

EXPLANATION OF SIGNIFICANT DIFFERENCES

for the

REMEDY PROTECTION SELECTED REMEDY

in the

2012 INTERIM ROD AMENDMENT

Star Parking Area and Gem Drainage

**BUNKER HILL MINING AND METALLURGICAL COMPLEX
SUPERFUND SITE**

EPA ID NUMBER: IDD048340921

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Andrew Wheeler
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Bunker Hill Mining and Metallurgical Complex Superfund Site
ESD #3 for Remedy Protection (Star Parking Area & Gem Drainage)

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1.0 INTRODUCTION

1.1 Site Name and Location

The Bunker Hill Mining and Metallurgical Complex Superfund Site (“the Bunker Hill Superfund Site”, or “the Site”) is located primarily in northern Idaho. The Site includes mining-contaminated areas in the Coeur d’Alene River corridor, adjacent floodplains, downstream water bodies, tributaries, and fill areas, as well as the 21-square-mile Bunker Hill “Box” where historical ore-processing and smelting operations occurred. The U.S. Environmental Protection Agency (EPA) has divided the Bunker Hill Superfund Site into three Operable Units (OUs):

- OU 1 includes the populated areas of the Bunker Hill Box.
- OU 2 comprises the non-populated areas of the Bunker Hill Box.
- OU 3 includes all areas of the Coeur d’Alene Basin outside the Bunker Hill Box where mining-related contamination is located. OU 3 extends from the Idaho-Montana border into the State of Washington and contains floodplains, populated areas, lakes, rivers, and tributaries. OU 3 includes areas surrounding and including the South Fork of the Coeur d’Alene River (SFCDR) and its tributaries, and areas surrounding and including the main stem of the Coeur d’Alene River down to the depositional areas of the Spokane River, which flows from Coeur d’Alene Lake into Washington State.

The EPA identification number for the Site is IDD048340921.

1.2 Lead and Support Agencies

The lead agency for this action is the U.S. Environmental Protection Agency (EPA). The State of Idaho Department of Environmental Quality (DEQ) is the support agency.

1.3 Statement of Purpose

EPA issued a Record of Decision (ROD) for OU1 in August 1991 (USEPA, 1991), a Record of Decision (ROD) for OU3 in September 2002 (USEPA, 2002), and an Interim ROD Amendment (IRODA) in August 2012 (USEPA, 2012(b)). The 2012 IRODA amended both the 1991 OU1 ROD and the 2002 OU3 ROD. Specific components of the remedy selected by the 1991 ROD, the 2002 ROD, and the 2012 IRODA are summarized in Section 2.3. This Explanation of Significant Differences (ESD) sets forth additional details which represent a significant, but not fundamental change to the Selected Remedy. This ESD impacts OU3 only and is issued in accordance with §117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC §9617(c), and the National Contingency Plan (NCP), 40 CFR §300.435(c)(2)(i).

Analyses completed for the *Final Focused Feasibility Study Report* (FFS Report) (USEPA August 2012(a)) found that portions of the barrier fabric and clean soil,

vegetative, or asphalt barriers (human health barriers) installed as part of the existing Selected Remedies for OU1, OU2, and the Upper Basin portion of OU3 are vulnerable to damage resulting from relatively small storm events. Consequently, actions to protect the remedy were included in the 2012 IRODA to enhance the long-term effectiveness and permanence of the existing remedies by providing protection from erosion and recontamination caused by storm water runoff, tributary flooding, and heavy rain and snowfall. The 2012 IRODA provided a preliminary list of side gulches that may require additional remedial actions to protect the human health barrier containment remedy (Remedy Protection actions), with provisions for refining the list through one or more ESDs. Side gulches are defined as tributaries of the SFCDR where lower densities of residential populations reside in the Upper Basin and, therefore, fewer of the existing Selected Remedies have been implemented.

