DEPARTMENT OF NATURAL RESOURCES
AND CONSERVATION

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FINAL
ENVIRONMENTAL ASSESSMENT

Project Name:	Lewis & Clark County Trinity Elementary School District #4 Canyon Creek Water – Septic System Expansion
Proposed Implementation Date:	Spring 2025
Proponent:	Trinity School District #4 in Canyon Creek, Montana
Location:	Section 16, T 12 N, R 05 W
County:	Lewis & Clark

I. TYPE AND PURPOSE OF ACTION

Trinity School District #4 in Canyon Creek, Lewis & Clark County, Montana is proposing a new public wastewater sewage treatment system and a public water supply well serving the Trinity School District #4. The wastewater treatment systems, septic tanks and drainfields serving the connection will be abandoned, unless noted in plans, and replaced with a public wastewater sewage treatment system.

Trinity School District #4 is a K-5 rural school located in Canyon Creek in Lewis and Clark County, and serves students from the communities of Canyon Creek, Silver City and Birdseye. Established in 1893, Trinity School is Montana's oldest continually operating school. The school district has experienced unprecedented growth in their enrollment over the past couple years, with 38 students enrolled in school year 2021-2022. This represents a nearly 2.4-fold increase in the school's 20-year average of 16 students/year and student enrollment is projected to continue to increase over the coming 5 years. Current student enrollment exceeds the school's building and infrastructure capacity, including that of the existing well and septic systems. The school currently uses delivered bottled water for drinking and needs to upgrade the well to a DEQ-approved public water system (PWS) to provide safe drinking water for the school's students and staff. Concurrently, the school's septic system, installed in 2013, was sized for a maximum of 25 total people and needs to be upgraded to a Level II system that will accommodate up to 100 total people. Both the water and septic components of the project are necessary for the immediate needs of the existing population at Trinity School.

There are two phases of the project:

1) Design and installation of new well and treatment system for drinking water; and
2) Installation of a Level II septic system;

The design phase for the septic system is already complete. Both phases address existing problems within the system as the current enrollment at the school exceeds the existing school's water and septic infrastructure capacity. It should be noted, however, that both Phases 1 and 2 will be/have been designed to support additional enrollment at the school, which is expected to continue to increase for at least the next few years. This environmental assessment is specific to Phase 1 of the

project. Phase 1: Design and siting of a new well and treatment system will be conducted by a licensed engineer and a PWS permit application will be submitted to DEQ for review and approval. Following DEQ permit approval, a well driller will be contracted, and the designed treatment system will be installed to approved specifications. Phase 2: An On-Site Wastewater Treatment System Design Report was completed by a licensed engineering firm in December 2021 that provided the design details for the recommended Level II Treatment Septic system for Trinity School. The design report has been submitted to Lewis and Clark Public Health, Environmental Services Division and DEQ for preliminary review. Upon full approval by the required agencies, a septic system installer will be contracted, and the design-approved system will be installed.

According to the July 25, 2024, Montana Department of Environmental Quality (DEQ) approval, the public wastewater sewage treatment system (WWTS) serving Trinity School District #4 will consist of a new sewer collection system that will connect to the existing cleanout, located on the Eastern side of the building, and will collect approximately 1,100 gallons per day (gpd) of wastewater. Wastewater will gravity flow to the 3.000-gallon septic tank, effluent filter, and 800-gallon dose tank followed by a pressure-dosed Elevated Sand Mound. The new system will comply with the Administrative Rules of Montana (ARM) Title 17, Chapter 36, Sub-Chapters 1, 3, 6, and the most current standards of DEQ, and shall be constructed in accordance with the approved plans and specifications provided by Great West Engineering.

The well for this Nontransient Noncommunity was approved by MDEQ on July 25, 2024. For this project, the eastern well GWIC#327010 will be equipped with a 1.5-hp Franklin Model 3554 submersible pump rated at 35 gpm at approximately 188 feet total dynamic head. The well pump is connected to one (1) Wellxtrol WX-350 pressure tank & one (1) Wellxtrol WX404C pressure tank will be installed to limit the number of pump starts.

Conditions of the public water supply approval to be provided with certification:

1. The operator responsible for the PWS must be identified.
2. The final operation and maintenance manual for the Public Water Supply, and distribution system must be provided.
3. A copy of any easements and deed restrictions as filed with the Clerk and Recorders Office.
4. The following constituents will need to be sampled: asbestos, cyanide, Dioxin, Diquat, Dibromochloropropane, Endothall, Ethylene dibromide, Glyphosphate Polychlorinated Biphebols, constituents will need to be sampled and submitted prior to activation and connection to the public water supply.

DEQ approval is conditioned on completion of construction within three years of the approval.

II. PROJECT DEVELOPMENT

1. PUBLIC INVOLVEMENT, AGENCIES, GROUPS OR INDIVIDUALS CONTACTED:

Provide a brief chronology of the scoping and ongoing involvement for this project. List number of individuals contacted, number of responses received, and newspapers in which notices were placed and for how long. Briefly summarize issues received from the public.

Ongoing communication has occurred between the Canyon Creek School PWS engineer-of-record, Ryan Casne of Casne and Associates; the Canyon Creek School WWTS engineer-of-record, Collette Anderson of Great West Engineering; DNRC; DEQ; Lewis & Clark County Health Department; the

Montana Historical Society; nearby property owners; and other local government entities. The project was presented at local meetings and made available for public comment.

DNRC will post a draft of this Environmental Assessment to be available for public comment for 30 days on the DNRC – Public Notices webpage. For any comments submitted by the public, the MEPA Coordinator will review and work with the Grant Manager and applicant to adequately address those comments.

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2. OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION, LIST OF PERMITS NEEDED:
Examples: cost-share agreement with U.S. Forest Service, 124 Permit, 3A Authorization, Air Quality Major Open Burning Permit.

The WWTS was approved by MDEQ on July 25, 2024, under EQ#22-1787. A septic permit from the Lewis & Clark County Health Department will be required.

The well for this Nontransient Noncommunity was approved by MDEQ on July 25, 2024, under EQ#24-1227.

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3. ALTERNATIVE DEVELOPMENT:
Describe alternatives considered and, if applicable, provide brief description of how the alternatives were developed. List alternatives that were considered but eliminated from further analysis and why. Include the No Action alternative.

No alternatives were considered, and no alternatives analysis was conducted. There is no way for DNRC to evaluate if this proposed system is the most cost-effective, whether or not it has a greater adverse environmental impact than any other means to accomplish the same goals. In that regard, this project does not meet the Montana Environmental Policy Act requirements.

III. IMPACTS ON THE PHYSICAL ENVIRONMENT

- *RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.*
- *Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.*
- *Enter "NONE" If no impacts are identified or the resource is not present.*

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4. GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE:
Consider the presence of fragile, compactable or unstable soils. Identify unusual geologic features. Specify any special reclamation considerations. Identify direct, indirect, and cumulative effects to soils.

Project site is not prone to geographic constraints and/or dangers due to steep slopes, subsidence, or seismic activity. The project is subsurface water and sewer utility work. The United States Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey mapping application indicates that the soils near the project area consist of:

- Crago gravelly loam, 0 to 8 percent slopes – 413.4 acres, 74% of the project area;

- Thess loam, 0 to 2 percent slopes – 101.5 acres, 18.2% of the project area;
- Villard-Villy silt loams, 0 to 2 percent slopes – 31.4 acres, 5.6% of the project area;
- Attewan loam, 0 to 2 percent slopes – 12.6 acres, 2.3% of the project area

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated by the NRCS Web Soil Survey mapping. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Saturated hydraulic conductivity, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

NRCS rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected. **The four (4) types of soils that exist on and around the proposed project site are either somewhat limited or very limited for septic tank absorption fields.**

Proposed Alternatives – Potentially direct and indirect, minor to major, short- to long-term, recurring adverse impact to soil quality, stability, and moisture. The soils on site are unsuitable for septic tank absorption due to the slope, the nature of how slowly and inefficiently water moves through the soils, the shallow depth of bedrock, and propensity for flooding. The soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated. The unsuitable soil limitations will be mitigated by the use of an elevated sand mound wastewater treatment system (WWTS) on this site. The WWTS will be permitted through MDEQ as a "public system" and will also require a septic permit from the Lewis & Clark County Health Department. The proposed alternative is expected to have a long-term beneficial impact on soil quality.

No Action Alternative – Potentially direct and indirect, minor to major, short- to long-term, recurring adverse impacts to soil quality, stability, and moisture. The inability to build the addition to the school and support increased attendance would continue to put strain on the existing system and overload the septic drainfield.

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5. WATER QUALITY, QUANTITY AND DISTRIBUTION:
Identify important surface or groundwater resources. Consider the potential for violation of ambient water quality standards, drinking water maximum contaminant levels, or degradation of water quality. Identify direct, indirect, and cumulative effects to water resources.

There are several surface water bodies within one-mile of the project site. The Jefferson Ditch is

located to the west of the project and the Vincent Ditch is located to the East. The Little Prickly Pear Creek is located to the north. The site is currently served by an existing well which will be abandoned upon completion of the project. The project will include a new elevated sand mound WWTS permitted through MDEQ as a "public system" and will also require a septic permit from Lewis & Clark County Health Department The project includes a new "public water system" and well. The site is currently being served by an existing septic tank and drainfield.

Proposed Alternatives – Potentially direct and indirect, minor to major, short- and long-term, local, recurring adverse impacts to water quality and quantity. If the soils perform as anticipated in processing water flow, there is the potential for groundwater contamination if the effluent is inadequately filtered by the drainfield. If the design of the wastewater treatment system functions properly, the proposed alternative is expected to have a long-term beneficial impact on water quality. The adverse impact on water quantity will come from a slight decrease in water availability due to the increased pumping capacity of the well. The WWTS review process requires a non-degradation evaluation that must prove impacts to groundwater and surface water quality are non-significant.

No Action Alternative –Potentially direct and indirect, moderate to major, short- and long-term, local and regional adverse impacts to water quality, quantity, and distribution. If the building addition is unable to be constructed, the water and septic systems could be unable to adequately address need and use of the expanding school population and could result in water shortages and reduced availability, overload of the septic capacity and potential contamination of groundwater.

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6. AIR QUALITY:

What pollutants or particulate would be produced (i.e. particulate matter from road use or harvesting, slash pile burning, prescribed burning, etc)? Identify the Airshed and Impact Zone (if any) according to the Montana/Idaho Airshed Group. Identify direct, indirect, and cumulative effects to air quality.

The project is in a rural setting, with a few nearby residential areas. The current air quality conditions are consistent with a rural western Montana setting. The proposed project is not located in an air quality Attainment Area, as set by the U.S. Environmental Protection Agency's National Ambient Air Quality Standards. The project area is not listed as impaired in air quality particulates per the Montana DEQ Air Quality Nonattainment StatusList (Montana DEQ Air Quality Website visit). No air pollution facilities are in, or near (within 1/2-mile) the project area. No nonattainment areas exist in the vicinity of the project.

Proposed Alternatives – Potentially direct, minor, short-term, local adverse impacts to air quality as there may be some dust introduced to the environment from construction activity and/or exhaust fumes from the operation of heavy construction equipment. The contractor will need to provide dust control measures and should limit construction working hours to approximately 7 AM to 7 PM.

No Action Alternative – No impacts to air quality.

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7. VEGETATION COVER, QUANTITY AND QUALITY:

What changes would the action cause to vegetative communities? Consider rare plants or cover types that would be affected. Identify direct, indirect, and cumulative effects to vegetation.

The project area is primarily within a rural residential and school area, and construction is indicated to be within an easement adjacent to the school property. Records from the Montana Natural Heritage Program (MTNHP) indicate the project area is surrounded by the following land cover types:

- Rocky Mountain Lower Montane, Foothill, and Valley Grassland – 2,791 acres, 48% project area;
- Cultivated crops – 1,643 acres, 28% project area;
- Northern Rocky Mountain Lower Montane Riparian Woodland and Shrubland – 359 acres, 6% project area;
- Big Sagebrush Steppe – 288 acres, 5% project area;
- Montane Sagebrush Steppe – 199 acres, 3% project area;
- Rocky Mountain Ponderosa Pine Woodland and Savanna - 167 acres, 3% project area;
- Human Land Use, Roads – 118 acres, 2% project area;

The following land cover categories are limited to less than or equal to 1% of the project area:

- Alpine-Montane Wet Meadow
- Pasture/Hay
- Low Intensity Residential
- Rocky Mountain Montane-Foothill Deciduous Shrubland
- Developed, Open Space
- Rocky Mountain Foothill Limber Pine – Juniper Woodland
- Introduced Upland Vegetation – Annual and Biennial Forbland
- Rocky Mountain Subalpine-Montane Mesic Meadow

There are 27 plant Species of Concern and Potential Species of Concern that may occur within the project area:

Potential Species

Crawe's Sedge	*Carex crawei*
Long-sheath Waterweed	*Elodea bifoliata*
Hare's-foot Locoweed	*Oxytropis lagopus var. conjugans*
Flatleaf Bladderwort	*Utricularia intermedia*
Beaked Spikerush	*Eleocharis rostellata*
Chaffweed	*Centunculus minimus*
Pale-yellow Jewel-weed	*Impatiens aurella*
Wedge-leaf Saltbush	*Atriplex truncata*
Platte Cinquefoil	*Potentilla plattensis*
Lesser Rushy Milkvetch	*Astragalus convallarius*
Mealy Primrose	*Primula incana*
Panic Grass	*Dichanthelium acuminatum*
Floriferous Monkeyflower	*Mimulus floribundus*
Linear-leaf Fleabane	*Erigeron linearis*

Simple Kobresia	*Kobresia simpliciuscula*
Small-winged Sedge	*Carex stenoptila*
Letterman's Needlegrass	*Stipa lettermanii*
Fleshy Stitchwort	*Stellaria crassifolia*
Dense-leaf Draba	*Draba densifolia*
Divide Bladderpod	*Physaria klausii*
Kalm's Lobelia	*Lobelia kalmia*
Suksdorf Monkeyflower	*Mimulus suksdorfii*
Heart-leaved Buttercup	*Ranunculus cardiophyllus*
Giant Helleborine	*Epipactis gigantea*
Rydberg's Parsley	*Musineon vaginatum*
Small Yellow Lady's-slipper	*Cypripedium parviflorum*
Scribner's Ragwort	*Senecio integerrimus var. scribneri*

Proposed Alternatives – Potentially direct, minor to moderate, short-term, localized adverse impacts to vegetation cover. The project construction will have a short-term adverse impact on existing vegetation within the school property and adjacent easement. Revegetation with native species will occur after construction. Efforts should be made to preserve existing vegetation where applicable. BMPs should be installed and monitored.

No Action Alternative – No impact on the vegetation cover, quantity and quality.

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8. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS:
Consider substantial habitat values and use of the area by wildlife, birds or fish. Identify direct, indirect, and cumulative effects to fish and wildlife.

The project area has existing terrestrial and avian habitats. Project location is not identified as a priority area for terrestrial conservations efforts within the Montana State Wildlife Action Plan (SWAP). The project does not exist within boundaries for Montana Sage Grouse habitat (see attached map; Montana Sage Grouse Habitat Conservation Plan web mapping tool). Records from the MTNHP indicate there are 18 species of concern observed in and around the project region including the following:

Species Occurrences and Observed Species:

Grizzly Bear	*Ursus arctos*
Bald Eagle	*Haliaeetus leucocephalus*
Bobolink	*Dolichonyx oryzivorus*
Great Blue Heron	*Ardea herodias*
Veery	*Catharus fuscescens*
Clark's Nutcracker	*Nucifraga columbiana*
Long-billed Curlew	*Numenius americanus*
Lewis's Woodpecker	*Melanerpes lewis*

Evening Grosbeak	*Coccothraustes vespertinus*
Sage Thrasher	*Oreoscoptes montanus*
Brewer's Sparrow	*Spizella breweri*
Burrowing Owl	*Athene cunicularia*
Trumpeter Swan	*Cygnus buccinator*
Barrow's Goldeneye	*Bucephala islandica*
American White Pelican	*Pelecanus erythrorthynchos*
Golden Eagle	*Aquila chrysaetos*
White-faced Ibis	*Plegadis chihi*
Loggerhead Shrike	*Lanius ludovicianus*

MTNHP records (see attached MTNHP report) indicate 75 other observed and potential animal and plant species of concern, and potential species may exist in the area including the following:

Other Observations:

Western Toad	*Anaxyrus boreas*
American Bittern	*Botaurus lentiginosus*
Hooded Merganser	*Lophodytes cucullatus*
Great Gray Owl	*Strix nebulosa*
Western Screech-Owl	*Megascops kennicottii*
Cassin's Finch	*Haemorhous cassinii*
American Goshawk	*Accipiter atricapillus*
Green-tailed Towhee	*Pipilo chlorurus*
Pinyon Jay	*Gymnorhinus cyanocephalus*
Sharp-tailed Grouse	*Tympanuchus phasianellus*
Yellow-billed Cuckoo	*Coccyzus americanus*
Common Poorwill	*Phalaenoptilus nuttallii*
Sprague's Pipit	*Anthus spragueii*
Harlequin Duck	*Histrionicus histrionicus*
Ovenbird	*Seiurus aurocapilla*
Black Tern	*Chlidonias niger*
Ferruginous Hawk	*Buteo regalis*
Pileated Woodpecker	*Dryocopus pileatus*
Black-necked Stilt	*Himantopus mexicanus*
Broad-tailed Hummingbird	*Selasphorus platycercus*
Caspian Tern	*Hydroprogne caspia*
Thick-billed Longspur	*Rhynchophanes mccownii*
Rufous Hummingbird	*Selasphorus rufus*
Western Pearlshell	*Margaritifera falcata*
Monarch	*Danaus plexippus*
Suckley Cuckoo Bumble Bee	*Bombus suckleyi*

Preble's Shrew	*Sorex preblei*
Western Pygmy Shrew	*Sorex eximius*
North American Porcupine	*Erethizon dorsatum*
Western Spotted Skunk	*Spilogale gracilis*
Little Brown Myotis	*Myotis lucifugus*
Spotted Bat	*Euderma maculatum*
Northern Hoary Bat	*Lasiurus cinereus*
Fringed Myotis	*Myotis thysanodes*
Townsend's Big-eared Bat	*Corynorhinus townsendii*
Silver-haired Bat	*Lasionycteris noctivagans*
Long-eared Myotis	*Myotis evotis*
Long-legged Myotis	*Myotis volans*
Dwarf Shrew	*Sorex nanus*
Canada Lynx	*Lynx canadensis*
Wolverine	*Gulo gulo*
Crawe's Sedge	*Carex crawei*
Long-sheath Waterweed	*Elodea bifoliata*
Hare's-foot Locoweed	*Oxytropis lagopus var. conjugans*
Flatleaf Bladderwort	*Utricularia intermedia*
Beaked Spikerush	*Eleocharis rostellata*
Chaffweed	*Centunculus minimus*
Pale-yellow Jewel-weed	*Impatiens aurella*
Wedge-leaf Saltbush	*Atriplex truncata*
Platte Cinquefoil	*Potentilla plattensis*
Lesser Rushy Milkvetch	*Astragalus convallarius*
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Small Yellow Lady's-slipper	*Cypripedium parviflorum*

Scribner's Ragwort	*Senecio integerrimus var. scribneri*

Proposed Alternatives – Potentially direct, indirect, short- to long-term, local, non-recurring adverse impacts to terrestrial, avian, and aquatic life and habitats during construction. Efforts should be made to preserve existing vegetation where applicable. BMPs should be installed and monitored. The contractor shall be required to minimize impacts and restore any disturbance to preexisting conditions.

No Action Alternative – Potentially direct, negligible to major, short- to long-term, local, recurring adverse impacts may occur to terrestrial, avian and aquatic life and habitats. The septic system could be unable to process the increase in septage as the school enrollment increases and begin overloading the system, creating the means for threatened or endangered species to come in contact with raw septage.

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9. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES:
Consider any federally listed threatened or endangered species or habitat identified in the project area. Determine effects to wetlands. Consider Sensitive Species or Species of special concern. Identify direct, indirect, and cumulative effects to these species and their habitat.

The National Wetlands Inventory (NWI) website was used to determine whether any wetlands were present within the lands adjacent to the project location (map attached). The following wetland and riparian habitats are present:

- 7 acres Semi-permanently flooded aquatic bed habitat (wetlands with vegetation growing on or below the water surface for most of the growing season);
- 27 acres Emergent habitat (wetlands with erect, rooted herbaceous vegetation present during most of the growing season);
- 108 acres Scrub-shrub habitat (wetlands dominated by woody vegetation less than 6 meters tall);
- 12 acres Forested habitat (wetlands dominated by woody vegetation greater than 6 meters tall);
- 2 acres Unconsolidated Bottom riverine habitat (stream channels where the substrate is at least 25% mud, silt, and other fine particles);
- 2 acres Unconsolidated Shore riverine habitat (shorelines with less than 75% areal cover of stones, boulders, or bedrock and less than 30% vegetation cover. The area is also irregularly exposed due to seasonal or irregular flooding and subsequent drying);
- 4 acres Stream Bed Intermittent riverine habitat (active river channel that contains periodic water flow);
- 12 acres Forested Lotic habitat (riparian class with woody vegetation that is greater than 6 meters tall).

According to records from the MTNHP there are no additional unique, endangered, fragile, or limited environmental resources within the project area. According to the USFWS, no critical habitat exists within the project area. The project does not have any identified unique natural features. The project is not identified as priority area for terrestrial conservation efforts within the Montana State Wildlife Action Plan (SWAP) but is located within one mile of the Helena and East Continental Divide terrestrial priority area. This project area is not identified as a priority area for

aquatic conservation efforts within the SWAP.

As mentioned in the previous section, there are 93 species of concern listed as present or potentially present using the project area as viable habitat. DNRC also used the U.S. Fish and Wildlife Service Information for Planning and Consultation (IPaC) tool to generate a resource list summarizing any endangered or threatened species that are known or expected to be near the project area. The IPaC list generated five (5) Federally-listed species under the Endangered Species Act as potentially occurring in the greater project area and nine (9) migratory bird species:

Monarch	*Danaus plexippus*
Suckley's Cuckoo Bumble Bee	*Bombus suckleyi*
Canada Lynx	*Lynx canadensis*
Wolverine	*Gulo gulo*
Grizzly Bear	*Ursus arctos horribilis*
Golden Eagle	*Aquila chrysaetos*
Bald Eagle	*Haliaeetus leucocephalus*
Bobolink	*Dolichonyx oryzivorus*
California Gull	*Larus californicus*
Evening Grosbeak	*Coccothraustes vespertinus*
Franklin's Gull	*Leucophaeus pipixcan*
Lesser Yellowlegs	*Tringa flavipes*
Lewis's Woodpecker	*Melanerpes lewis*
Rufous Hummingbird	*Selasphorus rufus*

Bald Eagle and Golden Eagle species are protected under the Bald and Golden Eagle Protection Act of 1940 and Montana Bald Eagle Management Plan, Migratory Bird Treaty Act of 1918, and Lacey Act of 1900. Migratory Birds are also protected under the Migratory Birds Treaty Act of 1918 and Lacey Act of 1900.

Although no eagle nests have been mapped in the project area, Bald Eagles and Golden Eagles may be present in the project area. Several wetland and riverine habitats are located in and around the project area. If an eagle nest is observed, MT Fish, Wildlife and Parks (FWP) may need to be consulted. For any work planned within 0.5 miles of an eagle nest, FWP staff will be consulted to determine if the eagle nest is active. FWP recommends avoiding disturbance during the breeding season (February 1 – August 15) if the eagle nest is active and avoiding tree removal during the breeding season.

Proposed Alternatives – Potentially direct and indirect, minor, short-term, temporary localized adverse impacts to unique, endangered, fragile or limited environmental resources exist for the project. Adverse impacts would be anticipated to occur during construction activities and cease once construction concludes. If an eagle nest is observed, FWP should be consulted prior to beginning construction near the nest.

No Action Alternative – Potentially direct, negligible to major, short- to long-term, local, recurring adverse impacts may occur to unique, endangered, fragile, or limited environmental resources. The septic system could be unable to process the septage as the school enrollment increases and begin

overloading the system, creating the means for threatened or endangered species to come in contact with raw septage.

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10. HISTORICAL AND ARCHAEOLOGICAL SITES:

Identify and determine direct, indirect, and cumulative effects to historical, archaeological or paleontological resources.

The project is in a previously developed area. No cultural or historical sites are expected to be within the construction extent for the project. The project proponent has not implemented a cultural survey. The Montana State Historic Preservation Office (SHPO) indicates there are National Register Historic Properties and Districts in the vicinity of the project location, none are located on the project area. The applicant provided a letter from Damon Murdo with the Montana State Historic Preservation Office indicating that a cultural resource inventory was unwarranted for the project at this time.

Proposed Alternatives – No cultural or historical resource impacts are anticipated. However, if previously unknown cultural or paleontological materials are identified during project related activities, all work will cease until a professional assessment of such resources can be made.

No Action Alternative – No impacts to historical and archaeological sites.

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11. AESTHETICS:

Determine if the project is located on a prominent topographic feature, or may be visible from populated or scenic areas. What level of noise, light or visual change would be produced? Identify direct, indirect, and cumulative effects to aesthetics.

The project location is within an area of previously existing infrastructure and development. The project area is visible to local property owners.

Proposed Alternatives – Potentially direct and indirect, negligible to minor, short-term, local, nonrecurring adverse impacts to aesthetics during construction. Adverse nuisance noise, light, exhaust fumes, and visible change from heavy construction equipment will be temporary during the project. Noise mitigation techniques to minimize impacts to the surrounding areas will be used by the contractor whenever possible. Construction working hours should be limited to 7 AM to 7 PM. Adverse impacts to aesthetics are expected to be temporary during construction activities and cease once construction is complete.

No Action Alternative – Potentially direct, negligible to major, short- to long-term, local, recurring adverse impacts may occur to aesthetics. The septic system could be unable to process the septage as the school enrollment increases and begin overloading the system, creating malodor and visible septage.

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12. DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR OR ENERGY:

Determine the amount of limited resources the project would require. Identify other activities nearby that the project would affect. Identify direct, indirect, and cumulative effects to environmental resources.

The proposed project involves the design and installation of a new well and treatment system for

drinking water, and the installation of a Level II septic system.

Proposed Alternatives – Potential direct, long-term, local to regional, recurring adverse impacts to water use. The project proposes to expand the school infrastructure and increase enrollment thereby increasing the demand and use of water resources and increase the demand for septic treatment.

No Action Alternative – No impacts to demands on environmental resources of land, water, air, or energy.

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13. OTHER ENVIRONMENTAL DOCUMENTS PERTINENT TO THE AREA:

List other studies, plans or projects on this tract. Determine cumulative impacts likely to occur as a result of current private, state or federal actions in the analysis area, and from future proposed state actions in the analysis area that are under MEPA review (scoped) or permitting review by any state agency.

Canyon Creek School, On-Site Wastewater Treatment System Design Report, December 2021.

The consultant has provided a MEPA Environmental Checklist. There are no other studies, plans, or projects on this site.

IV. IMPACTS ON THE HUMAN POPULATION

- *RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.*
- *Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.*
- *Enter "NONE" If no impacts are identified or the resource is not present.*

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14. HUMAN HEALTH AND SAFETY:

Identify any health and safety risks posed by the project.

The project area is primarily a rural low-intensity, developed, residential area and contains powerlines and other potentially hazardous utilities. According to the EPA NEPAssist mapping tool, there are no known regulated underground storage tanks or sources of hazardous waste in the area. Current student enrollment exceeds the school's building and infrastructure capacity, including that of the existing well and septic systems. The school currently uses delivered bottled water for drinking and needs to upgrade the well a public water system to provide safe drinking water for the school's students and staff. The current wastewater system is undersized for the potential growth the school district expects to experience.

Proposed Alternatives – Potentially direct and indirect, minor, short-term, non-recurring, local adverse impacts to human health and safety. Heavy equipment would be used during construction of the wastewater treatment system and the public water system. Operation of heavy equipment poses a potential threat to public safety. There should be no impact during construction, but the typical risk to the public's safety may be increased during construction. BMPs should be installed to protect the public from the working construction extents and to mitigate dust exposure, particularly around the school and other areas where there are higher-risk or sensitive residents. This project does not involve activities related to lead-based paint and/or asbestos. Once completed, the project will provide direct beneficial impacts to human health and safety by

providing a new public water system and well and upgraded wastewater treatment.

No Action Alternative – Potentially direct, negligible to major, short- to long-term, local, recurring adverse impacts may occur to human health and safety without the water and wastewater improvements. Bottled water will continue to be required to accommodate the water needs of the school, and the septic system could be unable to process the septage as the school enrollment increases and begin overloading the system.

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15. INDUSTRIAL, COMMERCIAL AND AGRICULTURE ACTIVITIES AND PRODUCTION:
Identify how the project would add to or alter these activities.

Industrial, commercial, and agricultural facilities occur outside of the project area.

Proposed Alternatives – Potentially direct, beneficial impacts through improvements to the public water supply and wastewater treatment system. These improvements will increase the water and septic capacity of Trinity School and allow the enrollment to increase as the town's population increases.

No Action Alternative – Potentially direct, minor to major, short- to long-term, local, recurring adverse impacts may occur to agricultural activities and production due failure of the septic system and contamination to soil and groundwater resources. No impact on industrial and commercial activities and production.

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16. QUANTITY AND DISTRIBUTION OF EMPLOYMENT:
Estimate the number of jobs the project would create, move or eliminate. Identify direct, indirect, and cumulative effects to the employment market.

The project area is within a rural low intensity, developed residential area in Lewis & Clark County, Montana. As of the 2024 Census, the County of Lewis and Clark had a population of 75,129 residents and the town of Canyon Creek had a population of 47. The population of the greater zip code area, serviced by Trinity School, was 246 in 2024. Median annual household income in the past 12 months was $76,816 for the county. There are 12.9% of the population in Lewis and Clark County under the poverty line, which is greater than both the state and national percentages.

Proposed Alternatives – Potentially direct, non-recurring, temporary beneficial impacts to quantity or distribution of employment. The project may temporarily bring local construction job opportunities that were not previously present.

No Action Alternative – No impacts to quantity and distribution of employment.

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17. LOCAL AND STATE TAX BASE AND TAX REVENUES:
Estimate tax revenue the project would create or eliminate. Identify direct, indirect, and cumulative effects to taxes and revenue.

The property assessment for tax purposes in the project area ranged broadly with values for mobile homes to 20-acre ranchettes to large ranch holdings, based on records obtained from Montana Cadastral. The average monthly water and sewer rates were not listed by the applicant.

Proposed Alternatives and *No Action Alternative* – No impact as the project is a replacement for the existing public water supply and wastewater treatment system and no change of tax revenues or bases would be expected.

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18. DEMAND FOR GOVERNMENT SERVICES:

Estimate increases in traffic and changes to traffic patterns. What changes would be needed to fire protection, police, schools, etc.? Identify direct, indirect, and cumulative effects of this and other projects on government services

Work is to be completed on the school property and adjacent easement and there may be temporary changes necessary to traffic patterns, fire protection, police, schools, or other government services.

Proposed Alternatives – Potentially indirect, minor, short-term, local, non-recurring adverse impacts to demand for government services. Construction work may require road closures or traffic control which could adversely impact the ability of government services, such as police, fire, health, or other services. Potentially direct, minor, long-term, local beneficial impacts to school. This project will increase the capacity of the water and wastewater systems to serve the school population as it increases.

No Action Alternative – No impacts on demand for government services.

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19. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS:

List State, County, City, USFS, BLM, Tribal, and other zoning or management plans, and identify how they would affect this project.

The existing public water supply and wastewater treatment systems fail to meet goals for drinking water and septic treatment for the proposed addition.

Proposed Alternatives – Potentially direct beneficial impacts to locally adopted environmental plans and goals. Replacement of the existing public water system and wastewater treatment system allows for growth in the school and construction of the proposed addition.

No Action Alternative – Potentially direct and indirect, moderate to major, short- and long-term, local and regional adverse impacts to water quality, quantity, and distribution. Bottled water will continue to be required to accommodate the water needs of the school, and the septic system could be unable to process the septage as the school enrollment increases and begin overloading the system.

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20. ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES:

Identify any wilderness or recreational areas nearby or access routes through this tract. Determine the effects of the project on recreational potential within the tract. Identify direct, indirect, and cumulative effects to recreational and wilderness activities.

The project is not located in or on a designated recreational, Wild & Scenic River, or Wilderness Area. There are Montana State Trust Lands located approximately half a mile to the south of the project location.

Proposed Alternatives and No Action Alternative – No impacts to access to and quality of recreational and wilderness activities. The preferred alternatives will not impact access to public lands, waterways, or public open spaces.

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21. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING:
Estimate population changes and additional housing the project would require. Identify direct, indirect, and cumulative effects to population and housing.

Property adjacent to the project area is primarily used for residential or ranching uses. The land use within the project area is dedicated for educational purposes. Data from the 2010-2020 Decennial census showed 24 housing units in the town of Canyon Creek with a 95.8% occupancy rate.

Proposed Alternatives and No Action Alternative – No impacts to density and distribution of population and housing as the proposed project is not expected to cause any changes in population demographics or housing conditions.

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22. SOCIAL STRUCTURES AND MORES:
Identify potential disruption of native or traditional lifestyles or communities.

The town of Canyon Creek is located on the traditional lands of the Niitsítpiis-stahkoii (Blackfoot / Niitsítapi); Cayuse, Umatilla, and Walla Walla; and Salish nations.

Proposed Alternatives and No Action Alternative – No impacts or changes to social structures are expected to occur. The project is not anticipated to impact native or traditional lifestyles or communities.

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23. CULTURAL UNIQUENESS AND DIVERSITY:
How would the action affect any unique quality of the area?

There are no unique facilities of unique culture or diversity in the project area.

Proposed Alternatives – Impacts on historic properties and cultural and archaeological resources are not anticipated as a result of the actions in the preferred alternative. No comments from SHPO or Tribal contacts were received regarding the project.

No Action Alternative – No impacts to cultural uniqueness and diversity.

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24. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:
Include appropriate economic analysis. Identify potential future uses for the analysis area other than existing management. Identify direct, indirect, and cumulative economic and social effects likely to occur as a result of the proposed action.

Median income for the county, as of 2024, was $76,816.

Proposed Alternatives – Potentially direct and indirect, negligible to minor, short-term beneficial impacts to appropriate social and economic circumstances. Workers and materials required for the construction of the project may temporarily provide beneficial impacts to local businesses

throughout construction.

No Action Alternative – No impact on other appropriate social and economic circumstances.

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25. DRINKING WATER AND/OR CLEAN WATER

Identify potential impacts to water and/or sewer infrastructure (e.g., community water supply, stormwater, sewage system, solid waste management) and identify direct, indirect, and cumulative effects likely to occur as a result of the proposed action.

The Trinity School is currently using delivered bottled water for drinking and the school's septic system, installed in 2013, was sized for a maximum of 25 total people. The current school enrollment exceeds the capacity of the septic system and safe drinking water is not available. The project proposes a new public water system well and abandonment of the existing well and construction of a new wastewater treatment system that meets the requirements of the proposed school addition.

Proposed Alternatives – Potentially direct and indirect, long-term, moderate to major, local beneficial impacts to drinking water and sewage systems. This project results in the completion of a new community water supply system installed at the school to provide clean drinking water for the school district. The project also installs a new wastewater treatment system to process septic waste and ensure the system capacity is large enough to serve the school without the risks of hazardous septage leakage from an undersized system.

No Action Alternative – Potentially direct and indirect, moderate to major, short- and long-term, local, and regional adverse impacts to water quality, quantity, and distribution. The Trinity School is currently using delivered bottled water for drinking and the school's septic system, installed in 2013, was sized for a maximum of 25 total people. The current school enrollment exceeds the capacity of the septic system and safe drinking water is not available. If no expansion occurs on the drinking water or wastewater systems, they will continue to be unable to serve the school population.

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26. ENVIRONMENTAL JUSTICE

Will the proposed project result in disproportionately high or adverse human health or environmental effects on minority or low-income populations per the Environmental Justice Executive Order 12898? Identify potential impacts to and identify direct, indirect, and cumulative effects likely to occur as a result of the proposed action.

Median annual household income in the past 12 months was $76,816 for Lewis and Clark County. There are 12.9% of the population in Lewis and Clark County under the poverty line, which is greater than both the state and national percentages.

Proposed Alternatives and No Action Alternative – The majority of residences are of low to moderate income households, however the proposed alternative and the no action alternative will not result in disproportionately high or adverse human health or environmental effects on minority or low-income populations.

EA Prepared By:	Name: Samantha Treu	Date: 7/1/2025
	Title: MEPA/NEPA Coordinator	Email: samantha.treu@mt.gov

V. FINDING

27. ALTERNATIVE SELECTED:

No alternatives were considered, and no alternatives analysis was conducted. There is no way for DNRC to evaluate if this proposed system is the most cost-effective, whether or not it has a greater adverse environmental impact than any other means to accomplish the same goals. In that regard, this project does not meet the Montana Environmental Policy Act requirements.

There are two phases of the proposed project:

1) Design and installation of new well and treatment system for drinking water; and
2) Installation of a Level II septic system;

The design phase for the septic system is already complete. Both phases address existing problems within the system as the current enrollment at the school exceeds the existing school's water and septic infrastructure capacity. It should be noted, however, that both Phases 1 and 2 will be/have been designed to support additional enrollment at the school, which is expected to continue to increase for at least the next few years. This environmental assessment is specific to Phase 1 of the project. Phase 1: Design and siting of a new well and treatment system will be conducted by a licensed engineer and a PWS permit application will be submitted to DEQ for review and approval. Following DEQ permit approval, a well driller will be contracted, and the designed treatment system will be installed to approved specifications. Phase 2: An On-Site Wastewater Treatment System Design Report was completed by a licensed engineering firm in December 2021 that provided the design details for the recommended Level II Treatment Septic system for Trinity School. The design report has been submitted to Lewis and Clark Public Health, Environmental Services Division and DEQ for preliminary review. Upon full approval by the required agencies, a septic system installer will be contracted, and the design-approved system will be installed.

28. SIGNIFICANCE OF POTENTIAL IMPACTS:

GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE

Potentially direct and indirect, minor to major, short- to long-term, recurring adverse impact to soil quality, stability, and moisture. The soils on site are unsuitable for septic tank absorption due to the slope, the nature of how slowly and inefficiently water moves through the soils, the shallow depth of bedrock, and propensity for flooding. The soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated. The unsuitable soil limitations will be mitigated by the use of an elevated sand mound wastewater treatment system (WWTS) on this site. The WWTS will be permitted through MDEQ as a “public system” and will also require a septic permit from the Lewis & Clark County Health Department.

WATER QUALITY, QUANTITY AND DISTRIBUTION

Potentially direct and indirect, minor to major, short- and long-term, local, recurring adverse impacts to water quality and quantity. If the soils perform as anticipated in processing water flow, there is the potential for groundwater contamination if the effluent is inadequately filtered by the drainfield. If the design of the wastewater treatment system functions properly, the proposed alternative is expected to have a long-term beneficial impact on water quality. The adverse impact on water quantity will come from a slight decrease in water availability due to the increased pumping capacity of the well. The WWTS review process requires a non-degradation evaluation that must prove impacts to groundwater and surface water quality are non-significant.

AIR QUALITY

Potentially direct, minor, short-term, local adverse impacts to air quality as there may be some dust introduced to the environment from construction activity and/or exhaust fumes from the operation of heavy construction equipment. The contractor will need to provide dust control measures and should limit construction working hours to approximately 7 AM to 7 PM.

VEGETATION COVER, QUANTITY AND QUALITY

Potentially direct, minor to moderate, short-term, localized adverse impacts to vegetation cover. The project construction will have a short-term adverse impact on existing vegetation within the school property and adjacent easement. Revegetation with native species will occur after construction. Efforts should be made to preserve existing vegetation where applicable. BMPs should be installed and monitored.

TERRESTRIAL, AVIAN, AND AQUATIC LIFE AND HABITATS

Potentially direct, indirect, short- to long-term, local, non-recurring adverse impacts to terrestrial, avian, and aquatic life and habitats during construction. Efforts should be made to preserve existing vegetation where applicable. BMPs should be installed and monitored. The contractor shall be required to minimize impacts and restore any disturbance to preexisting conditions.

UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES

Potentially direct and indirect, minor, short-term, temporary localized adverse impacts to unique, endangered, fragile or limited environmental resources exist for the project. Adverse impacts would be anticipated to occur during construction activities and cease once construction concludes. If an eagle nest is observed, FWP should be consulted prior to beginning construction near the nest.

AESTHETICS

Potentially direct and indirect, negligible to minor, short-term, local, nonrecurring adverse impacts to aesthetics during construction. Adverse nuisance noise, light, exhaust fumes, and visible change from heavy construction equipment will be temporary during the project. Noise mitigation techniques to minimize impacts to the surrounding areas will be used by the contractor whenever possible. Construction working hours should be limited to 7 AM to 7 PM. Adverse impacts to aesthetics are expected to be temporary during construction activities and cease once construction is complete.

DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR OR ENERGY

Potential direct, long-term, local to regional, recurring adverse impacts to water use. The project proposes to expand the school infrastructure and increase enrollment thereby increasing the demand and use of water resources and increasing the demand for septic treatment.

HUMAN HEALTH AND SAFETY

Potentially direct and indirect, minor, short-term, non-recurring, local adverse impacts to human health and safety. Heavy equipment would be used during construction of the wastewater treatment system and the public water system. Operation of heavy equipment poses a potential threat to public safety. There should be no impact during construction, but the typical risk to the public's safety may be increased during construction. BMPs should be installed to protect the public from the construction extents and to mitigate dust exposure, particularly around the school and other areas where there are higher-risk or sensitive residents. This project does not involve activities related to lead-based paint and/or asbestos.

DEMAND FOR GOVERNMENT SERVICES

Potentially indirect, minor, short-term, local, non-recurring adverse impacts to demand for government services. Construction work may require road closures or traffic control which could adversely impact the ability of government services, such as police, fire, health, or other services. Potentially direct, minor, long-term, local beneficial impacts to school. This project will increase the capacity of the water and wastewater systems to serve the school population as it increases.

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29. NEED FOR FURTHER ENVIRONMENTAL ANALYSIS:

No impacts appear to require a mitigated EA or EIS, however no alternatives analysis was conducted and DNRC cannot weigh the proposed alternative against other means to accomplish the same goal to fully understand the costs or benefits to the proposed alternative.

This is the final environmental review. DNRC concludes that no significant adverse impacts will occur as a result of the proposed project work, and therefore no additional environmental review is required. The draft environmental assessment was posted for a 30-day public notice. No public comments were received, and the final environmental assessment will be posted for an additional 30-day public notice. The environmental review of this project is complete.

☐	EIS	☐	More Detailed EA	☒	No Further Analysis

EA Approved By:	**Name:** Mark W Bostrom **Title:** Division Administrator	
Signature: Mark W Bostrom		**Date**: 9/10/2025

Lincoln #38

Wolf Creek #13

Trinity School #4

Helena #1

Trinity School

Kessler School

Blackfoot River

Landers Fork

South Fork Deadman River

Wolf Creek

Canyon Creek

Little Prickly Pear Creek

Nevada Creek

Silver Creek

Skelly Gulch

Dog Creek

Sevenmile Creek

Prickly Pear Creek

0 0.250.5 1 Miles

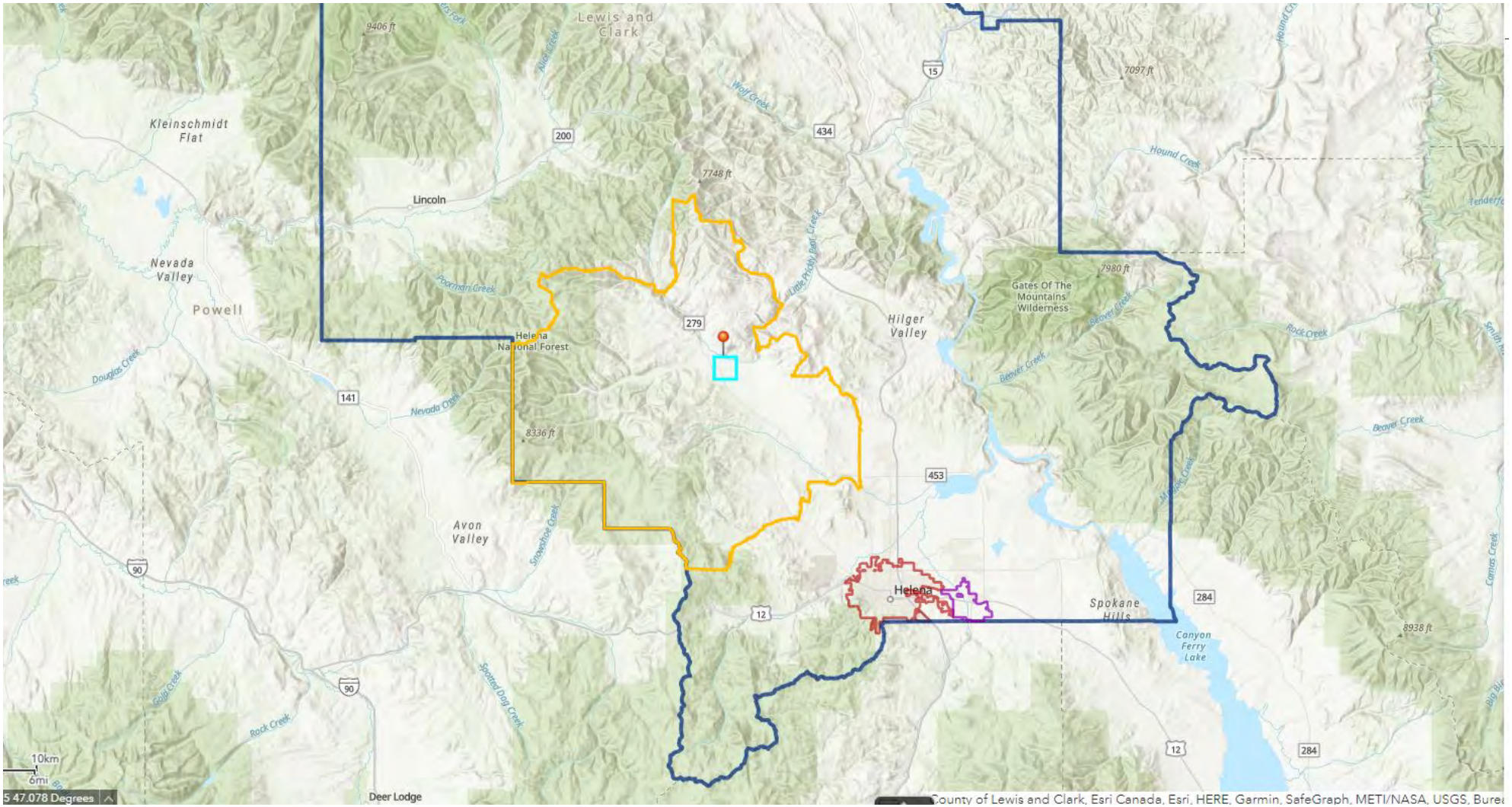
Lewis and Clark County School Districts

Trinity School

Map Document: (G:_ArcProjects\SchoolDistricts28x36_Mapseries.mxd)
February 11, 2009

City of Helena - Lewis and Clark County
Geographic Information Services
Room 147 City-County Building
316 N Park Ave
Helena, Montana 59624
406-447-8367
http://www.co.lewis-clark.mt.us/gis

Location of Trinity School District (denoted by pin) in southern Lewis and Clark County. Yellow outline denotes Canyon Creek polling district and is not the school district boundary.



Satellite imagery of Trinity School property, located at 7435 Duffy Lane in Canyon Creek, Lewis and Clark County.

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Lewis and Clark County, Montana

Local office

Montana Ecological Services Field Office

(406) 449-5225
(406) 449-5339

585 Shephard Way, Suite 1

Helena, MT 59601-6287

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Canada Lynx Lynx canadensis There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/3652	Threatened
Grizzly Bear Ursus arctos horribilis There is **proposed** critical habitat for this species. https://ecos.fws.gov/ecp/species/7642	Threatened
North American Wolverine Gulo gulo luscus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/5123	Threatened

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/9743	Proposed Threatened
Suckley's Cuckoo Bumble Bee Bombus suckleyi No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/10885	Proposed Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1]. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

There are Bald Eagles and/or Golden Eagles in your project area.

Measures for Proactively Minimizing Eagle Impacts
For information on how to best avoid and minimize disturbance to nesting bald eagles, please review the National Bald Eagle Management Guidelines. You may employ the timing and activity-specific distance recommendations in this document when designing your project/activity to avoid and minimize eagle impacts. For bald eagle information specific to Alaska, please refer to Bald Eagle Nesting and Sensitivity to Human Activity.

The FWS does not currently have guidelines for avoiding and minimizing disturbance to nesting Golden Eagles. For site-specific recommendations regarding nesting Golden Eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

If disturbance or take of eagles cannot be avoided, an incidental take permit may be available to authorize any take that results from, but is not the purpose of, an otherwise lawful activity. For assistance making this determination for Bald Eagles, visit the Do I Need A Permit Tool. For assistance making this determination for golden eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

Ensure Your Eagle List is Accurate and Complete
If your project area is in a poorly surveyed area in IPaC, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the Supplemental Information

on Migratory Birds and Eagles, to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to bald or golden eagles on your list, see the "Probability of Presence Summary" below to see when these bald or golden eagles are most likely to be present and breeding in your project area.

Review the FAQs

The FAQs below provide important additional information and resources.

