



Montana Department of Transportation

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Memorandum

To: Distribution
From: Ryan Dahlke, P.E.
Consultant Design Engineer
Date: August 19, 2019
Subject: IM-G 90-1(225)58
Quartz Flat Rest Area
UPN 6875000
Work Type 111 - New Construction - Facilities

The Scope of Work Report for this project has been released on ... We request that those on the distribution review this report and submit your concurrence within two weeks of the above date.

Your comments and recommendations are also requested if you do not concur or concur subject to certain conditions. When all the personnel on the distribution list have concurred, we will submit this report to the Preconstruction Engineer for approval.

I recommend approval:

Approved _____ Date _____

Distribution:

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Located at the end of this document

Scope of Work Report

IM-G 90-1(225)58, Quartz Flat Rest Area, 6875000
EPS Project Manager: Wade Salyards

Page 1 of 14

Scope of Work

The scope of work for this initial phase (Phase 1) of the Quartz Flat Rest Area project is to provide preliminary design of water/wastewater systems for the dual rest area site to meet expected future upgrades, obtain conditional permitting of the systems through the Montana Department of Environmental Quality (MDEQ), provide environmental compliance documentation, and assist MDT in procuring a new easement from the United States Forest Service (USFS) for the dual rest area future drainfields. Once approved, the conditional MDEQ permitting, environmental compliance documentation, and easement acquisition will allow for the development of a subsequent design-build project (Phase 2) to reconstruct the rest areas. The Phase 1 portion of the rest area reconstruction project is intended to minimize delays in the construction phase, and reduce potential risks associated with obtaining the necessary water/wastewater approvals and the needed easement area.

A conceptual site layout is in development as part of Phase 1 and will include a depiction of a possible rest area layout for the benefit of MDT to scope the subsequent design-build phase of the project. The conceptual layout will not be a site design but will identify the location of water and wastewater systems relative to the overall site and provide a schematic depiction of a possible layout (including parking, building locations and proposed easement area) for consideration by future design-build teams. Design of other site improvements will not be included in this project phase and will be addressed under a subsequent project phase (Phase 2).

Purpose and Need

The purpose of the overall project will be to reconstruct the existing Quartz Flat Rest Area to better meet current and future demand based on the projected facility usage and corridor growth. Wastewater systems with increased capacity and improved treatment capabilities, expanded truck parking, and upgraded building and restroom facilities are needed to accommodate future usage needs. New water supply systems will likely be required due to the associated overall site improvements anticipated for the reconstruction improvements of the rest area.

Phase 1 of the project will include preliminary design and conditional permitting for anticipated improvements to the water and wastewater systems to be used during the subsequent design and construction phases. Phase 1 will also include preparation of environmental compliance documentation. MDT will procure the easement from the USFS for the area anticipated for the future drainfields. At this time, MDT indicated that Phase 2 improvements are expected to be developed through a design-build project and are not included in this project phase scope of work.

Public Summary

Reconstruct the existing rest area facilities on both sides of Interstate 90 at around milepost 58, including buildings, parking lots, landscaping, and wastewater treatment systems.

Project Location and Limits

The project site is located at the Quartz Flat Rest Areas adjacent to Interstate 90 (I-90), approximately 10 miles southeast of Superior, MT, in Mineral County. The westbound (WB) site is at approximate reference post (RP) 58.2 and the eastbound (EB) site is at approximate RP 58.0. I-90 is functionally classified as a Principal Arterial – Interstate within the MDT functional classification system. The project limits will include the WB and EB rest area sites including portions of the entrance and exit ramps to tie into parking area upgrades and a portion of I-90 right-of-way adjacent to the rest area facilities to address potential drainage improvements associated with the overall site upgrades. Precise project limits will be determined during a subsequent design and/or construction phase of the project. Additionally, project limits include the need for an easement from the USFS, south of the existing EB rest area site, to accommodate the future wastewater drainfield areas.

The Clark Fork River generally parallels I-90 within the limits of the rest area and its floodplain is approximately 400 feet east of the existing WB site. Upstream, the river turns and crosses I-90 south of the rest area sites. The WB I-90 bridge is approximately 300 feet south of the WB rest area off-ramp and the EB I-90 bridge is approximately 800 feet south of the EB rest area on-ramp. The rest area is located above the river valley and floodplain.

As-built project numbers for the Quartz Flats Rest area are identified as I-IG 90-1(33)54 and IR 90-1(104)58.

REV 6/7/2019

Scope of Work Report

Physical Characteristics

The Quartz Flats Rest Area is a rural dual rest area site built in 1967 and rehabilitated in 1989. The rest area is located adjacent to I-90 and includes entry and exit ramps, paved parking areas, restroom buildings (one each at the WB and EB sites) and covered picnic shelters. The rest area facilities are generally in fair condition but are becoming outdated and worn out.

The rest area site is level with respect to the adjacent I-90 mainline and the terrain within existing right-of-way of each site is generally level with gradual slopes toward the Clark Fork River valley. Both sites are substantially above the grade of the Clark Fork River.

The area adjacent to the Quartz Flat Rest Area is bordered by Forest Service land. The Lolo National Forest Quartz Flat Campground is located adjacent to the rest area and is accessed from both the WB and EB rest area sites.

Water for potable use and site irrigation is provided to the sites through individual wells at each facility. Power is available at the rest area locations.