This ESD describes in detail two locations at which the selected Remedy Protection action will be implemented, the Star Parking Area and the Gem Drainage in Canyon Creek drainage near Wallace, Idaho (see Figure 1), and specifies the technology identified for these locations based on information developed since the IRODA was issued. This information includes desktop analysis, field investigation and measurements, hydrologic and hydraulic modeling, and flooding, scour, and deposition evaluation. This information was used to refine scour and deposition impacts and together with some preliminary engineering calculations is the basis for the change described in this ESD.

1.4 Administrative Record

This ESD and supporting documents will become part of the 2012 IRODA Administrative Record file, in accordance with the NCP, Section 300.825 (a)(2). The Administrative Record is available for review at the following locations:

USEPA Seattle Office
Superfund Records Center
1200 Sixth Avenue
Seattle, WA 98101
206-553-4494 or 800-424-4372

Kellogg Public Library
16 West Market Avenue
Kellogg, ID 83827
208-786-7231

St. Maries Library
822 W. College Avenue
St. Maries, Idaho 83861
208-245-3732

Coeur d'Alene Field Office, USEPA
1910 NW Boulevard, Suite 208

Coeur d'Alene, ID 83814
208-664-4588

Wallace Public Library
415 River Street
Wallace, ID 83873
208-752-4571

Molstead Library (North Idaho
College) Library
1000 Garden Avenue
Coeur d'Alene, ID 83814
208-769-3355

Spokane Public Library
906 West Main Avenue
Spokane, WA 99201-0976

509-444-5336 (reference desk; ask for Dana Dalrymple)

2.0 BACKGROUND

2.1 Summary of Site History

The Bunker Hill Superfund Site is within one of the largest historical mining districts in the world. Commercial mining for lead, zinc, silver, and other metals began in the Silver Valley in 1883. Heavy metals contamination in soil, sediment, surface water, and groundwater from over 100 years of commercial mining, milling, smelting, and associated modes of transportation has affected both human health and environmental resources in many areas throughout the Site.

The most significant contaminants are antimony, arsenic, cadmium, copper, lead, mercury, and zinc. The principal sources of metals contamination were tailings generated from the milling of ore discharged to the SFCDR and its tributaries or confined in large waste piles onsite, waste rock, and air emissions from smelter operations within OU2. Tailings were frequently used as fill for residential and commercial construction projects. Spillage from railroad operations also contributed to contamination across the Site.

EPA conducted a risk assessment for OU1 in 1990 and Idaho Department of Health and Welfare conducted a risk assessment for OU3 in 2001. Major exposure pathways identified by the risk assessments included, among others, ingestion of house dust and residential and community soils and sediments.

2.2 Summary of 2002 OU3 ROD and 2012 IRODA

The 2002 OU3 ROD selected a remedy consisting of, among other elements, excavation of contaminated soil and installation of visual barrier fabric and protective soil, vegetative, or asphalt barriers in residential, commercial, and right-of-way areas. This “human health barrier” remedy was selected to preclude direct contact with underlying contaminated materials. The remedial action objectives established for OU3 include, among other things, reduce human exposure to contaminated soils, sediments, and house dust and reduce mechanical transportation of contaminated soils and sediments into residential areas and structures.

In the 2012 IRODA, EPA recognized that certain precipitation and flood events may cause sufficient scour and/or deposition of contaminated sediments to adversely affect the long-term effectiveness and protectiveness of the human health barriers. To address this concern, EPA’s Selected Remedy includes “Remedy Protection” actions - specific technologies (standard engineering practices for stormwater and drainage management) applied to specific locations throughout the Upper Basin portion of OU3 to reduce the potential for adverse impacts to installed human health barriers due to scour and deposition of contaminated sediments. The range of storm water management options as well as selected community locations warranting Remedy Protection actions were

identified during investigation and hydrologic and hydraulic modeling work conducted to support the FFS Report.

The Selected Remedy also identified certain side gulches outside the more populated communities that may warrant Remedy Protection actions to enhance long-term effectiveness and protectiveness of the human health barriers. The Selected Remedy deferred identification of specific locations within these side gulches and deferred selection of specific storm water management options to be applied at these locations until more detailed investigation and modeling information was available.

