Appendix C

Environmental Scan Report

Old Highway 312 Corridor Study

Environmental Scan Report

June 2015

DOWL

MDT

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Attachments

Abbreviations and Acronyms

AASHTO	American Association of State Highway and Transportation Officials
ACS	American Community Survey
APE	Area of Potential Effect
BOR	Bureau of Reclamation
CAPS	Crucial Areas Planning System
CEIC	Census and Economic Information Center
CFR	Code of Federal Regulations
CRABS	Cultural Resource Annotated Bibliography System
CRIS	Cultural Resource Information Systems
DEQ	Montana Department of Environmental Quality
DNRC	Montana Department of Natural Resources and Conservation
DOC	Montana Department of Commerce
DOLI	Montana Department of Labor and Industry
EO	Executive Order
eREMI	Regional Economic Models, Inc.
ESA	Endangered Species Act
FAS	Fishing Access Site
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Maps
FPPA	Farmland Protection Policy Act
FWP	Montana Department of Fish, Wildlife, and Parks
GIS	Geographic Information System
HUC	Hydrologic Unit Code
LID	Low Impact Development
LUST	Leaking Underground Storage Tank
LWCFA	Land and Water Conservation Fund Act
MBMG	Montana Bureau of Mines and Geology
MBOG	Montana Board of Oil and Gas
MBTA	Migratory Bird Treaty Act
MDT	Montana Department of Transportation
MEPA	Montana Environmental Policy Act
MFISH	Montana Fisheries Information System
MNHP	Montana Natural Heritage Program
MPDES	Montana Pollutant Discharge Elimination System
MPO	Metropolitan Planning Organization
MS4	Municipal Separate Storm Sewer System (MS4)
MSATs	Mobile Source Air Toxics
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPL	National Priority List
NPMS	National Pipeline Mapping System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRIS	Natural Resource Information System
NWI	National Wetlands Inventory
PESC	Permanent Erosion and Sediment Control
PM	Particulate Matter
RP	Reference Post

Abbreviations and Acronyms, continued

SFHA	Special Flood Hazard Area
SHPO	State Historic Preservation Office
SOC	Species of Concern
T&E	Threatened and Endangered
TEDD	Targeted Economic Development District
TIP	Transportation Improvements Plan
TMDL	Total Maximum Daily Load
UM	University of Montana
USACE	United States Army Corps of Engineers
USC	United States Code
USCB	United States Census Bureau
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USNPS	United States National Park Services
UST	Underground Storage Tank

1.0 Introduction

The primary objective of this environmental scan report is to provide a planning-level overview of resources and determine potential constraints and opportunities for the Old Highway 312 Corridor Study. Information in this report was obtained from publically-available reports, websites, and documentation. This scan is not a detailed environmental investigation.

If improvement options are forwarded from this study into project development, an analysis for compliance with the National and Montana Environmental Policy Acts (NEPA and MEPA) will be completed as part of the Montana Department of Transportation (MDT) project development process. Information provided in this report may be forwarded into the NEPA/MEPA process at that time.

1.1 Study Area

Highway 312 (X-56788) is located in southcentral Montana in Yellowstone County. Highway 312 connects the communities of Huntley, Shepherd, and Worden with Billings.

According to the Natural Heritage database for Yellowstone County, land use adjacent to the corridor varies. Land use in the area is mainly agricultural in the form of cultivated crops with some pasture and hay intermixed. The corridor also contains some commercial land, low-density residential areas, and roads.

The three main communities of Huntley, Shepherd, and Worden are historically part of the area contributing to the Huntley Project, a federal irrigation project aimed at providing water to the arid district in 1907. Portions of the communities of Huntley and Worden fall within the buffer of this corridor study as Highway 312 travels directly through Worden, and Secondary 522 travels through Huntley. At the east end of the corridor is Pompeys Pillar National Monument. Inside the property boundaries of the National Monument is a 5,700 square foot interpretive center that shares information on the journey of Captain William Clark and receives approximately 50,000 visitors annually.

The corridor for this environmental scan report includes Highway 312, starting at its intersection with US 87 (but not including the intersection) and traveling approximately 26 miles northeast through the communities of Huntley and Worden. Highway 312 becomes Secondary 568 approximately one mile before the Pompeys Pillar Interchange, and the study area continues to and includes the interchange. The study area also includes Secondary 522 from its intersection with Highway 312 to the I-94 Interchange west bound on/off ramp, a distance of approximately 3 miles. The study area for this environmental scan includes a 200-foot buffer from centerline along both sides of the roadways (for a total buffer width of 400 feet) throughout the corridor.

Multiple maps have been prepared to illustrate resources present in the study area. For ease of reference, all exhibits are included in Attachment 1. Exhibit 1 is an illustration of the study area location, and Exhibit 2 is a topographic map of the study area.

1.2 Goals of the Study

Substantial growth has occurred in the area in recent years, leading to increased traffic and congestion. Because of this growth, MDT has identified a need for a planning study to investigate potential improvements along the Highway 312 corridor.

The corridor study aims to reduce planning time while considering community and social issues, and minimize construction costs through the identification of feasible improvement opportunities. The study will seek to minimize the cost of any possible improvements while considering environmental and social concerns.

2.0 Physical Environment

Contact information for MDT and the consultant will be provided in all published materials.

2.1 Soil Resources and Prime Farmland

Soils information was reviewed to determine the presence of prime and unique farmland in the study area to demonstrate compliance with the Farmland Protection Policy Act (FPPA). The FPPA is intended "to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses, and to assure that federal programs are administered in a manner that, to the extent practicable, will be compatible with State, unit of local government, and private programs and policies to protect farmland."

The term "farmland" refers to prime farmland; some prime if irrigated farmland; unique farmland; and farmland, other than prime or unique farmland, that is of statewide importance. Prime farmland soils are those that have the best combination of physical and chemical characteristics for producing food, feed, and forage; the area must also be available for these uses. Prime farmland can be either non-irrigated or lands that would be considered prime if irrigated. Farmland of statewide importance is land, in addition to prime and unique farmlands, that is of statewide importance for the production of food, feed, forage, and oilseed crops.

Soil surveys of the study area are available from the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). NRCS soil surveys indicate the presence of farmland of state or local importance, or prime farmland if irrigated within the study area. The actual percentage of the study area comprised of farmland of state or local importance or prime farmland if irrigated is low. Additionally, some of the areas previously designated as prime farmland may have been subsequently developed. Developed land previously designated as prime farmland is no longer subject to the FPPA, and will not be considered in impact analyses for future improvements forwarded from the study (refer to Exhibit 3 in Attachment 1).

Any forwarded improvement options that require right-of-way within identified farmlands and are supported with federal funds will require a CPA-106 Farmland Conversion Impact Rating Form for Linear Projects completed by MDT and coordinated with NRCS. The NRCS uses information from the impact rating form to keep inventory of the prime and important farmlands within the state.

2.2 Geologic Resources

Information on the geology and seismicity in the study area was obtained from several published sources. Geologic mapping was reviewed for rock types, the presence of unconsolidated material, and fault lines. Seismicity and potential seismic hazards were also reviewed. This geologic information can help determine potential design and construction issues related to embankments and road design. The following is a brief summary of the geologic and seismic conditions present in the study area. Exhibit 4 (in Attachment 1) presents the geologic formations and structures within the study area.

The western section of the corridor from the junction with US Highway 87 to the area around Huntley initially traverses colluvium and alluvial fan deposits of silty clay related to the Cretaceous Judith River Formation. This formation consists of a light colored sandstone, gray siltstone, sandy shale, greenish-gray clay, with some lignite beds. With the exception of the alluvial deposits associated with crossings of Twelve Mile Creek and the Yellowstone River, the majority of the material is Pleistocene alluvial gravel terraces (cobbles and pebbles with minor amounts of sand and silt) approximately 50 to 90 feet above the present elevation of Yellowstone River. There are clasts or mixed rock fragments present. They are mainly composed of granitic igneous rocks, granitic gneiss, schist, and quartzite, with much less limestone and sandstone. From Huntley, the corridor continues over terrace deposits as noted above, as well as alluvial fan deposits consisting of gravel, sand, silt, and clay deposited in fans by modern streams.

The majority of soils along the corridor are silts, fine silty sands, and clays. Specific to the existing road alignment of Highway 312, the soils exhibit moderate to high corrosion potential for steel, and low to moderate corrosion potential for concrete. Frost susceptibility of these soil types is low to moderate. In addition, the soil types that will be encountered during excavation will likely be moisture-sensitive soils that can adversely affect construction as well as the long-term viability of the roadway. These soils are sensitive to scour, which is the erosion of soil from around the base of bridge pier abutments due to the flow of air, ice, or water. Embankment construction, which is the placement of compacted materials for a roadway or structure to be built upon in this corridor, will likely require foundation reinforcement due to the moisture sensitivity of the soils present.

These types of soils can create revegetation challenges. The clay heavy soil reacts in extremes to either the lack of or presence of moisture. The design of future projects forwarded from the study should consider including permanent erosion and sediment control (PESC) measures to extent practicable to help the soils stay in place long enough for the plants and grasses to take hold and revegetate the project. Native plant and grass types that can live in soils with higher silt and/or clay content should be chosen.

Improvements brought forward from the study will be subject to more detailed geotechnical analysis. Part of this detailed analysis may involve taking advance borings to evaluate soil characteristics at exact project locations. This is standard procedure for the majority of MDT road projects. The design of any improvements should take into consideration specific requirements that come from the detailed analysis.

2.3 Surface Waters

Topographic maps and geographic information system (GIS) data were reviewed to identify the location of surface water bodies such as rivers, streams, lakes, and reservoirs within the study area. Listed below are the named streams within the study area.

- Five Mile Creek
- Seven Mile Creek
- Twelve Mile Creek
- Yellowstone River
- Pryor Creek
- Arrow Creek

A variety of additional surface waters, including unnamed streams, natural drainages, wetlands, and ponds are present in the study area. Impacts to these surface waters could occur from improvements such as culverts under the roadway, placement of fill, or rip rap armoring of banks. The United States Army Corps of Engineers (USACE), the Montana Fish, Wildlife and Parks (FWP), and the Montana Department of Environmental Quality (DEQ) all regulate portions of work within surface waters. Coordination with federal, state, and local agencies would be necessary to determine the appropriate permits based on choice of improvement options forwarded from this study. Impacts should be avoided and minimized to the maximum extent practicable. Stream and wetland impacts may trigger compensatory mitigation requirements of the USACE. Construction of forwarded improvement options may trigger the need to obtain coverage under the Montana Pollutant Discharge Elimination System (MPDES) General Permit for Storm Water Discharges Associated with Construction Activity. Exhibit 5 (in Attachment 1) contains six maps (5A – 5F) depicting surface waters found in the study area.

Total Maximum Daily Loads

The study area is located in the Middle Yellowstone Watershed (hydrologic unit code (HUC) 10070007). A search of the DEQ website revealed two water bodies on the 303d/305b integrated list within the buffer zone of the corridor. Those water bodies are the Yellowstone River and Pryor Creek, which are shown on multiple maps within Exhibit 5 in Attachment 1. Information on the Yellowstone River and Pryor Creek was then obtained from the DEQ website.

Section 303 subsection “d” of the Clean Water Act requires the state of Montana to develop a list, subject to United States Environmental Protection Agency (USEPA) approval, of water bodies that do not meet water quality standards. When water quality fails to meet state water quality standards, DEQ determines the causes and sources of pollutants in a sub-basin assessment and sets maximum pollutant levels, called total maximum daily loads (TMDL). TMDLs set by DEQ become the basis for implementation plans to restore water quality to a level that supports state designated beneficial water uses. The implementation plans identify and describe pollutant controls and management measures to be undertaken (such as best management practices), the mechanisms by which the selected measures would be put into action, and the individuals and entities responsible for implementation projects.

DEQ lists both the Yellowstone River (MT43Q001_011) and Pryor Creek (MT43E001_010) as having impairments in the Draft 2014 Integrated 303(d)/305(b) Water Quality Report for Montana (see Table 1). Both water bodies are characterized as Category 5, defined as waters where one or more applicable beneficial uses are impaired or threatened, and a TMDL is required to address the factors causing the impairment or threat. At this time, the TMDL for these two water bodies is not completed. For the Yellowstone River inside the study area, two probable sources of impairment are agriculture and irrigated crop production. Two possible other causes are industrial and municipal point source discharges, which could be a result of release of water from wastewater treatment systems. Probable sources of impairment for Pryor Creek are flow alterations from water diversions, and irrigated crop production. Currently the probable sources of impairments are not listed as being associated with road construction activities. If improvement options are advanced from this study, it will be necessary to reevaluate the 303(d)/305(b) integrated report for changes to listed impairments along with possible completed TMDLs.

Table 1 303(d) Listed Streams in Study Area

Named Stream	Use Class	Category	Possible Impairment	Beneficial Uses
Pryor Creek MT43E001_010	C-3	5	Benthic-Macroinvertebrate Bioassessments	Aquatic Life
		5	Low flow alterations	Aquatic Life, Primary Contact Recreation
Yellowstone River MT43Q001_011	B-3	5	Oil and Grease	Primary Contact Recreation, Aquatic Life
		5	Sedimentation/Siltation	Aquatic Life
		5	Total Dissolved Solids	Aquatic Life
		5	Ammonia (un-ionized)	Aquatic Life

Source: DEQ, 2015.

Storm Water

The western end of corridor is located within the Billings Municipal Separate Storm Sewer System (MS4) area. Exhibit 6 depicts the boundaries of the Billings MS4 related to the permit holder (City of Billings, Yellowstone County, or MDT) in relation to the study area. Under the current Small MS4 General Permit, new development or redevelopment projects greater than or equal to one acre in size must implement, when practicable, low impact development (LID) practices that infiltrate, evapo-transpire, or capture for reuse the runoff generated from the first half-inch of rainfall from a 24-hour storm preceded by 48 hours of no measurable precipitation.

The City of Billings, Yellowstone County, and MDT all manage MS4 programs that overlap the study area. Each program has specific requirements based on their individual storm water management plans. Information on the MS4 programs including specific requirements for the individual programs can be located on the respective permit holder's storm water website, which can be found in the references section at the end this document. These and other MS4 issues will need to be further evaluated during any future project design. The current MS4 permit is in the process of being reissued and MDT has applied for an Individual MS4 permit. As such, it is likely the permit requirements will be slightly different in the future.

Wild and Scenic Rivers

The Wild and Scenic Rivers Act, created by Congress in 1968, provides for the protection of certain rivers, and their immediate environments, that possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, or cultural resources, or other similar values. Based on a review of the United States National Park Service (USNPS) website, none of the waterways within the study area carry the wild and scenic designation.

2.4 Groundwater

According to the Montana Bureau of Mines and Geology (MBMG) Groundwater Information Center (GWIC), there are 13,184 wells on record in Yellowstone County. A portion of these wells are located within the study area. The newest well on record is from February 10, 2015, and the oldest well on record is from January 1881. Approximately 80 percent (10,463) of wells within Yellowstone County are at a depth of 0 to 99 feet. There are 40 statewide monitoring network wells in Yellowstone County. The wells in Yellowstone County have widely varying uses, with domestic wells being the most common, followed by stock water wells.

Wells can be a costly item to mitigate if they are not avoided. Mitigation of a well usually involves drilling a new well for the owner in a new location that will not be impacted by the potential project. Well costs are based on per foot price; the deeper and higher volume needed results in a higher cost.

As mentioned above, there are numerous private domestic wells located within the buffer zone of the study area. In addition to the private wells, three public water supply wells are located inside the buffer zone, two of which are in the community of Huntley. DEQ requires a 100-foot isolation zone around all public water supply wells to prevent the introduction of potential pollutant sources. Public water supply wells can also be deeper and require a higher volume of water to be discharged. This can translate into more costly well replacement, along with affecting a larger number of users compared to a private well if impacted. Public water supply well information is listed below in Table 2. A visual depiction of approximate location with DEQ's buffer zone is presented in Exhibit 7B (in Attachment 1).

Table 2 Public Water Supply within Study Area

Owner	Type	Approximate Location	Exhibit #
Town and Country Bar	Well #1	RP 6.6 of Highway 312	7B
Huntley and Yellowstone Water and Sewer District	Well #3	RP 0.6 of Secondary 522	7B
Huntley and Yellowstone Water and Sewer District	Well #4	RP 1.1 of Secondary 522	7B

Source: MDEQ, 2015.

In any future roadway improvements on the corridor, MDT will take measures to avoid adverse impacts to public water supply wells. Impacts to existing domestic wells will also be considered if improvement options are forwarded from the study.

2.5 Wetlands

The USACE defines wetlands as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping data is available for this area from the NWI website or the Montana Natural Resource Information System (NRIS) (see Exhibit 5 in Attachment 1). The potential wetland areas identified within the study area are primarily in the vicinity of Five Mile Creek, Seven Mile Creek, Twelve Mile Creek, and the Yellowstone River. A few natural drainages and channelized waters are also present in the study area and may have associated wetlands.

While some useful information can be ascertained from the NWI maps, these maps are based on the USFWS definition of wetlands, which does not follow the USACE definition that MDT uses in wetland determination and delineation. NWI maps are typically

generated based on aerial and satellite imagery and are not accurate enough or detailed enough for MDT project wetland determination and/or delineation.

Future wetland delineations would be required if improvement options are forwarded from the study that could potentially impact wetlands. Future projects in the study area would need to incorporate project design features to avoid and minimize adverse impacts to wetlands to the maximum extent practicable. Unavoidable impacts to wetlands must be compensated through mitigation in accordance with the USACE regulatory requirements and/or requirements of Executive Order 11990. Work within jurisdictional wetlands would require a Clean Water Act 404 permit from the USACE.

2.6 Floodplains and Floodways

Executive Order 11988, Floodplain Management, requires federal agencies to avoid to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. In accomplishing this objective, "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities" for the following actions:

- acquiring, managing, and disposing of federal lands and facilities;
- providing federally-undertaken, financed, or assisted construction and improvements; and
- conducting federal activities and programs affecting land use, including but not limited to, water and related land resources planning, regulation, and licensing activities.

Federal-aid Policy Guide, 23 CFR 650, Bridges, Structures, and Hydraulics, provides “policies and procedures for the location and hydraulic design of highway encroachments on flood plains, including direct Federal highway projects administered by the [Federal Highway Administration (FHWA)].” This document defines “base flood” as the “flood or tide having a 1-percent chance of being exceeded in any given year” and “base flood plain” as the “area subject to flooding by the base flood.”

Federal Emergency Management Agency (FEMA)-issued flood maps for Yellowstone County indicate three floodplain zones exist within the study area as follows.

Zone A: Areas subject to inundation by the 1% annual chance flood event, generally determined using approximate methodologies;
Zone AE: Special Flood Hazard Area (SFHA) – The 1% annual chance flood (100-Year Flood), Base Flood Elevations Determined; and
Zone X: Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

The delineated 100-year flood plains (Zone AE) that cross through the corridor study area buffer are on Five Mile Creek, Yellowstone River bridge and roadway immediately west of Huntley, Pryor Creek bridge on Secondary 522, and Yellowstone River for approximately the last mile of the corridor’s eastern terminus (Bundy Road area). These locations are shown on the floodplain maps in Exhibit 8.

Roadway improvements or developments could involve placement of fill within the regulatory floodplain and would require a floodplain permit. Project development would require coordination with Yellowstone County to minimize floodplain impacts and obtain necessary floodplain permits for project construction.

2.7 Irrigation

Irrigated agriculture land exists in Yellowstone County within the study area. Depending on the improvement option(s) proposed during the study, there is potential to impact irrigation facilities. Impacts to irrigation facilities should be avoided when practicable. Future modifications to existing irrigation canals, ditches, or pressurized systems could require redesigning and constructing in consultation with the owners to minimize impacts to agricultural operations. If there is impact to irrigation structures, there could be additional costs above typical project costs associated with the redesign, or moving of the irrigation structure(s). Available water resources survey maps (Attachment 4) indicate an abundance of water rights and agricultural land use throughout study area. As such, a large number of irrigation structures are not easily identified at the high-level review conducted for this study. A more in-depth review for irrigation structures should occur at the project development stage to identify possible impacts.

The communities of Huntley and Worden were established as a result of the Bureau of Reclamation's (BOR) Huntley Irrigation Project. The Huntley Irrigation Project is currently managed by BOR to provide water for agricultural purposes in the corridor and the surrounding area. In addition to the Huntley Irrigation Project's associated ditches and canals, the Billings Bench Water Association (BBWA) Irrigation System owns main canals and lateral ditches within the corridor. Currently 30,000 acres of alfalfa and other hay crops, sugar beets, silage, irrigated pasture, and small grains are watered from the Huntley Project waters. The portion of the canal that crosses Pryor Creek has been rebuilt three times because of flooding, evidencing the importance of these structures to the surrounding areas (Exhibit 16B).

These canals are of high importance to the areas surrounding the corridor and will need to be considered as part of the design process if the MDT forwards projects in the corridor. Please refer to Section 4.4 for historical information.

2.8 Air Quality

The USEPA has established National Ambient Air Quality Standards (NAAQS) for six criteria pollutants, including carbon monoxide, nitrogen dioxide, ozone, particulate matter (PM_{10} and $PM_{2.5}$), sulfur dioxide, and lead. The USEPA designates communities that do not meet NAAQS as "non-attainment areas." States are required to develop a plan to control source emissions and ensure future attainment of NAAQS. The study area is not located in a non-attainment area for any of the criteria pollutants. Additionally, there are currently no non-attainment areas nearby, although carbon monoxide and sulfur dioxide were historically ambient air quality concerns in Billings. As a result, special design considerations will not be required in future project design to accommodate NAAQS non-attainment issues.

Depending on the scope of improvements considered in the study area, an evaluation of mobile source air toxics (MSATs) may be required. MSATs are compounds emitted from highway vehicles and off-road equipment, which are known or suspected to cause cancer or other serious health and environmental effects.

2.9 Hazardous Substances

The NRIS and Montana Board of Oil and Gas (MBOG) databases were searched for information on underground storage tank (UST) sites, leaking underground storage tank (LUST) sites, abandoned mine sites, remediation response sites, landfills, National Priority List (NPL) sites, hazardous waste, crude oil pipelines, and toxic release inventory sites. There are no abandoned mine sites, landfills, NPL sites, hazardous waste handling facilities, oil and gas production wells, or toxic release inventory sites identified within the study area. None of the hazardous substance sites discussed below are expected to be substantial impediments for future project design.

Although it is unlikely that any of these sites will substantially impact projects forwarded from the study, any projects overlapping one of these sites should incorporate a soil survey. If contaminated soils are present, a special provision regarding handling contaminated soils is recommended to be included in project documentation. In addition, contaminated soils could result in the need for remediation. A brief summary of the primary sites that fall within the study area that could overlap potential improvements follows below. Please see Exhibit 9A-9F in Attachment 1 for approximate hazardous substance locations.

Underground Storage Tanks

There are three active and 55 closed UST sites located in or adjacent to the study area. Table 3 lists the currently known active UST sites within the study area. These UST sites are concentrated in Billings, Huntley, and Worden. However, there are several rural UST sites located throughout the study area. An active UST site is a tank system that is currently in use and registered with the DEQ. These sites may include service stations, convenience stores, farms, or ranches. A closed UST site is no longer in use. It is likely that the tanks, piping, and pumps have been removed from the ground. It is unlikely that a closed UST site will affect project development. However, project activities occurring in the vicinity of an active UST site may warrant additional soil/groundwater investigations or special provisions. Additional investigation regarding the precise locations of the USTs may need to take place depending on what improvement options are forwarded from this study.

Leaking Underground Storage Tanks

There are nine active LUST sites and 15 resolved LUST sites located in or adjacent to the study area. Table 3 lists the currently known active LUST sites within the study area. There are also LUST sites concentrated in Billings, Huntley, and Worden. However, there are several rural LUST sites located throughout the study area. A resolved LUST site has been characterized and cleaned up, and there is limited risk to human health and the environment. An active LUST site has petroleum hydrocarbon concentrations in soil or groundwater that exceed DEQ cleanup criteria. The responsible party, with oversight from DEQ, may be conducting soil and/or groundwater investigations or cleanup activities at an active LUST site. It is unlikely that a resolved LUST site will affect project development. If project activities occur near an active LUST site, further investigation and possible remediation may be necessary. This could create additional costs associated with a forwarded improvement.

Table 3 Active UST and LUST Sites

Site Name	Facility ID	Release ID	UST or LUST	Approximate RP on Highway 312
Greens Service and Repair Inc.	5600251	2655	LUST	0.9
Express Way	5600627		UST	1.0
Scwartz Family Trust	5611902	4046	LUST	1.4
Unknown Tank #1, #2	5600062		UST	5.5
Kautz Stop and Shop	5606949	661	LUST	7.1
Project Mercantile	5608624	2436	LUST	17.4
School Dist 24, Worden	5604326	468, 1754, 2501, 2502, 2283, 2284	LUST	17.4
Farmers Union Oil Co. Worden	5602326	4560, 4714	LUST	17.5

Source: NRIS, 2015.

Crude Oil Pipeline

The NRIS database, National Pipeline Mapping System, and Montana State Library data indicate that two crude oil pipelines owned by Phillips 66 cross Highway 312 within approximately the first three miles of the study area, just northeast of the City of Billings. A third crude oil pipeline is located adjacent to the study area south of Highway 312, between Huntley and Worden. Due to legal protections regarding the terms of use and data sharing agreements, up-to-date mapping data is not available. Data published in 1999 by Montana State Library for DEQ is available as a general reference to find potential sources of contamination from refined products and crude oil pipelines. It shows the general location of the refined products and crude oil pipelines in Montana from maps that were available at the time, and may not show all current pipelines. The three pipelines have been mapped using the historical data for reference purposes only (Exhibit 9A and 9C). If improvements are proposed in these areas, additional research and coordination with the owners should occur to identify pipeline locations and what, if any, potential conflicts exist.

Remediation Response Sites

There are two remediation response sites shown on Exhibit 9C by an orange triangle that are located adjacent to the study area. Cenex Pipeline Huntley would require further review to verify current conditions and boundaries of the remediation site. The Jones Junction Fueling Facility has been delisted and should not influence potential projects forwarded from this study. The individual descriptions for each remediation site follows.

- Cenex Pipeline Huntley - On January 29, 1989, an eight-inch diameter petroleum product pipeline located approximately one mile northeast of Huntley ruptured, resulting in the release of approximately 44,000 gallons of regular leaded gasoline. Initial containment measures included constructing a dike on Old Pryor Creek at Huntley Road to prevent the flow of product downstream. On January 29 through January 31, 1989, approximately 12,000 gallons of water and gas mixture were pumped from the stream and returned to the refinery for separation. The remaining free product was incinerated. In March 1990 a pump and treat system was installed. This system was in operation until January 1998, treating

approximately 100 million gallons of contaminated groundwater. A bioventing remediation system was installed in January 1998. If a project occurs in close proximity to this site, further review or potential soil investigation may be necessary.

- Jones Junction Fueling Facility (Burlington Northern) - Jones Junction is an inactive, temporary railroad fueling facility located three miles northeast of Huntley. Dates of operation are unknown. Possible spillage or leakage during fueling operations caused minor petroleum hydrocarbon soil contamination. In 1998 DEQ approved a voluntary clean-up plan and the facility was delisted in 2000, therefore it is unlikely that this site would impact a future highway project.

3.0 Biological Resources

3.1 Vegetation

According to the Montana Natural Heritage Program (MNHP) Landcover Report, the dominant land-cover types in the study area are Big Sagebrush Steppe, Cultivated Fields, and Great Plains Mixed Prairie. Lands adjacent to the corridor study area include cultivated fields and developed human land use in the form of low-density residential, roads, and some commercial land as shown in Table 4. Highway 312 crosses Five Mile Creek, Seven Mile Creek, Twelve Mile Creek, Arrow Creek, and the Yellowstone River; these drainages provide wetland and riparian vegetation along the corridor. All land types in the project area are either moderately or highly disturbed.

Table 4 Study Area Land Cover

% of Cover	Land Cover Type
20	Big Sagebrush Steppe
17	Great Plains Mixedgrass Prairie
12	Cultivated Crops
8	Roads
7	Great Plains Floodplain
7	Great Plains Pondersoa Pine Woodland and Savanna
6	Low Density Residential
5	Developed, open space
4	Great Plains Sand Prairie
3	Commercial/Industrial
3	Open Water
2	High-density Residential
2	Interstate

Source: MNHP, 2015.

