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Engineering • Surveying • Planning

RISE GRASS VALLEY INC.

FLOODPLAIN MANAGEMENT PLAN

for

Centennial Industrial Site
of the
Idaho Maryland Mine Project

Prepared by:

Nevada City Engineering, Inc.

REGISTERED PROFESSIONAL ENGINEER
ROBERT M. ROURKE
No. 29650
Exp. 3-31-21
CIVIL
STATE OF CALIFORNIA

January 2020

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I. REPORT COVER

Report Date: January 2020

Report Preparer: Robert M. Rourke, P.E.
Nevada City Engineering, Inc.

Project Site: Centennial Industrial Site

Project Site Location: SECTION 26, T.16N, R.8E

CENTENNIAL INDUSTRIAL SITE		
Assessor Parcel Number	**Site Address**	**Lot Size (Acres)**
009-550-032	N/A	20,908 SF (0.48 AC)
009-550-037	10344 Centennial Drive	4.47 AC
009-550-038	10350 Centennial Drive	40.1 AC
009-550-039	10344 Centennial Drive	42,668 SF (0.98 AC)
009-550-040	N/A	5,662 SF (0.13 AC)
009-560-036	10350 Centennial Drive	10.25 AC
Centennial Industrial Site - Land Total:		**56.41 AC**

Property Owner / Applicant: Rise Grass Valley, Inc.
PO Box 271
Grass Valley, CA 95945

Principal Investigators: Robert M. Rourke, P.E.

II. INTRODUCTION

II.1 Introduction

This Management Plan is prepared pursuant to Sec. L-II 4.3.3.C of the Nevada County Zoning Regulations, to minimize the impacts of development on environmentally sensitive resources and/or constraints. The Floodplain Management Plan has been prepared by Nevada City Engineering, Inc. ("NCE") for Rise Grass Valley Inc. ("Rise") for the Centennial Industrial Site ("Centennial Site") of the Idaho-Maryland Mine Project ("IMM Project").

The Federal Emergency Management Agency (FEMA) has identified the 100-year frequency floodplain along Wolf Creek, a perennial stream, in Nevada County. Wolf Creek flows in a westerly direction across the northern boundary of the Centennial Site. A Flood Insurance Rate Map (FIRM), an official map of a community, was developed for Nevada County and Grass Valley in the vicinity of the Centennial Site with an effective date of 02/03/2010 (FEMA, 2020). The FIRM delineates both the Special Flood Hazard Areas (SFHA) and the risk premium zones applicable.

The proposed development of the Centennial Industrial Site for the Idaho-Maryland Mine Project has been designed to remain outside the limits of the 100-year floodplain or SFHA.

II.2 Nevada County Land Use and Development Code

The Nevada County Land Use and Development Code, Chapter II: Zoning Regulations, Sec. L-II 4.3.10 requires that for projects with development located within 100 feet of the limits of the 100-year floodplain, a Floodplain Management Plan prepared by a registered professional engineer and consistent with Federal Emergency Management Agency (FEMA) standards, shall be prepared that minimizes impacts to the floodplain. The purpose is to mitigate the impact of development on floodplains and to protect development and downstream users from potential hazards associated with flooding.

Nevada County Land Use and Development Code, Chapter XII: Floodplain Management Regulations provides the floodplain management criteria for all development in areas of special flood hazard within the unincorporated areas of Nevada County.

As per Nevada County LUDC Sec. L-XII 1.5 (C.1.a), all new subdivision proposals and other proposed development greater than 50 lots or 5 acres, whichever is lesser, shall identify the Special Flood Hazard Areas (SFHA) and Base Flood Elevations (BFE).

A community's floodplain regulations are designed to ensure that new buildings will be protected from the flood levels shown on the FIRM and that development will not make the flood hazard worse (FEMA, 2005).

II.3 Federal Emergency Management Agency (FEMA)

FEMA, through the National Flood Insurance Program (NFIP), defines Floodplain Management Requirements. The floodplain management requirements incorporate floodplain management strategies that can be applied at the local level (FEMA, 2019).

Floodplain management is a decision-making process that aims to achieve the wise use of the nation's floodplains. "Wise use" refers to both reduced flood losses and protection of the natural resources and function of floodplains (FEMA, 2005).

The NFIP regulations can be found in Chapter 44 of the *Code of Federal Regulations* (44 CFR). A majority of the applicable regulation is found in 44 CFR Parts 59, 60, 65, and 70. Of particular importance is 44 CFR Part 60: Criteria for Land Management and Use.

FEMA, through the National Flood Insurance Program has set a national standard for regulating new development in floodplains. The Federal Interagency Floodplain Management Task Force has identified four floodplain management strategies, each strategy is supported by an array of tools (FEMA, 2005):

Strategy 1: Modify human susceptibility to flood damage.
Reduce disruption by avoiding hazardous, uneconomic or unwise use of floodplains.

Strategy 2: Modify the impact of flooding.
Assist individuals and communities to prepare for, respond to and recover from a flood.

Strategy 3: Modify flooding itself.
Develop projects that control floodwater.