NAME	BREEDING SEASON
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Jan 1 to Aug 31
Golden Eagle Aquila chrysaetos This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that

week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

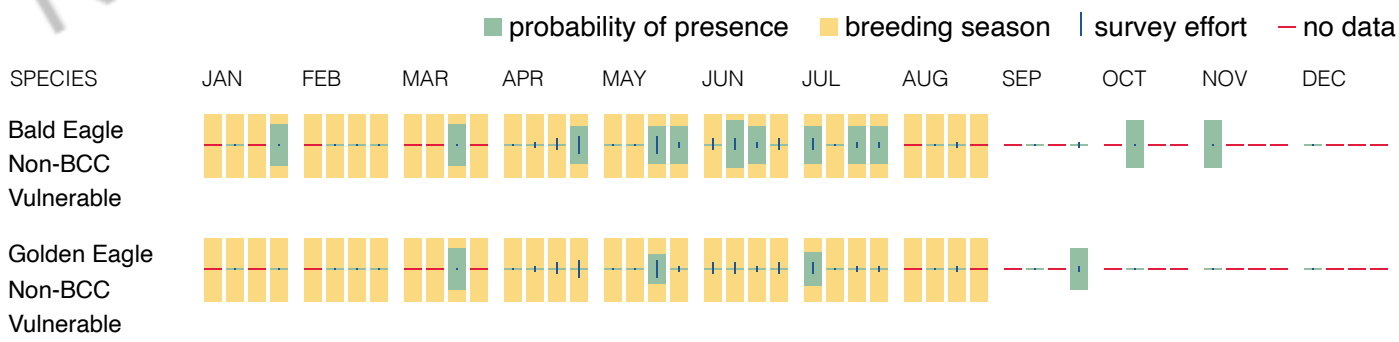
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Bald & Golden Eagles FAQs

What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are an eagle (Bald and Golden Eagle Protection Act requirements may apply).

Proper interpretation and use of your eagle report

On the graphs provided, please look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort line or no data line (red horizontal) means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list and associated information help you know what to look for to confirm presence and helps guide you in knowing when to implement avoidance and minimization measures to eliminate or reduce potential impacts from your project activities or get the appropriate permits should presence be confirmed.

How do I know if eagles are breeding, wintering, or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating, or resident), you may query your location using the RAIL Tool and view the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If an eagle on your IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your “IPaC PROBABILITY OF PRESENCE SUMMARY” at the top of your results list), there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

Interpreting the Probability of Presence Graphs

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. A taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

How is the probability of presence score calculated? The calculation is done in three steps:

The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season ()

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort ()

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data ()
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

Migratory birds

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service). The incidental take of migratory birds is the injury or death of birds that results from, but is not the purpose, of an activity. The Service interprets the MBTA to prohibit incidental take.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

Measures for Proactively Minimizing Migratory Bird Impacts

Your IPaC Migratory Bird list showcases birds of concern, including Birds of Conservation Concern (BCC), in your project location. This is not a comprehensive list of all birds found in your project area. However, you can help proactively minimize significant impacts to all birds at your project location by implementing the measures in the Nationwide avoidance and minimization measures for birds document, and any other project-specific avoidance and minimization measures suggested at the link Measures for avoiding and minimizing impacts to birds for the birds of concern on your list below.

Ensure Your Migratory Bird List is Accurate and Complete

If your project area is in a poorly surveyed area, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the Supplemental Information on Migratory Birds and Eagles document, to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

Review the FAQs

The FAQs below provide important additional information and resources.

NAME	BREEDING SEASON
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Jan 1 to Aug 31
Bobolink Dolichonyx oryzivorus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
California Gull Larus californicus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 1 to Jul 31
Evening Grosbeak Coccothraustes vespertinus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 15 to Aug 10
Franklin's Gull Leucophaeus pipixcan This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Golden Eagle Aquila chrysaetos This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Lewis's Woodpecker Melanerpes lewis — Breeds Apr 20 to Sep 30

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9408

Rufous Hummingbird Selasphorus rufus — Breeds Apr 15 to Jul 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8002

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

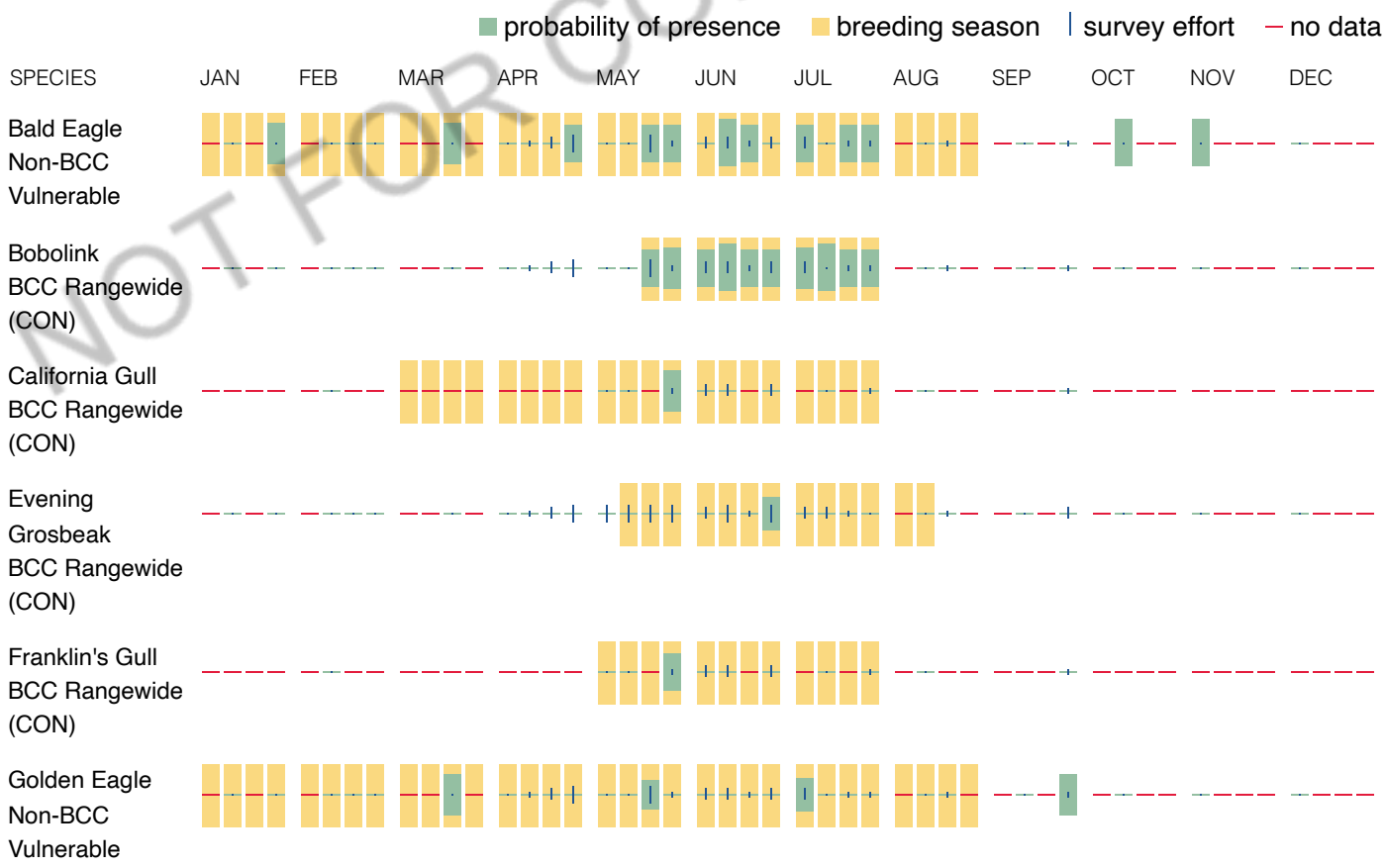
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

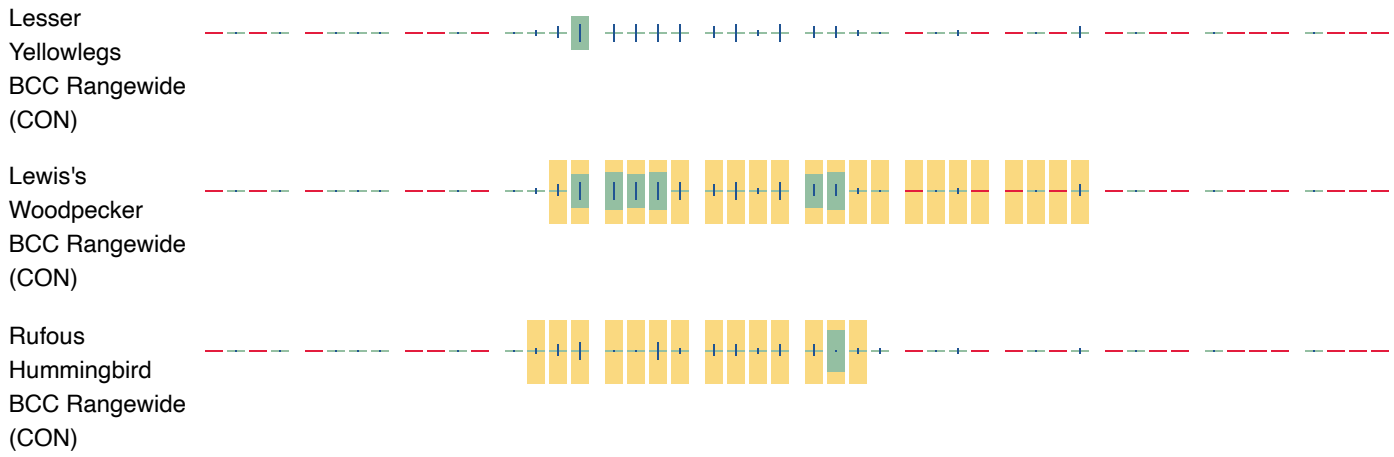
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





Migratory Bird FAQs

Tell me more about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Avoidance & Minimization Measures for Birds describes measures that can help avoid and minimize impacts to all birds at any location year-round. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is one of the most effective ways to minimize impacts. To see when birds are most likely to occur and breed in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location, such as those listed under the Endangered Species Act or the Bald and Golden Eagle Protection Act and those species marked as “Vulnerable”. See the FAQ “What are the levels of concern for migratory birds?” for more information on the levels of concern covered in the IPaC migratory bird species list.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) with which your project intersects. These species have been identified as warranting special attention because they are BCC species in that area, an eagle (Bald and Golden Eagle Protection Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, and to verify survey effort when no results present, please visit the Rapid Avian Information Locator (RAIL) Tool.

Why are subspecies showing up on my list?

Subspecies profiles are included on the list of species present in your project area because observations in the AKN for **the species** are being detected. If the species are present, that means that the subspecies may also be present. If a subspecies shows up on your list, you may need to rely on other resources to determine if that subspecies may be present (e.g. your local FWS field office, state surveys, your own surveys).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating, or resident), you may query your location using the RAIL Tool and view the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your “IPaC PROBABILITY OF PRESENCE SUMMARY” at the top of your results list), there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Bald and Golden Eagle Protection Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially BCC species. For more information on avoidance and minimization measures you can implement to help avoid and minimize migratory bird impacts, please see the FAQ “Tell me more about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds”.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project

review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Proper interpretation and use of your migratory bird report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list does not represent all birds present in your project area. It is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list and associated information help you know what to look for to confirm presence and helps guide implementation of avoidance and minimization measures to eliminate or reduce potential impacts from your project activities, should presence be confirmed. To learn more about avoidance and minimization measures, visit the FAQ "Tell me about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds".

Interpreting the Probability of Presence Graphs
Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. A taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

How is the probability of presence score calculated? The calculation is done in three steps:
The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season ()
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort ()
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data ()
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

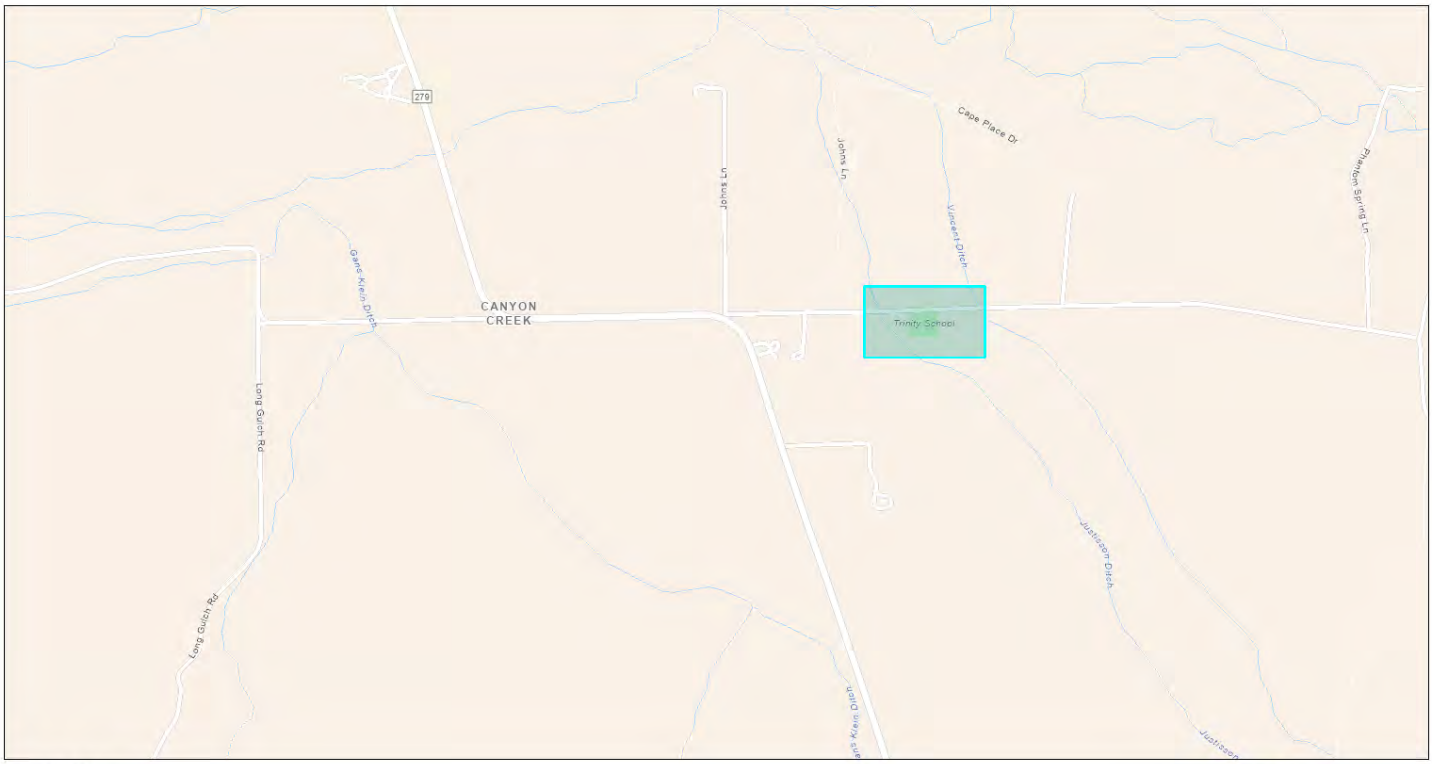
Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NEPAssist Report

Canyon Creek



May 23, 2025

Canyon Creek

1:18,058

0 0.15 0.3 0.6 mi

0 0.25 0.5 1 km

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community

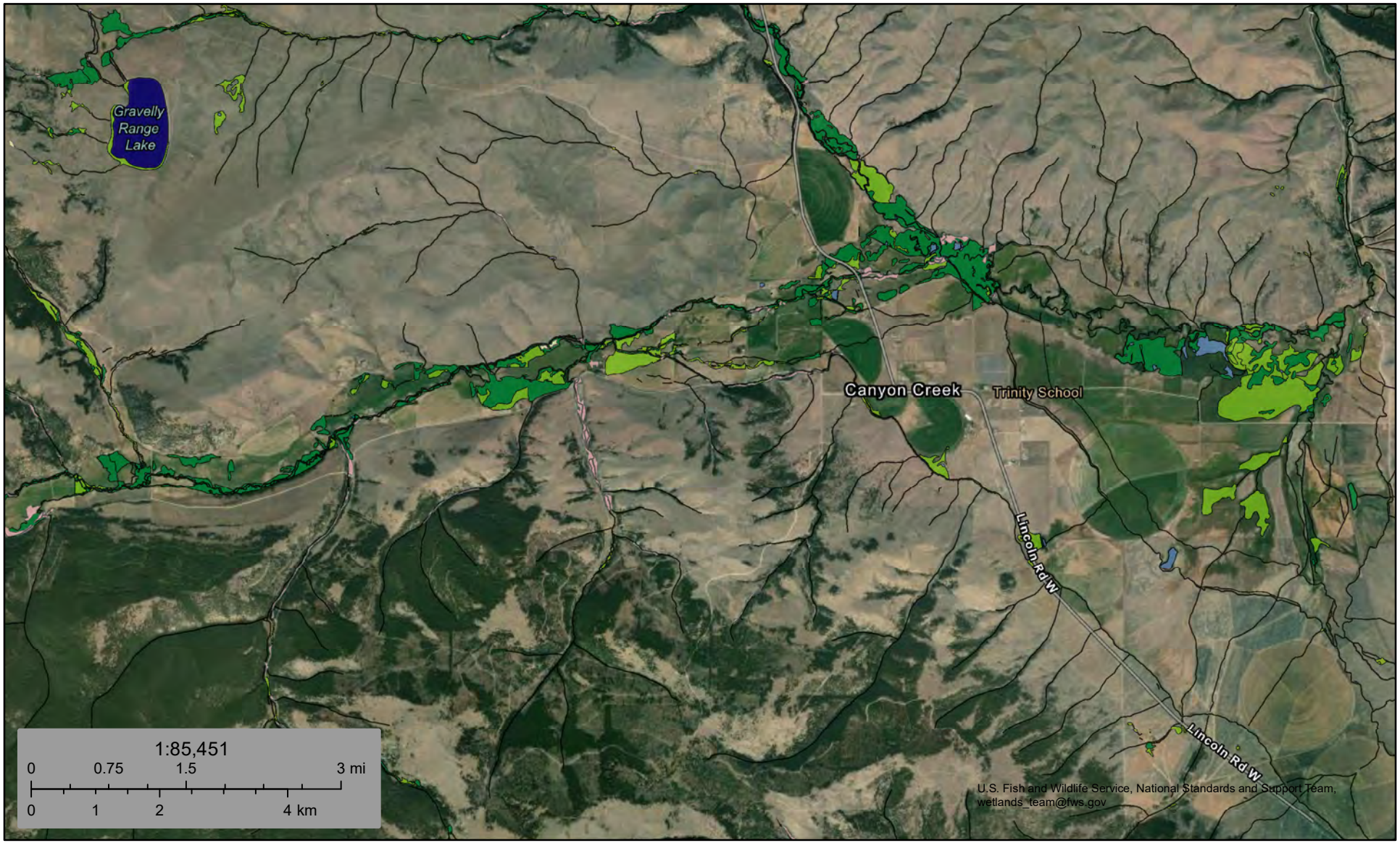
Input Coordinates: 46.806541,-112.247705,46.806541,-112.242212,46.804332,-112.242212,46.804332,-112.247705,46.806541,-112.247705	
Project Area	0.04 sq mi
Within an Ozone 1-hr (1979 standard) Non-Attainment/Maintenance Area?	no
Within an Ozone 8-hr (1997 standard) Non-Attainment/Maintenance Area?	no
Within an Ozone 8-hr (2008 standard) Non-Attainment/Maintenance Area?	no
Within an Ozone 8-hr (2015 standard) Non-Attainment/Maintenance Area?	no
Within a Lead (2008 standard) Non-Attainment/Maintenance Area?	no
Within a SO2 1-hr (2010 standard) Non-Attainment/Maintenance Area?	no
Within a PM2.5 24hr (2006 standard) Non-Attainment/Maintenance Area?	no
Within a PM2.5 Annual (1997 standard) Non-Attainment/Maintenance Area?	no
Within a PM2.5 Annual (2012 standard) Non-Attainment/Maintenance Area?	no
Within a PM10 (1987 standard) Non-Attainment/Maintenance Area?	no
Within a CO Annual (1971 standard) Non-Attainment/Maintenance Area?	no
Within a NO2 Annual (1971 standard) Non-Attainment/Maintenance Area?	no
Within a Federal Land?	no
Within an impaired stream?	no
Within an impaired waterbody?	no
Within a waterbody?	no
Within a stream?	yes
Within an NWI wetland?	Available Online
Within a Brownfields site?	no

Within a Superfund site?	no
Within a Toxic Release Inventory (TRI) site?	no
Within a water discharger (NPDES)?	no
Within a hazardous waste (RCRA) facility?	no
Within an air emission facility?	no
Within a school?	yes
Within an airport?	no
Within a hospital?	no
Within a designated sole source aquifer?	no
Within a historic property on the National Register of Historic Places?	no
Within a Chemical Data Reporting (CDR) site?	no
Within a Land Cession Boundary?	yes
Within a tribal area (lower 48 states)?	no
Within the service area of a mitigation or conservation bank?	yes
Within the service area of an In-Lieu-Fee Program?	yes
Within a Public Property Boundary of the Formerly Used Defense Sites?	no
Within a Munitions Response Site?	no
Within an Essential Fish Habitat (EFH)?	no
Within a Habitat Area of Particular Concern (HAPC)?	no
Within an EFH Area Protected from Fishing (EFHA)?	no
Within a Bureau of Land Management Area of Critical Environmental Concern?	no
Within an ESA-designated Critical Habitat Area per U.S. Fish & Wildlife Service?	no
Within an ESA-designated Critical Habitat river, stream or water feature per U.S. Fish & Wildlife Service?	no

Created on: 5/23/2025 2:07:22 PM

U.S. Fish and Wildlife Service
National Wetlands Inventory

Trinity School NWI map



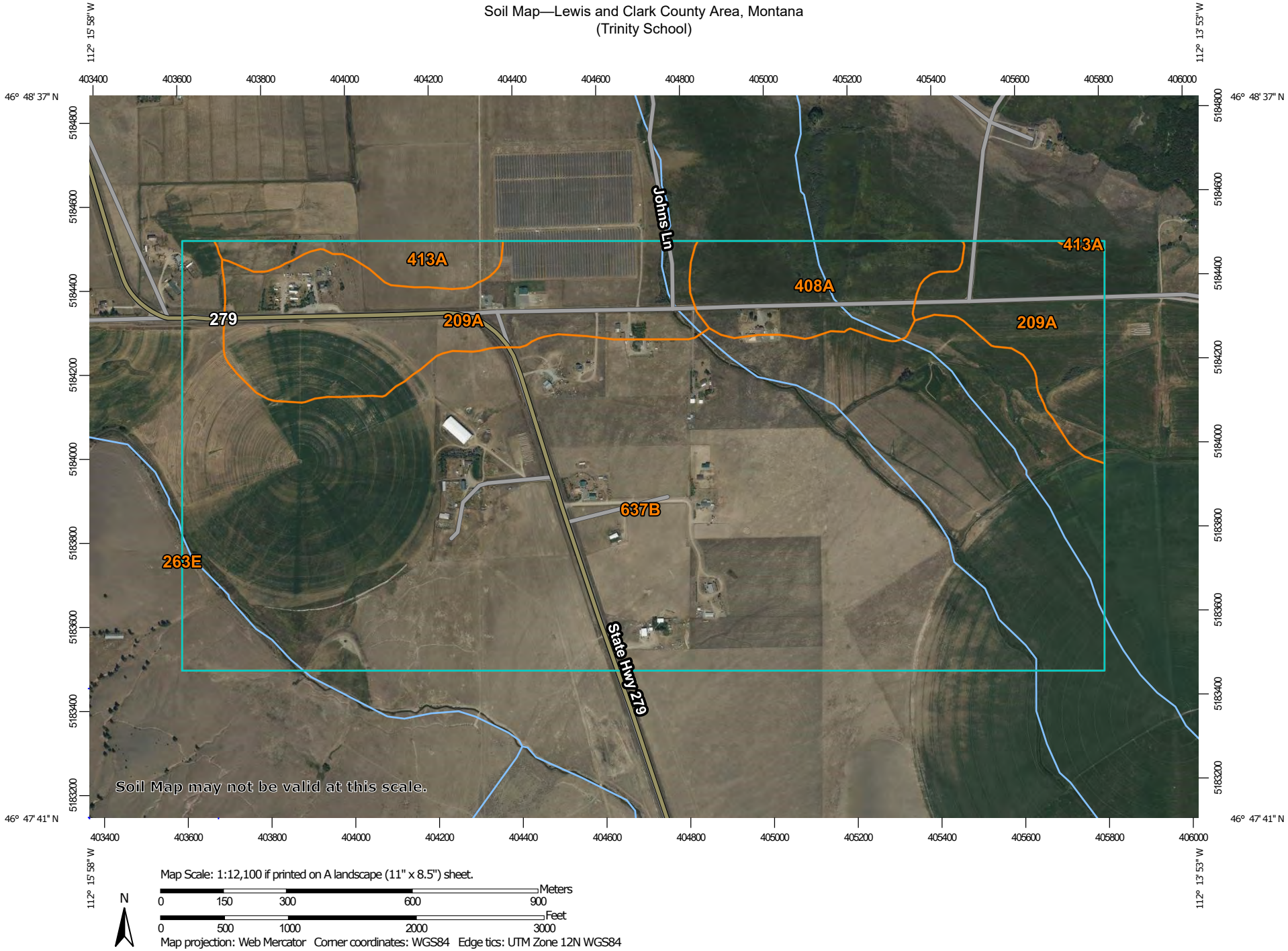
April 3, 2025

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

Soil Map—Lewis and Clark County Area, Montana
(Trinity School)



Map Scale: 1:12,100 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Lewis and Clark County Area, Montana
Survey Area Data: Version 19, Aug 22, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 13, 2022—Aug 16, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

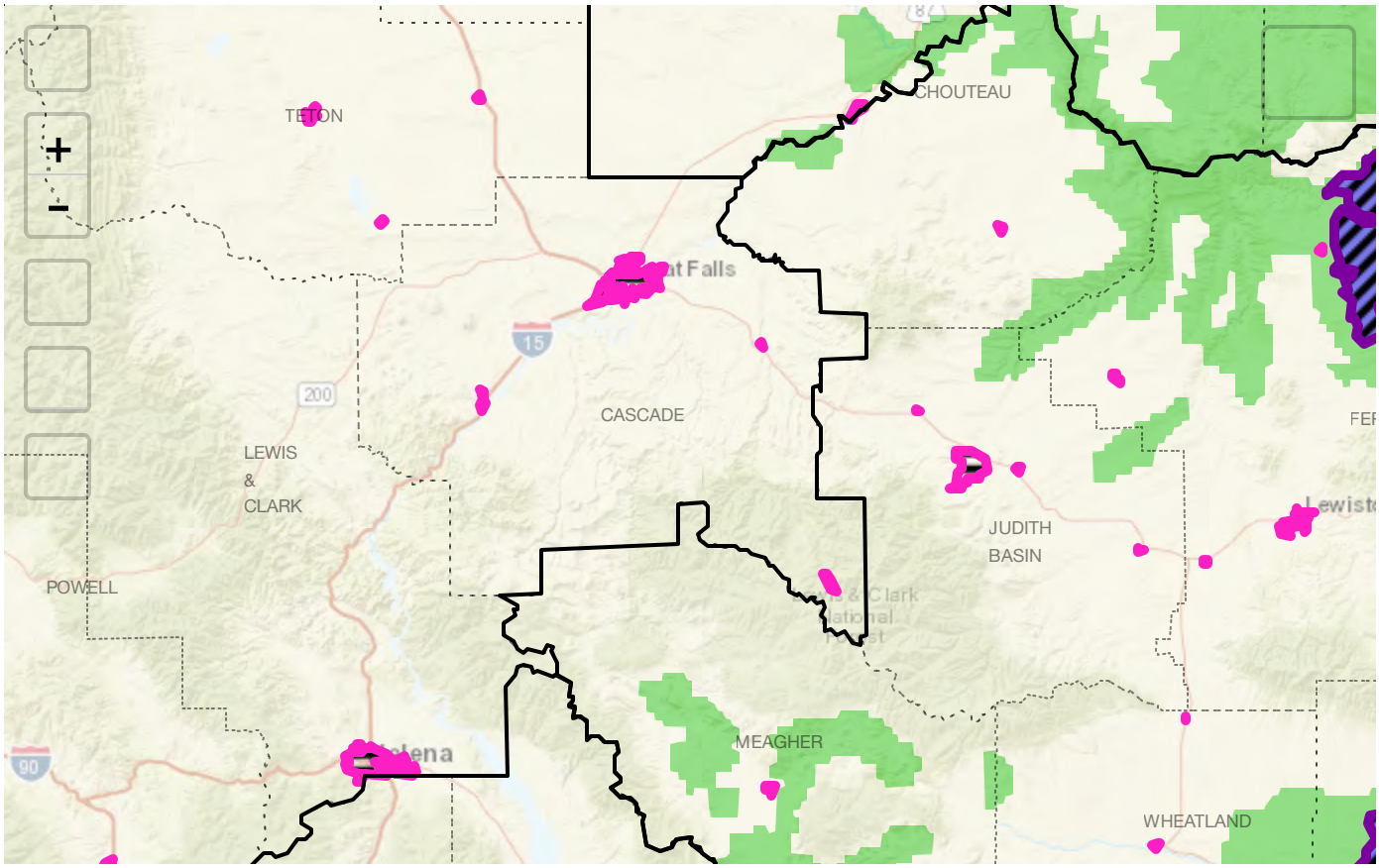
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
209A	Thess loam, 0 to 2 percent slopes	101.5	18.2%
263E	Hauz-Sieben-Tolman channery loams, 8 to 45 percent slopes	0.0	0.0%
408A	Villard-Villy silt loams, 0 to 2 percent slopes	31.4	5.6%
413A	Attewan loam, 0 to 2 percent slopes	12.6	2.3%
637B	Crago gravelly loam, 0 to 8 percent slopes	413.4	74.0%
Totals for Area of Interest		**559.0**	**100.0%**

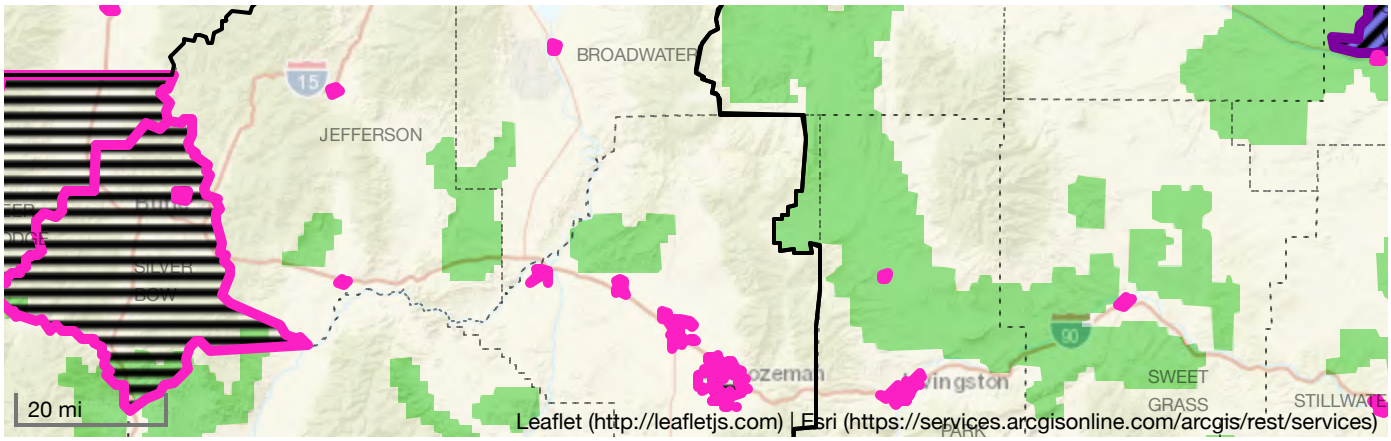
Photo Credit: Richard Prodgers

Montana Sage Grouse Habitat Conservation Map

Use this map to view and explore types of sage grouse habitat designated as core (blue), general (green), connectivity (light-blue) habitats or BLM priority areas. To zoom into an area, hold the Shift key and draw a rectangle. Anyone proposing new development activities in sage grouse habitat must submit a development project application (/ProposedProject/Instructions) for consultation.

If your project is close to designated sage grouse habitat or BLM Priority area, or if you are unsure your project is within designated sage grouse habitat or BLM Priority area, please submit your project for review as permitting agencies will be checking to see if your project is located within these designated sage grouse habitats. If your permitting agency requires evidence that your project is outside of designated sage grouse habitat, we recommend that you log in (/oauth2/authorization/okta) and start a project application and take a screenshot of your project's location.





MONTANA SAGE GROUSE HABITAT CONSERVATION PROGRAM
1539 ELEVENTH AVE. HELENA, MT 59601 | SAGEGROUSE@MT.GOV
(MAILTO:SAGEGROUSE@MT.GOV) | 406-444-6340

Last Built on 02/21/2025 5:32 PM

Trinity Board Minutes
January 12th, 2023

I. Call to Order at 5:51pm by Chairperson Tammy Burke. Attending were trustees Alison Fitzsimmons, Ben Quigg, Connie Horder and Robbie Bennett; Superintendent Katrina Chaney; Staff Jen Kueber, Robin Clark, Sara Wareham, Joane Bayer; Public Peggy Justesen, Christina Holmes, Katie Grady Selby, and Ashley Quigg.

II. Public Comment No public comment.

III. Agenda Approval Connie Horder moved and Robbie Bennett seconded a motion to approve the agenda. The motion passed unanimously.

IV. Minutes Approval Connie Horder moved and Ben Quigg seconded a motion to approve the November minutes. The motion passed unanimously.

V. New Business

A. Election Resolution Alison Fitzsimmons moved and Connie Horder seconded a motion to hold an election the first Tuesday of May to include 2 trustee positions and a General Fund levy. The motion passed unanimously.

B. Fire Alarm Monitoring Discussion about alarm monitoring in new addition, adding alarms in older section to alarm monitor, insurance discount? Connie Horder moved and Alison Fitzsimmons seconded a motion to 406 Electric monitor the fire alarms for $282 annually. The motion passed with 4 votes to monitor and Ben Quigg abstained.

VI. Old Business

A. Building Update Discussion involved the occupancy permit for addition, however no septic or well, type 2 vs type 1 septic pros and cons, well placement still unknow, $150K in county ARPA funds for well and septic, need to drill test well, may have to chlorinate well.

Discussion regarding $10K hold on Abraham construction project so they can later finish after well and septic installed. Abraham would like to close contract to avoid us having to pay ongoing construction insurance and bonding for addition.

Discussion moved to surface cement cracks in one classroom, aesthetically unacceptable, no way to repair cracks, several comments that Abraham should have to install flooring in classroom to cover cracks. Board member consensus to wait to close Abraham contract. Connie Horder will discuss flooring with Abraham, Ben Quigg will look into LVP. Ben Quigg will install both replacement dishwasher and new white boards.

B. Out of District Students Acceptance of out of district students will depend on enrollment numbers of in district students and class student enrollment. Tabled until next month.
C. Safe Return to Schools Ben Quigg moved and Robbie Bennett seconded a motion to accept the revised Safe Return to School policy revised by Alison Fitzsimmons. The motion passed unanimously.

VII. Superintendent Comments Katrina Chaney updated the Board regarding and Arts Council grant application and a request for 5 free air purifiers from DPHHS.

VIII. Supervising Teacher Comments Jen Kueber indicated that two new classrooms are now occupied and the students and teachers are delighted. The gym will be available for phys ed shortly. The safety book plan will need to be updated to reflect the two new classrooms; unable to acquire an AED; snow shoeing field trip planned January 31st; end of semester is January 13th; short discussion regarding snow plowing. Appreciation for Connie Horder's hard work pulling together the classroom construction.

IX. Committee Reports Transportation All going smoothly with the bus driver and bus route, still some concern about HSD bus on Birdseye delaying Trinity bus in afternoon.

X. Clerk Comments Robbie Bennett moved and Ben Quigg seconded a motion to accept the November claims. The motion passed unanimously. Robbie Bennet moved and Connie Horder seconded a motion to accept the December claims. The motion passed unanimously. Connie Horder moved and Alison Fitzsimmons seconded a motion to purchase a printer for the new addition from the Technology fund. The motion passed unanimously. Discussion about Chris Hovda providing one on one student assistance and salary from Title 1.

XI. Board Chair Comments Tammy Burke expressed appreciation for all the work everyone has done to keep the school running so well.

XII. Public Comments Discussion involved what to do with old shed parts; appreciation for donation, grants, and volunteers; PTO to hold a grand opening in March; window coverings; move lunch tables to gym.

XIII. Next Board Meeting February 9th, 2023 5:30pm.

XIV. Adjournment at 7:12pm.

Trinity Elementary #4
November 11th, 2021
Board Minutes

I. Call to Order by Chairperson Jill Pritchard at 5:03pm
Attending were trustees Alison Fitzsimmons, Connie Horder, and Crissy Kelly; staff Katrina Chaney, Jen Kueber, Robin Clark, John Chaffee, Lisa Quisenberry, Sara Wareham and Joane Bayer; public Ashley Quigg, Katie Grady-Selby, Christina Holmes and Peggy Justesen

II. Public Comments No comments

III. Agenda Approval Connie Horder moved and Crissy Kelly seconded a motion to approve the agenda. The motion passed unanimously.

IV. Minutes Approval Connie Horder moved and Crissy Kelly seconded a motion to approve the minutes. The motion passed unanimously.

V. Old Business / Action Items

A. Maintenance Issues Sara Wareham mentioned a few lights were out in the gym. Connie Horder will find a way to replace the bulbs.
B. Transportation Crissy Kelly said though that had been some behavior issues, they have been resolved and things are going well with the bus; talked to Josh Doss to remind to have the oil changed and tires rotated when needed. Crissy Kelly is also looking into replacing some bus lettering.
C. Safe Return to Schools The discussion started about the PTO using the school library for a meeting and requested clarification about providing monthly school lunches. Crissy Kelly pointed out that school policy dictates that per Policy 1900, only those who are part of the cohort or an integral part of school operation can be in the school, otherwise the cohort is violated. The Board does not meet in the school for this reason. A couple parents pointed out that the PTO followed the policies except for asking Board permission, but who is required to give permission and that there were a couple Board members at the school before the PTO meeting. Board members indicated they had no idea there was a PTO meeting scheduled in the Library. Regarding monthly school lunches Connie Horder pointed out that in the September minutes it was decided that the PTO could not use the kitchen because it would be disruptive to Kindergarten and violate the cohort; that the students can normally forgo the use of masks because we decided to be one big cohort (except in special circumstances); that it is the Board's job to protect all students. Jen Kueber indicated that lunch was being served out of

the library. Alison Fitzsimmons voiced that the policies are confusing to parents, but added that the PTO should ask the Board about meeting at the school and requested clarification on the mask policy. Alison Fitzsimmons gave an example of attending a sporting event held at a school in Helena and that very few people were wearing masks, most schools do not seem to be stringently following policy, ours included. This sets us up for failure; she would like the mask policy clarified. Requirements for visitors is mentioned in Policy 1905, but the wording is confusing.

A PTO member requested Board permission for the PTO to meet at the school in December and for the approval to be open ended. Crissy Kelly reminded the PTO that even the Board does not meet in the school because it will violate the cohort. The Board loves the PTO, but each meeting request will need to be heard by the Board; the Board does not always know what is going on with the PTO. Alison Fitzsimmons agreed to be the liaison between the Board and the PTO.

The Board verified that Jen Kueber is allowed to give approval for ***essential*** visitors and that as custodian, Sara Wareham is included as an essential part of the cohort. Connie Horder explained that in creating and limiting the school to one cohort the Board and staff are working to keep students safe to the best of their ability. It might not be perfect but the Board tries to clarify the policies and must follow the 1900 policy rules. Funding depends upon it.

Connie Horder moved and Crissy Kelly seconded a motion to change wording in Policy 1905 – "***All people entering the school must wear masks at all times, with the exception of enrolled students, paid staff and paid teachers who make up our Trinity School cohort."*** Jill Pritchard, Connie Horder and Crissy Kelly approved, Alison Fitzsimmons declined. The motion passed.

Ashley Quigg again asked for permission to hold monthly PTO lunches and PTO meetings at the school, including lunch the Wednesday before Thanksgiving. Alison Fitzsimmons moved and Connie Horder seconded a motion to approve monthly PTO lunches limited to 5 masked and social distanced parents. The motion passed unanimously.

There was no motion to approve PTO meetings inside the school. The school clerk volunteered to setup Zoom meetings for the PTO if requested.

Jen Kueber indicated that parent teacher meetings have already been scheduled at the school and she would like clarification that yes masks are needed. **(? Was this clarified?)**

D. ESSER Grants Per OPI, ESSER II and III require continuous Policy 1900 review. The school cannot afford to lose the ESSER grants. Policy updates must be posted on our website.

E. Building Updates and Architecture Connie Horder is working with the County Health Department to secure ARPA grants for both well and septic. She shared a site drawing and explained locations of well and septic. The

septic design must be completed before the architecture design can be completed.

F. Staff Contracts Crissy Kelly moved and Alison Fitzsimmons seconded a motion to approve a para employment contract for Christine Hovda. Jen Kueber reminded the Board that the second semester Spanish contract was up for renewal. Discussion revolved around benefits and costs. Alison Fitzsimmons moved and Crissy Kelly seconded a motion to renew the Spanish teacher employment contract. The motion passed unanimously.

G. Canyon Creek Historical The local historical society is looking for stories and photos of the Canyon Creek area. The CCH is publishing a calendar which will be available shortly.

VI. Superintendent Comments Next month Katrina Chaney needs the Board to address special ed preschool funding. Katrina Chaney has rapid COVID tests available if needed.

VII. Supervising Teacher Jen Kueber mentioned that the 1st quarter went well; staff is really looking forward to the addition and having more room; the substitute teacher loved Trinity; the Christmas program is scheduled for December 22nd – the music teacher has scheduled the kids to sing Christmas carols at two nursing homes and then from the trolley on the Walking Mall; the bus will be needed to transport children to and fro. Also the PTO is selling raffle tickets and there is a silent auction on the PTO website.

VIII. Committee Comments Safety Committee includes Jen Kueber and Katrina Chaney. The Dept. of Labor made a surprise visit and worked with Lisa Quisenberry as Jen Kueber was not available. The DOL agent made a number of minor recommendations: move stuff from electrical outlet in storage area, grounds keeper is required to have mower training, need a new employee checklist, annual safety inspection by committee (this is already being done).

IX. Clerk Comments Crissy Kelly moved and Connie Horder seconded a motion to approve $15398.78 for October expenditures. The motion passed unanimously.

X. Board Chair Comments Jill Pritchard thanked all staff, PTO and Board members for their efforts on behalf of Trinity School.

XI. Public Comments Lisa Quisenberry mentioned $5K in PTO raffle tickets sales will result in a field trip for the students.

XII. Scheduled Date of Next Board Meeting January 13th, 2022

XIII. Adjournment 7:16pm

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Trinity Board Minutes
December 21, 2024

I. Call to Order: at 10:01AM by Chairperson Tammy Burke. Attending were Connie Horder, Ben Quigg; staff Joane Bayer; public Jacob Augenstein. Absent were trustees Alison Fitzsimmons and Shelby Saarinen.

II. Public Comments: None

III. Agenda Approval: Connie Horder moved and Ben Quigg seconded a motion to approve the agenda. The motion passed unanimously.

IV. New Business:

A. Discussion and Approval of Septic and Water System bids.

Connie Horder and Jacob Augenstein reviewed the Bid Tabulation Sheet and pricing options for all four bids. Silvertip Irrigation came in considerably less than other three bids. Ryan Casne and Silvertip Irrigation reviewed the bid after receipt and ensured all items were included in the bid. Only item not on Silvertip Irrigation document is dewatering, which may or may not be necessary, but the cost will be their responsibility.
Discussion of installation timing due to irrigation. Ryan Casne will be on site regularly for both water system and septic installation to ensure proper installation and completion.
If bid winner does pull out they will lose the 10% security bond.
Discussion of remote control vs wired from well head to school and price differential.
Abraham Construction will still be involved due to water and septic hook up to building.
ARPA DNRC grant required project to go out to bid, bid acceptance due by end of December 2024.
Both Ryan Casne and Jacob Augenstein are comfortable with the Silvertip Irrigation bid and their bid has everything covered from prevailing wage to foam board insulation but recommends 10-20% in contingency funds because of septic design.
Bond company will ensure project is completed.
There was a lot of interest on the plans website, prior to bidding.

Price differential may be because Silvertip Irrigation is its own contractor and with other bids the work was subcontracted.
Completion deadline is July 31st, 2025

Connie Horder moved and Ben Quigg seconded a motion to accept the Silvertip Irrigation bid of $209,572.08 for water system and septic system installation as laid out in provided plans and engineering documents. The motion passed unanimously.

Jacob will send Chairperson Tammy Burke the A101 and A102 documents to be signed.

B. Adjournment:at 10:32am.

DEPARTMENT OF NATURAL RESOURCES
AND CONSERVATION

GREG GIANFORTE, GOVERNOR
1539 ELEVENTH AVENUE

STATE OF MONTANA

DIRECTOR'S OFFICE: (406) 444-2074
FAX: (406) 444-2684
PO BOX 201601
HELENA, MONTANA 59620-1601

Conservation and Resource Development Division
Environmental Checklist Instructions

Purpose of This Document:

All applicants must consider the potential environmental impacts of their projects. Consideration of these impacts on the location, design, or construction actions may help avoid expensive costs. A project will not be eligible for funding if it results in significant environmental degradation.

DNRC requires compliance with the Montana Environmental Policy Act (MEPA) per state law and associated DNRC Administrative Rules (ARM 36.2.523). MEPA requires state agencies to prepare a detailed statement on any project, program, or activity directly undertaken by the agency; a project or activity supported through a contract, grant, subsidy, loan, or other form of funding assistance from the agency; and a project or activity involving the issuance of a lease, permit, license, certificate, or other entitlement for use or permission by the agency (MCA Title 75, Chapter 1). Thus, all project applications will be subject to MEPA review.

What Does This Mean for Applicants?

- ☐ All applicants must complete the Environmental Checklist in its entirety and provide sufficient documentation on public participation.
- ☐ Public participation, or scoping, of the project must include stakeholder, landowner, and community engagement. These efforts can be in the form of documented public meetings (e.g., meeting minutes, pdf presentations) or letters of support.
  - The public meeting must be properly noticed (advertised) and the public must be provided with an opportunity at the meeting to comment on the project.
  - Minutes of the meeting should reflect what was discussed about the project, including all comments received from the public.
  - Letters of support must be included from any identified or interested stakeholders.
- ☐ Agency Comment Letters (see instructions below)
- ☐ Please submit these items with your application.
- ☐ Provide Affidavit of Publication or Meeting Minutes for the public comment period notice on the draft EA

How Will DNRC Use the Information Provided?

The information provided within the Environmental Checklist will be subject to a MEPA review by DNRC. If this review should result in an Environmental Assessment, please be aware that DNRC will draft the Environmental Assessment. The drafted Environmental Assessment decision will be posted for a public comment period of up to 30 days dependent on the level of environmental impact.

When the draft EA is posted, we require the project proponent to post the notice in either one local newspaper outlet in the legal advertising section or provide the notice during a publicly held meeting. The applicant must then provide the affidavit of publication if posted in the newspaper or meeting minutes if discussed in a public meeting. Please note this public comment period does not suffice for the public participation component mentioned above. The MEPA document will then require a final decision by DNRC before funds are awarded.

It is also important to note for projects with no environmental impacts, or those that do not lead directly to construction or any other sort of environmental degradation, will not be subject to an environmental assessment and the checklist/public participation does not need to be completed. Examples of these sorts of activities include, but are not limited to, development of a PER (professional engineering report), planning, and education/informational outreach. Please let us know if there are additional questions on what other projects may fall under this category.

Instructions:

Complete the Environmental Checklist on the following pages after the instructions below. DNRC retains the ultimate decision-making authority on all MEPA decisions. If DNRC determines this section to be incomplete, additional information will be required before consideration for funding.

Example			
Impact Code	**Impact Type**	**Permits/ Mitigation Required?**	**Explanation of Impact to Resource**
1. Soil Suitability, Topographic and/or Geologic Constraints (example: soil slump, steep slopes, subsidence, seismic activity)			
☐ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐ Permit ☐ Mitigation ☐ NA	*Current Conditions:* *Preferred Alternative Environmental Narrative:*

1. **Impact Code:** In the first column, identify the impact that the preferred alternative will have on each resource (e.g. 1. Soil Suitability, Topographic and/or Geologic Constraints) in the project area. Select from the following impact codes:
   - *No Impact*: No impact to the resource is anticipated or this is not applicable to this project.
   - *Beneficial*: Potentially beneficial impact to the resource.
   - *Adverse*: Potentially adverse impact to the resource.

   Please note that a resource may have more than one impact. Identify all possible impacts to the resource in the space provided. For example, the preferred alternative may have a short-term direct negative impact and a long-term direct and indirect positive impact on the resource. Check all boxes that apply and use the space provided in the final column "Explanation of Impact to Resource" to explain.

Example			
Impact Code	**Impact Type**	**Permits/ Mitigation Required?**	**Explanation of Impact to Resource**

1. Soil Suitability, Topographic and/or Geologic Constraints (example: soil slump, steep slopes, subsidence, seismic activity)			
☐ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	*Current Conditions:* *Preferred Alternative Environmental Narrative:*

2. **Impact Type:** In the second column, identify the type(s) of impact to the resource from the preferred alternative. (Impacts may be direct, indirect or cumulative).
   - *Direct impacts*: Occur at the same time and place as the proposed project.
   - *Indirect or secondary impacts*: Occur at a different location or later time than the proposed project.
   - *Cumulative impacts*: Collective impacts on the environment when considered in conjunction with other past, present, and future actions related to the proposed project. Cumulative impact analysis includes a review of all state and nonstate activities that have occurred, are occurring, or may occur that have impacted or may impact the same resource as the proposed project.

   Just as above, please note that a resource may have more than one impact. Identify all possible impacts to the resource in the space provided. For example, the preferred alternative may have a short-term direct negative impact and a long-term direct and indirect positive impact on the resource. Check all boxes that apply and use the space provided in the final column "Explanation of Impact to Resource" to explain.

Example			
Impact Code	**Impact Type**	**Permits/ Mitigation Required?**	**Explanation of Impact to Resource**
1. Soil Suitability, Topographic and/or Geologic Constraints (example: soil slump, steep slopes, subsidence, seismic activity)			
☐ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	*Current Conditions:* *Preferred Alternative Environmental Narrative:*

3. **Permits/Mitigation Required:** In the third column, please select if a permit and/or mitigation is required for the project (e.g., 310, USACE Section 404 Nationwide).
   - Please make sure to include which permits (if any) are required for the particular resource and what mitigation techniques will be used if impacts are to occur.