The rest area sites have developed parking areas with asphalt surfacing. As-builts indicate an existing pavement section consisting of 0.35' plant mix over 0.15' top surface over 1.0' crushed base course.

Traffic Data

Traffic volume data from the MDT Traffic Data Collection & Analysis Section indicates the following traffic characteristics for I-90 near the Quartz Flat Rest Area.

2018 (Current Year)	AADT =	6,480 vpd
2040 (Design Year)	AADT =	8,070 vpd
	DHV =	850 vpd
	T =	33.3%
	ESAL =	1145
	AGR =	1.0%

AADT: Annual Average Daily Traffic (both directions of travel)

DHV: Design Hourly Volume (both directions of travel)

T: Percent Trucks

ESAL: Equivalent Single Axle Load

AGR: Annual Growth Rate

vpd: vehicles per day

Based on information provided in the current Montana Rest Area Plan Update (2019), the WB parking area contains 10 truck parking stalls and 30 passenger vehicle stalls, and the EB parking area contains 11 truck parking stalls and 29 passenger vehicle stalls.

Crash Analysis

Crash data was provided by MDT for I-90 from RP 57.0 to RP 59.0 over a ten-year period from January 1, 2008 to December 31, 2017. The WB and EB rest area sites are encompassed within the limits of the crash data provided.

During the ten-year study period, twenty-six crashes occurred on I-90 within a one-mile radius of the Quartz Flat rest areas (approximately between RP 57.5 and RP 58.5). Of the total crashes reported, there have been three EB entrance to the rest area related crashes within the project limits. All of the crashes were no apparent injury (property damage only) crashes. The crashes consisted of one roll-over, one fixed object and one wild animal crash, of which, two of the crashes involved ice/frost on the roadway surface.

No WB entrance/exit ramp crashes were recorded during this time period.

Scope of Work Report

Contributing circumstances for most of the crashes near the rest area included traveling too fast for conditions and other road/environment conditions. With respect to crashes related to the interchange, no correctable trends could be identified for the ten-year analysis period.

Major Design Features

- a. **Design Speed.** Interstate 90 is currently posted for 80 mph. Due to the scope of this project phase, design speeds will not be a controlling element for the permitting of water-wastewater systems. Ramp re-alignment improvements are not anticipated.
- b. **Horizontal Alignment.** Interstate 90 exhibits a horizontal curve adjacent to the rest area. The north ramps (WB exit ramp and EB entrance ramp) tie into I-90 within the horizontal curve and the south ramps (WB entrance ramp and EB exit ramp) tie into I-90 along a tangent. Due to the scope of this project phase, horizontal features of the Interstate will not be a controlling element for the permitting of water-wastewater systems.

The horizontal alignment of the entry and exit ramps were not identified as being deficient by MDT District staff.

- c. **Vertical Alignment.** The area adjacent to the Quartz Flats Rest Area generally consists of gradual sloping hills. The project area generally slopes toward the Clark Fork River Valley. Interstate 90 is relatively level within the limits of the rest area. Due to the scope of this project phase, vertical features of the Interstate will not be a controlling element for the permitting of water-wastewater systems.

The vertical alignments of the entry and exit ramps were not identified as being deficient by MDT District staff. The maximum grade for the WB ramps is approximately 1.0%. The maximum grade for the EB ramps is approximately 1.3%.

- d. **Typical Sections.** Each of the WB and EB sites has a developed parking area with asphalt surfacing. Due to the scope of this project phase, typical sections will not be a controlling element for the permitting of water-wastewater systems.
- e. **Surface Design.** Surface design will be addressed in Phase 2 of this project.
- f. **Grading.** Grading for the water and wastewater systems will primarily consist of wastewater system excavation. Specific grading components for the overall site improvements will be addressed in Phase 2 of this project.
- g. **Slope Design.** Work conducted along the slopes adjacent to the road section will be in accordance with the MDT Road Design guidelines and will be addressed in Phase 2 of this project. Work along the slopes may include improvements associated with wastewater force main installation, general roadside drainage improvements, and parking area upgrades.
- h. **Geotechnical Considerations.** A Preliminary Geotechnical and Materials Report (Activity 106) has been completed and consisted of a geologic review, visual reconnaissance of the project area, excavation of six (6) test pits to characterize soil conditions at potential drainfield locations, completion of four (4) percolation tests to verify the soil's capacity to accept subsurface drainfield discharge, and the advancement of eight (8) geotechnical borings to characterize existing pavement sections and subgrade soil conditions.

Focus areas of the Phase 1 investigation are located at the southern portion of the EB rest area site, within the existing right-of-way, where the anticipated new drainfield treatment areas are expected to be generally located. In this area, soils were found to include loamy sand (well graded gravel with silt, sand cobbles and boulders), and sandy loam (well graded gravel with clay, sand cobbles and boulders) ranging 2 feet to 10 feet below the surface. Percolation rates in this area ranged from 12 to 15 minutes per inch. Based on these subsurface conditions, new wastewater systems are expected to be capable of handling the anticipated effluent flows.

