lower Rondout Cr	Lower RC	24383.59 Rondout_XS_32	100 YR	Sundown 10'	9470.00	968.68	979.83		981.34	0.011696	9.88	985.14	139.19	0.60
Lower Rondout Cr	Lower RC	24015.74	100 YR	Existing Conditions	9470.00	968.54	976.30		977.18	0.010114	8.41	1570.69	379.98	0.59
Lower Rondout Cr	Lower RC	24015.74	100 YR	Sundown 10'	9470.00	968.54	976.30		977.18	0.010114	8.41	1570.69	379.98	0.59
Lower Rondout Cr	Lower RC	23647.9 Rondout_XS_31	100 YR	Existing Conditions	9470.00	962.10	971.99		972.79	0.008342	7.31	1461.24	471.54	0.53
Lower Rondout Cr	Lower RC	23647.9 Rondout_XS_31	100 YR	Sundown 10'	9470.00	962.10	971.99		972.79	0.008342	7.31	1461.24	471.54	0.53
Lower Rondout Cr	Lower RC	23116.5 Rondout_XS_30	100 YR	Existing Conditions	9470.00	958.99	966.91		968.04	0.008869	8.57	1145.34	250.08	0.57
Lower Rondout Cr	Lower RC	23116.5 Rondout_XS_30	100 YR	Sundown 10'	9470.00	958.99	966.91		968.04	0.008869	8.57	1145.34	250.08	0.57
Lower Rondout Cr	Lower RC	22632.9 Rondout_XS_29	100 YR	Existing Conditions	9470.00	954.22	962.33		963.44	0.010093	8.82	1525.93	474.49	0.60
Lower Rondout Cr	Lower RC	22632.9 Rondout_XS_29	100 YR	Sundown 10'	9470.00	954.22	962.33		963.44	0.010093	8.82	1525.93	474.49	0.60
Lower Rondout Cr	Lower RC	22528.2 Rondout_XS_28	100 YR	Existing Conditions	9470.00	953.91	960.86	959.90	962.17	0.014176	9.61	1422.80	482.03	0.70
Lower Rondout Cr	Lower RC	22528.2 Rondout_XS_28	100 YR	Sundown 10'	9470.00	953.91	960.86	959.90	962.17	0.014176	9.61	1422.80	482.03	0.70
Lower Rondout Cr	Lower RC	22398.9 Rondout_XS_27	100 YR	Existing Conditions	9470.00	950.79	959.29	958.07	960.45	0.012055	8.85	1384.04	447.46	0.64
Lower Rondout Cr	Lower RC	22398.9 Rondout_XS_27	100 YR	Sundown 10'	9470.00	950.79	959.29	958.07	960.45	0.012055	8.85	1384.04	447.46	0.64
Lower Rondout Cr	Lower RC	21902.2 Rondout_XS_26	100 YR	Existing Conditions	9470.00	946.14	953.66		954.45	0.010329	8.73	1773.98	470.48	0.62
Lower Rondout Cr	Lower RC	21902.2 Rondout_XS_26	100 YR	Sundown 10'	9470.00	946.14	953.66		954.45	0.010329	8.73	1773.98	470.48	0.62
Lower Rondout Cr	Lower RC	21146.4 Rondout_XS_25	100 YR	Existing Conditions	9550.00	938.49	945.98		946.28	0.008140	5.52	2541.05	710.00	0.50
Lower Rondout Cr	Lower RC	21146.4 Rondout_XS_25	100 YR	Sundown 10'	9550.00	938.49	945.98		946.28	0.008140	5.52	2541.05	710.00	0.50
Lower Rondout Cr	Lower RC	19655.9 Rondout_XS_24	100 YR	Existing Conditions	9550.00	921.51	930.29		931.23	0.014932	9.49	1455.42	443.29	0.66
Lower Rondout Cr	Lower RC	19655.9 Rondout_XS_24	100 YR	Sundown 10'	9550.00	921.51	930.29		931.23	0.014932	9.49	1455.42	443.29	0.66
Lower Rondout Cr	Lower RC	18891.26 Rondout_XS_69	100 YR	Existing Conditions	9550.00	914.40	924.62		925.26	0.004862	7.17	1770.14	388.32	0.44
Lower Rondout Cr	Lower RC	18891.26 Rondout_XS_69	100 YR	Sundown 10'	9550.00	914.40	924.62		925.26	0.004862	7.17	1770.14	388.32	0.44
Lower Rondout Cr	Lower RC	18391.26 Rondout_XS_68	100 YR	Existing Conditions	10242.00	909.80	921.08	919.19	922.08	0.008284	8.46	1684.25	673.87	0.56
Lower Rondout Cr	Lower RC	18391.26 Rondout_XS_68	100 YR	Sundown 10'	10242.00	909.80	921.08	919.19	922.08	0.008284	8.46	1684.25	673.87	0.56
Lower Rondout Cr	Lower RC	17891.26 Rondout_XS_67	100 YR	Existing Conditions	10242.00	905.20	915.29		916.53	0.015563	9.05	1191.51	332.95	0.73
Lower Rondout Cr	Lower RC	17891.26 Rondout_XS_67	100 YR	Sundown 10'	10242.00	905.20	915.29		916.53	0.015563	9.05	1191.51	332.95	0.73
Lower Rondout Cr	Lower RC	17391.26 Rondout_XS_66	100 YR	Existing Conditions	10242.00	900.50	910.53		911.22	0.007333	9.17	2554.78	755.09	0.54
Lower Rondout Cr	Lower RC	17391.26 Rondout_XS_66	100 YR	Sundown 10'	10242.00	900.50	910.53		911.22	0.007333	9.17	2554.78	755.09	0.54
Lower Rondout Cr	Lower RC	16891.26 Rondout_XS_65	100 YR	Existing Conditions	10242.00	895.90	905.39	905.19	906.60	0.014474	10.36	1616.37	533.76	0.72
Lower Rondout Cr	Lower RC	16891.26 Rondout_XS_65	100 YR	Sundown 10'	10242.00	895.90	905.39	905.19	906.60	0.014474	10.36	1616.37	533.76	0.72
Lower Rondout Cr	Lower RC	16391.26 Rondout_XS_64	100 YR	Existing Conditions	10242.00	891.30	902.20		902.65	0.005078	7.75	2429.07	550.52	0.44
Lower Rondout Cr	Lower RC	16391.26 Rondout_XS_64	100 YR	Sundown 10'	10242.00	891.30	902.20		902.65	0.005078	7.75	2429.07	550.52	0.44
Lower Rondout Cr	Lower RC	15893.2 Rondout_XS_23	100 YR	Existing Conditions	10242.00	886.66	898.41	897.16	899.30	0.008821	8.21	1825.54	642.93	0.57

HEC-RAS Profile: 100 YR (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Lower Rondout Cr	Lower RC	15893.2 Rondout_XS_23	100 YR	Sundown 10'	10242.00	886.66	898.41	897.16	899.30	0.008821	8.21	1825.54	642.93	0.57
Lower Rondout Cr	Lower RC	14802.9 Rondout_XS_22	100 YR	Existing Conditions	10242.00	883.91	892.70		892.97	0.003993	6.14	3151.31	573.14	0.39
Lower Rondout Cr	Lower RC	14802.9 Rondout_XS_22	100 YR	Sundown 10'	10242.00	883.91	892.70		892.97	0.003993	6.14	3151.31	573.14	0.39
Lower Rondout Cr	Lower RC	14056.2 Rondout_XS_21	100 YR	Existing Conditions	10242.00	875.61	888.94		889.83	0.004239	7.63	1428.60	199.05	0.42
Lower Rondout Cr	Lower RC	14056.2 Rondout_XS_21	100 YR	Sundown 10'	10242.00	875.61	888.94		889.83	0.004239	7.63	1428.60	199.05	0.42
Lower Rondout Cr	Lower RC	13460.4 Rondout_XS_20	100 YR	Existing Conditions	10900.00	872.48	884.97		886.49	0.007313	10.11	1243.06	267.47	0.55
Lower Rondout Cr	Lower RC	13460.4 Rondout_XS_20	100 YR	Sundown 10'	10900.00	872.48	884.97		886.49	0.007313	10.11	1243.06	267.47	0.55
Lower Rondout Cr	Lower RC	13307.4 Rondout_XS_19	100 YR	Existing Conditions	10900.00	871.14	884.24	880.86	885.17	0.006138	7.96	1603.81	580.50	0.46
Lower Rondout Cr	Lower RC	13307.4 Rondout_XS_19	100 YR	Sundown 10'	10900.00	871.14	884.24	880.86	885.17	0.006138	7.96	1603.81	580.50	0.46
Lower Rondout Cr	Lower RC	13273.6			Bridge									
Lower Rondout Cr	Lower RC	13239.8 Rondout_XS_16	100 YR	Existing Conditions	10900.00	871.24	882.94	880.74	884.36	0.012110	9.90	1297.61	562.19	0.59
Lower Rondout Cr	Lower RC	13239.8 Rondout_XS_16	100 YR	Sundown 10'	10900.00	871.24	882.94	880.74	884.36	0.012110	9.90	1297.61	562.19	0.59
Lower Rondout Cr	Lower RC	13074.2 Rondout_XS_15	100 YR	Existing Conditions	10900.00	872.81	882.34		882.80	0.004120	6.57	2748.50	741.04	0.41
Lower Rondout Cr	Lower RC	13074.2 Rondout_XS_15	100 YR	Sundown 10'	10900.00	872.81	882.34		882.80	0.004120	6.57	2748.50	741.04	0.41
Lower Rondout Cr	Lower RC	12617.2 Rondout_XS_14	100 YR	Existing Conditions	10900.00	865.06	879.51		880.42	0.007518	8.73	1999.71	616.04	0.53
Lower Rondout Cr	Lower RC	12617.2 Rondout_XS_14	100 YR	Sundown 10'	10900.00	865.06	879.51		880.42	0.007518	8.73	1999.71	616.04	0.53
Lower Rondout Cr	Lower RC	11752 Rondout_XS_13	100 YR	Existing Conditions	10900.00	866.34	873.21		873.53	0.008390	7.51	3297.22	718.17	0.55
Lower Rondout Cr	Lower RC	11752 Rondout_XS_13	100 YR	Sundown 10'	10900.00	866.34	873.21		873.53	0.008390	7.51	3297.22	718.17	0.55
Lower Rondout Cr	Lower RC	10329.3 Rondout_XS_12	100 YR	Existing Conditions	10900.00	850.12	862.67	860.39	863.92	0.006501	9.70	1760.33	601.11	0.52
Lower Rondout Cr	Lower RC	10329.3 Rondout_XS_12	100 YR	Sundown 10'	10900.00	850.12	862.67	860.39	863.92	0.006501	9.70	1760.33	601.11	0.52
Lower Rondout Cr	Lower RC	9057.6 Rondout_XS_11	100 YR	Existing Conditions	10900.00	846.37	855.03		855.66	0.006124	7.69	3014.98	743.67	0.49
Lower Rondout Cr	Lower RC	9057.6 Rondout_XS_11	100 YR	Sundown 10'	10900.00	846.37	855.03		855.66	0.006124	7.69	3014.98	743.67	0.49
Lower Rondout Cr	Lower RC	8315.75 Rondout_XS_10	100 YR	Existing Conditions	10900.00	840.65	852.07		852.34	0.003083	5.36	3354.68	679.48	0.31
Lower Rondout Cr	Lower RC	8315.75 Rondout_XS_10	100 YR	Sundown 10'	10900.00	840.65	852.07		852.34	0.003083	5.36	3354.68	679.48	0.31
Lower Rondout Cr	Lower RC	7738.59 Rondout_XS_09	100 YR	Existing Conditions	10900.00	833.81	849.97		850.55	0.002673	7.40	3102.16	437.19	0.35
Lower Rondout Cr	Lower RC	7738.59 Rondout_XS_09	100 YR	Sundown 10'	10900.00	833.81	849.97		850.55	0.002673	7.40	3102.16	437.19	0.35
Lower Rondout Cr	Lower RC	7549.99 Rondout_XS_08	100 YR	Existing Conditions	14400.00	833.18	847.78		849.53	0.007111	11.57	2150.08	354.86	0.57
Lower Rondout Cr	Lower RC	7549.99 Rondout_XS_08	100 YR	Sundown 10'	14400.00	833.18	847.78		849.53	0.007111	11.57	2150.08	354.86	0.57
Lower Rondout Cr	Lower RC	6944.8 Rondout_XS_07	100 YR	Existing Conditions	14400.00	832.35	846.27		846.87	0.002484	7.00	3929.93	624.10	0.36
Lower Rondout Cr	Lower RC	6944.8 Rondout_XS_07	100 YR	Sundown 10'	14400.00	832.35	846.27		846.87	0.002484	7.00	3929.93	624.10	0.36
Lower Rondout Cr	Lower RC	6473.574 Rondout_XS_06	100 YR	Existing Conditions	14400.00	830.76	845.67	838.91	846.01	0.001220	4.97	3291.92	847.60	0.25
Lower Rondout Cr	Lower RC	6473.574 Rondout_XS_06	100 YR	Sundown 10'	14400.00	830.76	845.67	838.91	846.01	0.001220	4.97	3291.92	847.60	0.25
Lower Rondout Cr	Lower RC	6383.863 Rondout_XS_05	100 YR	Existing Conditions	14400.00	825.81	845.49	836.21	845.90	0.000982	5.15	2915.32	819.16	0.23
Lower Rondout Cr	Lower RC	6383.863 Rondout_XS_05	100 YR	Sundown 10'	14400.00	825.81	845.49	836.21	845.90	0.000982	5.15	2915.32	819.16	0.23
Lower Rondout Cr	Lower RC	6330.35			Bridge									
Lower Rondout Cr	Lower RC	6282.384 Rondout_XS_02	100 YR	Existing Conditions	14400.00	826.11	833.54	831.85	834.92	0.009741	9.42	1528.66	288.55	0.64
Lower Rondout Cr	Lower RC	6282.384 Rondout_XS_02	100 YR	Sundown 10'	14400.00	826.11	833.54	831.85	834.92	0.009741	9.42	1528.66	288.55	0.64
Lower Rondout Cr	Lower RC	6134.63 Rondout_XS_01	100 YR	Existing Conditions	14400.00	821.72	832.45	830.44	833.54	0.007207	8.59	1842.84	378.02	0.56
Lower Rondout Cr	Lower RC	6134.63 Rondout_XS_01	100 YR	Sundown 10'	14400.00	821.72	832.45	830.44	833.54	0.007207	8.59	1842.84	378.02	0.56