Example			
Impact Code	**Impact Type**	**Permits/ Mitigation Required?**	**Explanation of Impact to Resource**

1. Soil Suitability, Topographic and/or Geologic Constraints (example: soil slump, steep slopes, subsidence, seismic activity)			
☐ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐ Permit ☐ Mitigation ☐ NA	Current Conditions: Click or tap here to enter text. Preferred Alternative Environmental Narrative: Click or tap here to enter text.

4. **Explanation of Impact to Resource:** In the final column, use the space provided on the Environmental Checklist to summarize the following information:
    - ***Current Conditions***
        - Describe the current environmental resources of the affected area including the impact of no action. Your description of the current natural resources will provide a baseline to compare all alternatives and their associated environmental impacts.
    - ***Preferred Alternative Environmental Narrative:***
        - Describe the impact of the preferred alternative or ***indicate why there is no impact*** from the project.
        - Identify any reasonable cumulative impacts that may result from implementing the preferred alternative. Cumulative impacts are the collective impacts on the environment when considered in conjunction with other past, present, and future actions related to the proposed project.
        - If a potentially adverse impact is identified for the preferred alternative, the applicant must provide the following:
            - An analysis of the severity, duration, extent, and frequency of the impact. Please specify and describe the following:
                - Severity: negligible, minor, or major.
                - Duration: short-term or long-term.
                - Extent: local, regional, or statewide.
                - Frequency: non-recurring or recurring.
            - An explanation of short- and/or long-term measures to mitigate the impact with a discussion on the effects of those mitigative measures on the proposed project.
        - Identify any required permits.

5. **Additional Information:** Underneath the table the following information must be provided:
    - Cultural Survey Acknowledgement
    - Sources of Information: Identify all sources consulted for the completion of the Environmental Checklist. Sources may include studies, plans, documents, or the persons, organizations, or agencies contacted for assistance.

Certain sections of this Environmental Checklist require specialized knowledge. Please contact the following agencies and attach comments provided by those agencies to your application. Below are contacts for certain sections that require additional review by other agencies:

- *Physical Environment,* ***Section #5 – Surface Water Quality*** – Montana Department of Environmental Quality, (406) 444 - 3080.
- *Physical Environment,* ***Section #6 – Floodplains and Floodplain Management*** – Contact the Local Floodplain Administrator for your County and/or Community

1. Soil Suitability, Topographic and/or Geologic Constraints (example: soil slump, steep slopes, subsidence, seismic activity)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☒Mitigation ☒ NA	Current Conditions: Project site is not prone to geographic constraints and/or dangers due to steep slopes, subsidence, or seismic activity. Preferred Alternative Environmental Narrative: The project consists primarily of subsurface water and sewer utility work. The work will not increase the likelihood of geologic changes. According to NRCS soil survey data, the soils for this site where the sewage treatment system will be installed are classified as 408A – Villard-Villy silt loams, 0 to 2 percent slopes, this soil is rated as very limited for septic tank absorption fields. The unsuitable soil limitations will be mitigated by the use of an elevated sand mound wastewater treatment system (WWTS) on this site. The WWTS will be permitted through the Montana DEQ as a "public system" and will also require a septic permit from the Lewis & Clark County Health Department.
2. Hazardous Facilities (example: power lines, hazardous waste sites, acceptable distance from explosive and flammable hazards including chemical/petrochemical storage tanks, underground fuel storage tanks, and related facilities such as natural gas storage facilities and propane storage tanks)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: There are no known Hazardous Facilities located in the immediate project area, however, an EPA Envirofacts search, as well as a UST search yielded a few items of note within a one mile radius of the site. Notably there are two decommissioned underground storage tanks to the east of the project. The Great Divide Solar Array is located to the northeast of the project. There is an area of medium septic density located to the west of the project. Several tracts of land within a one mile radius of the project are currently being irrigated for agricultural use. Please refer to the attached exhibit for specific location information. Preferred Alternative Environmental Narrative: None of the above referenced items are expected to pose a hazard to the project, no mitigation has been proposed.
3. Surrounding Air Quality (example: dust, odors, emissions)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: The site is currently being served by an existing septic tank and drainfield. This project will include a new elevated sand mound WWTS. Preferred Alternative Environmental Narrative: No impact is expected, typically elevated sand mound WWTS's do not affect existing or future air quality.

4. Groundwater Resources and Aquifers (example: quantity, quality, distribution, depth to groundwater, sole source aquifers)			
☐ No Impact ☐ Beneficial ☒ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☒Permit ☒Mitigation ☐ NA	Current Conditions: The site is currently served by an existing well which will be abandoned upon completion of the project. The project includes a new "public water system" and well. There will be no impact to groundwater quality as a result of the new water system. The impact to water quantity as a result of the new water system will be very slightly be adverse, as the quantity of groundwater in the aquifer will be slightly decreased due to the increased pumping capacity of the well. The new WWTS will be permitted through the Montana DEQ as a "public system" and will also require a septic permit from the Lewis & Clark County Health Department. Preferred Alternative Environmental Narrative: The WWTS review processes require a Non-Degradation Evaluation that must prove impacts to groundwater quality are non-significant.
5. Surface Water/Water Quality, Quantity and Distribution (example: streams, lakes, storm runoff, irrigation systems, canals)			
☐ No Impact ☐ Beneficial ☒ Adverse	☐ Direct ☒ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: There are several surface water bodies within one-mile of the project site, however, because none of these are directly crossing the location of work, no direct impact is expected. The Jefferson Ditch is located to the west of the site, and the Vincent Ditch is located to the East. The little Prickly Pear Creek is located to the north. Please see the attached exhibit for more detail. Preferred Alternative Environmental Narrative: The WWTS review processes require a Non-Degradation Evaluation that must prove impacts to surface water quality are non-significant.
6. Floodplains and Floodplain Management (Identify any floodplains within one mile of the boundary of the project.)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: According to the FEMA flood map service center, the project, and all areas within one-mile of the project are located in zone D, "Area of Undetermined Flood Hazard". Preferred Alternative Environmental Narrative: No mitigation for the above factors has been proposed.

7. Wetlands (Identify any wetlands within one mile of the boundary of the project and state potential impacts.)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: There are Freshwater Emergent Wetlands located within one mile to the southwest of the project site as well as Freshwater Scrub-Shrub Wetlands located to the northwest of the project site. Due to the groundwater flow direction of northeast, no impact is expected on either of these wetlands from either the public water or public wastewater components of this project. Preferred Alternative Environmental Narrative: No mitigation for the above factors has been proposed.
8. Agricultural Lands, Production, and Farmland Protection (example: grazing, forestry, cropland, prime or unique agricultural lands) Identify any prime or important farm ground or forest lands within one mile of the boundary of the project.			
☐ No Impact ☐ Beneficial ☒ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☒Mitigation ☐ NA	Current Conditions: All land being used for agricultural purposes has been delineated on the attached one-mile inventory exhibit. A small area of farmland on the neighboring Chevalier Ranch will be temporarily impacted by this project during construction of the well and water line from the school to the well location on the Chevalaier Ranch. Preferred Alternative Environmental Narrative: Mitigation is proposed to minimize the severety and duration of the adverse agricultural impact. Mitigation will include dust control and reclamation & re-seeding of all disturbed agricultural areas affected by construction of the project. Long term imacts will be very minimal as the well will only require maintenance every 10-20 years.

9. Vegetation and Wildlife Species and Habitats, Including Fish (example: terrestrial, avian and aquatic life and habitats)			
☐ No Impact ☐ Beneficial ☒ Adverse	☐ Direct ☒ Indirect ☐ Cumulative	☐Permit ☒Mitigation ☐ NA	Current Conditions: A species of concern report has been provided by the Montana State Library Natural Heritage Program. While the report cites observations of several species of concern in the vicinity of the project site, there is only one Special Status Species which has habitat in the immediate area, the Bald Eagle. Bald Eagle habitat is located to the northeast of the project site and the boundary of said habitat crosses through the middle of the site. The Montana Sage Grouse Habitat Conservation Program has also been queried and the project does not contain any sage grouse habitat. Little Prickly Pear Creek is located approximately 0.6 miles north and east of the project site. Prickly pear creek is home to three species of trout as well as native white fish. Preferred Alternative Environmental Narrative: No deforestation or loss of wildlife habit is expected due to this project. The public wastewater treatment system design is required to include a comprehensive ground and surface water non-degradation analysis. This analysis has concluded that effects from this project on fish and aquatic wildlife is non-significant.
10. Unique, Endangered, Fragile, or Limited Environmental Resources, Including Endangered Species (example: plants, fish or wildlife)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: A species of concern report has been provided by the Montana State Library Natural Heritage Program. While the report cites observations of several species of concern in the vicinity of the project site, there is only one Special Status Species which has habitat in the immediate area, the Bald Eagle. Bald Eagle habitat is located to the northeast of the project site and the boundary of said habitat crosses through the middle of the site. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors. No deforestation or loss of habit is expected due to this project. The project site has already been developed and no changes are foreseen.
11. Unique Natural Features (example: geologic features)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: The project site is mostly flat and already largely developed, no unique natural features have been identified. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors.

12. Access to, and Quality of, Recreational and Wilderness Activities, Public Lands and Waterways (including Federally Designated Wild & Scenic Rivers), and Public Open Space			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: There are no recreational and wilderness activities, public lands and waterways, or public open spaces located in the vicinity of the project area. There are Montana State Trust Lands located approximately half a mile to the south of the project location, however, access to these lands is not affected by this project. None of the items on this list will be impacted by this project. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors.
Human Environment			
Impact Code	**Impact Type**	**Resource**	
1. Visual Quality – Coherence, Diversity, Compatibility of Use and Scale, Aesthetics			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: No impact to visual quality is anticipated as part of this project. The aesthetic of the site will remain largely unchanged after completion of work. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors.
2. Nuisances (example: glare, fumes)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: No impact due to nuisances are anticipated as part of this project. Because the existing wastewater treatment system is being replaced with an elevated sand mound, no additional fumes or noxious smells are projected to occur. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors.
3. Noise – Suitable Separation Between Housing and Other Noise Sensitive Activities and Major Noise Sources (example: aircraft, highways and railroads.)			
☐ No Impact ☐ Beneficial ☒ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☒Mitigation ☐ NA	Current Conditions: No permanent sources of additional noise will be constructed as part of this project. There will be temporary noises during construction of the proposed water and wastewater improvements. Preferred Alternative Environmental Narrative: Mitigation of construction noise will include restricted work hours and days to minimize impact on neighboring property owners and wildlife.
4. Historic Properties, Cultural, and Archaeological Resources*****(Please see end of Environmental Checklist for details if Cultural Survey has not been performed per SHPO Section 106)***			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: Damon Murdo of the Montana Historical Society has been contacted and has provided documentation of sites of historical importacts in the area. While there are several sites within the vicinity of the project location, none of these are located on the project area and are therefore not affected by this project. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors.

5. Changes in Demographic (Population) Characteristics (example: quantity, distribution, density)			
☐ No Impact ☒ Beneficial ☐ Adverse	☐ Direct ☒ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: The Canyon Creek Area is growing in population and consequently the school is receiving more students. The wastewater treatment system and water system need to be updated to meet this rise in population & provide opportunity for future growth of the facility population served. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors.
6. General Housing Conditions – Quality, Quantity, Affordability			
☐ No Impact ☒ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: This project will allow more studenty to attend the Canyon Creek School, a benefit for those living in the area that would otherwise have to send their children elsewhere, or relocate for access to another school with capacity for additional students. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors.
7. Businesses or Residents (example: loss of, displacement, or relocation)			
☐ No Impact ☒ Beneficial ☐ Adverse	☒ Direct ☒ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: We believe that this is a beneficial project to the local businesses and residents. As the community grows and expands it provides more opportunities for both businesses and residents living there. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors.
8. Public Health and Safety			
☐ No Impact ☒ Beneficial ☐ Adverse	☐ Direct ☒ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: A well functioning educational system is generally regarded as beneficial to communal public health and safety. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors.
9. Local Employment – Quantity or Distribution of Employment, Economic Impact			
☐ No Impact ☒ Beneficial ☐ Adverse	☐ Direct ☒ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: If parents have a place for their children to go to school, there is a greater chance that they may work, live, and shop within the community. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors.
10. Income Patterns – Economic Impact			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: We expect no changes in income patterns as a result of this project. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors.

11. Local and State Tax Base and Revenues			
☐ No Impact ☒ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: Because the school will be able to accommodate more students, more people will be able to live in the community which will lead to additional local tax revenue. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors.
12. Community and Government Services and Facilities (example: educational facilities; health and medical services and facilities; police; emergency medical services; and parks, playgrounds and open space)			
☐ No Impact ☒ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: This project will directly impact the educational system of the area allowing for additional students to attend the school. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors.
13. Commercial and Industrial Facilities – Production and Activity, Growth or Decline			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: The impact to commercial and industrial facilities is projected to be non existent due to this project. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors.
14. Social Structures and Mores (example: standards of social conduct/social conventions)			
☐ No Impact ☒ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: Social structures will be improved as part of this project as more children will be able to attend school, which is a method of formative social instruction. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors.
15. Land Use Compatibility (example: growth, land use change, development activity, adjacent land uses and potential conflicts)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: There will be no land use change, growth, development activity or potential conflicts as part of this project. A new well will be constructed on an adjacent lot, however, the land use for this lot will remain unchanged. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors.
16. Energy Resources – Consumption and Conservation			
☐ No Impact ☐ Beneficial ☒ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: It is expected that with more students at the school, energy consumption will increase accordingly but not disproportionately. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors.
17. Solid Waste Management			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: No new or additional solid waste management facilities will be required as a result of the proposed project. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors.

18. Wastewater Treatment – Sewage System			
☐ No Impact ☒ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☒Permit ☐Mitigation ☐ NA	Current Conditions: This project will provide a newer and more advanced wastewater treatment capacity for the school, as well as a new pubic water system. Preferred Alternative Environmental Narrative: The WWTS will be permitted through the Montana DEQ as a "public system" and will also require a septic permit from the Lewis & Clark County Health Department.
19. Storm Water – Surface Drainage			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: No adverse affects to storm water or surface drainage are anticipated as part of this project. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors.
20. Community Water Supply			
☐ No Impact ☒ Beneficial ☒ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☒Permit ☐Mitigation ☐ NA	Current Conditions: Because the new well will be providing additional capacity, it is expected that overall water usage will increase and therefore the aquifer's available water supply will decrease slightly. There is also a beneficial aspect to this project, a new public water system well located further from potential contaminates will increase the safety of the community drinking water source. Preferred Alternative Environmental Narrative: The new public water system and source well must be reviewed and approved by the Montana DEQ prior to serving the facility. This system must be regularly tested for water quality to protect the sesnsitive population being served.
21. Fire Protection – Hazards			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: The school will continue to be served by the Canyon Creek Volunteer Fire Department's staff and equipment. The fire department facilities are located on Duffy Lane, ¼ mile west of the project site. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors. Fire protection will not be reduced or changed as a result of this project.
22. Cultural Facilities, Cultural Uniqueness and Diversity			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: No impact to cultural facilities, cultural uniqueness or diversity is foreseen as part of this project. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors.

23. Transportation Networks and Traffic Flow Conflicts (example: rail; auto including local traffic; airport runway clear zones – avoidance of incompatible land use in airport runway clear zones)			
☐ No Impact ☐ Beneficial ☒ Adverse	☐ Direct ☒ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: No transportation network or traffic flow conflicts are foreseen as part of this project as no new roads will be modified or constructed. Because the student capacity of the school will be increased, a slight increase of traffic on Duffy Lane is expected. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors. Duffy Lane has been constructed and is mainted to accommodate the small amount of additional traffic anticiptated.
24. Consistency with Local Ordinances, Resolutions, or Plans (example: conformance with local comprehensive plans, zoning, or capital improvement plans.)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: All local ordinances, resolutions, and plans will be conformed with as part of the construction of this project. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors. The project site is located in an unzoned area.
25. Private Property Rights (example: a regulatory action or project activity that reduces, minimizes, or eliminates the use of private property.)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: No private property rights will be affected during the development of this project. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors.
26. Environmental Justice (example: does the project avoid placing lower income households in areas where environmental degradation has occurred, such as adjacent to brownfield sites?)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: There will be no impact to environmental justice per the completion of this project. No new housing will be constructed or is proposed. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors.
27. Lead Based Paint and/or Asbestos (example: does the project replace asbestos-lined pipes? Do any structures qualify as containing lead-based paint?)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: The scope of this project does not include the modification or demolition of any structures which include lead based paints or asbestos-lined pipes. All existing facilities will be abandoned in place and there is no possibility of environmental contamination. Preferred Alternative Environmental Narrative: No mitigation has been proposed for the above factors.

Additional Information

****If no cultural survey has been performed, or is not expected to be needed, applicant must agree to the following statement:**

☒ I hereby agree that, to my knowledge, there are no cultural or paleontological materials in the proposed project site. If previously unknown cultural or paleontological materials are identified during project related activities, the DNRC grant manager will be notified, and all work will cease until a professional assessment of such resources can be made.

List all sources of information used to complete the Environmental Checklist. Sources may include studies, plans, documents, or the individuals, organizations, or agencies contacted for assistance. For individuals, groups, or agencies, please include a contact person and phone number. List any scoping documents or meetings and/or public meetings during project development.

Montana Cadstral (https://svc.mt.gov/msl/mtcadastral)

Montana Digital Atlas (https://mslservices.mt.gov/Geographic_Information/Applications/DigitalAtlas/)

EPA Envirofacts (https://enviro.epa.gov/envirofacts/sems/search)

EPA UST Mapping Utility (https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=b03763d3f2754461adf86f121345d7bc)

Montana Groundwater Information Center (https://mbmggwic.mtech.edu/)

Montana Natural Heritage Program – Scott Blum (sblum@mt.gov)

Montana Historical Society – Damon Murdo (dmurdo@mt.gov)

NRCS Soil Survey (https://www.nrcs.usda.gov/resources/data-and-reports/web-soil-survey)

Montana Sage Grouse Habitat Conservation Program (https://sagegrouse.mt.gov/ProgramMap)

Below is a list of electronic resources available for data gathering to aid in the development of the Environmental Checklist:

Abandoned Mines (DEQ): https://deq.mt.gov/cleanupandrec/Programs/aml

Agricultural Statistics (USDA): USDA - National Agricultural Statistics Service - Data and Statistics

Air Quality

- Nonattainment Areas: Plan and Rule Development | Montana DEQ (mt.gov)
- Opening Burning Guidelines: Open Burning | Montana DEQ (mt.gov)

Army Corps of Engineers: http://www.usace.army.mil/Home.aspx

Bureau of Business and Economic Research, UM: http://www.bber.umt.edu/

Cadastral (for property ownership info): http://svc.mt.gov/msl/mtcadastral

Census Information, MT Dept. of Commerce: http://ceic.mt.gov

Conservation Districts, MT: http://macdnet.org/

Cultural Records

- Montana Historical Society: https://mhs.mt.gov/Shpo/CulturalRecords

DEQ data search tools: Montana DEQ's GIS Portal (mt.gov)

- Including Clean Water Act Info Center, Hazardous Waste Handlers, Petroleum Release Fund Claims, Unpermitted Releases, Underground Storage Tanks, Source Water Protection

EPA Enforcement and Compliance History Online http://echo.epa.gov/

Farmland Classification: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

Fish (Also See Wildlife)

- Montana Fisheries Information System: Montana Fish, Wildlife & Parks GIS Data (arcgis.com)
- Aquatic Invasive Species: Montana FWP AIS Surveys Dashboard 2021 (arcgis.com)

Floodplain Maps, FEMA: https://msc.fema.gov/portal

Geographic Information, Natural Resources Information System: http://nris.mt.gov/gis

Geologic Information - MBMG - Publications - Download Geologic Maps (mtech.edu)

Maps of Montana for species observations, land cover, wetland and riparian areas, land management: Montana Natural Heritage Program (mtnhp.org); http://mtnhp.org/mapviewer/?t=6

Montana Department of Transportation: https://www.mdt.mt.gov/

- Environmental Manual: http://www.mdt.mt.gov/publications/docs/manuals/env/preface.pdf
- Environmental Manual - Chapter 29, Permits Required: https://www.mdt.mt.gov/publications/docs/manuals/env/Chapter%2029%20PERMITS%20REQUIRED.pdf

Montana Board of Oil and Gas Conservation Information System:

- http://bogc.dnrc.mt.gov/webApps/DataMiner/

Plants

- Plant database, USDA Natural Resources Conservation Service: http://plants.usda.gov/java
- Plant Species, MT Field Guide: http://fieldguide.mt.gov/default.aspx
- Plant Species of Concern: http://mtnhp.org/SpeciesOfConcern/Default.aspx?AorP=p
- Threatened, Endangered and Rare Plants, USDA: https://plants.usda.gov/home/raritySearch

Soils

- USDA Natural Resource Conservation Service database: https://websoilsurvey.nrcs.usda.gov/app/
- Montana soil and water conservation districts: http://swcdmi.org/

State Historic Preservation Office: http://mhs.mt.gov/Shpo

Tourism, UM – Institute of Tourism & Recreation Research: http://www.itrr.umt.edu

Tribal Resources:

- Blackfeet Tribal Environmental Permits: http://www.blackfeetenvironmental.com
- CSKT Natural Resources Department: http://nrd.csktribes.org/
- Montana Office of Indian Affairs: http://tribalnations.mt.gov/
- Tribal Historic Preservation Officer List: Search - NATHPO
- Tribal Directory Assessment Tool (TDAT): https://egis.hud.gov/tdat/

Vehicle Traffic Count (MDT): http://www.mdt.mt.gov/publications/datastats/traffic.shtml

Water

- Stream Record Extension Facilitator, USGS: USGS | National Water Dashboard
- Streamstats basin characteristics, USGS: http://water.usgs.gov/osw/streamstats/
- Water Resources Division, DNRC: http://dnrc.mt.gov/divisions/water ; ArcGIS Web Application (mt.gov)
- Water Rights Bureau, DNRC: http://dnrc.mt.gov/divisions/water/water-rights
- Water Right Query System, DNRC: DNRC Water Right Query System (mt.gov)
- Wetlands database, USFWS: http://www.fws.gov/wetlands/Data/mapper.html

Wild and Scenic Rivers: http://www.rivers.gov/montana.php

Wildlife

- Animal Species, MT Field Guide: http://fieldguide.mt.gov/default.aspx
- Animal Species of Concern: http://mtnhp.org/SpeciesOfConcern/Default.aspx?AorP=a
- Aquatic Invasive Species: Montana FWP AIS Surveys Dashboard 2021 (arcgis.com)
- Critical Habitat Mapper, USFWS: http://ecos.fws.gov/crithab/
- Crucial Areas Planning System/Habitat Assessment Tool: Habitat MT (HB 526) Funded Lands (arcgis.com)
- FWP Contact Map: http://fwp.mt.gov/gis/maps/contactUs/ (includes biologist responsibility areas)
- Maps and GIS Data, FWP: Montana Fish, Wildlife & Parks GIS Data (arcgis.com)
- Sage grouse management, FWP: Montana Fish, Wildlife & Parks GIS Data : Sage-grouse Habitat/Current Distribution (Montana) : Sage-grouse Habitat/Current Distribution (Montana) (arcgis.com)
- Sage grouse habitat conservation program, DNRC: http://sagegrouse.mt.gov/

- Sage grouse habitat map: https://sagegrouse.mt.gov/ProgramMap

PHYSICAL ENVIRONMENT

1

SOILS

Soil Map—Lewis and Clark County Area, Montana
(CANYON CREEK SCHOOL)

Map Scale: 1:717 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 30 60 120 180

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Lewis and Clark County Area, Montana
Survey Area Data: Version 18, Aug 28, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 13, 2022—Aug 16, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
408A	Villard-Villy silt loams, 0 to 2 percent slopes	2.0	80.0%
637B	Crago gravelly loam, 0 to 8 percent slopes	0.5	20.0%
Totals for Area of Interest		**2.5**	**100.0%**

Chemical Soil Properties

This table shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Effective cation-exchange capacity refers to the sum of extractable cations plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

Soil reaction is a measure of acidity or alkalinity. It is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil.

Gypsum is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced saturated hydraulic conductivity and aeration, and a general degradation of soil structure.

Report—Chemical Soil Properties

Chemical Soil Properties–Lewis and Clark County Area, Montana								
Map symbol and soil name	**Depth**	**Cation-exchange capacity**	**Effective cation-exchange capacity**	**Soil reaction**	**Calcium carbonate**	**Gypsum**	**Salinity**	**Sodium adsorption ratio**
	In	*meq/100g*	*meq/100g*	*pH*	*Pct*	*Pct*	*mmhos/cm*	
408A—Villard-Villy silt loams, 0 to 2 percent slopes								
Villard	0-2	—	—	5.8-7.0	—	—	—	—
	2-5	15-20	—	7.9-8.4	5-10	0	0.0-2.0	0
	5-21	20-25	—	6.6-8.4	5-15	0	0.0-2.0	0
	21-32	10-15	—	6.6-7.3	0	0	0	0
	32-60	1.0-5.0	—	6.6-7.3	0	0	0	0
Villy	0-2	15-20	—	7.9-8.4	5-15	0	0	0
	2-60	10-20	—	7.9-8.4	5-15	0	0	0
637B—Crago gravelly loam, 0 to 8 percent slopes								
Crago	0-4	10-15	—	7.4-8.4	5-15	0	0	0
	4-32	10-20	—	7.4-8.4	40-70	0	0	0
	32-60	5.0-15	—	7.4-8.4	40-70	0	0	0

Data Source Information

Soil Survey Area: Lewis and Clark County Area, Montana
Survey Area Data: Version 18, Aug 28, 2023

Engineering Properties

This table gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

Hydrologic soil group is a group of soils having similar runoff potential under similar storm and cover conditions. The criteria for determining Hydrologic soil group is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba). Listing HSGs by soil map unit component and not by soil series is a new concept for the engineers. Past engineering references contained lists of HSGs by soil series. Soil series are continually being defined and redefined, and the list of soil series names changes so frequently as to make the task of maintaining a single national list virtually impossible. Therefore, the criteria is now used to calculate the HSG using the component soil properties and no such national series lists will be maintained. All such references are obsolete and their use should be discontinued. Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to a seasonal high water table, saturated hydraulic conductivity after prolonged wetting, and depth to a layer with a very slow water transmission rate. Changes in soil properties caused by land management or climate changes also cause the hydrologic soil group to change. The influence of ground cover is treated independently. There are four hydrologic soil groups, A, B, C, and D, and three dual groups, A/D, B/D, and C/D. In the dual groups, the first letter is for drained areas and the second letter is for undrained areas.

The four hydrologic soil groups are described in the following paragraphs:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly."

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Percentage of rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

References:

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Report—Engineering Properties

Absence of an entry indicates that the data were not estimated. The asterisk '*' denotes the representative texture; other possible textures follow the dash. The criteria for determining the hydrologic soil group for individual soil components is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba). Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Engineering Properties–Lewis and Clark County Area, Montana														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
408A—Villard-Villy silt loams, 0 to 2 percent slopes														
Villard	70	C/D	0-2	Slightly decomposed plant material	PT	A-8	0- 0- 0	0- 0- 0	100-100-100	100-100-100	100-100-100	100-100-100	—	—
			2-5	Silt loam	CL-ML, CL	A-4, A-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	90-95-100	70-80-90	20-25-30	5-10-15
			5-21	Silty clay loam	CL	A-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	95-98-100	85-90-95	30-35-40	10-15-20
			21-32	Loam	CL-ML, CL	A-4, A-6	0- 0- 0	0- 0- 0	95-98-100	95-98-100	85-90-95	60-68-75	20-25-30	5-10-15
			32-60	Very gravelly sand, very gravelly loamy sand, extremely gravelly sand	GP-GM, GP	A-1	0- 0- 0	0- 3- 5	20-30-40	15-25-35	5-13- 20	0- 5- 10	—	NP
Villy	20	C/D	0-2	Silt loam	CL-ML, CL	A-4	0- 0- 0	0- 0- 0	100-100-100	100-100-100	95-98-100	70-80-90	20-25-30	5-8 -10
			2-60	Silty clay loam, silt loam	CL-ML, CL	A-4, A-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	95-98-100	70-83-95	20-28-35	5-10-15

Engineering Properties–Lewis and Clark County Area, Montana														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
637B—Crago gravelly loam, 0 to 8 percent slopes														
Crago	90	B	0-4	Gravelly loam	CL-ML, GC-GM, SC-SM, GM	A-4	0- 0- 0	0- 5- 10	60-68-75	55-63-70	50-58-65	35-45-55	20-25-30	NP-5-10
			4-32	Gravelly loam, gravelly clay loam, very gravelly clay loam	GC-GM, GC	A-2, A-4, A-6	0- 3- 5	0- 8- 15	40-53-65	35-48-60	30-43-55	20-33-45	25-30-35	5-10-15
			32-60	Extremely gravelly loam, very gravelly clay loam, extremely gravelly sandy loam	GC-GM, GP-GM, GM	A-1, A-2	0- 3- 5	0- 8- 15	25-35-45	15-25-35	10-18-25	5-13- 20	20-25-30	NP-5-10

Data Source Information

Soil Survey Area: Lewis and Clark County Area, Montana
Survey Area Data: Version 18, Aug 28, 2023

Physical Soil Properties

This table shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In this table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In this table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, saturated hydraulic conductivity (Ksat), plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3- or 1/10-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute linear extensibility, shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates in the table are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity (Ksat) is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. The amount and type of clay minerals in the soil influence volume change.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In this table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter. The content of organic matter in a soil can be maintained by returning crop residue to the soil.

Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in the table as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and Ksat. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind and/or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the "National Soil Survey Handbook."

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Reference:
United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. (http://soils.usda.gov)

Report—Physical Soil Properties

Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Physical Soil Properties–Lewis and Clark County Area, Montana														
Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*micro m/sec*	*In/In*	*Pct*	*Pct*					
408A—Villard-Villy silt loams, 0 to 2 percent slopes														
Villard	0-2	—	—	0- 0- 0	—	42.00-373.00-705.00	—	—	28.0-50.0-70.0			3	4L	86
	2-5	-22-	-55-	20-24- 27	1.20-1.30-1.40	4.00-9.00-14.00	0.18-0.20-0.22	3.0- 4.5- 5.9	2.0- 3.5- 5.0	.37	.37			
	5-21	-18-	-51-	27-31- 35	1.20-1.35-1.50	1.40-2.70-4.00	0.16-0.18-0.20	3.0- 4.5- 5.9	1.0- 1.5- 2.0	.37	.37			
	21-32	-42-	-37-	15-21- 27	1.20-1.30-1.40	4.00-9.00-14.00	0.16-0.18-0.20	3.0- 4.5- 5.9	0.5- 0.8- 1.0	.37	.37			
	32-60	-94-	- 1-	0- 5- 10	1.20-1.30-1.40	141.00-141.00-141.00	0.02-0.03-0.03	0.0- 1.5- 2.9	0.0- 0.3- 0.5	.02	.02			
Villy	0-2	- 7-	-70-	18-23- 27	1.10-1.20-1.30	4.00-9.00-14.00	0.18-0.20-0.22	0.0- 1.5- 2.9	2.0- 3.5- 5.0	.43	.43	5	4L	86
	2-60	- 7-	-65-	18-28- 35	1.25-1.38-1.50	1.40-2.70-4.00	0.16-0.19-0.22	3.0- 4.5- 5.9	1.0- 1.5- 2.0	.43	.43			

Physical Soil Properties–Lewis and Clark County Area, Montana														
Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*micro m/sec*	*In/In*	*Pct*	*Pct*					
637B—Crago gravelly loam, 0 to 8 percent slopes														
Crago	0-4	-42-	-37-	15-21- 27	1.15-1.25 -1.35	4.00-9.00-14.00	0.10-0.11-0. 12	0.0- 1.5- 2.9	1.0- 2.0- 3.0	.10	.24	2	5	56
	4-32	-35-	-38-	20-28- 35	1.30-1.40 -1.50	4.00-9.00-14.00	0.07-0.08-0. 08	0.0- 1.5- 2.9	0.5- 0.8- 1.0	.10	.32			
	32-60	-39-	-37-	18-24- 30	1.30-1.43 -1.55	4.00-9.00-14.00	0.03-0.04-0. 04	0.0- 1.5- 2.9	0.0- 2.5- 5.0	.05	.28			

Data Source Information

Soil Survey Area: Lewis and Clark County Area, Montana
Survey Area Data: Version 18, Aug 28, 2023

Sewage Disposal

This table shows the degree and kind of soil limitations that affect septic tank absorption fields and sewage lagoons. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches or between a depth of 24 inches and a restrictive layer is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Saturated hydraulic conductivity (Ksat), depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, saturated hydraulic conductivity (Ksat), depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Saturated hydraulic conductivity (Ksat) is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a Ksat rate of more than 14 micrometers per second are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

Information in this table is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this table. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Report—Sewage Disposal

[Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. The table shows only the top five limitations for any given soil. The soil may have additional limitations]

Sewage Disposal–Lewis and Clark County Area, Montana					
Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
408A—Villard-Villy silt loams, 0 to 2 percent slopes					
Villard	70	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
		Slow water movement	0.50	Flooding	0.40
		Flooding	0.40		
Villy	20	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Flooding	0.40
		Flooding	0.40		
637B—Crago gravelly loam, 0 to 8 percent slopes					
Crago	90	Somewhat limited		Somewhat limited	
		Slow water movement	0.50	Seepage	0.50
				Slope	0.32

Data Source Information

Soil Survey Area: Lewis and Clark County Area, Montana
Survey Area Data: Version 18, Aug 28, 2023

2

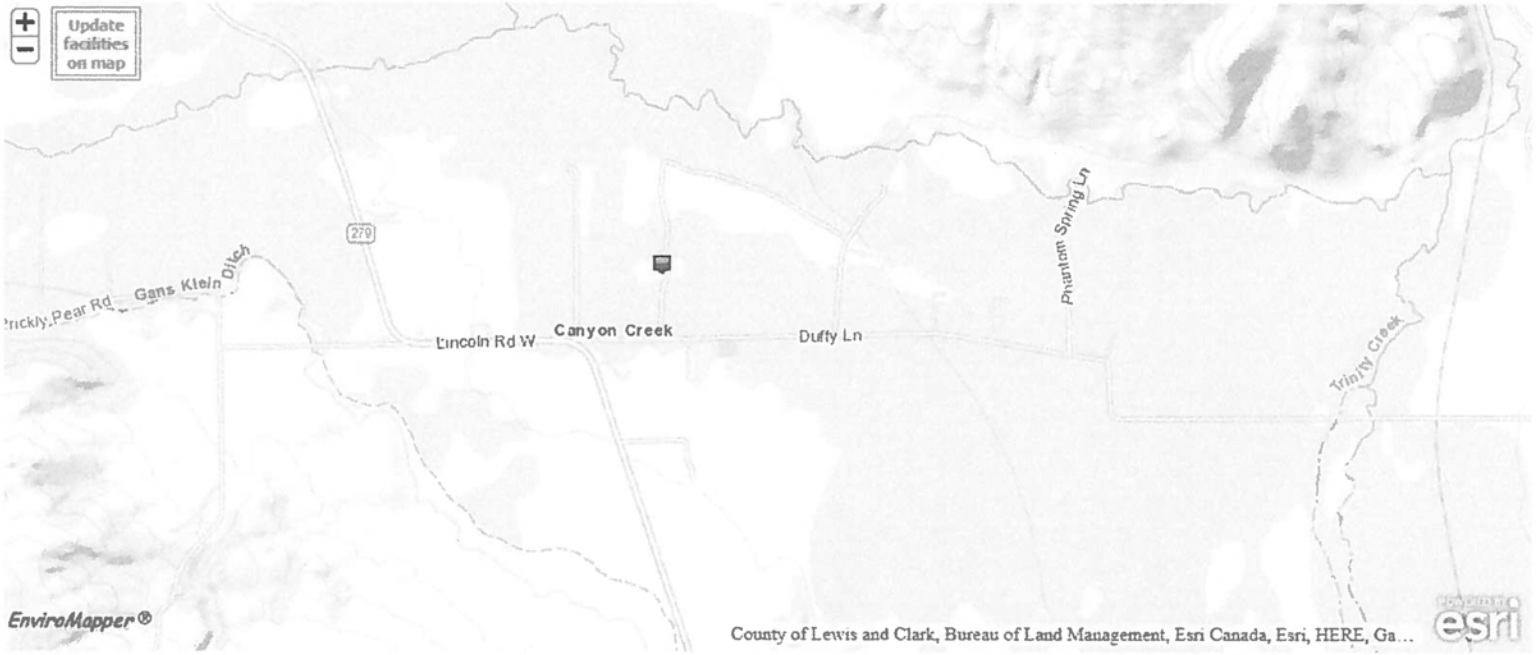
HAZARDOUS FACILITIES

Envirofacts Search | US EPA

FACILITY INFORMATION	AFS	ACRES	BR	SEMS	GHG	PCS/ICIS	RADInfo	RCRAInfo	TRI	TSCA
GREAT DIVIDE SOLAR ARRAYDUFFY LANE CANYON CREEK, MT 59633 Latitude: 46.808775 Longitude: -112.248941						ViewReport				

Search Results for:

7435 Duffy Lane, Canyon Creek, Montana, 59633



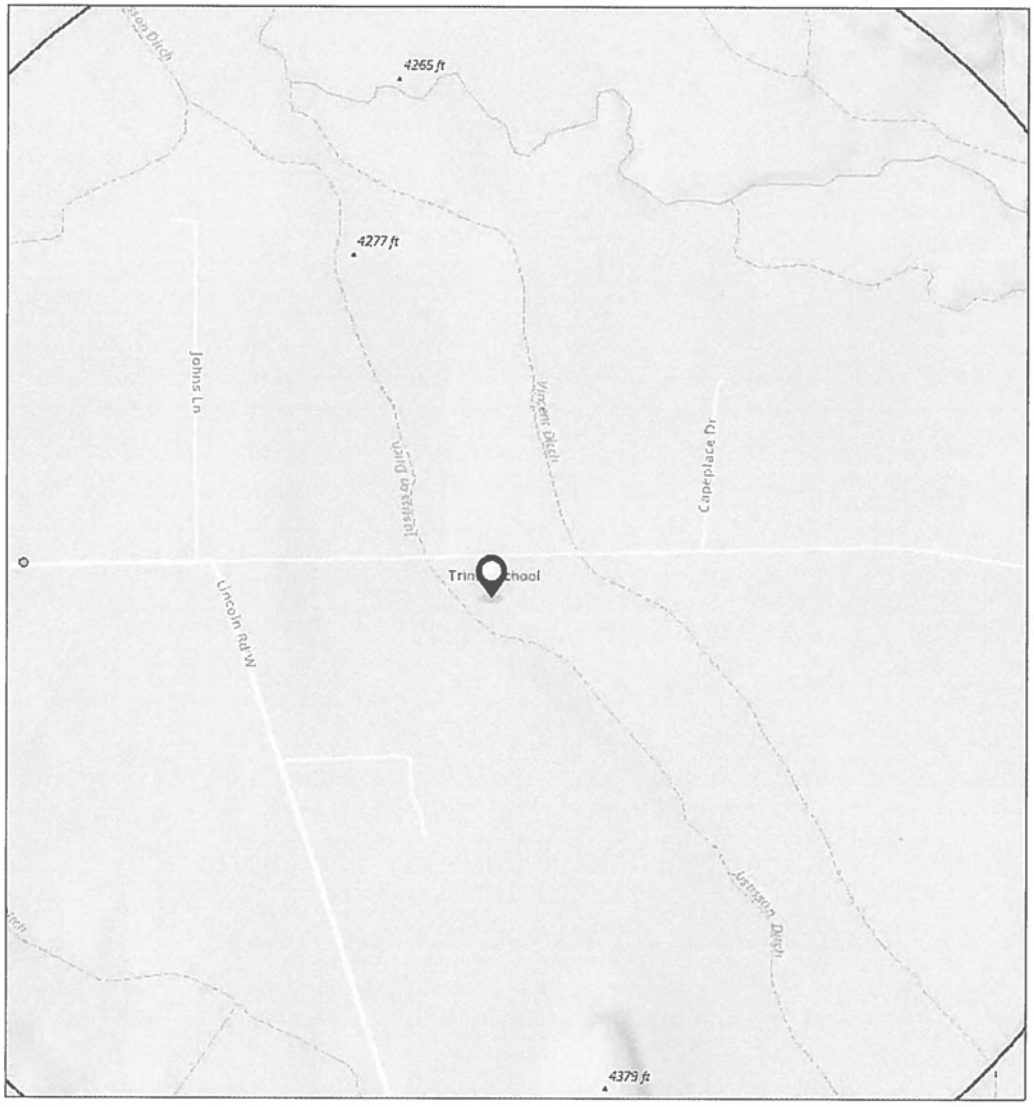
The facility list below is based upon the facilities that are visible with the map above. To refine your search to a more targeted area of interest, please visit the Envirofacts Multisystem Search Form. To searcl Envirofacts via an interactive map, please view your results in EnviroMapper for Envirofacts

EPA Screening Report

Area of Interest (AOI) Information

Area : 87,513,003.18 ft²

Mar 14 2024 11:12:14 Mountain Daylight Time



Facilities

Closed UST(s)

1:18,056

0 0.1 0.2 0.4 mi

0 0.15 0.3 0.6 km

Summary

Name	Count	Area(ft²)	Length(ft)
Releases	1	N/A	N/A
Facilities	1	N/A	N/A

Releases

#	Facility_ID	LUST_ID	Name	Address	City
1	MT2501916	MT1992	CANYON CREEK COUNTRY STORE #1992	8703 Lincoln Rd W	Canyon Creek

#	County	Zip_Code	State	Latitude	Longitude
1	LEWIS AND CLARK	0	Montana	46.8059	-112.2593

#	Coordinate_Source	Address_Match_Type	Reported_Date	Status	Substance
1	State	*No Data*	12/1/1993	No Further Action	*No Data*

#	Population_within_1500ft	DomesticWells_within_1500ft	LandUse	Within_SPA	SPA_PWS_FacilityID
1	4	2	Non-Developed	No	*No Data*

#	SPA_Water_Type	SPA_Facility_Type	SPA_HUC12	Within_WHPA	WHPA_PWS_FacilityID
1	*No Data*	*No Data*	*No Data*	No	*No Data*

#	WHPA_Water_Type	WHPA_Facility_Type	WHPA_HUC12	Within_100yr_Floodplain	Closed_With_Residual_Contaminat
1	*No Data*	*No Data*	*No Data*	No	*No Data*

#	EPA_Region	NFA_Letter	Tribe	Count
1	8		*No Data*	1

Facilities

#	Facility_ID	Name	Address	City	County
1	MT2501916	CANYON CREEK COUNTRY STORE	8703 Lincoln Rd W	CANYON CREEK	LEWIS AND CLARK

#	State	Zip_Code	Latitude	Longitude	Coordinate_Source
1	Montana	59633	46.8057	-112.2593	Geocode

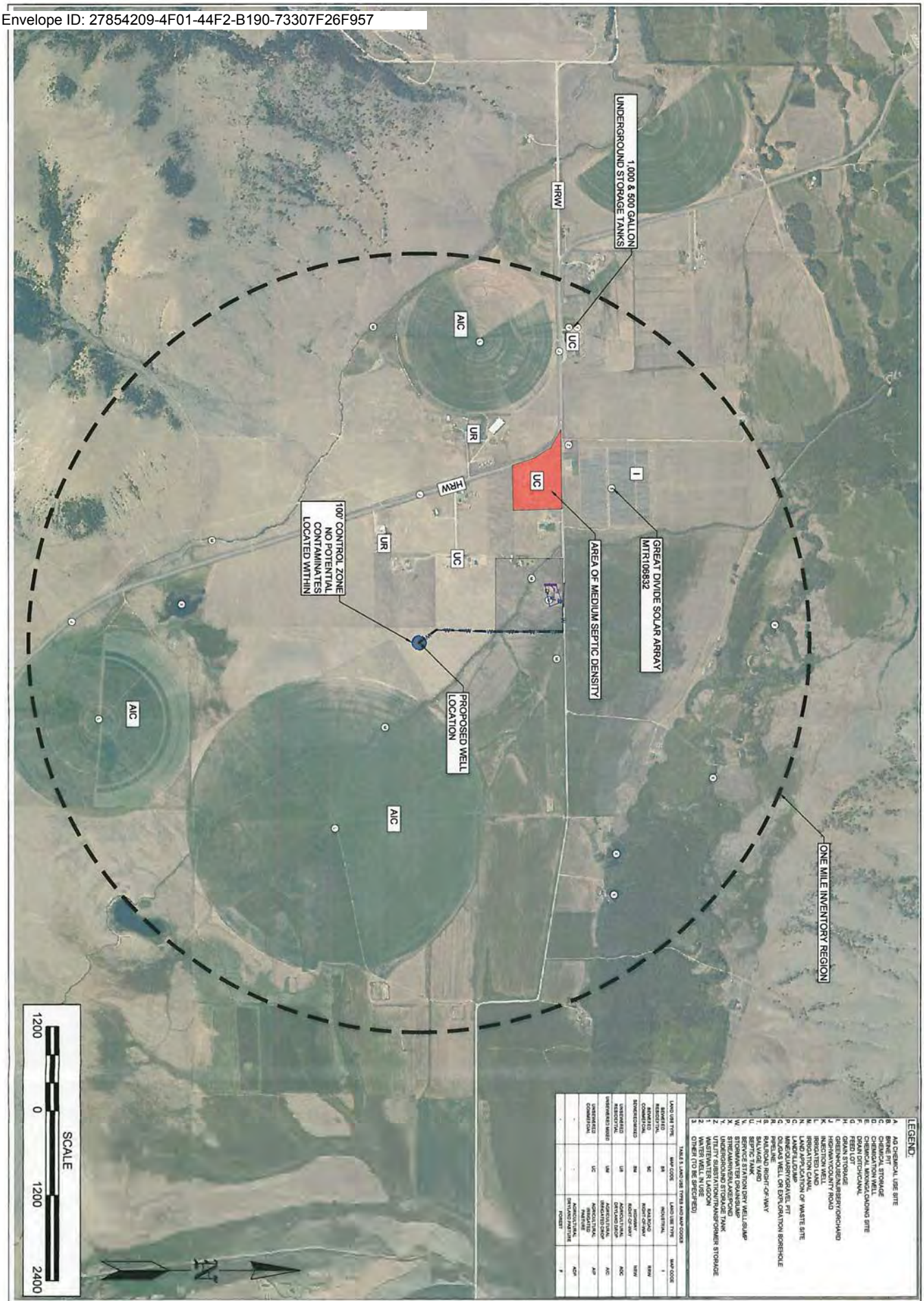
#	Address_Match_Type	Open_USTs	Closed_USTs	TOS_USTs	Facility_Status
1	PointAddress	0	2	0	Closed UST(s)

#	LandUse	Population_1500ft	Private_Wells_1500ft	Within_SPA	SPA_PWS_FacilityID
1	Non-Developed	3	1	No	*No Data*

#	SPA_Water_Type	SPA_Facility_Type	SPA_HUC12	Within_WHPA	WHPA_PWS_FacilityID
1	*No Data*	*No Data*	*No Data*	No	*No Data*

#	WHPA_Water_Type	WHPA_Facility_Type	WHPA_HUC12	Within_100yr_Floodplain	Date_of_Last_Inspection
1	*No Data*	*No Data*	*No Data*	No	*No Data*

#	EPA_Region	Tribe	Count
1	8	*No Data*	1



Project:
CANYON CREEK SCHOOL
S16, T12N, R05W,
LEWIS & CLARK COUNTY, MONTANA

Sheet Title:
PWS 6 INVENTORY REGION

Casne & Associates, Inc.
PO Box 1123
Helena, Montana 59624
(406) 443-1656
ryan@casneinc.com

CASNE ASSOCIATES INCORPORATED
Water Wastewater Subdivision Design and Environmental Solutions

9/25/2023
SHEET 1 OF 1
As-Shown

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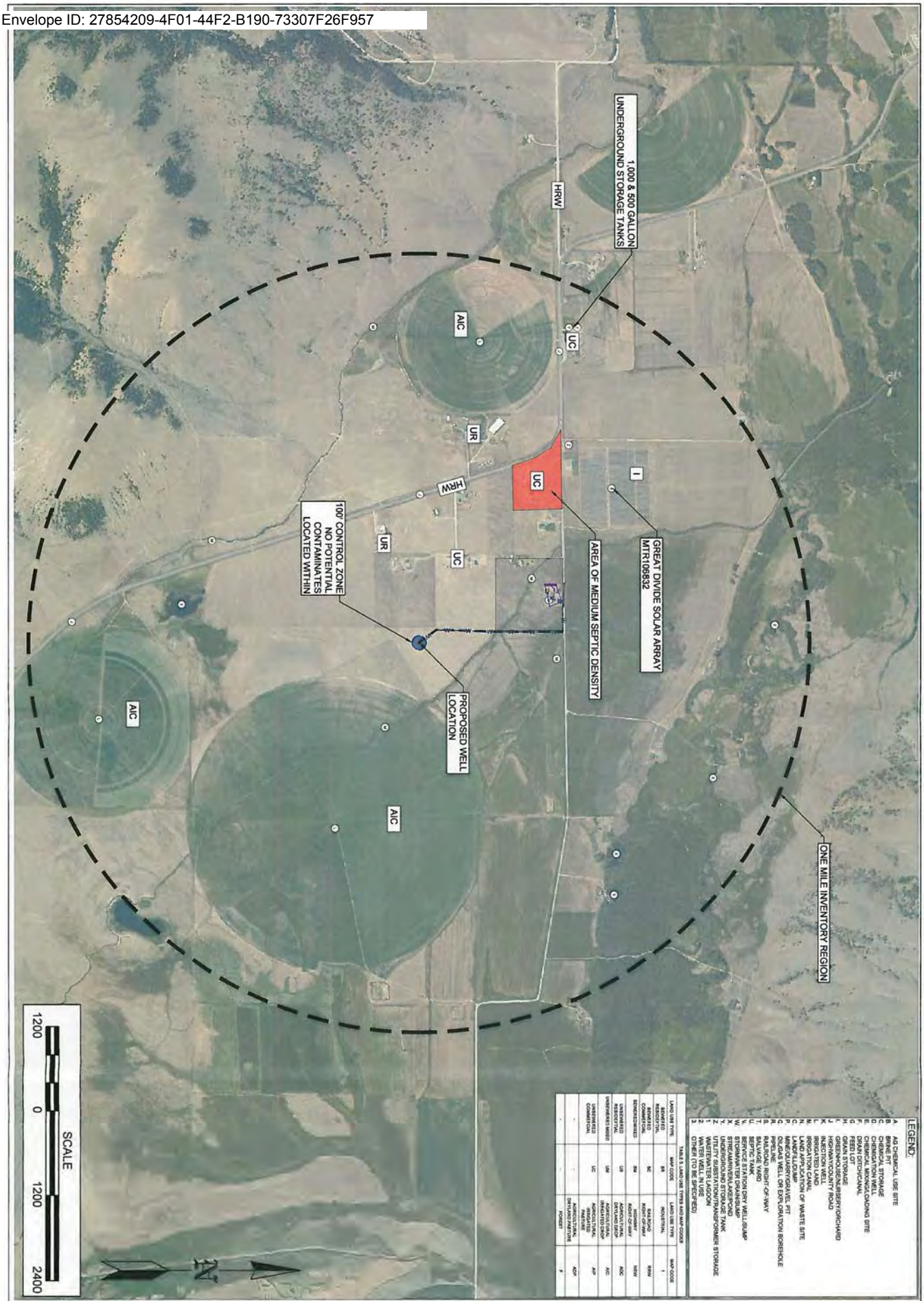