In October 2015, EPA issued the first Remedy Protection ESD for side gulches (EPA, 2015). The ESD identified five specific locations within side gulches that warranted Remedy Protection actions and selected the specific storm water management option to be constructed at each of the locations. In July 2017, EPA issued a second Remedy Protection ESD for a single additional side gulch location that warranted Remedy Protection action (EPA, 2017).

Because Remedy Protection actions are essentially improvements to existing infrastructure, EPA intends for these actions to be implemented one time only and that appropriate operation and maintenance (O&M) of these actions will ensure their effectiveness in the long term. Prior to construction, agreements are completed with the appropriate state or local entity to perform O&M tasks associated with each Remedy Protection action. Easements and/or restrictive covenants are generally necessary components of these remedies to ensure long-term access and functionality of the Remedy Protection actions.

2.3 Actions to Date

The human health barrier component of the 2002 OU3 ROD's Selected Remedy is ongoing with remediation complete at a majority of the parcels requiring remediation. Most of the Remedy Protection actions selected in the 2012 IRODA, the October 2015 ESD, and the July 2017 ESD have been completed and turned over to local governments for long-term O&M. Construction of the remaining selected Remedy Protection actions continues.

3.0 BASIS OF ESD

As contemplated in the 2012 RODA, the hydraulic analyses, remedy threats analysis, and characterization results presented in the 2012 FFS Report have been expanded to include side gulches through additional desktop analyses, field investigations and measurements, analytical computations, and ground-truthing via field reconnaissance (TerraGraphics, 2015). Implementing the same process applied to community areas and supporting the 2012 RODA, the following detailed information has been developed for the side gulches:

- Hydrologic Analysis – hydrologic conditions, including the 5-, 25-, and 50-year 24-hour storm events were computed.

- Hydraulic Analysis – simplified Hydrologic Engineering Centers (HEC) models were developed.
- Characterize Risk – Impact maps depicting estimated scour and deposition areas were developed along with an estimated quantity of human health barriers at risk.

Upon completion of scour and deposition risk characterization for the side gulches, hydrologic and hydraulic models were updated for the Star Parking Area portion of Canyon Creek (TerraGraphics, 2016) and Gem Drainage (Alta, 2018) to:

- Predict peak flow conditions for the 50-year design flood event,
- Evaluate the capacity of the existing system, and
- Develop a conceptual design chosen from the list of technologies and process options presented in FFS Table 9-4 *Technologies and Process Options for Remedy Protection*.

Results of this work identified two locations within Canyon Creek drainage at which certain precipitation and flood events would likely cause sufficient scour and/or deposition of contaminated sediments to adversely affect the long-term effectiveness and protectiveness of the human health barriers. In addition, flood events at both locations have eroded human health barriers, mobilized underlying contaminated materials, and caused recontamination of downgradient remediated properties.

4.0 DESCRIPTION OF SIGNIFICANT DIFFERENCES

This ESD, consistent with the 2012 IRODA, refines the preliminary list of side gulches in the IRODA that may require Remedy Protection actions by identifying two specific locations within the Canyon Creek drainage where Remedy Protection action will be implemented. The implemented actions will include appropriate remedial technologies and process options (standard engineering practices for stormwater and drainage management). The remedial technologies and process options selected by this ESD for the Star Parking Area includes installation of a drainage ditch and berm, catch basins, manholes, conveyance pipe, and an outfall to Canyon Creek (see Table 1 and Figure 2). The remedial technologies and process options selected by this ESD for the Gem Drainage includes upgrading the existing Gem drainage inlet, conveyance pipe, and outfall to Canyon Creek, and installation of manholes and a sock drain (see Table 1 and Figure 3).

This ESD does not change the scope of the remedial actions selected in the 2002 ROD as amended by the 2012 IRODA but rather provides greater detail on two specific locations and associated storm water management actions of the Remedy Protection component of the Selected Remedy.