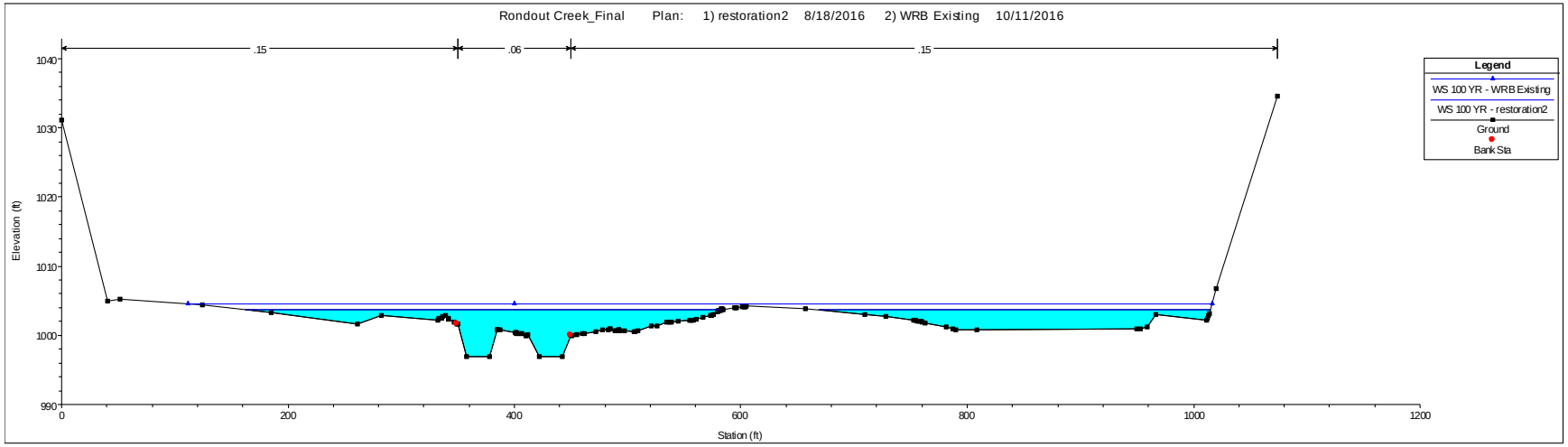
Rondout Creek Restoration

Existing & Proposed Profile (100-year storm)



Rondout Creek Restoration

Existing & Proposed Representative Cross Section (100-year storm)



Stream Restoration

HEC-RAS Profile: 100 YR

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Sundown Creek	Reach	14784 XS SUN_30X	100 YR	Existing Conditions	385.00	1615.28	1619.00	1619.00	1620.20	0.042174	8.80	45.10	21.02	0.97
Sundown Creek	Reach	14784 XS SUN_30X	100 YR	restoration2	385.00	1615.28	1619.00	1619.00	1620.20	0.042174	8.80	45.10	21.02	0.97
Sundown Creek	Reach	14479.08 XS SUN_36X	100 YR	Existing Conditions	385.00	1601.47	1604.81	1604.81	1605.87	0.042311	8.29	48.26	79.83	0.97
Sundown Creek	Reach	14479.08 XS SUN_36X	100 YR	restoration2	385.00	1601.47	1604.81	1604.81	1605.87	0.042311	8.29	48.26	79.83	0.97
Sundown Creek	Reach	14226.26 XS SUN_35X	100 YR	Existing Conditions	385.00	1588.21	1591.35	1591.35	1591.80	0.024809	6.62	108.29	107.25	0.75
Sundown Creek	Reach	14226.26 XS SUN_35X	100 YR	restoration2	385.00	1588.21	1591.35	1591.35	1591.80	0.024809	6.62	108.29	107.25	0.75
Sundown Creek	Reach	13701.46 XS SUN_29X	100 YR	Existing Conditions	385.00	1559.00	1562.55	1562.55	1563.47	0.046608	7.75	51.22	29.23	0.98
Sundown Creek	Reach	13701.46 XS SUN_29X	100 YR	restoration2	385.00	1559.00	1562.55	1562.55	1563.47	0.046608	7.75	51.22	29.23	0.98
Sundown Creek	Reach	13267.4 XS SUN_28X	100 YR	Existing Conditions	816.00	1539.96	1545.07	1545.07	1546.53	0.035310	9.84	89.89	153.24	0.94
Sundown Creek	Reach	13267.4 XS SUN_28X	100 YR	restoration2	816.00	1539.96	1545.07	1545.07	1546.53	0.035310	9.84	89.89	153.24	0.94
Sundown Creek	Reach	12500.49 XS SUN_27X	100 YR	Existing Conditions	816.00	1507.02	1511.77	1511.40	1512.93	0.028338	8.66	95.27	30.95	0.84
Sundown Creek	Reach	12500.49 XS SUN_27X	100 YR	restoration2	816.00	1507.02	1511.77	1511.40	1512.93	0.028338	8.66	95.27	30.95	0.84
Sundown Creek	Reach	12004.32 XS SUN_34X	100 YR	Existing Conditions	816.00	1490.77	1494.23	1494.23	1495.17	0.046806	9.23	130.08	82.35	1.04
Sundown Creek	Reach	12004.32 XS SUN_34X	100 YR	restoration2	816.00	1490.77	1494.23	1494.23	1495.17	0.046806	9.23	130.08	82.35	1.04
Sundown Creek	Reach	11756.8 XS SUN_26X	100 YR	Existing Conditions	816.00	1478.76	1483.30	1482.92	1484.00	0.024352	6.96	140.67	79.55	0.72
Sundown Creek	Reach	11756.8 XS SUN_26X	100 YR	restoration2	816.00	1478.76	1483.30	1482.92	1484.00	0.024352	6.96	140.67	79.55	0.72
Sundown Creek	Reach	11611.19 XS SUN_33X	100 YR	Existing Conditions	816.00	1476.69	1479.75	1479.30	1480.06	0.028036	5.30	201.21	135.86	0.75
Sundown Creek	Reach	11611.19 XS SUN_33X	100 YR	restoration2	816.00	1476.69	1479.75	1479.30	1480.06	0.028036	5.30	201.21	135.86	0.75
Sundown Creek	Reach	11360.01 XS SUN_47X	100 YR	Existing Conditions	816.00	1465.80	1470.48	1470.48	1471.86	0.039032	9.48	91.27	37.04	0.97
Sundown Creek	Reach	11360.01 XS SUN_47X	100 YR	restoration2	816.00	1465.80	1470.48	1470.48	1471.86	0.039032	9.48	91.27	37.04	0.97
Sundown Creek	Reach	11333.12 Bridge			Bridge									
Sundown Creek	Reach	11306.22 BR SUN_25B	100 YR	Existing Conditions	816.00	1462.42	1470.14	1466.98	1470.43	0.003968	4.42	220.92	72.80	0.33
Sundown Creek	Reach	11306.22 BR SUN_25B	100 YR	restoration2	816.00	1462.42	1470.14	1466.98	1470.43	0.003968	4.42	220.92	72.80	0.33
Sundown Creek	Reach	11280.27 BR SUN_25A	100 YR	Existing Conditions	816.00	1462.51	1470.12		1470.30	0.002023	3.42	260.86	57.83	0.24
Sundown Creek	Reach	11280.27 BR SUN_25A	100 YR	restoration2	816.00	1462.51	1470.12		1470.30	0.002023	3.42	260.86	57.83	0.24
Sundown Creek	Reach	11258 XS SUN_23X	100 YR	Existing Conditions	816.00	1464.48	1468.53	1468.53	1470.05	0.039630	9.93	86.65	34.25	0.99
Sundown Creek	Reach	11258 XS SUN_23X	100 YR	restoration2	816.00	1464.48	1468.53	1468.53	1470.05	0.039630	9.93	86.65	34.25	0.99
Sundown Creek	Reach	10956.28 XS SUN_22X	100 YR	Existing Conditions	816.00	1450.30	1454.02	1453.75	1454.97	0.029401	7.86	107.51	46.03	0.84
Sundown Creek	Reach	10956.28 XS SUN_22X	100 YR	restoration2	816.00	1450.30	1454.02	1453.75	1454.97	0.029401	7.86	107.51	46.03	0.84
Sundown Creek	Reach	10285.9 XS SUN_21XA	100 YR	Existing Conditions	816.00	1425.36	1429.38	1429.38	1431.05	0.043970	10.35	78.96	24.35	1.00
Sundown Creek	Reach	10285.9 XS SUN_21XA	100 YR	restoration2	816.00	1425.36	1429.38	1429.38	1431.05	0.043970	10.35	78.96	24.35	1.00
Sundown Creek	Reach	9888.424 XS SUN_21X	100 YR	Existing Conditions	816.00	1325.67	1329.55	1329.55	1331.18	0.037513	10.33	85.49	29.14	0.99
Sundown Creek	Reach	9888.424 XS SUN_21X	100 YR	restoration2	816.00	1325.67	1329.55	1329.55	1331.18	0.037513	10.33	85.49	29.14	0.99
Sundown Creek	Reach	9563.817 XS SUN_20X	100 YR	Existing Conditions	816.00	1309.30	1313.08	1313.08	1314.53	0.041465	9.67	85.33	31.26	0.99
Sundown Creek	Reach	9563.817 XS SUN_20X	100 YR	restoration2	816.00	1309.30	1313.08	1313.08	1314.53	0.041465	9.67	85.33	31.26	0.99
Sundown Creek	Reach	9120.165 XS SUN_44X	100 YR	Existing Conditions	816.00	1294.98	1298.06	1297.81	1298.62	0.029488	5.98	140.50	85.16	0.79
Sundown Creek	Reach	9120.165 XS SUN_44X	100 YR	restoration2	816.00	1294.98	1298.06	1297.81	1298.62	0.029488	5.98	140.50	85.16	0.79
Sundown Creek	Reach	8865.03 XS SUN_19X	100 YR	Existing Conditions	816.00	1286.27	1290.50		1291.52	0.025925	8.11	104.76	38.06	0.81
Sundown Creek	Reach	8865.03 XS SUN_19X	100 YR	restoration2	816.00	1286.27	1290.50		1291.52	0.025925	8.11	104.76	38.06	0.81
Sundown Creek	Reach	8701.974 XS SUN_18X	100 YR	Existing Conditions	2150.00	1277.94	1284.11	1284.11	1286.30	0.033756	11.92	191.65	49.61	0.98
Sundown Creek	Reach	8701.974 XS SUN_18X	100 YR	restoration2	2150.00	1277.94	1284.11	1284.11	1286.30	0.033756	11.92	191.65	49.61	0.98
Sundown Creek	Reach	8529.396 XS SUN_43X	100 YR	Existing Conditions	2150.00	1273.15	1278.41	1278.41	1280.47	0.029013	11.80	222.77	81.82	0.93
Sundown Creek	Reach	8529.396 XS SUN_43X	100 YR	restoration2	2150.00	1273.15	1278.41	1278.41	1280.47	0.029013	11.80	222.77	81.82	0.93
Sundown Creek	Reach	8169.187 XS SUN_42X	100 YR	Existing Conditions	2150.00	1260.30	1266.79	1266.79	1268.73	0.035270	13.63	296.35	79.07	1.03
Sundown Creek	Reach	8169.187 XS SUN_42X	100 YR	restoration2	2150.00	1260.30	1266.79	1266.79	1268.73	0.035270	13.63	296.35	79.07	1.03
Sundown Creek	Reach	7911.303 XS SUN_41X	100 YR	Existing Conditions	2150.00	1251.09	1256.60	1256.60	1258.76	0.032454	11.99	206.22	56.21	0.97
Sundown Creek	Reach	7911.303 XS SUN_41X	100 YR	restoration2	2150.00	1251.09	1256.60	1256.60	1258.76	0.032454	11.99	206.22	56.21	0.97
Sundown Creek	Reach	7734.417 XS SUN_17X	100 YR	Existing Conditions	2150.00	1243.99	1250.49	1250.35	1252.21	0.026851	10.78	242.70	79.71	0.86
Sundown Creek	Reach	7734.417 XS SUN_17X	100 YR	restoration2	2150.00	1243.99	1250.49	1250.35	1252.21	0.026851	10.78	242.70	79.71	0.86
Sundown Creek	Reach	7022.902 XS SUN_16X	100 YR	Existing Conditions	2150.00	1224.22	1229.83	1229.83	1231.96	0.030107	12.33	230.06	60.92	0.96
Sundown Creek	Reach	7022.902 XS SUN_16X	100 YR	restoration2	2150.00	1224.22	1229.83	1229.83	1231.96	0.030107	12.33	230.06	60.92	0.96
Sundown Creek	Reach	6426.67 XS SUN_40X	100 YR	Existing Conditions	2150.00	1203.03	1208.59	1208.59	1210.57	0.034048	11.38	203.52	56.80	0.98
Sundown Creek	Reach	6426.67 XS SUN_40X	100 YR	restoration2	2150.00	1203.03	1208.59	1208.59	1210.57	0.034048	11.38	203.52	56.80	0.98
Sundown Creek	Reach	5885.625 XS SUN_48X	100 YR	Existing Conditions	2150.00	1188.30	1193.61		1194.20	0.011244	5.79	361.54	119.85	0.52
Sundown Creek	Reach	5885.625 XS SUN_48X	100 YR	restoration2	2150.00	1188.30	1193.61		1194.20	0.011244	5.79	361.54	119.85	0.52
Sundown Creek	Reach	5846.653 BR SUN_15D	100 YR	Existing Conditions	2150.00	1183.83	1193.44	1191.93	1193.87	0.004211	5.86	459.73	117.39	0.37
Sundown Creek	Reach	5846.653 BR SUN_15D	100 YR	restoration2	2150.00	1183.83	1193.44	1191.93	1193.87	0.004211	5.86	459.73	117.39	0.37
Sundown Creek	Reach	5821.221 Bridge			Bridge									
Sundown Creek	Reach	5800.354 BR SUN_15C	100 YR	Existing Conditions	2150.00	1182.68	1191.86	1191.52	1192.75	0.011314	8.18	315.78	113.20	0.55
Sundown Creek	Reach	5800.354 BR SUN_15C	100 YR	restoration2	2150.00	1182.68	1191.86	1191.52	1192.75	0.011314	8.18	315.78	113.20	0.55
Sundown Creek	Reach	5775.103 BR SUN_15A	100 YR	Existing Conditions	2150.00	1181.72	1191.77		1192.36	0.008152	6.40	360.92	109.05	0.45
Sundown Creek	Reach	5775.103 BR SUN_15A	100 YR	restoration2	2150.00	1181.72	1191.77		1192.36	0.008152	6.40	360.92	109.05	0.45
Sundown Creek	Reach	5688.313 XS SUN_49X	100 YR	Existing Conditions	2150.00	1182.81	1190.05	1190.05	1191.31	0.017625	9.73	282.44	95.82	0.73
Sundown Creek	Reach	5688.313 XS SUN_49X	100 YR	restoration2	2150.00	1182.81	1190.05	1190.05	1191.31	0.017625	9.73	282.44	95.82	0.73
Sundown Creek	Reach	5356.54 XS SUN_32X	100 YR	Existing Conditions	2150.00	1164.83	1171.25	1171.25	1173.79	0.033660	12.93	182.88	40.75	0.98
Sundown Creek	Reach	5356.54 XS SUN_32X	100 YR	restoration2	2150.00	1164.83	1171.25	1171.25	1173.79	0.033660	12.93	182.88	40.75	0.98
Sundown Creek	Reach	4929.002 XS SUN_31X	100 YR	Existing Conditions	2150.00	1135.12	1140.88	1140.88	1143.48	0.035841	12.98	171.84	36.60	0.99