Strategy 4: Preserve and restore natural resources.
Renew the vitality and purpose of floodplains by re-establishing and maintaining floodplain environments in their natural state.

III. SUMMARY OF MANAGEMENT PLAN CONCLUSIONS AND RECOMMENDATIONS

This Floodplain Management Plan has been prepared for the Centennial Industrial Site in conformance with the requirements of the County of Nevada. It is based upon the materials submitted by Rise Grass Valley, Inc in support of its Conditional Use Permit Application for the Idaho-Maryland Mine Project consisting of the Brunswick Industrial Site and the Centennial Industrial Site.

A summation of the Conclusions and Recommendations of this Floodplain Management Plan is as follows:

1. Grading and land disturbance within the limits of the SFHA (100-year floodplain) of Wolf Creek should be avoided.

2. The 100-year floodplain boundary should be delineated by appropriate means on Centennial Site prior to construction commencing to ensure that construction activities remain outside the 100-year floodplain.

3. Any temporary disturbance of ground by construction within 100 feet of the 100-year floodplain, that is outside the designed development, should be mitigated by regrading to emulate the original ground contours.

4. Sediment and erosion control measures, in accordance with industry accepted Best Management Practices (BMPs), should be maintained during the grading operation at all times and permanent sediment and erosion control measures should be installed upon completion of grading.

5. As early as practicable once the engineered fill operation has begun, the detention basin proposed in the Preliminary Drainage Analysis & Detention Study by Nevada City Engineering, Inc. should be installed and made operational. During the grading operation, sediment and erosion control measures should be maintained in place on the fill pad to avoid silt and runoff from the pad proceeding over the slope toward the stream below, and to direct runoff to the detention basin which is to be constructed at the northwest corner of the fill area. During this time runoff from the engineered fill pad area should concurrently be directed to this basin for both its detention and de-siltation benefits.

IV. PROPERTY DESCRIPTION

IV.1 Project Setting

The Floodplain Management Plan includes a full coverage assessment of the 56.4-acre Centennial Industrial Site; see Appendix A for Centennial Site Plan (Figure 2). The recorded owner of the surface land which comprises the Centennial Industrial Site is Rise Grass Valley Inc.

The Centennial Industrial Site is located in western unincorporated Nevada County, California. The Centennial Site is located adjacent to the Grass Valley city limits and site access is from Whispering Pines Lane. The elevation of the site ranges from approximately 2,500 to 2,600 feet above mean sea level (MSL). The Centennial Site is bordered by Idaho Maryland Road on the northern boundary, Centennial Drive and Whispering Pines Lanes along the northeast boundary, DeMartini RV Sales along the western boundary, commercial development along the eastern boundary, and privately-owned industrial land along the southern boundary. Overall, the project area is surrounded by private commercial and industrial land use and zoning.

IV.2 Centennial Industrial Site Characterization

The Centennial Site has been disturbed by historic mining and lumber mill practices, public access, and vegetation removal, among other disturbances, for many years. The Centennial Site is part of the original land holdings of the historic Idaho-Maryland Mine, which operated between approximately 1851 and 1956. The Centennial Site was the location of the mine tailings storage area for the larger mine site. The site drains into the main stem of Wolf Creek via a decant tower located in the northwest portion of the site. During the 1930s, the Idaho-Maryland Mine operated a mineral processing plant, located adjacent and to the east of the Centennial Site. The results of historic mine tailing deposition on the Centennial Site are still evident across the site (Matuzak, 2019).

The Centennial Site includes the main stem of Wolf Creek, a perennial stream. The main stem of Wolf Creek generally runs parallel to and immediately south of Idaho Maryland Road along the northern boundary of the Centennial Industrial Site. The interior of the site is dominated by mixed hardwood-conifer forests, with areas of montane riparian woodland, mixed chaparral, mixed wetland types, and annual grassland (Matuzak, 2019). The Centennial Site Plan (Figure 2) is included in Appendix A.

IV.3 Centennial Industrial Site Resources

Floodplain natural resources include the soils, nutrients, water quality and quantity, and diverse species of plants and animals that exist between the water's edge and the higher ground adjoining flood-prone areas. These can be considered as natural "infrastructure". In recognizing the relationships between the hydrological, geological, and biological features of these systems, it is understood how changes to one feature can alter the entire system in significant ways (Smardon and Felleman, 1996).

Biological and cultural resources are described and discussed under separate cover:

- InContext Cultural Resources Solutions (InContext). Cultural Resources Survey Report for the Idaho-Maryland Mine Project Nevada County, California. November 2019.
- Greg Matuzak Environmental Consulting LLC (Matuzak). Centennial Industrial Site Biological Resources Assessment. November 2019.
- Greg Matuzak Environmental Consulting LLC (Matuzak). Technical Memorandum for Centennial Industrial Site: Idaho-Maryland Mine Project – Biological Resources Impact Assessment. November 2019.

The FEMA Flood Insurance Rate Map (FIRM) identifies Special Flood Hazard Areas along the north and south side of Wolf Creek on the Centennial Industrial Site. The FIRM Panel 0631E includes the Centennial Industrial Site. A copy of FIRM Map Number 06057C0631E is presented as Figure 3 in Appendix B (FEMA, 2020).