The level of protection provided by, and the design criteria used for, this action is consistent with those presented in the 2012 IRODA. This action will meet Applicable or

Relevant and Appropriate Requirements which are listed in the 2012 IROD and remain unchanged.

The IRODA did not specify costs for individual projects but rather estimated that Remedy Protection actions within the side gulches would total \$10,900,000 in capital costs and \$4,180,000 in O&M costs over a 30-year period calculated at net present value (see FFS Table D-36). The estimated capital costs for the two projects detailed in this ESD total \$616,000 and are two of eight Remedy Protection actions to be constructed within the side gulches. As for all previous Remedy Protection projects, local entities have agreed to perform long-term O&M of these two Remedy Protection projects. O&M Agreements and Environmental Covenants ensure long-term O&M is conducted by entities with overall responsible for local infrastructure.

5.0 SUPPORT AGENCY ACCEPTANCE

The Idaho Department of Environmental Quality (IDEQ) and EPA were close partners in developing the Remedy Protection component of the 2012 IRODA and IDEQ supports the actions described in this ESD. IDEQ and EPA continue to work together to plan, design, and construct the Remedy Protection projects, including the action addressed by this ESD.

6.0 STATUTORY DETERMINATIONS

The remedy for OU3, as modified by this ESD, continues to satisfy the requirements of §121 of CERCLA to:

- Protect human health and the environment, through a combination of treatment, engineering controls, and institutional controls,
- Comply with applicable or relevant and appropriate requirements, and
- Be cost-effective.

7.0 PUBLIC PARTICIPATION COMPLIANCE

The public participation requirements for an ESD set out in the NCP §300.435(c)(2)(ii), will be met as follows:

- The ESD and supporting information will be added to the Administrative Record for the 2012 RODA established under §300.815 and available at the locations listed in Section 1.4 of this ESD.
- The ESD will be made available on the EPA's Website.
- When this ESD is issued, a public notice of its availability will be published in the *Shoshone News Press*.

8.0 REFERENCES

Alta Science & Engineering. August 29, 2018. *Gem Drainage Pre-Design Memorandum*.

Alta Science & Engineering. February 13, 2019. *Star Parking Area Remedy Protection Project Final Design Report.*

Alta Science & Engineering. June 3, 2019. *Gem Drainage Remedy Protection Project Final Design Report.*

TerraGraphics Environmental Engineering. January 2015. *Upper Basin Side Gulches Addendum to the Human Health Remedy Protection Hydrologic Risk Characterization and Project Development.* Prepared for IDEQ and USEPA Region 10.

TerraGraphics Environmental Engineering. December 23, 2015. *TECHNICAL MEMORANDUM Remedy Protection Side Gulches – Canyon Creek ESD Data Collection Analysis.*

U.S. Environmental Protection Agency (USEPA). August 1991. *Record of Decision, Bunker Hill Mining and Metallurgical Complex Residential Soils Operable Unit, Shoshone County, Idaho.*

U.S. Environmental Protection Agency (USEPA). September 12, 2002. *Record of Decision, Bunker Hill Mining and Metallurgical Complex Operable Unit 3 (Coeur d'Alene Basin), Shoshone County, Idaho.*