If improvement options are forwarded from the study, practices outlined in MDT standard specifications should be followed to minimize adverse impacts to vegetation and facilitate establishment of final stabilization of disturbed areas. Removal of mature trees and shrubs should be limited to the extent practicable.

Noxious Weeds

Noxious weeds can degrade native vegetative communities; damage riparian areas; compete with native plants; create fire hazards; degrade agricultural and recreational lands; pose threats to the viability of livestock, humans, and wildlife; and are expensive to manage. Areas with a history of disturbance, like highway rights-of-way, are at particular risk of weed encroachment. The Invaders Database System lists 147 exotic plant species and 14 noxious weed species in Yellowstone County, some of which may be present in the study area (Table 5). Yellowstone County has weed management criteria in place that can be found on their website (http://www.co.yellowstone.mt.gov/publicworks/weed/).

Table 5 Noxious Weed Species in Yellowstone County

Noxious Weed Name	
Canada Thistle	Leafy Spurge
Dalmatian Toadflax	Orange Hawkweed
Diffuse Knapweed	Purple Loosestrife
Dryer's Woad	Russian Knapweed
Field Bindweed	Spotted Knapweed
Hoary Cress	Wandlike Loosestrife
Houndstoungue	Yellow Toadflax

Source: University of Montana Invaders Database System, 2015.

Reseeding of disturbed areas with desirable native plant species will help to reduce the spread and establishment of noxious weeds and to re-establish permanent vegetation. If improvements are forwarded from the study, field surveys for noxious weeds should take place prior to any ground disturbance and coordination with Yellowstone County Weed Board should occur. Proposed projects should incorporate the practices outlined in MDT standard specifications to minimize adverse impacts.

3.2 General Wildlife Species

Mammals

Wildlife species inhabiting or traversing the project study area are typical of those that occur in moderately developed areas of south central Montana. Since many species in this area are habituated to somewhat disturbed areas, species present in this area are predominantly, though not exclusively, generalists. Exhibit 10 (in Attachment 1) indicates distributions of game species mapped by FWP. Antelope distribution is presented in Exhibit 10A. White-tailed Deer distribution is presented in Exhibit 10B.

The study area is home to a variety of other unmapped mammal species including Mule Deer, Mountain Lion, and Coyote. Other common mammals potentially occurring in the study area include Porcupine, Raccoon, Striped Skunk, Beaver, Badger, Bobcat, Red Fox, Northern River Otter, Muskrat, Desert Cottontail, Bushy-tailed Woodrat, Western Harvest Mouse, House Mouse, Deer Mouse, Hayden's Shrew, Prairie Vole, Montane Vole, Least Chipmunk, Eastern Fox Squirrel, Eastern Gray Squirrel, Richardson's Ground Squirrel, Big Brown Bat, Long-eared Myotis, and Silver-haired Bat.

Limited information is available for review in the MDT Maintenance Animal Incident Database. Carcass locations are illustrated in Exhibit 11 (in Attachment 1). White-tailed and Mule Deer account for the majority of the recorded wildlife mortality. In addition one

Mountain Lion, one Raccoon, one domestic dog, and four unidentified animal carcasses were recorded.

If improvement options are forwarded from the study, the need for and viability of wildlife crossing mitigation measures should be considered during the project development process.

Amphibians and Reptiles

The MNHP Tracker database records and maps documented observations of species in a known location. The MHNP Tracker database indicates amphibian and reptile species known to occur within the study area include, but are not limited to, the Boreal Chorus Frog, Northern Leopard Frog, Woodhouse's Toad, Plains Gartersnake, and Terrestrial Gartersnake. Any improvements forwarded from the study should take into consideration and minimize impacts to amphibian and reptile habitat where practicable.

Birds

The MNHP Natural Heritage Tracker database indicates 40 species of birds have been documented with the potential to occur and nest in the study area. An additional 58 species have been documented during the winter in the general vicinity of the study area. These species include representative songbirds, birds of prey, waterfowl, owls, and shorebirds. Of the listed birds, many are tree and shrub nesters, which may constrain the ability to remove trees or structures within the study area. Exhibit 12A (Attachment 1) shows the species of concern bird distributions that are visible in the study area. The Wild Turkey (Exhibit 10D), and Ring-necked Pheasant (Exhibit 10C) are game birds present in the study area. The other bird species distributions are broad, encompassing large portions of the study area. Please refer to MNHP for exact locations of other bird species occurring in the study area.

Migratory birds are protected under the Migratory Bird Treaty Act (MBTA). Under this strict liability law, it is unlawful to pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product, manufactured or not. Direct disturbance of a nest occupied with birds or eggs is prohibited under the law. The destruction of unoccupied nests of eagles; colonial nesters such as cormorants, herons, and pelicans; and some ground/cavity nesters such as burrowing owls or bank or cliff swallows may also be prohibited under the MBTA.

Data searches revealed that currently there are no known Bald Eagle or Golden Eagle nests within the buffer zone of the study area. However, there are known Bald Eagle nests along this stretch of the Yellowstone River. The required half-mile buffer areas around these nests do not overlap the study area. This area is not typical Golden Eagle habitat so presence of Golden Eagle nests is unlikely. Bald and Golden Eagles are protected under the MBTA and managed under the Bald and Golden Eagle Protection Act, which prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" Bald Eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any Bald Eagle or Golden Eagle, alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

Any improvements forwarded from this study should consider potential constraints that may result from nesting/breeding periods of migratory birds and presence of unknown or

future Bald and Golden Eagles nests. Any work that involves the disturbance or removal of trees or structures associated with nesting birds will need to schedule this work to take place outside of the typical nesting season of April 15 to August 15.

If projects are forwarded from this study, potential staging and stockpiling areas may extend beyond the buffer area investigated in this study. Contractors will be required to comply with any potential conflicts with the Migratory Bird Treaty Act, if any arise.

Fisheries

There are four aquatic resources listed as possessing warm water fishery resources in the study area (see Exhibit 5 in Attachment 1). The largest is the Yellowstone River, which is listed as a high-value fishery resource and managed as a warm/cool fishery by FWP. According to the Montana Fisheries Information System (MFISH) database (report generated March 2015), fish species commonly occurring within the Yellowstone River within the study area are Brown Trout, Channel Catfish, Common Carp, Emerald Shiner, Fathead Minnow, Flathead Chub, Goldeye, Longnose Sucker, Mountain Sucker, River Carpsucker, Sauger, Shorthead Redhorse, Smallmouth Bass, Stonecat, Western Silvery Minnow, and White Sucker. Twenty-four additional fish species have been recorded for this stretch of the Yellowstone River, but are considered rare.

The other three aquatic resources are listed as limited fisheries. Of the three, Arrow Creek and Five Mile Creek are managed as trout fisheries while Twelve Mile Creek has an undesignated management classification. Table 6 depicts fisheries information for named streams within the study area for the most commonly occurring fish species. All of the streams have other fish species listed as common, rare, or unknown for varying reaches of the stream.

Table 6 Fisheries Data

Named Stream within Study Area	Fishery Value	Fish Species Commonly Occurring within Study Area
Yellowstone River	High	Brown Trout, Channel Catfish, Common Carp, Emerald Shiner, Fathead Minnow, Flathead Chub, Goldeye, Longnose Sucker, Mountain Sucker, River Carpsucker, Sauger, Shorhead Redhorse, Smallmouth Bass, Stonecat, Western Silvery Minnow, and White Sucker
Arrow Creek	Limited	Flathead Chub, Lake Chub, Longnose Dace, and Western Silvery Minnow
Twelve Mile Creek	Limited	Flathead Chub
Five Mile Creek	Limited	Fathead Minnow

Source: FWP Montana Fisheries Information System (MFISH), 2015.

Fish passage and/or barrier opportunities should be considered at affected drainages if improvements are forwarded from this study. Permitting from regulatory agencies for any future study area improvements may also require incorporation of design measures to facilitate aquatic species passage.

Crucial Areas Planning System

The FWP Crucial Areas Planning System (CAPS) is a resource intended to provide non-regulatory information during early planning stages of projects, conservation opportunities, and environmental review. The finest data resolution within CAPS is at the square-mile section scale or water body. Use of these data layers at a more localized

scale is not appropriate and may lead to inaccurate interpretations since the classification may or may not apply to the entire square-mile section. The CAPS system was consulted to provide a general overview of the study area. CAPS results are presented in Attachment 2.

The online CAPS mapping tool provides FWP general recommendations and recommendations specific to transportation projects for both terrestrial and aquatic species and habitat. These recommendations can be applied generically to possible future improvements carried forward from the study.

3.3 Threatened and Endangered Species

The USFWS maintains the federal list of threatened and endangered (T&E) species. Species on this list receive protection under the Endangered Species Act (ESA). An "endangered" species is in danger of extinction throughout all or a significant portion of its range. A "threatened" species is likely to become endangered in the foreseeable future. The USFWS also maintains a list of species that are candidates or proposed for possible addition to the federal list. According to the USFWS, four threatened, endangered, proposed, or candidate species are listed as occurring in Yellowstone County (see Table 7).

According to the MNHP - Map Viewer database, which records and maps documented observations of species in a known location, only the Greater Sage-Grouse has documented breeding occurrence boundaries recorded within 500 feet of the study corridor (see Exhibit 13 in Attachment 1). However, on September 22, 2015, the USFWS determined that the Greater Sage-Grouse no longer warrants protection under the ESA.

Table 7 Threatened and Endangered Species in Yellowstone County

Species	Status	Habitat
Greater Sage-Grouse[1]	Candidate	Sagebrush
Sprague's Pipit	Candidate	Mixed-grass prairie
Red Knot	Threatened	Wetlands
Whooping Crane	Endangered	Wet meadows/fields
Black-footed Ferret	Endangered	Grasslands/ Prairie Dog colonies

Source: USFWS, 2015.

1 On September 22, 2015 the U.S. Fish and Wildlife Service determined that the protection for the greater sage-grouse under the Endangered Species Act is no longer warranted and is withdrawing the species from the candidate species list. MDT will continue to follow the stipulations for the conservation of the greater sage-grouse contained in the State of Montana – Office of the Governor – Executive Order No. 12-2015 "Executive Order Amending and Providing for the implementation of the Montana Sage-Grouse Conservation Strategy".

If improvements are forwarded from the study, an evaluation of potential effects to T&E species will need to be completed during the project development process.

One observation of a Whooping Crane occurred near the project area in 2010. For any future projects, overhead utilities should be buried when possible, or otherwise marked to minimize impacts to the Whooping Crane.

As federal status of protected species changes over time, reevaluation of the listed status and afforded protection to each species should be completed prior to issuing a determination of effect relative to potential impacts.

3.4 Species of Concern

Montana species of concern (SOC) are native plants or native animals breeding in the state that are considered to be "at risk" due to declining population trends, threats to their habitats, and/or restricted distribution. Designation of a species as a Montana SOC is not a statutory or regulatory classification. Instead, these designations provide a basis for resource managers and decision-makers to direct limited resources to priority data collection needs and address conservation needs proactively. Each species is assigned a state rank that ranges from S1 (greatest concern) to S5 (least concern). Other state ranks include SU (unrankable due to insufficient information), SH (historically occurred), and SX (believed to be extinct). Modifiers, such as B (breeding) or N (non-breeding), may follow state ranks.

A search of the MNHP species of special concern database in March 2015, revealed 12 SOC in Yellowstone County. These 12 species have the potential to occur and breed in the study area based on presence of suitable habitat. For more information and a map depicting distribution, please see Table 8 and Exhibit 12 in Attachment 1.

Table 8 Species of Concern Overlapping the Study Area

Common Name	State Rank	Habitat Description	Exhibit
Greater Sage-Grouse	S2	Sagebrush	13
Great Blue Heron	S3	Riparian	12A
Bobolink	S3B	Wet meadow	12A
Loggerhead Shrike	S3B	Sagebrush shrubland	12A
Pinyon Jay	S3	Pine-juniper woodlands	12A
Spiny Softshell	S3	Rivers	12B
Snapping Turtle	S3	Rivers	12B
Greater Short-horned Lizard	S3	Sagebrush	12B
Sauger	S2	Rivers/lakes	12B
Spotted Bat	S3	Juniper/sagebrush	12C
Hoary Bat	S3	Riparian	12C
Little Brown Myotis	S3	Diverse	12C

Source: MNHP, 2015.

Montana's Governor Steve Bullock established by Executive Order the Greater Sage-Grouse Habitat Conservation Advisory Council on February 2, 2013. The purpose of the council was to "to gather information, furnish advice, and provide to the governor recommendations on policies and actions for a state-wide strategy to preclude the need to list the Greater Sage-Grouse under the ESA," by no later than January 31, 2014. The Council was co-chaired by FWP Director, Jeff Hagener, and the governor's Natural

Resources Policy Advisor, Tim Baker. Council members included representatives from agriculture and ranching, conservation and sportsmen, energy, mining and power transmission, tribal government, local government, and the legislature. The council has concluded its work and provided recommendations to the governor's office in the form of a "Montana Strategy to address threats to the Sage-Grouse in Montana" (Attachment 3). This plan should be taken into consideration if habitat for the Greater Sage-Grouse could be impacted. The USFWS has dedicated a website solely to the Greater Sage-Grouse.

On September 22, 2015, the U.S. Fish and Wildlife Service determined that the protection for the greater sage-grouse under the Endangered Species Act is no longer warranted and is withdrawing the species from the candidate species list. However, MDT will continue to follow the stipulations for the conservation of the greater sage-grouse contained in the State of Montana – Office of Governor – Executive Order No. 12-2015 "Executive Order Amending and Providing for the implementation of the Montana Sage-Grouse Conservation Strategy". A copy of the Greater-Sage Grouse Habitat Conservation Strategy is included in Attachment 3.

In 2011, FWP identified a Great Blue Heron rookery (nest) near the Huntley I-94 interchange. Additional rookeries exist along the Yellowstone River, paralleling the study corridor. Any future projects in the vicinity of the Huntley interchange should verify the use status of the rookery and minimize any potential effects to the Great Blue Heron.

A thorough field investigation for the presence and extent of these species should be conducted if improvement options are forwarded from this study. If present, special conditions that apply to the project design and/or during construction such as timing restrictions should be considered to avoid or minimize impacts to these species.

4.0 Social and Cultural Resources

4.1 Population Demographics and Economic Conditions

Under NEPA/MEPA and associated implementing regulations, state and federal agencies are required to assess potential social and economic impacts resulting from proposed actions. FHWA guidelines recommend consideration of impacts to neighborhoods and community cohesion, social groups including minority populations, and local and/or regional economies, as well as growth and development that may be induced by transportation improvements. Demographic and economic information presented in this section is intended to assist in identifying human populations that might be affected by improvements within the study area.

Title VI of the United States Civil Rights Act of 1964, as amended (USC 2000(d)) and EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, require that no minority or low-income person shall be disproportionately adversely impacted by any project receiving federal funds. For transportation projects, this means that no particular minority or low-income person may be disproportionately isolated, displaced, or otherwise subjected to adverse effects. If a project is forwarded from the improvement option(s), environmental justice will need to be further evaluated during the project development process.

An initial review of both City of Billings and Yellowstone County's currently-available growth and planning documents was conducted. This review did not identify any constraints for future forwarded projects.

Table 9 summarizes 2013 population and demographic data for the three communities along the corridor, Yellowstone County and includes Montana for comparison.

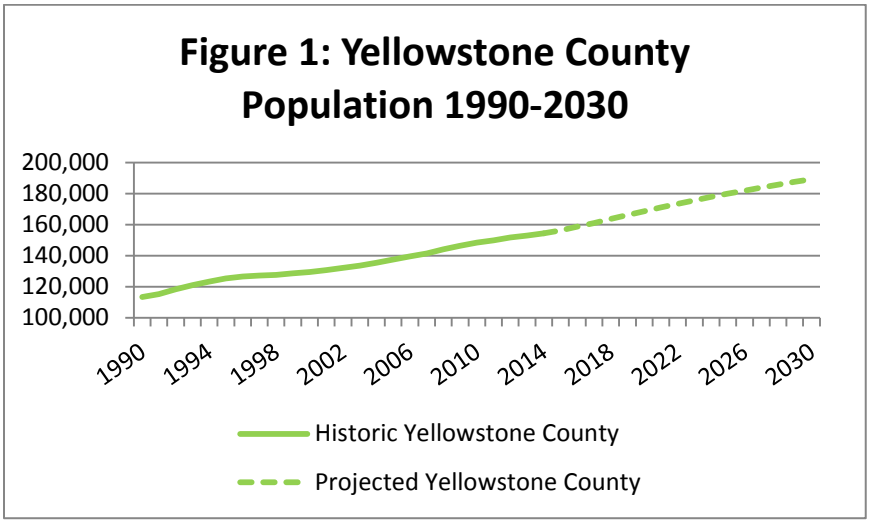
Table 9 2013 Census Data for Yellowstone County

Population		Worden	Huntley	Billings	Yellowstone County	Montana
		577	446	109,059	154,162	1,014,864
Ethnic Characteristics	White	93.0%	93.6%	89.6%	91.5%	89.5%
	Black or African American	0.3%	0.0%	0.8%	0.8%	0.6%
	American Indian and Alaska Native	2.6%	1.1%	4.4%	4.3%	6.5%
	Asian	0.3%	0.4%	0.7%	0.7%	0.8%
	Hispanic or Latino	3.8%	4.9%	5.2%	5.1%	3.3%

Source: U.S. Census Bureau, 2013.

The 2013 Census data indicates Yellowstone County ranks 1st out 56 for total county population in Montana. A large share of the population in Yellowstone County (70.7 percent) resides within the City of Billings. Ethnicity within Yellowstone County is primarily White/Caucasian (91.5 percent). American Indian Reservations are located within a short distance of Yellowstone County, which may contribute to the American Indian population at just over four percent, almost identical to the City of Billings. Hispanic or Latino individuals comprise just over five percent of the population.

Figure 1 Total Observed and Projected Population in the Study County

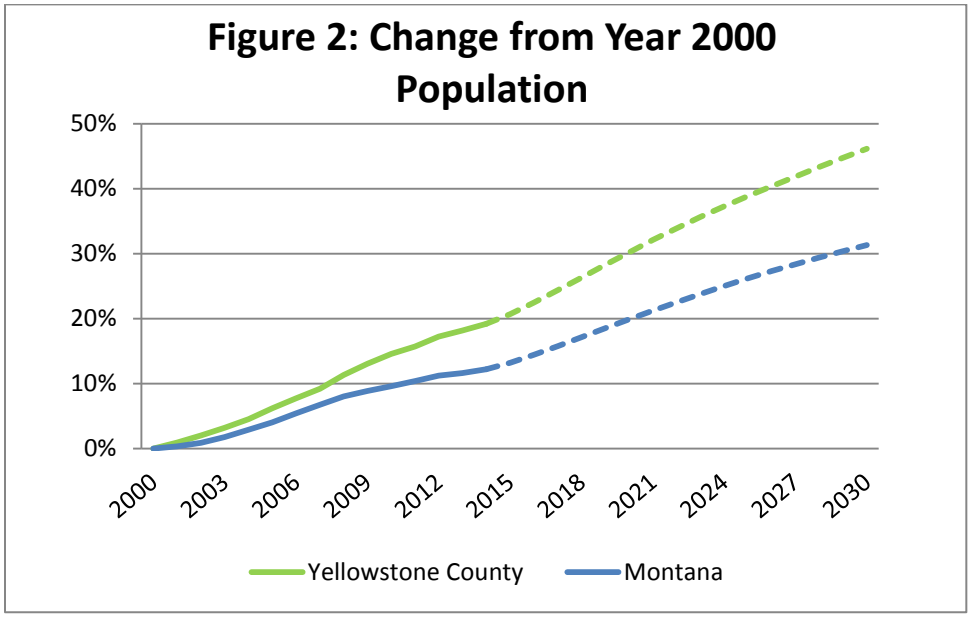


Source: Montana Department of Commerce, eREMI data.

According to the United States Census Bureau's estimate, Yellowstone County had a population of 154,162 people in 2013, and was the most populous county in Montana.

Billings, the largest city in the state, had a population of 109,059. Figure 1 depicts historic and projected population of Yellowstone County. All population projections are based on Regional Economic Models, Inc. (eREMI) forecasts of net migration and natural growth.

Figure 2 Population Comparison



Source: Montana Department of Commerce, eREMI data.

Over the last 25 years, Yellowstone County has experienced consistent population growth. Yellowstone County's population is expected to surpass 190,000 by the year 2030 if growth continues at its current pace. As shown in Figure 2, population growth in Yellowstone County has outpaced Montana over the last 15 years and that trend is projected to continue.

Some of Billings' growth can be attributed to the boom in the oil industry in the Bakken shale play. Billings is the closest urban area with a population over 100,000 people to the Bakken oil boom and many of its services support the Bakken and other energy development. Also, Billings serves as an economic hub for much of Montana and Wyoming and even parts of the Dakotas.

Table 10 Age Distribution

Range	Billings	Yellowstone County	Montana
Under 18	22.6%	23.6%	22.1%
18-64	62.4%	61.4%	61.7%
65 and Over	15.0%	15.0%	16.2%

Source: U.S. Census Bureau - ACS and 2010 Census.

The Yellowstone County median age is 38.3, which is slightly lower than the state average of 39.8 years. Yellowstone County has a higher percentage of people under the

age of 18, and a lower percentage over the age of 65 than the state average, resulting in a slightly younger population in Yellowstone County relative to the state. Table 10 illustrates age distribution.

Table 11 compares the Yellowstone County and national employment numbers as of December 2014. Yellowstone County demonstrates a strong labor market, which is expected to continue. As of December 2014, Yellowstone County's unemployment rate was a low 3%. Job orders through the Billings Job Service numbered 641 in January 2013, 997 in January 2014, and 944 in January 2015. Typically, employers requesting job orders through the Job Service represent about 25% of total available jobs in the market. Overall, these factors illustrate a high demand for labor in Billings and Yellowstone County. High demand for labor often means increased wages for workers and more economic activity in general.

Table 11 Employment Data

Non – Seasonally Adjusted Employment Data				
Location	**Labor Force**	**Employed**	**Unemployed**	**Unemployment Rate**
United States	155,521,000	147,190,000	8,331,000	5.4%
Montana	514,804	492,841	21,963	4.3%
Yellowstone County	85,775	83,223	2,552	3.0%

Source: December 2014 data –MT Dept. of Labor and Industry.

Retail and wholesale trade, finance and insurance, transportation and warehousing, and utilities are slightly more predominant in the County than the rest of Montana, although the County's large size influences the industry trends of Montana as a whole. Nonetheless, Billings is a retail, transportation, and finance hub for much of central and eastern Montana as well as northern Wyoming.

The County's largest industry is comprised of educational services, health care, and social assistance, which is 1.6 percentage points less than the state's share. According to a December 2014 article in the Billings Gazette, health care alone accounts for approximately 20% of Billings' total wages, and health care employment is expected to increase by 3,700 jobs in the next seven years according to the University of Montana's Bureau of Business and Economic Research. Table 12 displays employment for Yellowstone County by industry, according to the US Census Bureau.

Yellowstone County's median household income is $51,342, well above the state median of $46,230, an indicator that points to a strong economy in Yellowstone County. Yellowstone County's poverty rate of 12.3%, compared to 15.2% for Montana, also confirms the vitality of the Billings area economy. According to the University of Montana's Bureau of Business and Economic Research, nonfarm earnings are projected to grow between 2.4 and 2.8 percent annually from 2015 to 2018 in Yellowstone County. In 2013 and 2014, these numbers were 1.3 and 1.1 percent, respectively.

Table 12 County Employment by Industry (2009-2013)

Industry	Total Estimate			
	Yellowstone County		Montana	
Agriculture, forestry, fishing, and hunting	2,725	3.5%	34,395	7.2%
Construction	6,163	8.0%	37,617	7.9%
Manufacturing	4,114	5.3%	22,278	4.7%
Wholesale trade	3,427	4.4%	11,647	2.4%
Retail trade	10,401	13.5%	57,294	12.0%
Transportation and warehousing, and utilities	4,379	5.7%	23,539	4.9%
Information	1,296	1.7%	8,771	1.8%
Finance and insurance, and real estate and rental and leasing	5,269	6.8%	26,771	5.6%
Professional, scientific, and management , and administrative and waste management services	6,790	8.8%	39,604	8.3%
Educational Services, health care and social assistance	16,369	21.2%	108,670	22.8%
Arts, entertainment, recreation, and accommodation and food services	9,139	11.8%	54,179	11.4%
Other services, except public administration	4,209	5.5%	21,844	4.6%
Public Administration	2,893	3.7%	30,406	6.4%
Civilian employed population (16 years and over)	**77,174**	**100%**	**477,015**	**100%**

Source: US Census Bureau, 2009-2013 5-Year American Community Survey.

Special Considerations

The west end of the corridor is within the Billings Metropolitan Planning boundary (see Exhibit 6 in Attachment 1). The Metropolitan Planning Organization (MPO) is tasked with overseeing transportation planning for the Billings Urban Area. MPOs use a five-year Transportation Improvements Plan (TIP) to provide fiscal planning for federally assisted highway and transit improvements. The current draft TIP outlines projects for years 2015-2019. As possible projects are considered for advancement in the future, consultation with these documents should occur.

A very large future project in the immediate area is the Billings Bypass Project. The proposal is to construct a new principal arterial connecting Interstate 90 (I-90) east of Billings with Highway 312. The purpose of this project is to improve access and connectivity between I-90 and Highway 312 in order to improve mobility in the eastern area of Billings. This proposed project could create traffic impacts along Highway 312 with the improved mobility into Billings through I-90 access. The Billings Bypass Project has included extensive public involvement up to the date of this document. During the public comment process the concern for bicycle and pedestrian mobility was expressed as a high priority. This topic should be considered for potential projects forwarded from the study. Directly impacted by the Billings Bypass Project is the Lockwood Targeted Economic Development District (TEDD). TEDD is a proposed industrial park slated to include space for manufacturing, warehousing, transportation, and distribution

operations. Though not directly impacting the Highway 312 corridor, an industrial park along the proposed Billings Bypass would likely have effects on traffic along this corridor and the Billings area in general.

In summary, Yellowstone County and Billings weathered the 2008 recession relatively well and have experienced strong growth and performance in many areas of the economy. A slowdown in oil development in the Bakken region due to low oil prices or other factors could potentially impact the Billings economy but as of spring 2015, oil prices are on the rise which may spur renewed energy development. Billings' diverse economy is well positioned for continued growth. A reflection of this growth may also be seen in the suburbs surrounding Billings including the communities of Huntley and Worden, which are both within the study area. Investigation should take place to determine the possibility of low-income person(s) being disproportionately isolated, displaced, or otherwise subjected to adverse effects by any forwarded improvements on a project-by-project basis.

4.2 Land Ownership

Ownership of land in the study area is predominantly private, with some interspersed state and federal owners, including FWP, MDT, Montana State Trust lands, US Bureau of Land Management, and the US Bureau of Reclamation. Much of the private land throughout the study area is residential or agricultural. Commercial land use is seen at a higher frequency closer to the vicinity of the City of Billings. Land ownership maps for the study area are provided in Exhibit 14 (in Attachment 1).

Mixed land use arises from the varied land ownership throughout the study area. These land uses include commercial, industrial, crop/pasture, and mixed urban (see Exhibit 15 in Attachment 1). Even though there is a large amount of privately-owned land in the study area, the need to purchase right-of-way for possible improvements is minimal as most improvements brought forward would not require right-of-way. If the scope of possible projects requires purchasing right-of-way, land acquisition costs will depend on the per acre price at the time of purchase. If improvements are forwarded from this study, land use at and adjacent to possible projects will need to be considered during design to determine overall project costs.

4.3 Potential Section 4(f) Recreational Resources and 6(f) Resources

Yellowstone County and the Billings area offer a variety of year-round outdoor activities including fishing, boating, and swimming in the summer. In the winter, snowmobiling, ice-skating, and cross-country skiing are popular. Billings is home to a number of city parks, but none are within the study area.