The SFHA encompasses 2.31 acres on the Centennial Site, as shown on Figure 2. Within the Centennial Site, a portion of the floodplain extends across developed and previously disturbed areas, including the former Hap Warnke Sawmill Site. In addition, the floodplain extends on to portions of the adjacent Idaho Maryland Road and Centennial Road.

V. PROJECT DESCRIPTION

V.1 Project Description

Rise Grass Valley Inc. (Rise) proposes to reinitiate underground mining and gold mineralization processing of the Idaho-Maryland Mine (the "project") in unincorporated Nevada County. The proposed facilities and operations will be located on two properties owned by Rise referred to as the Brunswick Industrial Site and the Centennial Industrial Site. The project comprises five primary elements:

1. dewatering the existing underground mine workings,
2. mining existing and new underground mine workings,
3. processing gold mineralization and rock,
4. placing engineered fill at the Brunswick and Centennial Industrial Sites, and
5. export of engineered fill from the Brunswick Industrial Site to support local construction projects.

The majority of aboveground facilities, the access to the underground mining, the treated-water outfall structure, and a portion of the engineered fill will be located on Rise's 119-acre Brunswick Industrial Site. Engineered fill will also be placed on Rise's 56-acre Centennial Industrial Site.

As a component of the mine project, Rise proposes to grade the Centennial Industrial Site to create usable industrial property for potential future development. Grading of the Centennial Site will utilize engineered fill material produced from mining operations at the Brunswick Industrial Site. Development of the Centennial Industrial Site into an industrial subdivision is not part of the proposed IMM Project and is not proposed by Rise.

Certain zones within the approximate 56-acre Centennial Site contain elevated metal concentrations from historical land use. Rise is working with the California Department of Toxic Substances Control (DTSC) to fully remediate the site by developing a plan that consolidates and caps the contaminated soils in a manner consistent with current federal and state regulations.

The environmental cleanup work at the Centennial Site will be completed under the DTSC voluntary cleanup program and is a separate project from the IMM Project. It is estimated that the cleanup program will cause a surface disturbance of between 16 and 33 acres. Contaminated soils are not expected within the 100-year floodplain based on current information provided by Rise Grass Valley.

After the environmental cleanup work at the Centennial Site is complete, Rise proposes to truck engineered fill from the Brunswick Site to the Centennial Site. The engineered fill, composed of barren rock and sand, will be placed, graded, and compacted. Concurrent with fill and grading activities, the fill slopes will be revegetated to control erosion and ensure slope stability. The designed stormwater detention basin and related outlet works, which have capacity to detain net outflows to less than or equal to the pre-development 100-year frequency storm flow, will be

installed as early as is feasible near the northwest corner of the Centennial Site. The outlet from the stormwater detention basin will indirectly discharge to the main stem of Wolf Creek utilizing the existing historic decant tower and its outfall.

V.2 Design Features

The Idaho-Maryland Mine Project proposes development across approximately 44 acres of the Centennial Site, although much of the area will have experienced surface disturbance by site remediation efforts. Project development (disturbance and engineered fill placement) will be avoided on the remaining ~12 acres of the Centennial Site, which includes the main stem of Wolf Creek and an undisturbed zone containing Pine Hill flannelbush, a special-status plant species protected under the federal Endangered Species Act. In addition, the Project footprint has been designed to remain outside the SFHA (100-year floodplain) of Wolf Creek. Refer to Figure 2 in Appendix B for the Centennial Site Plan.

The Centennial Site design incorporates a Preliminary Drainage Analysis to demonstrate how post project storm-water discharge from the Centennial Site will be equal to or less than the estimated pre-project storm-water discharge levels. With the construction of the storm-water detention pond, as shown in Figure 2, the Project will have no impact nor result in any increase of flows to Wolf Creek during storm events (NCE, 2019). As currently designed, the detention facilities will result in a net decrease of flows exiting the project site into Wolf Creek during the storm events analyzed.

VI. ANALYSIS OF POTENTIAL IMPACTS

VI.1 FEMA Basic Rules

The FEMA 480 Document, *National Flood Insurance Program Floodplain Management Requirements, A Study Guide and Desk Reference for Local Officials*, prepared by FEMA in February 2005 (FEMA, 2005) provides explanation on FEMA regulations and management requirements, as well as strategies and best practices.

Unit 5: The NFIP Floodplain Management Requirements of the FEMA 480 Document incorporates various basic rules:

Basic Rule #1: Check to make sure you have the latest flood maps and data published by FEMA. You must use the latest maps to administer your floodplain management ordinance.

Basic Rule #2: A permit is required for all development in the SFHA shown on your FIRM.

Basic Rule #3: Development must not increase the flood hazard on other properties.