Scope of Work Report

No geotechnical investigations have been conducted in the proposed easement area for Phase 1 since this area is outside of existing MDT right-of-way. General assumptions are made that the geotechnical investigation conducted within the right-of-way will be representative of the conditions for the proposed drainfield area. Additional test pits and percolation tests within the drainfield area may be required for final MDEQ permitting of the wastewater systems. Final geotechnical investigation that may be required for final permitting will be completed during Phase 2, once the easement has been procured from the USFS. The conditional permitting process for Phase 1 will include feedback from MDEQ whether additional test pits will be needed for Phase 2.

No structural borings will be performed for Phase 1 of this project.

- i. **Hydraulics.** There have been no reported drainage or flooding issues at the rest area site.

The rest area sites are located outside of the floodplain of the Clark Fork River. The project area is approximately 96 feet above and 400 feet away from the floodplain of the Clark Fork River. The existing drinking water wells, proposed new wells, and proposed wastewater drainfield areas are all located such that drainage patterns for storm water and snowmelt runoff should not pose a flooding risk. The final grading and drainage plan developed under Phase 2 can be designed to divert any storm water and snowmelt runoff away from the proposed water and wastewater systems. The final rest area design should take into account the calculated runoff from the final site layout and incorporate storm water runoff quantity and quality control measures in accordance with MDT Hydraulics Design criteria. Storm water control measures will similarly need to be designed for the entirety of the rest area construction.

- j. **Permanent Erosion and Sediment Control (PESC) Features.** Due to vegetative cover and mild topography near the roadway and within the site, roadside and site erosion is not anticipated. All areas disturbed should be revegetated. Any final PESC features necessary for the rest area site will be designed under Phase 2.
- k. **Bridges.** There are no bridge structures within the project limits. There are bridge structures south of the project site along I-90 ranging approximately 300 feet to 800 feet south of the WB off-ramp and EB on-ramp, respectively. No impacts are anticipated to the bridges.
- l. **Safety Enhancements.** The upgraded water and wastewater systems are designed to protect public health.
- m. **Context Sensitive Design.** Context sensitive design elements will be considered in Phase 2 of the project.
- n. **Traffic.** A Preliminary Traffic Technical Memorandum (Activity 112) has been completed and identified the need for an expanded number of truck parking spaces at the WB and EB rest area sites, compared to current conditions, based on estimated future traffic volumes over the design period. The preliminary traffic memorandum identifies that the current number of passenger vehicle stalls meet or exceeds the calculated future parking demands based on estimated future traffic volumes.

Scope of Work Report

The estimated parking stall calculations from the traffic memorandum are provided in the following table:

Variable	Rest Area (Direction)	Current Conditions (2018)	Calculated Demand (2018)	Calculated Demand (2040)
		Current Conditions (No Improvements)	Modified WTI Methodology (95 th / 90 th PDD ¹)	Modified WTI Methodology (95 th / 90 th PDD ¹)
Passenger Vehicle Stalls	EB	29	7 / 6	9 / 7
	WB	30	7 / 5	8 / 6
Truck Stalls	EB	11	39 / 30	48 / 38
	WB	10	36 / 26	44 / 32

1- PDD = 95th and 90th percentile daily door count

It has been determined that expanding the parking areas to match the number of truck parking stalls from the estimated demand calculations is not reasonable for this project due to limited right-of-way, proximity of the adjacent forest service campgrounds, and other site constraints. This approach follows Guideline #6 per the Montana Rest Area Plan, which states "Site constraints such as available right-of-way, the presence of environmental features, and other limitation unique to each site may affect the practicability of meeting current and future parking demand." Therefore, the Phase 1 conceptual design will attempt to maximize truck parking capacity to a feasible extent while considering the physical constraints of each site (including right-of-way, adjacent campground access and land use, topography, sensitive natural resources, and state-required setbacks from groundwater wells and wastewater systems). It is noted that acquisition of additional right-of-way easement is anticipated and will be pursued from the USFS to balance the need for acceptable parking expansion with the need for space to develop primary drainfield areas, future replacement drainfield areas, and other associated site improvements. The proposed easement area has been coordinated with the USFS and the consensus is to acquire the easement area for the anticipated drainfield areas, not for parking expansion.

Access to the campgrounds will need to be perpetuated upon completion of this project and during the Phase 2 activities.

No changes are anticipated to existing mainline traffic patterns on I-90.

- o. **Miscellaneous Features.** Final design for miscellaneous features including but not limited to covered picnic shelters, pet areas and other site amenities common to rest area development will be completed during Phase 2.

A caretaker resides on the WB site year around to perform the day-to-day cleaning and upkeep of both sites. The caretaker addresses minor maintenance issues and general rest area upkeep. The caretaker resides in a modular structure on a designated trailer pad that includes on-site utility services (water, wastewater, power, etc.). It is anticipated that MDT will continue to utilize the caretaker beyond the completion of the rest area reconstruction project. The overall site improvements will consider maintaining the caretaker living pad. Final utility service tie-ins associated with the overall final rest area improvements will be completed during Phase 2.

New fencing will be needed along the acquired easement boundary to provide an added barrier between the proposed wastewater drainfield area and existing livestock located on the private property south and west of the EB rest area site. The fencing will also provide a barrier from any livestock from entering MDT right-of-way in the event that the existing private

Scope of Work Report

fence is breached or not properly maintained. The conceptual layout design for Phase 1 will consider the need for fencing along the proposed easement. Final fencing improvements and installation will be completed during Phase 2.