Recreational resource information was gathered through review of the FWP resource list for Yellowstone County and a June 10, 2015, site visit. Recreational areas may be protected under Section 4(f) of the U.S. Department of Transportation Act of 1966, which was enacted to protect publically-owned parks, recreation areas, wildlife and waterfowl refuges, and public and private historic sites of local, state, and national significance. Federally-funded transportation projects cannot impact Section 4(f)-protected properties unless there are no feasible and prudent avoidance alternatives and all possible planning to minimize harm has occurred. Prior to approving a project that "uses" a Section 4(f) resource, FHWA must find that there is no prudent or feasible alternative that completely avoids the 4(f) resource. "Use" can occur when land is permanently

incorporated into a transportation facility or when there is a temporary occupancy of the land that is adverse to a Section 4(f) resource. Constructive "use" can also occur when a project's proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are "substantially impacted." Potential effects on recreational use would need to be considered in accordance with Section 4(f) if improvements are forwarded from this study.

From a review of available information and the field review, there are several potential Section 4(f) recreational resources that could potentially be impacted from possible improvements within the buffer of the study area. These include:

- Lewis and Clark Trail, (RP 0.0 on Secondary 658);
- Pompeys Pillar, (658, RP 0.6);
- Bureau of Land Management (BLM) public land hunting access and picnic area (658, RP 0.6 and 0.7); and
- Barkemeyer Park (522, RP 1.1).

The Lewis and Clark Trail crosses Highway 312 where it becomes Secondary 658 for one mile on the eastern end of the study area. The trail crosses the study area at an overpass over the BNSF railroad near the intersection of Secondary 658 and Interstate 94.

The most prominent resource in the corridor is Pompeys Pillar National Monument, which has land that crosses into the study area buffer zone as shown on Exhibit 15 in Attachment 1. Acquiring right-of-way from this potential Section 4(f) site would need to go through the evaluation process described above which could add time and costs to a project. There are also two BLM hunting access sites adjacent to Pompeys Pillar that would likely be subject to the same 4(f) process.

Secondary 522 through Huntley is adjacent to Barkemeyer Park on the southeastern side of the road. The park contains a flag and memorial plaque, playground, picnic benches, and volleyball court.

Highway 312 also provides access to several FWP fishing access sites (FAS) along the Yellowstone River. These include the Gritty Stone, Voyagers Rest, and Bundy Bridge FAS. These sites are outside of the Highway 312 study area, and are unlikely to be affected by any potential projects forwarded from this corridor study.

At the time potential future improvements are forwarded to a project, reevaluation of possible Section 4(f) resources should take place. Efforts should be made with projects advanced from the study to avoid adverse impacts to right-of-way acquisitions from these recreational resources.

The National Land and Water Conservation Fund Act (LWCFA), or Section 6(f), was enacted to preserve, develop, and assure the quality and quantity of outdoor recreation resources. Section 6(f) protection applies to all projects that impact recreational lands purchased or improved with LWCFA funds. The Secretary of the Interior must approve any conversion of LWCFA property to a use other than public, outdoor recreation. According to FWP LWCFA Sites by County, there are no Section 6(f) resources directly within the buffer or adjacent to the study area. If improvement options are forwarded from this corridor study, a reevaluation of Section 6(f) resources should take place to

determine if any new Section 6(f) resources are present. As general guidance, converting these resources to a non-recreational purpose can be a difficult and time-consuming task and should be avoided if practicable.

4.4 Cultural Resources

For federally-funded transportation projects, a cultural resource survey must be conducted for the area of potential effect (APE) as specified in Section 106 of the National Historic Preservation Act (NHPA) (36 CFR 800). Section 106 requires federal agencies to "take into account the effects of their undertakings on historic properties." The purpose of the Section 106 process is to identify historic and archaeological properties that could be affected by the undertaking; assess the effects of the project; and investigate methods to avoid, minimize, or mitigate adverse effects on historic properties. These historic resource properties are also generally protected under Section 4(f) of the Transportation Act.

The cultural resource investigation conducted for this report included historic-age properties located within 0.15 miles on either side of Highway 312, Secondary 568, and Secondary 522. A file search of the proposed survey area through the Montana State Historic Preservation Office revealed 11 historic properties located within 0.15 miles of the existing alignments. Table 13 lists the properties, their approximate locations (Exhibit 16 in Attachment 1), and National Register of Historic Places (NRHP) eligibility. All of the sites have been previously recorded and their NRHP status established.

An aerial examination of the study area indicates that there are likely unrecorded historic properties along the entire length of the corridor. The Northern Pacific Railway (now BNSF Railway Company) grade (24YL0277) parallels Highway 312 from the intersection of Northern Avenue in Huntley to the end of the corridor at Interstate-94 Interchange #23. There are also likely historic age buildings and other segments of the abandoned Billings & Central Montana Railroad (24YL1592) paralleling the route between Billings and Huntley.

Table 13 Historical Properties

Site	Site No.	Sec.	Tsp	Rge	NRHP elig.	Route and RP±
Huntley Irrigation Project*	24YL0285	Multiple	Multiple	Multiple	Eligible	Multiple
Billings Bench Water Association System*	24YL0161	Multiple	Multiple	Multiple	Eligible	Multiple
Elevated Ditch	24YL1593	31	2N	27E	Eligible	3.5
BBWA Field Ditch	24YL1594	29 and 31	2N	27E	Eligible	4.2
Huntley Bridge	24YL0656	24	2N	27E	Listed	12.7
Abandoned Billings & Central Montana Railway	24YL1592	20, 29, 30 31, 1	2N 1N	27E 26E	Eligible	Multiple
Chicago, Burlington & Quincy Railway	24YL1599	25	2N	27E	Eligible	Multiple
Pryor Creek Battlefield	24YL0933	24 and 25 19 and 30	2N 2N	27E 28E	Eligible	N/A
Pompeys Pillar National Historic Landmark	24YL0176	21	3N	30E	NHL	N/A
Bundy Bridge	24YL0784	20	3N	30E	Eligible	S-568, RP 1.9
Yellowstone Trail and Bridge	24YL0695	28	3N	30E	Eligible	S-568, RP 0.06

* The Huntley Irrigation Project and the Billings Bench Water Association Irrigation System are located within multiple sections/townships/ranges within the project corridor. The systems include main canals and lateral ditches. See Exhibit 16 for locations. An in-depth discussion of historic irrigation systems and ditches is located in section 2.7 Irrigation.

Direct and indirect impacts (such as visual, noise, and access impacts) to eligible or listed properties would need to be considered if improvements options are carried forward. If an improvement option is forwarded from the corridor study, a cultural resource survey for unrecorded historic and archaeological properties within the APE will need to be completed during the project development process.

4.5 Noise

Evaluation of traffic noise may need to occur for any future improvements in the study area. Noise analysis is necessary for Type I projects, which involve a substantial shift in the horizontal or vertical alignments, increase the number of through lanes, provide passing lanes, or increase traffic speed and volume.

Type I projects require a detailed noise analysis, consistent with FHWA requirements and MDT policy, which includes measuring ambient noise levels at selected receivers and modeling design year noise levels using projected traffic volumes. If noise levels approach or substantially exceed noise abatement criteria for the project, noise abatement measures may be necessary. A number of possible abatement measures available for consideration include but are not limited to the following:

- alternating the horizontal or vertical alignment;
- constructing noise barriers such as sound walls or earthen berms; and/or
- decreasing traffic speed limits.

Noise abatement measures must be considered reasonable and feasible prior to implementation.

Construction activities in the study area may cause localized, short-duration noise impacts. These impacts can be minimized by using standard MDT specifications for the control of noise sources during construction.

4.6 Visual Resources

The visual resources of an area include landforms, vegetation, water features, and physical modifications caused by human activities that give the landscape its visual character and aesthetic qualities. Visual resources are typically assessed based on the landscape character (what is seen), visual sensitivity (human preferences and values regarding what is seen), scenic integrity (degree of intactness and wholeness in landscape character), and landscape visibility (relative distance of seen areas) of a geographically defined view shed.

Yellowstone County is located in south central Montana, and is the most populated county in Montana, resulting in a higher percentage of residential areas and anthropogenic features. The study corridor extends to the east from Billings leading to a moderately level agricultural setting, with the Yellowstone River meandering along Highway 312 just west of the community of Huntley.

"The first and second rise of the Billings Rimrocks" by Sara Goth

Throughout the City of Billings, sandstone outcroppings are visible in the distance. The Rimrocks sometimes referred to as the “Rims” are a valued visual resource to many of the local residents. Topography surrounding the study area and the actual locations of the rimrock outcroppings varies. Future improvements forwarded from this study should take into consideration the impact to scenic views of the Rimrocks.

At the east end of the corridor, Pompeys Pillar juts 150 feet from the ground, creating a visual interest against the flat land surrounding it. Future improvements forwarded from this study should take into consideration the impact to scenic views of Pompeys Pillar. The landscape in the study area predominantly presents itself as a typical central Montana environment with scattered agricultural fields and intermixed urbanization.

"Popi ownpillar" by BLM photo

Evaluation of the potential effects on visual resources would need to be conducted if improvement options are forwarded from this study.

5.0 Conclusion

This environmental scan report identifies physical, biological, social, and cultural resources within the study area that may be affected by potential future improvements in the Highway 312 corridor study area.

Project-level environmental analysis would be required for any improvements forwarded from this study. Information contained in this report may be used to support future NEPA/MEPA environmental documentation.

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Goth, Sara. (n.d.) "The first and second rise of the Billings Rimrocks" by Sara goth - Own work. Licensed under CC BY-SA 3.0 via Wikimedia Commons - http://commons.wikimedia.org/wiki/File:The_first_and_second_rise_of_the_Billings_Rimrocks.JPG#/media/File:The_first_and_second_rise_of_the_Billings_Rimrocks.JPG

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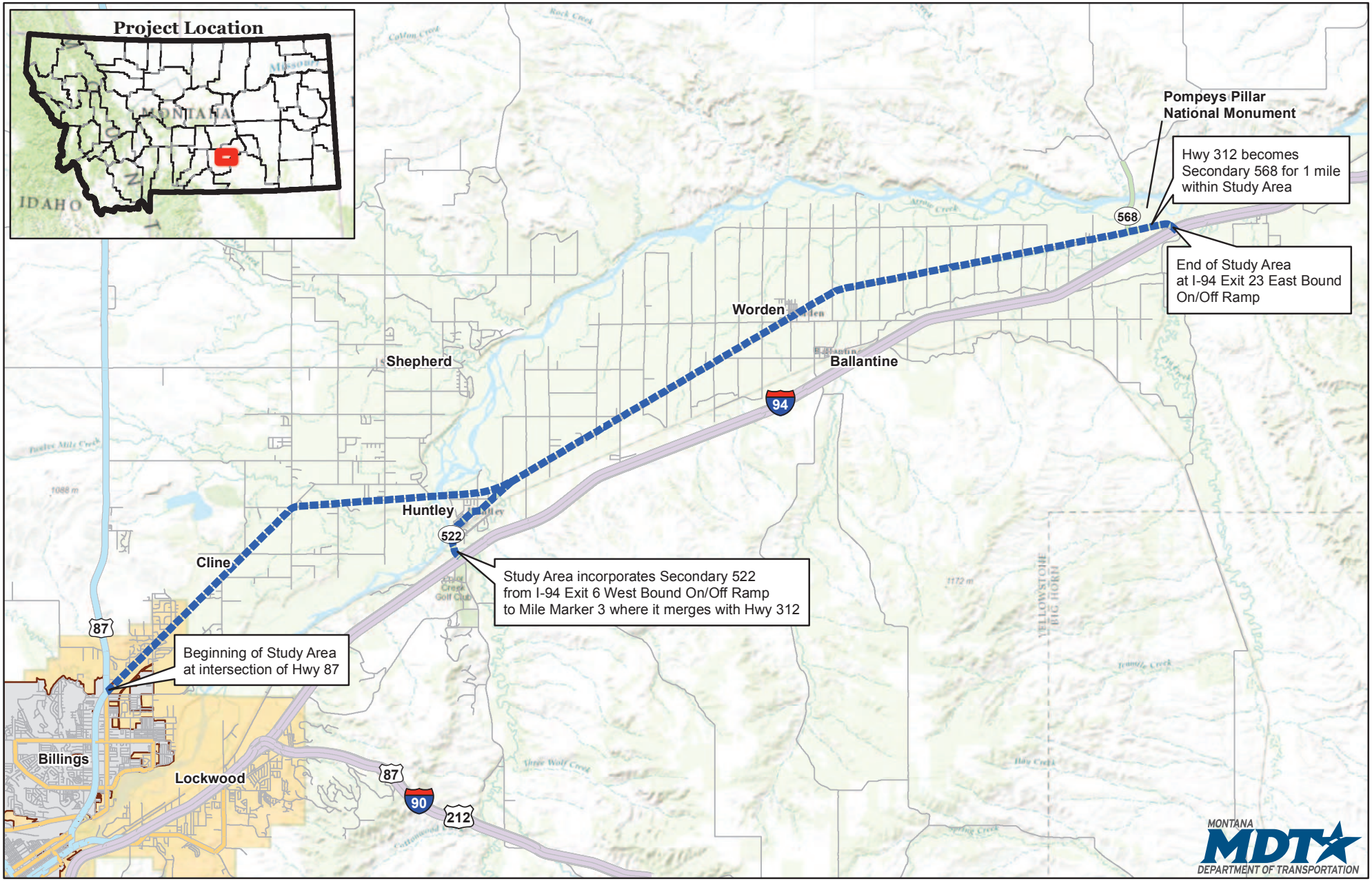
ATTACHMENT 1

Exhibits



0 1.25 2.5 5 Miles

Scale: 1:175,000

N
W E
S

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: ArcGIS Online ESRI World Topo Basemap

EXHIBIT 1 - STUDY AREA
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

- STUDY AREA
- CITY BOUNDARY
- URBAN BOUNDARY
- NHS INTERSTATE
- NHS NON-INTERSTATE
- SECONDARY
- URBAN
- OFF SYSTEM ROUTE

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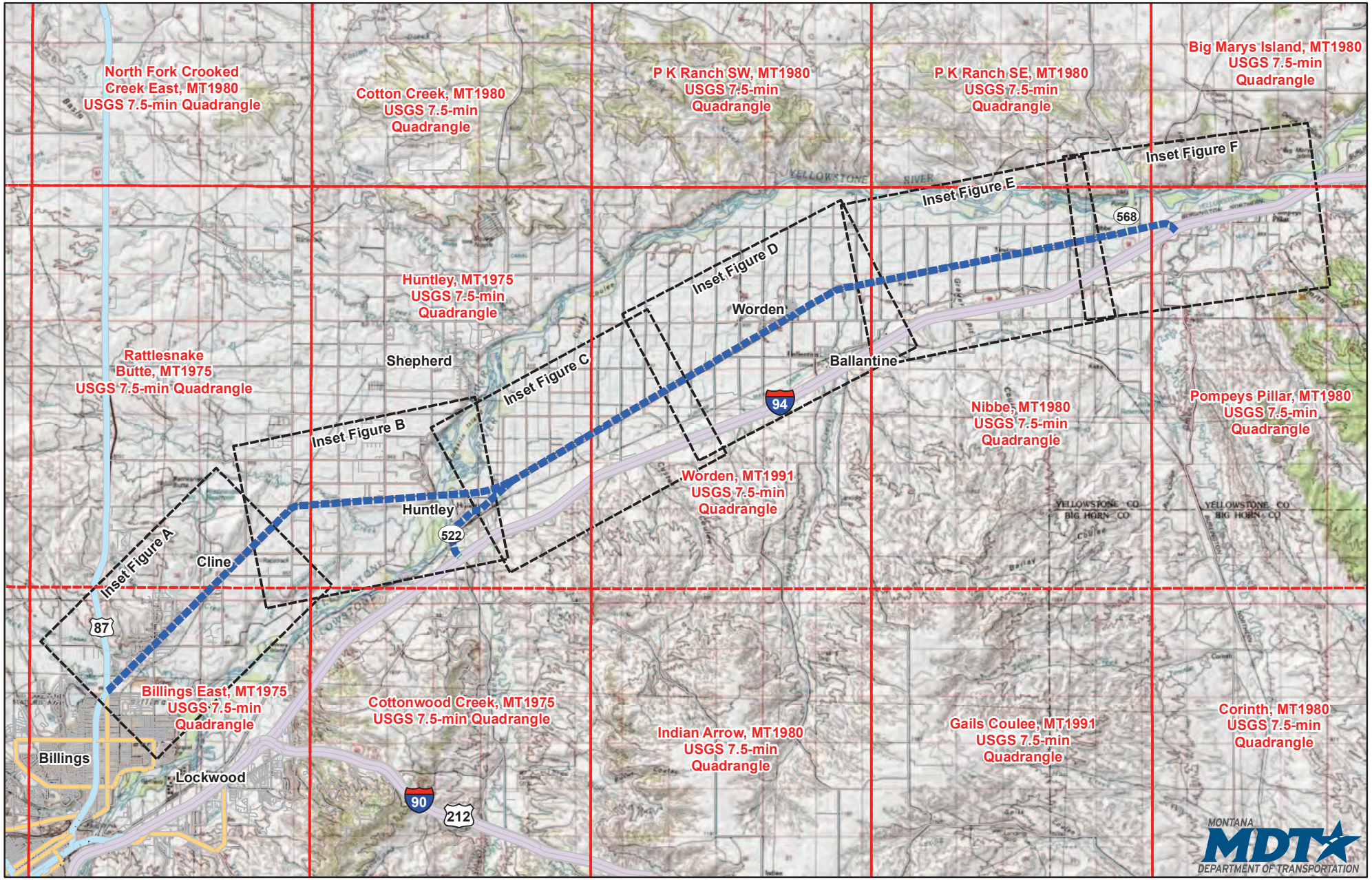

0 1.25 2.5 5 Miles

Scale: 1:175,000

N W E S

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: USGS Topographic 7.5 - minute quadrangles

EXHIBIT 2 - TOPOGRAPHIC MAP OF STUDY AREA
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

- STUDY AREA
- USGS 7.5-MIN QUADS
- INSET FIGURES
- NHS INTERSTATE
- NHS NON-INTERSTATE
- SECONDARY
- URBAN
- OFF SYSTEM ROUTE

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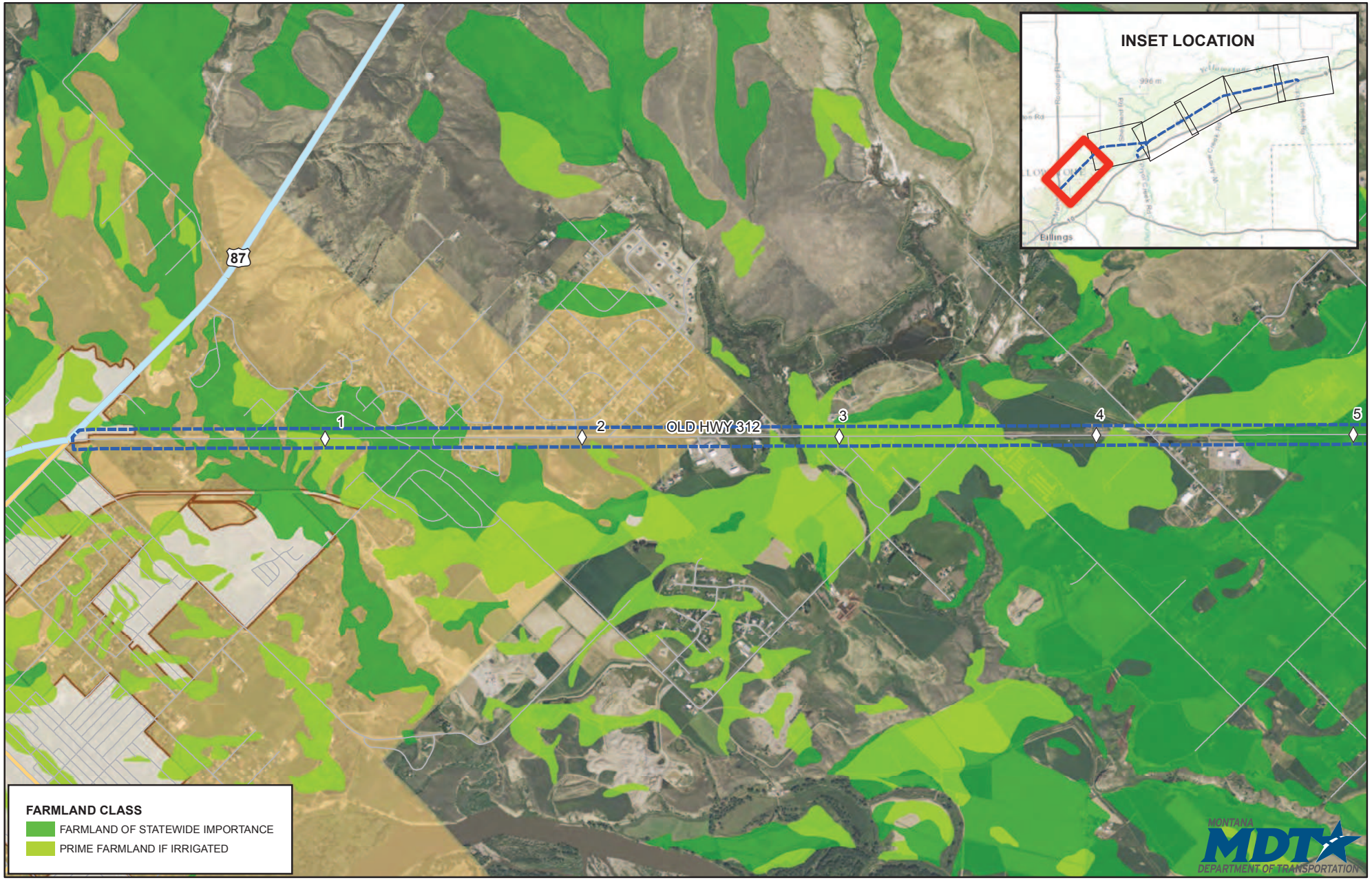

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Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: NRCS SSURGO database for Yellowstone County - 2014,
Aerial Imagery - NAIP 2013

EXHIBIT 3A - PRIME FARMLANDS
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
CITY BOUNDARY
URBAN BOUNDARY
NHS NON-INTERSTATE
URBAN
OFF SYSTEM ROUTE
REFERENCE MARKERS*

*There are no existing physical Reference Markers on Old Highway 312.
The Reference Markers shown here are for mapping and reference purrposes only.
There are existing physical Reference Markers for Secondary 522 and Secondary 568.

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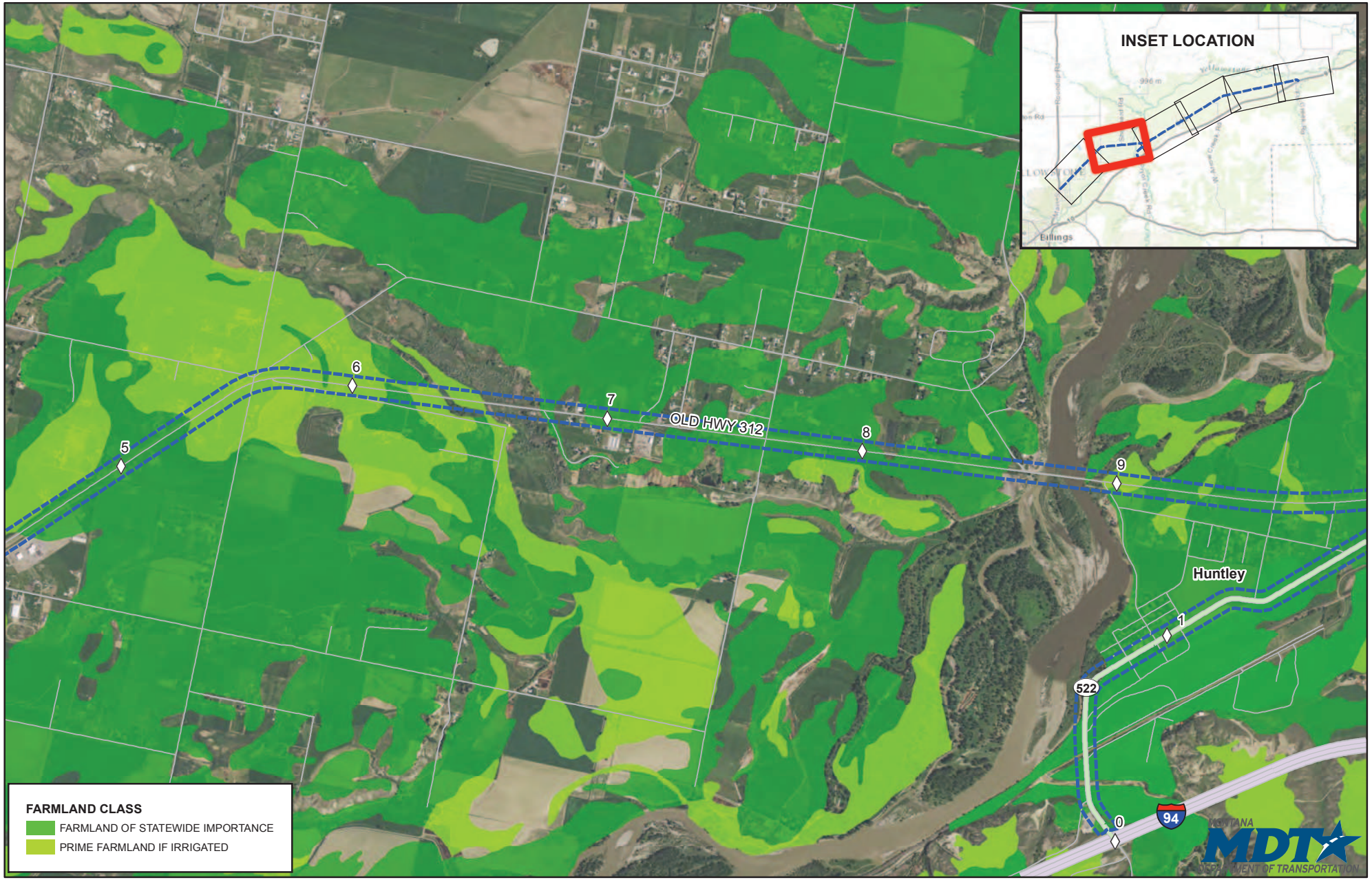


0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

N
W
E
S

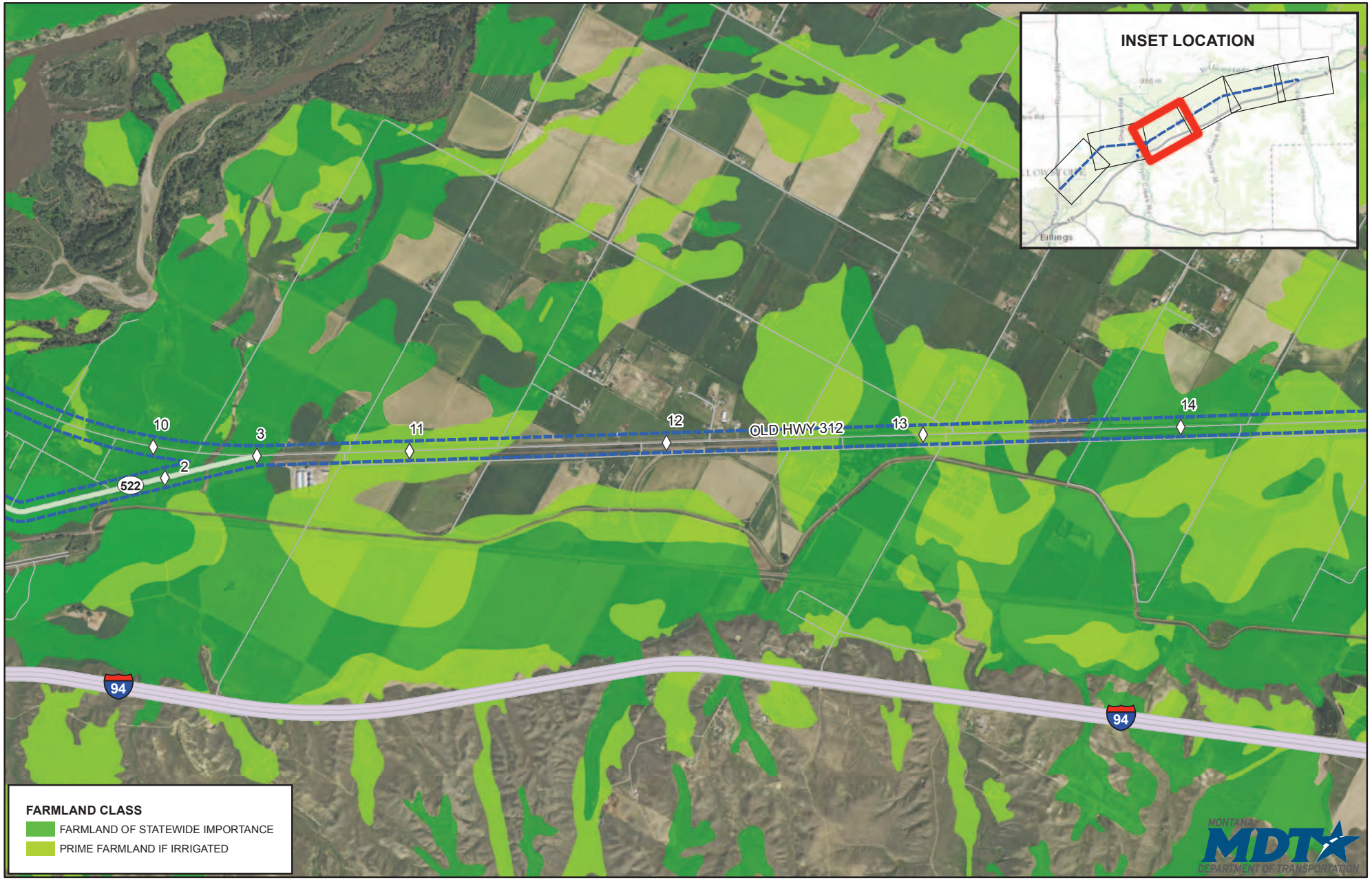
Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: NRCS SSURGO database for Yellowstone County - 2014,
Aerial Imagery - NAIP 2013

EXHIBIT 3B - PRIME FARMLANDS
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE MARKERS*

*There are no existing physical Reference Markers on Old Highway 312.
The Reference Markers shown here are for mapping and reference purposes only.
There are existing physical Reference Markers for Secondary 522 and Secondary 568.