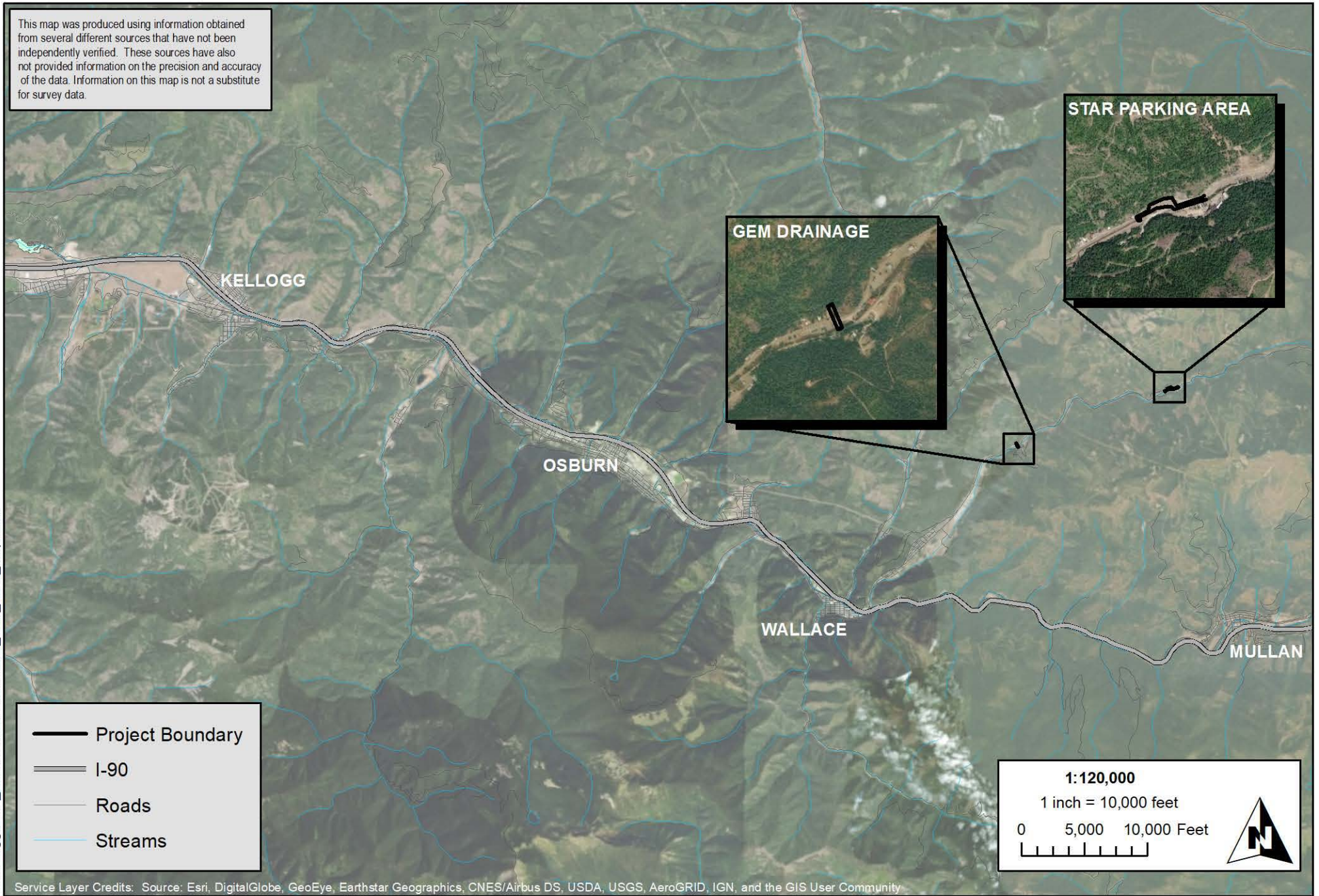
U.S. Environmental Protection Agency (USEPA). August 2012(a). *Focused Feasibility Study Report Upper Basin of the Coeur d'Alene River, Bunker Hill Mining and Metallurgical Complex Superfund Site.* Final. Prepared by CH2M HILL.

U.S. Environmental Protection Agency (USEPA). August 2012(b). *Interim Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River, Bunker Hill Mining and Metallurgical Complex Superfund Site.*

U.S. Environmental Protection Agency (USEPA). October 14, 2015. *Explanation of Significant Differences for the Remedy Protection Selected Remedy in the 2012 Interim ROD Amendment, Silver, Slaughterhouse, Blackcloud, McCarthy & Boulder Creeks, Bunker Hill Mining and Metallurgical Complex Superfund Site.*

U.S. Environmental Protection Agency (USEPA). July 25, 2017. *Explanation of Significant Differences for the Remedy Protection Selected Remedy in the 2012 Interim ROD Amendment, Hunt Gulch, Bunker Hill Mining and Metallurgical Complex Superfund Site.*