HEC-RAS Profile: 100 YR (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Sundown Creek	Reach	4929.002 XS SUN_31X	100 YR	restoration2	2150.00	1135.12	1140.88	1140.88	1143.48	0.035841	12.98	171.84	36.60	0.99
Sundown Creek	Reach	4792.939 XS SUN_14X	100 YR	Existing Conditions	2150.00	1118.46	1126.38		1126.90	0.005582	5.80	371.39	62.57	0.40
Sundown Creek	Reach	4792.939 XS SUN_14X	100 YR	restoration2	2150.00	1118.46	1126.38		1126.90	0.005582	5.80	371.39	62.57	0.40
Sundown Creek	Reach	4469.083 XS SUN_45X	100 YR	Existing Conditions	2150.00	1113.38	1120.67	1120.67	1123.15	0.030804	12.94	196.02	46.49	0.97
Sundown Creek	Reach	4469.083 XS SUN_45X	100 YR	restoration2	2150.00	1113.38	1120.67	1120.67	1123.15	0.030804	12.94	196.02	46.49	0.97
Sundown Creek	Reach	3643.11 XS SUN_13X	100 YR	Existing Conditions	2840.00	1080.11	1086.58	1086.14	1088.53	0.026537	11.23	259.49	53.73	0.87
Sundown Creek	Reach	3643.11 XS SUN_13X	100 YR	restoration2	2840.00	1080.11	1086.58	1086.14	1088.53	0.026537	11.23	259.49	53.73	0.87
Sundown Creek	Reach	3431.445 XS SUN_39X	100 YR	Existing Conditions	2840.00	1073.46	1080.73	1080.73	1083.06	0.024812	12.86	311.06	86.12	0.89
Sundown Creek	Reach	3431.445 XS SUN_39X	100 YR	restoration2	2840.00	1073.46	1080.73	1080.73	1083.06	0.024812	12.86	311.06	86.12	0.89
Sundown Creek	Reach	3050.617 XS SUN_38X	100 YR	Existing Conditions	2840.00	1064.51	1070.57	1070.40	1072.58	0.026184	11.95	317.13	83.98	0.90
Sundown Creek	Reach	3050.617 XS SUN_38X	100 YR	restoration2	2840.00	1064.51	1070.57	1070.40	1072.58	0.026184	11.95	317.13	83.98	0.90
Sundown Creek	Reach	2828.606 XS SUN_37X	100 YR	Existing Conditions	2840.00	1058.75	1064.00	1064.00	1065.97	0.034122	11.49	278.51	75.38	0.98
Sundown Creek	Reach	2828.606 XS SUN_37X	100 YR	restoration2	2840.00	1058.75	1064.00	1064.00	1065.97	0.034122	11.49	278.51	75.38	0.98
Sundown Creek	Reach	2533.334 XS SUN_12X	100 YR	Existing Conditions	2840.00	1046.13	1053.50	1053.12	1055.76	0.029930	12.07	235.92	43.77	0.90
Sundown Creek	Reach	2533.334 XS SUN_12X	100 YR	restoration2	2840.00	1046.13	1053.50	1053.12	1055.76	0.029930	12.07	235.92	43.77	0.90
Sundown Creek	Reach	1689.646 XS SUN_11X	100 YR	Existing Conditions	2840.00	1017.07	1024.52	1024.52	1027.33	0.038081	13.43	212.34	39.77	1.00
Sundown Creek	Reach	1689.646 XS SUN_11X	100 YR	restoration2	2840.00	1017.07	1024.52	1024.52	1027.33	0.038081	13.43	212.34	39.77	1.00
Sundown Creek	Reach	1587.831 BR SUN_10D	100 YR	Existing Conditions	2840.00	1014.72	1022.56	1021.43	1024.01	0.018691	9.66	293.96	52.91	0.72
Sundown Creek	Reach	1587.831 BR SUN_10D	100 YR	restoration2	2840.00	1014.72	1022.56	1021.43	1024.01	0.018691	9.66	293.96	52.91	0.72
Sundown Creek	Reach	1559.583 Bridge			Bridge									
Sundown Creek	Reach	1512.841 BR SUN_10A	100 YR	Existing Conditions	2840.00	1013.17	1020.32	1019.43	1022.12	0.019547	10.85	273.38	51.09	0.78
Sundown Creek	Reach	1512.841 BR SUN_10A	100 YR	restoration2	2840.00	1013.17	1020.32	1019.43	1022.12	0.019547	10.85	273.38	51.09	0.78
Sundown Creek	Reach	1410.457 XS SUN_07X	100 YR	Existing Conditions	2840.00	1009.83	1016.58	1016.58	1019.32	0.032050	13.36	221.99	43.76	0.98
Sundown Creek	Reach	1410.457 XS SUN_07X	100 YR	restoration2	2840.00	1009.83	1016.58	1016.58	1019.32	0.032050	13.36	221.99	43.76	0.98
Sundown Creek	Reach	1144.503 XS SUN_06X	100 YR	Existing Conditions	2840.00	1002.51	1011.39	1009.72	1013.05	0.015577	10.37	283.76	44.08	0.67
Sundown Creek	Reach	1144.503 XS SUN_06X	100 YR	restoration2	2840.00	1002.51	1011.39	1009.72	1013.05	0.015577	10.37	283.76	44.08	0.67
Sundown Creek	Reach	1026.719 BR SUN_05D	100 YR	Existing Conditions	2840.00	1000.10	1010.31	1007.08	1011.43	0.008803	8.50	343.11	132.78	0.50
Sundown Creek	Reach	1026.719 BR SUN_05D	100 YR	restoration2	2840.00	1000.10	1010.31	1007.08	1011.43	0.008803	8.50	343.11	132.78	0.50
Sundown Creek	Reach	993.8764 Bridge			Bridge									
Sundown Creek	Reach	962.1789 BR SUN_05A	100 YR	Existing Conditions	2840.00	998.71	1006.73	1005.71	1008.56	0.021396	10.86	261.85	95.01	0.77
Sundown Creek	Reach	962.1789 BR SUN_05A	100 YR	restoration2	2840.00	998.71	1006.73	1005.71	1008.56	0.021396	10.86	261.85	95.01	0.77
Sundown Creek	Reach	837.2104 XS SUN_03X	100 YR	Existing Conditions	2840.00	995.92	1003.23	1002.76	1005.53	0.025108	12.21	242.98	89.87	0.88
Sundown Creek	Reach	837.2104 XS SUN_03X	100 YR	restoration2	2840.00	995.92	1003.23	1002.76	1005.53	0.025108	12.21	242.98	89.87	0.88
Sundown Creek	Reach	467.9756 XS SUN_02X	100 YR	Existing Conditions	2840.00	988.37	993.51	993.51	995.20	0.030326	10.64	351.90	255.32	0.90
Sundown Creek	Reach	467.9756 XS SUN_02X	100 YR	restoration2	2840.00	988.37	993.51	993.51	995.20	0.030326	10.64	351.90	255.32	0.90
Sundown Creek	Reach	181.3982 XS SUN_01X	100 YR	Existing Conditions	2840.00	978.20	985.73	985.73	987.35	0.023753	10.59	378.83	326.06	0.82
Sundown Creek	Reach	181.3982 XS SUN_01X	100 YR	restoration2	2840.00	978.20	985.73	985.73	987.35	0.023753	10.59	378.83	326.06	0.82
Sundown Creek	Reach	50.00015 XS SUN_46X	100 YR	Existing Conditions	2840.00	975.97	982.09	982.09	983.28	0.027826	10.16	416.08	225.76	0.87
Sundown Creek	Reach	50.00015 XS SUN_46X	100 YR	restoration2	2840.00	975.97	982.09	982.09	983.28	0.027826	10.16	416.08	225.76	0.87
Rondout Creek	Reach	36559.8 Rondout_XS_63	100 YR	Existing Conditions	8100.00	1110.01	1120.51		1121.22	0.005891	7.11	1528.11	310.62	0.46
Rondout Creek	Reach	36559.8 Rondout_XS_63	100 YR	restoration2	8100.00	1110.01	1120.51		1121.22	0.005891	7.11	1528.11	310.62	0.46
Rondout Creek	Reach	36437.5 Rondout_XS_62	100 YR	Existing Conditions	8100.00	1109.07	1120.12		1120.58	0.003828	5.80	1983.43	366.45	0.37
Rondout Creek	Reach	36437.5 Rondout_XS_62	100 YR	restoration2	8100.00	1109.07	1120.12		1120.58	0.003828	5.80	1983.43	366.45	0.37
Rondout Creek	Reach	35949 Rondout_XS_61	100 YR	Existing Conditions	8100.00	1105.35	1114.45	1114.45	1116.42	0.030839	13.91	1196.24	362.27	0.98
Rondout Creek	Reach	35949 Rondout_XS_61	100 YR	restoration2	8100.00	1105.35	1114.45	1114.45	1116.42	0.030839	13.91	1196.24	362.27	0.98
Rondout Creek	Reach	35517.78 Rondout_XS_73	100 YR	Existing Conditions	8100.00	1095.53	1108.83		1109.05	0.001388	4.71	3513.14	454.07	0.24
Rondout Creek	Reach	35517.78 Rondout_XS_73	100 YR	restoration2	8100.00	1095.53	1108.83		1109.05	0.001388	4.71	3513.14	454.07	0.24
Rondout Creek	Reach	35484 Rondout_XS_60	100 YR	Existing Conditions	8100.00	1094.42	1107.42	1104.98	1108.83	0.010231	10.10	1329.12	430.44	0.58
Rondout Creek	Reach	35484 Rondout_XS_60	100 YR	restoration2	8100.00	1094.42	1107.42	1104.98	1108.83	0.010231	10.10	1329.12	430.44	0.58
Rondout Creek	Reach	35260 Rondout_XS_59	100 YR	Existing Conditions	8100.00	1091.61	1106.42	1103.11	1106.85	0.006514	6.26	2223.08	427.33	0.33
Rondout Creek	Reach	35260 Rondout_XS_59	100 YR	restoration2	8100.00	1091.61	1106.42	1103.11	1106.85	0.006514	6.26	2223.08	427.33	0.33
Rondout Creek	Reach	35226.02			Bridge									
Rondout Creek	Reach	35192 Rondout_XS_56	100 YR	Existing Conditions	8100.00	1092.23	1102.27	1101.87	1104.28	0.015507	11.98	1076.49	351.29	0.74
Rondout Creek	Reach	35192 Rondout_XS_56	100 YR	restoration2	8100.00	1092.23	1102.27	1101.87	1104.28	0.015507	11.98	1076.49	351.29	0.74
Rondout Creek	Reach	35114 Rondout_XS_55	100 YR	Existing Conditions	8100.00	1092.03	1101.59		1102.89	0.011282	10.22	1435.73	368.49	0.63
Rondout Creek	Reach	35114 Rondout_XS_55	100 YR	restoration2	8100.00	1092.03	1101.59		1102.89	0.011282	10.22	1435.73	368.49	0.63
Rondout Creek	Reach	34544.4 Rondout_XS_54	100 YR	Existing Conditions	8100.00	1084.87	1096.37		1097.37	0.008419	9.07	1495.91	281.50	0.56
Rondout Creek	Reach	34544.4 Rondout_XS_54	100 YR	restoration2	8100.00	1084.87	1096.37		1097.37	0.008419	9.07	1495.91	281.50	0.56
Rondout Creek	Reach	33437.5 Rondout_XS_53	100 YR	Existing Conditions	8100.00	1072.93	1082.31	1081.89	1084.05	0.019044	10.91	952.17	273.82	0.79
Rondout Creek	Reach	33437.5 Rondout_XS_53	100 YR	restoration2	8100.00	1072.93	1082.31	1081.89	1084.05	0.019044	10.91	952.17	273.82	0.79
Rondout Creek	Reach	32259.3 Rondout_XS_52	100 YR	Existing Conditions	8100.00	1056.05	1066.51	1064.34	1068.00	0.010188	9.91	957.36	647.77	0.61
Rondout Creek	Reach	32259.3 Rondout_XS_52	100 YR	restoration2	8100.00	1056.05	1066.51	1064.34	1068.00	0.010188	9.91	957.36	647.77	0.61
Rondout Creek	Reach	31637.7 Rondout_XS_51	100 YR	Existing Conditions	8100.00	1049.72	1060.71	1057.85	1062.23	0.008471	10.09	988.24	651.43	0.56
Rondout Creek	Reach	31637.7 Rondout_XS_51	100 YR	restoration2	8100.00	1049.72	1060.71	1057.85	1062.23	0.008471	10.09	988.24	651.43	0.56
Rondout Creek	Reach	31417.9 Rondout_XS_50	100 YR	Existing Conditions	8100.00	1044.82	1056.82	1055.80	1059.47	0.018579	13.08	652.72	523.17	0.81
Rondout Creek	Reach	31417.9 Rondout_XS_50	100 YR	restoration2	8100.00	1044.82	1056.82	1055.80	1059.47	0.018579	13.08	652.72	523.17	0.81