Date: 4/1/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT3B_OLD_HWY_312_SSURGO.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: NRCS SSURGO database for Yellowstone County - 2014,
Aerial Imagery - NAIP 2013

EXHIBIT 3C - PRIME FARMLANDS
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE MARKERS*

*There are no existing physical Reference Markers on Old Highway 312.
The Reference Markers shown here are for mapping and reference puprposes only.
There are existing physical Reference Markers for Secondary 522 and Secondary 568.

Date: 4/1/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT3C_OLD_HWY_312_SSURGO.mxd

0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

N W E S

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: NRCS SSURGO database for Yellowstone County - 2014, Aerial Imagery - NAIP 2013

EXHIBIT 3D - PRIME FARMLANDS
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
OFF SYSTEM ROUTE
REFERENCE MARKERS*

*There are no existing physical Reference Markers on Old Highway 312.
The Reference Markers shown here are for mapping and reference purrposes only.
There are existing physical Reference Markers for Secondary 522 and Secondary 568.

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0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

N W E S

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: NRCS SSURGO database for Yellowstone County - 2014, Aerial Imagery - NAIP 2013

EXHIBIT 3E - PRIME FARMLANDS
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
OFF SYSTEM ROUTE
REFERENCE MARKERS*

*There are no existing physical Reference Markers on Old Highway 312.
The Reference Markers shown here are for mapping and reference purrposes only.
There are existing physical Reference Markers for Secondary 522 and Secondary 568.

Date: 4/1/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT3E_OLD_HWY_312_SSURGO.mxd

0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

N W E S

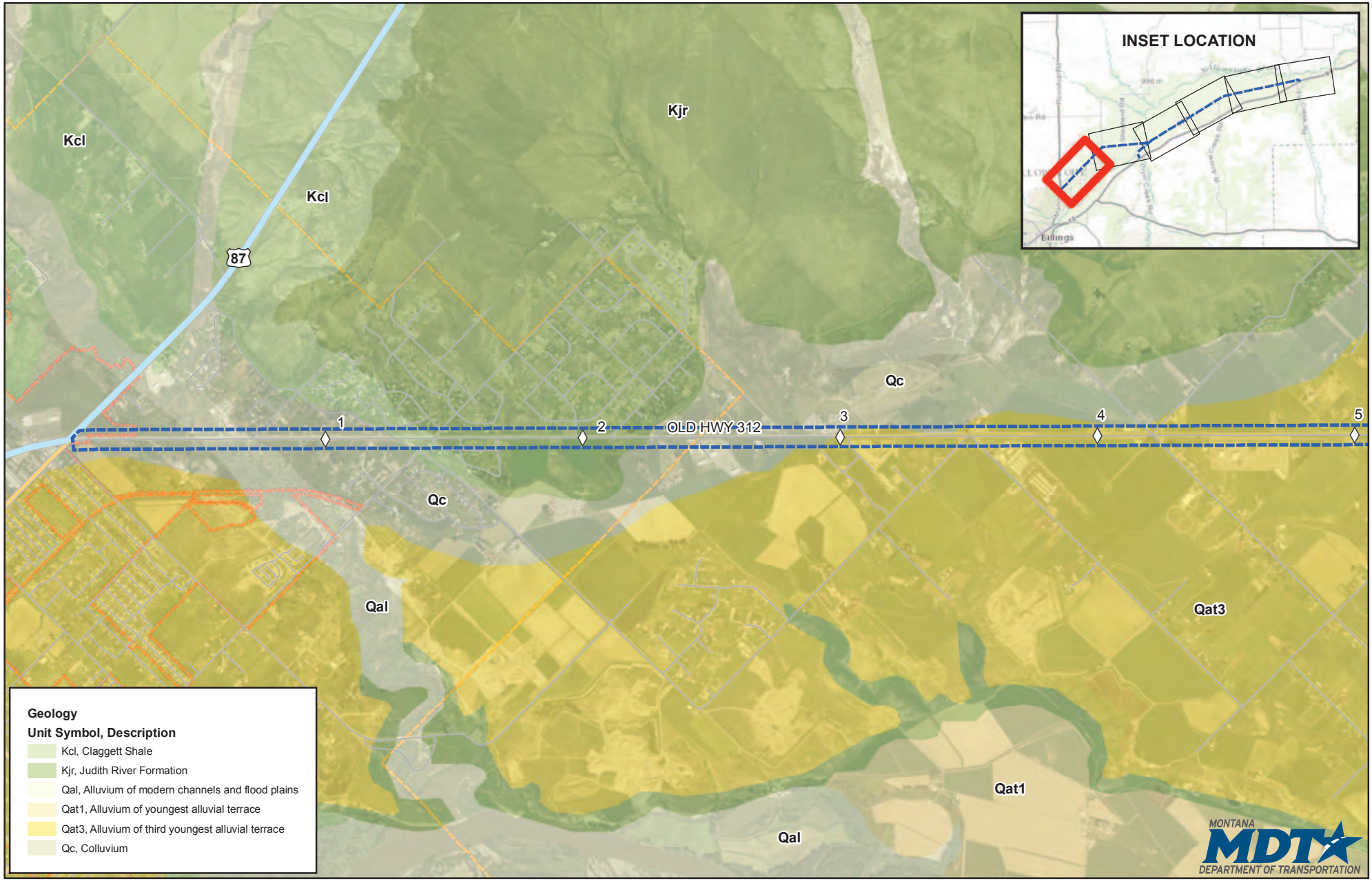
Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: NRCS SSURGO database for Yellowstone County - 2014, Aerial Imagery - NAIP 2013

EXHIBIT 3F - PRIME FARMLANDS
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE MARKERS*

*There are no existing physical Reference Markers on Old Highway 312.
The Reference Markers shown here are for mapping and reference purrposes only.
There are existing physical Reference Markers for Secondary 522 and Secondary 568.

Date: 4/1/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT3F_OLD_HWY_312_SSURGO.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

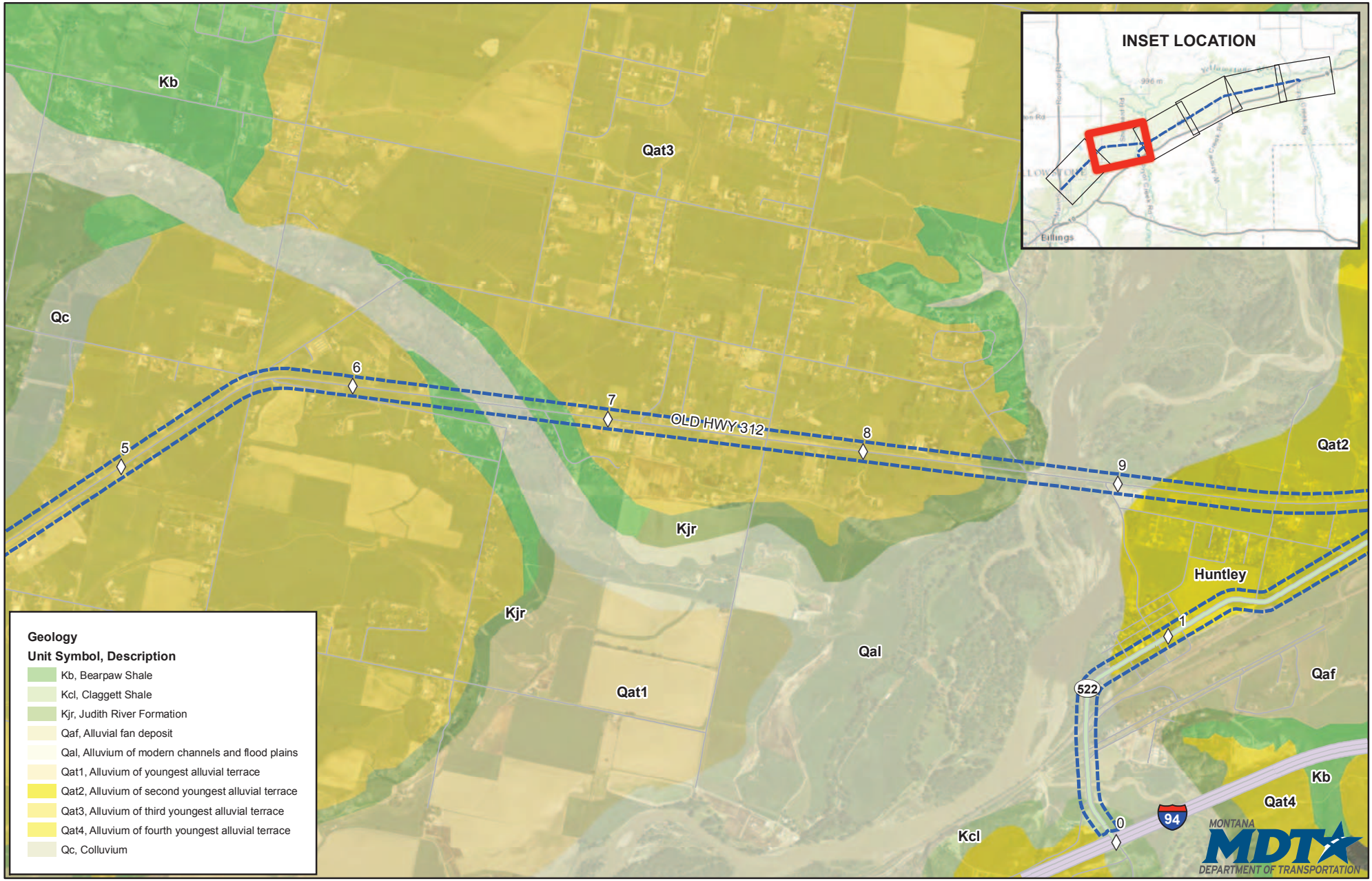
Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Bureau of Mines and Geology (MBMG)
Billings 100k Geologic Quad - David A. Lopez, 2000.
Aerial Imagery - NAIP 2013

EXHIBIT 4A - GEOLOGY
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
CITY BOUNDARY
URBAN BOUNDARY
NHS NON-INTERSTATE
URBAN
OFF SYSTEM ROUTE
REFERENCE MARKERS*

*There are no existing physical Reference Markers on Old Highway 312.
The Reference Markers shown here are for mapping and reference purrposes only.
There are existing physical Reference Markers for Secondary 522 and Secondary 568.

Date: 4/2/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT4A_OLD_HWY_312_GEOLOGY.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

N
W
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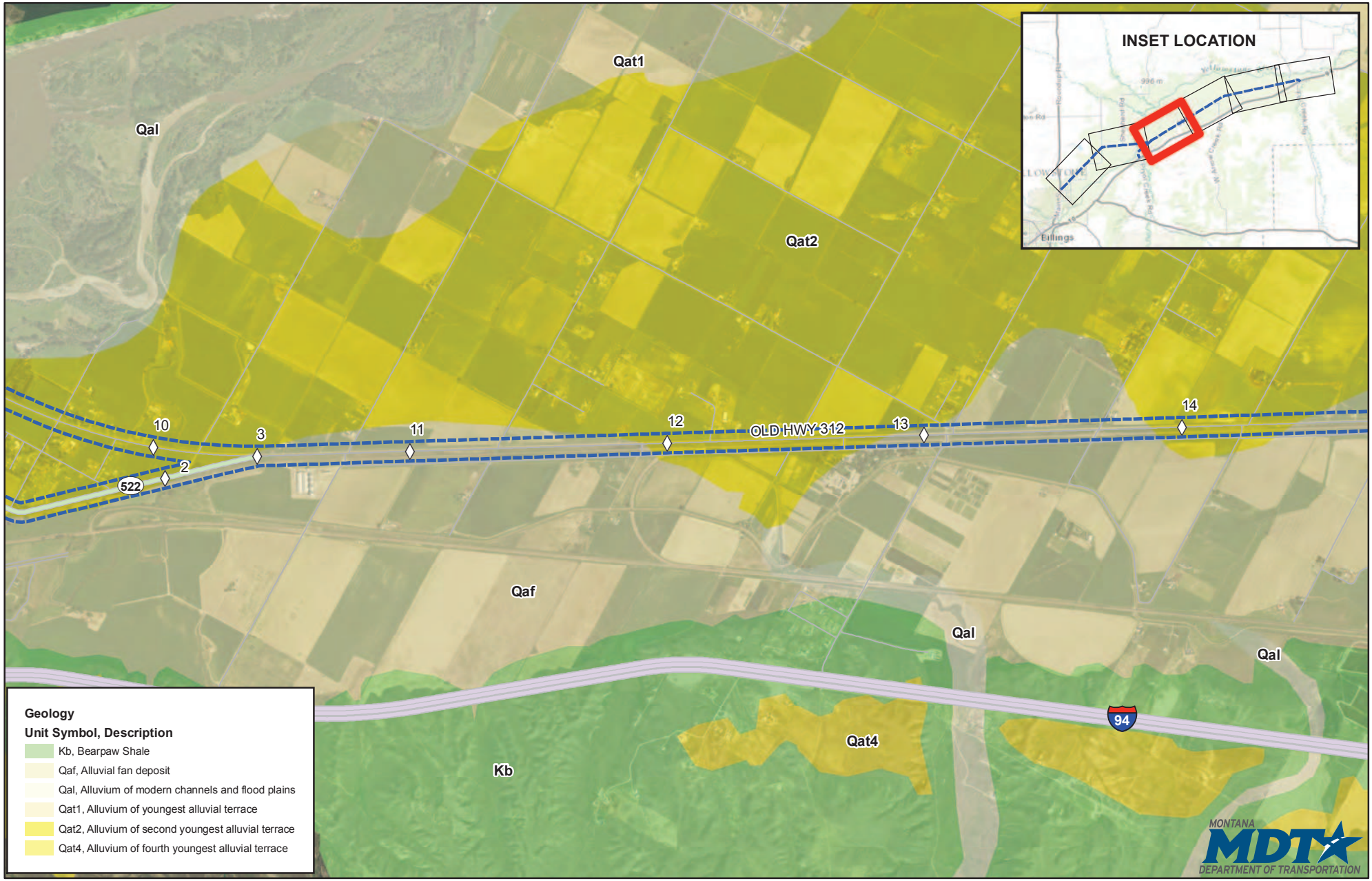
Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Bureau of Mines and Geology (MBMG)
Billings 100k Geologic Quad - David A. Lopez, 2000.
Aerial Imagery - NAIP 2013

EXHIBIT 4B - GEOLOGY
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE MARKERS*

*There are no existing physical Reference Markers on Old Highway 312.
The Reference Markers shown here are for mapping and reference purrposes only.
There are existing physical Reference Markers for Secondary 522 and Secondary 568.

Date: 4/2/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT4B_OLD_HWY_312_GEOLOGY.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Bureau of Mines and Geology (MBMG)
Billings 100k Geologic Quad - David A. Lopez, 2000.
Aerial Imagery - NAIP 2013

EXHIBIT 4C - GEOLOGY
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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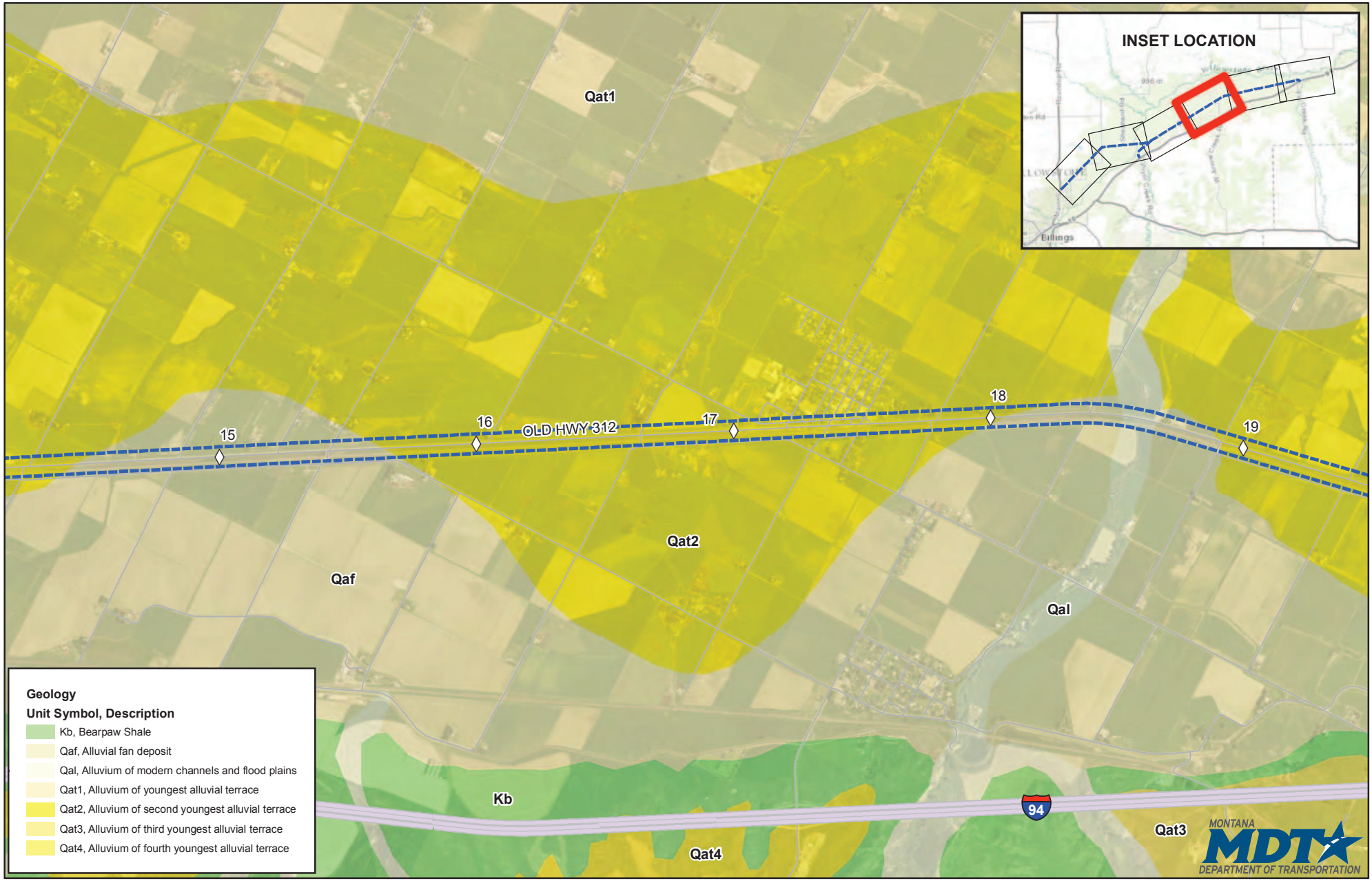
There are existing physical Reference Markers for Secondary 522 and Secondary 568.

Date: 4/2/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT4C_OLD_HWY_312_GEOLOGY.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Bureau of Mines and Geology (MBMG)
Billings 100k Geologic Quad - David A. Lopez, 2000.
Aerial Imagery - NAIP 2013

N W E S

EXHIBIT4D - GEOLOGY
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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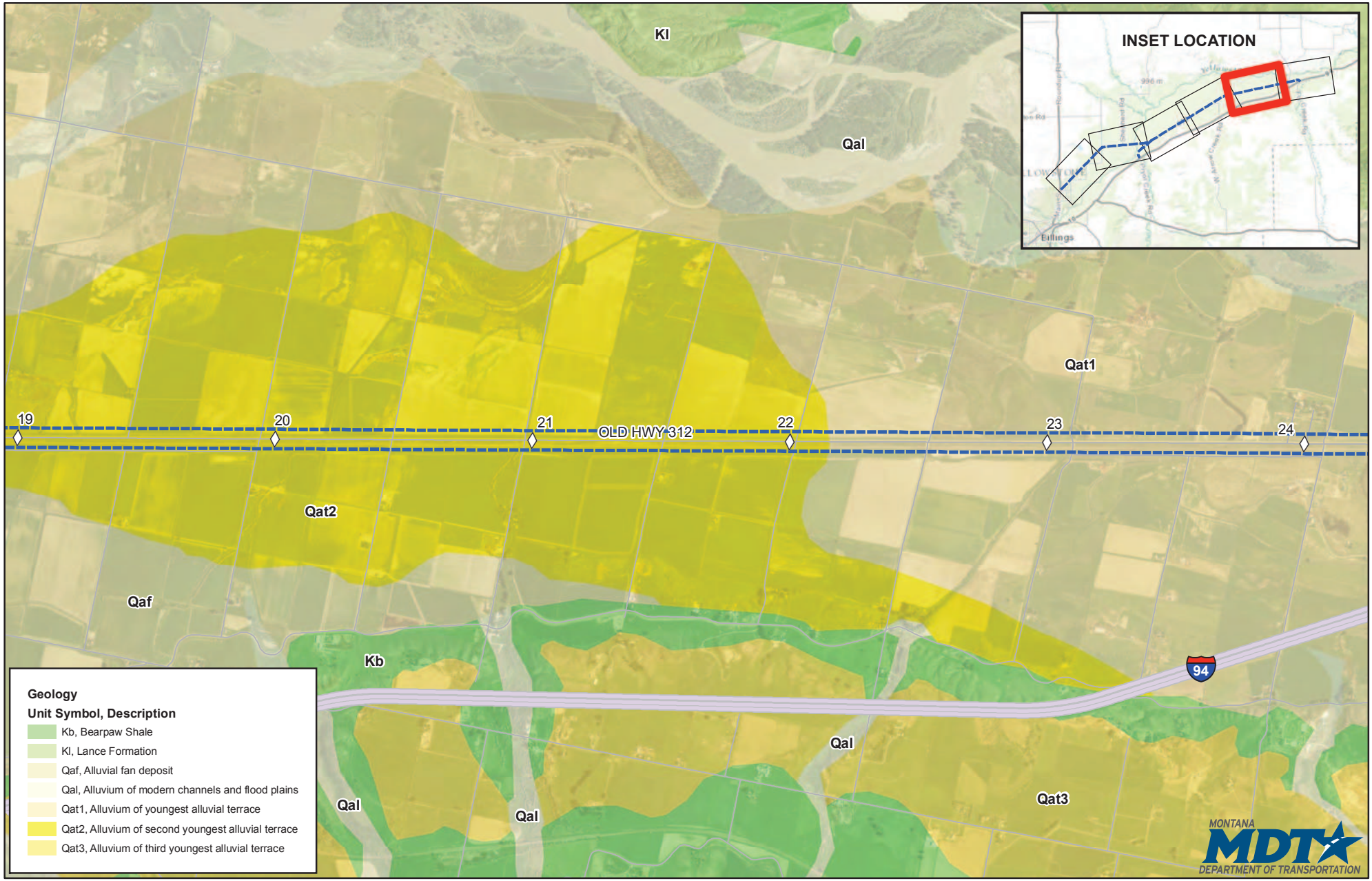
There are existing physical Reference Markers for Secondary 522 and Secondary 568.

Date: 4/2/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT4D_OLD_HWY_312_GEOLOGY.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

N
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Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Bureau of Mines and Geology (MBMG)
Billings 100k Geologic Quad - David A. Lopez, 2000.
Aerial Imagery - NAIP 2013

EXHIBIT 4E - GEOLOGY
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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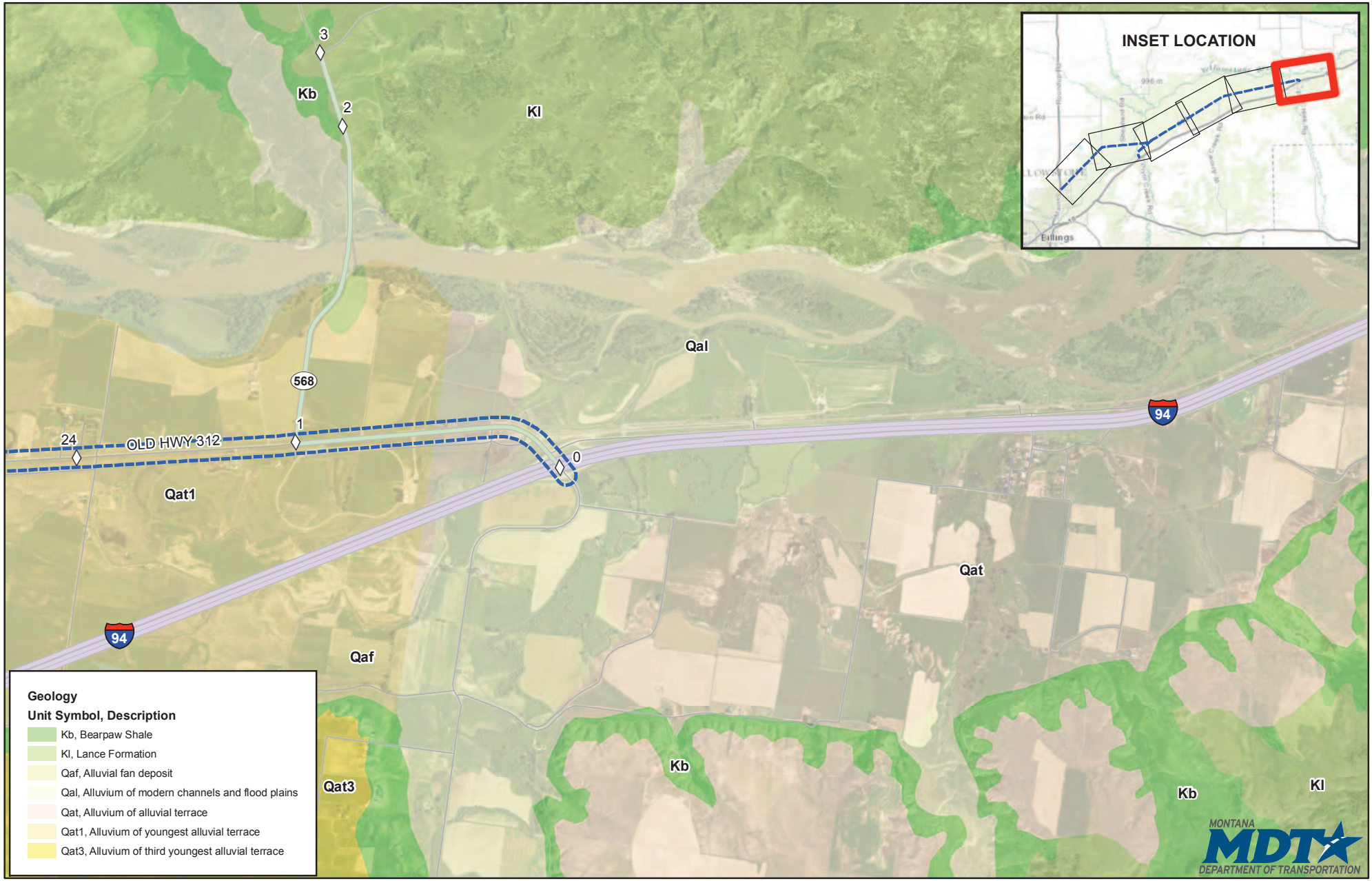
There are existing physical Reference Markers for Secondary 522 and Secondary 568.