Project:
CANYON CREEK SCHOOL
S16, T12N, R05W,
LEWIS & CLARK COUNTY, MONTANA

Sheet Title:
PWS 6 INVENTORY REGION

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SHEET 1 OF 1
As-Shown

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4

GROUNDWATER

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Go to GWIC website
Plot this site in State Library Digital Atlas
Plot this site in Google Maps
View scanned well log (12/7/2006 2:11:22 PM)

Site Name: SIEBEN RANCH CO
GWIC Id: 126703

Section 1: Well Owner(s)

1) SIEBEN RANCH CO (MAIL)
BOX 1683
HELENA MT 59624 [02/11/1992]

Section 2: Location

Township	Range	Section	Quarter Sections
12N	05W	9	SE¼ SE¼

County: LEWIS AND CLARK
Geocode:

Latitude	Longitude	Geomethod	Datum
46.807684	-112.236069	TRS-SEC	NAD83

Ground Surface Altitude: **Ground Surface Method:** **Datum:** **Date:**

Addition: **Block:** **Lot:**

Section 3: Proposed Use of Water

DOMESTIC (1)

Section 4: Type of Work

Drilling Method: AIR ROTARY
Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Tuesday, February 11, 1992

Section 6: Well Construction Details

Borehole dimensions

From	To	Diameter
0	80	6

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
-2	80	6				STEEL

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
80	80	6			OPEN BOTTOM *

Annular Space (Seal/Grout/Packer)

From	To	Description	Cont. Fed?
0	20	BENTONITE	

Section 7: Well Test Data

Total Depth: 80
Static Water Level: 15
Water Temperature:

Air Test *

20 gpm with drill stem set at _ feet for 2 hours.
Time of recovery _ hours.
Recovery water level _ feet.
Pumping water level 15 feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source

Unassigned

From	To	Description
0	4	TOPSOIL
4	30	CLAY AND GRAVEL
30	70	SAND AND CLAY
70	75	CLAY
75	80	GRAVEL

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name: TERRY LINDSAY
Company: LINDSAY DRILLING CO INC
License No: WWC-253
Date Completed: 2/11/1992

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Go to GWIC website
Plot this site in State Library Digital Atlas
Plot this site in Google Maps
View scanned well log (12/7/2006 2:11:39 PM)

Site Name: CANYON CREEK VOLUNTEER FIRE DISTRICT
GWIC Id: 198772

Section 1: Well Owner(s)

1) CANYON CREEK VOLUNTEER FIRE DISTRICT (MAIL)
PO BOX 464
CANYON CREEK MT 59633 [08/08/2002]

Section 2: Location

Township	Range	Section	Quarter Sections
12N	05W	9	SW¼ SW¼

County: LEWIS AND CLARK
Geocode:

Latitude	Longitude	Geomethod	Datum
46.807684	-112.251949	TRS-SEC	NAD83

Ground Surface Altitude: **Ground Surface Method:** **Datum:** **Date:**

Addition: **Block:** **Lot:**

Section 3: Proposed Use of Water

DOMESTIC (1)

Section 4: Type of Work

Drilling Method: ROTARY
Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Thursday, August 8, 2002

Section 6: Well Construction Details

Borehole dimensions

From	To	Diameter
0	67	6

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
-2	67	6	0.25		WELDED	STEEL

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
67	67	6			OPEN BOTTOM

Annular Space (Seal/Grout/Packer)

From	To	Description	Cont. Fed?
0	0	BENTONITE	Y

Section 7: Well Test Data

Total Depth: 67
Static Water Level: 20
Water Temperature:

Air Test *

100 gpm with drill stem set at 67 feet for 1 hours.
Time of recovery 0.25 hours.
Recovery water level 20 feet.
Pumping water level _ feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source
Unassigned

From	To	Description
0	1	TOPSOIL
1	23	BROWN CLAY AND SHALEY GRAVEL
23	36	BROWN CLAY AND MED/BIG GRAVEL
36	67	SHALEY GRAVEL

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company: H & L DRILLING INC
License No: WWC-447
Date Completed: 8/8/2002

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Return to menu
Plot this site in State Library Digital Atlas
Plot this site in Google Maps

Site Name: TRINITY SCHOOL DISTRICT #4
GWIC Id: 327010

Section 1: Well Owner(s)

1) TRINITY SCHOOL DISTRICT #4 (WELL)
7435 DUFFY LANE
CANYON CREEK MONTANA 59633 [06/19/2023]

Section 2: Location

Township	Range	Section	Quarter Sections
12N	05W	16	SW¼ NE¼

County: LEWIS AND CLARK
Geocode:

Latitude	Longitude	Geomethod	Datum
46.800278	-112.2425	MAP	WGS84

Ground Surface Altitude: **Ground Surface Method:** **Datum:** **Date:**

Addition: **Block:** **Lot:**

Section 3: Proposed Use of Water

PUBLIC WATER SUPPLY (1)

Section 4: Type of Work

Drilling Method: ROTARY
Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Monday, June 19, 2023

Section 6: Well Construction Details

Borehole dimensions

From	To	Diameter
0	25	11
25	100	6

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
-2	100	6	0.25		WELDED	A53B STEEL

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
60	90	6	200	5/16"	HOLTE PERFORATOR SLOTS

Annular Space (Seal/Grout/Packer)

From	To	Description	Cont. Fed?
0	25	BENTONITE	Y

Section 7: Well Test Data

Total Depth: 100
Static Water Level: 30
Water Temperature:

Air Test *

50 gpm with drill stem set at 95 feet for 1 hours.
Time of recovery 1 hours.
Recovery water level 30 feet.
Pumping water level _ feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source

Unassigned

From	To	Description
0	2	TOPSOIL
2	50	CLAY AND ROCKS
50	90	CLAY AND SHALE GRAVEL
90	100	BROKEN SHALE

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name: BRITT LINDSAY
Company: LINDSAY DRILLING CO
License No: WWC-570
Date Completed: 6/19/2023

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Go to GWIC website
Plot this site in State Library Digital Atlas
Plot this site in Google Maps
View scanned well log (12/7/2006 2:18:51 PM)

Site Name: HELDENSTAB SONNY
GWIC Id: 66386
DNRC Water Right: 9807

Section 1: Well Owner(s)

1) HELDENSTAB, SONNY (MAIL)
2980 HOWARD RD
HELENA MT 59601 [06/12/1976]

Section 2: Location

Township	Range	Section	Quarter Sections
12N	05W	16	NE¼ NW¼

County: LEWIS AND CLARK
Geocode:

Latitude	Longitude	Geomethod	Datum
46.804329	-112.246624	TRS-SEC	NAD83

Ground Surface Altitude: 4270
Ground Surface Method:
Datum:
Date:

Addition:
Block:
Lot:

Section 3: Proposed Use of Water

DOMESTIC (1)

Section 4: Type of Work

Drilling Method: CABLE
Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Saturday, June 12, 1976

Section 6: Well Construction Details

Borehole dimensions

From	To	Diameter
0	42	6

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
0	42	6			WELDED	STEEL

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
42	42	6			OPEN BOTTOM *

Annular Space (Seal/Grout/Packer)

From	To	Description	Cont. Fed?
0	20	CLAY	

Section 7: Well Test Data

Total Depth: 42
Static Water Level: 20
Water Temperature:

Bailer Test *

20 gpm with _ feet of drawdown after 2 hours.
Time of recovery _ hours.
Recovery water level _ feet.
Pumping water level 30 feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source

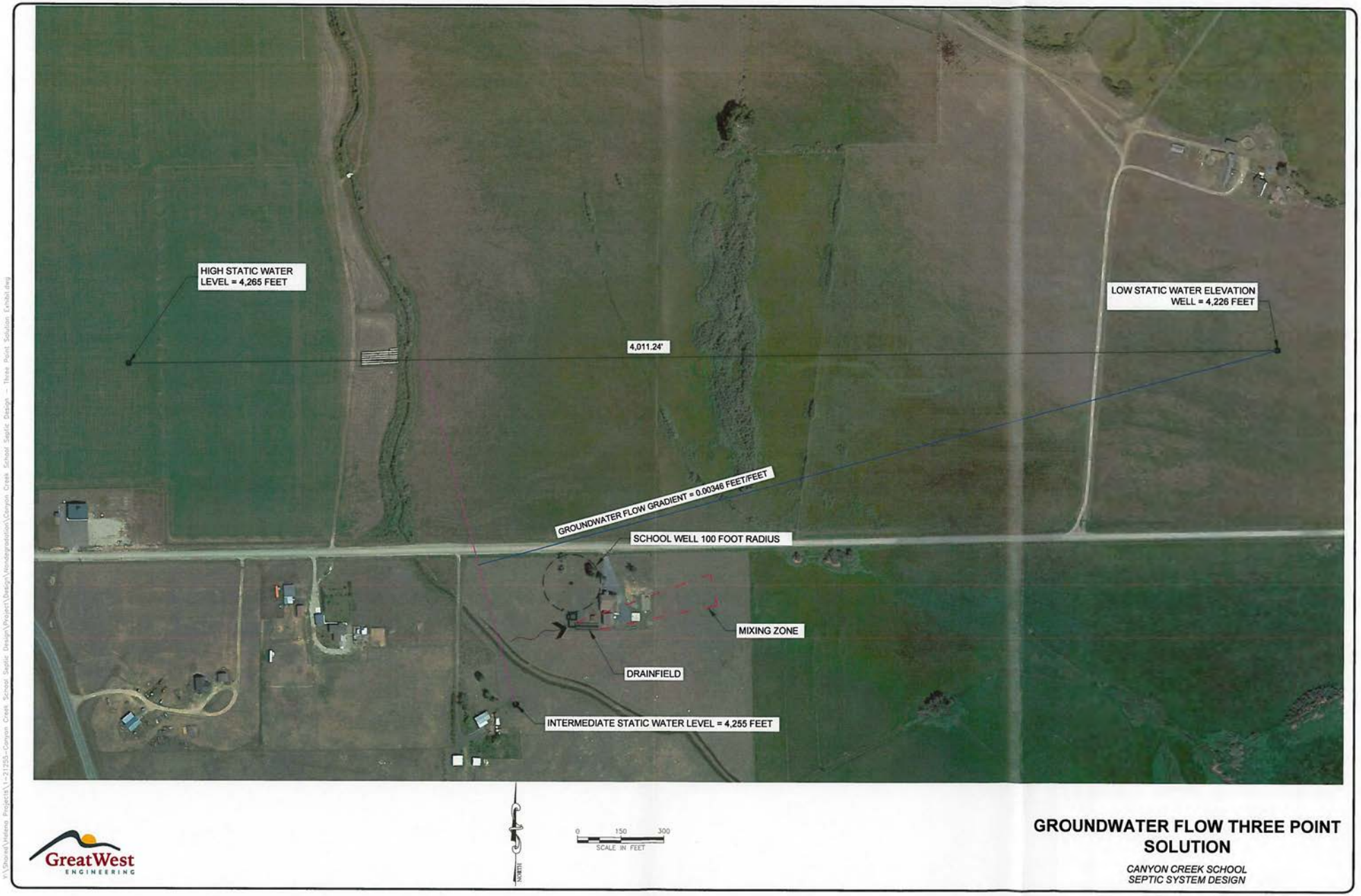
120SDMS - SEDIMENTS (TERTIARY)

From	To	Description
0	5	TOPSOIL
5	26	CLAY & GRAVEL
26	39	SAND
39	42	SAND & GRAVEL

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company: LINDSAY DRILLING CO INC
License No: WWC-38
Date Completed: 6/12/1976



GreatWest ENGINEERING

GROUNDWATER FLOW THREE POINT SOLUTION

CANYON CREEK SCHOOL
SEPTIC SYSTEM DESIGN

MONTANA WELL LOG REPORT

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Other Options

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Plot this site in State Library Digital Atlas
Plot this site in Google Maps
View scanned well log (12/7/2006 2:11:22 PM)

Site Name: SIEBEN RANCH CO
GWIC Id: 126703

Section 1: Well Owner(s)

1) SIEBEN RANCH CO (MAIL)
BOX 1683
HELENA MT 59624 [02/11/1992]

Section 2: Location

Township	Range	Section	Quarter Sections
12N	05W	9	SE¼ SE¼

County: LEWIS AND CLARK
Geocode:

Latitude	Longitude	Geomethod	Datum
46.807684	-112.236069	TRS-SEC	NAD83

Ground Surface Altitude: **Ground Surface Method:** **Datum:** **Date:**

Addition: **Block:** **Lot:**

Section 3: Proposed Use of Water

DOMESTIC (1)

Section 4: Type of Work

Drilling Method: AIR ROTARY
Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Tuesday, February 11, 1992

Section 6: Well Construction Details

Borehole dimensions

From	To	Diameter
0	80	6

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
-2	80	6				STEEL

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
80	80	6			OPEN BOTTOM *

Annular Space (Seal/Grout/Packer)

From	To	Description	Cont. Fed?
0	20	BENTONITE	

Section 7: Well Test Data

Total Depth: 80
Static Water Level: 15
Water Temperature:

Air Test *

20 gpm with drill stem set at _ feet for 2 hours.
Time of recovery _ hours.
Recovery water level _ feet.
Pumping water level 15 feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source
Unassigned

From	To	Description
0	4	TOPSOIL
4	30	CLAY AND GRAVEL
30	70	SAND AND CLAY
70	75	CLAY
75	80	GRAVEL

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name: TERRY LINDSAY
Company: LINDSAY DRILLING CO INC
License No: WWC-253
Date Completed: 2/11/1992

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Go to GWIC website
Plot this site in State Library Digital Atlas
Plot this site in Google Maps
View scanned well log (12/7/2006 2:11:39 PM)

Site Name: CANYON CREEK VOLUNTEER FIRE DISTRICT
GWIC Id: 198772

Section 1: Well Owner(s)

1) CANYON CREEK VOLUNTEER FIRE DISTRICT (MAIL)
PO BOX 464
CANYON CREEK MT 59633 [08/08/2002]

Section 2: Location

Township	Range	Section	Quarter Sections
12N	05W	9	SW¼ SW¼

County: LEWIS AND CLARK
Geocode:

Latitude	Longitude	Geomethod	Datum
46.807684	-112.251949	TRS-SEC	NAD83

Ground Surface Altitude:
Ground Surface Method:
Datum:
Date:

Addition:
Block:
Lot:

Section 3: Proposed Use of Water

DOMESTIC (1)

Section 4: Type of Work

Drilling Method: ROTARY
Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Thursday, August 8, 2002

Section 6: Well Construction Details

Borehole dimensions

From	To	Diameter
0	67	6

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
-2	67	6	0.25		WELDED	STEEL

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
67	67	6			OPEN BOTTOM

Annular Space (Seal/Grout/Packer)

From	To	Description	Cont. Fed?
0	0	BENTONITE	Y

Section 7: Well Test Data

Total Depth: 67
Static Water Level: 20
Water Temperature:

Air Test *

100 gpm with drill stem set at 67 feet for 1 hours.
Time of recovery 0.25 hours.
Recovery water level 20 feet.
Pumping water level _ feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source

Unassigned

From	To	Description
0	1	TOPSOIL
1	23	BROWN CLAY AND SHALEY GRAVEL
23	36	BROWN CLAY AND MED/BIG GRAVEL
36	67	SHALEY GRAVEL

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company: H & L DRILLING INC
License No: WWC-447
Date Completed: 8/8/2002

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Return to menu
Plot this site in State Library Digital Atlas
Plot this site in Google Maps

Site Name: TRINITY SCHOOL DISTRICT #4
GWIC Id: 327010

Section 1: Well Owner(s)

1) TRINITY SCHOOL DISTRICT #4 (WELL)
7435 DUFFY LANE
CANYON CREEK MONTANA 59633 [06/19/2023]

Section 2: Location

Township	Range	Section	Quarter Sections
12N	05W	16	SW¼ NE¼

County	Geocode
LEWIS AND CLARK	

Latitude	Longitude	Geomethod	Datum
46.800278	-112.2425	MAP	WGS84

Ground Surface Altitude	Ground Surface Method	Datum	Date

Addition	Block	Lot

Section 3: Proposed Use of Water

PUBLIC WATER SUPPLY (1)

Section 4: Type of Work

Drilling Method: ROTARY
Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Monday, June 19, 2023

Section 6: Well Construction Details

Borehole dimensions

From	To	Diameter
0	25	11
25	100	6

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
-2	100	6	0.25		WELDED	A53B STEEL

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
60	90	6	200	5/16"	HOLTE PERFORATOR SLOTS

Annular Space (Seal/Grout/Packer)

From	To	Description	Cont. Fed?
0	25	BENTONITE	Y

Section 7: Well Test Data

Total Depth: 100
Static Water Level: 30
Water Temperature:

Air Test *

50 gpm with drill stem set at 95 feet for 1 hours.
Time of recovery 1 hours.
Recovery water level 30 feet.
Pumping water level _ feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source

Unassigned

From	To	Description
0	2	TOPSOIL
2	50	CLAY AND ROCKS
50	90	CLAY AND SHALE GRAVEL
90	100	BROKEN SHALE

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name: BRITT LINDSAY
Company: LINDSAY DRILLING CO
License No: WWC-570
Date Completed: 6/19/2023

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Go to GWIC website
Plot this site in State Library Digital Atlas
Plot this site in Google Maps
View scanned well log (12/7/2006 2:18:51 PM)

Site Name: HELDENSTAB SONNY
GWIC Id: 66386
DNRC Water Right: 9807

Section 1: Well Owner(s)

1) HELDENSTAB, SONNY (MAIL)
2980 HOWARD RD
HELENA MT 59601 [06/12/1976]

Section 2: Location

Township	Range	Section	Quarter Sections
12N	05W	16	NE¼ NW¼

County: LEWIS AND CLARK
Geocode:

Latitude	Longitude	Geomethod	Datum
46.804329	-112.246624	TRS-SEC	NAD83

Ground Surface Altitude	Ground Surface Method	Datum	Date
4270			

Addition: **Block:** **Lot:**

Section 3: Proposed Use of Water

DOMESTIC (1)

Section 4: Type of Work

Drilling Method: CABLE
Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Saturday, June 12, 1976

Section 6: Well Construction Details

Borehole dimensions

From	To	Diameter
0	42	6

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
0	42	6			WELDED	STEEL

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
42	42	6			OPEN BOTTOM *

Annular Space (Seal/Grout/Packer)

From	To	Description	Cont. Fed?
0	20	CLAY	

Section 7: Well Test Data

Total Depth: 42
Static Water Level: 20
Water Temperature:

Bailer Test *

20 gpm with _ feet of drawdown after 2 hours.
Time of recovery _ hours.
Recovery water level _ feet.
Pumping water level 30 feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source

120SDMS - SEDIMENTS (TERTIARY)

From	To	Description
0	5	TOPSOIL
5	26	CLAY & GRAVEL
26	39	SAND
39	42	SAND & GRAVEL

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company: LINDSAY DRILLING CO INC
License No: WWC-38
Date Completed: 6/12/1976

Pathogen Transport Model

	Input Parameters	units			converted	
K	hydraulic conductivity	ft/day	158.09			from non-deg analysis
i	groundwater gradient	ft/ft	0.0035			triangulated or published data
b	aquifer saturated thickness	ft	10			from drinking water well log
d	depth to groundwater	feet	4	cm	121.92	depth of soil test pit less trench depth
dw	distance to drinking water well	ft	200			from lot layout - drainfield to well isolation zone
Q	drinking water well pumping rate	gpd	18,000	ft3/day	2406.095	
p	annual precipitation	in/year	10.9	cm/year	27.686	NOAA (https://www.ncdc.noaa.gov/cdo-
e	effluent application rate	gpd/sf	0.4	cm/year	594.8	from test pits
	soil type		sandy clay loam			from test pits
n	effective soil porosity	%	0.33			** see soil properties sheet below
0.045	volumetric soil moisture content	mL/cm3	0.244			** see soil properties sheet below
	virulo soil type		sandy clay loam			from test pits
	soil depth	m	1.2192			depth from bottom of infiltrative surface to either limiting layer or
	virulo virus		Hep A			must run all virus to see the worst case for the soil type
	number of runs		5			minimum of 5 runs/ worst case virus
	highest # of exceedances		22			highest value
	log equivalent		4.657577319			

Horizontal travel time	1.264256	logs
Vertical travel time - Wyoming	0.697731	logs
Total	**1.961987**	**logs**

Results with Virulo:

Horizontal travel time	1.264256	logs
Vertical travel time - virulo	4.657577	
Total	**5.921833**	**logs**

	Well	Topographic Elevation (ft)		Depth to Static Water (ft bgs)		Static Water Elevation (ft)	Wells		Horizontal Distance (ft)
Low Static Water Elevation	1 (Sieben)	4241	-	15	=	4226	1 to 2	=	4011.24
High Static Water Elevation	2 (Canyon Creek Fire)	4285	-	20	=	4265	2 to 3	=	
Intermediate Static Water Elevation	3 (Heldenstab)	4275	-	20	=	4255	3 to 1	=	

1

(a)	HSWE	minus	LSWE	=		39	ft
(b)	HD between HSWE well and LSWE well divided by (a) = (b)					102.85	ft/ft
(c)	HSWE	minus	ISWE	=		10	ft
(d)	(b)	X	(c)	=	(d)	1028.52	ft
(e)	From Autocadd					2889.72	ft
Hydraulic Gradient = (c) divided by (e)						0.0034605	

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Go to GWIC website
Plot this site in State Library Digital Atlas
Plot this site in Google Maps
View scanned well log (12/7/2006 2:20:47 PM)

Site Name: LUNDBERG MICHAEL
GWIC Id: 129433

Section 1: Well Owner(s)

1) LUNDBERG, MICHAEL (MAIL)
BOX 475
CANYON CREEK MT 59633 [08/13/1992]

Section 2: Location

Township	Range	Section	Quarter Sections
12N	05W	16	NW¼ NW¼ NW¼

County: LEWIS AND CLARK
Geocode:

Latitude	Longitude	Geomethod	Datum
46.805273	-112.253155	TRS-SEC	NAD83

Ground Surface Altitude: Ground Surface Method: Datum: Date:

Addition: Block: Lot:

Section 3: Proposed Use of Water

DOMESTIC (1)

Section 4: Type of Work

Drilling Method: UNKNOWN
Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Thursday, August 13, 1992

Section 6: Well Construction Details

Borehole dimensions

From	To	Diameter
0	60	6

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
-2	58	6			WELDED	STEEL

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
58	60	6			OPEN BOTTOM

Annular Space (Seal/Grout/Packer)

There are no annular space records assigned to this well.

Section 7: Well Test Data

Total Depth: 60
Static Water Level: 25
Water Temperature:

Air Test *

20 gpm with drill stem set at _ feet for 2 hours.
Time of recovery 2 hours.
Recovery water level 25 feet.
Pumping water level 48 feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source

Unassigned

From	To	Description
0	1	TOPSOIL
1	60	SAND AND GRAVEL

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company: BRAZILL DRILLING
License No: WWC-355
Date Completed: 8/13/1992

State of Montana
Department of Health and Human Services
Environmental Laboratory
1400 Broadway, Room B 206 Helena, MT 59620
phone: 406-444-3444 fax: 406-444-5527

RESULTS OF CHEMICAL ANALYSIS

Billing ID: G0020733

Canyon Creek School
PO Box 523
Canyon Creek, MT 59633

Lab #: 2110011-01
Sample ID: CC School Nitrate

Account ID #:	G0020733
Collected:	10/01/2021
Time:	10:15
By:	Lisa Quisenberry
Received Date:	10/01/2021
Sample Type:	
Matrix:	Water
Report Date:	10/20/2021
Print Date:	10/20/2021

TEST	FLAG	RESULT	UNITS	**EPA Drinking Water Limit	ANALYSIS DATE	METHOD
Anions						
Nitrate plus Nitrite as N		0.555	mg/L	10	10/13/2021	353.2

Reviewed By: _____

Comments:

Flags:
< = less than
> = greater than
H = above EPA limit for drinking water
* = holding time exceeded
** Not all parameters have EPA Drinking Water Limits

Qualifiers: No Qualifiers were applied to the sample results.

State of Montana
Department of Health and Human Services
Environmental Laboratory
1400 Broadway, Room B 206 Helena, MT 59620
phone: 406-444-3444 fax: 406-444-5527

RESULTS OF CHEMICAL ANALYSIS

The results of our analysis are recorded on the attached sheet; most results are reported in milligrams per liter (mg/L), which is equivalent to parts per million (parts of material per million parts of water). Parts per million may be converted to grains per gallon by dividing by 17.1.

Alkalinity - The alkalinity of water is a measure of its capacity to neutralize acids and is due primarily to the presence of carbonates and bicarbonates. The acceptable alkalinity for municipal water supplies is generally between 30 and 500 mg/L as CaCO3, but there are many water supplies above and below these limitations. Waters with alkalinity greater than 500 mg/L as CaCO3 may have objectionable tastes.

Arsenic - Arsenic occurs naturally in rock and soil. Arsenic in water is frequently found near mining areas and hot springs. Normal weathering or exposure to acid mine drainage can cause arsenic to be deposited in water. Arsenic is also used in manufacturing, refineries, wood preservatives, animal feed additives and herbicides. Some people who drink water containing arsenic in excess of the recommended limit over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer. The EPA has set a limit of 0.010 mg/L in public water supplies.

Calcium - Calcium in water is the major cause of calcium water hardness and is usually in the range of 5 - 500 mg/l, as CaCO3 . Calcium is also the fifth most abundant dissolved ion in water. It is essential for living organisms <http://en.wikipedia.org/wiki/Organism>, particularly in cell <http://en.wikipedia.org/wiki/Cell_(biology)> physiology <http://en.wikipedia.org/wiki/Physiology>. As a major material used in mineralization of bones and shells, calcium is the most abundant metal <http://en.wikipedia.org/wiki/Metal> by mass in many animals <http://en.wikipedia.org/wiki/Animal>. Calcium in water, as with all water hardness, can be removed with a simple sodium form cation exchanger (water softener <http://www.freshwatersystems.com/s-219-water-softening-cartridges.aspx>). Reverse Osmosis Water System <http://www.freshwatersystems.com/c-137-reverse-osmosis-systems.aspx> will remove 95 - 98 % of the calcium in the water.

Chloride - Chloride salts in excess of 100 mg/L may give a salty taste to water, Chloride may increase the corrosive activity of water when combined with calcium and magnesium. EPA recommends that the chloride content should not exceed 250 mg/L.

Copper - Copper is a metal found in natural ore deposits. It is an essential nutrient, required by the body in very small amounts.. It is widely used in household plumbing materials. Corrosion of household plumbing systems, erosion of natural deposits, and leaching from wood preservatives are ways copper may enter drinking water. The EPA has found that copper may cause stomach and intestinal distress in sensitive individuals when they are exposed to levels above the Action Level* (1.3 mg/L) for relatively short periods of time. Some who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor. It is always a good idea to let a faucet run for a minute or two before drawing water for drinking or cooking. EPA's action level for copper is 1.3 mg/L.

E. Coli is a coliform bacterium of fecal origin whose presence indicates that the water may be contaminated with human or animal wastes. These wastes may come from septic systems, sewage plants, feedlots and pastures, or from wildlife, domesticated animals and pets. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, and people with severely compromised immune systems.

Fluoride - Fluoride is found in combined form in numerous rock types in nature. Fluoride may enter drinking water through erosion of natural deposits, as a water additive which promotes strong teeth, and through discharge from fertilizer and aluminum factories. A fluoride concentration between 0.7 to 1.5 mg/L is effective in the prevention of dental caries. Fluoride concentrations greater than 2.0 mg/L may produce fluorosis (mottling of the teeth) in children under the age of nine. Drinking levels of fluoride in excess of the EPA's drinking water limit may lead to fluorosis and bone damage, including pain and tenderness of the bones. EPA has set a drinking water limit for fluoride at 4 mg/L.

Hardness - In most water nearly all of the hardness is due to calcium and magnesium. Calcium and magnesium, which are naturally occurring in rock and soil, react with soap to form precipitates which increase soap consumption, and react with certain constituents to form scale. As a general rule, a value of below 60 mg/L is considered soft; from 60 to 120 mg/L is considered moderately hard; from 120 to 180 mg/L is considered hard; and values above 180 mg/L are considered very hard.

Iron - More than about 0.3 mg/L of iron may stains laundry and utensils reddish brown. Larger quantities cause unpleasant taste and odor, and may encourage growth of iron bacteria, which may produce a "rotten egg" or sulfur odor. Excessive iron may also interfere with the efficient operation of exchange-silicate water softeners. EPA recommends iron levels in water be below 0.3 mg/L, for aesthetic purposes.

Lead - Lead is a naturally occurring element that is found is small amounts in the earth's crust. Most contamination from lead is caused by human activities. Lead may be released into the environment through discharges from factories or smelters, or leaching by acid mine drainage. Drinking water may leach lead from soldered joints or old lead pipes. Infants and young children are typically more vulnerable to lead in drinking water than the general population. Lead in drinking water is rarely the sole cause of lead poisoning, but it can add to a person's total lead exposure. Infants and children who drink water containing lead in excess of the Action Level* could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure. It is always a good idea to let a faucet run for a minute or two before drawing water for drinking or cooking. The EPA has set an action level of 0.015 mg/L lead in public water supplies.

Magnesium - Magnesium is the 11th most abundant element by mass in the human body <http://en.wikipedia.org/wiki/Human_body>; its ions are essential to all living cells <http://en.wikipedia.org/wiki/Cell_(biology)>. Magnesium salts are frequently included in various foods <http://en.wikipedia.org/wiki/Food>, fertilizers <http://en.wikipedia.org/wiki/Fertilizer> and culture media <http://en.wikipedia.org/wiki/Culture_medium>. It is present in seawater in amounts of about 1300 ppm. Drinking water usually contains between 1 and 5 mg of magnesium per liter. Magnesium and other alkali earth metals such as calcium are responsible for water hardness.

Manganese - Manganese is a naturally occurring substance found in rocks, soil, and food. It is an essential nutrient usually supplied by foods. Manganese is often found in drinking water, where it may be considered an undesirable impurity in high levels due to its tendency to form black oxide stains. The EPA has not set a specific drinking water limit, but the recommended limit is 0.05 mg/L to prevent staining of clothes or plumbing fixtures.

ment. It is a constituent of plant material, where it is found in varying levels dependent on the type of plant. Foods such as lettuce, celery, beets and spinach may contain elevated levels of nitrate, but when nitrate-containing foods are eaten as part of a balanced diet, nitrate exposure is not thought to be harmful. Elevated levels of nitrate in drinking water (above 10 milligrams per liter) may cause a condition called methemoglobinemia, or "blue baby syndrome", in infants under 6 months of age. Nitrate is converted to nitrite in the digestive system of infants; nitrite then interferes with the oxygen-carrying ability of the blood, causing lack of oxygen to the brain and other organs. Infants suffering from "blue baby syndrome" need immediate medical care. Adults are normally not affected by nitrate at this level. Nitrate contamination may come from erosion of natural deposits, from dead and decaying plant material, runoff from fertilizer use, leaching from septic tanks or sewage systems and from runoff of animal wastes from feedlots, corrals and barns. EPA has set a limit for nitrate in public drinking water systems at 10 mg/L.

pH - The pH of a sample is an indication of how acidic or basic the water is. On a scale of 1 to 14, with 1 being highly acidic and 14 being highly basic, lemon juice may have a pH of around 2, while household bleach may have a pH of 12.5. A pH of 7 units is considered neutral. Highly acidic water may promote the leaching of metals from plumbing pipes. The US EPA recommends drinking water have a pH between 6.5 to 8.5 units.

Sodium - Sodium is a naturally occurring element usually found in the environment that combines with other compounds (such as chloride or bicarbonate) to form salts. Sodium is an essential nutrient in human physiology, and is normally supplied by food. Sodium content may be of interest to persons on sodium restricted diets. Sodium restricted diets are essential in treating congestive cardiac failure, hypertension, renal disease, cirrhosis of the liver, toxemias of pregnancy, and Meniere=s disease. If you feel this may be applicable to you or members of your household, it is recommended that your physicians be informed of the sodium content. EPA has set no drinking water limit for sodium.

Specific Conductance - Specific Conductivity, measured in micro mhos per centimeter (umho/cm), is a measure of the ability of water to conduct an electrical current; it is also referred to as the salinity, salt content, the total mineral content or "alkali" content. It is dependent on the amount of dissolved minerals (such as salt) in the water. Generally, the more dissolved material in the water, the more electrical current that can be transmitted. A large amount of dissolved material in water may adversely affect its quality. Distilled water has a very low conductivity of around 2 umho, while sea water or saline seep water has a high conductivity of 10,000-20,000 umho/cm. Some typical dissolved materials are sodium, magnesium, calcium, iron, chloride, nitrate, sulfate and phosphate. Dissolved minerals may come from rocks and soil as water runs through and across it. Due to the many different constituents that make up the total mineral content, it is difficult to set a standard for human consumption. Drinking waters up to 400 umhos/cm are considered excellent, while water with conductivity above 8500 umhos/cm may have an objectionable taste. Conductivity may be converted to Total Dissolved Solids (TDS) by the following formula: TDS = (SPC) * (0.55 to 0.7)

Sulfate - Sulfate is a substance that occurs naturally in drinking water. Sulfate in water containing calcium forms hard scale in steam boilers. High concentrations of sulfate in combination with other constituents give a bitter taste to water. Concentrations above 250 mg/L may have a laxative effect for those not used to drinking the water, but 500 mg/L is considered safe for human consumption. Domestic water in Montana containing as much as 1,000 mg/L sulfate is used for drinking in the absence of a less mineralized water supply. EPA recommends sulfate be below 250 mg/L, based on aesthetic effects (i.e., taste and odor).

Total Coliform Bacteria - Total Coliforms are a large group of usually harmless bacteria that are naturally present in soil and vegetation , and also in the intestinal tract of warm-blooded animals. Although total coliforms normally do not produce illness, their presence in drinking water is used as an indicator that other, potentially harmful bacteria from the intestinal tract of animals may be present. Since total coliforms and fecal coliforms often coexist, the presence of total coliform in drinking water is a warning to check for possible sources of contamination.

Uranium - Uranium is a naturally-occurring radioactive element. Uranium is commonly found in very small amounts in rocks, soil, water, plants, and animals (including humans). Uranium is weakly radioactive and contributes to low levels of natural background radiation in the environment. EPA has set a limit of 0.03 mg/l. More information can be found at http://www.epa.gov/rpdweb00/radionuclides/uranium.html

Zinc - Zinc is one of the most common elements in the earth's crust. It is found in air, soil, and water, and is present in foods. It has many commercial uses as coatings to prevent rust, in dry cell batteries, and mixed with other metals to make alloys like brass and bronze. A zinc and copper alloy is used to make pennies in the United States. Zinc combines with other elements to form zinc compounds which are widely used in industry to make paint, rubber, dye, wood preservatives, and ointments. EPA does not regulate zinc in drinking water, but recommends that there be no more than 5 parts per million (5 ppm) of zinc drinking water because of taste.

All sources of drinking water are subject to potential contamination by constituents that are naturally occurring or are man made. Those constituents can be microbes, organic or inorganic chemicals, or radioactive materials. All drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the **Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791**, or by contacting your local County Health Department, County Sanitarian, County Extension Agent or the DPHHS Environmental Laboratory. Please call the DPHHS Environmental Laboratory at (406) 444-2642 for questions about your results or for additional testing.

State of Montana
Department of Health and Human Services
Environmental Laboratory
1400 Broadway, Room B 206 Helena, MT 59620
phone: 406-444-3444 fax: 406-444-5527

RESULTS OF CHEMICAL ANALYSIS

46°48'27.7"N 112°14'09.9"W

Imagery ©2021 Maxar Technologies, USDA Farm Service Agency, Map data ©2021 200 ft

46°48'27.7"N 112°14'09.9"W

46.807684, -112.236069

Directions | Save | Nearby | Send to your phone | Share

Trinity Elementary, MT

RQ57+3H Canyon Creek, Montana

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Return to menu
Plot this site in State Library Digital Atlas
Plot this site in Google Maps
View scanned well log (12/7/2006 2:11:22 PM)

Site Name: SIEBEN RANCH CO
GWIC Id: 126703

Section 1: Well Owner(s)

1) SIEBEN RANCH CO (MAIL)
BOX 1683
HELENA MT 59624 [02/11/1992]

Section 2: Location

Township	Range	Section	Quarter Sections
12N	05W	9	SE¼ SE¼

County: LEWIS AND CLARK
Geocode:

Latitude	Longitude	Geomethod	Datum
46.807684	-112.236069	TRS-SEC	NAD83

Ground Surface Altitude:
Ground Surface Method:
Datum:
Date:

Addition:
Block:
Lot:

Section 3: Proposed Use of Water

DOMESTIC (1)

Section 4: Type of Work

Drilling Method: AIR ROTARY
Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Tuesday, February 11, 1992

Section 6: Well Construction Details

Borehole dimensions

From	To	Diameter
0	80	6

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
-2	80	6				STEEL

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
80	80	6			OPEN BOTTOM *

Annular Space (Seal/Grout/Packer)

Section 7: Well Test Data

Total Depth: 80
Static Water Level: 15
Water Temperature:

Air Test *

20 gpm with drill stem set at _ feet for 2 hours.
Time of recovery _ hours.
Recovery water level _ feet.
Pumping water level 15 feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source
Unassigned

From	To	Description
0	4	TOPSOIL
4	30	CLAY AND GRAVEL
30	70	SAND AND CLAY
70	75	CLAY
75	80	GRAVEL

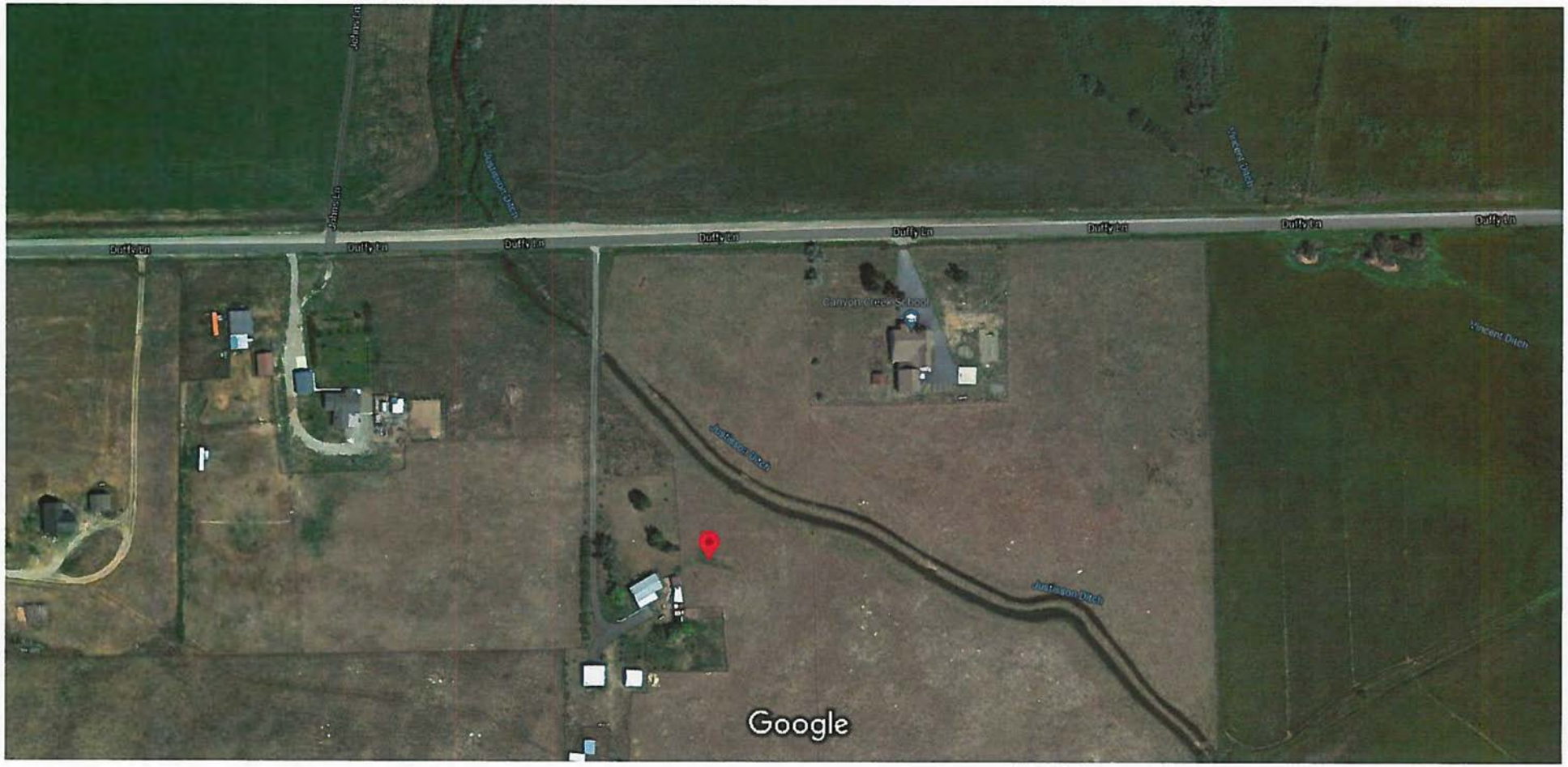
Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

From	To	Description	Cont. Fed?
0	20	BENTONITE	

Name: TERRY LINDSAY
Company: LINDSAY DRILLING CO INC
License No: WWC-253
Date Completed: 2/11/1992

46°48'15.6"N 112°14'47.9"W



Imagery ©2021 Maxar Technologies, Map data ©2021 100 ft

46°48'15.6"N 112°14'47.9"W

46.804329, -112.246624

Directions | Save | Nearby | Send to your phone | Share

Trinity Elementary, MT

RQ33+P9 Canyon Creek, Montana

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Return to menu
Plot this site in State Library Digital Atlas
Plot this site in Google Maps
View scanned well log (12/7/2006 2:18:51 PM)

Site Name: HELDENSTAB SONNY
GWIC Id: 66386
DNRC Water Right: 9807

Section 1: Well Owner(s)

1) HELDENSTAB, SONNY (MAIL)
2980 HOWARD RD
HELENA MT 59601 [06/12/1976]

Section 2: Location

Township	Range	Section	Quarter Sections
12N	05W	16	NE¼ NW¼

County / **Geocode**: LEWIS AND CLARK

Latitude	Longitude	Geomethod	Datum
46.804329	-112.246624	TRS-SEC	NAD83

Ground Surface Altitude	Ground Surface Method	Datum	Date
4270			

Addition / **Block** / **Lot**

Section 3: Proposed Use of Water

DOMESTIC (1)

Section 4: Type of Work

Drilling Method: CABLE
Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Saturday, June 12, 1976

Section 6: Well Construction Details

Borehole dimensions

From	To	Diameter
0	42	6

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
0	42	6			WELDED	STEEL

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
42	42	6			OPEN BOTTOM *

Section 7: Well Test Data

Total Depth: 42
Static Water Level: 20
Water Temperature:

Bailer Test *

20 gpm with _ feet of drawdown after 2 hours.
Time of recovery _ hours.
Recovery water level _ feet.
Pumping water level 30 feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source

120SDMS - SEDIMENTS (TERTIARY)

From	To	Description
0	5	TOPSOIL
5	26	CLAY & GRAVEL
26	39	SAND
39	42	SAND & GRAVEL

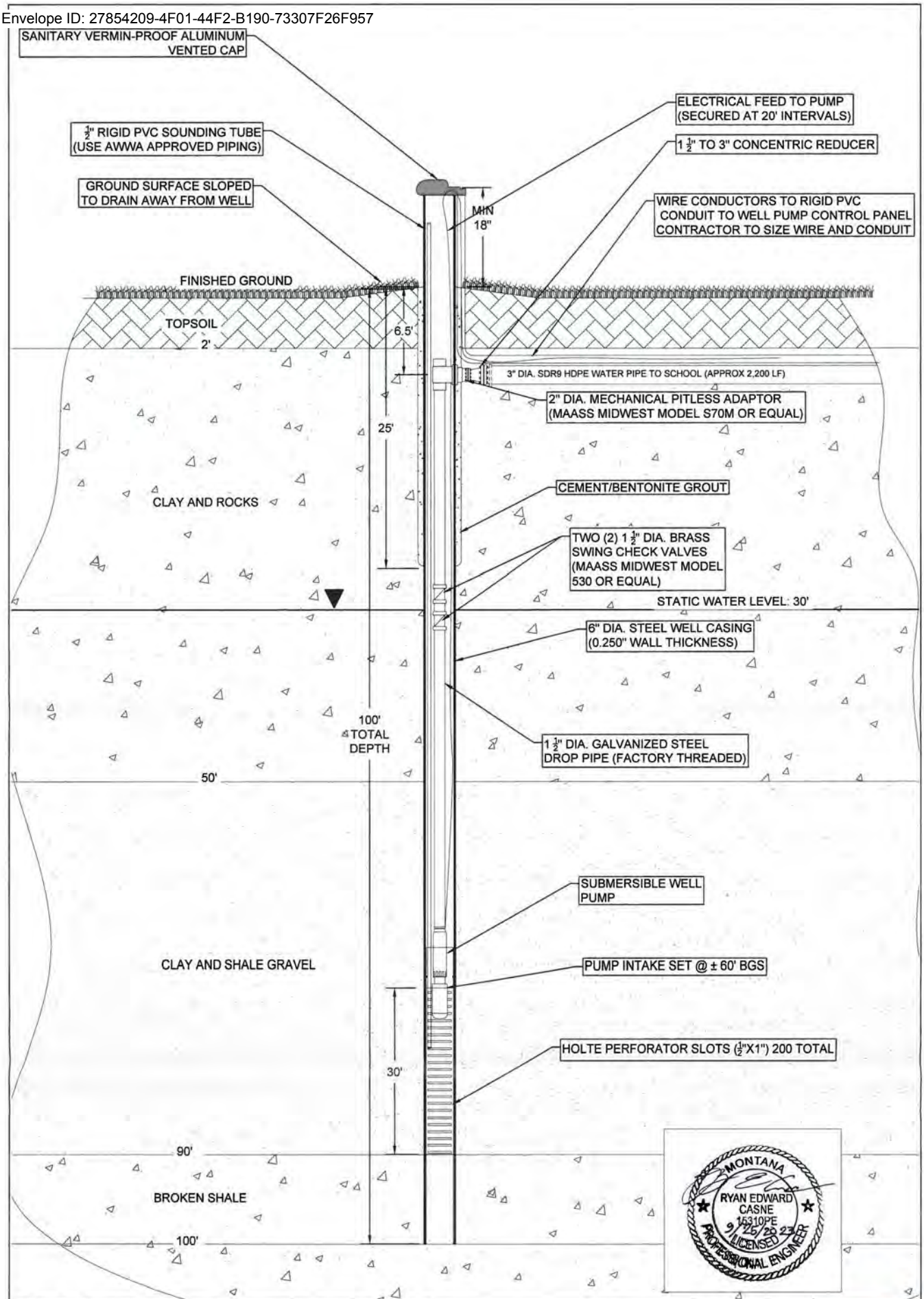
Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Annular Space (Seal/Grout/Packer)

From	To	Description	Cont. Fed?
0	20	CLAY	

Name:
Company: LINDSAY DRILLING CO INC
License No: WWC-38
Date Completed: 6/12/1976



Scale: As-Shown	Sheet: WELL 1	Date: 9/25/2023	Project: CANYON CREEK SCHOOL S16, T12N, R05W, LEWIS & CLARK COUNTY, MONTANA	Sheet Title: NTNC PWS SUPPLY WELL (GWIC # 327010)

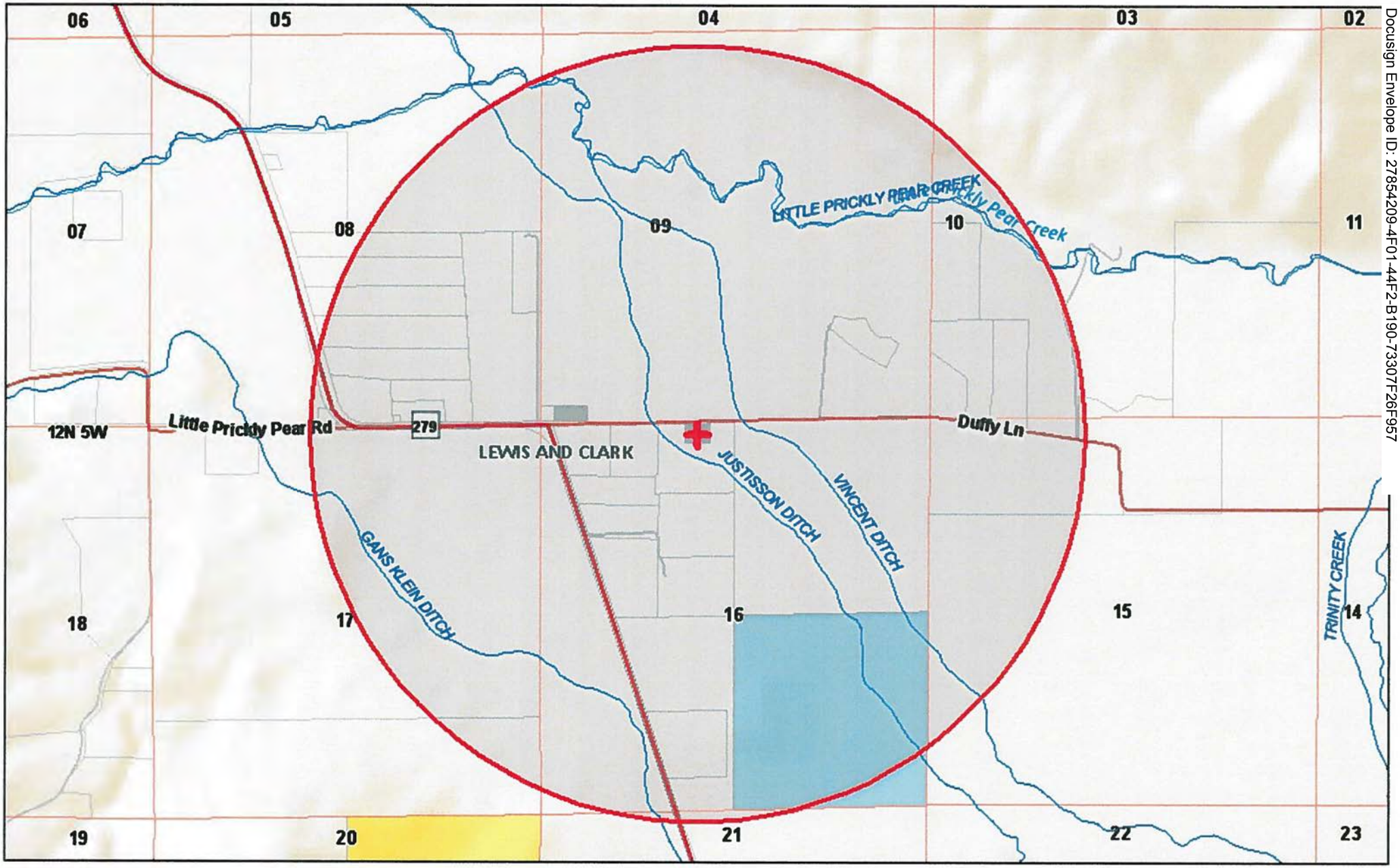
Casne & Associates, Inc.
PO Box 1123
Helena, Montana 59624
(406) 443-1656
ryan@casneinc.com

CASNE ASSOCIATES INCORPORATED
Water, Wastewater, Subdivision Design and Environmental Solutions

P:\2023 Projects\Canyon Creek School\CAD\WORKING DRAWINGS\WELL.dwg | 9/25/2023 1:52 PM

5

SURFACE WATER



Lakes24K_NamedOnly

Streams24K_NamedOnly

Map created using the Digital Atlas March 14, 2024
http://msl.mt.gov/GIS/Atlas

Montana State Libary - Digital Library
(406) 444-5354 | geoinfo@mt.gov | http://msl.mt.gov

6

FLOOD

National Flood Hazard Layer FIRMette

FEMA

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represen an authoritative property location.