HEC-RAS Profile: 100 YR (Continued)

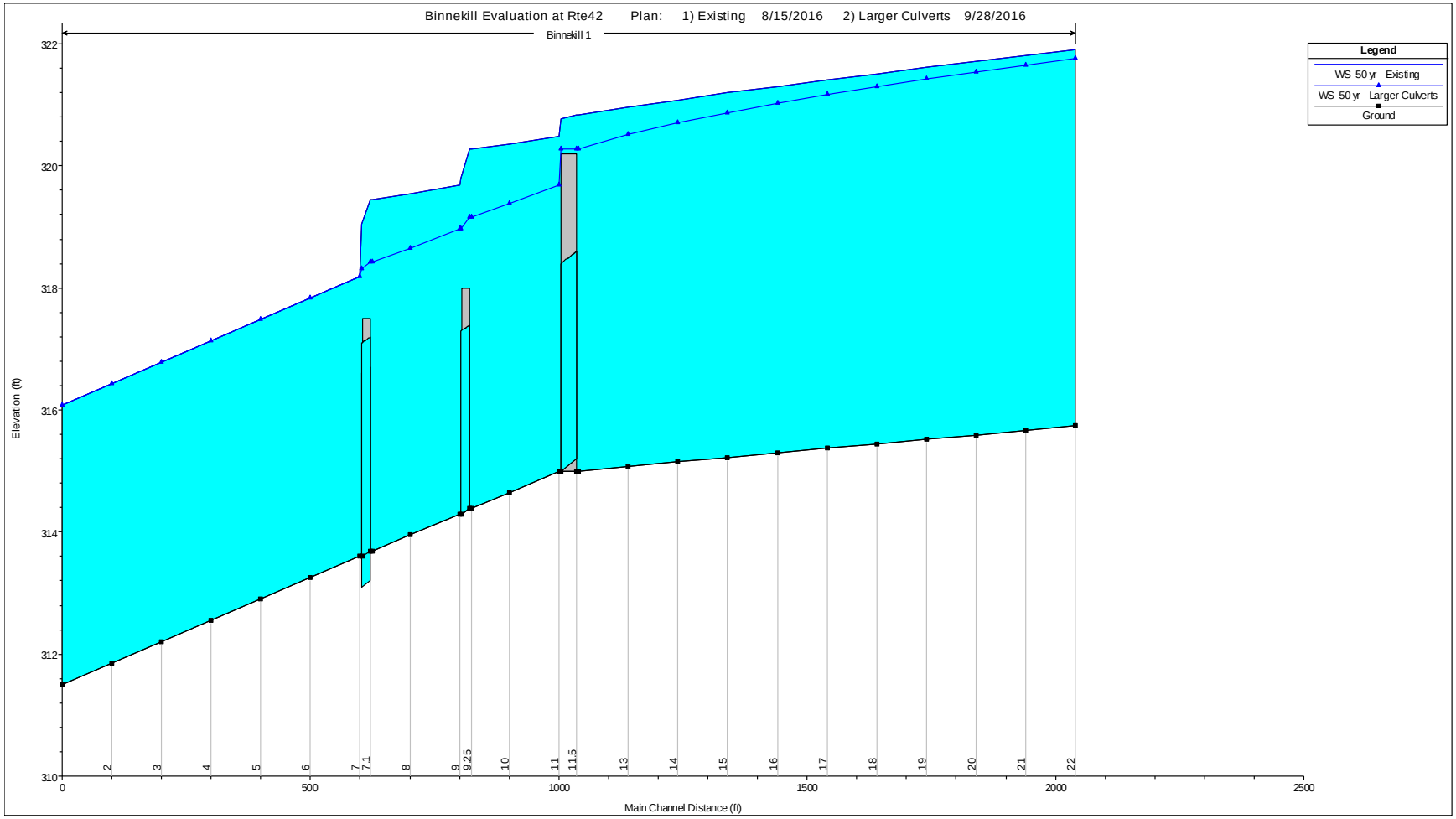
River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Rondout Creek	Reach	30913.9 Rondout_XS_49	100 YR	Existing Conditions	8100.00	1045.49	1051.68		1052.13	0.009721	6.88	1996.26	610.36	0.56
Rondout Creek	Reach	30913.9 Rondout_XS_49	100 YR	restoration2	8100.00	1045.49	1051.68		1052.13	0.009721	6.88	1996.26	610.36	0.56
Rondout Creek	Reach	29580.7 Rondout_XS_48	100 YR	Existing Conditions	8100.00	1025.25	1035.42	1035.42	1036.67	0.014974	10.02	1324.84	548.93	0.71
Rondout Creek	Reach	29580.7 Rondout_XS_48	100 YR	restoration2	8100.00	1025.25	1035.42	1035.42	1036.67	0.014974	10.02	1324.84	548.93	0.71
Rondout Creek	Reach	28843 Rondout_XS_47	100 YR	Existing Conditions	8100.00	1018.80	1027.32		1028.00	0.008063	7.93	1943.43	445.14	0.53
Rondout Creek	Reach	28843 Rondout_XS_47	100 YR	restoration2	8100.00	1018.80	1027.32		1028.00	0.008052	7.92	1944.36	445.15	0.53
Rondout Creek	Reach	28726.3 Rondout_XS_46	100 YR	Existing Conditions	8100.00	1015.06	1026.71	1023.56	1027.29	0.004654	7.01	2163.13	443.38	0.41
Rondout Creek	Reach	28726.3 Rondout_XS_46	100 YR	restoration2	8100.00	1015.06	1026.72	1023.56	1027.29	0.004647	7.00	2164.38	443.39	0.41
Rondout Creek	Reach	28695.20		Bridge										
Rondout Creek	Reach	28664.1 Rondout_XS_43	100 YR	Existing Conditions	8100.00	1014.00	1025.41	1023.72	1026.46	0.008452	9.42	1707.95	423.84	0.55
Rondout Creek	Reach	28664.1 Rondout_XS_43	100 YR	restoration2	8100.00	1014.00	1025.43	1023.72	1026.47	0.008392	9.39	1713.96	424.69	0.55
Rondout Creek	Reach	28539.3 Rondout_XS_42	100 YR	Existing Conditions	8100.00	1013.94	1024.44		1025.06	0.010982	7.56	1897.75	440.25	0.46
Rondout Creek	Reach	28539.3 Rondout_XS_42	100 YR	restoration2	8100.00	1013.94	1024.47		1025.08	0.010789	7.51	1910.92	440.30	0.45
Rondout Creek	Reach	27901.6 Rondout_XS_41	100 YR	Existing Conditions	8100.00	1010.19	1017.26		1017.67	0.013651	6.53	2191.06	607.37	0.46
Rondout Creek	Reach	27901.6 Rondout_XS_41	100 YR	restoration2	8100.00	1010.19	1018.45		1018.58	0.010759	3.55	2810.78	609.96	0.24
Rondout Creek	Reach	26788.23 Rondout_XS_70	100 YR	Existing Conditions	8100.00	996.90	1004.50		1005.15	0.010314	8.12	2413.44	904.53	0.58
Rondout Creek	Reach	26788.23 Rondout_XS_70	100 YR	restoration2	8100.00	992.80	1003.67		1004.04	0.018862	5.67	2169.86	765.54	0.33
Rondout Creek	Reach	26509.47	100 YR	Existing Conditions	8100.00	994.51	1003.33		1003.65	0.005274	5.16	2220.35	506.74	0.41
Rondout Creek	Reach	26509.47	100 YR	restoration2	8100.00	990.76	1002.06	998.18	1002.44	0.004416	5.32	2037.42	466.51	0.40
Rondout Creek	Reach	26230.71	100 YR	Existing Conditions	8100.00	985.84	996.50	996.50	998.45	0.041104	12.32	939.10	240.25	0.86
Rondout Creek	Reach	26230.71	100 YR	restoration2	8100.00	986.55	994.74		996.76	0.120945	11.40	710.50	110.00	0.79
Rondout Creek	Reach	25673.2 Rondout_XS_40	100 YR	Existing Conditions	8100.00	983.66	992.62		992.83	0.003267	4.88	2872.84	752.24	0.34
Rondout Creek	Reach	25673.2 Rondout_XS_40	100 YR	restoration2	8100.00	981.74	992.46		992.68	0.002270	4.72	3013.76	751.86	0.28
Rondout Creek	Reach	25602.8*	100 YR	restoration2	8100.00	981.07	991.88		992.38	0.004002	6.36	2120.46	721.24	0.39
Rondout Creek	Reach	25532.4*	100 YR	restoration2	8100.00	980.40	990.75	987.82	991.81	0.007427	8.33	1123.28	439.75	0.52
Rondout Creek	Reach	25462.0*	100 YR	restoration2	8100.00	979.72	990.06		991.11	0.007112	8.20	991.04	127.30	0.51
Rondout Creek	Reach	25391.6*	100 YR	restoration2	8100.00	979.05	989.40		990.42	0.006978	8.09	1004.14	129.77	0.51
Rondout Creek	Reach	25383.8 Rondout_XS_39	100 YR	Existing Conditions	8100.00	980.80	989.86	989.86	990.99	0.016074	9.88	1395.09	677.83	0.73
Rondout Creek	Reach	25321.3*	100 YR	restoration2	8100.00	978.38	988.76		989.74	0.006816	7.97	1019.05	132.44	0.50
Rondout Creek	Reach	25250.9*	100 YR	restoration2	8100.00	977.71	988.13		989.09	0.006621	7.84	1036.07	135.24	0.49
Rondout Creek	Reach	25180.5*	100 YR	restoration2	8100.00	977.03	987.53		988.45	0.006376	7.69	1056.33	138.15	0.48
Rondout Creek	Reach	25110.1*	100 YR	restoration2	8100.00	976.36	986.96		987.84	0.006071	7.53	1080.48	141.10	0.47
Rondout Creek	Reach	25071.05	100 YR	Existing Conditions	8100.00	973.91	986.06	979.66	986.16	0.000795	2.57	3687.52	690.99	0.17
Rondout Creek	Reach	25039.8*	100 YR	restoration2	8100.00	975.69	986.42		987.26	0.005705	7.33	1110.06	144.14	0.46
Rondout Creek	Reach	24969.4*	100 YR	restoration2	8100.00	975.02	985.94		986.72	0.005109	7.10	1146.92	147.26	0.44
Rondout Creek	Reach	24899.0*	100 YR	restoration2	8100.00	974.34	985.50		986.23	0.004716	6.87	1185.58	150.45	0.43
Rondout Creek	Reach	24828.6*	100 YR	restoration2	8100.00	973.67	985.12		985.79	0.004166	6.56	1243.36	167.66	0.40
Rondout Creek	Reach	24758.3	100 YR	Existing Conditions	8100.00	973.68	984.79	980.60	985.38	0.003690	6.19	1318.75	219.22	0.37
Rondout Creek	Reach	24758.3	100 YR	restoration2	8100.00	973.00	984.76	980.75	985.38	0.003980	6.31	1293.27	218.29	0.38
Rondout Creek	Reach	24670.86		Bridge										
Rondout Creek	Reach	24637.7 Rondout_XS_34	100 YR	Existing Conditions	8100.00	970.89	982.66	980.36	984.08	0.012300	9.58	850.98	114.76	0.60
Rondout Creek	Reach	24637.7 Rondout_XS_34	100 YR	restoration2	8100.00	970.89	982.66	980.36	984.08	0.012300	9.58	850.98	114.76	0.60
Rondout Creek	Reach	24591.1 Rondout_XS_33	100 YR	Existing Conditions	8100.00	970.22	982.02		983.55	0.009560	9.92	823.87	104.43	0.59
Rondout Creek	Reach	24591.1 Rondout_XS_33	100 YR	restoration2	8100.00	970.22	982.02		983.55	0.009560	9.92	823.87	104.43	0.59
Lower Rondout Cr	Lower RC	24383.59 Rondout_XS_32	100 YR	Existing Conditions	9470.00	968.68	979.83		981.34	0.011696	9.88	985.14	139.19	0.60
Lower Rondout Cr	Lower RC	24383.59 Rondout_XS_32	100 YR	restoration2	9470.00	968.68	979.83		981.34	0.011696	9.88	985.14	139.19	0.60
Lower Rondout Cr	Lower RC	24015.74	100 YR	Existing Conditions	9470.00	968.54	976.30		977.18	0.010114	8.41	1570.69	379.98	0.59
Lower Rondout Cr	Lower RC	24015.74	100 YR	restoration2	9470.00	968.54	976.30		977.18	0.010114	8.41	1570.69	379.98	0.59
Lower Rondout Cr	Lower RC	23647.9 Rondout_XS_31	100 YR	Existing Conditions	9470.00	962.10	971.99		972.79	0.008342	7.31	1461.24	471.54	0.53
Lower Rondout Cr	Lower RC	23647.9 Rondout_XS_31	100 YR	restoration2	9470.00	962.10	971.99		972.79	0.008342	7.31	1461.24	471.54	0.53
Lower Rondout Cr	Lower RC	23116.5 Rondout_XS_30	100 YR	Existing Conditions	9470.00	958.99	966.91		968.04	0.008869	8.57	1145.34	250.08	0.57
Lower Rondout Cr	Lower RC	23116.5 Rondout_XS_30	100 YR	restoration2	9470.00	958.99	966.91		968.04	0.008869	8.57	1145.34	250.08	0.57
Lower Rondout Cr	Lower RC	22632.9 Rondout_XS_29	100 YR	Existing Conditions	9470.00	954.22	962.33		963.44	0.010093	8.82	1525.93	474.49	0.60
Lower Rondout Cr	Lower RC	22632.9 Rondout_XS_29	100 YR	restoration2	9470.00	954.22	962.33		963.44	0.010093	8.82	1525.93	474.49	0.60
Lower Rondout Cr	Lower RC	22528.2 Rondout_XS_28	100 YR	Existing Conditions	9470.00	953.91	960.86	959.90	962.17	0.014176	9.61	1422.80	482.03	0.70
Lower Rondout Cr	Lower RC	22528.2 Rondout_XS_28	100 YR	restoration2	9470.00	953.91	960.86	959.90	962.17	0.014176	9.61	1422.80	482.03	0.70
Lower Rondout Cr	Lower RC	22398.9 Rondout_XS_27	100 YR	Existing Conditions	9470.00	950.79	959.29	958.07	960.45	0.012055	8.85	1384.04	447.46	0.64
Lower Rondout Cr	Lower RC	22398.9 Rondout_XS_27	100 YR	restoration2	9470.00	950.79	959.29	958.07	960.45	0.012055	8.85	1384.04	447.46	0.64
Lower Rondout Cr	Lower RC	21902.2 Rondout_XS_26	100 YR	Existing Conditions	9470.00	946.14	953.66		954.45	0.010329	8.73	1773.98	470.48	0.62
Lower Rondout Cr	Lower RC	21902.2 Rondout_XS_26	100 YR	restoration2	9470.00	946.14	953.66		954.45	0.010329	8.73	1773.98	470.48	0.62
Lower Rondout Cr	Lower RC	21146.4 Rondout_XS_25	100 YR	Existing Conditions	9550.00	938.49	945.98		946.28	0.008140	5.52	2541.05	710.00	0.50
Lower Rondout Cr	Lower RC	21146.4 Rondout_XS_25	100 YR	restoration2	9550.00	938.49	945.98		946.28	0.008140	5.52	2541.05	710.00	0.50