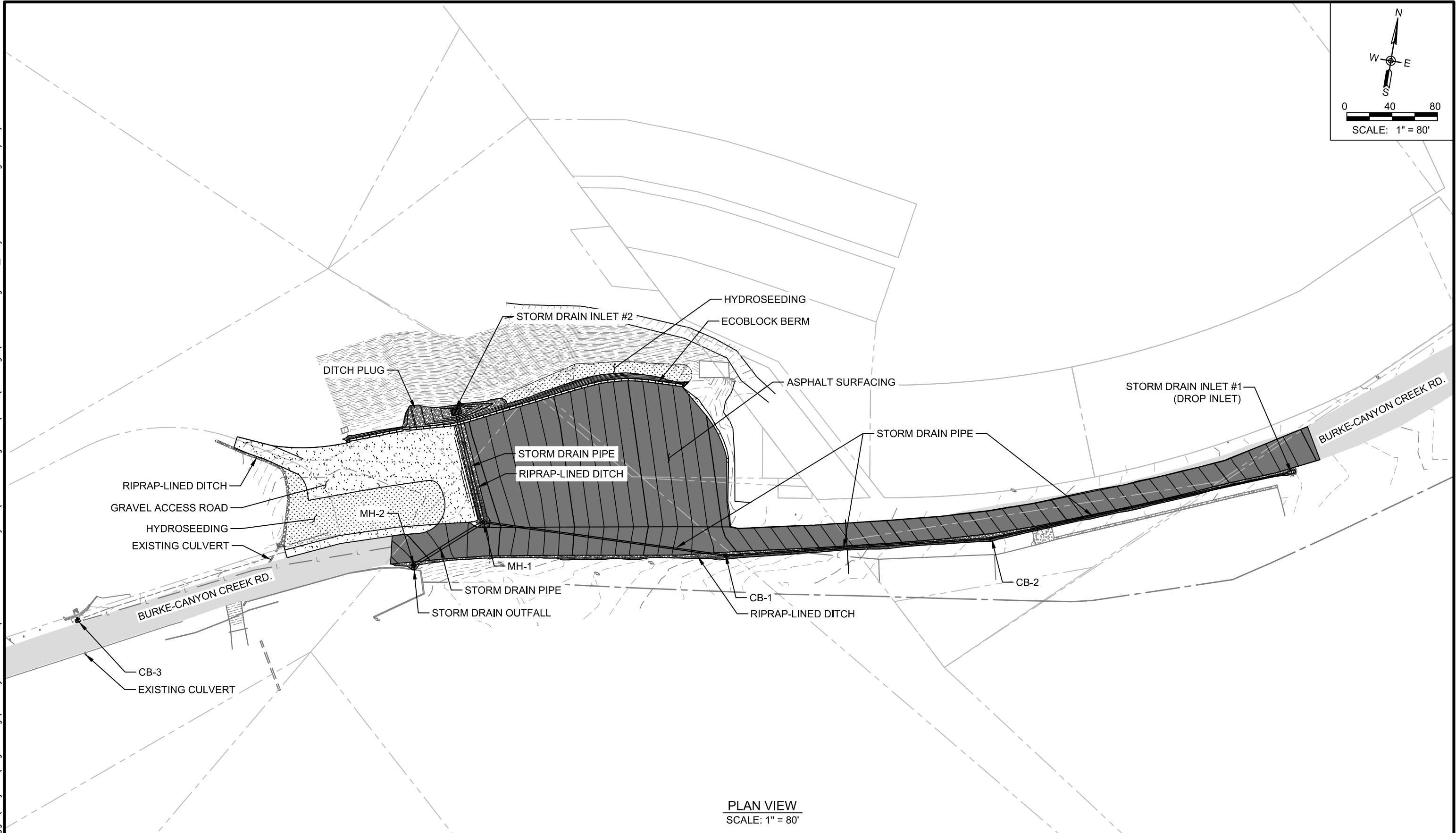
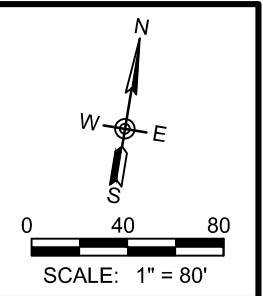
This map was produced using information obtained from several different sources that have not been independently verified. These sources have also not provided information on the precision and accuracy of the data. Information on this map is not a substitute for survey data.