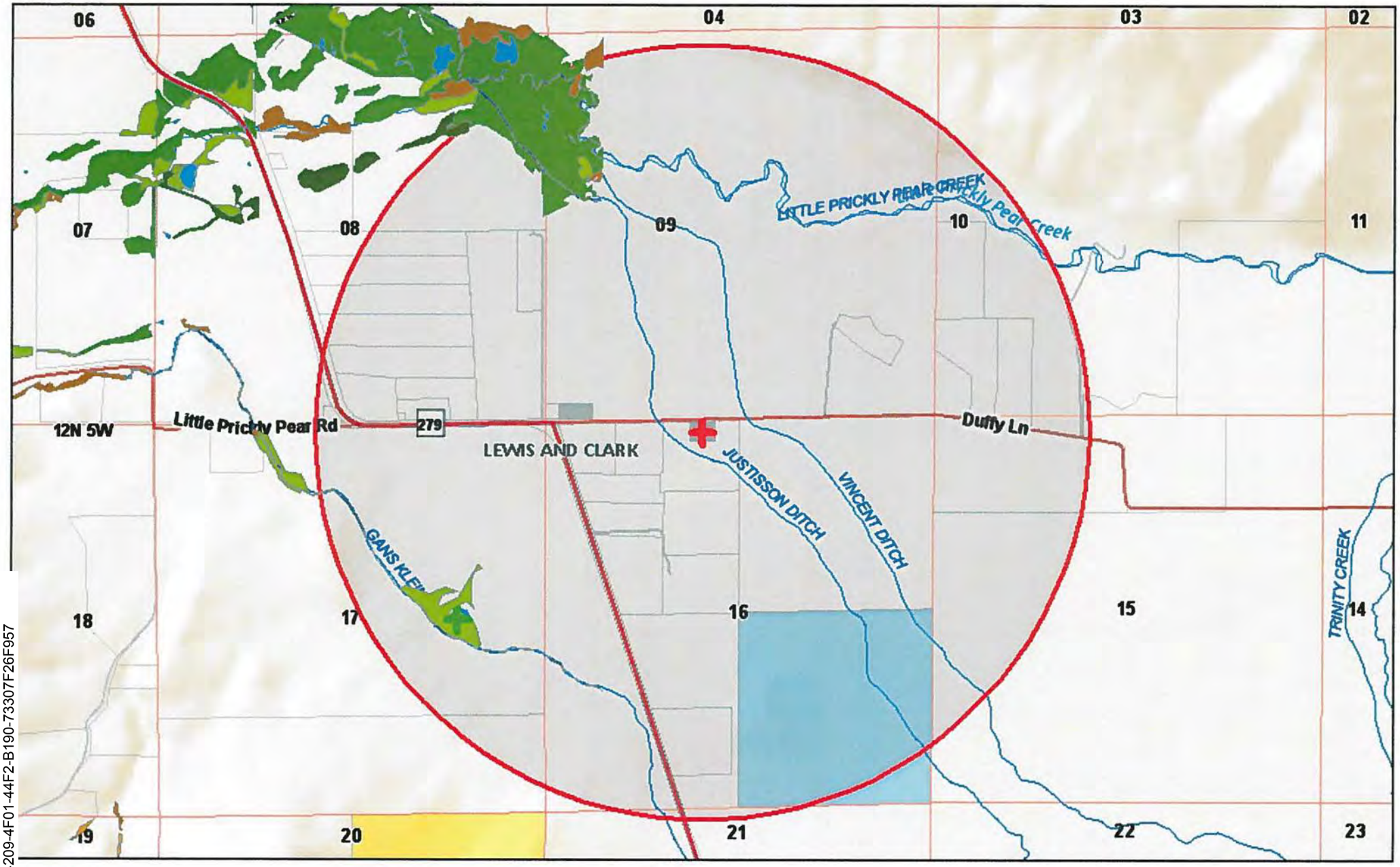
This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/14/2024 at 1:36 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

7

WETLANDS



WETLANDS

- River
- Freshwater Pond
- Freshwater Emergent Wetland
- Freshwater Scrub-Shrub Wetland
- Freshwater Forested Wetland
- Riparian Scrub-Shrub
- Riparian Forested
- Lakes24K_NamedOnly
- Streams24K_NamedOnly

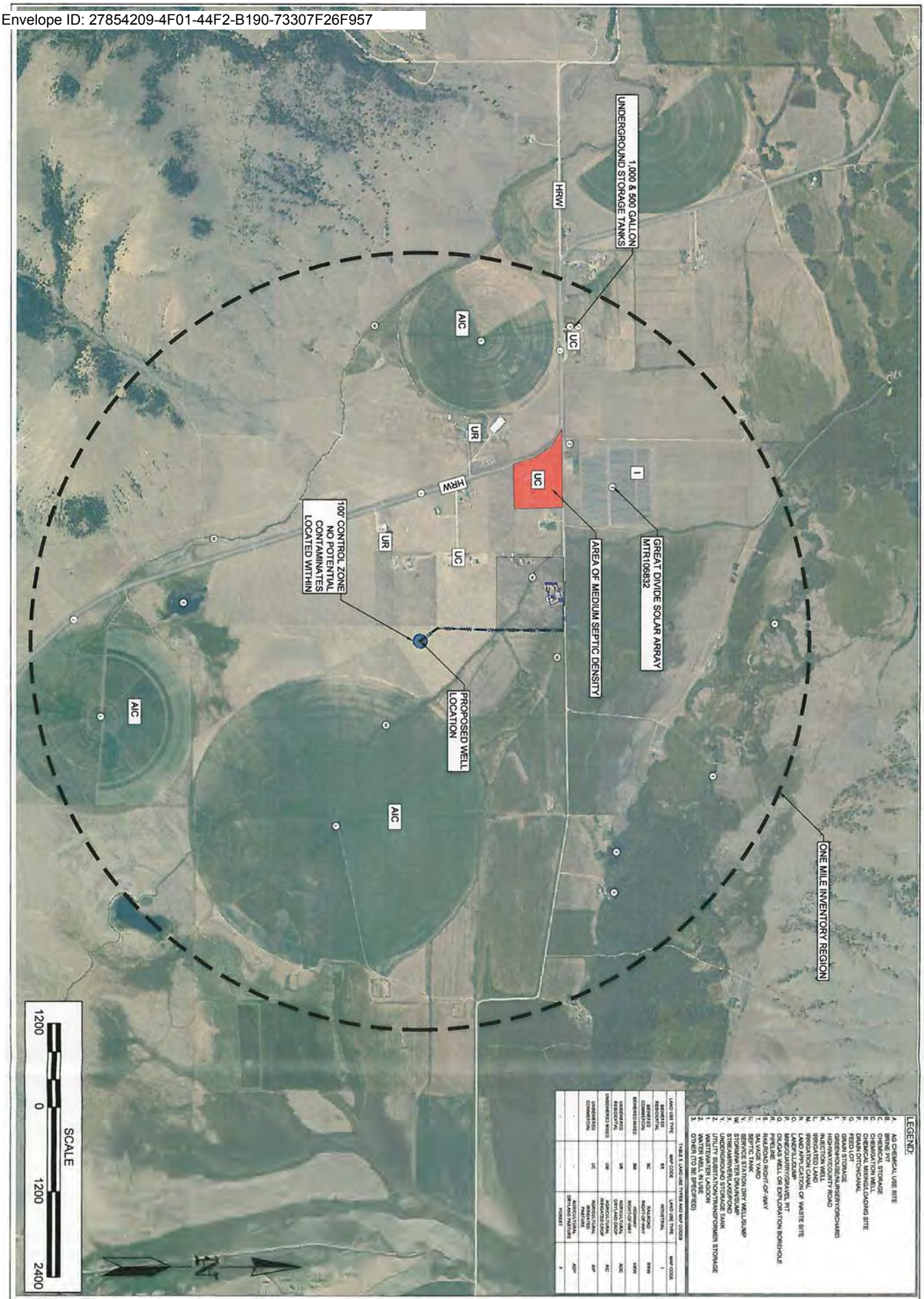
Map created using the Digital Atlas March 14, 2024
http://msl.mt.gov/GIS/Atlas

Montana State Libary - Digital Library
(406) 444-5354 | geoinfo@mt.gov | http://msl.mt.gov

Mor

8

AGRICULTURE



Project:
CANYON CREEK SCHOOL
S16, T12N, R05W,
LEWIS & CLARK COUNTY, MONTANA

Sheet Title:
PWS 6 INVENTORY REGION

Date: 9/25/2023
Sheet: SHEET 1 OF 1
Scale: As-Shown

Casne & Associates, Inc.
PO Box 1123
Helena, Montana 59624
(406) 443-1656
ryan@casneinc.com

CASNE ASSOCIATES INCORPORATED
Water Wastewater Subdivision Design and Environmental Solutions

P:\2023 Projects\Canyon Creek School\CAD\WORKING DRAWINGS\WORKING DRAWING.dwg | 9/25/2023 1:51 PM

9

SPECIES OF CONCERN

MONTANA STATE LIBRARY
NATURAL HERITAGE PROGRAM

PO Box 201800 • 1201 11th Avenue • Helena, MT 59620-1800 • fax 406.444.0266 • tel 406.444.5363 • https://mtnhp.org

March 14, 2024

Steve Kotson
Casne & Associates
664 Logan
Helena, MT 59601

Greetings Steve Kotson,

Thank you for your request for Natural Heritage information for the Canyon Creek School Area, at 7435 DUFFY LANE CANYON CREEK, MT 59633 S16,T12N,R05W. Included with this letter is an Environmental Summary report PDF and a companion Excel workbook summarizing information managed in the Montana Natural Heritage Program's (MTNHP) databases for: (1) species occurrences; (2) other observed species without Species Occurrences; (3) other species potentially present based on their range, presence of associated habitats, or predictive distribution model output if available; (4) structured surveys (organized efforts following a protocol capable of detecting one or more species); (5) land cover mapped as ecological systems; (6) wetland and riparian mapping; (7) land management categories; and (8) biological reports associated with plant and animal observations. The PDF report contains introductory materials and limitations associated with the use of each of these data types, a list of additional information resources, data use terms and conditions, and suggested contacts. The Excel workbook contains worksheets for each data type that can be easily sorted to summarize particular information needs. In addition to these materials, we have included a compilation of one page snapshots containing general description, habitat, spatial and temporal distribution, and conservation status information for each species listed in the species occurrence, other observed species, and other potential species sections of the Environmental Summary report. These three field guide compilations are excerpted from the full accounts found on the Montana Field Guide https://fieldguide.mt.gov for general reference use and, if desired, as appendices to environmental review documents.

Please keep in mind the following when using and interpreting the enclosed information:

(1) This information is intended for distribution or use only within your department, agency, or business. Please see the Data Use Terms and Conditions in the Environmental Summary report PDF for additional guidelines.

(2) Our minimum search area for standard information requests consists of the requested area buffered by an additional mile in order to capture records that may be immediately adjacent to the requested area. Please let us know if a buffer greater than 1 mile would be of use to your efforts.

(3) Additional information on animal, plant, and lichen species and ecological systems in Montana is available on the Montana Field Guide at https://fieldguide.mt.gov/

(4) In addition to the information you receive from us, we encourage you to contact state, federal, and tribal resource management agencies in the area where your project is located (see Environmental Summary report PDF).

I hope the enclosed information is helpful to you. Please feel free to contact me at the phone or email address below if you have any questions, require additional information, or have suggestions for how we could improve our information resources.

Sincerely,

Bryce A. Maxell

Bryce A. Maxell
Montana Natural Heritage Program
(406) 444-3989
bmaxell@mt.gov

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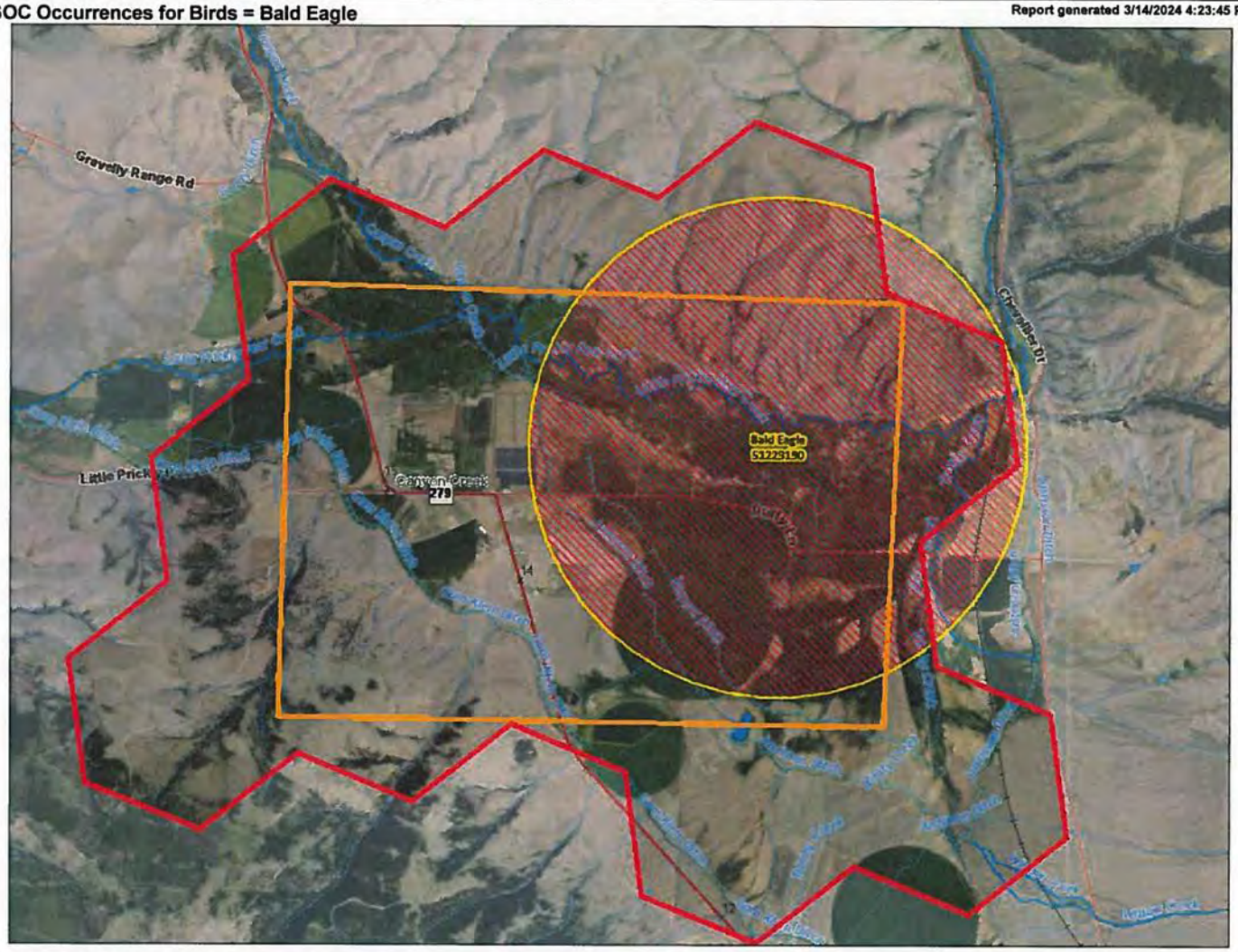
Latitude	Longitude
46.78042	-112.17017
46.83292	-112.31037

Montana SOC Occurrences Report

SOC Occurrences for Birds = Bald Eagle

Report generated 3/14/2024 4:23:45 PM



Birds - Bald Eagle *(Haliaeetus leucocephalus)*

SO Count: 1 | Obs Count: 8 | Earliest Obs: 2004 | Recent Obs: 2015

Special Status Species
Native Species
Global Rank: G5
State Rank: S4

Agency Status
USFWS: BGEPA; MBTA
USFS: Sensitive - Known in Forests (LOLO)
BLM: SENSITIVE
FWP SWAP:
PIF: 2

Delineation Criteria
Confirmed nesting area buffered by a minimum distance of 2,000 meters in order to be conservative about encompassing the breeding territory and area commonly used for renesting. Only nesting observations with a locational uncertainty of 1,000 meters or less will be used to delineate a nesting area.

Last Updated
Mar 13, 2024

SO ID: 51223190 | Acres: 3,095 | Obs Count: 8 | Earliest Obs: 2004 | Recent Obs: 2015

Citation for this report:
Montana SOC Occurrences Report
SOC Occurrences for Birds = Bald Eagle
Within Lat/Long: (46.78042,-112.17017) to (46.83292,-112.31037)
Natural Heritage Map Viewer. Montana Natural Heritage Program.
Retrieved on March 14, 2024, from https://mtnhp.org/MapViewer/SOReport.aspx

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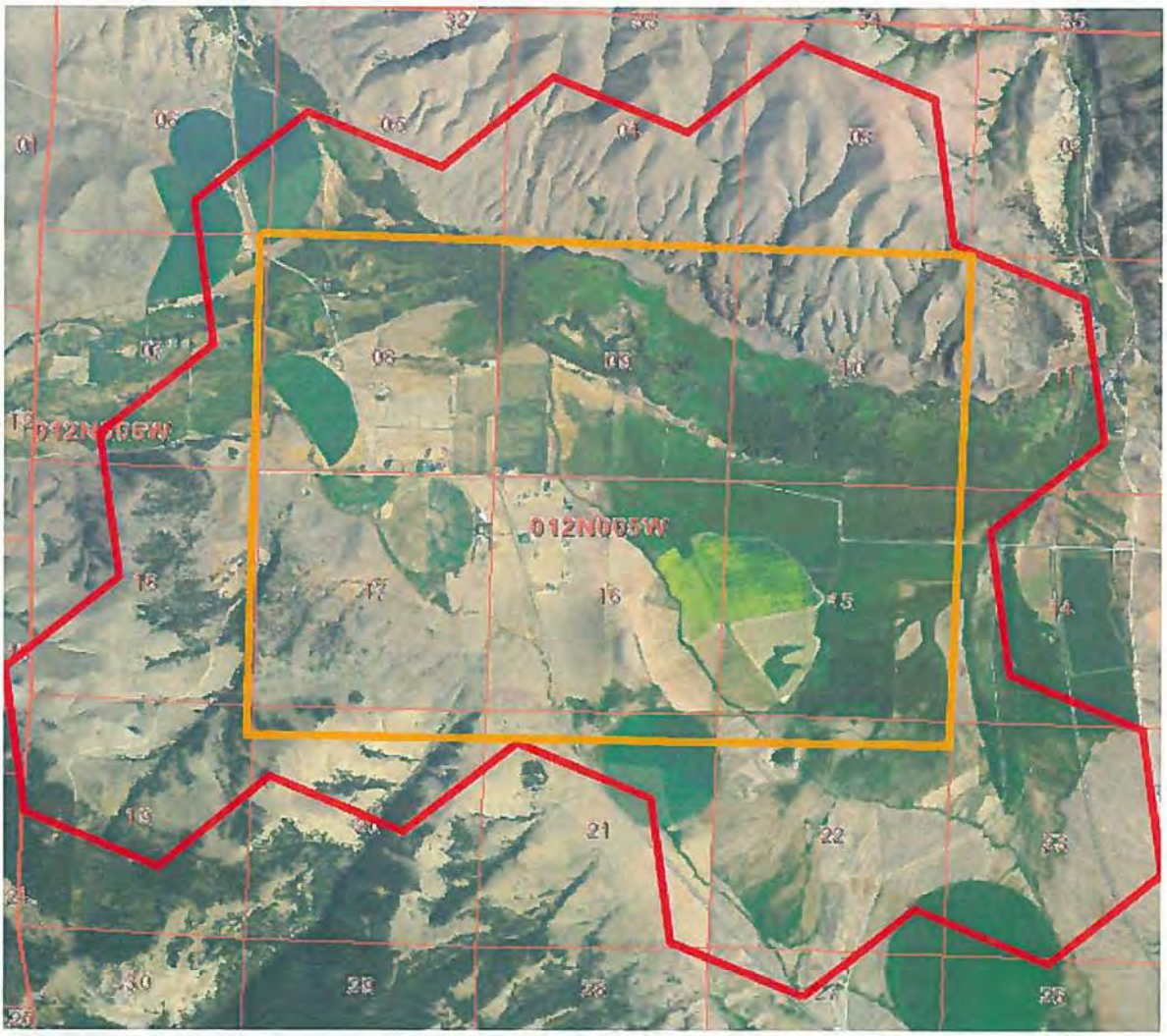
1201 11th Ave • P.O. Box 201800 • Helena, MT 59620-1800 • fax 406-444-0266 • phone 406-444-3989

Latitude	Longitude
46.77242	-112.19468
46.83404	-112.29662

Summarized by:
24PRVT0262
(Custom Area of Interest)



Suggested Citation
Montana Natural Heritage Program. Environmental Summary Report.
for Latitude 46.77242 to 46.83404 and Longitude -112.19468 to -112.29662. Retrieved on 3/14/2024.

The Montana Natural Heritage Program is part of the Montana State Library's Natural Resource Information System. Since 1985, it has served as a neutral and non-regulatory provider of easily accessible information on Montana's species and biological communities to inform all stakeholders in environmental review, permitting, and planning processes. The program is part of the NatureServe network that is composed of over 60 member programs across North America that work to provide current and comprehensive distribution and status information on species and biological communities.

MONTANA STATE LIBRARY NATURAL HERITAGE PROGRAM

NATURESERVE

Environmental Summary

Introduction to Environmental Summary Report

Environmental Summary Reports from the Montana Natural Heritage Program (MTNHP) provide information on species and biological communities to inform all stakeholders in environmental review, permitting, and planning processes. For information on environmental permits in Montana, please see permitting overviews by the Montana Department of Environmental Quality, the Montana Department of Natural Resources and Conservation, the Index of Environmental Permits for Montana and our Suggested Contacts for Natural Resource Management Agencies. The report for your area of interest consists of introductory and related materials in this PDF and an Excel workbook with worksheets summarizing information managed in the MTNHP databases for: (1) species occurrences; (2) other observed species without species occurrences; (3) other species potentially present based on their range, presence of associated habitats, or predictive distribution model output if available; (4) structured surveys that follow a protocol capable of detecting one or more species; (5) land cover mapped as ecological systems; (6) wetland and riparian mapping; (7) land management categories; and (8) biological reports associated with plant and animal observations. If your area of interest corresponds to a statewide polygon layer (e.g., watersheds, counties, or public land survey sections) information summaries in your report will exactly match those boundaries. However, if your report is for a custom area, users should be aware that summaries do not correspond to the exact boundaries of the polygon they have specified, but instead are a summary across a layer of hexagons intersected by the polygon they specified as shown on the report cover. Summarizing by these hexagons which are one square mile in area and approximately one kilometer in length on each side allows for consistent and rapid delivery of summaries based on a uniform grid that has been used for planning efforts across North America.

In presenting this information, MTNHP is working towards assisting the user with rapidly assessing the known or potential species and biological communities, land management categories, and biological reports associated with the report area. Users are reminded that this information is likely incomplete and may be inaccurate as surveys to document species are lacking in many areas of the state, species' range polygons often include regions of unsuitable habitat, methods of predicting the presence of species or communities are constantly improving, and information is constantly being added and updated in our databases. **Field verification by professional biologists of the absence or presence of species and biological communities in a report area will always be an important obligation of users of our data. Users are encouraged to only use this environmental summary report as a starting point for more in depth analyses and are encouraged to contact state, federal, and tribal resource management agencies for additional data or management guidelines relevant to your efforts. Please see the Appendix for introductory materials to each section of the report, additional information resources, and a list of relevant agency contacts.**

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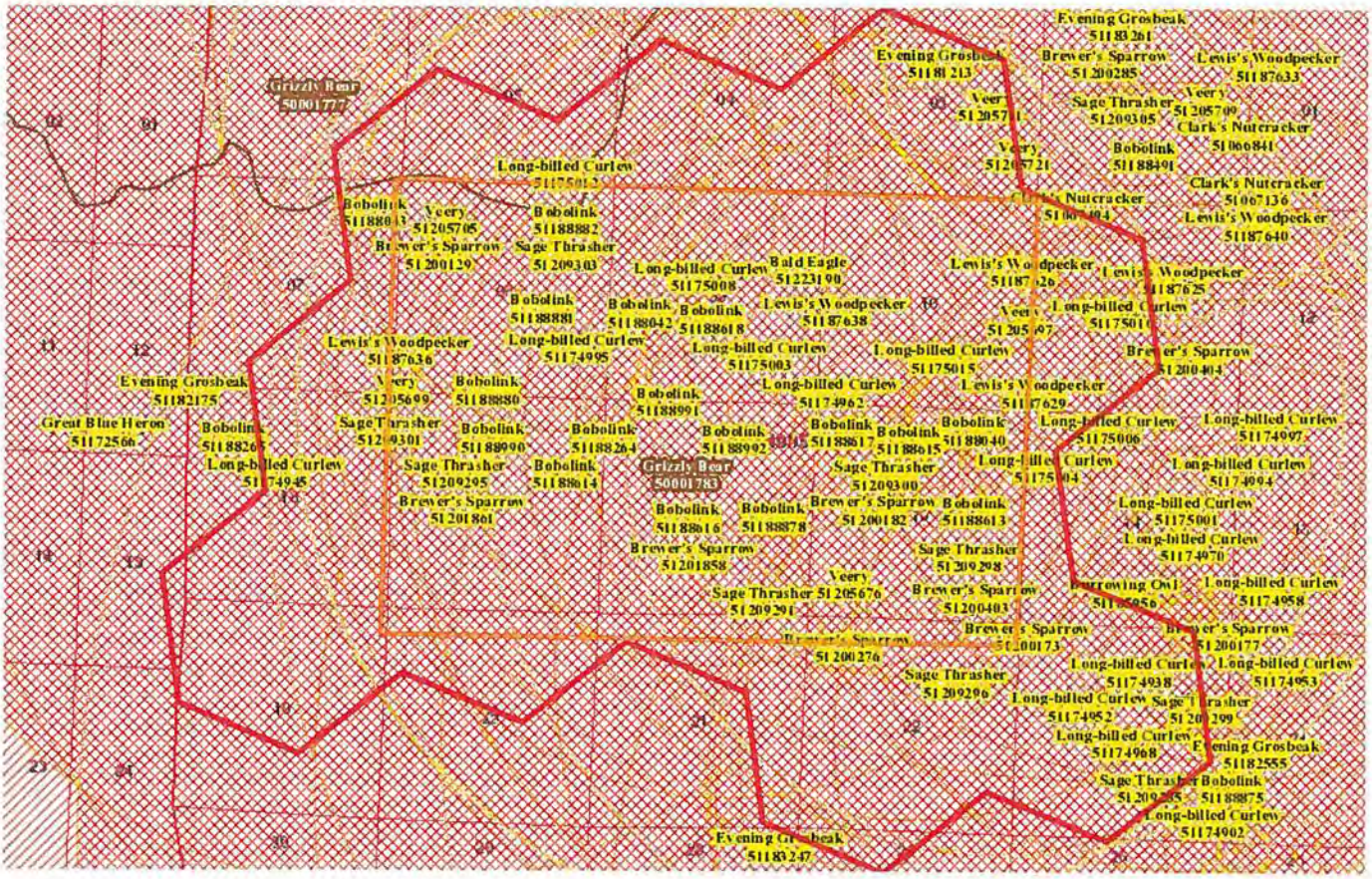
Legend

Model Icons	Habitat Icons	Range Icons	Num Obs
Suitable (native range)	Common	Native / Year-round	Count of obs with 'good precision' (<=1000m)
Optimal Suitability	Occasional	Summer	+ indicates additional 'poor precision' obs (1001m-10,000m)
Moderate Suitability		Winter	
Low Suitability		Migratory	
Suitable (introduced range)		Non-native	
		Historical	

Latitude	Longitude
46.77242	-112.19468
46.83404	-112.29662

Native Species

Summarized by: **24PRVT0262** *(Custom Area of Interest)*
Filtered by:
Native Species reports are filtered for Species with MT Status = Species of Concern, Special Status, Important Animal Habitat, Potential SOC



Species Occurrences

	USFWS Sec7	# SO	# Obs	Predicted Model	Range
B - Bobolink *(Dolichonyx oryzivorus)* SOC		22	10 +		M M

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA; BCC10; BCC11; BCC17** FWP SWAP: **SGCN3** PIF: **3**

Delineation Criteria Confirmed breeding area based on the presence of a nest, chicks, or territorial adults during the breeding season. Point observation location is buffered by a minimum distance of 150 meters in order to conservatively encompass male territory size reported for the species and otherwise is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Dec 28, 2023)

Predicted Models: M 38% Moderate (inductive), L 46% Low (inductive)

B - Great Blue Heron *(Ardea herodias)* SOC		1	4 +		M

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA** FWP SWAP: **SGCN3**

Delineation Criteria Confirmed nesting area buffered by a minimum distance of 6,500 meters in order to be conservative about encompassing the areas commonly used for foraging near the breeding colony and otherwise buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Dec 22, 2023)

Predicted Models: M 38% Moderate (inductive), L 38% Low (inductive)

B - Veery *(Catharus fuscescens)* SOC		6	2 +		M

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**

Delineation Criteria Observations with evidence of breeding activity buffered by a minimum distance of 300 meters in order to be conservative about encompassing home ranges and otherwise buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Dec 28, 2023)

Predicted Models: M 38% Moderate (inductive), L 31% Low (inductive)

B - Clark's Nutcracker *(Nucifraga columbiana)* SOC		2	3 +		

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA** USFS: **Species of Conservation Concern in Forests (FLAT)** FWP SWAP: **SGCN3** PIF: **3**

Delineation Criteria Observations with direct evidence of breeding activity or indirect evidence of breeding activity between early March and mid-July within forested habitats containing Whitebark Pine (Pinus albicaulis), Limber Pine (Pinus flexilis), or Ponderosa Pine (Pinus ponderosa). Observations are buffered by a minimum distance of 1,000 meters in order to encompass the spring/summer breeding territory size reported for the species or the locational uncertainty of the observation to a maximum distance of 10,000 meters. (Last Updated: Jan 12, 2023)

Predicted Models: M 23% Moderate (inductive), L 69% Low (inductive)

46 | 36 +

View in Field Guide **View Predicted Models** **View Range Maps**

Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA; BCC11** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**

Delineation Criteria Confirmed breeding area based on the presence of a nest, chicks, or territorial adults during the breeding season. Point observation location is buffered by a minimum distance of 200 meters in order to approximate the breeding territory size reported for the species in Idaho and otherwise is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Dec 22, 2023)

Predicted Models: M 15% Moderate (inductive), L 85% Low (inductive)

B - Lewis's Woodpecker *(Melanerpes lewis)* SOC

8 | 1 +

View in Field Guide **View Predicted Models** **View Range Maps**

Species of Concern - Native Species Global: **G4** State: **S2B** USFWS: **MBTA; BCC10; BCC17** USFS: **Species of Conservation Concern in Forests (HLC)** BLM: **SENSITIVE** FWP SWAP: **SGCN2** PIF: **2**

Delineation Criteria Confirmed breeding area based on the presence of a nest, chicks, or territorial adults during the breeding season. Point observation location is buffered by a minimum distance of 300 meters in order to encompass the likely foraging area used by breeding adults around the nest tree and otherwise is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Dec 28, 2023)

Predicted Models: M 15% Moderate (inductive), L 54% Low (inductive)

B - Sage Thrasher *(Oreoscoptes montanus)* SOC

10 | 3 +

View in Field Guide **View Predicted Models** **View Range Maps**

Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **3**

Delineation Criteria Confirmed breeding area based on the presence of a nest, chicks, or territorial adults during the breeding season. Point observation location is buffered by a minimum distance of 75 meters in order to encompass the maximum breeding territory size reported for the species and otherwise is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Dec 28, 2023)

Predicted Models: M 8% Moderate (inductive), L 92% Low (inductive)

M - Grizzly Bear *(Ursus arctos)* SOC

7 | 2

View in Field Guide **View Predicted Models** **View Range Maps**

Species of Concern - Native Species Global: **G4** State: **S2S3** USFWS: **LT** BLM: **THREATENED** FWP SWAP: **SGCN2-3**

Delineation Criteria Species Occurrence polygons represent areas delineated by the U.S. Fish and Wildlife Service (USFWS) that encompass both home ranges and potential transitory movements based on verified sightings. Within these areas, the USFWS wants project proponents to consider whether the species â€œmay be presentâ€ when evaluating the potential impacts of a project and to work with the USFWS to develop and implement best management practices to minimize or eliminate project effects on the species. (Last Updated: Dec 22, 2023)

Predicted Models: L 100% Low (inductive)

B - Brewer's Sparrow *(Spizella breweri)* SOC

12 | 6 +

View in Field Guide **View Predicted Models** **View Range Maps**

Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**

Delineation Criteria Confirmed breeding area based on the presence of a nest, chicks, or territorial adults during the breeding season. Point observation location is buffered by a minimum distance of 100 meters in order to encompass the maximum territory size reported for the species and otherwise is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Dec 28, 2023)

Predicted Models: L 92% Low (inductive)

B - Evening Grosbeak *(Coccothraustes vespertinus)* SOC

5 | +

View in Field Guide **View Predicted Models** **View Range Maps**

Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA; BCC10** FWP SWAP: **SGCN3**

Delineation Criteria Confirmed breeding area based on the presence of a nest, chicks, or territorial adults during the breeding season. Point observation location is buffered by a minimum distance of 1,000 meters in order to encompass the maximum foraging distance from nests reported for the species and otherwise is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Dec 28, 2023)

Predicted Models: L 46% Low (inductive)

B - Burrowing Owl *(Athene cunicularia)* SOC

1

View in Field Guide **View Predicted Models** **View Range Maps**

Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **1**

Delineation Criteria Confirmed breeding area based on the presence of a nest, chicks, or territorial adults during the breeding season. Direct observation of a bird or birds at/on a prairie dog town is indirect but sufficient evidence of breeding (b). Point observation location is buffered by a minimum distance of 2,700 meters in order to encompass the maximum foraging distance reported for breeding adults and otherwise is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Dec 28, 2023)

Predicted Models: L 8% Low (inductive)

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Legend

Model Icons	Habitat Icons	Range Icons	Num Obs
Suitable (native range)	Common	Native / Year-round	Count of obs with 'good precision' (<=1000m)
Optimal Suitability	Occasional	Summer	+ indicates additional 'poor precision' obs (1001m-10,000m)
Moderate Suitability		Winter	
Low Suitability		Migratory	
Suitable (introduced range)		Non-native	
		Historical	

Latitude 46.77242 46.83404
Longitude -112.19468 -112.29662

Native Species

Summarized by: **24PRVT0262** *(Custom Area of Interest)*
Filtered by:
Native Species reports are filtered for Species with MT Status = Species of Concern, Special Status, Important Animal Habitat, Potential SOC

Other Observed Species

	USFWS Sec7	# Obs	Predicted Model	Range
B - Bald Eagle *(Haliaeetus leucocephalus)* SSS		18 +		
B - Trumpeter Swan *(Cygnus buccinator)* SOC		3		
B - Barrow's Goldeneye *(Bucephala islandica)* PSOC		1		
B - American White Pelican *(Pelecanus erythrorhynchos)* SOC		1		
B - Golden Eagle *(Aquila chrysaetos)* SOC		3 +		
B - White-faced Ibis *(Plegadis chihi)* SOC		1		
B - Franklin's Gull *(Leucophaeus pipixcan)* SOC		+	Not Assessed	

B - Bald Eagle *(Haliaeetus leucocephalus)* SSS

View in Field Guide | View Predicted Models | View Range Maps
Special Status Species - Native Species Global: **G5** State: **S4** USFWS: **BGEPA; MBTA** USFS: **Sensitive - Known in Forests (LOLO)** BLM: **SENSITIVE** PIF: **2**
Predicted Models: 8% Optimal (inductive), 31% Moderate (inductive), 38% Low (inductive)

B - Trumpeter Swan *(Cygnus buccinator)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **1**
Predicted Models: 54% Moderate (inductive), 46% Low (inductive)

B - Barrow's Goldeneye *(Bucephala islandica)* PSOC

View in Field Guide | View Predicted Models | View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S4** USFWS: **MBTA** FWP SWAP: **SGIN** PIF: **2**
Predicted Models: 46% Moderate (inductive), 31% Low (inductive)

B - American White Pelican *(Pelecanus erythrorhynchos)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA** FWP SWAP: **SGCN3** PIF: **3**
Predicted Models: 31% Moderate (inductive), 69% Low (inductive)

B - Golden Eagle *(Aquila chrysaetos)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **BGEPA; MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3**
Predicted Models: 23% Moderate (inductive), 54% Low (inductive)

B - White-faced Ibis *(Plegadis chihi)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
Predicted Models: 38% Low (inductive)

B - Franklin's Gull *(Leucophaeus pipixcan)* SOC

View in Field Guide | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA; BCC10; BCC11; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**

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Legend

Model Icons	Habitat Icons	Range Icons	Num Obs
Suitable (native range)	Common	Native / Year-round	Count of obs with 'good precision' (<=1000m)
Optimal Suitability	Occasional	Summer	+ indicates additional 'poor precision' obs (1001m-10,000m)
Moderate Suitability		Winter	
Low Suitability		Migratory	
Suitable (introduced range)		Non-native	
		Historical	

Latitude	Longitude
46.77242	-112.19468
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Native Species

Summarized by: **24PRVT0262** *(Custom Area of Interest)*
Filtered by:
Native Species reports are filtered for Species with MT Status = Species of Concern, Special Status, Important Animal Habitat, Potential SOC

Other Potential Species

	USFWS Sec7	Predicted Model	Range
M - Preble's Shrew *(Sorex preblei)* SOC			
V - Oxytropis lagopus var. conjugans *(Hare's-foot Locoweed)* PSOC			
V - Carex crawei *(Crawe's Sedge)* SOC			
I - Bombus suckleyi *(Suckley Cuckoo Bumble Bee)* SOC			
V - Eleocharis rostellata *(Beaked Spikerush)* SOC			
V - Utricularia intermedia *(Flatleaf Bladderwort)* SOC			
M - North American Porcupine *(Erethizon dorsatum)* PSOC			
M - Western Pygmy Shrew *(Sorex eximius)* SOC			
M - Western Spotted Skunk *(Spilogale gracilis)* PSOC			
V - Centunculus minimus *(Chaffweed)* SOC			
M - Little Brown Myotis *(Myotis lucifugus)* SOC			
M - Spotted Bat *(Euderma maculatum)* SOC			B M

M - Preble's Shrew *(Sorex preblei)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3** FWP SWAP: **SGCN3**
Predicted Models: M 92% Moderate (inductive), L 8% Low (inductive)

V - Oxytropis lagopus var. conjugans *(Hare's-foot Locoweed)* PSOC

View in Field Guide | View Predicted Models | View Range Maps
Potential Species of Concern - Native Species Global: **G4G5T3T4** State: **S3S4**
Predicted Models: M 92% Moderate (inductive), L 8% Low (inductive)

V - Carex crawei *(Crawe's Sedge)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S2S3** Plant Threat Score: **Low**
Predicted Models: M 85% Moderate (inductive), L 15% Low (inductive)

I - Bombus suckleyi *(Suckley Cuckoo Bumble Bee)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G2G3** State: **S1**
Predicted Models: M 77% Moderate (inductive), L 23% Low (inductive)

V - Eleocharis rostellata *(Beaked Spikerush)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** USFS: **Species of Conservation Concern in Forests (CG, FLAT, HLC)** Plant Threat Score: **Unknown**
CCVI: **Less Vulnerable**
Predicted Models: M 69% Moderate (inductive), L 23% Low (inductive)

V - Utricularia intermedia *(Flatleaf Bladderwort)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S2** USFS: **Sensitive - Known in Forests (KOOT)** Plant Threat Score: **No Known Threats**
Predicted Models: M 69% Moderate (inductive), L 15% Low (inductive)

M - North American Porcupine *(Erethizon dorsatum)* PSOC

View in Field Guide | View Predicted Models | View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S3S4** FWP SWAP: **SGIN**
Predicted Models: M 62% Moderate (inductive), L 38% Low (inductive)

M - Western Pygmy Shrew *(Sorex eximius)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3** FWP SWAP: **SGCN3**
Predicted Models: M 54% Moderate (inductive), L 31% Low (inductive)

M - Western Spotted Skunk *(Spilogale gracilis)* PSOC

View in Field Guide | View Predicted Models | View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **SU** FWP SWAP: **SGIN**
Predicted Models: M 46% Moderate (inductive), L 54% Low (inductive)

V - Centunculus minimus *(Chaffweed)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G5** State: **S2** Plant Threat Score: **No Known Threats**
Predicted Models: M 46% Moderate (inductive), L 38% Low (inductive)

M - Little Brown Myotis *(Myotis lucifugus)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G3G4** State: **S3** USFS: **Sensitive - Known in Forests (BD, BRT, KOOT)** FWP SWAP: **SGCN3**
Predicted Models: M 38% Moderate (inductive), L 62% Low (inductive)

M - Spotted Bat *(Euderma maculatum)* SOC

View in Field Guide | View Predicted Models | View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3** BLM: **SENSITIVE** FWP SWAP: **SGCN3, SGIN**
Predicted Models: M 31% Moderate (inductive), L 69% Low (inductive)

V - Atriplex truncata *(Mound-leaf Saltbush)* SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3** Plant Threat Score: **Unknown**

Predicted Models: M 31% Moderate (inductive), L 54% Low (inductive)

M - Fringed Myotis *(Myotis thysanodes)* SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G4** State: **S3** BLM: **SENSITIVE** FWP SWAP: **SGCN3**

Predicted Models: M 31% Moderate (inductive), L 38% Low (inductive)

V - Impatiens aurella *(Pale-yellow Jewel-weed)* SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G4** State: **S3** Plant Threat Score: **No Known Threats**

Predicted Models: M 31% Moderate (inductive), L 38% Low (inductive)

M - Hoary Bat *(Lasiurus cinereus)* SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G3G4** State: **S3B** BLM: **SENSITIVE** FWP SWAP: **SGCN3**

Predicted Models: M 23% Moderate (inductive), L 77% Low (inductive)

V - Elodea bifoliata *(Long-sheath Waterweed)* SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G4G5** State: **S2?** Plant Threat Score: **No Known Threats**

Predicted Models: M 23% Moderate (inductive), L 69% Low (inductive)

I - Danaus plexippus *(Monarch)* SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G4** State: **S2S3** USFWS: **C** USFS: **Sensitive - Migratory in Forests (BD, BRT, KOOT)**

Predicted Models: M 23% Moderate (inductive), L 69% Low (inductive)

V - Dichanthelium acuminatum *(Panic Grass)* SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S2S3** Plant Threat Score: **Unknown**

Predicted Models: M 23% Moderate (inductive), L 54% Low (inductive)

V - Mimulus floribundus *(Floriferous Monkeyflower)* SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G5** State: **SH** Plant Threat Score: **No Known Threats** CCVI: **Highly Vulnerable**

Predicted Models: M 23% Moderate (inductive), L 23% Low (inductive)

V - Potentilla plattensis *(Platte Cinquefoil)* SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G4** State: **S3** Plant Threat Score: **No Known Threats** CCVI: **Highly Vulnerable**

Predicted Models: M 23% Moderate (inductive)

B - American Bittern *(Botaurus lentiginosus)* SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **3**

Predicted Models: M 15% Moderate (inductive), L 62% Low (inductive)

M - Townsend's Big-eared Bat *(Corynorhinus townsendii)* SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G4** State: **S3** USFS: **Sensitive - Known in Forests (LOLO)** BLM: **SENSITIVE** FWP SWAP: **SGCN3**

Predicted Models: M 15% Moderate (inductive), L 54% Low (inductive)

V - Cypripedium parviflorum *(Small Yellow Lady's-slipper)* PSOC

View in Field Guide | View Predicted Models | View Range Maps

Potential Species of Concern - Native Species Global: **G5** State: **S3S4** USFS: **Sensitive - Known in Forests (LOLO)** **Species of Conservation Concern in Forests (CG, HLC)**

Predicted Models: M 15% Moderate (inductive), L 54% Low (inductive)

B - Hooded Merganser *(Lophodytes cucullatus)* PSOC

View in Field Guide | View Predicted Models | View Range Maps

Potential Species of Concern - Native Species Global: **G5** State: **S4** USFWS: **MBTA** FWP SWAP: **SGIN** PIF: **2**

Predicted Models: M 15% Moderate (inductive), L 46% Low (inductive)

V - Primula incana *(Mealy Primrose)* SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3** Plant Threat Score: **High** CCVI: **Highly Vulnerable**

Predicted Models: M 15% Moderate (inductive), L 38% Low (inductive)

V - Kobresia simpliciuscula *(Simple Kobresia)* SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3** Plant Threat Score: **Unknown**

Predicted Models: M 8% Moderate (inductive), L 85% Low (inductive)

B - Western Screech-Owl *(Megascops kennicottii)* PSOC

View in Field Guide | View Predicted Models | View Range Maps

Potential Species of Concern - Native Species Global: **G4G5** State: **S3S4** USFWS: **MBTA** FWP SWAP: **SGIN** PIF: **3**

Predicted Models: M 8% Moderate (inductive), L 77% Low (inductive)

V - Astragalus convallarius (Lesser Rushy Milkvetch) SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3** USFS: **Species of Conservation Concern in Forests (HLC)** Plant Threat Score: **Medium - Low** CCVI: **Moderately Vulnerable**

Predicted Models: M 8% Moderate (Inductive), L 62% Low (Inductive)

B - Great Gray Owl (*Strix nebulosa*) SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3, SGIN** PIF: **3**

Predicted Models: M 8% Moderate (Inductive), L 46% Low (Inductive)

B - Green-tailed Towhee (*Pipilo chlorurus*) SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** FWP SWAP: **SGCN3** PIF: **3**

Predicted Models: M 8% Moderate (Inductive), L 38% Low (Inductive)

V - Erigeron linearis (*Linear-leaf Fleabane*) SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S2** Plant Threat Score: **Low** CCVI: **Less Vulnerable**

Predicted Models: M 8% Moderate (Inductive), L 31% Low (Inductive)

B - Sharp-tailed Grouse (*Tympanuchus phasianellus*) SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G5** State: **SX,S4** FWP SWAP: **SGCN1** PIF: **2**

Predicted Models: L 100% Low (Inductive)

M - Silver-haired Bat (*Lasionycteris noctivagans*) PSOC

View in Field Guide | View Predicted Models | View Range Maps

Potential Species of Concern - Native Species Global: **G3G4** State: **S4**

Predicted Models: L 92% Low (Inductive)

M - Long-eared Myotis (*Myotis evotis*) SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3**

Predicted Models: L 77% Low (Inductive)

B - Common Poorwill (*Phalaenoptilus nuttallii*) PSOC

View in Field Guide | View Predicted Models | View Range Maps

Potential Species of Concern - Native Species Global: **G5** State: **S4B** USFWS: **MBTA** FWP SWAP: **SGIN** PIF: **3**

Predicted Models: L 77% Low (Inductive)

M - Dwarf Shrew (*Sorex nanus*) SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G4** State: **S2S3** FWP SWAP: **SGCN2-3**

Predicted Models: L 69% Low (Inductive)

M - Long-legged Myotis (*Myotis volans*) SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G4G5** State: **S3**

Predicted Models: L 69% Low (Inductive)