Date: 4/2/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT4E_OLD_HWY_312_GEOLOGY.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

N
W
E
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Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Bureau of Mines and Geology (MBMG)
Billings 100k Geologic Quad - David A. Lopez, 2000.
Aerial Imagery - NAIP 2013

EXHIBIT 4F - GEOLOGY
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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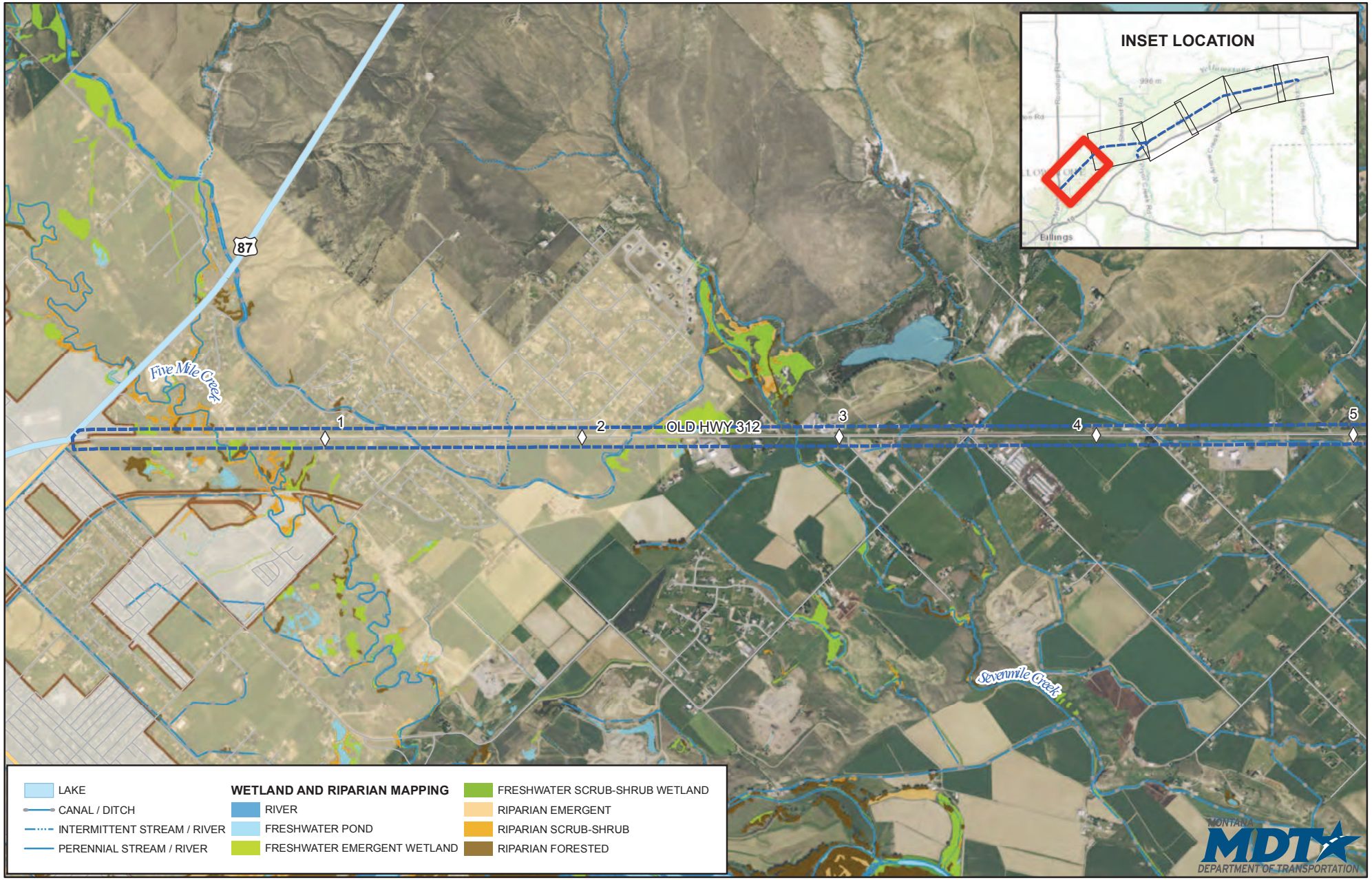
There are existing physical Reference Markers for Secondary 522 and Secondary 568.

Date: 4/2/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT4F_OLD_HWY_312_GEOLOGY.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

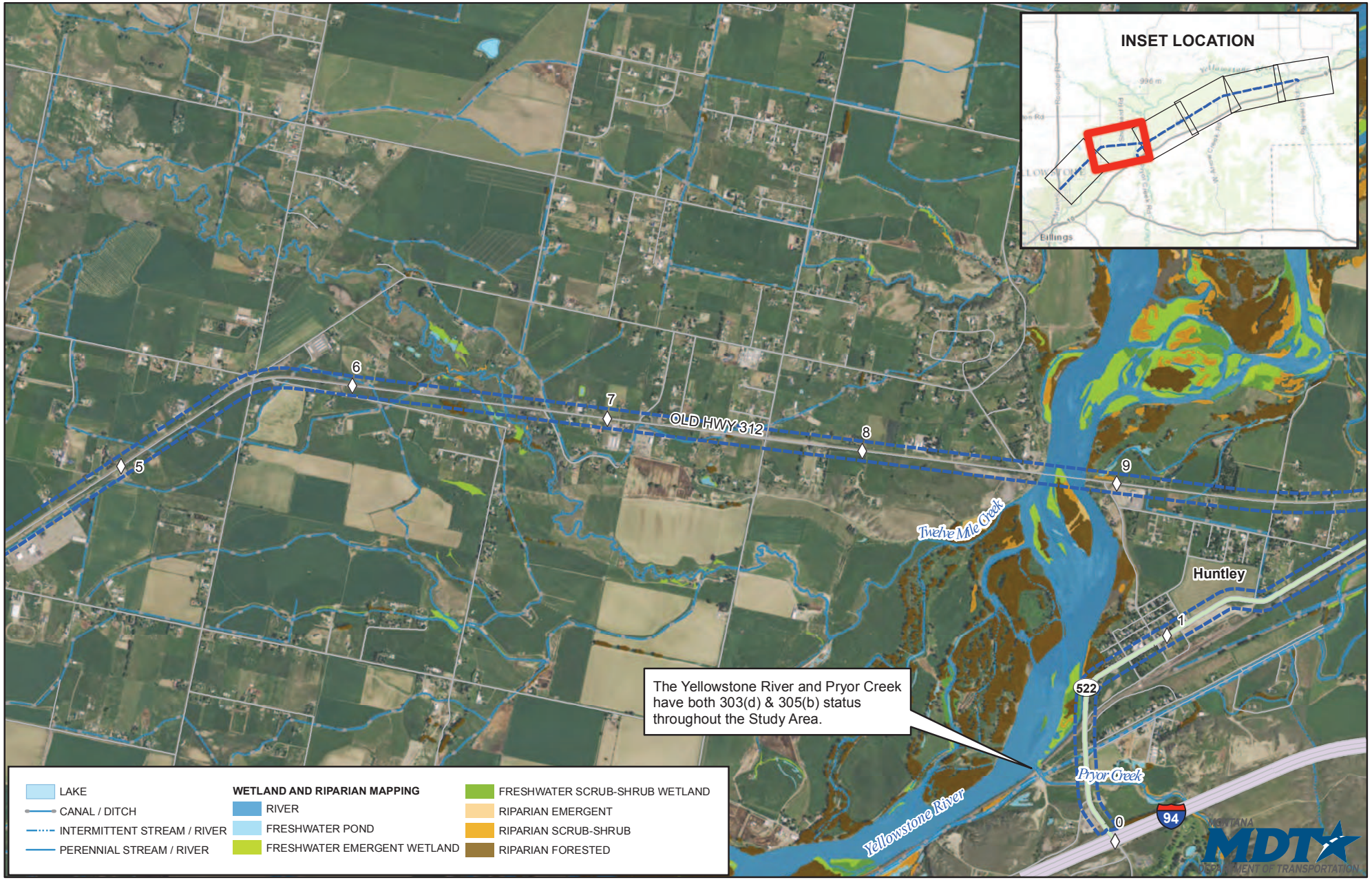
Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: National Hydrography Dataset 2015,
Montana NHP Wetland And Riparian Framework 2015,
Aerial Imagery - NAIP 2013

EXHIBIT 5A - SURFACE WATER & WETLANDS
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
CITY BOUNDARY
URBAN BOUNDARY
NHS NON-INTERSTATE
URBAN
OFF SYSTEM ROUTE
REFERENCE MARKERS*

*There are no existing physical Reference Markers on Old Highway 312.
The Reference Markers shown here are for mapping and reference purrposes only.
There are existing physical Reference Markers for Secondary 522 and Secondary 568.

Date: 4/3/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT5A_OLD_HWY_312_SURFACEWATER_WETLANDS.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

N
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Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: National Hydrography Dataset 2015,
Montana NHP Wetland And Riparian Framework 2015,
Aerial Imagery - NAIP 2013

EXHIBIT 5B - SURFACE WATER & WETLANDS
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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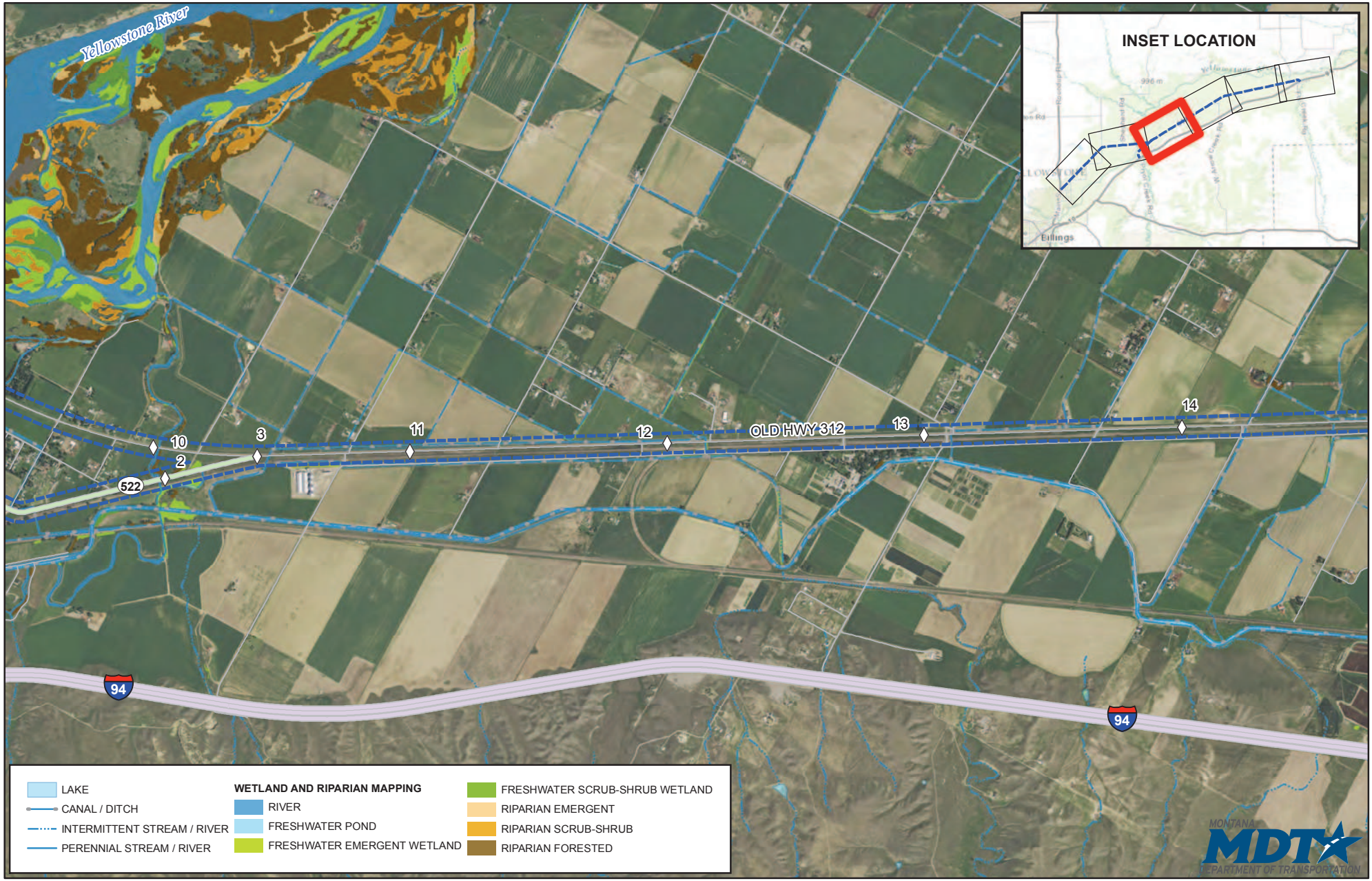
The Reference Markers shown here are for mapping and reference purrposes only.
There are existing physical Reference Markers for Secondary 522 and Secondary 568.

Date: 4/3/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT5B_OLD_HWY_312_SURFACEWATER_WETLANDS.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: National Hydrography Dataset 2015,
Montana NHP Wetland And Riparian Framework 2015,
Aerial Imagery - NAIP 2013

EXHIBIT 5C - SURFACE WATER & WETLANDS
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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There are existing physical Reference Markers for Secondary 522 and Secondary 568.

Date: 4/2/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT5C_OLD_HWY_312_SURFACEWATER_WETLANDS.mxd

0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: National Hydrography Dataset 2015,
Montana NHP Wetland And Riparian Framework 2015,
Aerial Imagery - NAIP 2013

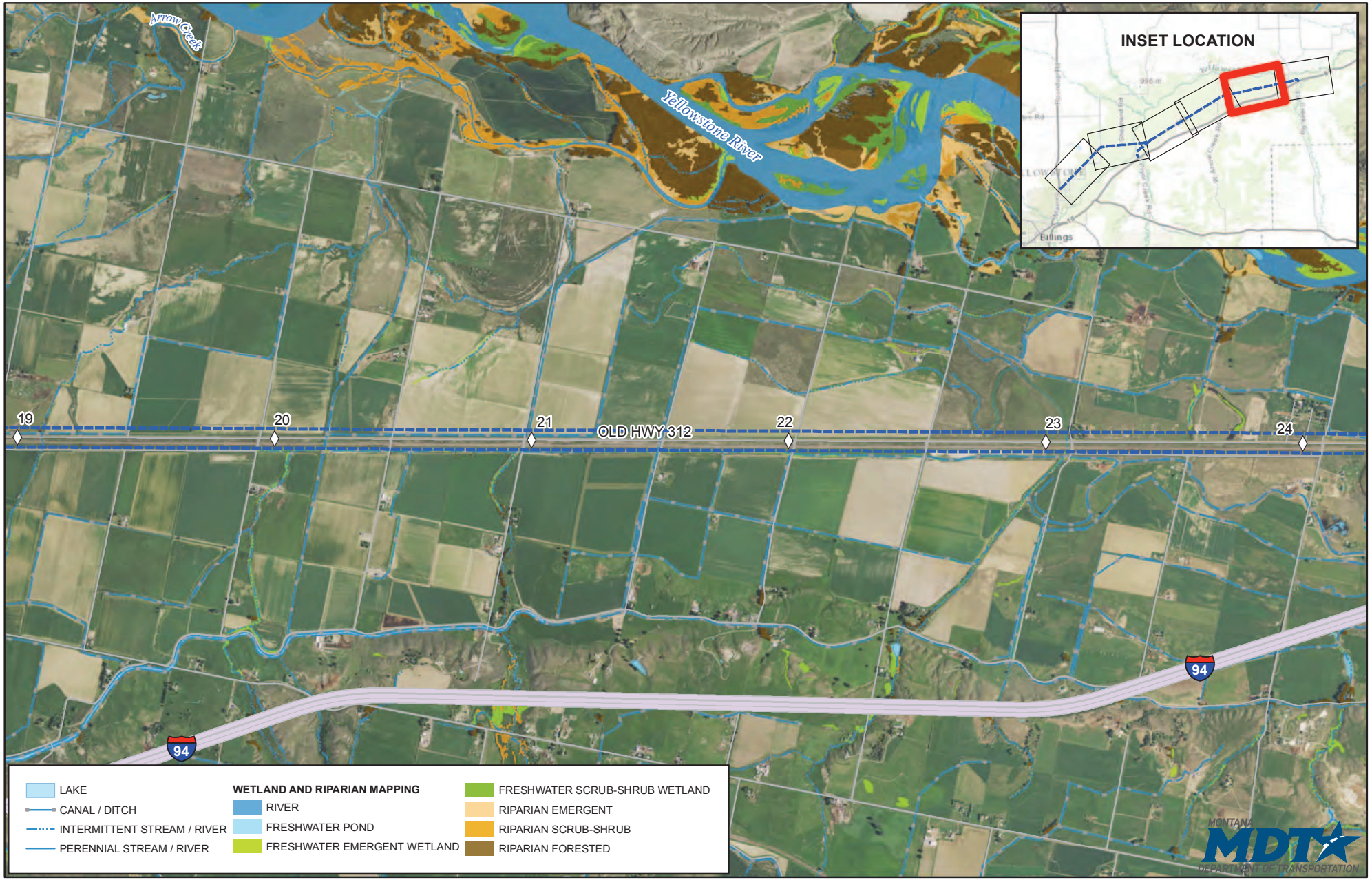
N W E S

EXHIBIT 5D - SURFACE WATER & WETLANDS
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
OFF SYSTEM ROUTE
REFERENCE MARKERS*

*There are no existing physical Reference Markers on Old Highway 312.
The Reference Markers shown here are for mapping and reference purposes only.
There are existing physical Reference Markers for Secondary 522 and Secondary 568.

Date: 4/2/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT5D_OLD_HWY_312_SURFACEWATER_WETLANDS.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

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Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: National Hydrography Dataset 2015,
Montana NHP Wetland And Riparian Framework 2015,
Aerial Imagery - NAIP 2013

EXHIBIT 5E - SURFACE WATER & WETLANDS
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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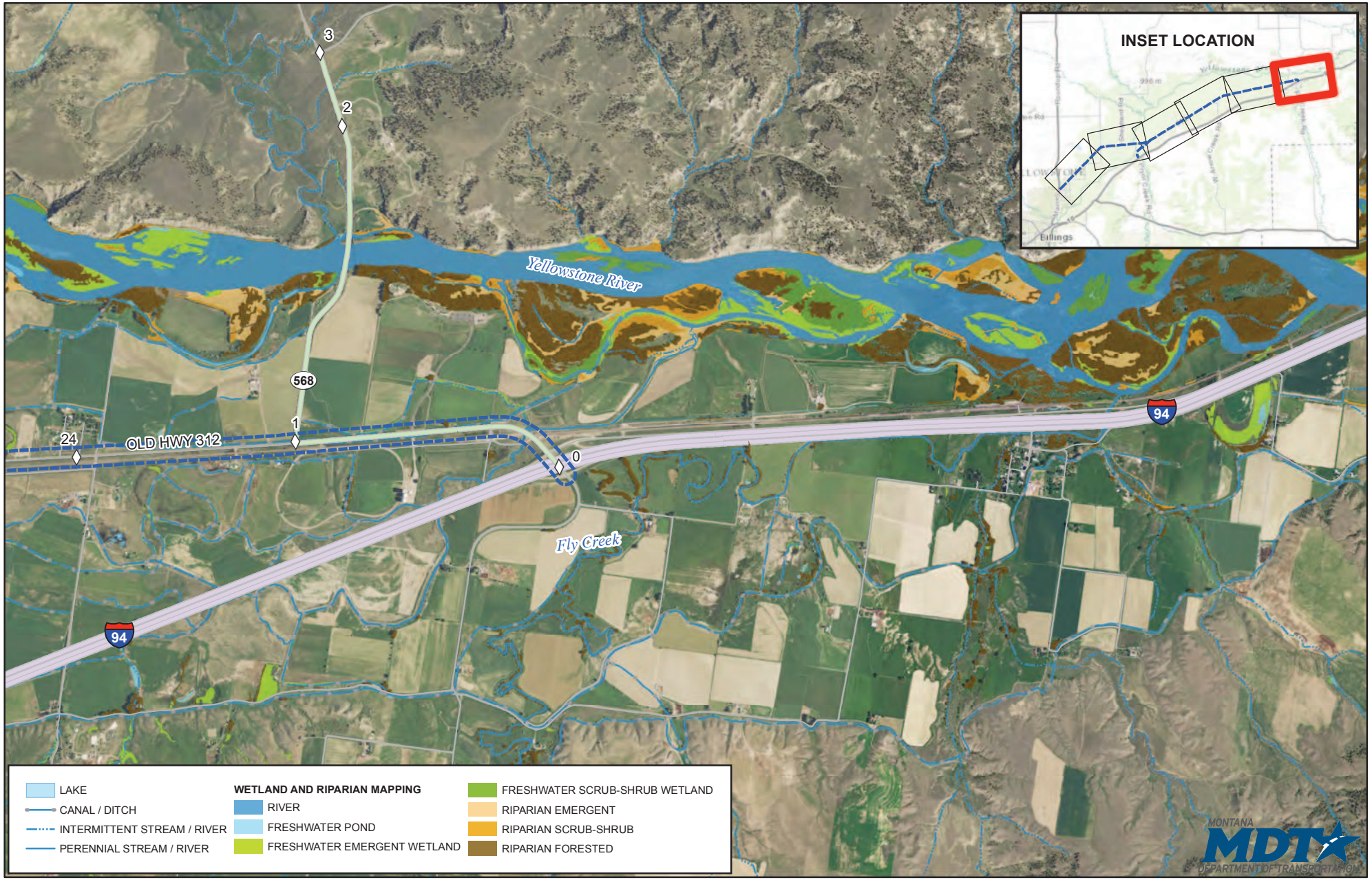
There are existing physical Reference Markers for Secondary 522 and Secondary 568.

Date: 4/2/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT5E_OLD_HWY_312_SURFACEWATER_WETLANDS.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: National Hydrography Dataset 2015,
Montana NHP Wetland And Riparian Framework 2015,
Aerial Imagery - NAIP 2013

N
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EXHIBIT 5F - SURFACE WATER & WETLANDS
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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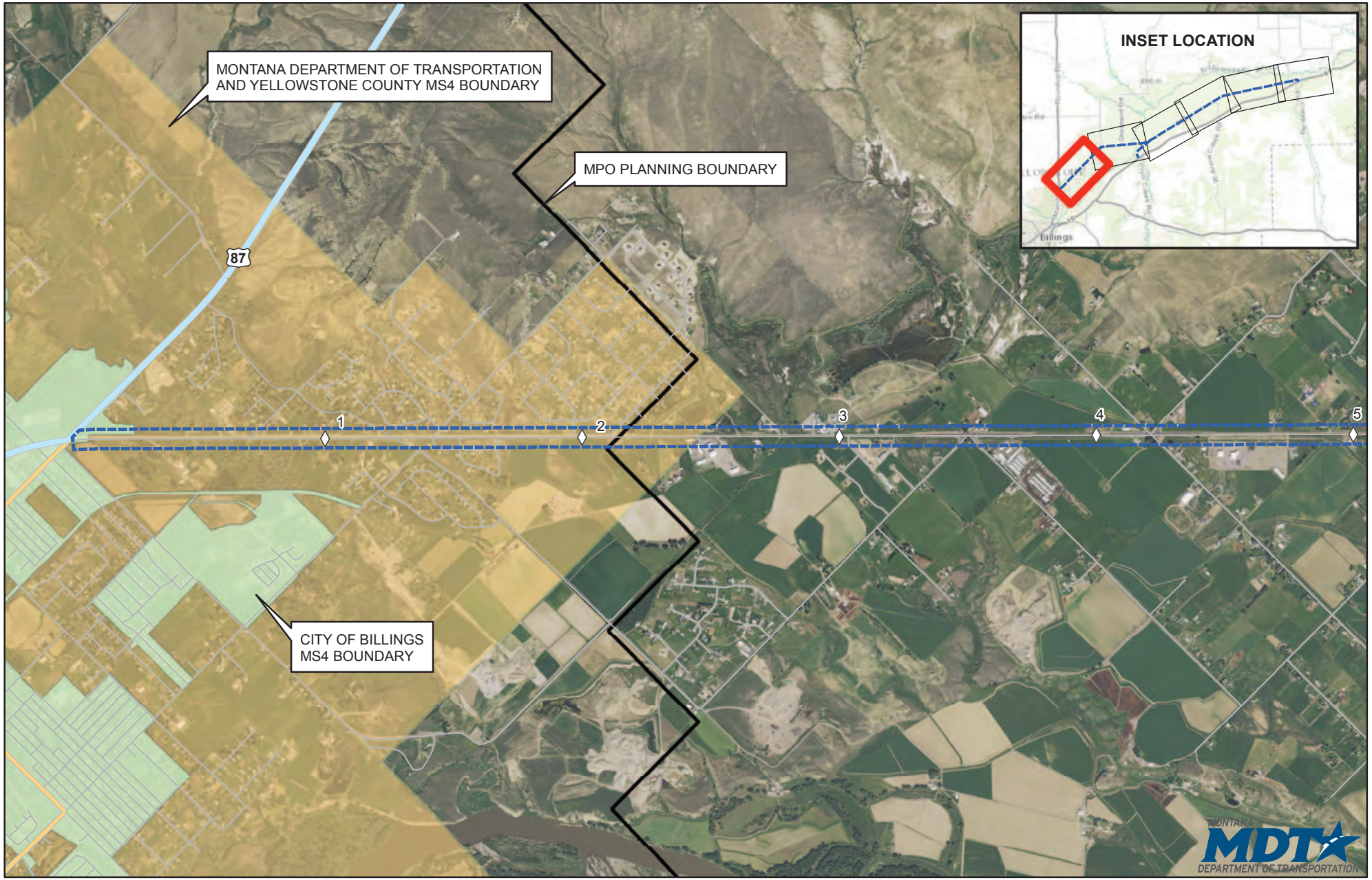
There are existing physical Reference Markers for Secondary 522 and Secondary 568.