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	PRINT DATE	Jul 01, 2019	REQUESTOR	D. Pfeifer	PROJECT NAME Star Parking Area & Gem Drainage Remedy Protection ESD	Figure 1 Star Parking Area & Gem Drainage Remedy Protection Site Location Map
	PROJECT NUMBER	19010-20	PROJECT MANAGER	D. Pfeifer		
			CARTOGRAPHER	J. Gilley		

\\BARYTE\kellogg1\Projects\Engineering\Remedy Protection\2017 Basin RP Projects\Star Parking Area\O&M Drawings\Star Parking Area_Project Overview.dwg 2/13/2019



PLAN VIEW
SCALE: 1" = 80'

NO.	DATE	REVISIONS	BY	CHK

DRAFTER:	B. DAVIS/D. PFEIFER	COORDINATE SYSTEM:	NAD83, ISP WEST, US FT
DESIGNER:	D. FORSETH	SCALE:	AS NOTED
CHECKED:	B. DAVIS	APPROVED:	D. FORSETH
DATE:	12/06/2018	DATE:	12/12/2018

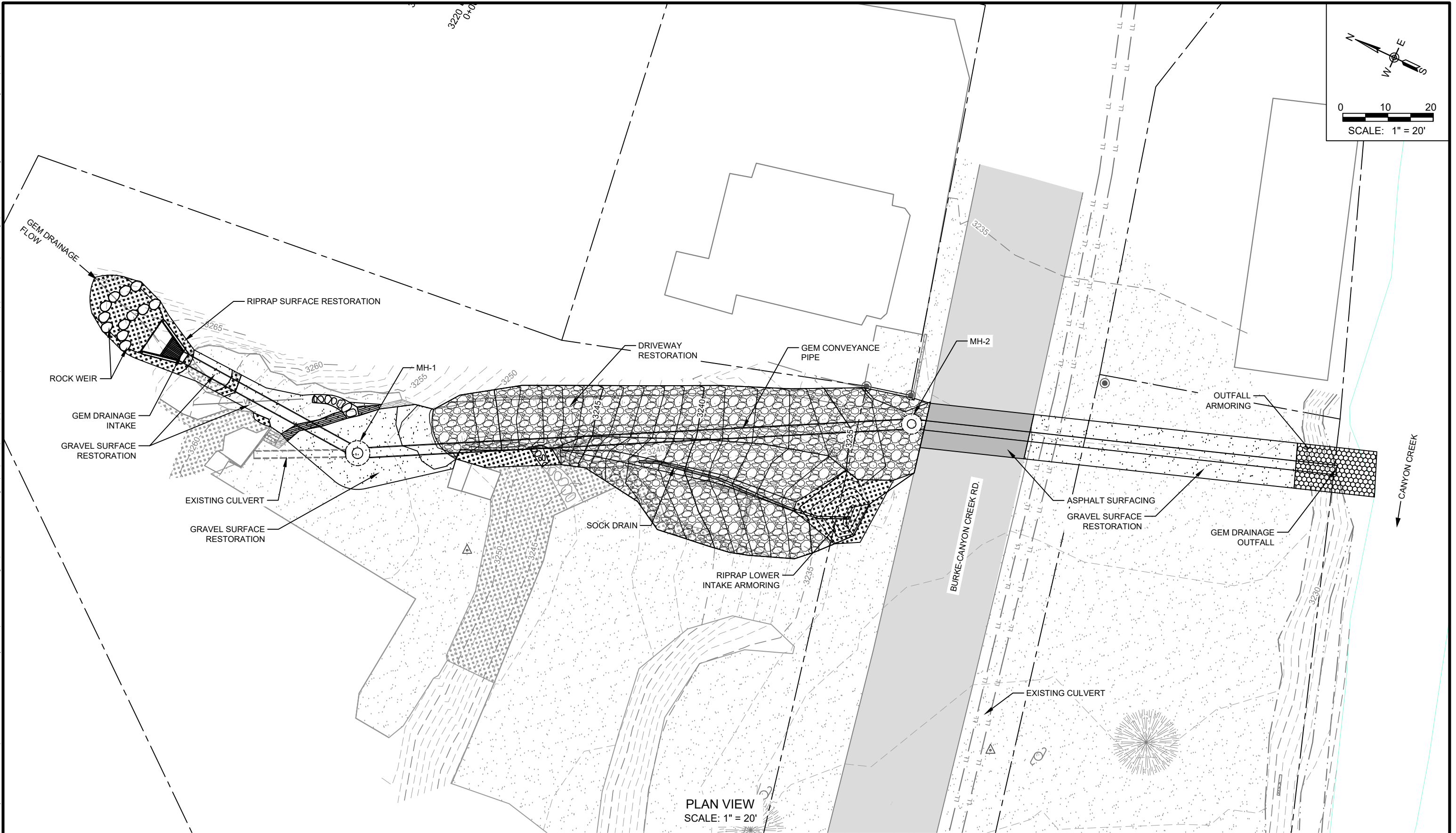


STAR PARKING AREA REMEDY PROTECTION
BURKE, IDAHO

Figure 2
PROJECT OVERVIEW

SHEET:	A1
DATE:	2/13/2019
PROJECT NO.:	18014-05
SHEET NO.:	1 OF 1

V:\Engineering\Remedy Protection\2018 Basin RP Projects\Gem Drainage\04_Final Design\Report\03_Appendices\07_O&M - Appendix G\Drawing\Gem Drainage Overview.dwg 5/28/2019



NO.	DATE	REVISIONS	BY	CHK

DRAFTER: R. SATICHTCHEV/D. PFEIFER	COORDINATE SYSTEM: ISP WEST NAD83 NAVD88
DESIGNER: D. PFEIFER	SCALE: 1" = 20'
CHECKED: B. DAVIS	APPROVED: D. FORSETH
DATE: 04/02/2019	DATE: 04/03/2019



GEM DRAINAGE REMEDY
PROTECTION
GEM, ID

Figure 3
PROJECT OVERVIEW