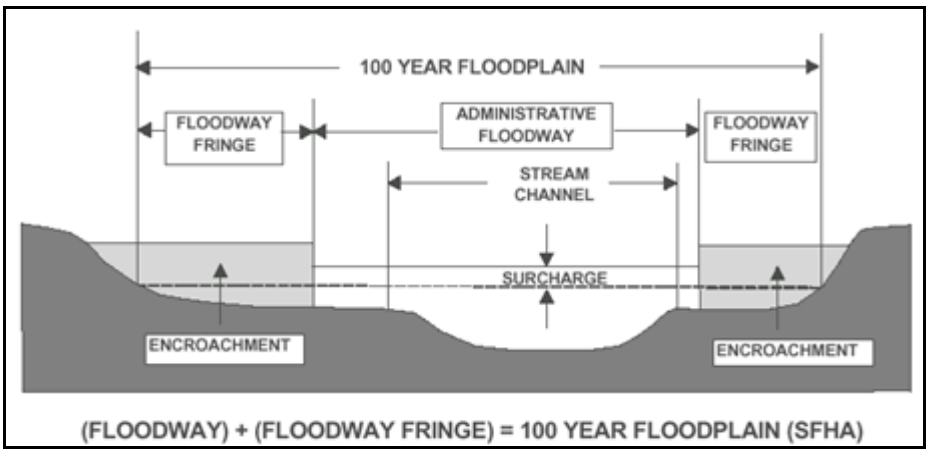
Basic Rule #4: New, substantially improved or substantially damaged buildings must be protected from damage by the base flood.

Basic Rule #5: Due to wave impacts, V Zones have special building protection standards in addition to the requirements for A Zones.

VI.2 Floodway Encroachment

All projects located within the regulatory floodway must undergo an encroachment review to determine their effect on flood flows and ensure that they do not cause problems. In accordance with the NFIP definition of Flood Fringe, as the portion of the floodplain lying on either side of the floodway, development projects in the flood fringe by definition do not increase flood heights above the allowable level (typically 1.0 feet), so encroachment reviews are not needed (FEMA, 2005). See Figure 1 below for a floodway schematic.

FIGURE 1: FLOODWAY SCHEMATIC



Note: Definitions for floodplain terms are presented in Appendix A.

VI.3 Floodplain Evaluation

FEMA has issued two kinds of maps (FEMA, 2005):

1. Flood Hazard Boundary Map (FHBM): Shows the boundaries of the floodplain using approximate methods.
2. Most communities have had their FHBMs replaced by a Flood Insurance Rate Map, or FIRM. A FIRM usually is based on a Flood Insurance Study and includes flood elevations and other hazard information needed to better protect new construction from flood damage.

A FIRM has been developed for Nevada County and Grass Valley in the vicinity of the Centennial Industrial Site which is dated effective 02/03/2010. The FEMA Flood Insurance Rate Map (Map Number 06057C0631E) identifies Special Flood Hazard Areas along the north and south side of Wolf Creek on the Centennial Site, as presented in Figure 3 in Appendix B (FEMA, 2020). Delineation of the 100-year floodplain (from the FIRM) on the Centennial Site Plan, Figure 2, shows that the Project footprint is outside the Special Flood Hazard Area (100-year floodplain). However, approximately 0.55 acres of the engineered fill placement encroaches into the County of Nevada mandated 100 foot zone beyond the 100-year floodplain limit, necessitating this Floodplain Management Plan.

VI.4 Assessment Considerations

Concerns related to development within floodplains include (Smardon and Felleman, 1996):

- The loss of natural floodplain functions in heavily developed areas not only impedes flood storage, but also increases erosion and reduces the mitigation effects that vegetated areas can have on the pollution of waterways.

- Impermeable surfaces replace vegetation as ground cover, increasing the runoff that would have infiltrated in a natural floodplain.
- The removal of vegetation, destruction of wetlands, and paving in urban and suburban settings can thus increase the risk of flooding.
- Vegetation loss and excessive runoff within the floodplain can also cause increased erosion and sedimentation.
- Upstream development outside the floodplain can also result in increased runoff.

VI.5 Minimization of Potential Impacts

The development on the Centennial Industrial Site for the Idaho-Maryland Mine Project has been designed to be outside the limits of the 100-year floodplain or SFHA. As the proposed grading at the Centennial Industrial Site is outside the SFHA/floodplain, which includes both the floodway and flood fringe, an encroachment review is not necessary (FEMA, 2005). While FEMA does not exercise any jurisdiction over, or interest in lands outside the floodway and flood fringe, the County of Nevada has mandated that in certain instances as defined in its Land Use and Development Code, Chapter XII, a Floodplain Management Plan must be prepared when development is within 100 feet of the 100-year floodplain boundary in order to minimize impacts to the floodplain.