B - Meesia triquetra (*Meesia Moss*) SOC

View in Field Guide | View Predicted Models | View Range Maps

USFS: **Sensitive - Known in Forests (BD, BRT, KOOT)**
Sensitive - Suspected in Forests (LOLO)

Species of Concern - Native Species Global: **G5** State: **S2** **Species of Conservation Concern in Forests (CG, FLAT)**

Predicted Models: L 69% Low (Inductive)

B - Yellow-billed Cuckoo (*Coccyzus americanus*) SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **PS: LT; MBTA** BLM: **THREATENED** FWP SWAP: **SGCN3, SGIN** PIF: **2**

Predicted Models: L 69% Low (Inductive)

B - Cassin's Finch (*Haemorhous cassinii*) SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA; BCC10** FWP SWAP: **SGCN3** PIF: **3**

Predicted Models: L 62% Low (Inductive)

A - Western Toad (*Anaxyrus boreas*) SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G4** State: **S2** USFS: **Sensitive - Known in Forests (BD, BRT, KOOT, LOLO)** BLM: **SENSITIVE** FWP SWAP: **SGCN2**

Predicted Models: L 62% Low (Inductive)

V - Stellaria crassifolia (*Fleshy Stitchwort*) SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S2** Plant Threat Score: **No Known Threats**

Predicted Models: L 62% Low (Inductive)

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3** USFS: **Sensitive - Known in Forests (BD, LOLO)** **Species of Conservation Concern in Forests (CG, HLC)** Plant Threat Score: **Low** CCVI: **Highly Vulnerable**
Predicted Models: L 54% Low (Inductive)

B - Harlequin Duck *(Histrionicus histrionicus)* SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G4** State: **S2B** USFWS: **MBTA** USFS: **Sensitive - Known in Forests (BD, KOOT, LOLO)** **Sensitive - Migratory in Forests (BRT)** FWP SWAP: **SGCN2** PIF: **1**
Predicted Models: L 54% Low (Inductive)

B - Black Tern *(Chlidonias niger)* SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G4G5** State: **S3B** USFWS: **MBTA; BCC10; BCC11; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
Predicted Models: L 46% Low (Inductive)

B - Ferruginous Hawk *(Buteo regalis)* SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
Predicted Models: L 46% Low (Inductive)

B - Ovenbird *(Seiurus aurocapilla)* PSOC

View in Field Guide | View Predicted Models | View Range Maps

Potential Species of Concern - Native Species Global: **G5** State: **S4B** USFWS: **MBTA** PIF: **3**
Predicted Models: L 46% Low (Inductive)

V - Epipactis gigantea *(Giant Helleborine)* SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G4** State: **S2S3** USFS: **Sensitive - Known in Forests (BD, BRT, KOOT, LOLO)** **Species of Conservation Concern in Forests (FLAT, HLC)** Plant Threat Score: **Low** CCVI: **Moderately Vulnerable**
Predicted Models: L 38% Low (Inductive)

V - Mimulus suksdorfii *(Suksdorf Monkeyflower)* PSOC

View in Field Guide | View Predicted Models | View Range Maps

Potential Species of Concern - Native Species Global: **G4** State: **S3S4** Plant Threat Score: **No Known Threats**
Predicted Models: L 38% Low (Inductive)

V - Physaria klausii *(Divide Bladderpod)* SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G3** State: **S3** Plant Threat Score: **Low** CCVI: **Moderately Vulnerable**
Predicted Models: L 38% Low (Inductive)

B - Sprague's Pipit *(Anthus spragueii)* SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G3G4** State: **S3B** USFWS: **MBTA; BCC11; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **1**
Predicted Models: L 38% Low (Inductive)

B - Pileated Woodpecker *(Dryocopus pileatus)* SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA** FWP SWAP: **SGCN3** PIF: **2**
Predicted Models: L 31% Low (Inductive)

B - Pinyon Jay *(Gymnorhinus cyanocephalus)* SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G3** State: **S3** USFWS: **MBTA; BCC10; BCC17** FWP SWAP: **SGCN3**
Predicted Models: L 31% Low (Inductive)

V - Carex stenoptila *(Small-winged Sedge)* SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G3** State: **S2S3** Plant Threat Score: **No Known Threats** CCVI: **Less Vulnerable**
Predicted Models: L 31% Low (Inductive)

V - Lobelia kalmii *(Kalm's Lobelia)* SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3** Plant Threat Score: **No Known Threats**
Predicted Models: L 31% Low (Inductive)

B - Black-necked Stilt *(Himantopus mexicanus)* SOC

View in Field Guide | View Predicted Models | View Range Maps

Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** FWP SWAP: **SGCN3** PIF: **3**
Predicted Models: L 31% Low (Inductive)

B - Broad-tailed Hummingbird *(Selasphorus platycercus)* PSOC

View in Field Guide | View Predicted Models | View Range Maps

Potential Species of Concern - Native Species Global: **G5** State: **S4B** USFWS: **MBTA; BCC10** FWP SWAP: **SGIN**
Predicted Models: L 31% Low (Inductive)

View in Field Guide View Predicted Models View Range Maps
Species of Concern - Native Species Global: **G5** State: **S2B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN2** PIF: **2**
Predicted Models: L 31% Low (Inductive)

V - Botrychium hesperium *(Western Moonwort)* SOC

View in Field Guide View Predicted Models View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3** CCVI: **Less Vulnerable**
Predicted Models: L 23% Low (Inductive)

V - Draba densifolia *(Dense-leaf Draba)* SOC

View in Field Guide View Predicted Models View Range Maps
Species of Concern - Native Species Global: **G5** State: **S2** USFS: **Sensitive - Known in Forests (BD, BRT)** **Species of Conservation Concern in Forests (CG, HLC)** Plant Threat Score: **Low**
CCVI: **Moderately Vulnerable**
Predicted Models: L 23% Low (Inductive)

V - Ranunculus cardiophyllus *(Heart-leaved Buttercup)* SOC

View in Field Guide View Predicted Models View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** Plant Threat Score: **Low**
Predicted Models: L 23% Low (Inductive)

B - Rufous Hummingbird *(Selasphorus rufus)* PSOC

View in Field Guide View Predicted Models View Range Maps
Potential Species of Concern - Native Species Global: **G4** State: **S4B** USFWS: **MBTA; BCC10** PIF: **3**
Predicted Models: L 23% Low (Inductive)

B - Thick-billed Longspur *(Rhynchophanes mccownii)* SOC

View in Field Guide View Predicted Models View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA; BCC10; BCC11; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
Predicted Models: L 23% Low (Inductive)

M - Canada Lynx *(Lynx canadensis)* SOC

View in Field Guide View Predicted Models View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **LT; CH** BLM: **THREATENED** FWP SWAP: **SGCN3**
Predicted Models: L 8% Low (Inductive)

M - Wolverine *(Gulo gulo)* SOC

View in Field Guide View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3** USFWS: **LT** USFS: **Sensitive - Known in Forests (LOLO)** BLM: **SENSITIVE** FWP SWAP: **SGCN3**

MONTANA STATE LIBRARY
NATURAL HERITAGE PROGRAM
A program of the **Montana State Library's Natural Resource Information System**

Latitude	Longitude
46.77242	-112.19468
46.83404	-112.29662

Structured Surveys

Summarized by: **24PRVT0262** *(Custom Area of Interest)*

The Montana Natural Heritage Program (MTNHP) records information on the locations where more than 80 different types of well-defined repeatable survey protocols capable of detecting an animal species or suite of animal species have been conducted by state, federal, tribal, university, or private consulting biologists. Examples of structured survey protocols tracked by MTNHP include: visual encounter and dip net surveys for pond breeding amphibians, point counts for birds, call playback surveys for selected bird species, visual surveys of migrating raptors, kick net stream reach surveys for macroinvertebrates, visual encounter cover object surveys for terrestrial mollusks, bat acoustic or mist net surveys, pitfall and/or snap trap surveys for small terrestrial mammals, track or camera trap surveys for large mammals, and trap surveys for turtles. Whenever possible, photographs of survey locations are stored in MTNHP databases.

MTNHP does not typically manage information on structured surveys for plants; surveys for invasive species may be a future exception.

Within the report area you have requested, structured surveys are summarized by the number of each type of structured survey protocol that has been conducted, the number of species detections/observations resulting from these surveys, and the most recent year a survey has been conducted.

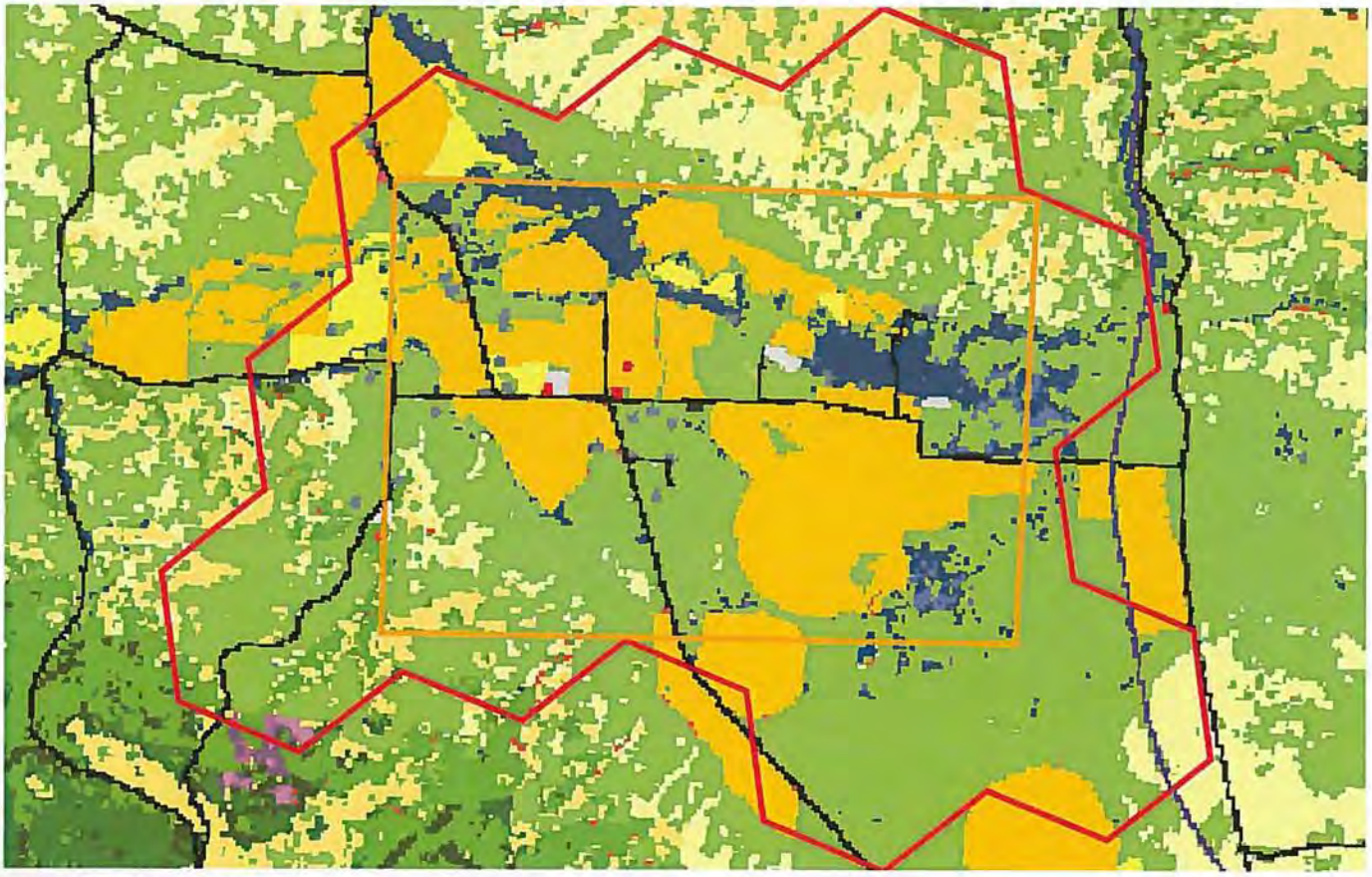
B-Bald Eagle Nest *(Bald Eagle Nest Survey)*	Survey Count: 4	Obs Count: 4	Recent Survey: 2011
B-Long-billed Curlew *(Long-billed Curlew, Road-based, Point Count)*	Survey Count: 53	Obs Count: 15	Recent Survey: 2022
E-Invasive Mussel Plankton Tow *(Plankton tows for veligers of Invasive Mussels)*	Survey Count: 1	Obs Count:	Recent Survey: 2023
E-Noxious Weed, Road-based *(Noxious Weed Road-based Visual Surveys)*	Survey Count: 6	Obs Count: 10	Recent Survey: 2003
I-Mussel *(Stream Mussel Survey)*	Survey Count: 1	Obs Count:	Recent Survey: 2007

MONTANA STATE LIBRARY
NATURAL HERITAGE PROGRAM
A program of the Montana State Library's
Natural Resource Information System

Latitude	Longitude
46.77242	-112.19468
46.83404	-112.29662

Land Cover

Summarized by: **24PRVT0262** *(Custom Area of Interest)*



49% (*4,085 Acres*)

Grassland Systems
Montane Grassland
Rocky Mountain Lower Montane, Foothill, and Valley Grassland

This grassland system of the northern Rocky Mountains is found at lower montane to foothill elevations in mountains and valleys throughout Montana. These grasslands are floristically similar to Big Sagebrush Steppe but are defined by shorter summers, colder winters, and young soils derived from recent glacial and alluvial material. They are found at elevations from 548 - 1,650 meters (1,800-5,413 feet). In the lower montane zone, they range from small meadows to large open parks surrounded by conifers; below the lower treeline, they occur as extensive foothill and valley grasslands. Soils are relatively deep, fine-textured, often with coarse fragments, and non-saline. Microphytic crust may be present in high-quality occurrences. This system is typified by cool-season perennial bunch grasses and forbs (>25%) cover, with a sparse shrub cover (<10%). Rough fescue (*Festuca campestris*) is dominant in the northwestern portion of the state and Idaho fescue (*Festuca idahoensis*) is dominant or co-dominant throughout the range of the system. Bluebunch wheatgrass (*Pseudoroegneria spicata*) occurs as a co-dominant throughout the range as well, especially on xeric sites. Western wheatgrass (*Pascopyrum smithii*) is consistently present, often with appreciable coverage (>10%) in lower elevation occurrences in western Montana and virtually always present, with relatively high coverages (>25%), on the edge of the Northwestern Great Plains region. Species diversity ranges from a high of more than 50 per 400 square meter plot on mesic sites to 15 (or fewer) on xeric and disturbed sites. Most occurrences have at least 25 vascular species present. Farmland conversion, noxious species invasion, fire suppression, heavy grazing and oil and gas development are major threats to this system.

21% (*1,747 Acres*)

Human Land Use
Agriculture
Cultivated Crops

These areas used for the production of crops, such as corn, soybeans, small grains, sunflowers, vegetables, and cotton, typically on an annual cycle. Agricultural plant cover is variable depending on season and type of farming. Other areas include more stable land cover of orchards and vineyards.

9% (778 Acres)

Sagebrush Steppe

Big Sagebrush Steppe

This widespread ecological system occurs throughout much of central Montana, and north and east onto the western fringe of the Great Plains. In central Montana, where this system occurs on both glaciated and non-glaciated landscapes, it differs slightly, with more summer rain than winter precipitation and more precipitation annually. Throughout its distribution, soils are typically deep and non-saline, often with a microphytic crust. This shrub-steppe is dominated by perennial grasses and forbs with greater than 25% cover. Overall shrub cover is less than 10 percent. In Montana and Wyoming, stands are more mesic, with more biomass of grass, and have less shrub diversity than stands farther to the west, and 50 to 90% of the occurrences are dominated by Wyoming big sagebrush with western wheatgrass (*Pascopyrum smithii*). Japanese brome (*Bromus japonicus*) and cheatgrass (*Bromus tectorum*) are indicators of disturbance, but cheatgrassis typically not as abundant as in the Intermountain West, possibly due to a colder climate. The natural fire regime of this ecological system maintains a patchy distribution of shrubs, preserving the steppe character. Shrubs may increase following heavy grazing and/or with fire suppression. In central and eastern Montana, complexes of prairie dog towns are common in this ecological system.

6% (479 Acres)

Shrubland, Steppe and Savanna Systems

Sagebrush Steppe

Montane Sagebrush Steppe

This system dominates the montane and subalpine landscape of southwestern Montana from valley bottoms to subalpine ridges and is found as far north as Glacier National Park. It can also be seen in the island mountain ranges of the north-central and south-central portions of the state. It primarily occurs on deep-soiled to stony flats, ridges, nearly flat ridgetops, and mountain slopes. In general, this system occurs in areas of gentle topography, fine soils, subsurface moisture or mesic conditions, within zones of higher precipitation and areas of snow accumulation. It occurs on all slopes and aspects, variable substrates and all soil types. The shrub component of this system is generally dominated by mountain big sagebrush (*Artemisia tridentata ssp. vaseyana*). Other co-dominant shrubs include silver sagebrush (*Artemisia cana ssp. viscidula)*, subalpine big sagebrush (*Artemisia tridentata ssp. spiciformis*), three tip sagebrush (*Artemisia tripartita* ssp. *tripartita*) and antelope bitterbrush (*Purshia tridentata*). Little sagebrush (*Artemisia arbuscula ssp. arbuscula*) shrublands are only found in southwestern Montana on sites with a perched water table. Wyoming big sagebrush (*Artemisia tridentata ssp. wyomingensis*) sites may be included within this system if occurrences are at montane elevations, and are associated with montane graminoids such as Idaho fescue (*Festuca idahoensis),* spike fescue (*Leucopoa kingii*), or poverty oatgrass (*Danthonia intermedia)*. In ares where sage has been eliminated by human activities like burning, disking or poisoning, other shrubs may be dominant, especially rubber rabbitbrush (*Ericameria nauseosa*), and green rabbitbrush (*Chrysothamnus viscidiflorus*). Because of the mesic site conditions, most occurrences support a diverse herbaceous undergrowth of grasses and forbs. Shrub canopy cover is extremely variable, ranging from 10 percent to as high as 40 or 50 percent.

5% (448 Acres)

Wetland and Riparian Systems

Floodplain and Riparian

Northern Rocky Mountain Lower Montane Riparian Woodland and Shrubland

This ecological system is found throughout the Rocky Mountain and Colorado Plateau regions. In Montana, sites occur at elevations of 609-1,219 meters (2,000-4,000 feet) west of the Continental Divide. East of the Continental Divide, this system ranges up to 1,676 meters (5,500 feet). It generally comprises a mosaic of multiple communities that are tree-dominated with a diverse shrub component. It is dependent on a natural hydrologic regime with annual to episodic flooding, so it is usually found within the flood zone of rivers, on islands, sand or cobble bars, and along streambanks. It can form large, wide occurrences on mid-channel islands in larger rivers, or narrow bands on small, rocky canyon tributaries and well-drained benches. It is also typically found in backwater channels and other perennially wet but less scoured sites, such as floodplains, swales and irrigation ditches. In some locations, occurrences extend into moderately high intermountain basins where the adjacent vegetation is sage steppe. Black cottonwood (*Populus balsamifera* ssp. *trichocarpa*) is the key indicator species. Other dominant trees may include boxelder maple (*Acer negundo*), narrowleaf cottonwood (*Populus angustifolia*), eastern cottonwood (*Populus deltoides*), Douglas-fir (*Pseudotsuga menziesii*), peachleaf willow (*Salix amygdaloides*), or Rocky Mountain juniper (*Juniperus scopulorum*). Dominant shrubs include Rocky Mountain maple (*Acer glabrum*), thinleaf alder (*Alnus incana*), river birch (*Betula occidentalis*), redoiser dogwood (*Cornus sericea*), hawthorne (*Crataegus* species), chokecherry (*Prunus virginiana*), skunkbush sumac (*Rhus trilobata*), willows (*Salix* species), rose (*Rosa* species), silver buffaloberry (*Shepherdia argentea*), or snowberry (*Symphoricarpos* species).

2% (189 Acres)

Human Land Use

Agriculture

Pasture/Hay

These agriculture lands typically have perennial herbaceous cover (e.g. regularly-shaped plantings) used for livestock grazing or the production of hay. There are obvious signs of management such as irrigation and haying that distinguish it from natural grasslands. Identified CRP lands are included in this land cover type.

Human Land Use

Developed

No Image

Other Roads

2% (159 Acres)

County, city and or rural roads generally open to motor vehicles.

2% (158 Acres)

Forest and Woodland Systems

Conifer-dominated forest and woodland (xeric-mesic)

Rocky Mountain Ponderosa Pine Woodland and Savanna

This system occurs on warm, dry, exposed sites in the foothills of the Rocky Mountains in west-central and central Montana, at the ecotone between grasslands or shrublands and more mesic coniferous forests. Elevations range from 1,066 to 1,676 meters (3,500-5,500 feet), with higher elevation examples mostly confined to central Montana. Occurrences are found on all slopes and aspects; however, moderately steep to very steep slopes or ridgetops are most common. True savanna types are infrequent; the system is more characteristically an open forest with a grassy understory. In the western part of the state, this system is seen mostly on dry slopes in the rainshadow of the Bitterroot Mountains. East of the Continental Divide, it is most widespread around Helena and Lewistown, although it occurs throughout mountain ranges as far east as the Little Rocky and Bearpaw Mountains. Ponderosa pine (*Pinus ponderosa*) is the dominant conifer. Douglas-fir (*Pseudotsuga menziesii*) and western larch (*Larix occidentalis*) may be present in the tree canopy in the more western areas, but are usually absent. In central Montana, limber pine (*Pinus flexilis*) and horizontal juniper (*Juniperus horizontalis*) are frequently components. Although the understory of ponderosa pine forests is often shrubby in other states, in Montana, habitats are mostly dominated by graminoids, although bitterbrush (*Purshia tridentata*), white snowberry (*Symphoricarpos albus*), and skunkrush (*Rhus trilobata*) occur in forests on benchlands and rocky slopes in the central portion of the state. Understory vegetation is more typically grasses and forbs that resprout following low to moderate intensity surface fires. Prolonged drought, beetle kill and exotic invasion are rapidly changing the dynamics of this system.

Additional Limited Land Cover

1% (*75 Acres*) Alpine-Montane Wet Meadow

1% (*46 Acres*) Low Intensity Residential

<1% (*32 Acres*) Rocky Mountain Montane-Foothill Deciduous Shrubland

<1% (20 Acres) Railroad
<1% (13 Acres) Rocky Mountain Subalpine-Montane Mesic Meadow
<1% (12 Acres) Introduced Upland Vegetation - Annual and Biennial Forbland
<1% (9 Acres) Low Sagebrush Shrubland
<1% (7 Acres) Insect-Killed Forest
<1% (6 Acres) Harvested forest-grass regeneration
<1% (6 Acres) Harvested forest-shrub regeneration
<1% (5 Acres) Commercial / Industrial
<1% (5 Acres) Rocky Mountain Montane Douglas-fir Forest and Woodland
<1% (3 Acres) Harvested forest-tree regeneration
<1% (2 Acres) Open Water
<1% (2 Acres) Rocky Mountain Foothill Limber Pine - Juniper Woodland
<1% (2 Acres) Emergent Marsh
<1% (2 Acres) High Intensity Residential

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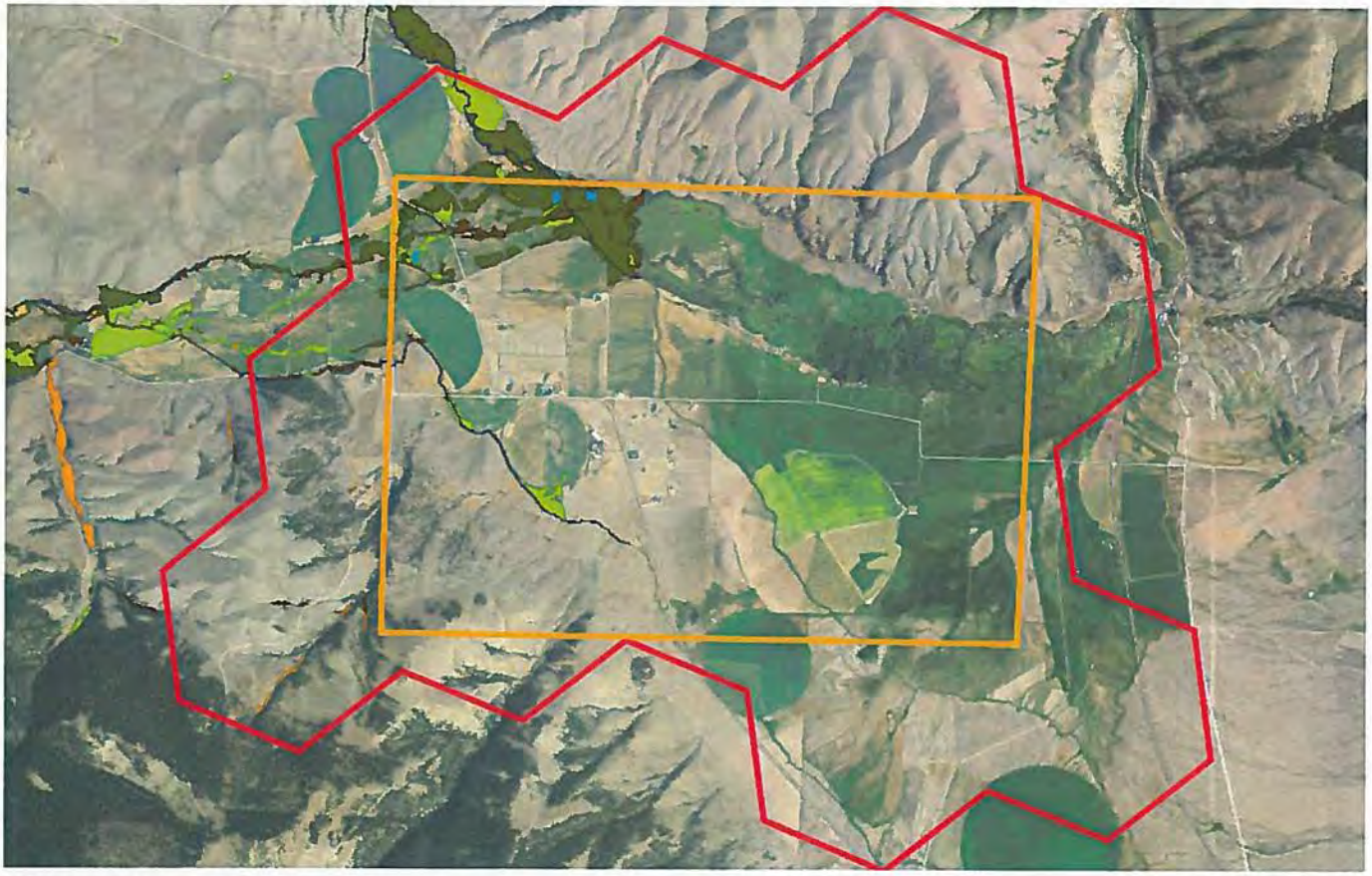
46.77242	-112.19468
46.83404	-112.29662

Wetland and Riparian

Summarized by: **24PRVT0262** *(Custom Area of Interest)*



Wetland and Riparian Mapping

P - Palustrine

AB - Aquatic Bed

F - Semipermanently Flooded	7 Acres	
(no modifier)	**<1 Acres**	PABF
b - Beaver	**5 Acres**	PABFb
h - Diked/Impounded	**2 Acres**	PABFh
x - Excavated	**<1 Acres**	PABFx

P - Palustrine, AB - Aquatic Bed
Wetlands with vegetation growing on or below the water surface for most of the growing season.

EM - Emergent

A - Temporarily Flooded	57 Acres	
(no modifier)	**56 Acres**	PEMA
h - Diked/Impounded	**1 Acres**	PEMAh
C - Seasonally Flooded	6 Acres	
(no modifier)	**6 Acres**	PEMC

P - Palustrine, EM - Emergent
Wetlands with erect, rooted herbaceous vegetation present during most of the growing season.

SS - Scrub-Shrub

A - Temporarily Flooded	110 Acres	
(no modifier)	**110 Acres**	PSSA
C - Seasonally Flooded	52 Acres	
(no modifier)	**52 Acres**	PSSC

P - Palustrine, SS - Scrub-Shrub
Wetlands dominated by woody vegetation less than 6 meters (20 feet) tall. Woody vegetation includes tree saplings and trees that are stunted due to environmental conditions.

FO - Forested

A - Temporarily Flooded	12 Acres	
(no modifier)	**12 Acres**	PFOA

P - Palustrine, FO - Forested
Wetlands dominated by woody vegetation greater than 6 meters (20 feet) tall.

R - Riverine (Rivers)

3 - Upper Perennial

UB - Unconsolidated Bottom

F - Semipermanently Flooded	3 Acres	
(no modifier)	**3 Acres**	R3UBF
G - Intermittently Exposed	1 Acres	

R - Riverine (Rivers), 3 - Upper Perennial, UB - Unconsolidated Bottom
Stream channels where the substrate is at least 25% mud, silt or other fine particles.

(no modifier) 1 Acres R3UBG

US - Unconsolidated Shore

A - Temporarily Flooded <1 Acres

(no modifier) **<1 Acres** R3USA

C - Seasonally Flooded <1 Acres

(no modifier) **<1 Acres** R3USC

R - Riverine (Rivers), 3 - Upper Perennial, US - Unconsolidated Shore
Shorelines with less than 75% areal cover of stones, boulders, or bedrock and less than 30% vegetation cover. The area is also irregularly exposed due to seasonal or irregular flooding and subsequent drying.

4 - Intermittent

SB - Stream Bed

C - Seasonally Flooded 4 Acres

x - Excavated **4 Acres** R4SBCx

R - Riverine (Rivers), 4 - Intermittent, SB - Stream Bed
Active channel that contains periodic water flow.

Rp - Riparian

1 - Lotic

SS - Scrub-Shrub
(no modifier) **2 Acres** Rp1SS

Rp - Riparian, 1 - Lotic, SS - Scrub-Shrub
This type of riparian area is dominated by woody vegetation that is less than 6 meters (20 feet) tall. Woody vegetation includes tree saplings and trees that are stunted due to environmental conditions.

FO - Forested
(no modifier) **19 Acres** Rp1FO

Rp - Riparian, 1 - Lotic, FO - Forested
This riparian class has woody vegetation that is greater than 6 meters (20 feet) tall.

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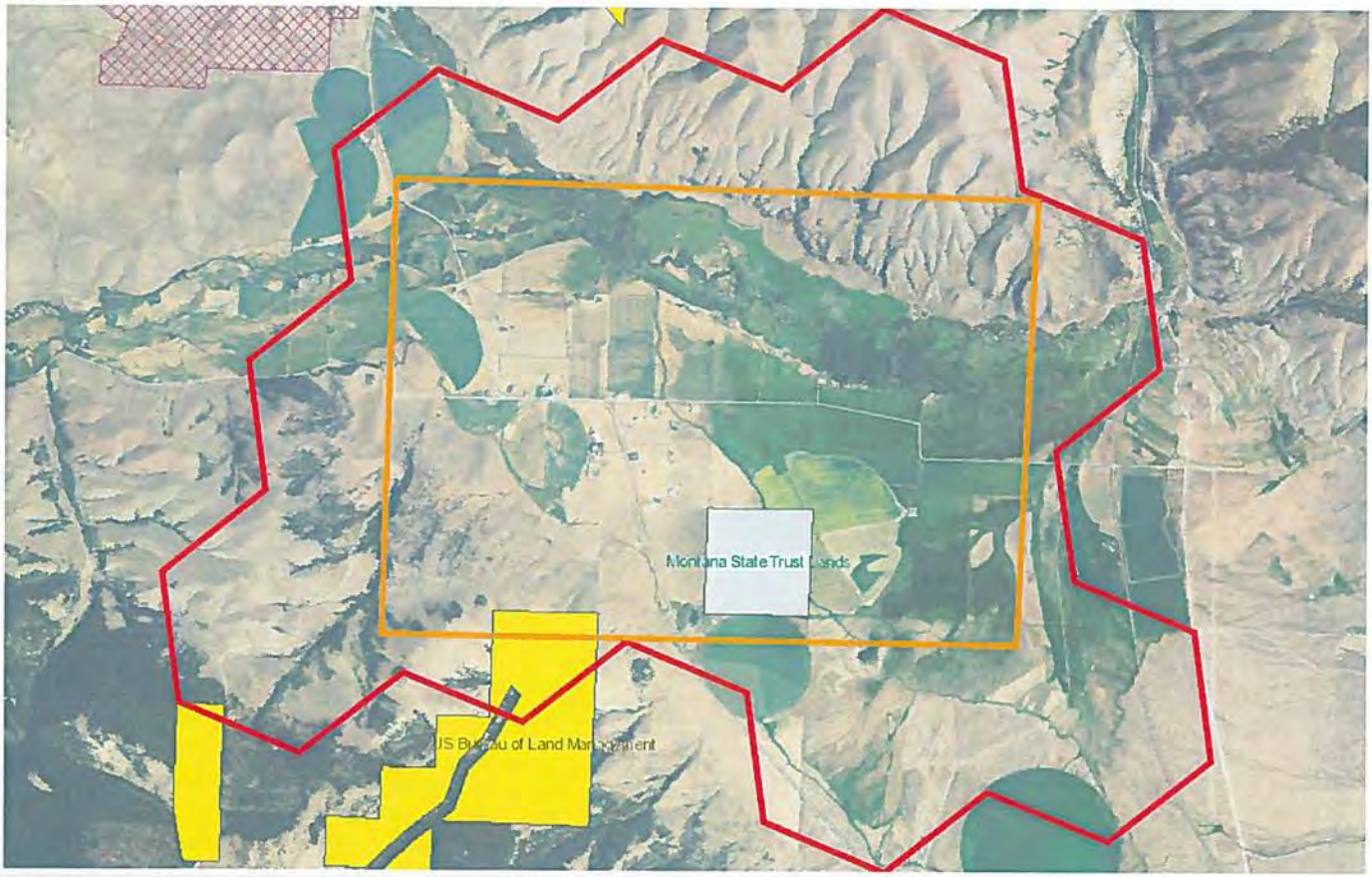
Land Management

Summarized by: **24PRVT0262** *(Custom Area of Interest)*



Land Management Summary

	Ownership	Tribal	Easements	Other Boundaries (possible overlap)
⊞ Public Lands	292 Acres (4%)			
⊞ Federal	132 Acres (2%)			
⊞ US Bureau of Land Management	132 Acres (2%)			
BLM Owned	132 Acres (2%)			
⊞ State	160 Acres (2%)			
⊞ Montana State Trust Lands	160 Acres (2%)			
MT State Trust Owned	160 Acres (2%)			
Private Lands or Unknown Ownership	8,018 Acres (96%)			

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Biological Reports

Summarized by: **24PRVT0262** *(Custom Area of Interest)*

Within the report area you have requested, citations for all reports and publications associated with plant or animal observations in Montana Natural Heritage Program (MTNHP) databases are listed and, where possible, links to the documents are included.

The MTNHP plans to include reports associated with terrestrial and aquatic communities in the future as allowed for by staff resources. If you know of reports or publications associated with species or biological communities within the report area that are not shown in this report, please let us know: mtnhp@mt.gov

No Biological Reports were found in the selected area

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Legend

Model Icons	Habitat Icons	Range Icons	Num Obs
Suitable (native range)	Common	Non-native	Count of obs with 'good precision' (<=1000m)
Optimal Suitability	Occasional		+ indicates additional 'poor precision' obs (1001m-10,000m)
Moderate Suitability			
Low Suitability			
Suitable (introduced range)			

Latitude	Longitude
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Invasive and Pest Species

Summarized by: **24PRVT0262** *(Custom Area of Interest)*

	# Obs	Predicted Model	Range

Aquatic Invasive Species

V - Iris pseudacorus *(Yellowflag Iris)* N2A/AIS

View in Field Guide | View Predicted Models | View Range Maps

Noxious Weed: Priority 2A - Aquatic Invasive Species - Non-native Species Global: **GNR** State: **SNA**

Predicted Models: L 54% Low (inductive)

V - Myriophyllum spicatum *(Eurasian Water-milfoil)* N2A/AIS

View in Field Guide | View Predicted Models | View Range Maps

Noxious Weed: Priority 2A - Aquatic Invasive Species - Non-native Species Global: **GNR** State: **SNA**

Predicted Models: L 46% Low (inductive)

V - Nymphaea odorata *(American Water-lily)* AIS

View in Field Guide | View Predicted Models | View Range Maps

Aquatic Invasive Species - Non-native Species Global: **G5** State: **SNA**

Predicted Models: I 8% Suitable (introduced range) (deductive)

Noxious Weeds: Priority 1A

V - Centaurea solstitialis *(Yellow Starthistle)* N1A

View in Field Guide | View Predicted Models | View Range Maps

Noxious Weed: Priority 1A - Non-native Species Global: **GNR** State: **SNA**

Predicted Models: M 54% Moderate (inductive), L 23% Low (inductive)

V - Isatis tinctoria *(Dyer's Woad)* N1A

View in Field Guide | View Predicted Models | View Range Maps

Noxious Weed: Priority 1A - Non-native Species Global: **GNR** State: **SNA**

Predicted Models: M 8% Moderate (inductive), L 92% Low (inductive)

Noxious Weeds: Priority 1B

V - Lythrum salicaria *(Purple Loosestrife)* N1B

View in Field Guide | View Predicted Models | View Range Maps

Noxious Weed: Priority 1B - Non-native Species Global: **G5** State: **SNA**

Predicted Models: M 8% Moderate (inductive), L 54% Low (inductive)

V - Polygonum cuspidatum *(Japanese Knotweed)* N1B

View in Field Guide | View Predicted Models | View Range Maps

Noxious Weed: Priority 1B - Non-native Species Global: **GNRTNR** State: **SNA**

Predicted Models: L 54% Low (inductive)

Noxious Weeds: Priority 2A

V - Rhamnus cathartica *(Common Buckthorn)* N2A

View in Field Guide | View Predicted Models | View Range Maps

Noxious Weed: Priority 2A - Non-native Species Global: **GNR** State: **SNA**

Predicted Models: M 23% Moderate (inductive), L 69% Low (inductive)

V - Hieracium praealtum *(Kingdevil Hawkweed)* N2A

View in Field Guide | View Predicted Models | View Range Maps

Noxious Weed: Priority 2A - Non-native Species Global: **GNR** State: **SNA**

Predicted Models: M 8% Moderate (inductive), L 31% Low (inductive)

V - Ventenata dubia *(Ventenata)* N2A

View in Field Guide | View Predicted Models | View Range Maps

Noxious Weed: Priority 2A - Non-native Species Global: **GNR** State: **SNA**

Predicted Models: L 100% Low (inductive)

V - Iris pseudacorus *(Yellowflag Iris)* N2A/AIS

View in Field Guide | View Predicted Models | View Range Maps

Noxious Weed: Priority 2A - Aquatic Invasive Species - Non-native Species Global: **GNR** State: **SNA**

Predicted Models: L 54% Low (inductive)

V - Ranunculus acris *(Tall Buttercup)* N2A

View in Field Guide | View Predicted Models | View Range Maps

Noxious Weed: Priority 2A - Non-native Species Global: **G5** State: **SNA**

Predicted Models: L 54% Low (inductive)

V - Myriophyllum spicatum *(Eurasian Water-milfoil)* N2A/AIS

View in Field Guide | View Predicted Models | View Range Maps

Noxious Weed: Priority 2A - Aquatic Invasive Species - Non-native Species Global: **GNR** State: **SNA**

Predicted Models: L 46% Low (inductive)

View in Field Guide | View Predicted Models | View Range Maps
Noxious Weed: Priority 2A - Non-native Species Global: GNR State: SNA
Predicted Models: L 38% Low (inductive)

Noxious Weeds: Priority 2B

V - Cynoglossum officinale *(Common Hound's-tongue)* N2B

View in Field Guide | View Predicted Models | View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: GNR State: SNA
Predicted Models: M 62% Moderate (inductive), L 38% Low (inductive)

V - Linaria dalmatica *(Dalmatian Toadflax)* N2B

View in Field Guide | View Predicted Models | View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: G5 State: SNA
Predicted Models: M 62% Moderate (inductive), L 38% Low (inductive)

V - Centaurea stoebe *(Spotted Knapweed)* N2B 4

View in Field Guide | View Predicted Models | View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: GNR State: SNA
Predicted Models: M 54% Moderate (inductive), L 46% Low (inductive)

V - Lepidium draba *(Whitetop)* N2B

View in Field Guide | View Predicted Models | View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: GNR State: SNA
Predicted Models: M 54% Moderate (inductive), L 46% Low (inductive)

V - Centaurea diffusa *(Diffuse Knapweed)* N2B

View in Field Guide | View Predicted Models | View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: GNR State: SNA
Predicted Models: M 38% Moderate (inductive), L 62% Low (inductive)

V - Cirsium arvense *(Canada Thistle)* N2B 3

View in Field Guide | View Predicted Models | View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: G5 State: SNA
Predicted Models: M 23% Moderate (inductive), L 77% Low (inductive)

V - Euphorbia virgata *(Leafy Spurge)* N2B

View in Field Guide | View Predicted Models | View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: GNR State: SNA
Predicted Models: M 23% Moderate (inductive), L 77% Low (inductive)

V - Tanacetum vulgare *(Common Tansy)* N2B

View in Field Guide | View Predicted Models | View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: GNR State: SNA
Predicted Models: M 15% Moderate (inductive), L 46% Low (inductive)

V - Convolvulus arvensis *(Field Bindweed)* N2B 3

View in Field Guide | View Predicted Models | View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: GNR State: SNA
Predicted Models: M 8% Moderate (inductive), L 38% Low (inductive)

V - Potentilla recta *(Sulphur Cinquefoil)* N2B

View in Field Guide | View Predicted Models | View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: GNR State: SNA
Predicted Models: L 85% Low (inductive)

V - Berteroa incana *(Hoary False-alyssum)* N2B

View in Field Guide | View Predicted Models | View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: GNR State: SNA
Predicted Models: L 62% Low (inductive)

V - Linaria vulgaris *(Yellow Toadflax)* N2B

View in Field Guide | View Predicted Models | View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: GNR State: SNA
Predicted Models: L 62% Low (inductive)

V - Leucanthemum vulgare *(Oxeye Daisy)* N2B

View in Field Guide | View Predicted Models | View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: GNR State: SNA
Predicted Models: L 54% Low (inductive)

V - Acroptilon repens *(Russian Knapweed)* N2B

View in Field Guide | View Predicted Models | View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: GNR State: SNA
Predicted Models: L 38% Low (inductive)

V - Tamarix ramosissima *(Salt Cedar)* N2B

View in Field Guide | View Predicted Models | View Range Maps
Noxious Weed: Priority 2B - Non-native Species Global: GNR State: SNA
Predicted Models: L 31% Low (inductive)

Regulated Weeds: Priority 3

View in Field Guide **View Predicted Models** **View Range Maps**
Regulated Weed: Priority 3 - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: L 100% Low (inductive)

V - Elaeagnus angustifolia *(Russian Olive)* R3

View in Field Guide **View Predicted Models** **View Range Maps**
Regulated Weed: Priority 3 - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: L 38% Low (inductive)

Biocontrol Species

I - Aphthona lacertosa *(Brown-legged Leafy Spurge Flea Beetle)* BIOCNTRL

View in Field Guide **View Predicted Models** **View Range Maps**
Biocontrol Species - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 100% Moderate (inductive)

I - Oberea erythrocephala *(Red-headed Leafy Spurge Stem Borer)* BIOCNTRL

View in Field Guide **View Predicted Models** **View Range Maps**
Biocontrol Species - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 92% Moderate (inductive), L 8% Low (inductive)

I - Aphthona nigriscutis *(Black Dot Leafy Spurge Flea Beetle)* BIOCNTRL

View in Field Guide **View Predicted Models** **View Range Maps**
Biocontrol Species - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 54% Moderate (inductive), L 38% Low (inductive)

I - Cyphocleonus achates *(Knapweed Root Weevil)* BIOCNTRL

View in Field Guide **View Predicted Models** **View Range Maps**
Biocontrol Species - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 15% Moderate (inductive), L 85% Low (inductive)

I - Mecinus janthiniformis *(Dalmatian Toadflax Stem-boring Weevil)* BIOCNTRL

View in Field Guide **View Predicted Models** **View Range Maps**
Biocontrol Species - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 8% Moderate (inductive), L 92% Low (inductive)

I - Mecinus janthinus *(Yellow Toadflax Stem-boring Weevil)* BIOCNTRL

View in Field Guide **View Predicted Models** **View Range Maps**
Biocontrol Species - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: L 31% Low (inductive)

Introduction to Montana Natural Heritage Program

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NATURAL HERITAGE PROGRAM

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Introduction

The Montana Natural Heritage Program (MTNHP) is Montana's source for reliable and objective information on Montana's native species and habitats, emphasizing those of conservation concern. MTNHP was created by the Montana legislature in 1983 as part of the Natural Resource Information System (NRIS) at the Montana State Library (MSL). MTNHP is "a program of information acquisition, storage, and retrieval for data relating to the flora, fauna, and biological community types of Montana" (MCA 90-15-102). MTNHP's activities are guided by statute as well as through ongoing interaction with, and feedback from, principal data source agencies such as Montana Fish, Wildlife, and Parks, the Montana Department of Environmental Quality, the Montana Department of Natural Resources and Conservation, the Montana University System, the US Forest Service, and the US Bureau of Land Management. Since the first staff was hired in 1985, the Program has logged a long record of success, and developed into a highly respected, service-oriented program. MTNHP is widely recognized as one of the most advanced and effective of over 60 natural heritage programs that are distributed across North America.

Vision

Our vision is that public agencies, the private sector, the education sector, and the general public will trust and rely upon MTNHP as the source for information and expertise on Montana's species and habitats, especially those of conservation concern. We strive to provide easy access to our information to allow users to save time and money, speed environmental reviews, and make informed decisions.

Core Values

- We endeavor to be a single statewide source of accurate and up-to-date information on Montana's plants, animals, and aquatic and terrestrial biological communities.
- We actively listen to our data users and work responsively to meet their information and training needs.
- We strive to provide neutral, trusted, timely, and equitable service to all of our information users.
- We make every effort to be transparent to our data users in setting work priorities and providing data products.

Confidentiality

All information requests made to the Montana Natural Heritage Program are considered library records and are protected from disclosure by the Montana Library Records Confidentiality Act (MCA 22-1-11).

Information Managed

Information managed at the Montana Natural Heritage Program is botanical, zoological, and ecological information that describes the distribution (e.g., observations, structured surveys, range polygons, predicted habitat suitability models), conservation status (e.g., global and state conservation status ranks, including threats), and other supporting information (e.g., accounts and references) on the biology and ecology of species and biological communities.

Data Use Terms and Conditions

- Montana Natural Heritage Program (MTNHP) products and services are based on biological data and the objective interpretation of those data by professional scientists. MTNHP does not advocate any particular philosophy of natural resource protection, management, development, or public policy.
- MTNHP has no natural resource management or regulatory authority. Products, statements, and services from MTNHP are intended to inform parties as to the state of scientific knowledge about certain natural resources, and to further develop that knowledge. The information is not intended as natural resource management guidelines or prescriptions or a determination of environmental impacts. MTNHP recommends consultation with appropriate state, federal, and tribal resource management agencies and authorities in the area where your project is located.
- Information on the status and spatial distribution of biological resources produced by MTNHP are intended to inform parties of the state-wide status, known occurrence, or the likelihood of the presence of those resources. **These products are not intended to substitute for field-collected data, nor are they intended to be the sole basis for natural resource management decisions.**
- MTNHP does not portray its data as exhaustive or comprehensive inventories of rare species or biological communities. **Field verification of the absence or presence of sensitive species and biological communities will always be an important obligation of users of our data.**
- MTNHP responds equally to all requests for products and services, regardless of the purpose or identity of the requester.
- Because MTNHP constantly updates and revises its databases with new data and information, products will become outdated over time. Interested parties are encouraged to obtain the most current information possible from MTNHP, rather than using older products. We add, review, update, and delete records on a daily basis. Consequently, we strongly advise that you update your MTNHP data sets at a minimum of every four months for most applications of our information.
- MTNHP data require a certain degree of biological expertise for proper analysis, interpretation, and application. Our staff is available to advise you on questions regarding the interpretation or appropriate use of the data that we provide. See Contact Information for MTNHP Staff
- The information provided to you by MTNHP may include sensitive data that if publicly released might jeopardize the welfare of threatened, endangered, or sensitive species or biological communities. This information is intended for distribution or use only within your department, agency, or business. Subcontractors may have access to the data during the course of any given project, but should not be given a copy for their use on subsequent, unrelated work.
- MTNHP data are made freely available. Duplication of hard-copy or digital MTNHP products with the intent to sell is prohibited without written consent by MTNHP. Should you be asked by individuals outside your organization for the type of data that we provide, please refer them to MTNHP.
- MTNHP and appropriate staff members should be appropriately acknowledged as an information source in any third-party product involving MTNHP data, reports, papers, publications, or in maps that incorporate MTNHP graphic elements.
- Sources of our data include museum specimens, published and unpublished scientific literature, field surveys by state and federal agencies and private contractors, and reports from knowledgeable individuals. MTNHP actively solicits and encourages additions, corrections and updates, new observations or collections, and comments on any of the data we provide.
- MTNHP staff and contractors do not enter or cross privately-owned lands without express permission from the landowner. However, the program cannot guarantee that information provided to us by others was obtained under adherence to this policy.

Suggested Contacts for Natural Resource Management Agencies

As required by Montana statute (MCA 90-15), the Montana Natural Heritage Program works with state, federal, tribal, nongovernmental organizations, and private partners to ensure that the latest animal and plant distribution and status information is incorporated into our databases so that it can be used to inform a variety of permitting and planning processes and management decisions. We encourage you to contact state, federal, and tribal resource management agencies in the area where your project is located and review the permitting overviews by the Montana Department of Environmental Quality, the Montana Department of Natural Resources and Conservation and the Index of Environmental Permits for Montana for guidelines relevant to your efforts. In particular, we encourage you to contact the Montana Department of Fish, Wildlife, and Parks for the latest data and management information regarding hunted and high-profile management species and to use the U.S. Fish and Wildlife Service's Information Planning and Consultation (IPAC) website regarding U.S. Endangered Species Act listed Threatened, Endangered, or Candidate species.