- p. **Pedestrian/Bicycle/ADA.** Final design and inclusion of pedestrian, bicycle, and ADA features will be completed during Phase 2.

- q. **Water Supply.** Groundwater is the source of potable water at the Quartz Flat Rest Area and is used to serve the rest area facilities for irrigation of the grass and associated landscaping. The existing public wells, located on each rest area site, have been tested and evaluated for quality and quantity. From these findings, the WB public well, GWIC #72196, provides adequate quantity and the water supply is within drinking water standards and of good quality. The only water parameter that was slightly elevated was hardness, which tested at 133 mg/L and Iron at 0.31 mg/L. The upper limit of hardness is 120 mg/L and Iron is 0.30 mg/L. Hardness above the upper limit typically leads to scaling of plumbing fixtures but does not pose a health threat at the measured levels. Iron levels above 0.30 mg/L exceed EPA's Secondary Maximum Contaminant Levels (SMCL) leading to water discoloration, fixture staining, sedimentation, and a metallic taste. The cause of the elevated iron levels in the WB well is likely due to the age of the water supply well casing, (\pm 55 years). In addition to the water quality samples, the coliform/microbial water quality results for the facility was reviewed for the last two years through DEQ's Drinking Water Watch. The system has tested "absence" for coliform and E. Coli over the period reviewed.

The testing of the active EB well, GWIC #257271, shows that the well provides adequate quantity and the water supply is within drinking water standards and of good quality. The only water parameter that was slightly elevated was hardness, which tested at 125 mg/L. The upper limit of hardness is 120 mg/L. Hardness above the upper limit typically leads to scaling of plumbing fixtures but does not pose a health threat at the measured levels. In addition to the water quality samples, the coliform/microbial water quality results for the facility was reviewed for the last two years through DEQ's Drinking Water Watch. The system has tested "absence" for coliform and E. Coli over the period reviewed.

The original EB water supply well, GWIC #72195, was installed in 1963. A new water supply well, GWIC #257271, on the EB site was constructed in 2010. Upon installation of the new well the power to the original well was disconnected but the well was not abandoned as it was intended to be used as a backup or irrigation well if needed in the future.

During the water and wastewater systems field investigation conducted on January 28th and 29th, 2019 groundwater levels were measured at approximately 120 feet below the surface in the rest area wells and the Quartz Flats Campground well. The measured depth to groundwater is near the approximate elevation of the Clark Fork River in the underlying sand and gravel alluvial material. Additionally, the Montana Bureau of Mines and Geology (MBMG) monitored the groundwater elevation in the WB well (GWIC #72196) between 1992 and 2001. The MBMG groundwater measurements identified the groundwater at approximately 115 feet below the surface with an average annual groundwater fluctuation of 4.2 feet. The Source Water Delineation and Assessments Report (SWDAR) for the rest area facilities identify the underlying aquifer as being an unconfined aquifer.

The EB rest area facility has a dual use, commercial and irrigation well groundwater right. The groundwater right on file with the State of Montana Department of Natural Resources and Conservation (DNRC) is number 76M30051576 with a priority date of August 8, 2011. The water right identifies a maximum flow rate of 35 gallons per minutes (gpm) and an annual maximum volume of 5.72 acre-feet. The maximum volume is divided into a commercial use volume of 1.12 acre-feet annually and a lawn and garden use of 4.60 acre-feet limited to the period between April 1st to October 31st annually.

The WB rest area facility has a well groundwater right on file with the DNRC as water right number 76M30112644 with a priority date of August 8, 2017. The water right allocates a maximum flow rate of 35 gpm and an annual maximum volume of 1.28 acre-feet.

Scope of Work Report

It is recommended that the water right volume for the EB site be increased upon the reconstruction of the rest area facility. It should be noted that DNRC only allows water rights to be increased based on "present" water consumption (i.e. they do not allow water right increases based on projected growth). Additionally, a new well pump or flow restrictor should be installed on the system to limit the pumped flow to 35 gpm. Due to the proposed overall site improvements, it is anticipated that the two existing wells at the EB site will be abandoned and a single new well be drilled. A new well is recommended and proposed to be placed in a location so that the reconstructed rest area will optimize the space available outside of the public well influence. The replacement of the EB well will be addressed during Phase 2.

Based on the measured water consumption and estimated irrigation consumption, it is recommended that the water right volume for the WB site be increased upon reconstruction of the rest area facility and modified to include a seasonal irrigation volume. Upon reconstruction of the rest area facility the water usage should be re-evaluated and the water right should be adjusted to accurately account for the usage. Due to the proposed overall site improvements, it is anticipated that the existing well at the WB site will be abandoned and a new well will be installed. Also, due to the age of the WB water supply well and the presence of elevated iron levels in the water quality results, it is recommended the WB well be replaced with the facility improvements. A new well is recommended and proposed to be placed in a location so that the reconstructed rest area will optimize the space available outside of the public well influence. The replacement of the WB well will be addressed during Phase 2.

The water system improvements will be designed to meet the water demand for the year 2040 projected rest area use with an estimated water usage of 2.5 gallons per user, the facility peak instantaneous demand based on a water system fixture count, and the estimated irrigation water consumption.

All water supply upgrades will be in accordance with current EPA and MDEQ drinking water standards.