Date: 4/2/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT5F_OLD_HWY_312_SURFACEWATER_WETLANDS.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: MS4 and MPO Boundaries 2015,
Aerial Imagery - NAIP 2013

EXHIBIT 6 - MS4 AND MPO BOUNDARIES
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

- STUDY CORRIDOR
- MPO BOUNDARY
- CITY OF BILLINGS MS4 BOUNDARY
- MDT / YELLOWSTONE COUNTY MS4 BOUNDARY
- NHS NON-INTERSTATE
- URBAN
- OFF SYSTEM ROUTE
- REFERENCE MARKERS*

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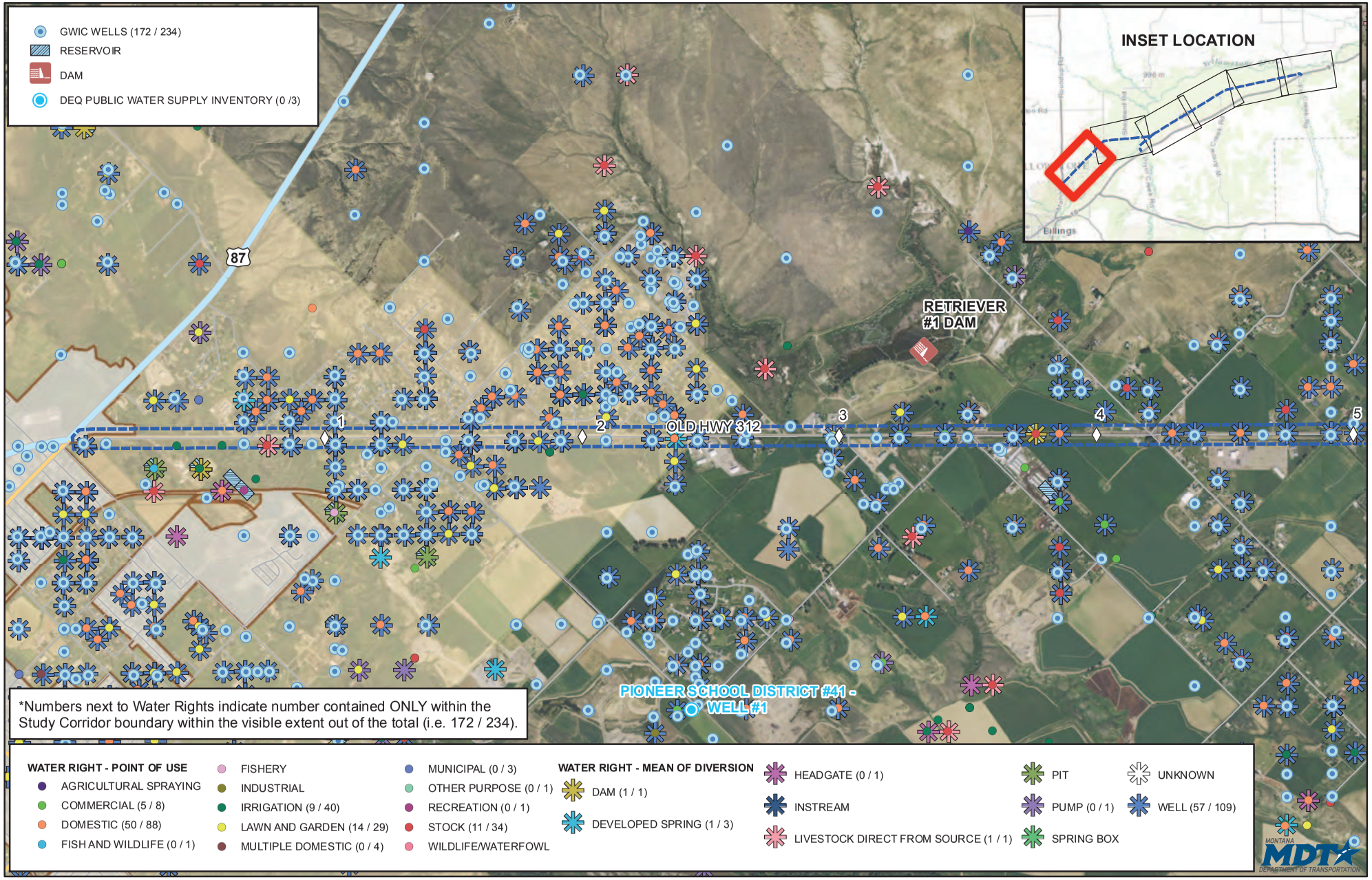
The Reference Markers shown here are for mapping and reference purrposes only.
There are existing physical Reference Markers for Secondary 522 and Secondary 568.

Date: 4/2/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT6_OLD_HWY_312_MS4_MPO.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana DNRC Water Rights 2015, DEQ Public Water Supply Inventory 2015, MBMG GWIC Well Database 2015, Aerial Imagery - NAIP 2013

EXHIBIT 7A - WELLS & WATER RIGHTS
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
CITY BOUNDARY
URBAN BOUNDARY
NHS NON-INTERSTATE
URBAN
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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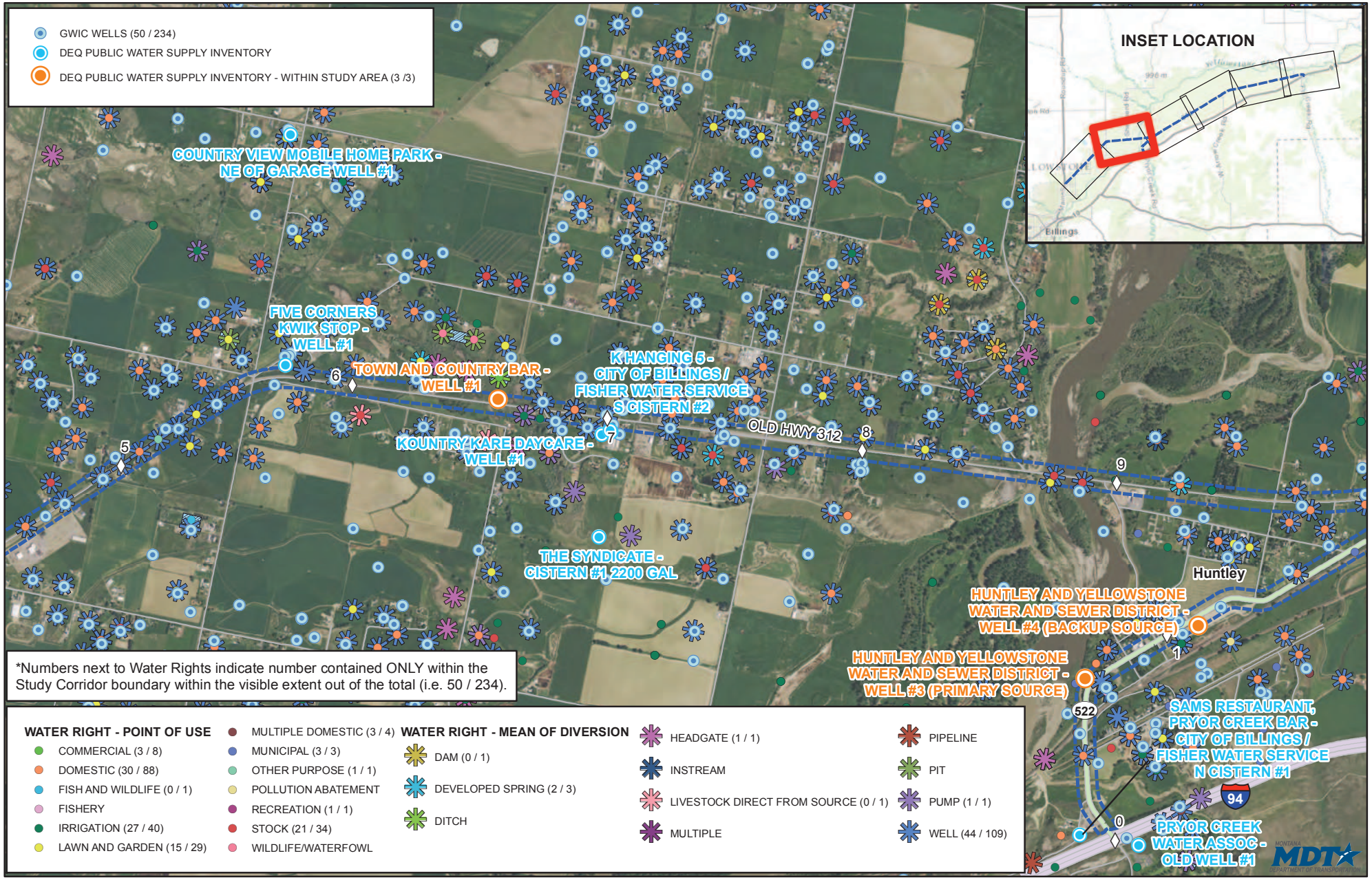
There are existing physical Reference Markers for Secondary 522 and Secondary 568.

Date: 4/2/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT7A_OLD_HWY_312_WELLS_WATERRIGHTS.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

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Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana DNRC Water Rights 2015, DEQ Public Water Supply Inventory 2015, MBMG GWIC Well Database 2015, Aerial Imagery - NAIP 2013

EXHIBIT 7B - WELLS & WATER RIGHTS
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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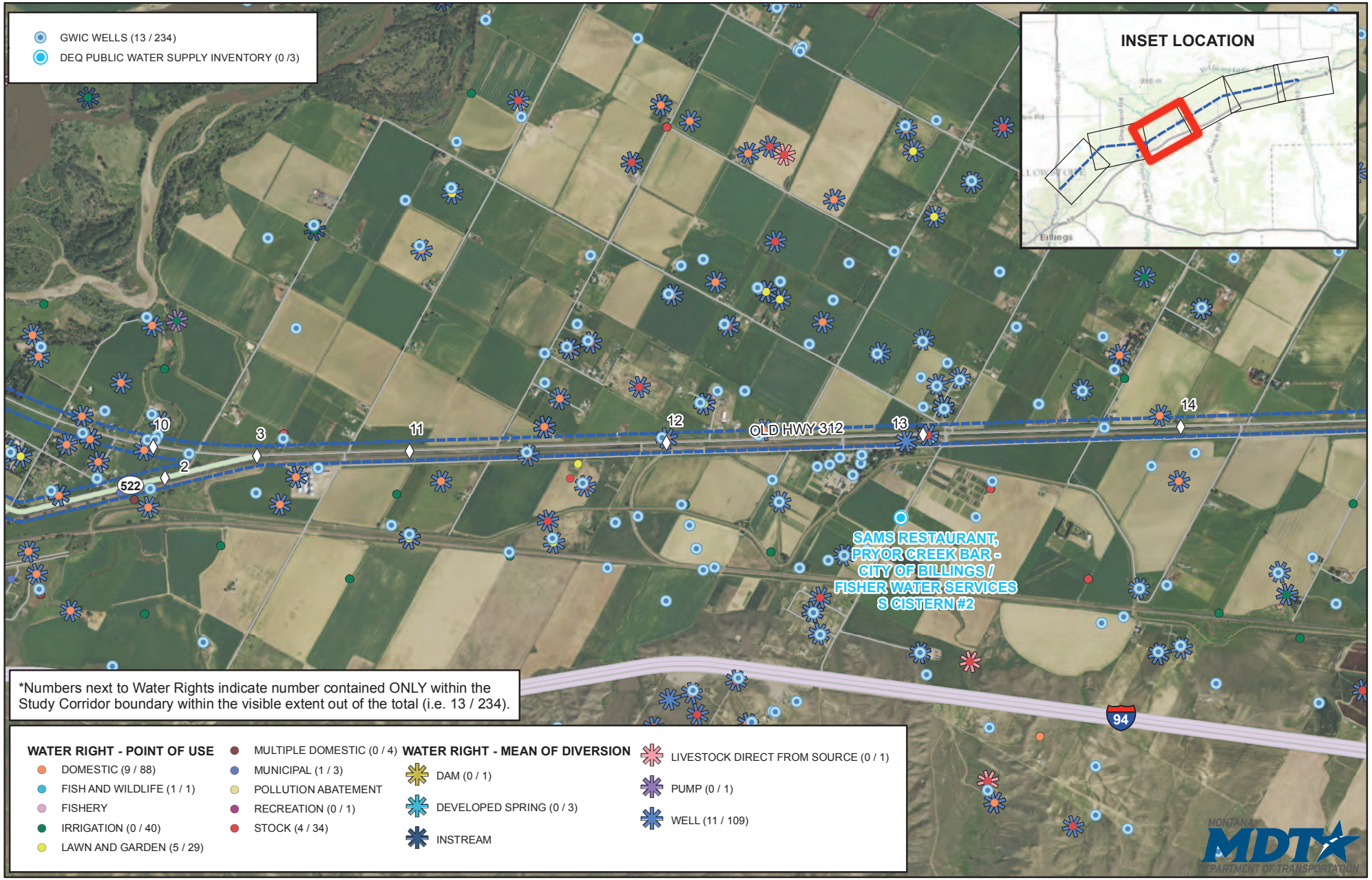
There are existing physical Reference Markers for Secondary 522 and Secondary 568.

Date: 4/2/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT7B_OLD_HWY_312_WELLS_WATERRIGHTS.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana DNRC Water Rights 2015, DEQ Public Water Supply Inventory 2015, MBMG GWIC Well Database 2015, Aerial Imagery - NAIP 2013

EXHIBIT 7C - WELLS & WATER RIGHTS
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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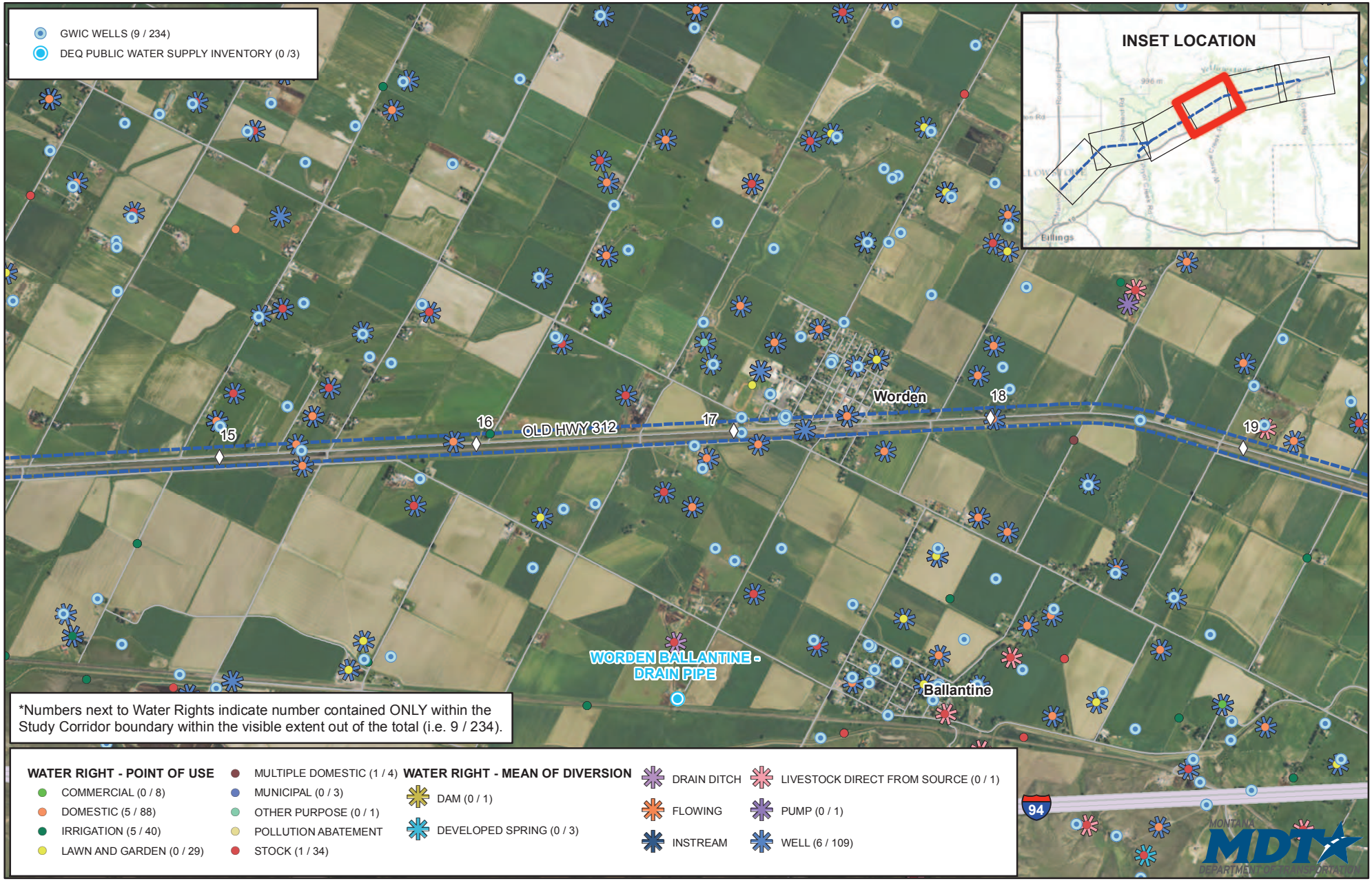
There are existing physical Reference Markers for Secondary 522 and Secondary 568.

Date: 4/2/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT7C_OLD_HWY_312_WELLS_WATERRIGHTS.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana DNRC Water Rights 2015, DEQ Public Water Supply Inventory 2015, MBMG GWIC Well Database 2015, Aerial Imagery - NAIP 2013

EXHIBIT 7D - WELLS & WATER RIGHTS
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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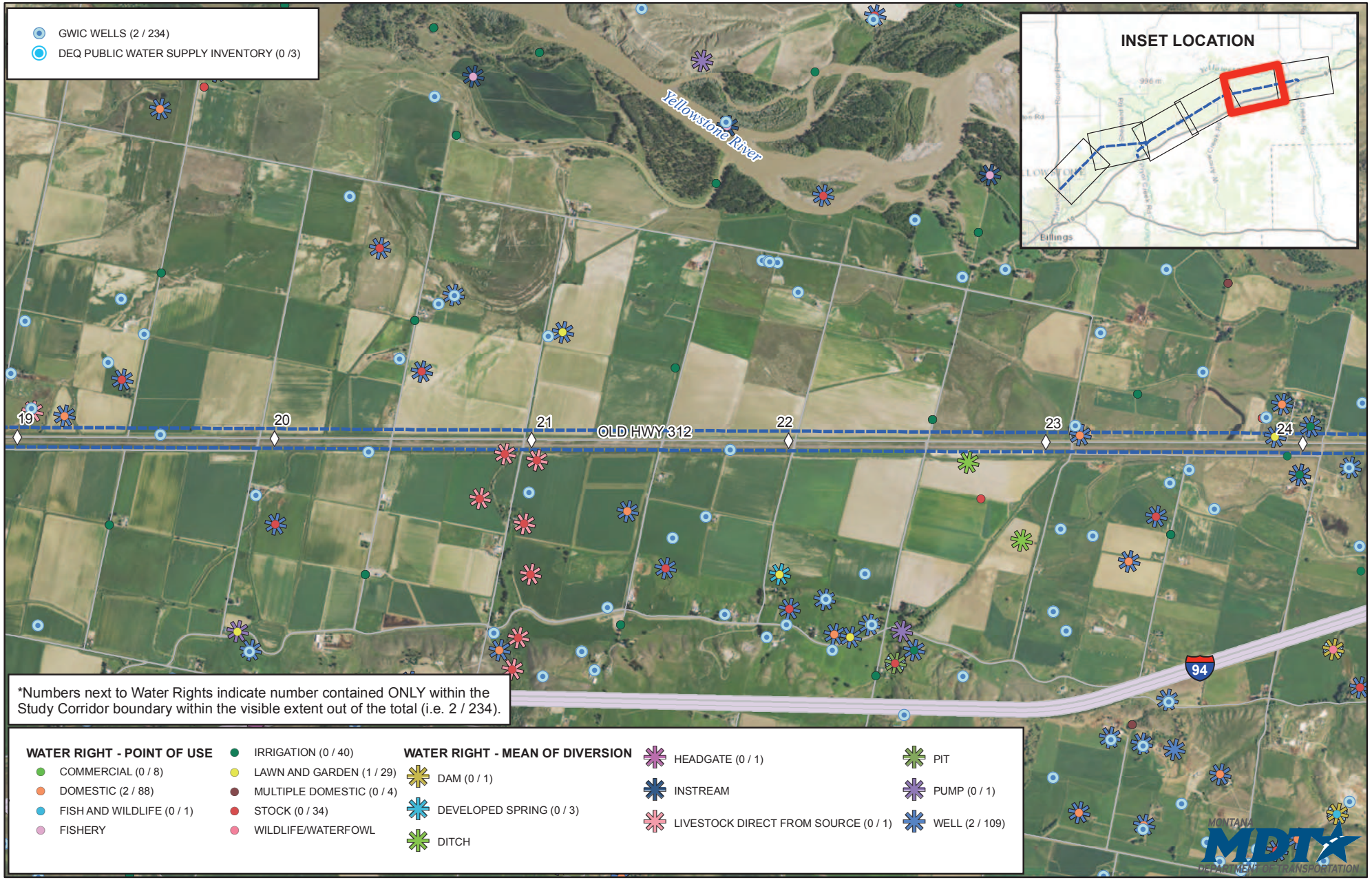
Date: 4/2/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT7D_OLD_HWY_312_WELLS_WATERRIGHTS.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana DNRC Water Rights 2015, DEQ Public Water Supply Inventory 2015, MBMG GWIC Well Database 2015, Aerial Imagery - NAIP 2013

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EXHIBIT 7E - WELLS & WATER RIGHTS
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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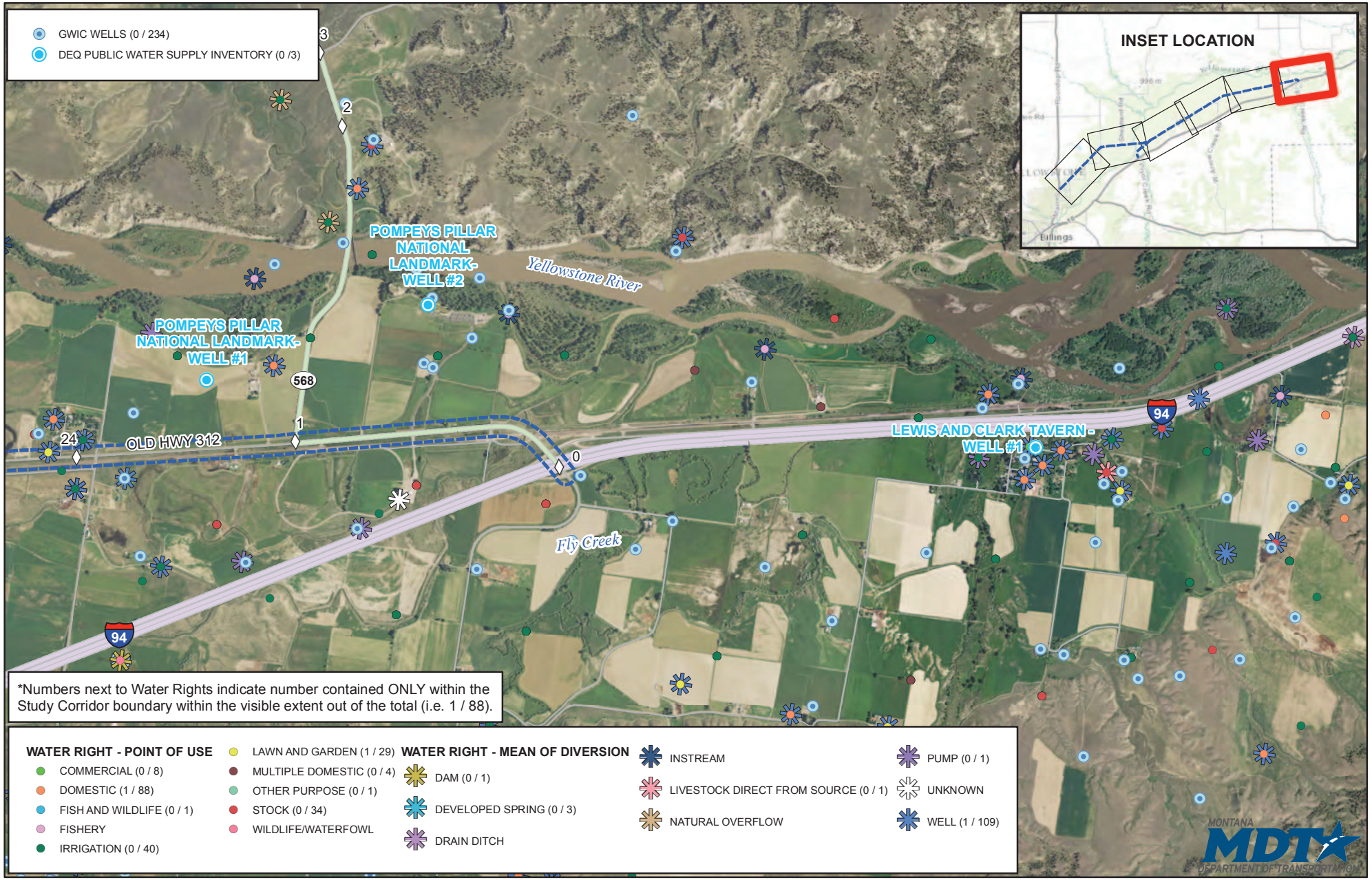
Date: 4/2/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT7E_OLD_HWY_312_WELLS_WATERRIGHTS.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

N W E S

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana DNRC Water Rights 2015, DEQ Public Water Supply Inventory 2015, MBMG GWIC Well Database 2015, Aerial Imagery - NAIP 2013

EXHIBIT 7F - WELLS & WATER RIGHTS
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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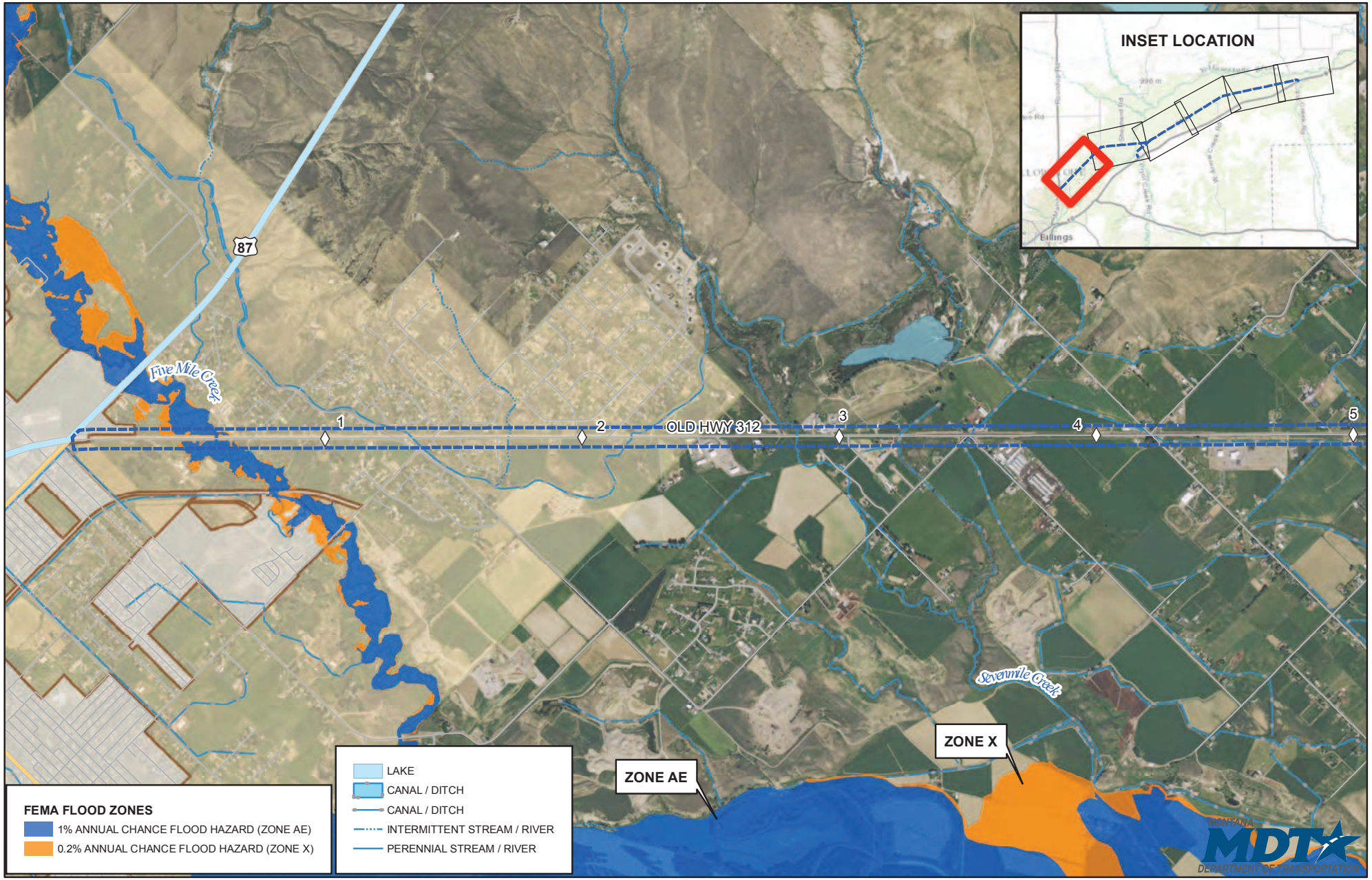
Date: 4/2/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT7F_OLD_HWY_312_WELLS_WATERRIGHTS.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: National Hydrography Dataset 2015,
FEMA DFRIM Panels '30111' eff. 11/6/2013,
Aerial Imagery - NAIP 2013