HEC-RAS Profile: 100 YR (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Lower Rondout Cr	Lower RC	19655.9 Rondout_XS_24	100 YR	Existing Conditions	9550.00	921.51	930.29		931.23	0.014932	9.49	1455.42	443.29	0.66
Lower Rondout Cr	Lower RC	19655.9 Rondout_XS_24	100 YR	restoration2	9550.00	921.51	930.29		931.23	0.014932	9.49	1455.42	443.29	0.66
Lower Rondout Cr	Lower RC	18891.26 Rondout_XS_69	100 YR	Existing Conditions	9550.00	914.40	924.62		925.26	0.004862	7.17	1770.14	388.32	0.44
Lower Rondout Cr	Lower RC	18891.26 Rondout_XS_69	100 YR	restoration2	9550.00	914.40	924.62		925.26	0.004862	7.17	1770.14	388.32	0.44
Lower Rondout Cr	Lower RC	18391.26 Rondout_XS_68	100 YR	Existing Conditions	10242.00	909.80	921.08	919.19	922.08	0.008284	8.46	1684.25	673.87	0.56
Lower Rondout Cr	Lower RC	18391.26 Rondout_XS_68	100 YR	restoration2	10242.00	909.80	921.08	919.19	922.08	0.008284	8.46	1684.25	673.87	0.56
Lower Rondout Cr	Lower RC	17891.26 Rondout_XS_67	100 YR	Existing Conditions	10242.00	905.20	915.29		916.53	0.015563	9.05	1191.51	332.95	0.73
Lower Rondout Cr	Lower RC	17891.26 Rondout_XS_67	100 YR	restoration2	10242.00	905.20	915.29		916.53	0.015563	9.05	1191.51	332.95	0.73
Lower Rondout Cr	Lower RC	17391.26 Rondout_XS_66	100 YR	Existing Conditions	10242.00	900.50	910.53		911.22	0.007333	9.17	2554.78	755.09	0.54
Lower Rondout Cr	Lower RC	17391.26 Rondout_XS_66	100 YR	restoration2	10242.00	900.50	910.53		911.22	0.007333	9.17	2554.78	755.09	0.54
Lower Rondout Cr	Lower RC	16891.26 Rondout_XS_65	100 YR	Existing Conditions	10242.00	895.90	905.39	905.19	906.60	0.014474	10.36	1616.37	533.76	0.72
Lower Rondout Cr	Lower RC	16891.26 Rondout_XS_65	100 YR	restoration2	10242.00	895.90	905.39	905.19	906.60	0.014474	10.36	1616.37	533.76	0.72
Lower Rondout Cr	Lower RC	16391.26 Rondout_XS_64	100 YR	Existing Conditions	10242.00	891.30	902.20		902.65	0.005078	7.75	2429.07	550.52	0.44
Lower Rondout Cr	Lower RC	16391.26 Rondout_XS_64	100 YR	restoration2	10242.00	891.30	902.20		902.65	0.005078	7.75	2429.07	550.52	0.44
Lower Rondout Cr	Lower RC	15893.2 Rondout_XS_23	100 YR	Existing Conditions	10242.00	886.66	898.41	897.16	899.30	0.008821	8.21	1825.54	642.93	0.57
Lower Rondout Cr	Lower RC	15893.2 Rondout_XS_23	100 YR	restoration2	10242.00	886.66	898.41	897.16	899.30	0.008821	8.21	1825.54	642.93	0.57
Lower Rondout Cr	Lower RC	14802.9 Rondout_XS_22	100 YR	Existing Conditions	10242.00	883.91	892.70		892.97	0.003993	6.14	3151.31	573.14	0.39
Lower Rondout Cr	Lower RC	14802.9 Rondout_XS_22	100 YR	restoration2	10242.00	883.91	892.70		892.97	0.003993	6.14	3151.31	573.14	0.39
Lower Rondout Cr	Lower RC	14056.2 Rondout_XS_21	100 YR	Existing Conditions	10242.00	875.61	888.94		889.83	0.004239	7.63	1428.60	199.05	0.42
Lower Rondout Cr	Lower RC	14056.2 Rondout_XS_21	100 YR	restoration2	10242.00	875.61	888.94		889.83	0.004239	7.63	1428.60	199.05	0.42
Lower Rondout Cr	Lower RC	13460.4 Rondout_XS_20	100 YR	Existing Conditions	10900.00	872.48	884.97		886.49	0.007313	10.11	1243.06	267.47	0.55
Lower Rondout Cr	Lower RC	13460.4 Rondout_XS_20	100 YR	restoration2	10900.00	872.48	884.97		886.49	0.007313	10.11	1243.06	267.47	0.55
Lower Rondout Cr	Lower RC	13307.4 Rondout_XS_19	100 YR	Existing Conditions	10900.00	871.14	884.24	880.86	885.17	0.006138	7.96	1603.81	580.50	0.46
Lower Rondout Cr	Lower RC	13307.4 Rondout_XS_19	100 YR	restoration2	10900.00	871.14	884.24	880.86	885.17	0.006138	7.96	1603.81	580.50	0.46
Lower Rondout Cr	Lower RC	13273.6			Bridge									
Lower Rondout Cr	Lower RC	13239.8 Rondout_XS_16	100 YR	Existing Conditions	10900.00	871.24	882.94	880.74	884.36	0.012110	9.90	1297.61	562.19	0.59
Lower Rondout Cr	Lower RC	13239.8 Rondout_XS_16	100 YR	restoration2	10900.00	871.24	882.94	880.74	884.36	0.012110	9.90	1297.61	562.19	0.59
Lower Rondout Cr	Lower RC	13074.2 Rondout_XS_15	100 YR	Existing Conditions	10900.00	872.81	882.34		882.80	0.004120	6.57	2748.50	741.04	0.41
Lower Rondout Cr	Lower RC	13074.2 Rondout_XS_15	100 YR	restoration2	10900.00	872.81	882.34		882.80	0.004120	6.57	2748.50	741.04	0.41
Lower Rondout Cr	Lower RC	12617.2 Rondout_XS_14	100 YR	Existing Conditions	10900.00	865.06	879.51		880.42	0.007518	8.73	1999.71	616.04	0.53
Lower Rondout Cr	Lower RC	12617.2 Rondout_XS_14	100 YR	restoration2	10900.00	865.06	879.51		880.42	0.007518	8.73	1999.71	616.04	0.53
Lower Rondout Cr	Lower RC	11752 Rondout_XS_13	100 YR	Existing Conditions	10900.00	866.34	873.21		873.53	0.008390	7.51	3297.22	718.17	0.55
Lower Rondout Cr	Lower RC	11752 Rondout_XS_13	100 YR	restoration2	10900.00	866.34	873.21		873.53	0.008390	7.51	3297.22	718.17	0.55
Lower Rondout Cr	Lower RC	10329.3 Rondout_XS_12	100 YR	Existing Conditions	10900.00	850.12	862.67	860.39	863.92	0.006501	9.70	1760.33	601.11	0.52
Lower Rondout Cr	Lower RC	10329.3 Rondout_XS_12	100 YR	restoration2	10900.00	850.12	862.67	860.39	863.92	0.006501	9.70	1760.33	601.11	0.52
Lower Rondout Cr	Lower RC	9057.6 Rondout_XS_11	100 YR	Existing Conditions	10900.00	846.37	855.03		855.66	0.006124	7.69	3014.98	743.67	0.49
Lower Rondout Cr	Lower RC	9057.6 Rondout_XS_11	100 YR	restoration2	10900.00	846.37	855.03		855.66	0.006124	7.69	3014.98	743.67	0.49
Lower Rondout Cr	Lower RC	8315.75 Rondout_XS_10	100 YR	Existing Conditions	10900.00	840.65	852.07		852.34	0.003083	5.36	3354.68	679.48	0.31
Lower Rondout Cr	Lower RC	8315.75 Rondout_XS_10	100 YR	restoration2	10900.00	840.65	852.07		852.34	0.003083	5.36	3354.68	679.48	0.31
Lower Rondout Cr	Lower RC	7738.59 Rondout_XS_09	100 YR	Existing Conditions	10900.00	833.81	849.97		850.55	0.002673	7.40	3102.16	437.19	0.35
Lower Rondout Cr	Lower RC	7738.59 Rondout_XS_09	100 YR	restoration2	10900.00	833.81	849.97		850.55	0.002673	7.40	3102.16	437.19	0.35
Lower Rondout Cr	Lower RC	7549.99 Rondout_XS_08	100 YR	Existing Conditions	14400.00	833.18	847.78		849.53	0.007111	11.57	2150.08	354.86	0.57
Lower Rondout Cr	Lower RC	7549.99 Rondout_XS_08	100 YR	restoration2	14400.00	833.18	847.78		849.53	0.007111	11.57	2150.08	354.86	0.57
Lower Rondout Cr	Lower RC	6944.8 Rondout_XS_07	100 YR	Existing Conditions	14400.00	832.35	846.27		846.87	0.002484	7.00	3929.93	624.10	0.36
Lower Rondout Cr	Lower RC	6944.8 Rondout_XS_07	100 YR	restoration2	14400.00	832.35	846.27		846.87	0.002484	7.00	3929.93	624.10	0.36
Lower Rondout Cr	Lower RC	6473.574 Rondout_XS_06	100 YR	Existing Conditions	14400.00	830.76	845.67	838.91	846.01	0.001220	4.97	3291.92	847.60	0.25
Lower Rondout Cr	Lower RC	6473.574 Rondout_XS_06	100 YR	restoration2	14400.00	830.76	845.67	838.91	846.01	0.001220	4.97	3291.92	847.60	0.25
Lower Rondout Cr	Lower RC	6383.863 Rondout_XS_05	100 YR	Existing Conditions	14400.00	825.81	845.49	836.21	845.90	0.000982	5.15	2915.32	819.16	0.23
Lower Rondout Cr	Lower RC	6383.863 Rondout_XS_05	100 YR	restoration2	14400.00	825.81	845.49	836.21	845.90	0.000982	5.15	2915.32	819.16	0.23
Lower Rondout Cr	Lower RC	6330.35			Bridge									
Lower Rondout Cr	Lower RC	6282.384 Rondout_XS_02	100 YR	Existing Conditions	14400.00	826.11	833.54	831.85	834.92	0.009741	9.42	1528.66	288.55	0.64
Lower Rondout Cr	Lower RC	6282.384 Rondout_XS_02	100 YR	restoration2	14400.00	826.11	833.54	831.85	834.92	0.009741	9.42	1528.66	288.55	0.64
Lower Rondout Cr	Lower RC	6134.63 Rondout_XS_01	100 YR	Existing Conditions	14400.00	821.72	832.45	830.44	833.54	0.007207	8.59	1842.84	378.02	0.56
Lower Rondout Cr	Lower RC	6134.63 Rondout_XS_01	100 YR	restoration2	14400.00	821.72	832.45	830.44	833.54	0.007207	8.59	1842.84	378.02	0.56