- r. **Wastewater Treatment.** The existing wastewater system at the WB site is a conventional system constructed in 1989 consisting of a septic tank, a dosing siphon tank, and a drainfield. Based on the size of the drainfield and an estimated application rate of 0.50 gallons per day per square foot (gpd/ft²), the approximate design capacity of the existing system is 2,100 gpd. The estimated existing seasonal peak wastewater flow based on door count records from 2013 to 2017 and measured per user water usage rates is approximately 2,221 gpd. In addition to the WB site septic system, the caretaker has an individual septic system in the northeast portion of the site consisting of a septic tank, distribution box and two drainfield laterals. Overall the wastewater treatment system is near its useful life and showing signs of aging.

The existing wastewater system at the EB site is a conventional system constructed in 1989 consisting of a septic tank, effluent pump station, and a drainfield. Based on the size of the drainfield and an estimated application rate of 0.50 gpd/ft², the approximate design capacity of the existing system is 2,100 gpd. The estimated existing seasonal peak wastewater flow based on door count records from 2013 to 2017 and measured per user water usage rates is about 2,475 gpd. Overall the wastewater treatment system is near its useful life and showing signs of aging. Additionally, the caretaker has indicated that the lift station pumps have been replaced but there are still ongoing issues with it due to age. At the field investigation, surface rutting over the drainfield was observed and is indicative of a drainfield that is failing due to being hydraulically overloaded.

Due to the potential of high strength waste streams at rest areas, it is recommended that the wastewater treatment facilities be upgraded to include advanced treatment capabilities in addition to new septic tanks, dose tanks, and drainfields. A detailed analysis has been performed to adequately size the new systems and define groundwater characteristics that affect the treatment objectives at the site.

Scope of Work Report

The preliminary engineering analysis performed under Phase 1 (Activity 102 – Preliminary Site Evaluation Document) consisted of a review of existing geologic and geotechnical information, investigation of subsurface conditions, and application of the results to project design considerations. The following section presents preliminary design and sizing of the proposed wastewater systems based on the peak seasonal door count data from each site, and a projected growth rate of 1.0% to determine the 2040 design year rest area usage. Recorded door count data from 2013 to 2017 was evaluated to identify the peak seasonal rest area usage, which ultimately resulted in a peak seasonal usage in the month of July. Wastewater system design for both the EB and WB systems will be identical using the highest usage rate for the conditional permitting of this Phase 1 project.

The recommendations presented herein are based on available project information to date and are intended to assist in final planning and design.

Drainfield System Sizing

The future wastewater flows are estimated using the highest projected door count data over the design period with an estimated usage rate of 2.5 gallons/user.

Peak Seasonal Rest Area Usage

Facility	2013-2017 Peak Seasonal Door Count (PPD)	2040 Estimated Door Counts (1.0% Growth Rate) (PPD)
EB Rest Area	1,294	1,611
WB Rest Area	1,147	1,427

$$1,611 \text{ people per day} \times 2.5 \text{ gallons/user} = 4,027 \text{ gpd}$$

Design Flow = 4,100 gpd

Based on percolation rates of 15.0 minutes per inch and the existence of loamy sand and sandy loam in the test pits, Table 2.1.1 in DEQ Circular 4 specifies an application rate of 0.6-0.5 gpd/ft². For this preliminary septic system evaluation, the lower application rate of 0.5 gpd/ft² is used for drainfield sizing.

The primary drainfield system is sized assuming a Level II wastewater treatment system will be installed which results in a 50% reduction in the overall drainfield size.

$$\begin{aligned} \text{Design Flow} &= 4,100 \text{ gpd} \\ \text{Application Rate} &= 0.5 \text{ gpd/ft}^2 \\ \text{Drainfield Size} &= 4,100 \text{ gpd} \div 0.5 \text{ gpd/ft}^2 \times 0.5 \\ &= 4,100 \text{ ft}^2 \\ \# \text{ 120-ft Laterals} &= 11 \text{ (assume 3-ft wide trench)} \\ \text{Total Drainfield Footprint} &= 9,167 \text{ ft}^2 \text{ (assume laterals placed on 7-ft centers)} \end{aligned}$$

MDEQ will make the final determination on drainfield size reduction. This will be based on treatment effluent strength, soil conditions, and non-degradation to groundwater.

A 100% replacement area is required to be identified and utilized in the event that the primary drainfield fails. The replacement area is required to be sized without reduction factors.

$$\begin{aligned} \text{Design Flow} &= 4,100 \text{ gpd} \\ \text{Application Rate} &= 0.5 \text{ gpd/ft}^2 \\ \text{Drainfield Size} &= 4,100 \text{ gpd} \div 0.5 \text{ gpd/ft}^2 \\ &= 8,200 \text{ ft}^2 \\ \# \text{ 100-ft Laterals} &= 27 \text{ (assume 3-ft wide trench)} \\ \text{Total Drainfield Footprint} &= 18,733 \text{ ft}^2 \text{ (assume laterals placed on 7-ft centers)} \end{aligned}$$

Scope of Work Report

- s. **Conceptual Site Layout.** Existing right-of-way was evaluated in a conceptual manner with the intent of this evaluation leading to an understanding of a possible conceptual site layout for the future rest area reconstruction project. A preliminary conceptual site layout will be developed to the point of being able to define the site for a future design-build phase of the project without defining parameters that could hinder a design-build process. The final conceptual site layout will include a planning-level estimate of parking expansion, MDEQ-required setbacks, and well locations relative to the proposed drainfield locations. A final report summarizing the features that were reviewed and evaluated will be provided for use in future phases of the project.