EXHIBIT 8A - FEMA FLOOD ZONES
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
CITY BOUNDARY
URBAN BOUNDARY
NHS NON-INTERSTATE
URBAN
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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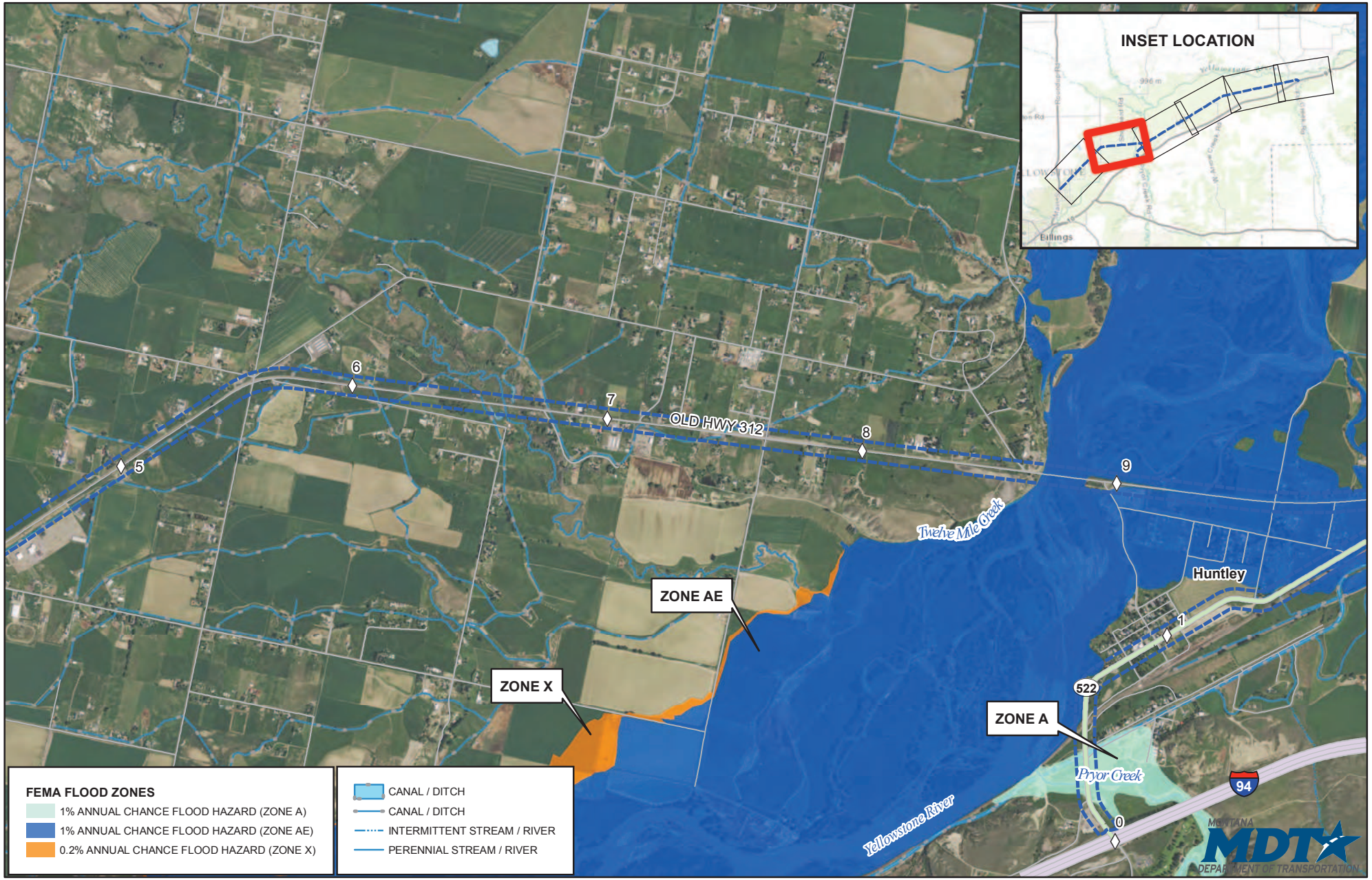
Date: 4/2/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT8A_OLD_HWY_312_FEMA_FLOODZONES.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: National Hydrography Dataset 2015,
FEMA DFRIM Panels '30111' eff. 11/6/2013,
Aerial Imagery - NAIP 2013

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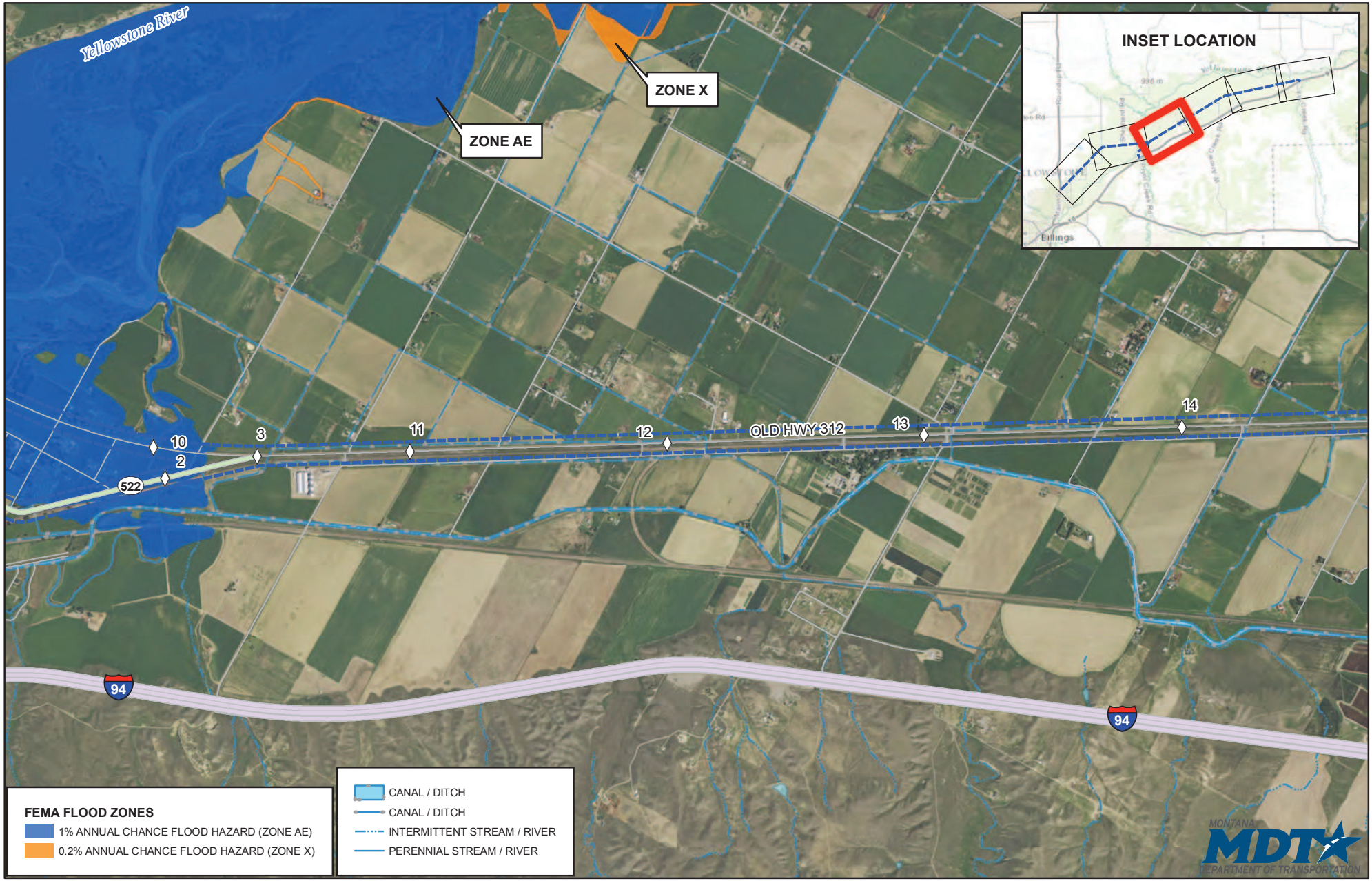
EXHIBIT 8B - FEMA FLOOD ZONES
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE MARKERS*

*There are no existing physical Reference Markers on Old Highway 312.
The Reference Markers shown here are for mapping and reference puprposes only.
There are existing physical Reference Markers for Secondary 522 and Secondary 568.

Date: 4/2/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT8B_OLD_HWY_312_FEMA_FLOODZONES.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: National Hydrography Dataset 2015,
FEMA DFRIM Panels '30111' eff. 11/6/2013,
Aerial Imagery - NAIP 2013

N W E S

EXHIBIT 8C - FEMA FLOOD ZONES
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE MARKERS*

*There are no existing physical Reference Markers on Old Highway 312.
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There are existing physical Reference Markers for Secondary 522 and Secondary 568.

Date: 4/2/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT8C_OLD_HWY_312_FEMA_FLOODZONES.mxd

0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: National Hydrography Dataset 2015,
FEMA DFRIM Panels '30111' eff. 11/6/2013,
Aerial Imagery - NAIP 2013

N W E S

EXHIBIT 8D - FEMA FLOOD ZONES
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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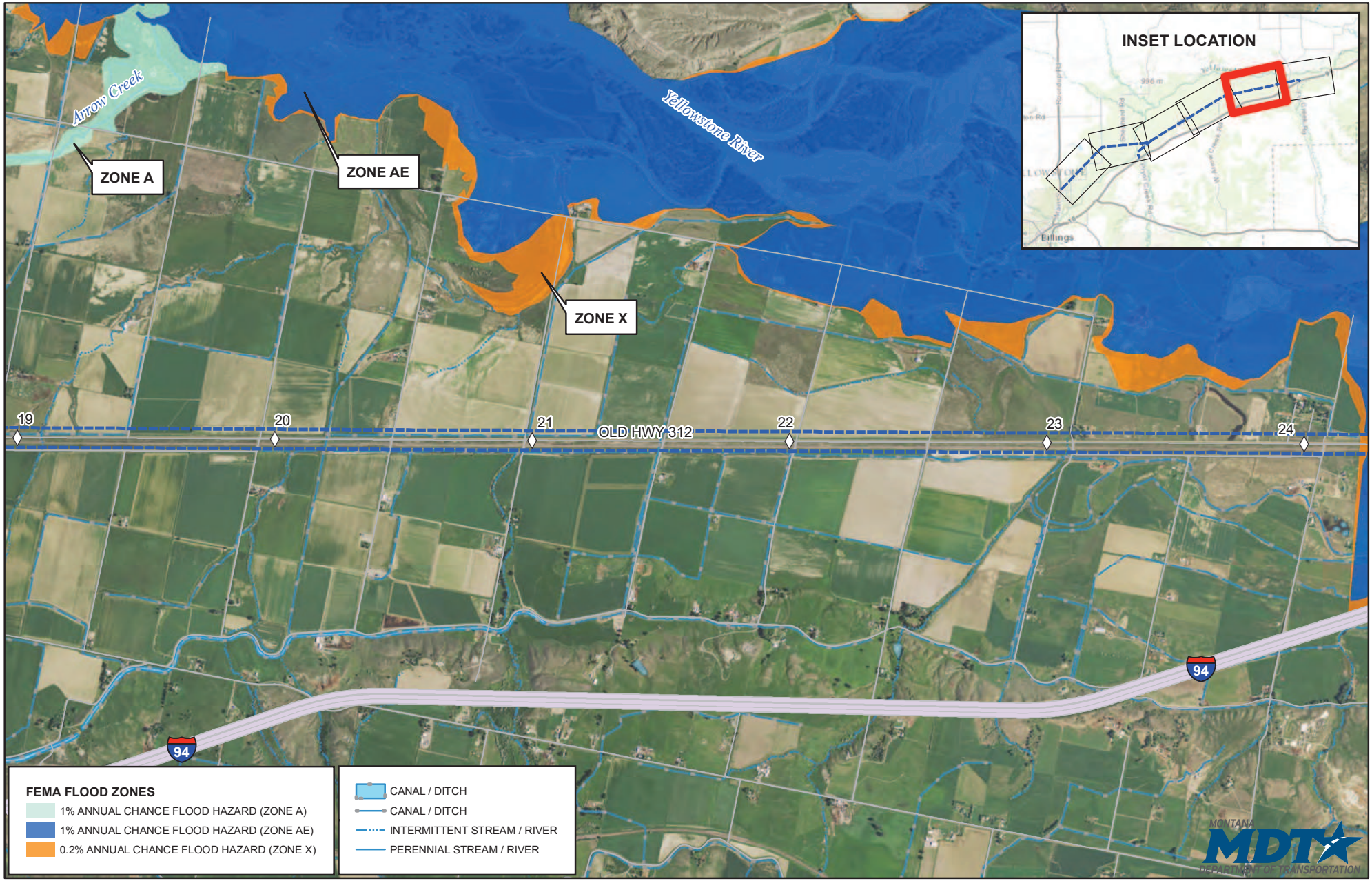
There are existing physical Reference Markers for Secondary 522 and Secondary 568.

Date: 4/2/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT8D_OLD_HWY_312_FEMA_FLOODZONES.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: National Hydrography Dataset 2015,
FEMA DFRIM Panels '30111' eff. 11/6/2013,
Aerial Imagery - NAIP 2013

N W E S

EXHIBIT 8E - FEMA FLOOD ZONES
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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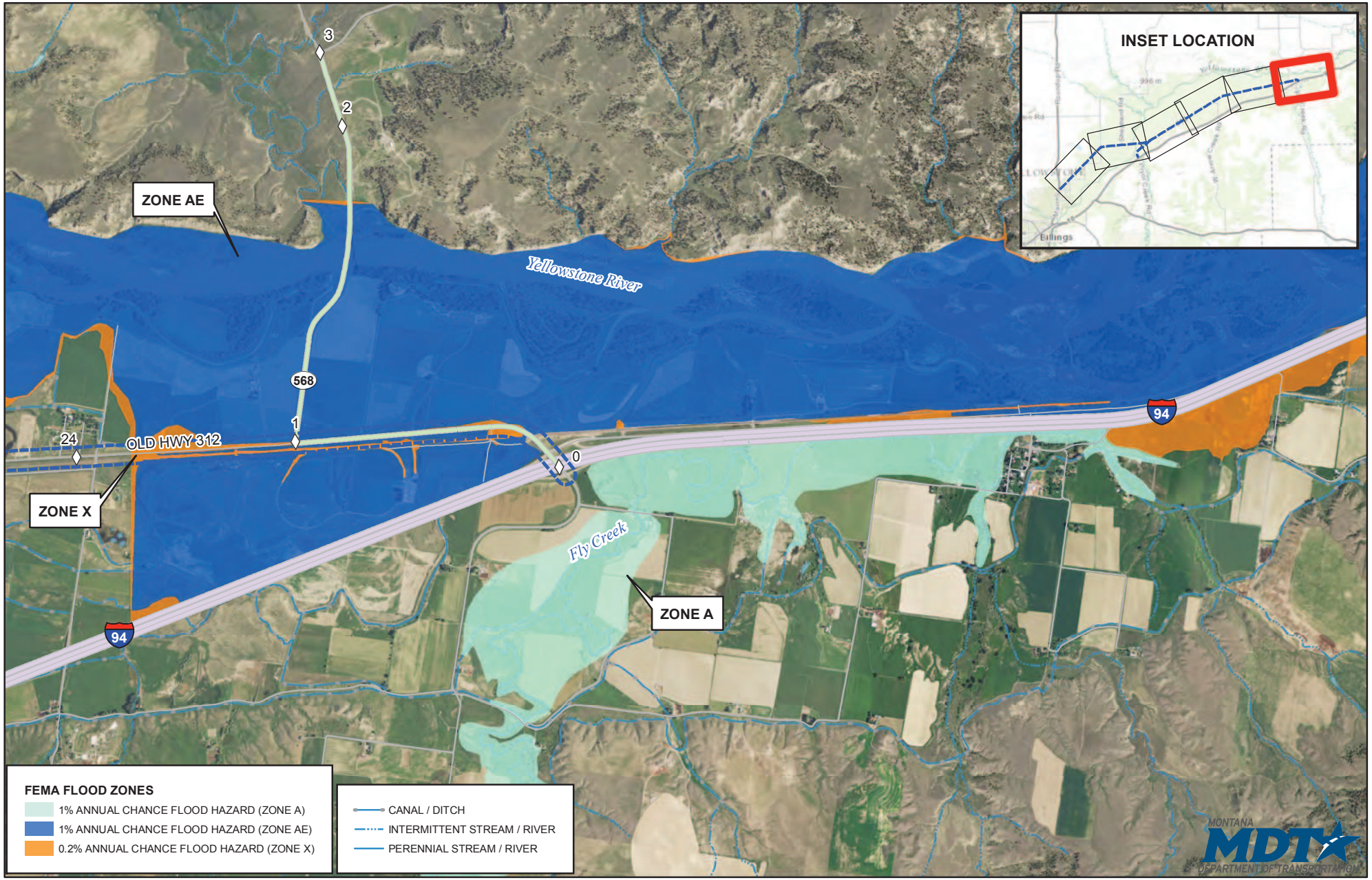
Date: 4/2/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT8E_OLD_HWY_312_FEMA_FLOODZONES.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: National Hydrography Dataset 2015,
FEMA DFRIM Panels '30111' eff. 11/6/2013,
Aerial Imagery - NAIP 2013

N W E S

EXHIBIT 8F - FEMA FLOOD ZONES
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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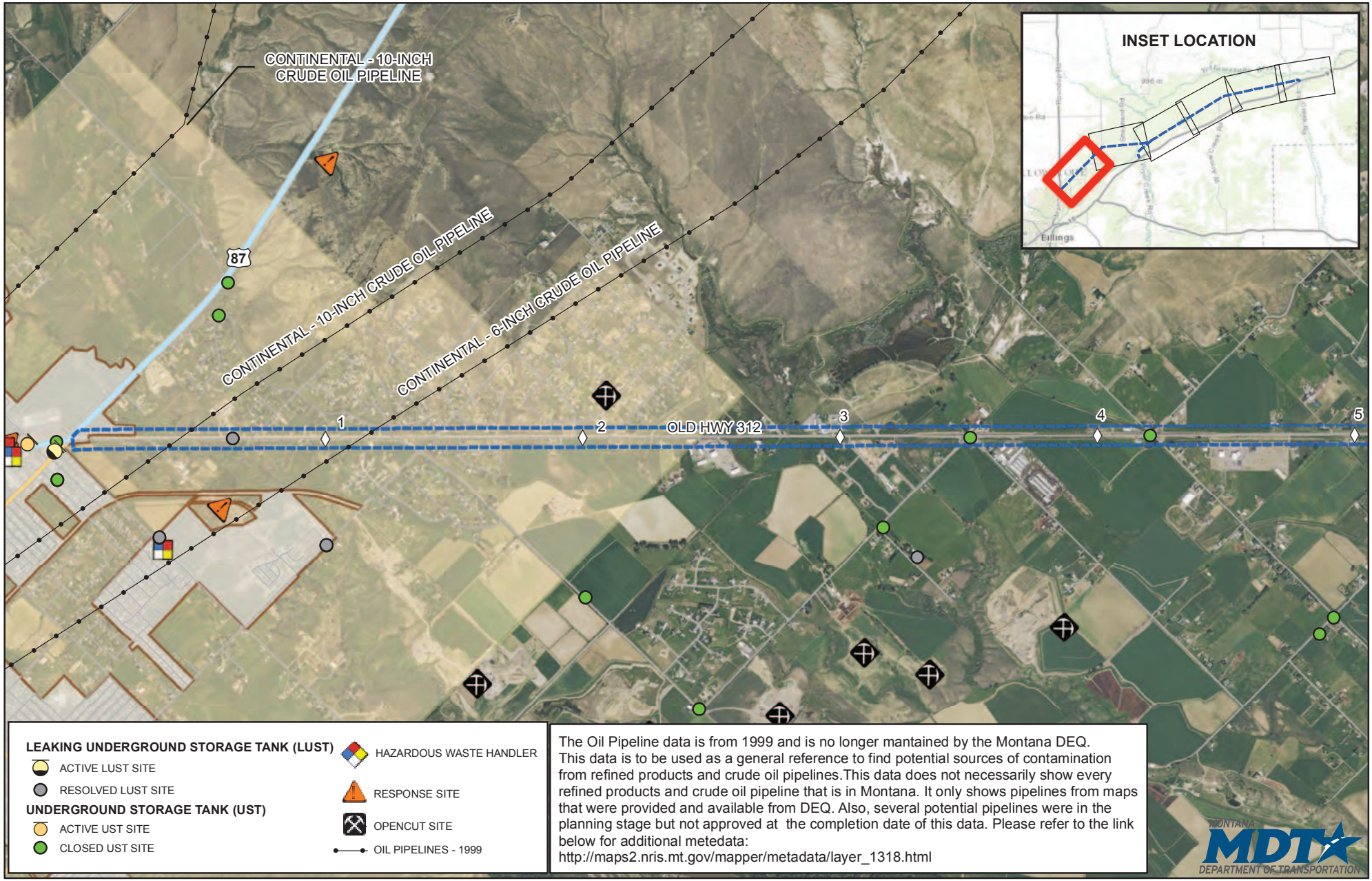
Date: 4/2/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT8F_OLD_HWY_312_FEMA_FLOODZONES.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana DEQ/DST Mapping Service includes: LUST/UST, Hazardous Waste Handlers, Response Sites, and Opencut Sites 2015, Aerial Imagery - NAIP 2013

EXHIBIT 9A - LUST, UST, & HAZARDOUS WASTE FACILITIES OLD HIGHWAY 312 CORRIDOR STUDY YELLOWSTONE COUNTY, MONTANA

STUDY AREA
CITY BOUNDARY
URBAN BOUNDARY
NHS NON-INTERSTATE
URBAN
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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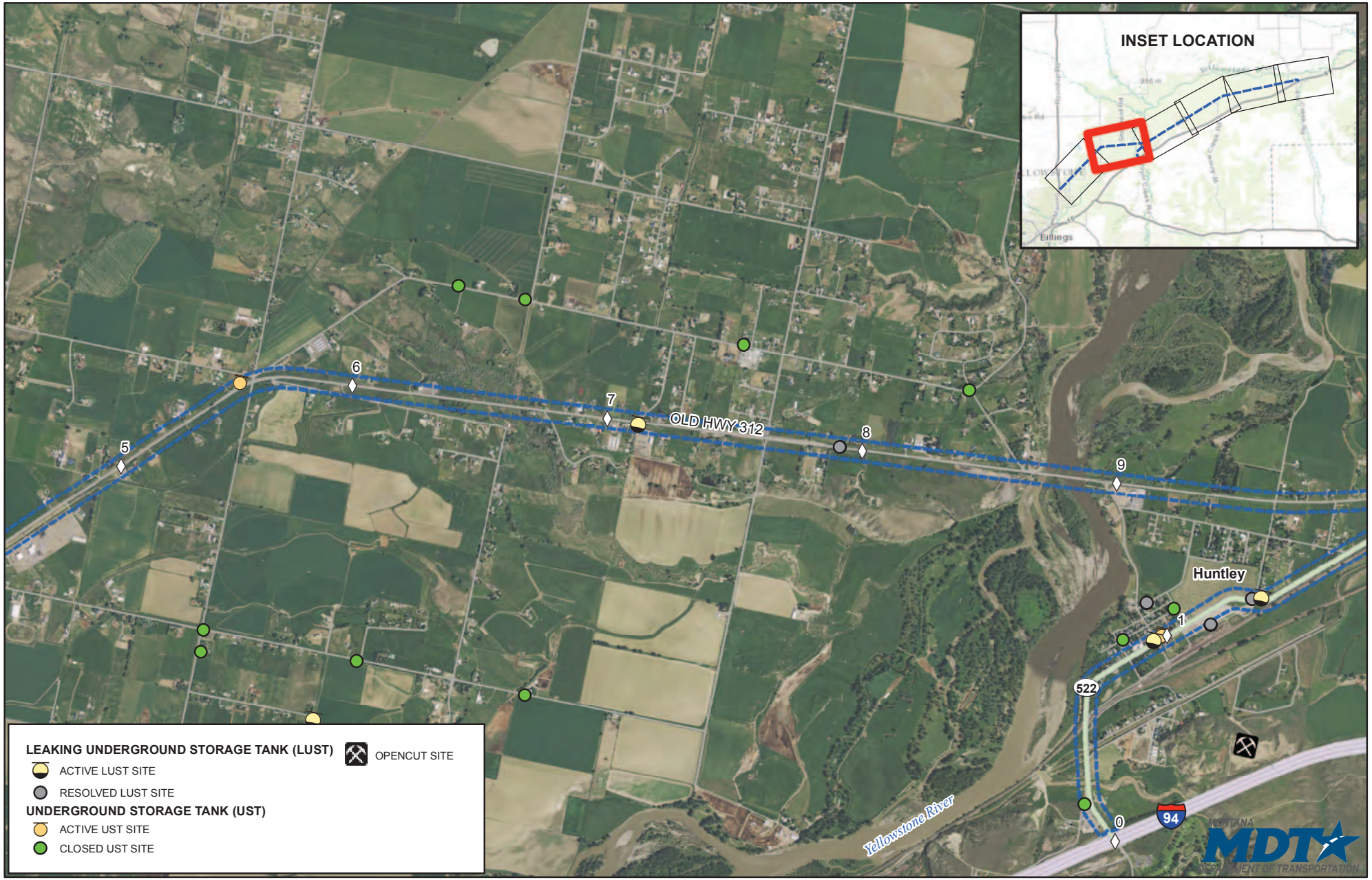
Date: 4/3/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT9A_OLD_HWY_312_UST_LUST_RESPONSESITES.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana DEQ/DST Mapping Service includes: LUST/UST, Hazardous Waste Handlers, Response Sites, and Opencut Sites 2015, Aerial Imagery - NAIP 2013

N W E S

EXHIBIT 9B - LUST, UST, & HAZARDOUS WASTE FACILITIES OLD HIGHWAY 312 CORRIDOR STUDY YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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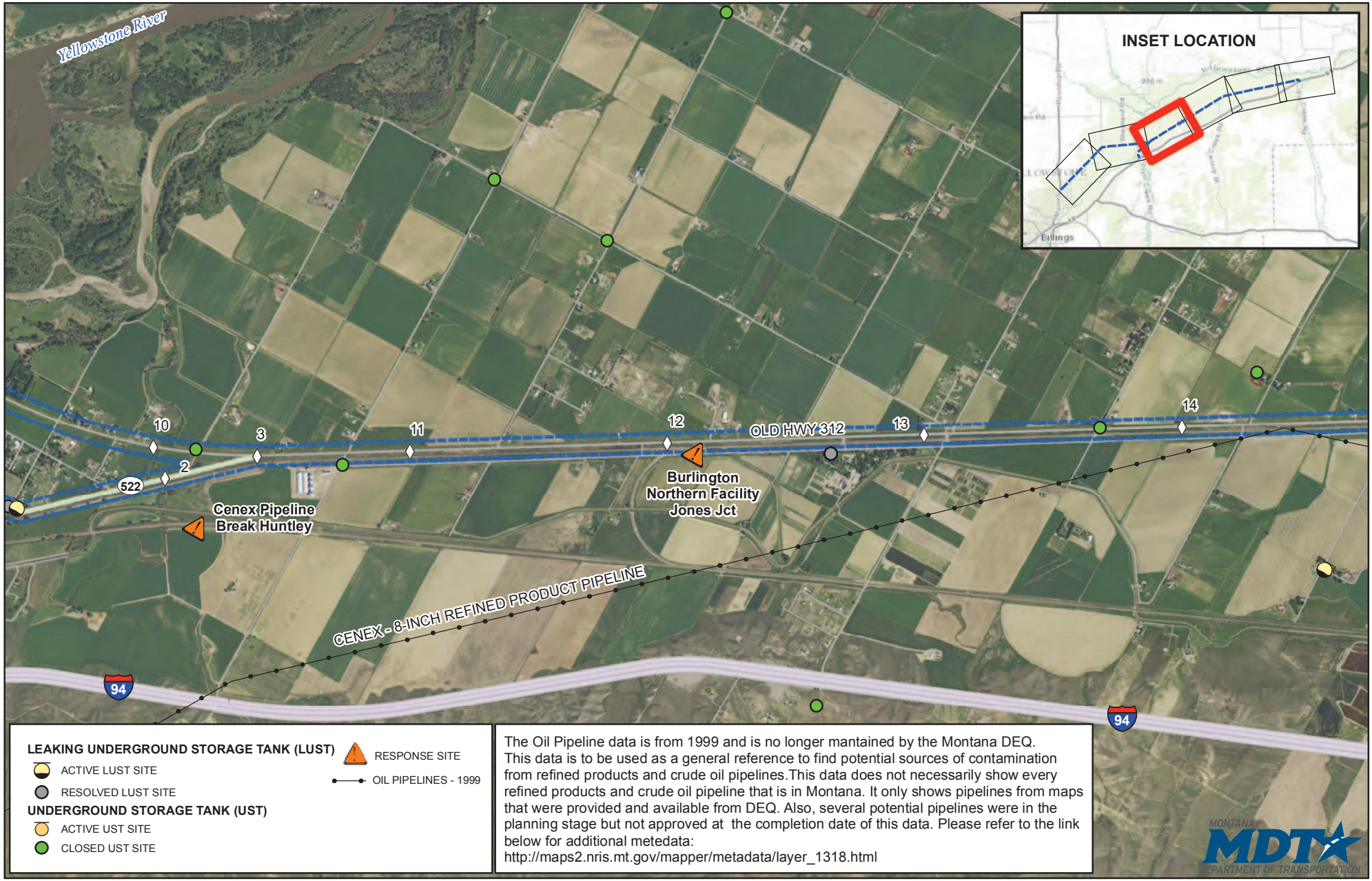
There are existing physical Reference Markers for Secondary 522 and Secondary 568.