Open spaces and/or greenways are generally considered to be compatible with the healthy functioning of floodplain ecosystems (Smardon and Felleman, 1996). The Idaho-Maryland Mine Project incorporates open space in the project design, including but not limited to the 100-foot non-disturbance buffer zone along Wolf Creek. The 100-year floodplain, as delineated by FEMA from the FIRM, is located within the 100 year non disturbance buffer zone. The portion of the 100-year floodplain which is within the limits of the Centennial Site property is 2.31 acres. The area encompassed by the Floodplain Management Plan, the 100 foot floodplain buffer zone, comprises 2.85 acres within the Centennial Site. Furthermore, no buildings are proposed on the 3:1 fill slope located to the south of the 100-year floodplain boundary. The fill slopes will be revegetated to control erosion and ensure slope stability resulting in an additional 3.91 acres of open space outside the 100-foot buffer of the 100-year floodplain boundary. Temporary erosion control measures during construction and permanent erosion control measures post construction will further protect the floodplain environment.

VII. RECOMMENDED MITIGATIONS AND CONDITIONS

From the above discussions of general FEMA Strategies, Rules, and Assessment Considerations, the following mitigation measures and conditions are recommended and have been developed in the design and planning for development of the Centennial Site to aid in preserving environmentally sensitive resources, specifically the floodplain resource.

VII.1 MITIGATION MEASURES

The following mitigation measures are measures that have been incorporated into the design of proposed development on the Centennial Site which mitigate the impact of development on floodplains, preserve the functions of the floodplains, and assist in protecting development and downstream users from the potential for hazards associated with flooding:

- Project development is located outside the mapped limits of the 100-year floodplain boundary or SFHA.
- The 100-year floodplain boundary utilized for this Floodplain Management Plan as shown on Figure 2, was obtained from the published FIRM dated 02/03/10 which has been adopted by the County of Nevada. The published FIRM (Map Number 06057C0631E) for the Centennial Site is included as Figure 3 in Appendix B (FEMA, 2020). FIRM Map Number 06057C0631E is the latest available mapping in the vicinity of the Centennial Industrial Site.
- The natural characteristics of the floodplain of the main stem of Wolf Creek will be preserved and maintained in its existing state as no disturbance will occur within the 100-year floodplain boundary or SHFA.
- Development of this project will not increase the flood hazard on other properties due to significant stormwater detention facilities on-site which will attenuate peak flows emanating from the development to less than or equal to pre-development values. The preliminary drainage analysis for the Centennial Industrial Site, is detailed in the Preliminary Drainage Analysis & Detention Basin Sizing study by Nevada County Engineering, Inc., dated October 2019. Additional site grading and/or drainage features include:
    - The preliminary grading plans incorporate drainage of stormwater from the Centennial Site to a stormwater detention facility which limits discharge from the site to less than or equal to historic pre-development values. This is done for both the 10-year and 100-year frequency storms as required by the County of Nevada. The currently proposed detention facility as analyzed reduces flows to the downstream community (NCE, 2019).
    - The preliminary grading plans include construction of a concrete V-ditch at the toe of the engineered fill slope. This facility will collect off-site drainage from the neighboring property and surface runoff from the proposed 3:1 fill slope on the northern margin of the Centennial Industrial Site and direct it towards the stormwater detention facility outlet. Consequently, these flows will not flow into the adjacent

floodplain. Final design of the concrete V ditch will, if necessary, incorporate higher walls on the downstream (northern side) so that potential flood events (if flows are higher than the mapped 100-year floodplain) do not flow into the concrete V-ditch and negatively impact the functioning of the ditch. Surface water runoff and off-site drainage will be routed to the concrete V-ditch which will reduce erosion from concentrated surface water flow.

- Any increase in runoff generated by upstream development outside the floodplain on the Centennial Industrial Site will be fully mitigated by the construction of the stormwater detention facilities and site drainage features proposed (NCE, 2019).
- No buildings are being proposed within the limits of the 100-year floodplain or within 100 feet of the 100-year floodplain. Development within 100 feet of the 100-year floodplain only includes ~0.55 acres of engineered fill and a concrete V-ditch located on the northeast corner of the Centennial Site (see Figure 2 in Appendix B).
- No significant increase in impermeable surfaces will occur within 100 feet of the 100-year floodplain. The only added impervious surface will be approximately 520 lineal feet of concrete V-ditch, as discussed above. This will have no measurable impact on drainage runoff or flooding.
- Areas within 100 feet of the 100-year floodplain which are disturbed due to construction activity will be regraded to a smooth, natural contour resembling their pre-development configuration, with the exception of ~0.55 acres of engineered fill located on the northeast corner of the proposed Centennial Industrial Site. Grading will be done in such a manner as to smoothly convey flows through the property without accelerating their transit to downstream areas. All disturbed areas will be subject to erosion control measures and protection during and after the engineered fill placement operation in order to stabilize any disturbed soil, thus eliminating the likelihood of increased erosion exiting the site toward downstream properties.
- Temporary disturbance of vegetation within 100 feet of the 100-year floodplain due to construction will be remediated by appropriate replacement plantings as recommended by the project biologist and as per the project Reclamation Plan.

VII.2 RECOMMENDED CONDITIONS

The following recommended conditions are Best Management Practices (BMPs) that are recommended to be incorporated into the construction and development of the industrial pad development project on the Centennial Industrial Site which assist in protecting development and downstream users from the potential for hazards associated with flooding:

- Grading and land disturbance within the limits of the SFHA (100-year floodplain) of Wolf Creek should be avoided.