Design Exceptions

No design exceptions have been identified at this time.

Right-of-Way

A Preliminary Right-of-Way Ownership Map (Activity 110) has been completed listing property owners on and adjacent to the project. The proposed rest area improvements are anticipated to require additional right-of-way easement from the USFS for the placement of the future drainfield areas. It is estimated that approximately 4.7 acres of additional easement will be necessary to complete the project. The Preliminary Site Evaluation Document (Activity 102) has been completed and preliminary conceptual site designs have been coordinated with the USFS in which a preferred concept has been confirmed between MDT and USFS. The final conceptual site layout for Phase 1 will depict the proposed easement boundary anticipated for the future rest area reconstruction improvements.

Utilities/Railroads

Utilities are anticipated to be impacted by the rest area reconstruction improvements within the rest area boundary. Existing overhead power poles, underground power lines and underground telephone lines are anticipated to be impacted due to the expansion and upgrades of the rest area. A planning level Phase I SUE was included in the development of Phase 1 of the project to show known utilities within the project limits that were picked up during the engineering survey along with utilities identified from as-built drawings. Details regarding the perpetuation and upgrade of utility services to the rest area sites will be determined under Phase 2 of the project.

There is a railroad mainline situated approximately 1,200 feet west of the EB site and will not be impacted by this project.

Maintenance Items

In order to provide routine maintenance at the site and handle any non-routine maintenance (including troubleshooting and repair), a water and wastewater operator familiar with the site facilities is recommended. General personnel duties are outlined below. Site-specific needs may require the addition or deletion of items on this list.

- Perform building and facility maintenance and repairs as necessary.
- Note and report maintenance issues that need attention beyond staff's capabilities.
- Arrange for removal of septic waste when levels in the septic tank warrant.
- Arrange for flow testing of the drinking water system.
- Perform MDEQ water sampling.
- Perform periodic checks and replacement of water filters.

Advanced wastewater treatment maintenance may require staff trained in the operation of the advanced treatment system.

Environmental Considerations

A categorical exclusion for this project concluding that it will not cause any significant environmental impacts and will not involve unusual circumstances is expected to be approved soon. The Scope of Work for this project will not be approved until the environmental document is signed and approved.

Phase 1 permitting will include MDEQ conditional approval of the water and wastewater systems. Other construction-related permitting is expected to occur during Phase 2 of the project.

Scope of Work Report

No wetlands or other aquatic resources were identified within the project limits where ground-disturbing project improvements would likely take place. No permits will be required for impacts to wetlands, streams, or any other aquatic resource, as none are present within the project limits. Depending on the project design, construction storm water permits may be required.

A Preliminary Traffic Noise Analysis (Activity 179) has been completed. It was determined that no permanent noise impacts are anticipated as the rest area is adjacent to I-90, and I-90 traffic noise is already the dominant noise source in the project area. A detailed noise analysis is not required for this project.

A Class III cultural resources inventory and subsurface testing (Activity 177) has been completed for this project because improvements are anticipated to occur outside of existing MDT right-of-way. The cultural investigation was conducted in coordination and concurrence with the USFS. No evidence of significant cultural activity was identified.

A hazardous materials investigation of each rest area building will be conducted by MDT personnel or under a consultant term assignment.

Wildlife accommodations will not be considered for the project.

Energy Savings/Eco-Friendly Considerations

Development of this project is anticipated to improve nutrient loading such as nitrates and phosphorus within the project area. These nutrient improvements will be the direct result of the installation of improved wastewater systems. Further energy saving or eco-friendly considerations will be addressed during Phase 2 of the project.

Experimental Features

Experimental features have not been identified for this project.

Work Zone Safety and Mobility

Work zone safety and mobility will be important for moving traffic safely through work zones and for keeping campground patrons from accessing the work sites.

Other Projects

No other projects have been identified as having a direct impact to this project.

Traffic Control

It is anticipated that traffic impacts along I-90 will be minimal. All construction work and staging can be completed outside of the interstate travel lanes.

The only way for recreationists to access the USFS Quartz Flats campgrounds on both sides of the interstate is through the rest areas. Traffic control will need to be carefully considered during Phase 2 of the project because the USFS indicated that they would like to maintain access to the campgrounds, for all vehicles including RVs with trailers, during the open camping season (Memorial Day through Labor Day), throughout the duration of construction. Campground fees are the primary funding source for the Superior District's recreational budget. The USFS did mention that they could consider shortening their camping season if needed. Construction access for the campground will need to be addressed during Phase 2 when developing special provisions, traffic control plans and signage requirements.

The USFS will prohibit using the campgrounds for construction staging and prohibit the contractor from using the campground underpass for construction purposes.

The USFS also indicated that they would like campground signs to be replaced/updated per USFS standards. They prefer to use the brown signs in place of the blue signs. Coordination with the USFS will be necessary for the future design-build phase to incorporate any requirements based on the outcome of the coordination efforts.

Scope of Work Report

Intelligent Transportation Systems (ITS) Features

No ITS features have been identified for this project at this time.