Binnekill/Driveway Culvert Evaluation

Existing & Proposed Profile (50-year storm)



Binnekill/Driveway Culverts - 50 & 100 Year

HEC-RAS River: Binnekill Reach: 1

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	22	50 yr	Existing	330.00	315.74	321.90		322.04	0.000903	3.56	139.37	49.32	0.26
1	22	50 yr	Larger Culverts	330.00	315.74	321.76		321.92	0.001021	3.73	132.46	49.03	0.27
1	22	100 yr	Existing	417.00	315.74	322.40		322.56	0.000956	3.87	164.19	50.31	0.27
1	22	100 yr	Larger Culverts	417.00	315.74	322.30		322.47	0.001035	3.98	159.17	50.11	0.28
1	21	50 yr	Existing	330.00	315.67	321.80		321.95	0.000921	3.59	138.19	49.27	0.26
1	21	50 yr	Larger Culverts	330.00	315.67	321.65		321.81	0.001057	3.78	130.54	48.96	0.28
1	21	100 yr	Existing	417.00	315.67	322.30		322.46	0.000979	3.90	162.67	50.25	0.27
1	21	100 yr	Larger Culverts	417.00	315.67	322.19		322.37	0.001069	4.03	157.15	50.03	0.29
1	20	50 yr	Existing	330.00	315.59	321.71		321.86	0.000933	3.61	137.48	49.24	0.26
1	20	50 yr	Larger Culverts	330.00	315.59	321.54		321.71	0.001088	3.81	128.99	48.89	0.28
1	20	100 yr	Existing	417.00	315.59	322.19		322.36	0.000996	3.93	161.60	50.21	0.28
1	20	100 yr	Larger Culverts	417.00	315.59	322.07		322.26	0.001098	4.07	155.51	49.97	0.29
1	19	50 yr	Existing	330.00	315.52	321.61		321.76	0.000956	3.64	136.11	49.18	0.27
1	19	50 yr	Larger Culverts	330.00	315.52	321.42		321.60	0.001136	3.88	126.63	48.80	0.29
1	19	100 yr	Existing	417.00	315.52	322.09		322.26	0.001024	3.97	159.83	50.14	0.28
1	19	100 yr	Larger Culverts	417.00	315.52	321.95		322.15	0.001142	4.13	153.09	49.87	0.29
1	18	50 yr	Existing	330.00	315.44	321.51		321.67	0.000972	3.66	135.18	49.15	0.27
1	18	50 yr	Larger Culverts	330.00	315.44	321.30		321.48	0.001181	3.93	124.56	48.71	0.29
1	18	100 yr	Existing	417.00	315.44	321.98		322.16	0.001046	4.00	158.47	50.08	0.28
1	18	100 yr	Larger Culverts	417.00	315.44	321.83		322.03	0.001183	4.18	150.97	49.78	0.30
1	17	50 yr	Existing	330.00	315.37	321.41		321.57	0.001001	3.70	133.57	49.08	0.27
1	17	50 yr	Larger Culverts	330.00	315.37	321.16		321.36	0.001250	4.02	121.58	48.59	0.30
1	17	100 yr	Existing	417.00	315.37	321.87		322.05	0.001082	4.05	156.38	50.00	0.29
1	17	100 yr	Larger Culverts	417.00	315.37	321.70		321.91	0.001243	4.26	147.97	49.66	0.31
1	16	50 yr	Existing	330.00	315.30	321.30		321.47	0.001033	3.74	131.78	49.01	0.28
1	16	50 yr	Larger Culverts	330.00	315.30	321.02		321.23	0.001336	4.12	118.10	48.45	0.31
1	16	100 yr	Existing	417.00	315.30	321.75		321.94	0.001124	4.11	154.05	49.91	0.29
1	16	100 yr	Larger Culverts	417.00	315.30	321.56		321.78	0.001318	4.35	144.54	49.52	0.31
1	15	50 yr	Existing	330.00	315.22	321.19		321.36	0.001060	3.78	130.38	48.95	0.28
1	15	50 yr	Larger Culverts	330.00	315.22	320.87		321.09	0.001430	4.22	114.64	48.30	0.32
1	15	100 yr	Existing	417.00	315.22	321.63		321.83	0.001162	4.16	152.06	49.83	0.30
1	15	100 yr	Larger Culverts	417.00	315.22	321.41		321.64	0.001396	4.45	141.21	49.39	0.32
1	14	50 yr	Existing	330.00	315.15	321.08		321.25	0.001103	3.84	128.21	48.86	0.29
1	14	50 yr	Larger Culverts	330.00	315.15	320.70		320.94	0.001574	4.37	109.80	48.10	0.34
1	14	100 yr	Existing	417.00	315.15	321.51		321.71	0.001218	4.23	149.20	49.71	0.30
1	14	100 yr	Larger Culverts	417.00	315.15	321.25		321.50	0.001512	4.58	136.66	49.21	0.34
1	13	50 yr	Existing	330.00	315.07	320.96		321.14	0.001142	3.88	126.35	48.78	0.29
1	13	50 yr	Larger Culverts	330.00	315.07	320.51		320.77	0.001756	4.55	104.42	47.88	0.35
1	13	100 yr	Existing	417.00	315.07	321.37		321.58	0.001273	4.30	146.57	49.61	0.31
1	13	100 yr	Larger Culverts	417.00	315.07	321.07		321.34	0.001648	4.73	131.84	49.01	0.35
1	12	50 yr	Existing	330.00	315.00	320.83	318.25	321.02	0.001203	3.96	123.56	48.67	0.30
1	12	50 yr	Larger Culverts	330.00	315.00	320.27	318.24	320.57	0.002070	4.84	96.56	47.55	0.38
1	12	100 yr	Existing	417.00	315.00	321.23	318.69	321.45	0.001355	4.40	142.91	49.46	0.32
1	12	100 yr	Larger Culverts	417.00	315.00	320.87	318.69	321.16	0.001867	4.95	125.10	48.73	0.37
1	11.5			Culvert									
1	11	50 yr	Existing	330.00	315.00	320.48		320.74	0.001701	4.51	102.02	38.94	0.35
1	11	50 yr	Larger Culverts	330.00	315.00	319.68		320.08	0.003204	5.53	75.30	25.74	0.47
1	11	100 yr	Existing	417.00	315.00	320.87		321.18	0.001953	5.07	117.32	40.48	0.38
1	11	100 yr	Larger Culverts	417.00	315.00	320.27		320.75	0.003297	6.10	93.73	38.08	0.48
1	10	50 yr	Existing	330.00	314.65	320.36		320.57	0.001403	4.21	110.76	39.83	0.32
1	10	50 yr	Larger Culverts	330.00	314.65	319.38		319.77	0.003083	5.46	76.42	25.91	0.46
1	10	100 yr	Existing	417.00	314.65	320.72		320.99	0.001663	4.78	125.36	41.27	0.35
1	10	100 yr	Larger Culverts	417.00	314.65	319.95		320.42	0.003198	6.03	95.01	38.21	0.48
1	9.25	50 yr	Existing	330.00	314.39	320.28	317.64	320.47	0.001206	3.99	118.00	40.55	0.30
1	9.25	50 yr	Larger Culverts	330.00	314.39	319.16	317.63	319.54	0.002977	5.40	77.45	26.07	0.45
1	9.25	100 yr	Existing	417.00	314.39	320.62	318.08	320.86	0.001463	4.57	132.10	41.91	0.33
1	9.25	100 yr	Larger Culverts	417.00	314.39	319.72	318.08	320.18	0.003109	5.97	96.19	38.33	0.47
1	9.2			Culvert									
1	9	50 yr	Existing	330.00	314.30	319.68		319.96	0.001867	4.66	97.98	38.52	0.36
1	9	50 yr	Larger Culverts	330.00	314.30	318.97		319.37	0.003251	5.56	74.88	25.67	0.47
1	9	100 yr	Existing	417.00	314.30	320.12		320.44	0.002030	5.14	115.44	40.29	0.39
1	9	100 yr	Larger Culverts	417.00	314.30	319.57		320.04	0.003304	6.10	93.64	38.07	0.48
1	8	50 yr	Existing	330.00	313.95	319.54		319.77	0.001556	4.37	106.02	39.35	0.34
1	8	50 yr	Larger Culverts	330.00	313.95	318.65		319.05	0.003146	5.50	75.83	25.82	0.46