For your convenience, we have compiled a list of relevant agency contacts and links below:

Montana Fish, Wildlife, and Parks

Fish Species	Zachary Shattuck zshattuck@mt.gov (406) 444-1231 or Eric Roberts eroberts@mt.gov (406) 444-5334
American Bison Black-footed Ferret Black-tailed Prairie Dog Bald Eagle Golden Eagle Common Loon Least Tern Piping Plover Whooping Crane	Kristina Smucker KSmucker@mt.gov (406) 444-5209
Grizzly Bear Greater Sage Grouse Trumpeter Swan Big Game Upland Game Birds Furbearers	Brian Wakeling brian.wakeling@mt.gov (406) 444-3940
Managed Terrestrial Game Data	Adam Messer – MFWP GIS Coordinator amesser@mt.gov (406) 444-0095
Fisheries Data and Nongame Animal Data	Adam Messer – MFWP GIS Coordinator amesser@mt.gov (406) 444-0095
Wildlife and Fisheries Scientific Collector's Permits	https://fwp.mt.gov/buyandapply/commercialwildlifeandscientificpermits/scientific Kristina Smucker for Wildlife ksmucker@mt.gov (406) 444-5209 Dave Schmetterling for Fisheries dschmetterling@mt.gov (406) 542-5514
Fish and Wildlife Recommendations for Subdivision Development	Stevie Burton stevie.burton@mt.gov (406) 594-7354 See https://fwp.mt.gov/conservation/living-with-wildlife/subdivision-recommendations
Regional Contacts  	Region 1 (Kalispell) (406) 752-5501 fwprg12@mt.gov Region 2 (Missoula) (406) 542-5500 fwprg22@mt.gov Region 3 (Bozeman) (406) 577-7900 fwprg3@mt.gov Region 4 (Great Falls) (406) 454-5840 fwprg42@mt.gov Region 5 (Billings) (406) 247-2940 fwprg52@mt.gov Region 6 (Glasgow) (406) 228-3700 fwprg62@mt.gov Region 7 (Miles City) (406) 234-0900 fwprg72@mt.gov

Montana Department of Agriculture
General Contact Information: https://agr.mt.gov/About/Office-Locations/Office-Locations-and-Field-Offices
Noxious Weeds: https://agr.mt.gov/Noxious-Weeds

Montana Department of Environmental Quality
Permitting and Operator Assistance for all Environmental Permits: https://deq.mt.gov/Permitting

Montana Department of Natural Resources and Conservation
Overview of, and contacts for, licenses and permits for state lands, water, and forested lands: https://dnrc.mt.gov/Permits-Services

Stream Permitting (310 permits) and an overview of various water and stream related permits (e.g., Stream Protection Act 124, Federal Clean Water Act 404, Federal Rivers and Harbors Act Section 10, Short-term Water Quality Standard for Turbidity 318 Authorization, etc.).
https://dnrc.mt.gov/Licenses-and-Permits/Stream-Permitting

Wildfire Resources: https://dnrc.mt.gov/Forestry/Wildfire

Bureau of Land Management

Montana Field Office Contacts:

Billings	(406) 896-5013
Butte	(406) 533-7600
Dillon	(406) 683-8000
Glasgow	(406) 228-3750
Havre	(406) 262-2820
Lewistown	(406) 538-1900
Malta	(406) 654-5100
Miles City	(406) 233-2800
Missoula	(406) 329-3914

United States Army Corps of Engineers
Montana Regulatory Office for federal permits related to construction in water and wetlands
https://www.nwo.usace.army.mil/Missions/Regulatory-Program/Montana/ (406) 441-1375

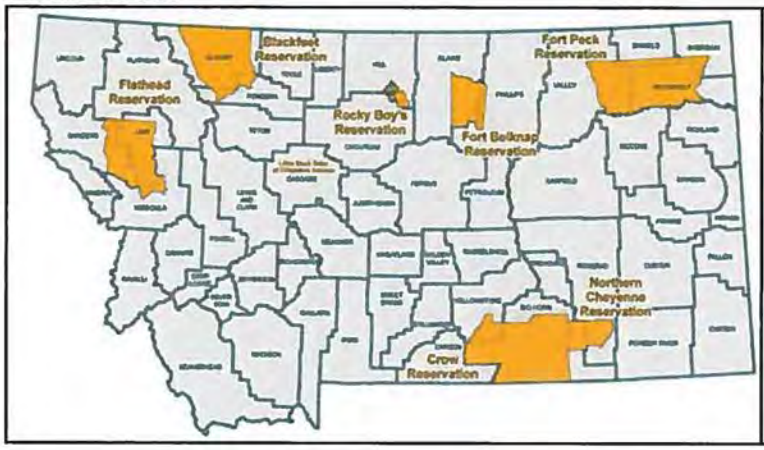
United States Environmental Protection Agency
Environmental information, notices, permitting, and contacts https://www.epa.gov/mt
Gateway to state resource locators https://www.envcap.org/srl/index.php

United States Fish and Wildlife Service
Information Planning and Conservation (IPAC) website: https://ipac.ecosphere.fws.gov
Montana Ecological Services Field Office: https://www.fws.gov/office/montana-ecological-services (406) 449-5225

United States Forest Service

Regional Office – Missoula, Montana Contacts			
Wildlife Program Leader	Tammy Fletcher	tammy.fletcher2@usda.gov	(406) 329-3086
Wildlife Ecologist	Cara Staab	cara.staab@usda.gov	(406) 329-3677
Aquatic Ecologist	Justin Jimenez	justin.jimenez@usda.gov	(435) 370-6830
TES Program	Lydia Allen	lydia.allen@usda.gov	(406) 329-3558
Interagency Grizzly Bear Coordinator	Scott Jackson	scott.jackson@usda.gov	(406) 329-3664
Regional Botanist	Amanda Hendrix	amanda.hendrix@usda.gov	(651) 447-3016
Regional Vegetation Ecologist	Mary Manning	marry.manning@usda.gov	(406) 329-3304
Invasive Species Program Manager	Michelle Cox	michelle.cox2@usda.gov	(406) 329-3669

Tribal Nations



Assiniboine & Gros Ventre Tribes – Fort Belknap Reservation
Assiniboine & Sioux Tribes – Fort Peck Reservation
Blackfeet Tribe - Blackfeet Reservation
Chippewa Creek Tribe - Rocky Boy's Reservation
Crow Tribe – Crow Reservation
Little Shell Chippewa Tribe
Northern Cheyenne Tribe – Northern Cheyenne Reservation
Salish & Kootenai Tribes - Flathead Reservation

Natural Heritage Programs and Conservation Data Centers in Surrounding States and Provinces

Alberta Conservation Information Management System
British Columbia Conservation Data Centre
Idaho Natural Heritage Program
North Dakota Natural Heritage Program
Saskatchewan Conservation Data Centre
South Dakota Natural Heritage Program
Wyoming Natural Diversity Database

Invasive Species Management Contacts and Information

Aquatic Invasive Species
Montana Fish, Wildlife, and Parks Aquatic Invasive Species staff
Montana Department of Natural Resources and Conservation's Aquatic Invasive Species Grant Program
Montana Invasive Species Council (MISC)
Western Montana Conservation Commission

Noxious Weeds
Montana Weed Control Association Contacts Webpage
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Fish, Wildlife, and Parks - Noxious Weeds
Montana State University Integrated Pest Management Extension
Integrated Noxious Weed Management after Wildfires
Fire Management and Invasive Plants

Introduction to Native Species

Within the report area you have requested, separate summaries are provided for: (1) Species Occurrences (SO) for plant and animal Species of Concern, Special Status Species (SSS), Important Animal Habitat (IAH) and some Potential Plant Species of Concern; (2) other observed non Species of Concern or Species of Concern without suitable documentation to create Species Occurrence polygons; and (3) other non-documented species that are potentially present based on their range, predicted suitable habitat model output, or presence of associated habitats. Each of these summaries provides the following information when present for a species: (1) the number of Species Occurrences and associated delineation criteria for construction of these polygons that have long been used for considerations of documented Species of Concern in environmental reviews; (2) the number of observations of each species; (3) the geographic range polygons for each species that the report area overlaps; (4) predicted relative habitat suitability classes that are present if a predicted suitable habitat model has been created; (5) the percent of the report area that is mapped as commonly associated or occasionally associated habitat as listed for each species in the Montana Field Guide; and (6) a variety of conservation status ranks and links to species accounts in the Montana Field Guide. Details on each of these information categories are included under relevant section headers below or are defined on our Species Status Codes page. In presenting this information, the Montana Natural Heritage Program (MTNHP) is working towards assisting the user with rapidly determining what species have been documented and what species are potentially present in the report area. We remind users that this information is likely incomplete as surveys to document native and introduced species are lacking in many areas of the state, information on introduced species has only been tracked relatively recently, the MTNHP's staff and resources are restricted by budgets, and information is constantly being added and updated in our databases. **Thus, field verification by professional biologists of the absence or presence of species and biological communities will always be an important obligation of users of our data.**

If you are aware of observation datasets that the MTNHP is missing, please report them to the Program Botanist apipp@mt.gov or Senior Zoologist dbachen@mt.gov If you have animal or plant observations that you would like to contribute, you can also submit them via Excel spreadsheets, geodatabases, iNaturalist, or a Survey123 form. Various methods of data submission are reviewed in this playlist of videos: https://www.youtube.com/playlist?list=PLRaydtZpHu2qOHPoSPq9cnM9uXGmEXACx

Observations

The MTNHP manages information on several million animal and plant observations that have been reported by professional biologists and private citizens from across Montana. The majority of these observations are submitted in digital format from standardized databases associated with research or monitoring efforts and spreadsheets of incidental observations submitted by professional biologists and amateur naturalists. At a minimum, accepted observation records must contain a credible species identification (i.e. appropriate geographic range, date, and habitat and, if species are difficult to identify, a photograph and/or notes on key identifying features), a date or date range, observer name, locational information (ideally with latitude and longitude in decimal degrees), notes on numbers observed, and species behavior or habitat use (e.g., is the observation likely associated with reproduction). Bird records are also required to have information associated with date-appropriate breeding or overwintering status of the species observed. MTNHP reviews observation records to ensure that they are mapped correctly, occur within date ranges when the species is known to be present or detectable, occur within the known seasonal geographic range of the species, and occur in appropriate habitats. MTNHP also assigns each record a locational uncertainty value in meters to indicate the spatial precision associated with the record's mapped coordinates. Only records with locational uncertainty values of 10,000 meters or less are included in environmental summary reports and number summaries are only provided for records with locational uncertainty values of 1,000 meters or less.

Species Occurrences

The MTNHP evaluates plant and animal observation records for species of higher conservation concern to determine whether they are worthy of inclusion in the Species Occurrence (SO) layer for use in environmental reviews; observations not worthy of inclusion in this layer include long distance dispersal events, migrants observed away from key migratory stopover habitats, and winter observations. An SO is a polygon depicting what is known about a species occupancy from direct observation with a defined level of locational uncertainty and any inference that can be made about adjacent habitat use from the latest peer-reviewed science. If an observation can be associated with a map feature that can be tracked (e.g., a wetland boundary for a wetland associated plant) then this polygon feature is used to represent the SO. Areas that can be inferred as probable occupied habitat based on direct observation of a species location and what is known about the foraging area or home range size of the species may be incorporated into the SO. Species Occurrences generally belong to one of the following categories:

Plant Species Occurrences

A documented location of a specimen collection or observed plant population. In some instances, adjacent, spatially separated clusters are considered subpopulations and are grouped as one occurrence (e.g., the subpopulations occur in ecologically similar habitats, and their spatial proximity likely allows them to interbreed). Tabular information for multiple observations at the same SO location is generally linked to a single polygon. Plant SO's are only created for Species of Concern and Potential Species of Concern.

Animal Species Occurrences

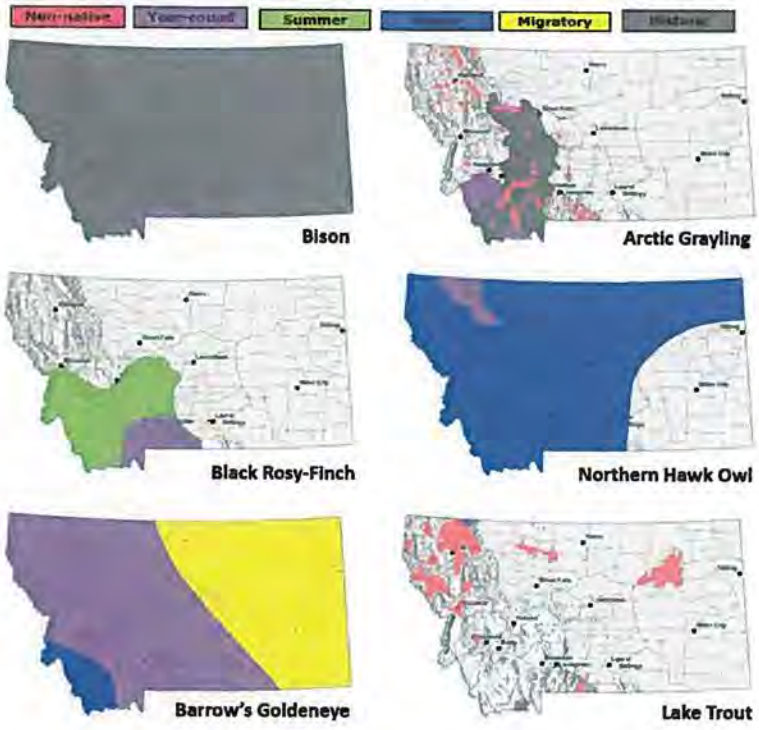
The location of a verified observation or specimen record typically known or assumed to represent a breeding population or a portion of a breeding population. Animal SO's are generally: (1) buffers of terrestrial point observations based on documented species' home range sizes; (2) buffers of stream segments to encompass occupied streams and immediate adjacent riparian habitats; (3) polygonal features encompassing known or likely breeding populations (e.g., a wetland for some amphibians or a forested portion of a mountain range for some wide-ranging carnivores); or (4) combinations of the above. Tabular information for multiple observations at the same SO location is generally linked to a single polygon. Species Occurrence polygons may encompass some unsuitable habitat in some instances in order to avoid heavy data processing associated with clipping out habitats that are readily assessed as unsuitable by the data user (e.g., a point buffer of a terrestrial species may overlap into a portion of a lake that is obviously inappropriate habitat for the species). Animal SO's are only created for Species of Concern and Special Status Species (e.g., Bald Eagle).

Other Occurrence Polygons

These include significant biological features not included in the above categories, such as Important Animal Habitats like bird rookeries and bat roosts, and peatlands or other wetland and riparian communities that support diverse plant and animal communities.

Geographic Range Polygons

Geographic range polygons are still under development for most plant and invertebrate species. Native year-round, summer, winter, migratory and historic geographic range polygons as well as polygons for introduced populations have been defined for most vertebrate animal species for which there are enough observations, surveys, and knowledge of appropriate seasonal habitat use to define them (see examples to left). These native or introduced range polygons bound the extent of known or likely occupied habitats for non-migratory and relative sedentary species and the regular extent of known or likely occupied habitats for migratory and long-distance dispersing species; polygons may include unsuitable intervening habitats. For most species, a single polygon can represent the year-round or seasonal range, but breeding ranges of some colonial nesting water birds and some introduced species are represented more patchily when supported by data. Some ranges are mapped more broadly than actual distributions in order to be visible on statewide maps (e.g., fish).



Predicted Suitable Habitat Models

Predicted habitat suitability models have been created for plant and animal Species of Concern and are undergoing development for non-Species of Concern. For species for which models have been completed, the environmental summary report includes simple rule-based associations with streams for aquatic species and seasonal habitats for game species as well as mathematically complex Maximum Entropy models (Phillips et al. 2006, Ecological Modeling 190:231-259) constructed from a variety of statewide biotic and abiotic layers and presence only data for individual species for most terrestrial species. For the Maximum Entropy models, we reclassified 90 x 90-meter continuous model output into suitability classes (unsuitable, low, moderate, and optimal) then aggregated that into the one square mile hexagons used in the environmental summary report; this is the finest spatial scale we suggest using this information in management decisions and survey planning. Full model write ups for individual species that discuss model goals, inputs, outputs, and evaluation in much greater detail are posted on the MTNHP's Predicted Suitable Habitat Models webpage. Evaluations of predictive accuracy and specific limitations are included with the metadata for models of individual species. **Model outputs should not be used in place of on-the-ground surveys for species. Instead model outputs should be used in conjunction with habitat evaluations to determine the need for on-the-ground surveys for species.** We suggest that the percentage of predicted optimal and moderate suitable habitat within the report area be used in conjunction with geographic range polygons and the percentage of commonly associated habitats to generate lists of potential species that may occupy broader landscapes for the purposes of landscape-level planning.

Associated Habitats

Within the boundary of the intersected hexagons, we provide the approximate percentage of commonly or occasionally associated habitat for vertebrate animal species that regularly breed, overwinter, or migrate through the state; a detailed list of commonly and occasionally associated habitats is provided in individual species accounts in the Montana Field Guide We assigned common or occasional use of each of the ecological

systems mapped in Montana by: (1) using personal knowledge and reviewing literature that summarizes the breeding, overwintering, or migratory habitat requirements of each species; (2) evaluating structural characteristics and distribution of each ecological system relative to the species' range and habitat requirements; (3) examining the observation records for each species in the state-wide point observation database associated with each ecological system; and (4) calculating the percentage of observations associated with each ecological system relative to the percent of Montana covered by each ecological system to get a measure of numbers of observations versus availability of habitat. Species that breed in Montana were only evaluated for breeding habitat use, species that only overwinter in Montana were only evaluated for overwintering habitat use, and species that only migrate through Montana were only evaluated for migratory habitat use. In general, species were listed as associated with an ecological system if structural characteristics of used habitat documented in the literature were present in the ecological system or large numbers of point observations were associated with the ecological system. However, species were not listed as associated with an ecological system if there was no support in the literature for use of structural characteristics in an ecological system, even if point observations were associated with that system. Common versus occasional association with an ecological system was assigned based on the degree to which the structural characteristics of an ecological system matched the preferred structural habitat characteristics for each species as represented in the scientific literature. The percentage of observations associated with each ecological system relative to the percent of Montana covered by each ecological system was also used to guide assignment of common versus occasional association.

We suggest that the percentage of commonly associated habitat within the report area be used in conjunction with geographic range polygons and the percentage of predicted optimal and moderate suitable habitat from predictive models to generate lists of potential species that may occupy broader landscapes for the purposes of landscape-level planning. Users of this information should be aware that land cover mapping accuracy is particularly problematic when the systems occur as small patches or where the land cover types have been altered over the past decade. Thus, particular caution should be used when using the associations in assessments of smaller areas (e.g., evaluations of public land survey sections).

Introduction to Land Cover

Land Use/Land Cover is one of 15 Montana Spatial Data Infrastructure framework layers considered vital for making statewide maps of Montana and understanding its geography. The layer records all Montana natural vegetation, land cover and land use, classified from satellite and aerial imagery, mapped at a scale of 1:100,000, and interpreted with supporting ground-level data. The baseline map is adapted from the Northwest ReGAP (NWGAP) project land cover classification, which used 30m resolution multi-spectral Landsat imagery acquired between 1999 and 2001. Vegetation classes were drawn from the Ecological System Classification developed by NatureServe (Comer et al. 2003). The land cover classes were developed by Anderson et al. (1976). The NWGAP effort encompasses 12 map zones. Montana overlaps seven of these zones. The two NWGAP teams responsible for the initial land cover mapping effort in Montana were Sanborn and NWGAP at the University of Idaho. Both Sanborn and NWGAP employed a similar modeling approach in which Classification and Regression Tree (CART) models were applied to Landsat ETM+ scenes. The Spatial Analysis Lab within the Montana Natural Heritage Program was responsible for developing a seamless Montana land cover map with a consistent statewide legend from these two separate products. Additionally, the Montana land cover layer incorporates several other land cover and land use products (e.g., MSDI Structures and Transportation themes and the Montana Department of Revenue Final Land Unit classification) and reclassifications based on plot-level data and the latest NAIP imagery to improve accuracy and enhance the usability of the theme. Updates are done as partner support and funding allow, or when other MSDI datasets can be incorporated. Recent updates include fire perimeters and agricultural land use (annually), energy developments such as wind, oil and gas installations (2014), roads, structures and other impervious surfaces (various years): and local updates/improvements to specific ecological systems (e.g., central Montana grassland and sagebrush ecosystems). Current and previous versions of the Land Use/Land Cover layer with full metadata are available for download from the Montana State Library's GIS Data List More information on the land cover layer is available at: https://msl.mt.gov/geoinfo/msdi/land_use_land_cover/

Within the report area you have requested, land cover is summarized by acres of Level 1, Level 2, and Level 3 Ecological Systems.

Literature Cited

Anderson, J.R. E.E. Hardy, J.T. Roach, and R.E. Witmer. 1976. A land use and land cover classification system for use with remote sensor data. U.S. Geological Survey Professional Paper 964.

Comer, P., D. Faber-Langendoen, R. Evans, S. Gawler, C. Josse, G. Kittel, S. Menard, M. Pyne, M. Reid, K. Schulz, K. Snow, and J. Teague. 2003. Ecological systems of the United States: A working classification of U.S. terrestrial systems. NatureServe, Arlington, VA.

Introduction to Wetland and Riparian

Within the report area you have requested, wetland and riparian mapping is summarized by acres of each classification present. Summaries are only provided for modern MTNHP wetland and riparian mapping and not for outdated (NWI Legacy) or incomplete (NWI Scalable) mapping efforts; described here. MTNHP has made all three of these datasets and associated metadata available for separate download on the Montana Wetland and Riparian Framework web page.

Wetland and Riparian mapping is one of 15 Montana Spatial Data Infrastructure framework layers considered vital for making statewide maps of Montana and understanding its geography. The wetland and riparian framework layer consists of spatial data representing the extent, type, and approximate location of wetlands, riparian areas, and deep water habitats in Montana.

Wetland and riparian mapping is completed through photointerpretation of 1-m resolution color infrared aerial imagery acquired from 2005 or later. A coding convention using letters and numbers is assigned to each mapped wetland. These letters and numbers describe the broad landscape context of the wetland, its vegetation type, its water regime, and the kind of alterations that may have occurred. Ancillary data layers such as topographic maps, digital elevation models, soils data, and other aerial imagery sources are also used to improve mapping accuracy. Wetland mapping follows the federal Wetland Mapping Standard and classifies wetlands according to the Cowardin classification system of the National Wetlands Inventory (NWI) (Cowardin et al. 1979, FGDC Wetlands Subcommittee 2013). Federal, State, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands differently than the NWI. Similar coding, based on U.S. Fish and Wildlife Service conventions, is applied to riparian areas (U.S. Fish and Wildlife Service 2009). These are mapped areas where vegetation composition and growth is influenced by nearby water bodies, but where soils, plant communities, and hydrology do not display true wetland characteristics. **These data are intended for use at a scale of 1:12,000 or smaller. Mapped wetland and riparian areas do not represent precise boundaries and digital wetland data cannot substitute for an on-site determination of jurisdictional wetlands.**

See detailed overviews, with examples, of both wetland and riparian classification systems and associated codes as a storymap and companion guide

Literature Cited

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Fish and Wildlife Service, FWS/OBS-79/31. Washington, D.C. 103pp.

Federal Geographic Data Committee. 2013. Classification of wetlands and deepwater habitats of the United States. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, D.C.

U.S. Fish and Wildlife Services. 2009. A system for mapping riparian areas in the western United States. Division of Habitat and Resource Conservation, Branch of Resource and Mapping Support, Arlington, Virginia.

Introduction to Land Management

Within the report area you have requested, land management information is summarized by acres of federal, state, and local government lands, tribal reservation boundaries, private conservation lands, and federal, state, local, and private conservation easements. Acreage for "Owned", "Tribal", or "Easement" categories represents non-overlapping areas that may be totaled. However, "Other Boundaries" represents managed areas such as National Forest boundaries containing private inholdings and other mixed ownership which may cause boundaries to overlap (e.g. a wilderness area within a forest). Therefore, acreages may not total in a straight-forward manner.

Because information on land stewardship is critical to effective land management, the Montana Natural Heritage Program (MTNHP) began compiling ownership and management data in 1997. The goal of the Montana Land Management Database is to manage a single, statewide digital data set that incorporates information from both public and private entities. The database assembles information on public lands, private conservation lands, and conservation easements held by state and federal agencies and land trusts and is updated on a regular basis. Since 2011, the Information Management group in the Montana State Library's Digital Library Division has led the Montana Land Management Database in partnership with the MTNHP.

Public and private conservation land polygons are attributed with the name of the entity that owns it. The data are derived from the statewide Montana Cadastral Parcel layer Conservation easement data shows land parcels on which a public agency or qualified land trust has placed a conservation easement in cooperation with the landowner. The dataset contains no information about ownership or status of the mineral estate. For questions about the dataset or to report errors, please contact the Montana Natural Heritage Program at (406) 444-5363 or mtnhp@mt.gov. You can download various components of the Land Management Database and view associated metadata at the Montana State Library's GIS Data List at the following links:

Public Lands
Conservation Easements
Private Conservation Lands
Managed Areas

Map features in the Montana Land Management Database or summaries provided in this report are not intended as a legal depiction of public or private surface land ownership boundaries and should not be used in place of a survey conducted by a licensed land surveyor. Similarly, map features do not imply public access to any lands. The Montana Natural Heritage Program makes no representations or warranties whatsoever with respect to the accuracy or completeness of this data and assumes no responsibility for the suitability of the data for a particular purpose. The Montana Natural Heritage Program will not be liable for any damages incurred as a result of errors displayed here. Consumers of this information should review or consult the primary data and information sources to ascertain the viability of the information for their purposes.

Introduction to Invasive and Pest Species

Within the report area you have requested, separate summaries are provided for: Aquatic Invasive Species, Noxious Weeds, Agricultural Pests, Forest Pests, and Biocontrol species that have been documented or potentially occur there based on the predicted suitability of habitat. Definitions for each of these invasive and pest species categories can be found on our Species Status Codes page.

Each of these summaries provides the following information when present for a species: (1) the number of observations of each species; (2) the geographic range polygons for each species, if developed, that the report area overlaps; (3) predicted relative habitat suitability classes that are present if a predicted suitable habitat model has been created; (4) the percent of the report area that is mapped as commonly associated or occasionally associated habitat as listed for each species in the Montana Field Guide; and (5) links to species accounts in the Montana Field Guide. Details on each of these information categories are included under relevant section headers under the Introduction to Native Species above or are defined on our Species Status Codes page. In presenting this information, the Montana Natural Heritage Program (MTNHP) is working towards assisting the user with rapidly determining what invasive and pest species have been documented and what species are potentially present in the report area. We remind users that this information is likely incomplete as surveys to document introduced species are lacking in many areas of the state, information on introduced species has only been tracked relatively recently, the MTNHP's staff and resources are limited, and information is constantly being added and updated in our databases. **Thus, field verification by professional biologists of the absence or presence of species will always be an important obligation of users of our data.**

If you are aware of observation or survey datasets for invasive or pest species that the MTNHP is missing, please report them to the Program Coordinator bmaxell@mt.gov Program Botanist apipp@mt.gov or Senior Zoologist dbachen@mt.gov If you have animal or plant observations that you would like to contribute, you can also submit them via Excel spreadsheets, geodatabases, iNaturalist, or a Survey123 form. Various methods of data submission are reviewed in this playlist of videos:
https://www.youtube.com/playlist?list=PLRaydtZpHu2qOHPoSPq9cnM9uXGmEXACx

Additional Information Resources

MTNHP Staff Contact Information

Montana Field Guide

MTNHP Species of Concern Report - Animals and Plants

MTNHP Species Status Codes - Explanation

MTNHP Predicted Suitable Habitat Models (for select Animals and Plants)

MTNHP Request Information page

Montana Cadastral

Montana Code Annotated

Montana Fisheries Information System

Montana Fish, Wildlife, and Parks Subdivision Recommendations

Montana GIS Data Layers

Montana GIS Data Bundler

Montana Greater Sage-Grouse Project Submittal Site

Montana Ground Water Information Center

Montana Index of Environmental Permits, 21st Edition (2018)

Montana Environmental Policy Act (MEPA)

Montana Environmental Policy Act Analysis Resource List

Laws, Treaties, Regulations, and Agreements on Animals and Plants

Montana Spatial Data Infrastructure Layers

Montana State Historic Preservation Office Review and Compliance

Montana Stream Permitting: a guide for conservation district supervisors and others

Montana Water Information System

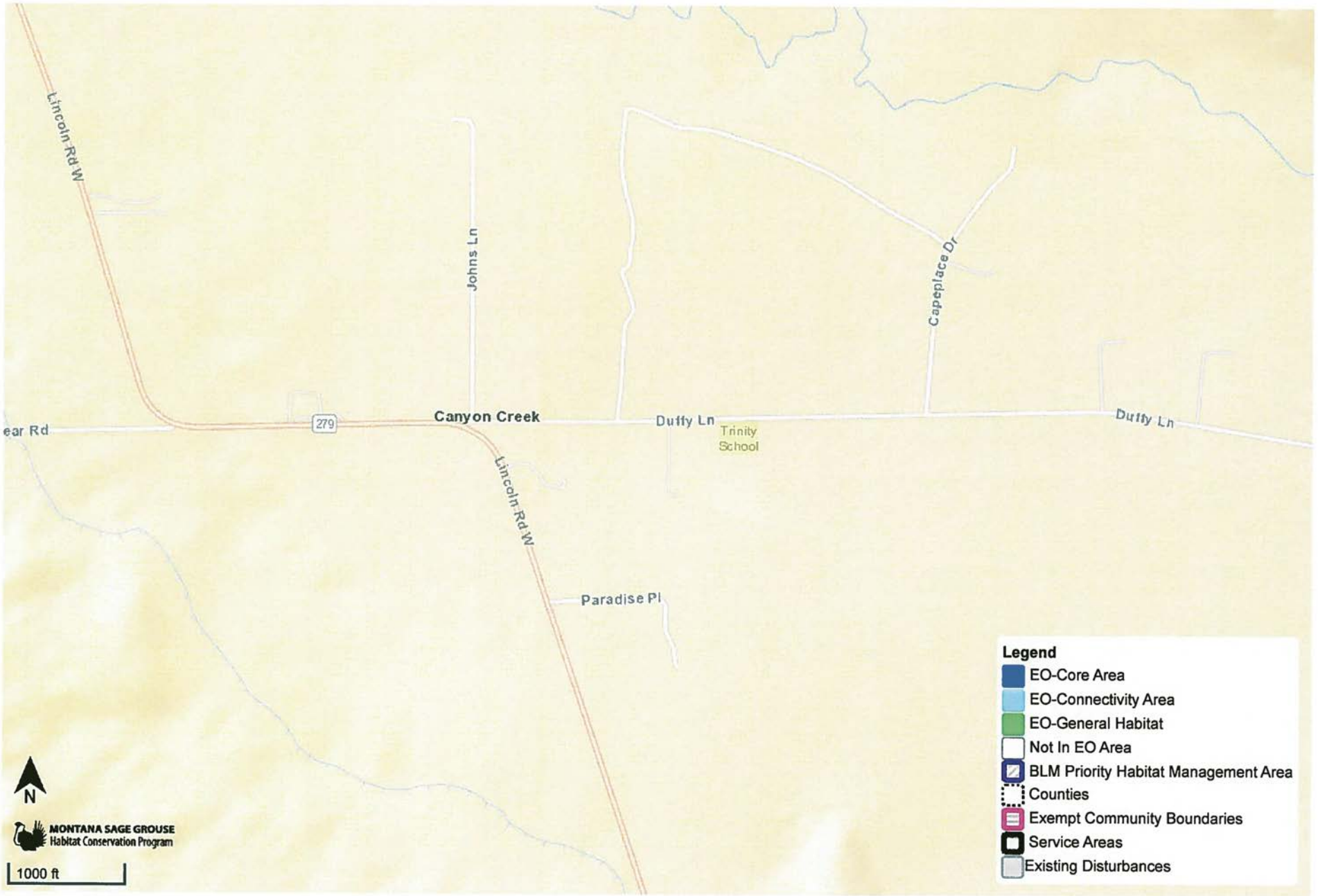
Montana Web Map Services

National Environmental Policy Act

Penalties for Misuse of Fish and Wildlife Location Data (MCA 87-6-222)

U.S. Fish and Wildlife Service Information for Planning and Consultation (Section 7 Consultation)

Web Soil Survey Tool



HUMAN ENVIRONMENT

4

HISTORIC SITES

Steve Kotson

From: Murdo, Damon <dmurdo@mt.gov>
Sent: Friday, March 15, 2024 10:55 AM
To: Steve Kotson
Subject: RE: Historic Search Request for the Canyon Creek School
Attachments: Reports.pdf; Sites.pdf; 2024031407.pdf

March 15, 2024

Steve Kotson
Casne & Associates
664 Logan St.
Helena MT 59601

MONTANA
HISTORICAL SOCIETY
State Historic
Preservation Office

RE: CANYON CREEK SCHOOL WATER TREATMENT SYSTEM REPLACEMENT. SHPO Project #: 2024031407

Dear Mr. Kotson:

I have conducted a cultural resource file search for the above-cited project located in Section 16, T12N R5W. According to our records there have been a few previously recorded sites within the designated search locales. In addition to the sites there have been a few previously conducted cultural resource inventories done in the areas. I've attached a list of these sites and reports. If you would like any further information regarding these sites or reports, you may contact me at the number listed below.

It is SHPO's position that any structure over fifty years of age is considered historic and is potentially eligible for listing on the National Register of Historic Places. Site 24LC2277 is the historic Justisson Irrigation Ditch. As long as there will be no disturbance or alteration to this ditch or structures over fifty years of age, we feel that there is a low likelihood cultural properties will be impacted. We, therefore, feel that a recommendation for a cultural resource inventory is unwarranted at this time. However, should structures need to be altered or if cultural materials are inadvertently discovered during this project, we would ask that our office be contacted, and the site investigated.

If you have any further questions or comments, you may contact me at (406) 444-7767 or by e-mail at dmurdo@mt.gov. I have attached an invoice for the file search. Thank you for consulting with us.

Sincerely,

Damon Murdo
Cultural Records Manager
State Historic Preservation Office

File: DEQ/AWWM/2024

STATE HISTORIC PRESERVATION OFFICE
Montana Cultural Resource Database
CRABS Township,Range,Section Results
Report Date:3/15/2024

Township:12 N Range:5 W Section: 16

JEPSON DANIEL A., ET AL.

12/1/1989 CLASS I AND CLASS III CULTURAL RESOURCE INVENTORIES OF AT & T SPOKANE-BILLINGS FIBER OPTIC FACILITIES IN MONTANA

CRABS Document Number: ZZ 6 10823 Agency Document Number:

Township:12 N Range:5 W Section: 16

AXLINE JON A.

7/17/1991 SILVER CITY - WEST (RS 279-1(3)9) REPORT PREPARED FOR MONTANA DEPT OF TRANSPORTATION, JULY, 1991

CRABS Document Number: LC 4 12811 Agency Document Number: RS 279-1(3)9

Township:12 N Range:5 W Section: 16

HALL DANIEL S, WILLIAM T. NORMAN, RYAN E. WENDEL & ...

10/1/2014 LINCOLN FIBER OPTIC CLASS I SURVEY

CRABS Document Number: LC 6 38001 Agency Document Number:

STATE HISTORIC PRESERVATION OFFICE
Cultural Resource Information Systems
CRIS Township, Range, Section Report
Report Date:3/15/2024

Site #	Twp	Rng	Sec	Qs	Site Type 1	Site Type 2	Time Period	Owner	NR Status
24LC2277	12N	5W	16	comb	Historic Irrigation System		Historic More Than One Decade	Combination	Undetermined*
24LC0990	12N	5W	16		Historic Irrigation System		Historic More Than One Decade	Private	Unresolved
24LC2797	12N	5W	16		Historic Road		Historic More Than One Decade	MDOT	Eligible

CANYON CREEK SCHOOL

On-Site Wastewater Treatment System Design

Design Report

December 2021

GreatWest
ENGINEERING

Table of Contents

1.0 General

This report provides the Canyon Creek School, Lewis and Clark County Public Health Department, and reviewing agencies with detailed information regarding the on-site wastewater treatment system design for the building addition to the school in accordance with the Montana Department of Environmental Quality's (DEQ's) Circular DEQ 4: Montana Standards for Subsurface Wastewater Treatment Systems. The report also serves as a forum for the discussion of the design criteria so that the needs of the School and the requirements of the reviewing authorities are satisfied.

2.0 Design Flows

The school is anticipated to have approximately 40 students and staff for the 2021-2022 school year. The maximum capacity of the school is approximately 100 students. The existing septic system was designed based on 11 gallons per day per student/staff (gpd/unit). From Table 3.1-1 in DEQ-4, this corresponds to a school without cafeteria, gym, and showers. The school addition will not include adding a cafeteria, gym, or showers. Multiplying 40 students/staff by 11 gpd/unit gives a design average wastewater flow of 440 gpd. Multiplying 100 students by 11 gpd/unit gives a peak design flow of 1,100 gpd.

3.0 Wastewater Loads

In order to reduce the footprint of the septic system, the Lewis and Clark County Public Health recommends installing a Level II treatment system. Using Table 1 Application Rates for a school from the Orenco Systems Design Criteria for Commercial Treatment Systems, the typical concentrations of Biochemical Oxygen Demand-5 day (BOD5) is 400 milligrams per liter (mg/L), for Total Suspended Solids (TSS) is 165 mg/L, and for Total Kjeldahl Nitrogen (TKN) is 120 mg/L. These are the expected concentrations in the primary treated effluent. The design wastewater concentrations and loads are presented in Table 3.1.

Table 3.1 – Design Concentrations and Loads

Parameter	Concentration (mg/L)	Average Flow Rate (gpd)	Peak Flow Rate (gpd)	Load from Average Flow (lbs/day)	Load from Peak Flow (lbs/day)
BOD	400	440	1,100	1.47	3.67
TSS	165	440	1,100	0.61	1.51
TKN	120	440	1,100	0.44	1.10

4.0 Level 2 Treatment Design

4.1.1 Secondary Treatment

An Orenco Advantex Level II treatment system will be installed. To determine the amount of textile surface area necessary to meet treatment requirements, the design and peak flow rates are divided by the organic loading rates and the hydraulic loading rates. The loading rate that corresponds to the largest textile surface area will control the design. The organic loading rate for the AdvanTex system is 0.08 pounds of BOD per square foot (lbs BOD_5/ft^2), the design average day hydraulic loading rate is 25 gallons per day per square foot (gpd/ft^2), and the design peak hydraulic loading is 50 gpd/ft^2. Tables 4.1 through 4.3 show the media sizing calculation results.

Table 4.1 – Treatment Media Sizing by BOD Loading

Media Sizing by BOD Organic Loading		
BOD Loading Rate	0.08	lbs $BOD/ft^2/day$
Design Average BOD Loading	1.47	lbs BOD/day
Design Peak BOD Loading	3.67	lbs BOD/day
Design Average Media Sizing	18.38	ft^2
Design Peak Media Sizing	45.88	ft^2

Table 4.2 – Treatment Media Sizing by TKN Loading

Media Sizing by TKN Organic Loading		
TKN Loading Rate	0.07	lbs $TKN/ft^2/day$
Design Average TKN Loading	0.44	lbs TKN/day
Design Peak TKN Loading	1.10	lbs TKN/day
Design Average Media Sizing	6.29	ft^2
Design Peak Media Sizing	15.71	ft^2

Table 4.3 – Treatment Media Sizing by Hydraulic Loading

Media Sizing by Hydraulic Loading		
Design Average Flow Rate	440	gpd
Design Peak Flow Rate	1,100	gpd
Design Average Day Hydraulic Loading Rate	25	gpd/ft^2
Design Peak Day Hydraulic Loading Rate	50	gpd/ft^2
Design Average Flow Media Sizing	17.6	ft^2
Design Maximum Flow Media Sizing	22	ft^2

The loading analysis shows 46 square feet of treatment area will be needed for the unit. The specified unit is an AX-MAX-075-14.

4.1.2 System Tanks

Circular DEQ-4 requires a minimum septic tank storage 2.5 times the peak design flow. The peak flow rate of 1,100 gallons per day would therefore require a minimum 2,750 gallons of septic tank capacity. Septic tanks are not available for 2,750 gallons so the next available size of 3,000 gallons be used. The Orenco Design Manual suggests sizing the pre-anoxic tank equal to one day of the peak flow, 1,100 gallons per day. A 1,500-gallon septic tank will be used for the pre-anoxic tank. The anoxic return line will enter the first compartment of the 3,000-gallon septic tank. For the Advantex Treatment Max systems, the recirculation-blend and anoxic tankage are a part of the level two treatment system.

Wastewater flows from the 1,500-gallon pre-anoxic tank to the single pod AX-Max-075-14 treatment unit for level two secondary treatment. After the effluent leaves the treatment unit, it flows by gravity to a 800 gallon dosing tank, which includes a duplex pumping system for pressurizing the drainfield. Based on DEQ sizing criteria, the minimum dose volume is 200 gallons, so the pumps will be sized for a 200 gallon dose. The dosing calculations are located in Appendix B.

5.0 Drainfield Design

5.1.1 Soil Properties

The Lewis and Clark County Public Health Department performed a soil test pit on April 6, 2021. The test pit was 84 inches deep. The test hole dug identified the thickness of each layer, the type of soil, the percent of gravel, and the soil color. The test pit soil information is located in Appendix A. The site

evaluation inspection report performed by the Lewis and Clark Public Health Department states the system must be sized on a 0.4 gallons per day per square feet (gpd/ft^2) application rate, sandy clay loam.

5.1.2 Drainfield Design

The site evaluation inspection report performed by the Lewis and Clark Public Health Department states the system must be sized on a 0.4 gallons per day per square feet (gpd/ft2) application rate, sandy clay loam. With a peak design flow rate of 1,100 gpd, the basal area of the drainfield is 2,750 square feet. Per Section 6.7.1 of Circular DEQ-4, since a level II secondary treatment system will be used prior to the drainfield, the final absorption area will be reduced by 50 percent since the percolation rate of sandy loam [16-31 minutes per inch (mpi)] is between 3 and 50 mpi. Section 6.7.3.3 of DEQ-4 states the required bottom area of the bed be based on an application area of 0.8 gpd/ft^2. Diving the peak flow rate by this application rate gives a total bed area of 1,375 feet. Reducing the bed area by 50 percent gives a total design bed area of 687.5 feet. Section 6.7.1 also states pressure distribution must be provided for all elevated sand mounds. Two laterals consisting of leaching chambers 36 inches wide will be used. Dividing the design bed area of 687.5 feet by the total width of six feet gives a lateral length of 115 feet.

DEQ-4 recommends using the *Wisconsin Mound Soil Absorption System Siting, Design, and Construction Manual* as a guidance in the design of elevated sand mounds. The manual recommends the dose volume be at least five times the lateral pipe volume and not to exceed 20 percent of the design flow. The dosing volume using these requirements is 200 gallons. Also, the manual recommends short, frequent doses with 3/16-inch diameter orifices spaced closely for better treatment of effluent. Because of this, four feet of spacing between orifices will be used. The dosing pump was sized for a minimum pressure of five feet of head at the end of each distribution pipe. Using these requirements, the pump flow is 47 gpm at 23 feet of head. The maximum difference in nozzle spray is 9.22 percent which meets the requirements of not exceeding 10 percent. The detailed calculations are located in Appendix B.

The drainfield will be served by a 2-inch Schedule 40 Polyvinyl Chloride (PVC) forcemain which runs from the dosing tank to the drainfield. The manifolds to each lateral will also be 2-inch Schedule 40 PVC. The drainfield laterals will consist of 2-inch PVC pipe that incorporate 36-inch wide, leaching chambers.

6.0 Non-degradation Analysis

The purpose of the non-degradation analysis is to protect high quality state ground and surface waters. A non-degradation analysis is required as part of the drainfield design and permitting. Hydrogeologic parameters are based on the nearest and best available information sources for the shallowest groundwater

beneath the site. As allowed by the reviewing authorities, onsite data and data in the near proximity are used for the analysis. The non-degradation analysis can be found in Appendix C.

6.1.1 Nitrate Sensitivity Analysis

Hydraulic Conductivity

Hydraulic conductivity is a measure of the geologic media's ability to transmit water. The combination of hydraulic conductivity and hydraulic gradient control the amount of groundwater that is available for dilution. Two hydraulic conductivities were calculated based on the two closest available wells to the site. The Groundwater Information Center (GWIC) revealed the two closest wells to be the Canyon Creek Volunteer Fire District well 1,844 feet northwest of the site, and the Sonny Heldenstab well located 497 feet southwest of the site. The well log information for the wells is located in Appendix C. The hydraulic conductivities of the wells were calculated using Fetter equation, and the average of the two wells is approximately 185 feet per day. The hydraulic conductivities' calculations are located in Appendix C.

Hydraulic Gradient

Hydraulic gradient is a measure of the slope of the water table in the direction that yields the maximum slope. Along with the hydraulic conductivity, the hydraulic gradient control the amount of groundwater that is available for dilution. The hydraulic gradient was calculated on the basis of static water levels of the three wells with available information closest to the site. This includes the Canyon Creek Volunteer Fire District, Heldenstab well, and the Sieben well. The well locations are shown on the figure in Appendix C. The static water levels of the three wells were from the GWIC well logs. This allowed a three point solution to be calculated which is shown graphically on the figure located in Appendix C. The resultant potentiometric surface slopes towards the northeast at a gradient of 0.00346 feet per feet (ft/ft).

Mixing Zone Thickness

The mixing zone thickness constant of 15 feet was determined to be the appropriate value. The standard mixing zone thickness is 15 feet because this is the theoretical thickness that the effluent plume will mix in the vertical direction below the water table.

Mixing Zone Length

A 200-foot Source Specific Mixing Zone (SSMZ) was used. In order to request a SSMZ, criteria from the Administrative Rules of Montana (ARM) must be met. One requirement is that 4 log virus attenuation must be met for the worst-case scenario. Virulo, a program developed by the Environmental Protection Agency (EPA), models the worst-case scenario using the soil type and depth to high seasonal

groundwater. Using sandy clay loam and the seasonal high groundwater, Virulo modeled 22 exceedances with the Hepatitis A virus. Inputting these values in the pathogen transport spreadsheet revealed the total horizontal and vertical log removal to equal 5.804 which meets the minimum requirement of 4 log virus attenuation. The pathogen transport calculations are located in Appendix C.

Precipitation

A value of 10.88 inches per year was used based on the Western Regional Climate Center (WRCC)'s Canyon Creek station.

Percent of Precipitation Recharging Groundwater

The percent of precipitation recharging groundwater constant of 0.20 was determined to be the appropriate value and was utilized for the design.

Design Flow

The peak design flow of 1,100 gpd was used for the non-degradation analysis.

Width of Drainfield Perpendicular to Groundwater Flow

The mixing zone width is determined by the total width of the primary drainfield (or replacement drainfield) as measured perpendicular to the groundwater flow direction. The width increases downgradient from the drainfield as defined by equal to the width of the source plus the distance determined by the tangent of five degrees times the length of the mixing zone on both sides of the source. This width was determined to be 115 feet at the drainfield and 150.15 feet at the end of the mixing zone.

Background Nitrate Concentration

The background nitrate concentration is used to determine the initial quality of the groundwater that will be impacted by the drainfield. The background nitrate concentration for sampling the school's well is 0.55 milligrams per liter (mg/L). A copy of the well sampling results is located in Appendix C.

Nitrate Concentration in Precipitation

The nitrate concentration in precipitation constant of 1.0 mg/L was determined to be the appropriate value.

Nitrate Concentration in Effluent

The nitrate concentration in the effluent value is prescribed as 50 mg/L for a conventional system or 24 mg/L for a Level II system. It was determined to use 24 mg/L as the proposed design utilizes Level II technology.

Nitrate Sensitivity Results

After inputting the values discussed above into the Montana Department of Environmental Quality's Nitrate Sensitivity worksheet, the calculated nitrate concentration at the end of the mixing zone is 2.71 mg/L which is below the allowable 7.5 mg/L.

6.1.2 Phosphorus Breakthrough Analysis

The phosphorous breakthrough analysis requires sufficient soil adsorption capacity of 50 years prior to discharge to surface water.

Length of Primary Drainfield as Measured Perpendicular to Groundwater Flow

The length of the drainfield measured perpendicular to groundwater flow is used to determine the width of the soil available to adsorb phosphorous from the drainfield to the surface water. The groundwater flow direction was determined from the Hydraulic Gradient Three Point Solution worksheet. The length of the primary drainfield measured perpendicular to groundwater flow is 6.22 feet.

Length of Primary Drainfield's Long Axis

The length of the primary drainfield's long axis is 115 feet.

Width of Primary Drainfield's Short Axis

The width of the primary drainfield's short axis is 6 feet.

Depth to Limiting Layer from Bottom of Drainfield Laterals

The amount of soil directly beneath the drainfield that is available for absorption of phosphorous is dependent upon the depth to a limiting layer. A limiting layer can be seasonal groundwater, an impervious layer such as clay, or bedrock which has no absorption capacity for phosphorous. The limiting layer is the groundwater at a level of 20 feet below the ground surface.

Distance from Drainfield to Surface Water

A high-quality surface water and a state surface water are defined in the Water Quality Act 75-5-103(13) and (34) Montana Code Annotated (MCA). Because site specific data has been presented to determine the groundwater flow direction, the distance to the surface water is measured along the groundwater flow direction to the next downgradient high-quality state surface water. A wetland is located approximately 3,614 feet northeast and downgradient of the drainfield.

Phosphorous Mixing Depth in Groundwater

The phosphorous mixing depth in groundwater is defined as either 0.5 feet for coarse-textured soils or 1.0 foot for fine-textured soils. The soil texture used to define the mixing depth is the soil type immediately above the limiting layer, or where the limiting layer is assumed to be. Fine soils were determined to be immediately above the limiting layer, thus 1.0 feet was utilized as the appropriate value in the analysis.

Soil Weight

The site evaluation performed by the Lewis and Clark Public Health Department revealed the soils are sandy loam and sandy clay loam. The density of sandy loam and sandy clay loam soil is 103 pounds per cubic foot.