SHEET:	A1
DATE:	5/28/2019
PROJECT NO.:	19010-30-20
SHEET NO.:	1 OF 1

Table 1 – Refined Remedy Protection Actions

NAME	LOCATION	TECHNOLOGY^a	PROCESS OPTION^a	PROJECT DESCRIPTION^b	CAPITAL COST ESTIMATE^c
Star Parking Area (Canyon Creek)	Approximately 6 miles north of I-90 on Burke-Canyon Creek Road	General Drainage Improvements	Stormwater Drainage Network	Installation of a drainage ditch and berm, catch basins, manholes, conveyance pipe, and an outfall to Canyon Creek.	\$481,000
Gem Drainage	Approximately 1.5 miles north of I-90 on Burke-Canyon Creek Road	General Drainage Improvements	Stormwater Drainage Network	Upgrade of the existing Gem drainage inlet, conveyance pipe, and outfall to Canyon Creek, and installation of manholes and a sock drain.	\$135,000
TOTAL ESTIMATED CAPITAL COSTS					\$616,000

^a From FFS Table 9-4 *Technologies and Process Options for Remedy Protection*.

^b For a more detailed description of the Remedy Protection project, see *Star Parking Area Remedy Protection Project Final Design Report* (Alta, February 2019) and *Gem Drainage Remedy Protection Project Final Design Report* (Alta, June 2019).

^c For presentation of the cost estimate, see *Star Parking Area Remedy Protection Project Final Design Report* (Alta, February 2019) and *Gem Drainage Remedy Protection Project Final Design Report* (Alta, June 2019).