HEC-RAS River: Binnekill Reach: 1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	8	100 yr	Existing	417.00	313.95	319.96		320.25	0.001737	4.86	123.13	41.05	0.36
1	8	100 yr	Larger Culverts	417.00	313.95	319.25		319.72	0.003207	6.04	94.88	38.20	0.48
1	7.25	50 yr	Existing	330.00	313.69	319.45	316.94	319.66	0.001344	4.15	112.78	40.03	0.31
1	7.25	50 yr	Larger Culverts	330.00	313.69	318.43	316.94	318.81	0.003054	5.44	76.70	25.95	0.46
1	7.25	100 yr	Existing	417.00	313.69	319.86	317.38	320.11	0.001533	4.65	129.62	41.68	0.34
1	7.25	100 yr	Larger Culverts	417.00	313.69	319.02	317.38	319.48	0.003122	5.98	96.02	38.32	0.47
1	7.1			Culvert									
1	7	50 yr	Existing	330.00	313.60	318.19		318.61	0.003500	5.69	72.80	25.35	0.49
1	7	50 yr	Larger Culverts	330.00	313.60	318.19		318.61	0.003500	5.69	72.80	25.35	0.49
1	7	100 yr	Existing	417.00	313.60	318.80		319.31	0.003500	6.23	91.25	37.82	0.50
1	7	100 yr	Larger Culverts	417.00	313.60	318.80		319.31	0.003500	6.23	91.25	37.82	0.50
1	6	50 yr	Existing	330.00	313.25	317.84		318.26	0.003500	5.69	72.80	25.35	0.49
1	6	50 yr	Larger Culverts	330.00	313.25	317.84		318.26	0.003500	5.69	72.80	25.35	0.49
1	6	100 yr	Existing	417.00	313.25	318.45		318.96	0.003500	6.23	91.25	37.82	0.50
1	6	100 yr	Larger Culverts	417.00	313.25	318.45		318.96	0.003500	6.23	91.25	37.82	0.50
1	5	50 yr	Existing	330.00	312.90	317.49		317.91	0.003500	5.69	72.80	25.35	0.49
1	5	50 yr	Larger Culverts	330.00	312.90	317.49		317.91	0.003500	5.69	72.80	25.35	0.49
1	5	100 yr	Existing	417.00	312.90	318.10		318.61	0.003500	6.23	91.25	37.82	0.50
1	5	100 yr	Larger Culverts	417.00	312.90	318.10		318.61	0.003500	6.23	91.25	37.82	0.50
1	4	50 yr	Existing	330.00	312.55	317.14		317.56	0.003500	5.69	72.80	25.35	0.49
1	4	50 yr	Larger Culverts	330.00	312.55	317.14		317.56	0.003500	5.69	72.80	25.35	0.49
1	4	100 yr	Existing	417.00	312.55	317.75		318.26	0.003500	6.23	91.25	37.82	0.50
1	4	100 yr	Larger Culverts	417.00	312.55	317.75		318.26	0.003500	6.23	91.25	37.82	0.50
1	3	50 yr	Existing	330.00	312.20	316.79		317.21	0.003500	5.69	72.80	25.35	0.49
1	3	50 yr	Larger Culverts	330.00	312.20	316.79		317.21	0.003500	5.69	72.80	25.35	0.49
1	3	100 yr	Existing	417.00	312.20	317.40		317.90	0.003500	6.23	91.25	37.82	0.50
1	3	100 yr	Larger Culverts	417.00	312.20	317.40		317.90	0.003500	6.23	91.25	37.82	0.50
1	2	50 yr	Existing	330.00	311.85	316.44		316.86	0.003500	5.69	72.80	25.35	0.49
1	2	50 yr	Larger Culverts	330.00	311.85	316.44		316.86	0.003500	5.69	72.80	25.35	0.49
1	2	100 yr	Existing	417.00	311.85	317.05		317.55	0.003500	6.23	91.25	37.82	0.50
1	2	100 yr	Larger Culverts	417.00	311.85	317.05		317.55	0.003500	6.23	91.25	37.82	0.50
1	1	50 yr	Existing	330.00	311.50	316.09	314.74	316.51	0.003500	5.69	72.80	25.35	0.49
1	1	50 yr	Larger Culverts	330.00	311.50	316.09	314.75	316.51	0.003500	5.69	72.80	25.35	0.49
1	1	100 yr	Existing	417.00	311.50	316.70	315.18	317.20	0.003501	6.23	91.25	37.81	0.50
1	1	100 yr	Larger Culverts	417.00	311.50	316.70	315.18	317.20	0.003501	6.23	91.25	37.81	0.50

APPENDIX C

General Stream Management Recommendations

Stream Management Program Recommendations

The LFA process highlighted many of the general recommendatiions adopted by Denning and Neversink in their Rondout and Neversink Stream Management Plans. These sections are included here because they describe comprehensive solutions that serve both the Towns of Denning and Neversink and the target audiences of the Rondout and Neversink watersheds.

Flood Protection

The impact of floods on private property, public infrastructure and the quality of life have historically been a primary concern of many watershed stakeholders and continues today, as indicated by the Streamside Landowner Survey (Gilmour 2009). Though the valley is highly prone to flood events due to its local climate, topography and geology, stakeholders can work proactively to reduce or prevent some of their impacts. Flood-related damages and recovery expenses strain local resources and disrupt the fragile economy of the community. The recommendations in the following section represent on-going projects and proposed initiatives which could be implemented to reduce flood impacts.

Selective Stream Gravel Management

Recommended: that an independent stream scientist is funded to create a guidance document with recommendation on how, when and where to scientifically manage problematic gravel deposits with the Rondout Creek watershed.

Notes: Numerous concerns have been expressed regarding current policies and regulations restricting gravel removal. It is the Stream Management Program's role to investigate these issues by advancing discussion with the appropriate regulatory agencies.

Debris Management

Recommended: that a protocol be developed for the inventory of floodplain debris and assistance to municipalities and communities in debris management.

Notes: Develop protocol to ensure responsible floodplain management, including annual clean-up efforts, prevention of illegal dumping, and flood event debris management. The Program Team may need to explore issues of landowner liability for managing large woody debris. Removal of large woody debris would focus on areas that pose a flood hazard to

infrastructure and a threat to human welfare.

Post-Flood Technical Assistance

Recommended: to work cooperatively on improving immediate post-flood emergency intervention capabilities through demonstration and training with contractors and local municipalities in scientifically-based stream principles, procedures and methods.

Notes In many areas post-flood work unravels stream systems more than any other non-flood work combined. Using Delaware County SWCD's contractor training workshop as a model, provide local contractors and highway superintendents with training on regional hydraulic relationship curves, natural stream restoration principles and techniques, and identifying best management post-flood intervention techniques.

Highway Activities and Infrastructure for Water Quality Improvement

Recommended: that the Town and County Highway Departments and NYSDOT integrate geomorphology principles in all new projects and routine maintenance activities related to the Rondout Creek stream system.

Notes: Road/drainage infrastructure improvements are of particular interest to respondents of the Streamside Landowner Survey (Gilmour 2009). Activities related to maintenance of highway infrastructure accounts for the vast majority of stream management activities. Highway activities including maintenance, new construction and flood response, can greatly benefit from consideration of stream process. One possible area for collaboration is the creation of a protocol to evaluate existing culverts and bridges following geomorphic principles, and working together to prioritize and design culverts for retrofitting and replacement where necessary.

Stream Stability Restoration

Recommended: Secure funding commitments for additional unfunded restoration projects on the Rondout Creek as discussed in individual management segments.

Notes: In this Plan, the Project Team identified a number of reaches which are strongly recommended for restoration. Additional restoration sites should be prioritized, ranked and continuing funding sought.

Historic & Current Condition Analysis & Documentation

Recommended: that historical records for precipitation metrics be analyzed so current trends in precipitation amount, intensity, timing of snowmelt and other forces potentially affecting flood frequency and stream flow response can be shared with planners seeking to mitigate their effects.

Flood Response Technical Resources

Recommended: that trained professionals be identified to provide onsite guidance for stream modifications immediately following flooding. Guidelines that integrate stream form and function should be developed for use during post flood response.

Notes: The existing approach to flood management of patching flood damage without stream process knowledge wastes limited funding, may leave localities more vulnerable to future floods and may create liability for already devastated communities. Guidelines for work on flood damaged with minimal stream disturbance would greatly reduce risk of further instability. Stream professionals can provide for rapid and coordinated expert review and guidance on a regional basis during planning, funding, permitting and construction phases of flood remediation.

Flood Damage Prevention Library

Recommended: that the Program Team develop a "one stop shop" for public distribution of National Flood Insurance Program publications; and that an annual notice be published in local newspapers providing notification about the availability of this flood damage prevention library.

Notes: FEMA, the National Association of Floodplain Managers and others have developed extensive materials to assist watershed stakeholders in making sound development decisions related to flooding and flood damage prevention.

Flood Ordinance Review

Recommended: that the Towns of Denning and Neversink conduct a review of current floodplain ordinances and consider adopting revisions that integrate broader community plans, reflect current building codes. It is also recommended that the Towns of Denning and Neversink acquire and utilize geographic information system (GIS) software to assist with floodplain mapping.

Notes: The Sullivan and Ulster County Soil and Water Conservation Districts can provide technical and administrative support to the review process in consultation with NYSDEC and the Sullivan and Ulster County Planning departments respectively.

Community Rating System

Recommended: that the Towns of Denning and Neversink consider participation in the FEMA Community Rating System.

Notes: Municipalities may be able to reduce flood insurance premium rates under the Community Rating System. The Municipalities are strongly encouraged to adopt a "No Rise/Good Neighbor" clause in their revised floodplain ordinance. A "No Rise/Good Neighbor" clause would charge townships to develop codes which would prevent new construction from causing a rise in floodwaters.

Notification

Recommended: that the Towns of Neversink and Denning facilitate periodic notification to landowners who have special flood hazard areas (SFHA) located on their property.

Notes: Recent digitization of the real property tax parcels in the NYC watershed, and the development of digital flood maps by NYSDEC can be integrated into a database which would allow for notification of landowners regarding the presence of SFHA on or near their property or business. The database can be used to develop a mailing list of properties with a SFHA present, and periodically a direct mailing can be made to each property owner.

Flood Hazard Education Sessions

Recommended: that the Towns of Denning and Neversink, working with local and state agencies, support periodic training sessions on flood related issues; and that the audience include municipal leaders, code enforcement staff, planning boards, landowners, realtors, lending institutions and others.

Notes: Knowing how to properly manage floodplains is crucial to continued safety and economic sustainability. NYSDEC and the New York State Department of State (NYSDOS) have established education programs geared to local municipalities. Better understanding of flood damage potential, stormwater implications, the NFIP, and use of Federal Insurance Rate Maps will empower local officials to make informed decisions.

Flood Damage Database

Recommended: that the Towns of Denning and Neversink facilitate development of a flood damage reporting system to track types of flooding, their location and the costs associated with flood damage.

Notes: Initially, a database would collect overall records on past floods; then localized flooding occurrences and damages could be documented. Areas with repetitive damage can be prioritized for mitigation because this cumulative cost damage data provides justification for mitigation grant program funding. Training and administrative support would ensure success.