- The 100-year floodplain boundary should be delineated by appropriate means on Centennial Site prior to construction commencing to ensure that construction activities remain outside the 100-year floodplain.
- Sediment and erosion control measures, in accordance with industry accepted Best Management Practices (BMPs), should be used during and after construction as needed to reduce erosion and retain sediment within the construction area. Typical BMPs include seeding, mulch, straw with jute netting, tackifiers, fiber rolls, silt fences, rock/log check dams and sediment traps.
- Sediment and erosion control measures should be maintained during the grading operation and permanent sediment and erosion control measures should be installed upon completion of grading.
- Existing vegetation should be preserved to the extent practical, and exposed soil should be protected from wind and water erosion. Graded portions of the site should be seeded as soon as possible following grading, as per Rise's Reclamation Plan. Any temporary disturbance of ground by construction within 100 feet of the 100-year floodplain, that is outside the designed development, should be remediated by regrading to emulate the original ground contours.
- As early as practicable once the engineered fill development has begun, the detention basin proposed in the Preliminary Drainage Analysis & Detention Study by Nevada City Engineering, Inc. should be installed and made operational. During the grading operation, erosion control measures should be maintained in place on the fill pad to avoid silt and runoff from the pad proceeding down the fill slope towards Wolf Creek, and to direct all runoff to the detention basin which is to be constructed at the northwest corner of the fill area. During this time all potential runoff from the engineered fill pad area should concurrently be directed to this basin for both its detention and de-siltation benefits.
- It is anticipated that a storm water pollution prevention plan (SWPPP) will be required for the project. The sediment and erosion control elements, as well as the monitoring requirements, of the SWPPP should be implemented to reduce the likelihood of storm water pollution.

VIII. JUSTIFICATION TO SUPPORT MANAGEMENT PLAN

Avoidance of development within the 100-year floodplain of Wolf Creek on the Centennial Site has been achieved within and through the project design.

This Floodplain Management Plan is being submitted as required by the County of Nevada, as a part of the overall Use Permit application for the Centennial Industrial Site component of the Idaho-Maryland Mine Project, as development will occur within 100 feet of the SFHA.

The Floodplain Management Plan has been prepared to incorporate best practices and considerations so that development adjacent to the floodplain does not impact the floodplain or cause increased runoff. Additionally, practical measures have been incorporated so that potential flood activities do not impact the project infrastructure.

IX. STATEMENT OF QUALIFICATIONS

Robert M. Rourke, P.E., principal engineer with Nevada City Engineering, Inc. has been licensed as a civil engineer in the State of California for 42 years, and the States of Colorado and Utah for 37 years. He has had, since 1986, his own firm, RMR Design Group, and has begun work with Nevada City Engineering in 2018. He has performed extensive work as a hydraulic engineer, having worked on the analysis and design of complex drainage systems throughout Southern California, Northern California, and the Denver Metropolitan area. In the earliest days of the National Flood Insurance Program he did extensive amounts of hydraulic modeling for Flood Insurance Studies throughout San Bernardino, Riverside, and Ventura Counties. This experience included the analysis of complex riverine floodplains with multiple break outs which had to be tracked individually and with difficult unpredictable alluvial fan environments. This work led to involvement in the development of techniques for anticipating and rating flows on alluvial fans leading to newly defined forms of flood zones which were later codified into the National Flood Insurance Program. In addition to hydrology and hydraulics, his career has focused on land planning and land development at all levels and sizes, ranging from one acre estate lots through large scale subdivisions ranging from 100 lots to 1,000 lots, and complete master planned communities ranging from 2,500 acres to 5,000 acres. .

X. REFERENCES

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XI. APPENDIX A

DEFINITIONS

AS PER FEMA 480 Document (FEMA, 2005) & 44 CFR 59

100-Year Flood:

A 100-year base flood is defined as having a one-percent chance of being reached or exceeded in any single year. The terms "base flood", "100-year flood", and "one-percent annual change flood" are often used interchangeably.

Development:

Any man-made change to real estate.

44 CFR 59. Definitions: "Development" means any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials.

Encroachments:

Encroachments are activities or construction within the floodway including fill, new construction, substantial improvements, and other development. These activities are prohibited within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses that the proposed encroachment would not result in any increase in flood levels.

FEMA:

Federal Emergency Management Agency. Most of the National Flood Insurance Program field work and community coordination are done by the 10 FEMA Regional Offices.

FIRM:

Flood Insurance Rate Map. An official map of a community, on which the Federal Insurance Administration has delineated both the Special Flood Hazard Areas and the risk premium zones applicable to the community.

Flood:

A general and temporary condition of partial or complete inundation of normally dry land areas.

Floodway:

The stream channel and that portion of the adjacent floodplain which must remain open to permit passage of the base flood.

Regulatory Floodway:

44 CFR 59.1 Definitions: "Regulatory Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

Flood Fringe:

The portion of the floodplain lying on either side of the floodway.