Public Involvement

Based on the nature of this project phase, a Level A public involvement plan was initiated for this project, consisting of a news release during the survey phase of this project. No public comments have been received as a result of the news release.

To supplement the public involvement efforts of Phase 1 of this project, MDT employed an on-line optional survey tool called OPINIATOR for users of the Quartz Flat Rest Area. Informational signage was installed at both sites providing instructional direction to an on-line survey which visitors could provide comment on their experience. The survey was initiated in September 2018. A summary of the survey responses, including comments and suggestions, is provided in the Preliminary Site Evaluation Document that was completed in March 2019. The survey summary includes responses received between September 1, 2018 and March 6, 2019. More than half of the responses included a comment regarding the need for improved facilities associated with non-working or inadequate restroom features, inadequate space, parking, or odors from the facility.

No additional public involvement elements are anticipated for this phase of the project. If Phase 2 is delayed, another news release may be necessary.

The need for construction phase (Phase 2) public involvement will be evaluated by the MDT Public Involvement Officer prior to construction.

Construction Cost Estimate

The project has a primary scope of a G-matching activity (Safety Rest Area). Therefore, all work and costs associated with the project will be applied at the increased federal share. All phases that have not already been obligated will also be obligated at the increased federal share.

Preliminary planning level costs have been developed based on the proposed configurations for the water systems, wastewater systems, and conceptual site development only.

Task	CN	IDC (10.41%)	Total (CN+IDC)
Mobilization	\$350,000	\$36,435	\$386,435
Project Administration	\$350,000	\$36,435	\$386,435
Site Construction	\$3,062,000	\$318,754	\$3,380,754
Building Construction	\$3,343,000	\$348,006	\$3,691,006
Signing/Pavement Markings	\$100,000	\$10,410	\$110,410
Traffic Control	\$40,000	\$4,164	\$44,164
Erosion Control	\$25,000	\$2,603	\$27,603
Miscellaneous Work	\$50,000	\$5,205	\$55,205
Contingency (10%)	\$732,000	\$76,201	\$808,201
Total	\$8,052,000	\$838,213	\$8,890,213

Incidental Construction (IC) costs are estimated to be \$44,164. Estimated MDT PE costs (after award) are \$55,205 and estimate D-B PE costs are \$949,526. Estimated MDT CE costs are \$714,750 and estimated D-B CE costs are \$176,656. **The total estimated project cost is \$10,830,514.**

The cost estimate will be further defined during Phase 2 of this project once the specific water and wastewater systems are identified and the final designs associated with the buildings and final site improvements are developed.

Preliminary Engineering

The percent PE expended is 58%. A review of the expended preliminary engineering and hours used compared to the anticipated amounts required for completing the project design indicates that a modification is not needed.

Scope of Work Report

IM-G 90-1(225)58, Quartz Flat Rest Area, 6875000
EPS Project Manager: Wade Salyards

Page 12 of 14

Project and Risk Management

This permitting phase (Phase 1) is a consultant designed project and is being administered by Wade Salyards, P.E., of the Consultant Design Bureau in Helena. The consultant for this Phase 1 project is DOWL and the Project Manager is Doug Fischer, P.E. This project is not considered a Project of Division Interest (PoDI) by FHWA.

Final MDEQ and construction permitting poses a moderate risk of delaying the project. Conditional approval of the water and wastewater systems will be pursued during Phase 1 to help mitigate this risk.

There is low risk to the project that the USFS does not grant the additional right-of-way easement for the proposed drainfield areas. To help mitigate this risk, the proposed easement boundary limits have been coordinated with the USFS during Phase 1 and the USFS have verbally indicated their concurrence of the proposed easement limits based on review and feedback of the preferred conceptual alternative. MDT will begin to procure the easement upon the approval of this Scope of Work Report.