APPENDIX D

Ulster County Hazard Mitigation Plan Excerpts

Action Worksheet	
Your plan name	***Ulster County Multi-jurisdictional Hazard Mitigation Plan***
Your community name	***Town of Denning***
Community action number	*Denning #1 - Upper Rondout Creek Infrastructure Protection - Debris Removal*
Assessing the Risk	
Hazard(s) addressed	*Flooding*
Risk finding	*Two rapidly aggrading gravel bars are re-directing streamflow alongside County Route 42/Peekamoose Road in Sundown and threatening this critical road.*
Describing the Action	
Action category	*infrastructure protection*
Action type	*flood hazard mitigation*
Action description	*Removal of two large gravel bars that direct stream flow from storm events directly at road; stream would then be re-aligned/re-dimensioned; Two locations (0.2-mile apart are in Sundown (Longitude: -74.464198, Latitude: 41.891950; Longitude: -74.465686, Latitude: 41.888883). Gravel removed would be approximately 25,000 cubic yards*
Existing, future &/or NA	*protects existing road and access to private properties*
Evaluating the Action	
Losses avoided (i.e., benefits)	*Substantially reduce damged to existing infrastructure and to neighboring private property; resulting detour would be 90 minutes*
Cost estimate	*$500,000*
Cost effectiveness (i.e., benefit/cost)	*yes, money saved in long term to proactively address known problem; beneifts are unquantifiable, but anticipated to be in excess of project costs, for a cost-effective project*
Technical	*Technically feasible.*
Political	*town is supportive, as are affected homes*
Legal	*none*
Environmental	*permit from NYSDEC would be needed*
Social	*none*
Administrative capability	*Town Highway Dept would be lead; UC DPW coordination*
Local champion	*Yes; Town of Denning town board, residents*
Other community objectives	*none*
Implementing the Action	
Priority	*High*
Local planning mechanism	*Rondout Neversink Stream Managemetn Plan; DPW has been monitoring annually and conditions worsen*
Responsible party	*Denning Town Highway; UC DPW*
Potential funding sources	*Grants*
Time line	*When grant funding becomes available*
Reporting on Progress	
Action progress status	*New action*

Action Worksheet	
Your plan name	***Ulster County Multi-jurisdictional Hazard Mitigation Plan***
Your community name	***Town of Denning***
Community action number	*Denning #2 - Rural Road Improvement Initiative*
Assessing the Risk	
Hazard(s) addressed	*Repetitive Washouts*
Risk finding	*Dirt roads that repeadetly washout in town result in a lack of access and eggress for residents (roughly 30) and emergency personnel. These sections are steep and very susceptible to washouts.*
Describing the Action	
Action category	*infrastructure protection*
Action type	*drainage improvement*
Action description	*To improve drainage along sections of these roads, installation of additional culverts and blacktopping of the road surface. Proposed action would occur at three locations in Sundown is Brooks Hill Road, Balace Road, Raymond George Road (Longitude: -74.462054, Latitude: 41.890209; Longitude: -74.464564, Latitude: 41.898763; Longitude: -74.443638, Latitude: 41.889970); In Denning hamlet, location is Coons Road and portion of Red Hill Road from its intersection with New Hill Road to its intersection with Rudolph Rd (Longitude: -74.489064; Latitude: 41.934936)*
Existing, future &/or NA	*protects existing road and access to private properties*
Evaluating the Action	
Losses avoided (i.e., benefits)	*Substantially reduce damge to existing infrastructure and to neighboring private property;*
Cost estimate	*6 miles at $146K per mile = $876,000*
Cost effectiveness (i.e., benefit/cost)	*yes, money saved in long term to proactively address known problem; beneifts are unquantifiable, but anticipated to be in excess of project costs, for a cost-effective project*
Technical	*Technically feasible.*
Political	*town is supportive, as are affected homes*
Legal	*none*
Environmental	*none;*
Social	*none*
Administrative capability	*Town Highway Dept would be lead*
Local champion	*Yes; Town of Denning town board*
Other community objectives	*none*
Implementing the Action	
Priority	*Medium*
Local planning mechanism	*2007 Town of Denning Comprehensive Plan*
Responsible party	*Denning Town Highway*
Potential funding sources	*Grants*
Time line	*When grant funding becomes available*
Reporting on Progress	
Action progress status	*New action*

Action Worksheet	
Your plan name	***Ulster County Multi-jurisdictional Hazard Mitigation Plan***
Your community name	***Town of Denning***
Community action number	*Denning #4 - Upper Rondout Creek Infrastructure Protection - Balace Road Bridge*
Assessing the Risk	
Hazard(s) addressed	*Hillslope failure*
Risk finding	*A massive failing hillslope (landslide) along the Rondout Creek below Balace Rd (near Sundown) jeopardizes several private properties and is beginning to threaten the downstream abutment of the Balace Rd bridge.*
Describing the Action	
Action category	*structural*
Action type	*stormwaater*
Action description	*This project would seek to stabilize a large failing hillslope near County Route 42/Peekamoose Road and Balace Rd which would prevent further streambank erosion in the near future that will threaten the upstream bridge. This area is very active and rock and tree material are routinely lost to the stream. Approximate length is 375'. LLongitude: -74.465113, Latitude: 41.897378*
Existing, future &/or NA	*protects existing road and access to private properties*
Evaluating the Action	
Losses avoided (i.e., benefits)	*Substantially will reduce damge to existing infrastructure and to neighboring private property*
Cost estimate	$500,000
Cost effectiveness (i.e., benefit/cost)	*yes, money saved in long term to proactively address known problem; beneifts are unquantifiable, but anticipated to be in excess of project costs, for a cost-effective project*
Technical	*Technically feasible.*
Political	*town is supportive, as are affected homes*
Legal	*none*
Environmental	*NYSDEC permits required*
Social	*none*
Administrative capability	*Town Highway Dept would be lead*
Local champion	*Yes; Town of Denning town board*
Other community objectives	*none*
Implementing the Action	
Priority	*Medium*
Local planning mechanism	*Denning DPW has monitired site over several years and coniditions continue to worsen*
Responsible party	*Denning Town DPW*
Potential funding sources	*Grants*
Time line	*When grant funding becomes available*
Reporting on Progress	
Action progress status	*New action*

Action Worksheet	
Your plan name	***Ulster County Multi-jurisdictional Hazard Mitigation Plan***
Your community name	***Town of Denning***
Community action number	*Denning #2 -Preemptive Infrastructure Protection - Peekamoose Road*
Assessing the Risk	
Hazard(s) addressed	*flooding*
Risk finding	*A large, and recent (appeared after TS Irene) hillslope failure along Peekamoose Rd on the upper Rondout Creek is starting to erode the base of the County Road. This problem started in 2011, and each high water event since continues to take more embankment away, causing stream to migrate toward road.*
Describing the Action	
Action category	*structural*
Action type	*drainage improvement; infrastructure protection*
Action description	*Project would stabilze the embankment where a massive hillslope failure (500' long by 100' high) is already impacting the road. After stabliziation of the toe of the embankment, the stream channel would be re-aligned to keep it away from the road. Location is Longitude: -74.450908, Latitude: 41.911057; There are additional locations, as yet to be determined, that also may need mitigation*
Existing, future &/or NA	*future and existing development*
Evaluating the Action	
Losses avoided (i.e., benefits)	*This will protect the roadway. The resulting detour , should the road wash out, is 120 minutes.*
Cost estimate	$650,000
Cost effectiveness (i.e., benefit/cost)	*public health and safety are the benefits;beneifts are unquantifiable, but anticipated to be in excess of project costs, for a cost-effective project*
Technical	*Technically feasible.*
Political	*Town Board is supportive and will coordinate and support Ulster County.*
Legal	*none*
Environmental	*will improve the environment by preventing erosion; NYSDEC permit needed*
Social	*none*
Administrative capability	*Town of Denning DPW would be lead; coordination with County of Ulster*
Local champion	*Yes; Town of Denning town board*
Other community objectives	*economic development*
Implementing the Action	
Priority	*High*
Local planning mechanism	*Town officials have been monitoring locations closely and have recommended remediation.*
Responsible party	*Denning DPW*
Potential funding sources	*Grants*
Time line	*When grant funding becomes available*
Reporting on Progress	
Action progress status	*New action*

Action Worksheet	
Your plan name	***Ulster County Multi-jurisdictional Hazard Mitigation Plan***
Your community name	***Town of Denning***
Community action number	*Denning #10 -Preemptive Infrastructure Protection - Peekamoose Road at Peekamoose Lake*
Assessing the Risk	
Hazard(s) addressed	*flooding*
Risk finding	*A recent (appeared after TS Irene) embankment failure along Peekamoose Rd on the upper Rondout Creek, just downstream of the impoundment at Peekamoose Lake is starting to erode the base of the Town Road. This problem started in before 2011, and each high water event since continues to take more embankment away, causing stream to migrate toward road.*
Describing the Action	
Action category	*structural*
Action type	*drainage improvement; infrastructure protection*
Action description	*Project would stabilze the embankment (and additional locations, as yet to be determined) where a small, but very active road embankment failure is threatening the integrity of the Town Rd. After stabliziation of the embankment, the stream channel would be re-aligned to keep it away from the road. Location is Longitude: Longitude: -74.380699, Latitude: 41.927073*
Existing, future &/or NA	*future and existing development*
Evaluating the Action	
Losses avoided (i.e., benefits)	*This will protect the roadway. The resulting detour , should the road wash out, is 120 minutes.*
Cost estimate	$200,000
Cost effectiveness (i.e., benefit/cost)	*public health and safety are the benefits; beneifts are unquantifiable, but anticipated to be in excess of project costs, for a cost-effective project*
Technical	*Technically feasible.*
Political	*Town Board is supportive*
Legal	*none*
Environmental	*will improve the environment by preventing erosion; NYSDEC permit needed*
Social	*none*
Administrative capability	*Town DPW would be lead*
Local champion	*Yes; Town of Denning town board*
Other community objectives	*economic development*
Implementing the Action	
Priority	*Low*
Local planning mechanism	*Rondout Neversink Stream Management Plan*
Responsible party	*Town Denning DPW*
Potential funding sources	*Grants*
Time line	*When grant funding becomes available*
Reporting on Progress	
Action progress status	*New action*

Action Worksheet	
Your plan name	***Ulster County Multi-jurisdictional Hazard Mitigation Plan***
Your community name	***Town of Denning***
Community action number	*Denning #11 -Preemptive Infrastructure Protection - Raymond George Rd*
Assessing the Risk	
Hazard(s) addressed	*landslide*
Risk finding	*This project would remediate an ongoing hillslope failure along Raymond George Road that requires ongoing attention and maintance by the Town.*
Describing the Action	
Action category	*structural*
Action type	*infrastructure protection*
Action description	*This project would stabilize and protect more than 300' of hilllslope (200' high) which continues to deteriorate and slide onto a town-owned road. Stabliziation with a large rock wall would be designed for the embankment. Location is Longitude: -74.445282, Latitude: 41.888714*
Existing, future &/or NA	*future and existing development*
Evaluating the Action	
Losses avoided (i.e., benefits)	*This will protect the roadway*
Cost estimate	$250,000
Cost effectiveness (i.e., benefit/cost)	*public health and safety are the benefits;*
Technical	*Technically feasible.*
Political	*Town Board is supportive*
Legal	*none*
Environmental	*will improve the environment by preventing erosion*
Social	*none*
Administrative capability	*Town DPW would be lead*
Local champion	*Yes; Town of Denning town board*
Other community objectives	*economic development*
Implementing the Action	
Priority	*Low*
Local planning mechanism	*DPW has been monitoring location for several years and mitigation is recommended in the near future.*
Responsible party	*Town Denning DPW*
Potential funding sources	*Grants*
Time line	*When grant funding becomes available*
Reporting on Progress	
Action progress status	*New action*

Action Worksheet	
Your plan name	*Ulster County Multi-jurisdictional Hazard Mitigation Plan*
Your community name	*Town of Denning*
Community action number	*Denning #14 - Upper Rondout Creek Preemptive Stormwater Mitigation*
Assessing the Risk	
Hazard(s) addressed	*Flooding*
Risk finding	*Two under-sized culverts (0.4-mile apart) routinely become over-topped with flood flows during heavy storms that force the Town to close Peekamoose Rd (a crucial road that serves half of the town in an extremely remote area) prevent ingress/egress by residents and emergency personnel.*
Describing the Action	
Action category	*structural*
Action type	*drainage improvement*
Action description	*This project would resize (based upon results of H&H analysis) a 6' culvert pipe to a concrete box culvert - likely 8' x 8' to better convey stormwater underneath a crucial road in the most populated location along this rural mountain road. A second mitigation action (0.4-mile up the valley on another small tributary) would replace an antiquated and vastly undersized 14' long bridge to a span of at least 18' in length. The debris that has accumulated in the channel upstream of each structure woudl also be cleaned out so that conveyance is maximized.*
Existing, future &/or NA	*protects existing and future development*
Evaluating the Action	
Losses avoided (i.e., benefits)	*Substantially reduce damage to existing infrastructure and to neighboring private property; resulting detour would be 180 minutes*
Cost estimate	*$125,000*
Cost effectiveness (i.e., benefit/cost)	*yes, money saved in long term to proactively address known problem; beneifts are unquantifiable, but anticipated to be in excess of project costs, for a cost-effective project*
Technical	*Technically feasible.*
Political	*none*
Legal	*none*
Environmental	*permit from NYSDEC would be needed*
Social	*none*
Administrative capability	*Town Highway Dept*
Local champion	*Town of Denning town board, residents*
Other community objectives	*none*
Implementing the Action	
Priority	*Medium*
Local planning mechanism	*Rondout Neversink Stream Management Plan; DPW has been monitoring annually and conditions worsen*
Responsible party	*Denning Town Highway;*
Potential funding sources	*Grants*
Time line	*When grant funding becomes available*
Reporting on Progress	
Action progress status	*New action*