NFIP:

National Flood Insurance Program. The National Flood Insurance Program, managed by FEMA, aims to reduce the impact of flooding on private and public structures. It does so by providing affordable insurance to property owners, renters and businesses and by encouraging communities to adopt and enforce floodplain management regulations.

Special Flood Hazard Area and Base Flood Elevation:

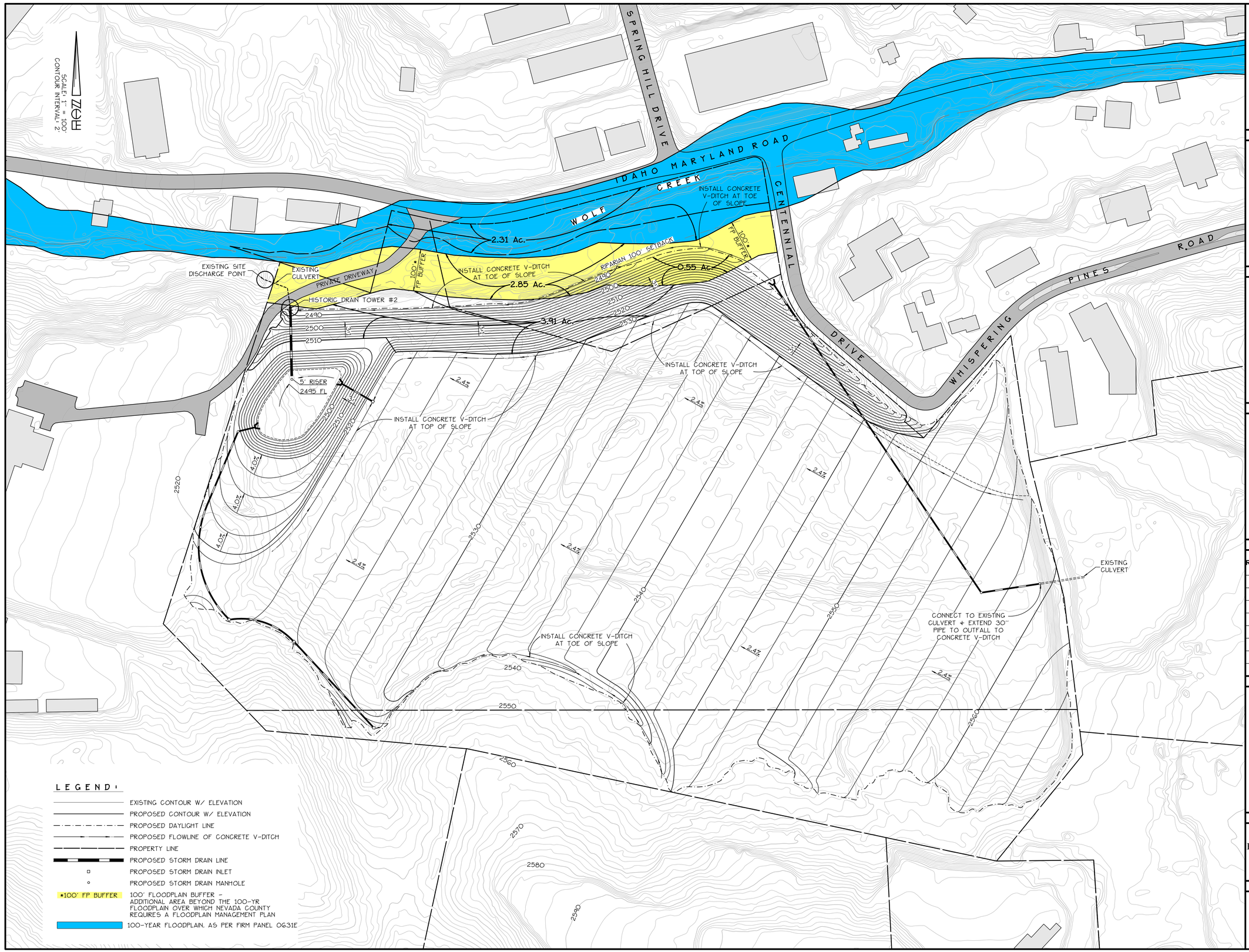
The land area covered by the floodwaters of the base flood is the base floodplain. On NFIP maps, the base floodplain is called the Special Flood Hazard Area (SFHA). The SFHA is designated as Zone A, AE, A1-30, AO, AH, V, VE or V1-30 depending on the amount of flood data available, the severity of the flood hazard, or the age of the flood map.

The SFHA is the area where the NFIP's floodplain management regulations must be enforced by the community as a condition of participation in the NFIP and the area where the mandatory flood insurance purchase requirement applies.

The computed elevation to which floodwater is anticipated to rise during the base flood is the Base Flood Elevation (BFE).

XII. APPENDIX B

FIGURES



ENGINEERING • SURVEYING
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NEVADA CITY ENGINEERING, INC.

505-B COYOTE STREET NEVADA CITY
(530)265-6911

REGISTERED PROFESSIONAL ENGINEER
ROBERT M ROBBE
No. 29650
Exp. 3/31/21
CIVIL
STATE OF CALIFORNIA

REVISION:	DATE:	DESCRIPTION:

CENTENNIAL SITE

RISE GRASS VALLEY INC.