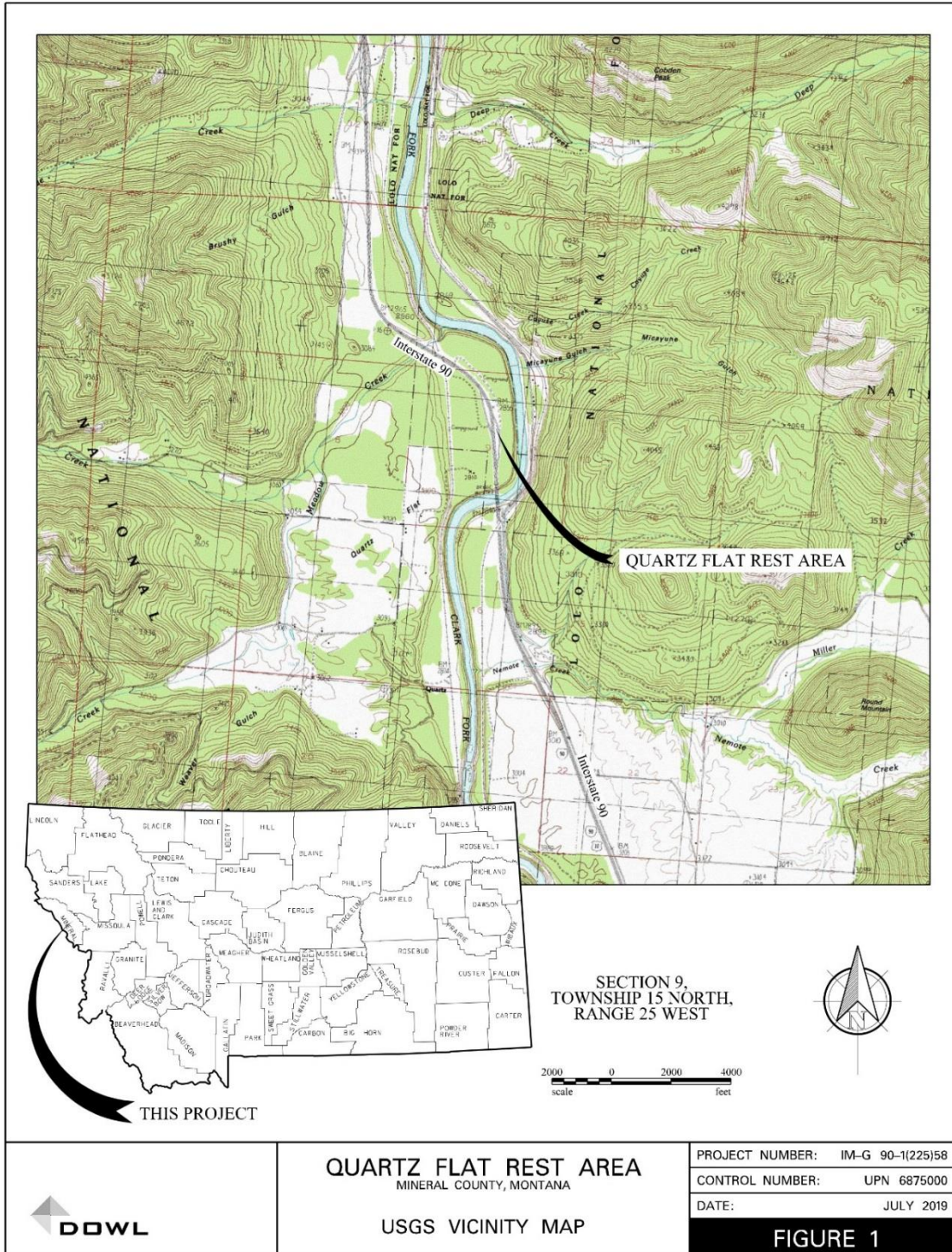
Ready Date

DOWL will prepare and submit a Final Plan Report package which will include a final conceptual site layout, MDEQ water and wastewater system conditional approvals, and relevant reports developed during Phase 1.

The Phase 1 Final Plan Report package is expected to be completed and ready by Spring 2020. The Ready Date for the project is April 1, 2020. The project does not currently have a Letting Date in the Tentative Construction Program, but will likely be let in Summer/Fall of 2020. The current PE End Date is 10/31/2024. A review of the remaining EPS schedule, critical path activities, and target Ready Date isn't needed.

Scope of Work Report

Vicinity Map



Scope of Work Report

IM-G 90-1(225)58, Quartz Flat Rest Area, 6875000
EPS Project Manager: Wade Salyards

Page 14 of 14

e-copies:

Dustin Rouse, Preconstruction Engineer
William Squires, Acting Highways Design Engineer
Dave Hedstrom, Hydraulics Engineer
Bill Weber, Acting Supervisor, Photogrammetry & Survey
Stanton Brelin, Traffic Operations Engineer
Ivan Ulberg, Traffic Design Engineer
Patricia Burke, Safety Engineer
Chad Richards, Engineering Cost Analyst
John Pirre, Engineering Information Services
Vacant, Public Involvement Officer
Sue Sillick, Research Section Supervisor
Lisa Hurley, Fiscal Programming Section
David Phillips, Engineering Division

Jeff Nehring, Engineering Division

Andy White, Acting Secondary Roads Engineer

Sheila Ludlow, Bicycle/Pedestrian Coordinator

Tom Martin, Environmental Services Bureau Chief

Joe Radonich, Remediation and Assessment

Darin Reynolds, Construction Bureau – VA Engineer

Nathan Haddick, Bridge Design Engineer

Robert Vosen (acting), District Administrator
Steve Felix, Maintenance Chief (Missoula)
Justun Juelfs, Maintenance Chief (Kalispell)
Vacant, Right of Way Design Supervisor
Johnathon Schmidt (acting), Construction Ops Engineer
Christopher Hardan, Bridge Area Engineer
Bret Boundy, Geotechnical Manager
Susan Kilcrease, Project Development Engineer
Pat Metzger, District MCS Captain
Vacant, Surfacing Design
Patricia Hogan, District Utility Agent

Gabe Priebe, Utilities Engineering Manager
David Hoerning, Lands Section Supervisor
Jerilee Weibel, Acquisition Section Supervisor
Joe Zody, R/W Access Management Section Manager

Jim Davies, Materials Bureau Chief
DJ Berg, Pavement Analysis Engineer
Miles Yerger, Surfacing Design Supervisor
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Dawn Stratton, Fiscal Programming Section
Amanda Jackson, Eng. Manager, Bridge Management System
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Bill Semmens, Environmental Resources Section Supervisor
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Joe Wiegand, Biologist
Benjamin Nunnallee, Projects Engineer
Breta Palmer, District Utility Agent
Steve McEvoy, Constructability Reviewer