Phosphorous Adsorption Capacity of Soil

The phosphorous adsorption capacity of soil constant of 200 parts per million (ppm) was determined to be the appropriate value and is utilized for the analysis.

Phosphorous Load from School

Table 3-8 from the US EPA Onsite Wastewater Treatment Systems Manual states the approximate phosphorous loads from garbage disposals is 0.1 grams per capita day (grpcd), for toilets is 1.6 grpcd, and sink/shower appliances is 1.0 grpcd. These loads are from residential wastewater and are mostly representative of the school beside the sink/shower appliances load. Since the school does not have showers and this rate includes domestic dish washing which will not apply to the school, this value will be reduced in half for the school's anticipated loads. Combining these values gives an approximate total of 2.2 grpcd of phosphorous. Multiplying this rate by the peak population of 100 persons and converting units gives an approximate phosphorus load from the school's sewer system of 177 pounds of phosphorous per year.

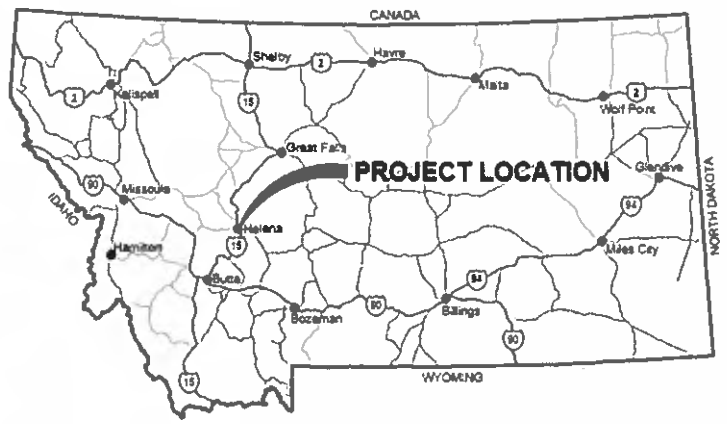
Phosphorous Breakthrough Results

After inputting the values discussed above into MDEQ's Phosphorous Breakthrough Analysis worksheet, the calculated breakthrough time to surface water is approximately 137 years, which exceeds the minimum requirement of 50 years.

Appendix A: Soil Information

Appendix B: Drainfield Calculations

Appendix C: Non-degradation Analysis



CANYON CREEK SCHOOL SEPTIC SYSTEM DESIGN

CONSTRUCTION PLANS

SECTION 16, TOWNSHIP 12 NORTH, AND RANGE 05 WEST

NOT TO SCALE

SHEET INDEX

PROJECT: 1-21255
DATE: 10/14/2021

PLANS PREPARED FOR:

JILLIAN PRITCHARD, SCHOOL BOARD CHAIR
CANYON CREEK SCHOOL, SCHOOL DISTRICT 4
TRINITY SCHOOL

APPROVED BY:

COLLETTE ANDERSON, PE
GREAT WEST ENGINEERING

MONTANA COLLETTE TONA ANDERSON 23762PE LICENSED PROFESSIONAL ENGINEER

QA/QC BY:

ROBERT CHURCH, P.E.
GREAT WEST ENGINEERING

MONTANA ROBERT E CHURCH 9707P.E. REGISTERED PROFESSIONAL ENGINEER

PLANS PREPARED BY:

EUGENIA BARRY, PE

GreatWest ENGINEERING
2501 BELT VIEW DRIVE
HELENA, MT 59601
(406)449-8827

NO.	REVISION DESCRIPTION	BY	DATE

SET NO

SHEET NO
1

Y:\Shared\Helena Projects\1-21255-Canyon Creek School Septic Design\CADD 1-21255\Sheets\1-21255-01-Cover.dwg

ABBREVIATIONS

@	AT
Δ	ANGLE OF DEFLECTION, DELTA ANGLE
<PT	ANGLE POINT
AB	ANCHOR BOLT
ABDN	ABANDON
AC	ASBESTOS CONCRETE
ADDN	ADDITIONAL
ADJ	ADJACENT
AFF	ABOVE FINISHED FLOOR
ALT	ALTERNATE
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APPROX	APPROXIMATE
APVD	APPROVED
ARCH	ARCHITECTURE, ARCHITECTURAL
ASPH	ASPHALT
AVE	AVENUE
AVG	AVERAGE
BFV	BUTTERFLY VALVE
BLDG	BUILDING
BLK	BLOCK
BLVD	BOULEVARD
BM	BEAM, BENCHMARK
BOT	BOTTOM
BRG	BEARING
BRKT	BRACKET
BVC	BEGIN VERTICAL CURVE
C-C	CENTER TO CENTER
CHAN	CHANNEL
CHK	CHECK
CI	CAST IRON
CIPC	CAST-IN-PLACE CONCRETE
CIRC	CIRCULAR
CJ	CONSTRUCTION JOINT, CONTROL JOINT
℄	CENTER LINE
CLR	CLEAR, CLEARANCE
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNITS
CO	CLEANOUT
COL	COLUMN
CONC	CONCRETE
CONSTR	CONSTRUCTION
CONT	CONTINUE, CONTINUED, CONTINUOUS
CONTR	CONTRACTOR
COORD	COORDINATE
CP	CONTROL PANEL, CONTROL POINT
CPLG	COUPLING
CTR	CENTER
CTV	CABLE TELEVISION
CU	CUBIC, COPPER
CF	CUBIC FEET
CULV	CULVERT
CY	CUBIC YARD
DET	DETAIL
DI	DUCTILE IRON, DRAIN INLET
DIA, ⌀	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DR	DRIVE
DWG	DRAWING
E	EAST
EA	EACH
EL, ELEV	ELEVATION
ELB	ELBOW
ELEC	ELECTRIC, ELECTRICAL
ENCL	ENCLOSE
ENGR	ENGINEER
EOP	EDGE OF PAVEMENT
EQ	EQUAL, EQUALLY
EQ SP	EQUALLY SPACED
EQUIP	EQUIPMENT
EQUIV	EQUIVALENT
EVC	END VERTICAL CURVE
EW	EACH WAY
EXC	EXCAVATE
EXP	EXPANSION
EXP JT	EXPANSION JOINT
EXST	EXISTING
FCV	FLOW CONTROL VALVE
FD	FLOOR DRAIN
FDN	FOUNDATION
FES	FLARED END SECTION
FET	FLARED END TERMINAL
FF	FINISHED FLOOR
FG	FINISH GRADE
FHYD	FIRE HYDRANT
FJ	FLANGE JOINT
FL	FLOW LINE
FLEX	FLEXIBLE
FM	FORCEMAIN
FT	FOOT, FEET
FO	FIBER OPTIC
FTG	FOOTING, FITTING
G	NATURAL GAS
GA	GAGE, GAUGE
GAL	GALLON
GALV	GALVANIZED
GND	GROUND
GVL	GRAVEL
HB	HOSE BIB
HDPE	HIGH DENSITY POLYETHYLENE
HOR, HORIZ	HORIZONTAL
HWY	HIGHWAY
HYD	HYDRANT
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IN	INCH
INV	INVERT
JB	JUNCTION BOX
JT	JOINT
K	RATE OF VERTICAL CURVATURE
LBS	POUNDS
LF	LINEAR FEET
LN	LANE
LPG	LIQUID PROPANE GAS
LT	LEFT
MAX	MAXIMUM
MD	MEASURE DOWN
MFD	MANUFACTURED
MFR	MANUFACTURE, MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
MOV	MOTOR OPERATED VALVE
MPWSS	MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS
N	NORTH
NE	NORTHEAST
NG	NATURAL GAS
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NTS	NOT TO SCALE
NW	NORTHWEST
OC	ON CENTER
OD	OUTSIDE DIAMETER
OF	OVERFLOW
OH	OVERHEAD
OHP	OVERHEAD POWER
OHT	OVERHEAD TELEPHONE
OPNG	OPENING
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PE	PLAIN END, POLYETHYLENE
PERP	PERPENDICULAR
PI	POINT OF INTERSECTION
ℙ	PROPERTY LINE
PNL	PANEL
PRC	POINT OF REVERSE CURVATURE
PREFAB	PREFABRICATED
PRELIM	PRELIMINARY
PREP	PREPARE, PREPARATION
PROP	PROPERTY
PRV	PRESSURE REDUCING VALVE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POINT, POINT OF TANGENCY
PVC	POLYVINYL CHLORIDE
PVI	POINT OF VERTICAL INTERSECTION
PVMT	PAVEMENT
R, RAD	RADIUS
RC	REINFORCED CONCRETE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDCR	REDUCER
REBAR	REINFORCEMENT BAR
REF	REFERENCE
REINF	REINFORCE
REQD	REQUIRED
RR	RAILROAD
RST	REINFORCING STEEL
RT	RIGHT
R/W	RIGHT-OF-WAY
S	SOUTH, SANITARY SEWER
SAN	SANITARY
SCH	SCHEDULE
SD	STORM DRAIN
SDWK	SIDEWALK
SE	SOUTHEAST
SECT	SECTION
SF	SQUARE FOOT
SHT	SHEET
SIM	SIMILAR
SLP	SLOPE
SPEC	SPECIFICATION
SQ	SQUARE
SSTL	STAINLESS STEEL
STA	STATION
SS	SANITARY SEWER SERVICE
STD	STANDARD
ST	STREET
STL	STEEL
STRUCT	STRUCTURE
SW	SOUTHWEST
SYM	SYMMETRICAL
TB	THRUST BLOCK
TBC	TOP BACK OF CURB
TBM	TEMPORARY BENCH MARK
TEL	TELEPHONE
TEMP	TEMPORARY
THRU	THROUGH
TYP	TYPICAL
UG	UNDERGROUND
UGP	UNDERGROUND POWER
UGT	UNDERGROUND TELEPHONE
UTIL	UTILITY
V	VALVE, VOLT
VB	VALVE BOX
VERT	VERTICAL
VOL	VOLUME
W	WEST, WATER
WTR	WATER
WD	WOOD
W/	WITH
W/O	WITHOUT
WL	WETLAND
WM	WIRE MESH, WATER METER
WS	WATERSTOP, WATER SURFACE, WATER SERVICE
WT	WEIGHT
WV	WATER VALVE
WWF	WELDED WIRE FABRIC
WWM	WELDED WIRE MESH
XFMR	TRANSFORMER
X-ING	CROSSING
XS	CROSS SECTION
YD	YARD

LEGEND

EXISTING	PROPOSED	DESCRIPTION
		MAJOR CONTOUR
		MINOR CONTOUR
OHT	OHT	OVERHEAD TELEPHONE
UGT	UGT	UNDERGROUND TELEPHONE
CTV	CTV	CABLE TELEVISION
FO	FO	FIBER OPTIC
G	G	NATURAL GAS
OHP	OHP	OVERHEAD POWER
UGP	UGP	UNDERGROUND POWER
S	S	SANITARY SEWER
SS SS SS	SS SS SS	SANITARY SEWER SERVICE
FM	FM	SANITARY SEWER FORCEMAIN
SD	SD	STORM DRAIN
		STORM CULVERT
W	W	WATER
WS WS SAN	WS WS SAN	WATER SERVICE
		CHAINLINK FENCE
X X X	X X X	BARBED WIRE FENCE
		WOOD FENCE
		PAVED ROAD
		GRAVEL ROAD
		PROPERTY/LOT LINE
		PROPERTY EASEMENT
		PROPERTY SETBACK
		RIGHT-OF-WAY
		CITY LIMIT/DISTRICT BOUNDARY
		RAILROAD
		DITCH
		WATER EDGE
WL		WETLAND
		BUILDING
		BENCHMARK
		CONTROL POINT
		PROPERTY PIN
		BORING
		MONITORING WELL
		TEST PIT
		BOLLARD
		MAIL BOX
		SIGN

EXISTING	PROPOSED	DESCRIPTION
		STUMP
		SHRUB/BUSH
		TREE-CONIFER
		TREE-DECIDUOUS
		TREE LINE
		COMMUNICATION MANHOLE
C	C	COMMUNICATION VAULT
T	T	TELEPHONE RISER
TV	TV	CABLE TV RISER
		NATURAL GAS METER
G	G	NATURAL GAS RISER
		NATURAL GAS VALVE
		LIGHT POLE
		STREET LIGHT POLE
P	P	POWER RISER
		PAD MOUNTED TRANSFORMER
P	P	POWER VAULT
		UTILITY POLE
		GUY WIRE
		SANITARY MANHOLE
		SANITARY CLEANOUT
		SANITARY LAMPHOLE
		STORM MANHOLE
		STORM ROUND INLET
		STORM SQUARE INLET
		STORM CATCH BASIN
		11.25° ELBOW
		22.50° ELBOW
		45° ELBOW
		90° ELBOW
		TEE
		CROSS
		CAP
		FIRE HYDRANT
		GATE VALVE
		REDUCER
		WATER METER
		WELL
		CURB STOP
		FROST FREE HYDRANT

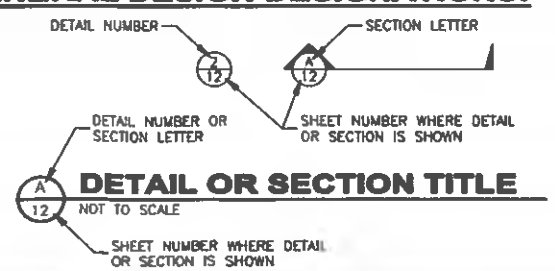
GENERAL NOTES:

1. THIS IS A STANDARD LEGEND AND ABBREVIATION LIST. THEREFORE, NOT ALL SYMBOLS AND ABBREVIATIONS MAY BE USED ON THIS PROJECT
2. UNLESS MODIFIED BY THE CONTRACT DOCUMENTS, ALL WORK WILL CONFORM TO THE MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS, SIXTH EDITION, APRIL 2010 (REFERRED TO COLLECTIVELY AS MPWSS).
3. EXISTING UNDERGROUND UTILITIES SHOWN ARE FROM THE BEST INFORMATION AVAILABLE. THIS INFORMATION IS APPROXIMATE AND MAY BE INCOMPLETE. FOR ACCURATE LOCATION, THE CONTRACTOR SHALL CONTACT, PRIOR TO EXCAVATION, THE UTILITIES UNDERGROUND LOCATION CENTER AT: 1-800-424-5555.

PROJECT NOTES:

1. NOTES

GENERAL DESIGN DESIGNATIONS:



NO	REVISION DESCRIPTION	BY	DATE

PROJECT: 1:21255
DESIGNED: CTA,ECB
DRAWN: ECB
CHECKED: REC
APPROVED: CTA
DATE: 10/14/2021

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2601 BELT VIEW DRIVE
HELENA, MT 59601
(406) 495-8627

CANYON CREEK SCHOOL
CANYON CREEK SCHOOL SEPTIC DESIGN
GENERAL

SHEET NO.
2
OF 9

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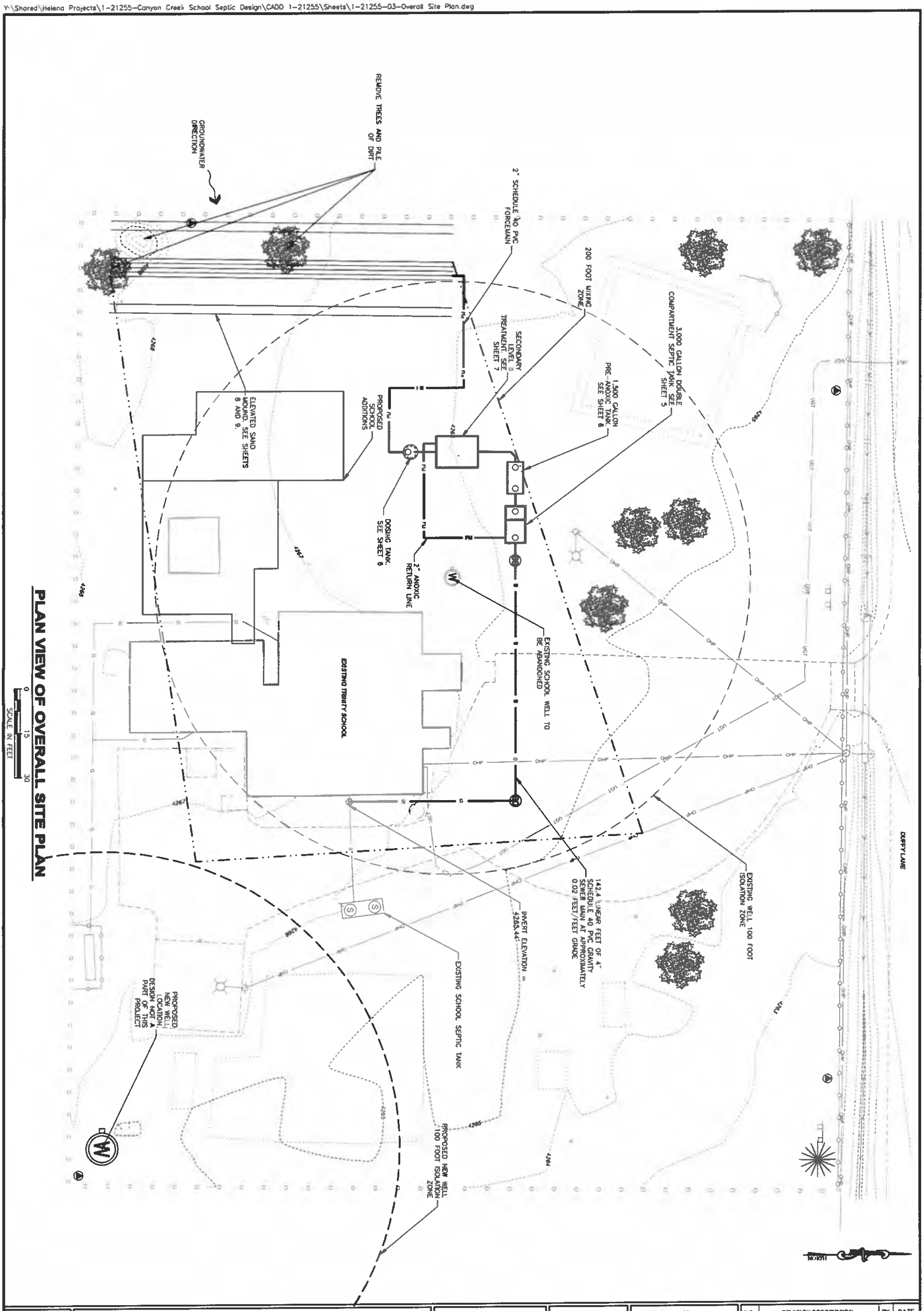

PLAN VIEW OF OVERALL SITE PLAN

SHEET NO. 3 OF 9

CANYON CREEK SCHOOL

CANYON CREEK SCHOOL SEPTIC DESIGN

OVERALL SITE PLAN

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DESIGNED:	CTA, ECB
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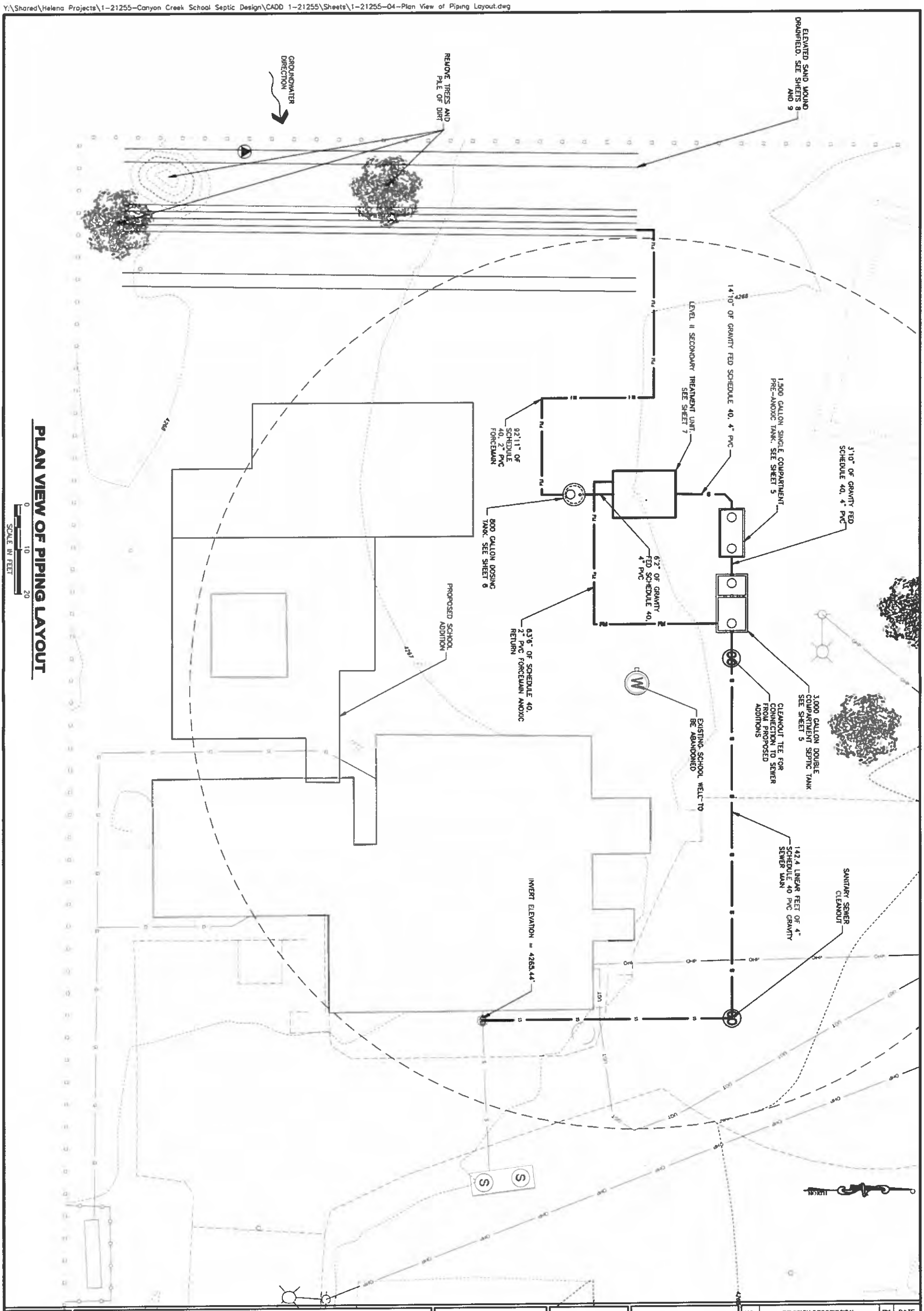

PLAN VIEW OF PIPING LAYOUT

SCALE IN FEET
0 10 20

SHEET NO 4 OF 9

CANYON CREEK SCHOOL

CANYON CREEK SCHOOL SEPTIC DESIGN

PLAN VIEW OF PIPING LAYOUT

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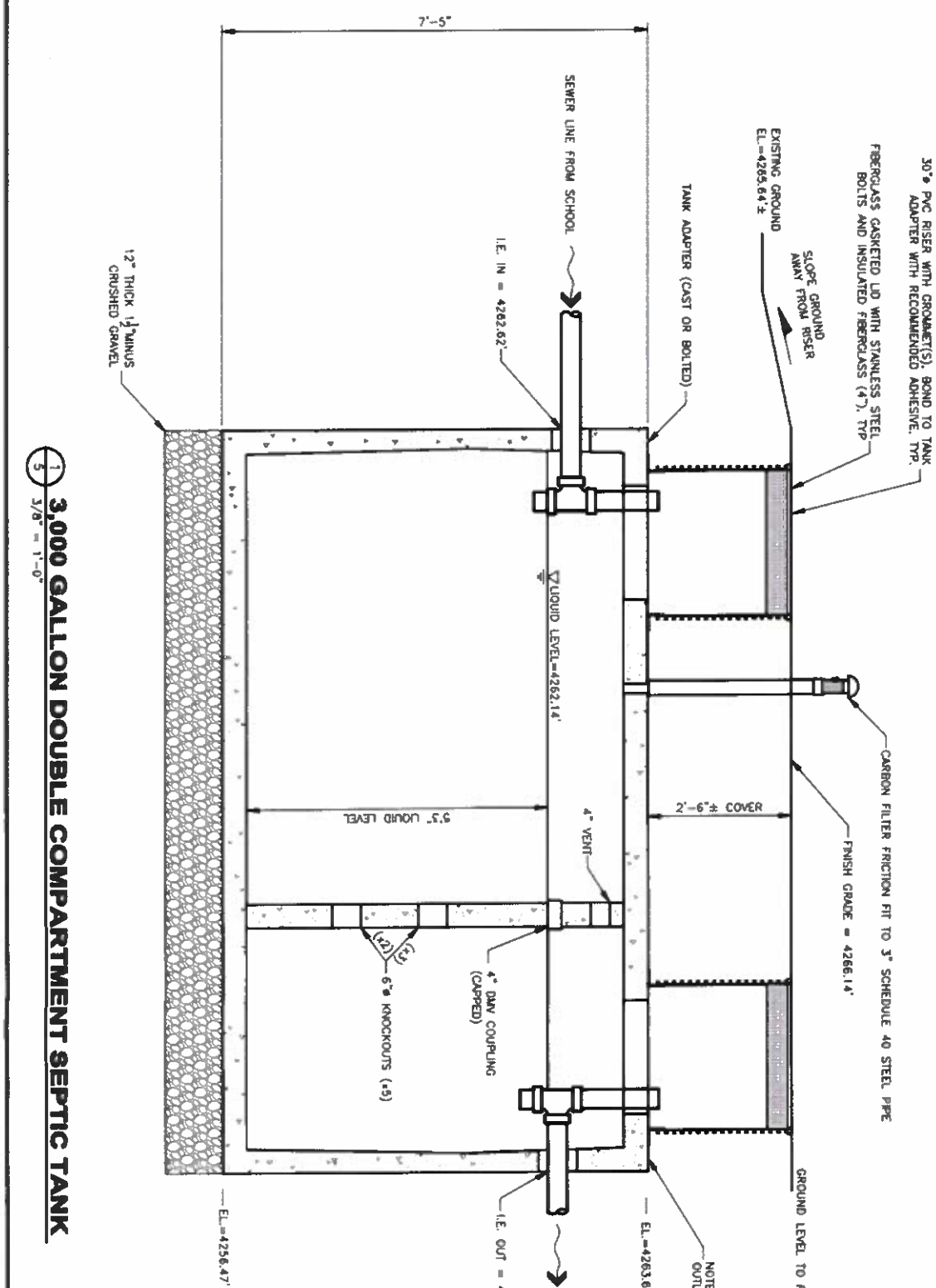

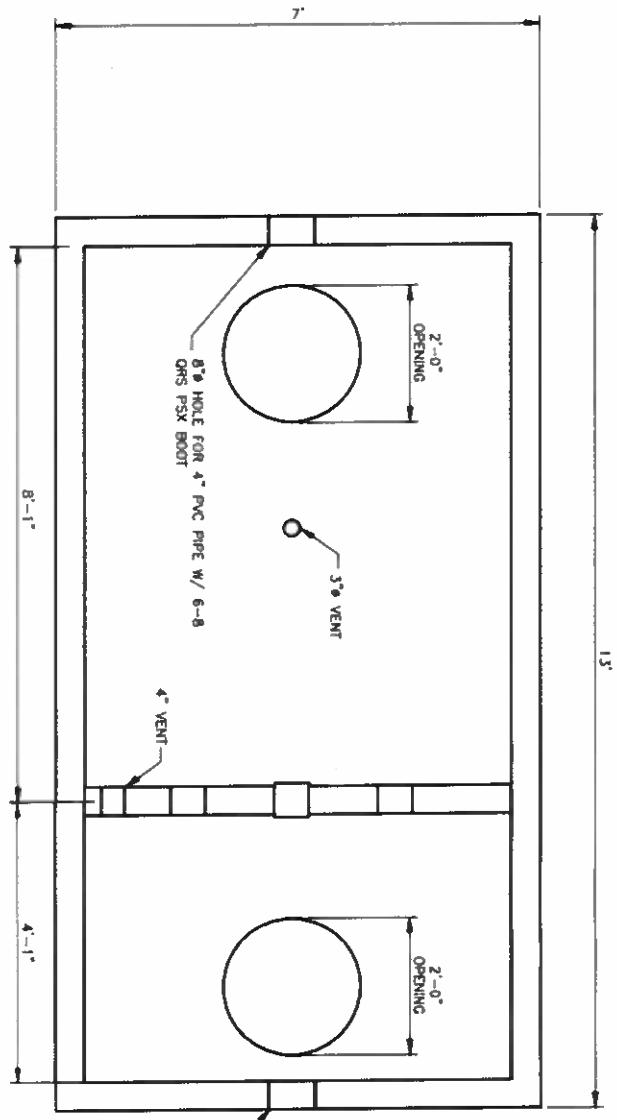

1/5 3,000 GALLON DOUBLE COMPARTMENT SEPTIC TANK

3/8" = 1'-0"

SHEET NO. 5 OF 9

CANYON CREEK SCHOOL

CANYON CREEK SCHOOL SEPTIC DESIGN

3,000 GALLON DOUBLE COMPARTMENT SEPTIC TANK

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DRAWN: ECB	
CHECKED: REC	
APPROVED: CTA	
DATE: 10/14/2021	

NO.	REVISION DESCRIPTION	BY	DATE
1			
2			
3			
4			
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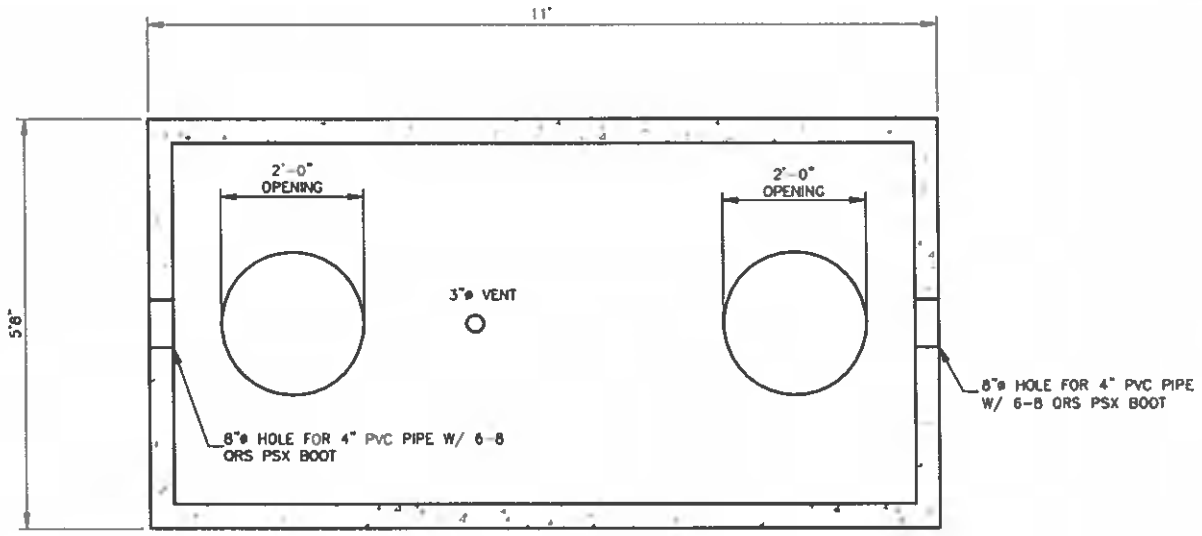
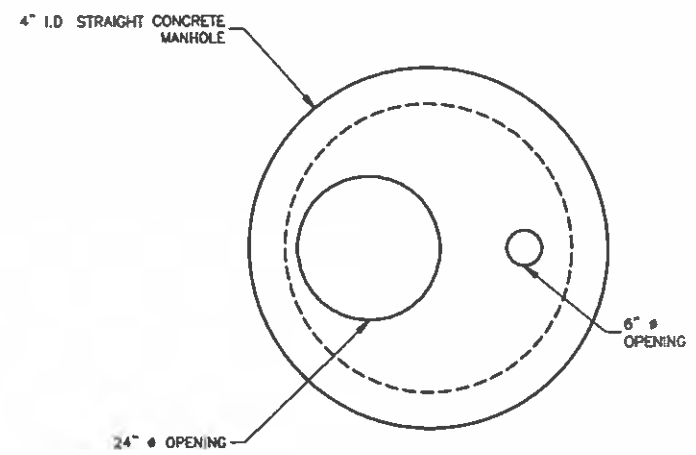
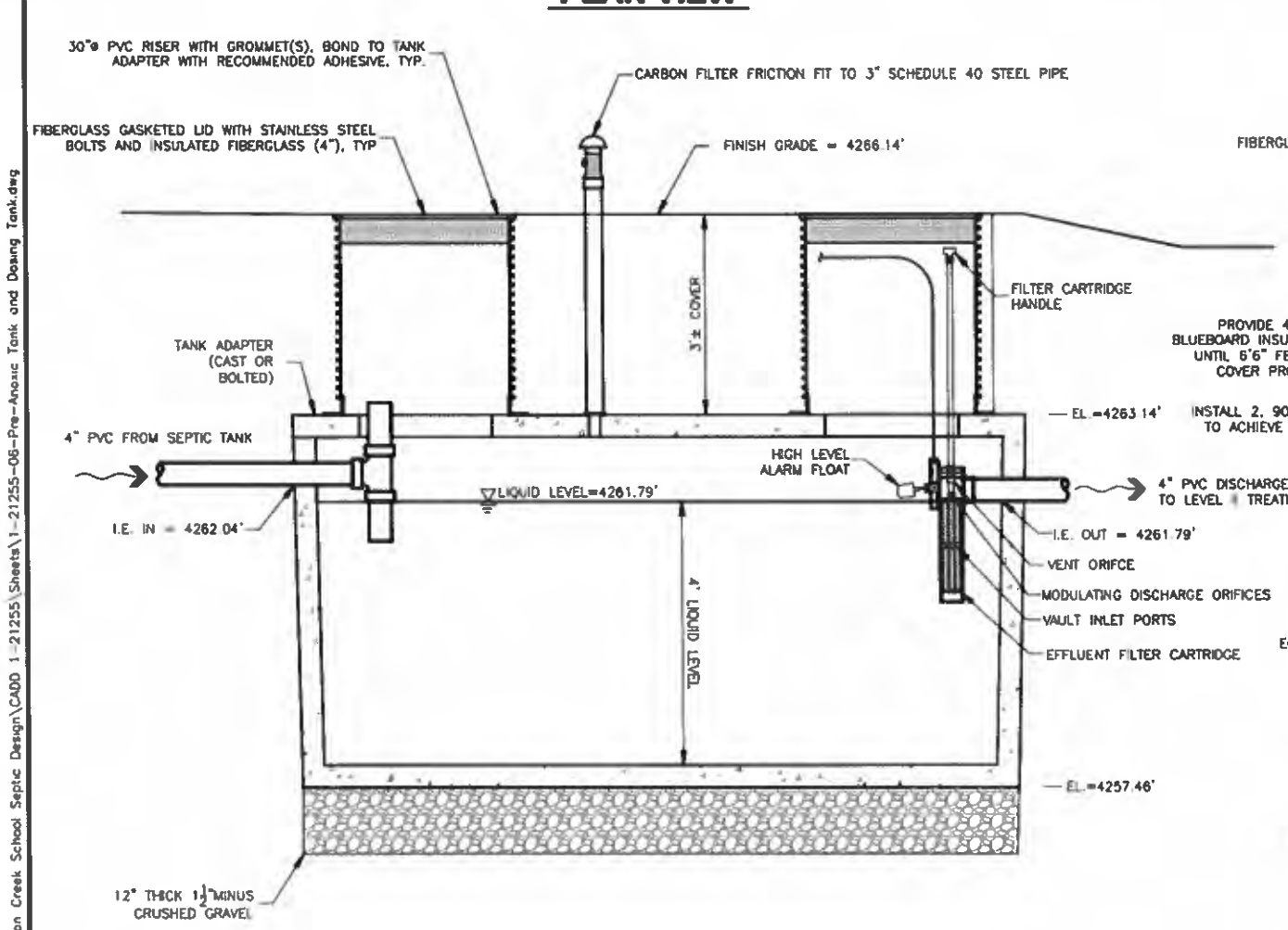


PLAN VIEW

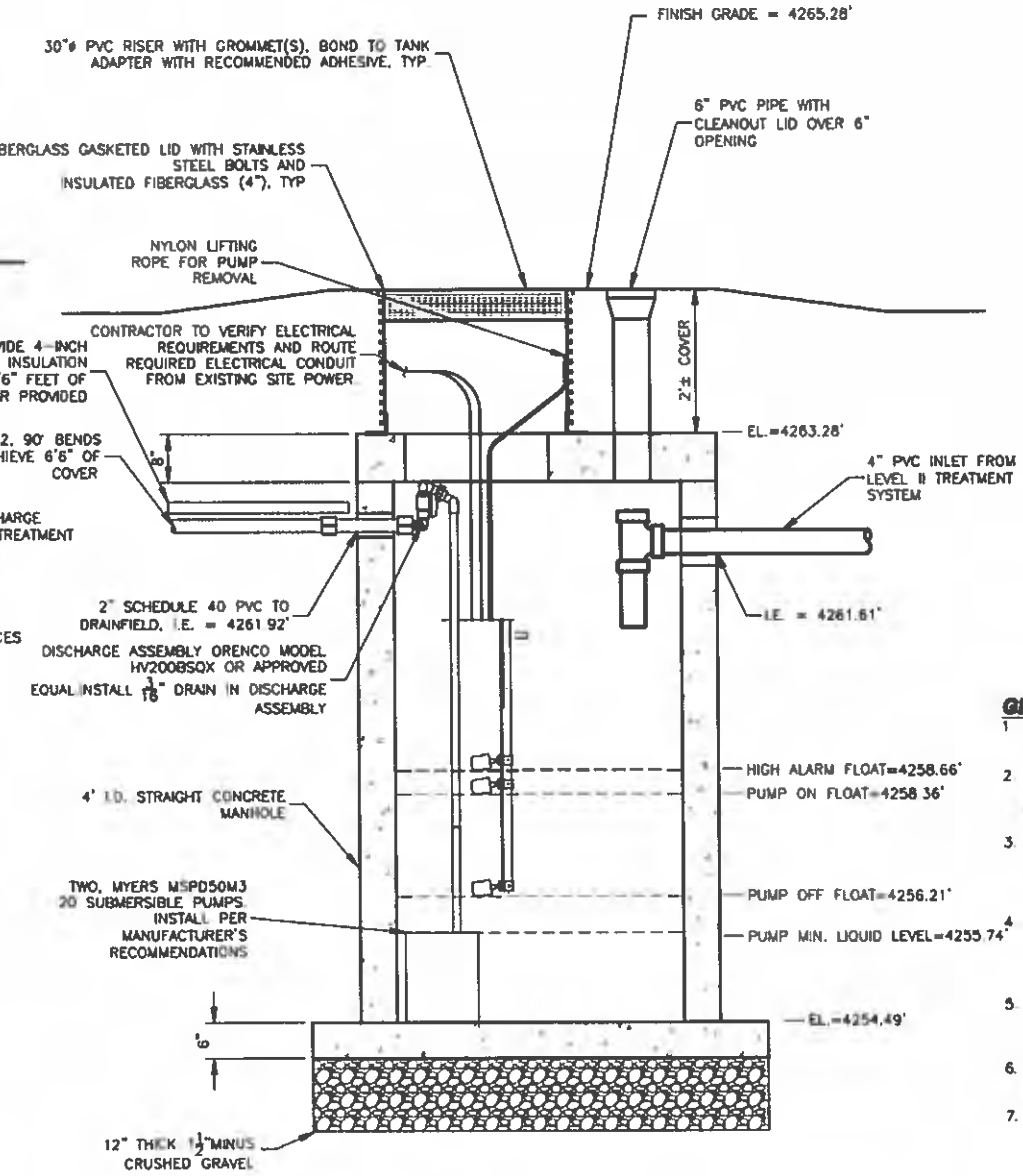




ELEVATION VIEW

1/6 1,500 GALLON PRE-ANOXIC TANK

3/8" = 1'-0"



2/5 800 GALLON DOSING TANK

NOT TO SCALE

GENERAL NOTES:

1. ALL TANKS SHALL MEET MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY CIRCULAR DEQ-4.
2. A MINIMUM RESERVE VOLUME OF 275 GALLONS (25% 1,100 GPD AVERAGE DESIGN FLOW) SHALL BE PROVIDED IN THE DOSE TANK.
3. HIGH LEVEL ALARM FLOAT SHALL BE PLACED AT ELEVATION BELOW THE DOSE TANK INVERT TO PROVIDE A RESERVE VOLUME OF 275 GALLONS BETWEEN THE HIGH LEVEL ALARM FLOAT AND THE INLET INVERT.
4. PUMP ON FLOAT SHALL BE INSTALLED TO SWITCH ON AT AN ELEVATION 3" BELOW THE HIGH LEVEL ALARM. FLOATS IN DOSE TANK SHALL BE SET FOR 200 GALLON DOSE SIZE.
5. PUMP OFF FLOAT SHALL BE INSTALLED ABOVE THE PUMP TO ENSURE THE PUMP IS ALWAYS SUBMERGED AND TO PROVIDE REQUIRED DOSE VOLUME.
6. ALL TANKS SHALL BE TESTED FOR LEAKAGE AFTER INSTALLATION.
7. INSULATION BOARD IS REQUIRED WHERE FORCEMAIN COMES OUT OF RISER UNTIL IT BENDS AT 6'-6" MINIMUM BURY.
8. UTILITY ANCHORS IN WALLS AND COVER FOR LIFTING UNIT NOT SHOWN FOR CLARITY.
9. 30"ø PVC RISERS AND PIPING NOT SHOWN IN PLAN VIEW FOR CLARITY.

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PROJECT 121265
DESIGNED CTA, ECB
DRAWN ECB
CHECKED REC
APPROVED CTA
DATE 10/14/2021

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CANYON CREEK SCHOOL
CANYON CREEK SCHOOL SEPTIC DESIGN

PRE-ANOXIC TANK AND DOSING TANK

SHEET NO
6
OF 9

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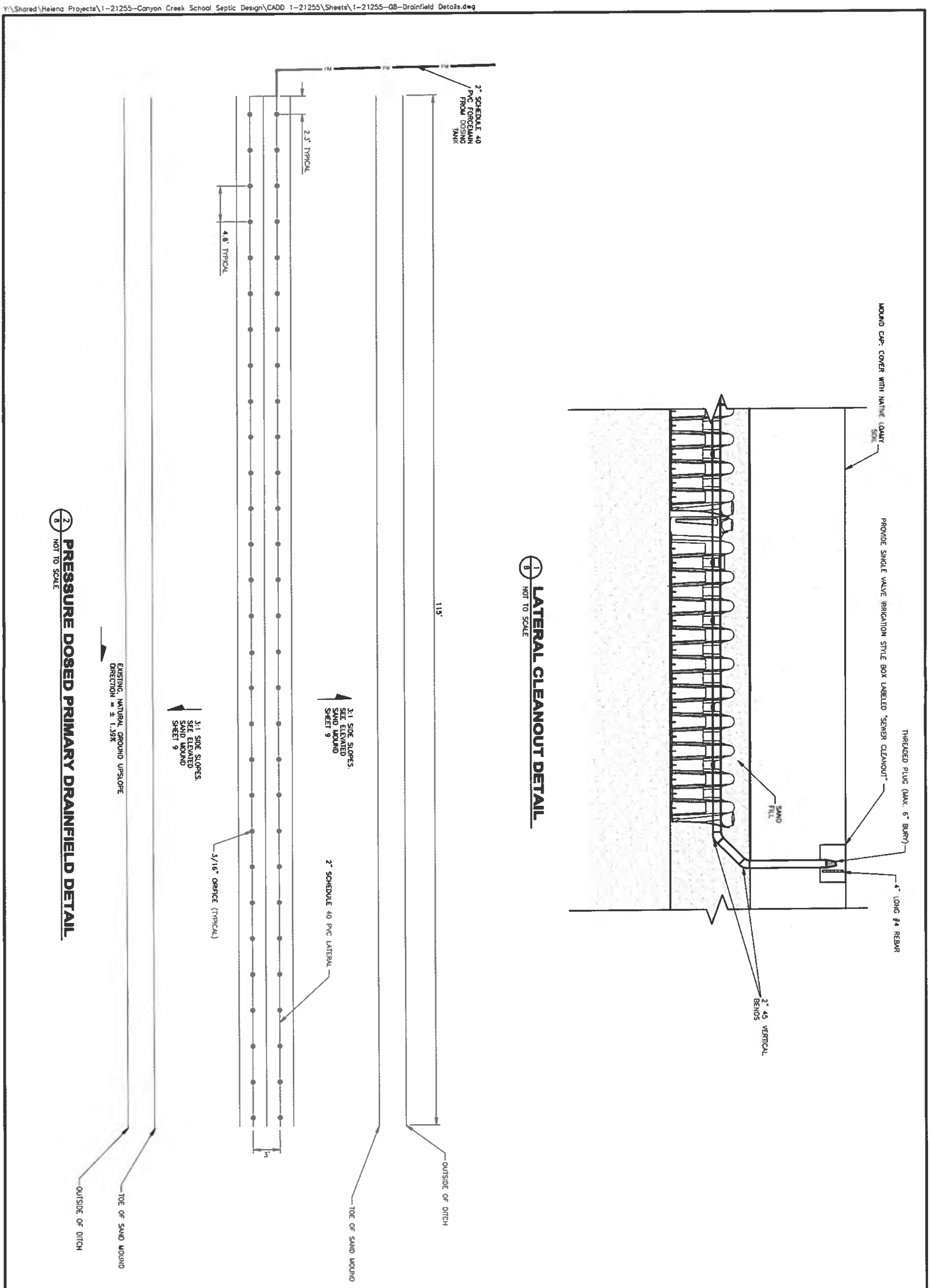

1/8 **LATERAL CLEANOUT DETAIL**
NOT TO SCALE

2/8 **PRESSURE DOSED PRIMARY DRAINFIELD DETAIL**
NOT TO SCALE

SHEET NO. 8 OF 9

CANYON CREEK SCHOOL
CANYON CREEK SCHOOL SEPTIC DESIGN
DRAINFIELD DETAILS

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PROJECT 1-21255	NO.	REVISION DESCRIPTION	BY	DATE
DESIGNED: CTA, ECB				
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CHECKED: REC				
APPROVED: CTA				
DATE: 10/14/2021				

SAND MOUND MATERIAL SPECIFICATIONS

A. ASTM C-33-13 FOR FINE AGGREGATE, WITH A MAXIMUM OF 2 PERCENT PASSING THE NO. 100 SIEVE; OR

B. FT WITHIN THE FOLLOWING PARTICLE SIZE DISTRIBUTION:

SIEVE	PARTICLE SIZE (mm)	PERCENT PASSING
3/8 IN.	9.50	100
NO. 4	4.75	95 TO 100
NO. 8	2.36	80 TO 100
NO. 16	1.18	45 TO 85
NO. 30	0.60	20 TO 60
NO. 50	0.30	10 TO 20
NO. 100	0.15	0 TO 2

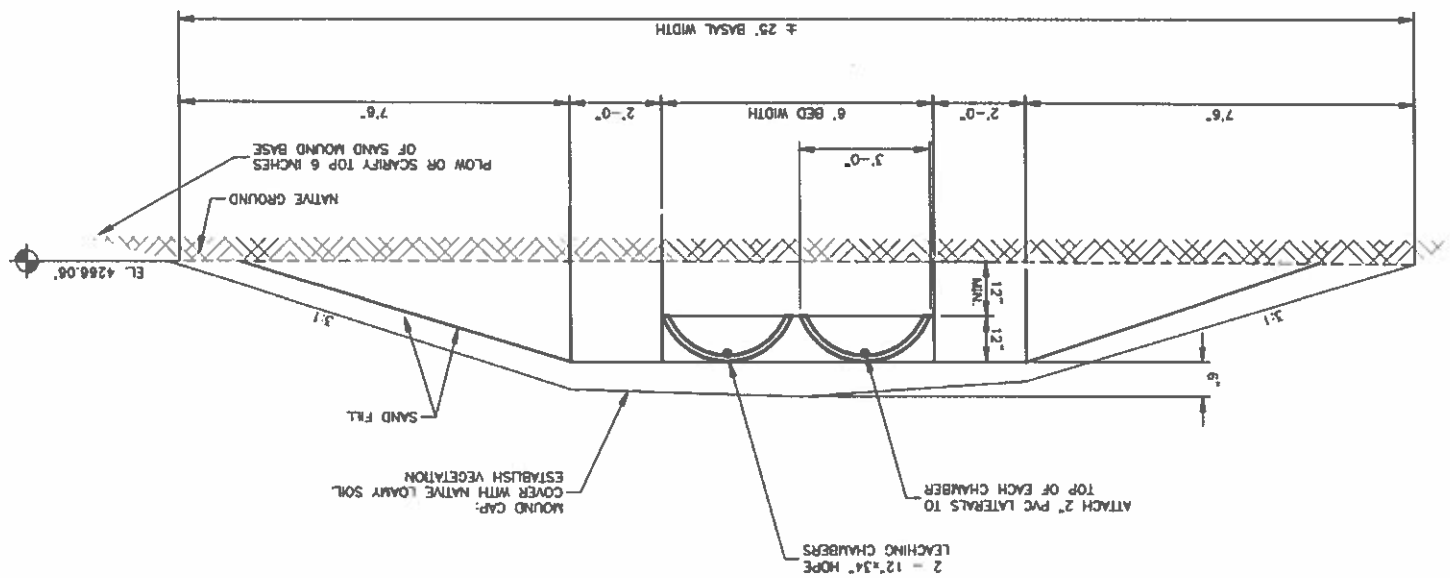
C. HAVE AN EFFECTIVE SIZE (D10) OF 0.15mm TO 0.30mm WITH A UNIFORMITY COEFFICIENT (D60/D10) OF 4 TO 6, WITH A MAXIMUM OF 3 PERCENT PASSING THE NO. 100 SIEVE.

GENERAL NOTES:

1. CONSTRUCT DRAINFIELD IN ACCORDANCE WITH MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY CIRCULAR DEQ-4.

1 ELEVATED SAND MOUND - LEACHING CHAMBERS

9 NOT TO SCALE



CANYON CREEK SCHOOL
CANYON CREEK SCHOOL SEPTIC DESIGN
ELEVATED SAND MOUND DETAILS

SHEET NO. **9** OF 9

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