SEC. 26, T.16N., R.8E., M.D.M.

NEVADA COUNTY , CALIFORNIA

FLOODPLAIN MANAGEMENT PLAN
CENTENNIAL SITE PLAN

FIGURE-2

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 10N. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by the USDA National Agriculture Imagery Program (NAIP). This information was photogrammetrically compiled at a scale of 1:24,000 from aerial photography dated 2005.

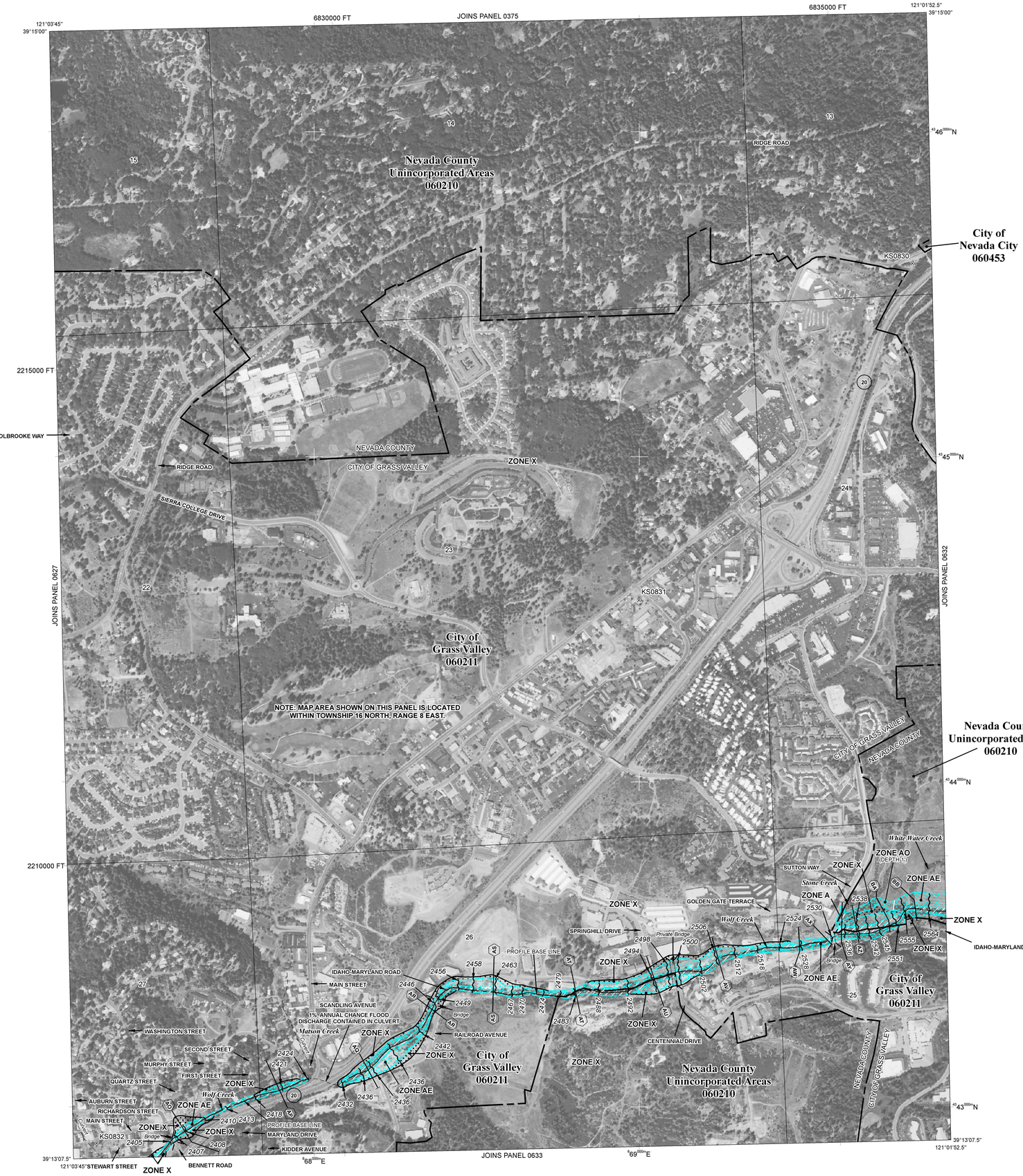
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4276000mN — 1000-meter Universal Transverse Mercator grid values, zone 10N
- 600000 FT — 5000-foot grid values: California State Plane coordinate system, zone II (FIPSZONE 0402), Lambert Conformal Conic projection
- DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- ● M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
February 3, 2010

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0631E

FIRM

FLOOD INSURANCE RATE MAP

NEVADA COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 631 OF 800

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GRASS VALLEY, CITY OF	060211	0631	E
NEVADA CITY, CITY OF	060453	0631	E
NEVADA COUNTY	060210	0631	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06057C0631E

EFFECTIVE DATE
FEBRUARY 3, 2010

Federal Emergency Management Agency