Date: 4/3/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT9B_OLD_HWY_312_UST_LUST_RESPONSESITES.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana DEQ/DST Mapping Service includes: LUST/UST, Hazardous Waste Handlers, Response Sites, and Opencut Sites 2015, Aerial Imagery - NAIP 2013

N W E S

EXHIBIT 9C - LUST, UST, & HAZARDOUS WASTE FACILITIES OLD HIGHWAY 312 CORRIDOR STUDY YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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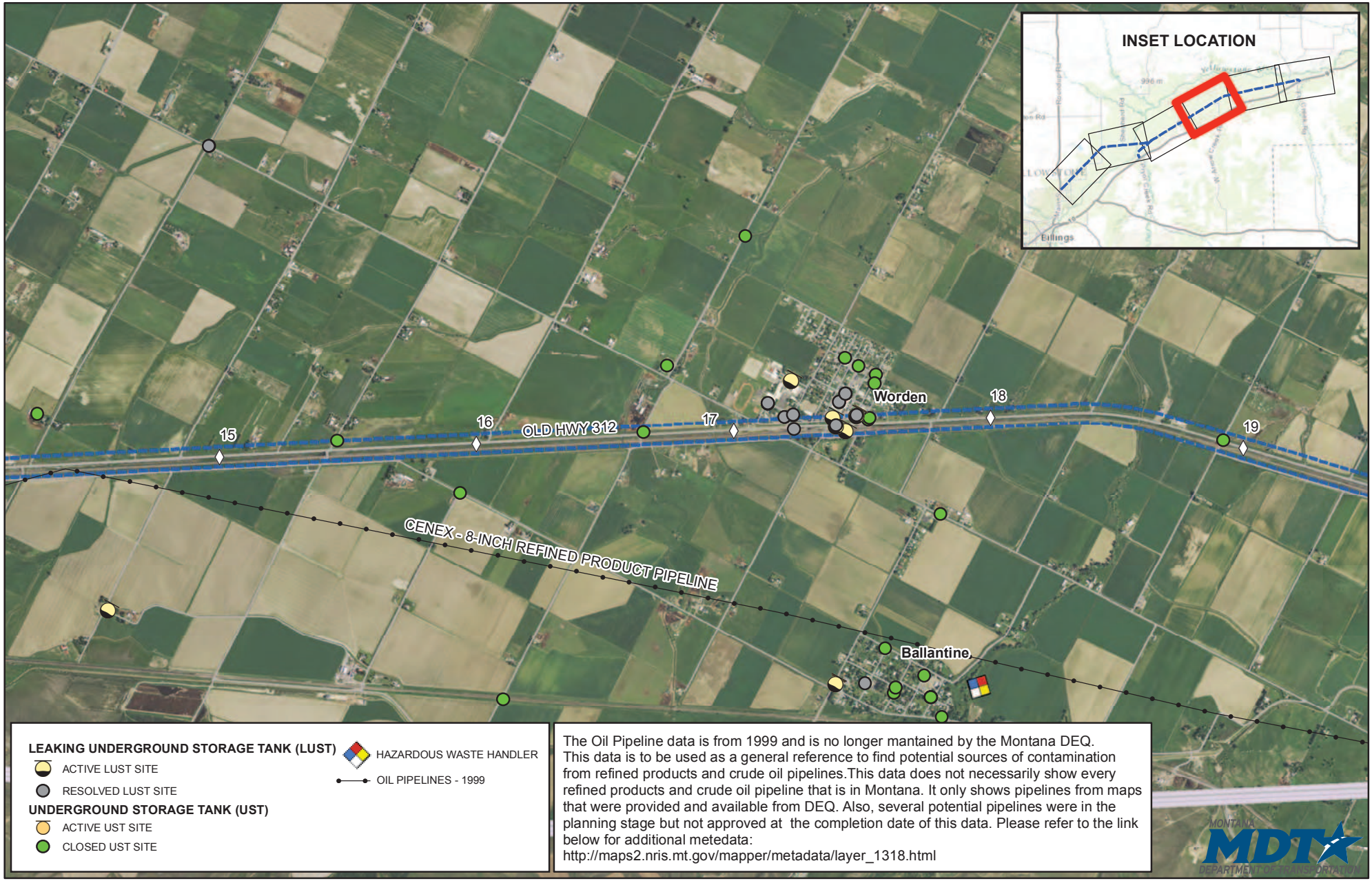

0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana DEQ/DST Mapping Service includes: LUST/UST, Hazardous Waste Handlers, Response Sites, and Opencut Sites 2015, Aerial Imagery - NAIP 2013

N W E S

EXHIBIT 9D - LUST, UST, & HAZARDOUS WASTE FACILITIES OLD HIGHWAY 312 CORRIDOR STUDY YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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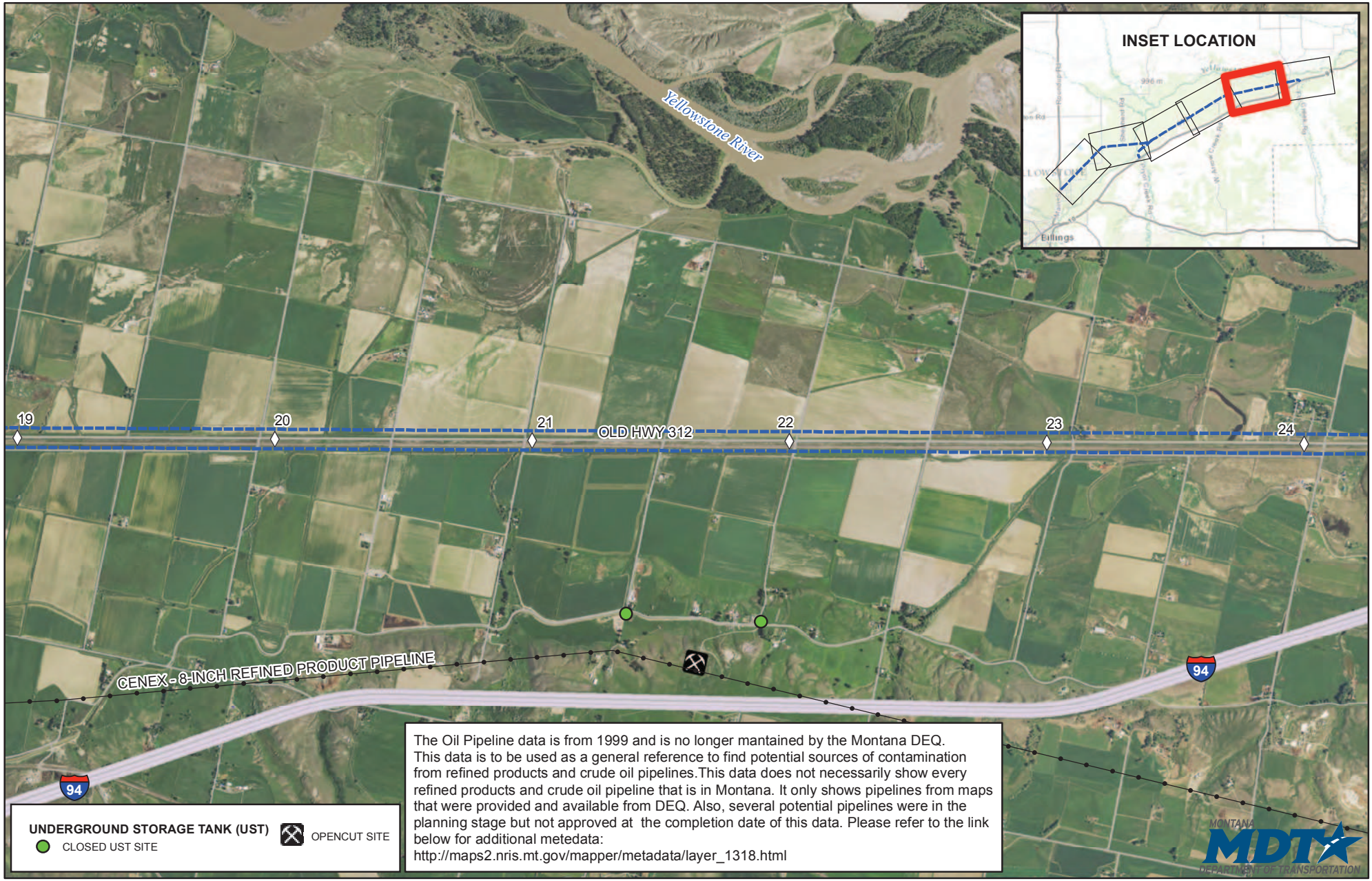
Date: 4/3/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT9D_OLD_HWY_312_UST_LUST_RESPONSESITES.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana DEQ/DST Mapping Service includes: LUST/UST, Hazardous Waste Handlers, Response Sites, and Opencut Sites 2015, Aerial Imagery - NAIP 2013

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EXHIBIT 9E - LUST, UST, & HAZARDOUS WASTE FACILITIES OLD HIGHWAY 312 CORRIDOR STUDY YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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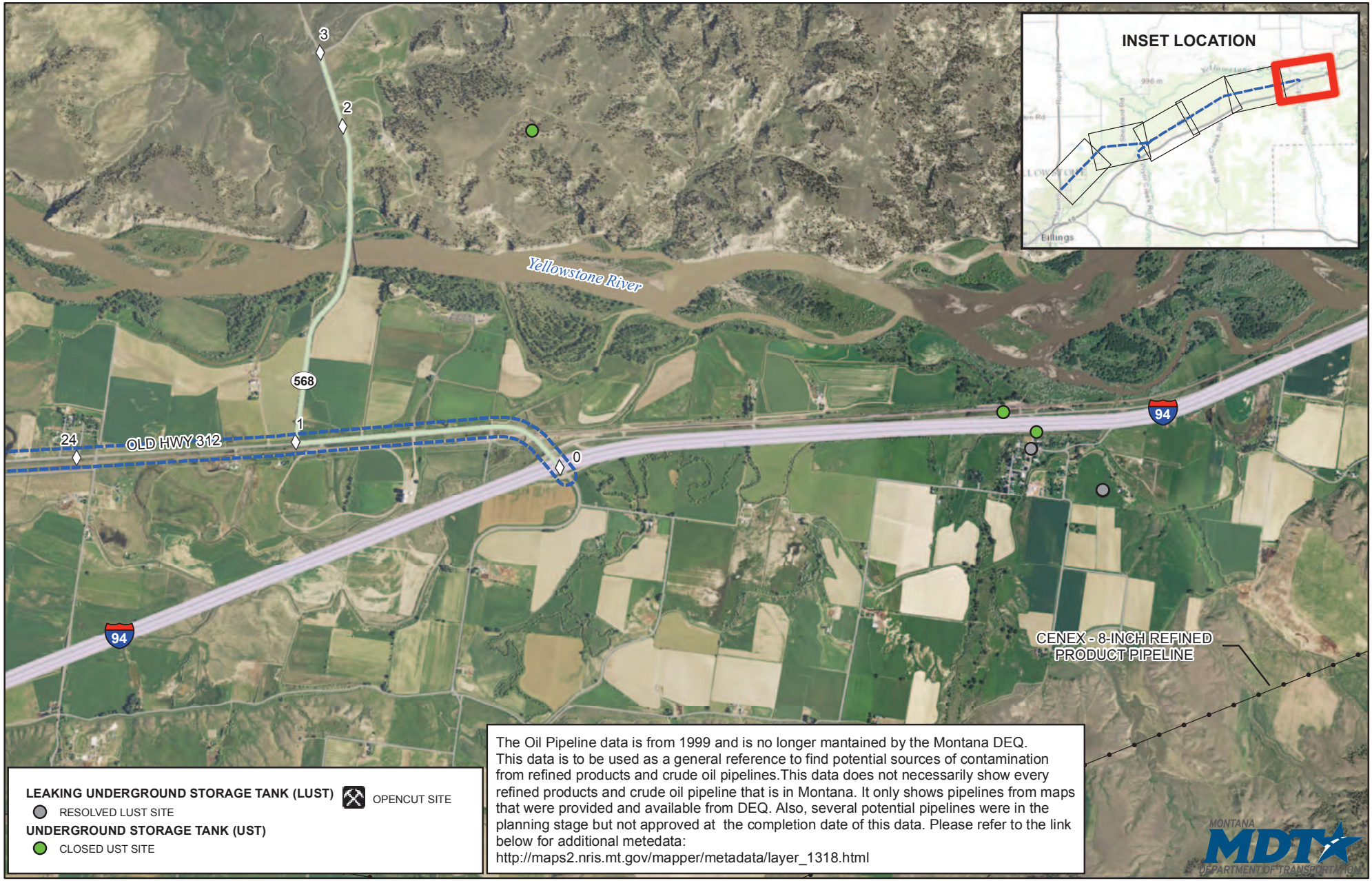
Date: 4/3/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT9E_OLD_HWY_312_UST_LUST_RESPONSESITES.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana DEQ/DST Mapping Service includes: LUST/UST, Hazardous Waste Handlers, Response Sites, and Opencut Sites 2015, Aerial Imagery - NAIP 2013

N W E S

EXHIBIT 9F - LUST, UST, & HAZARDOUS WASTE FACILITIES OLD HIGHWAY 312 CORRIDOR STUDY YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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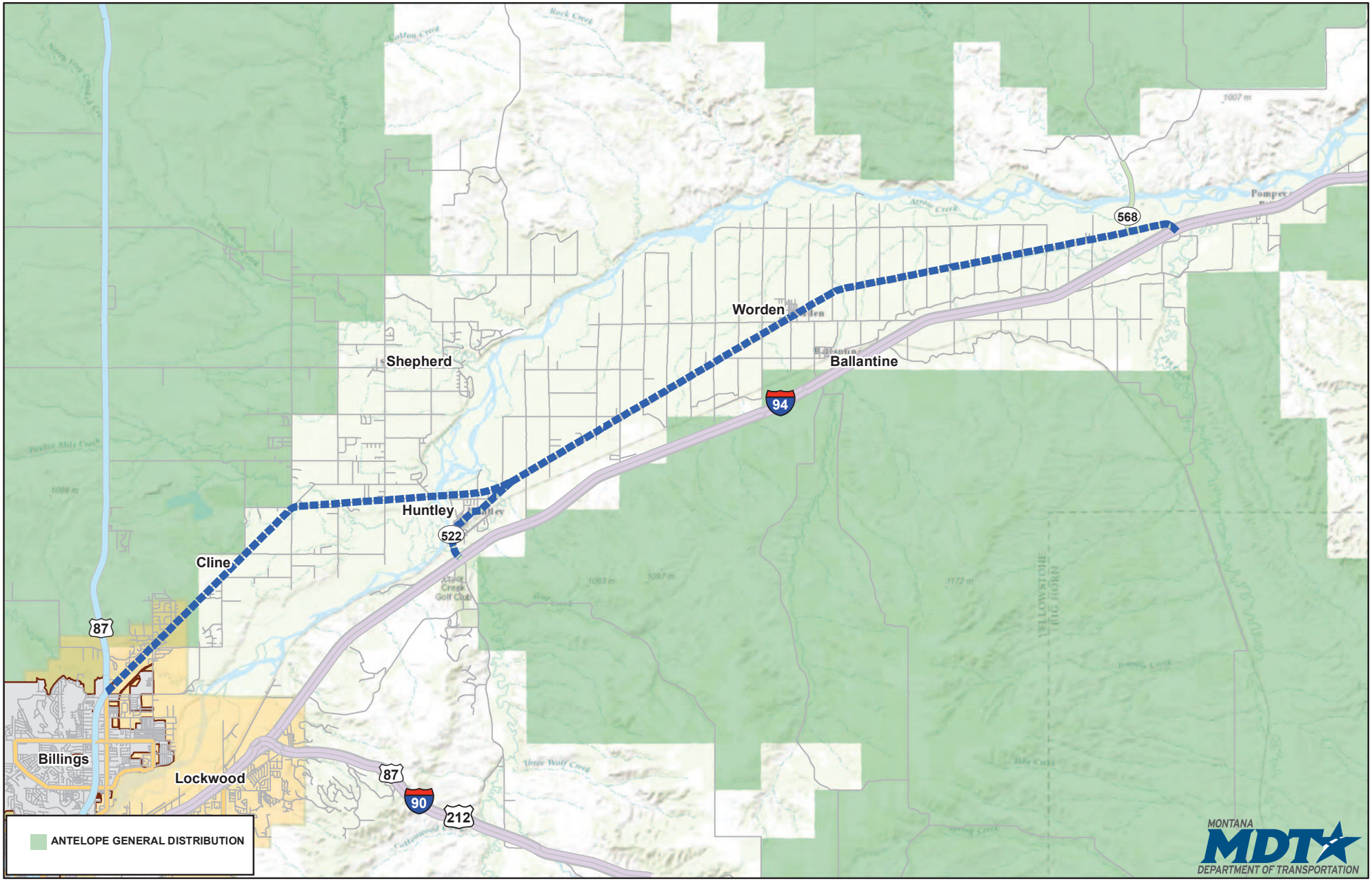
Date: 4/3/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT9F_OLD_HWY_312_UST_LUST_RESPONSESITES.mxd



0 1.25 2.5 5 Miles

Scale: 1:175,000

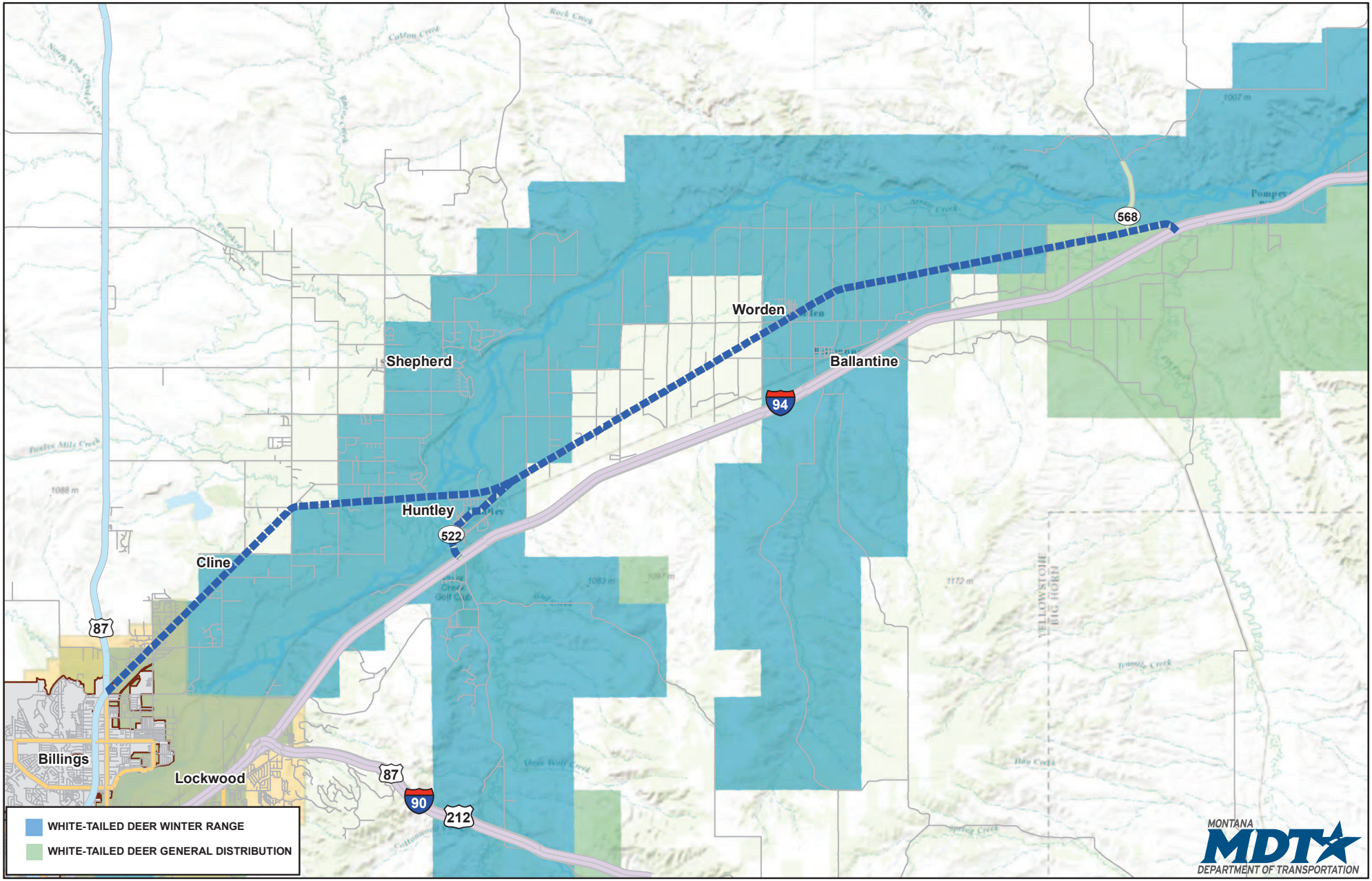
Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Fish, Wildlife, and Parks (FWP)
Wildlife Distribution dataset 2015,
ArcGIS Online ESRI World Topo Basemap

N W E S

EXHIBIT 10A - ANTELOPE GENERAL DISTRIBUTION
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

- STUDY AREA
- CITY BOUNDARY
- URBAN BOUNDARY
- NHS INTERSTATE
- NHS NON-INTERSTATE
- SECONDARY
- URBAN
- OFF SYSTEM ROUTE

Date: 4/3/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT10A_OLD_HWY_312_ANTELOPE_GENERAL_DISTRIBUTION.mxd



0 1.25 2.5 5 Miles

Scale: 1:175,000

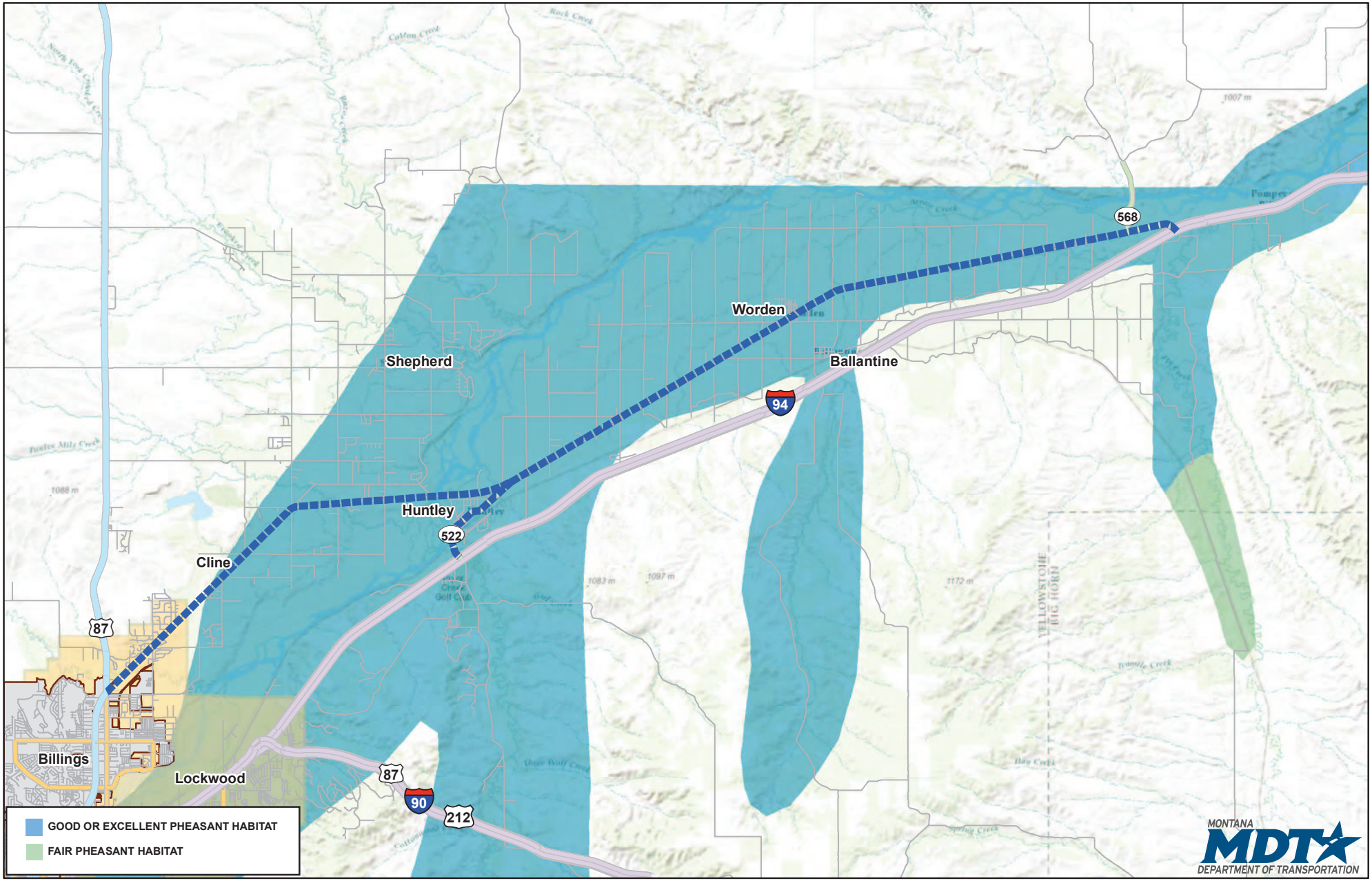
Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Fish, Wildlife, and Parks (FWP)
Wildlife Distribution dataset 2015,
ArcGIS Online ESRI World Topo Basemap

N W E S

EXHIBIT 10B - WHITE-TAILED DEER DISTRIBUTION
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

- STUDY AREA
- CITY BOUNDARY
- URBAN BOUNDARY
- NHS INTERSTATE
- NHS NON-INTERSTATE
- SECONDARY
- URBAN
- OFF SYSTEM ROUTE

Date: 4/3/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT10B_OLD_HWY_312_WHITETAIL_DISTRIBUTION.mxd



0 1.25 2.5 5 Miles

Scale: 1:175,000

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Fish, Wildlife, and Parks (FWP)
Wildlife Distribution dataset 2015,
ArcGIS Online ESRI World Topo Basemap

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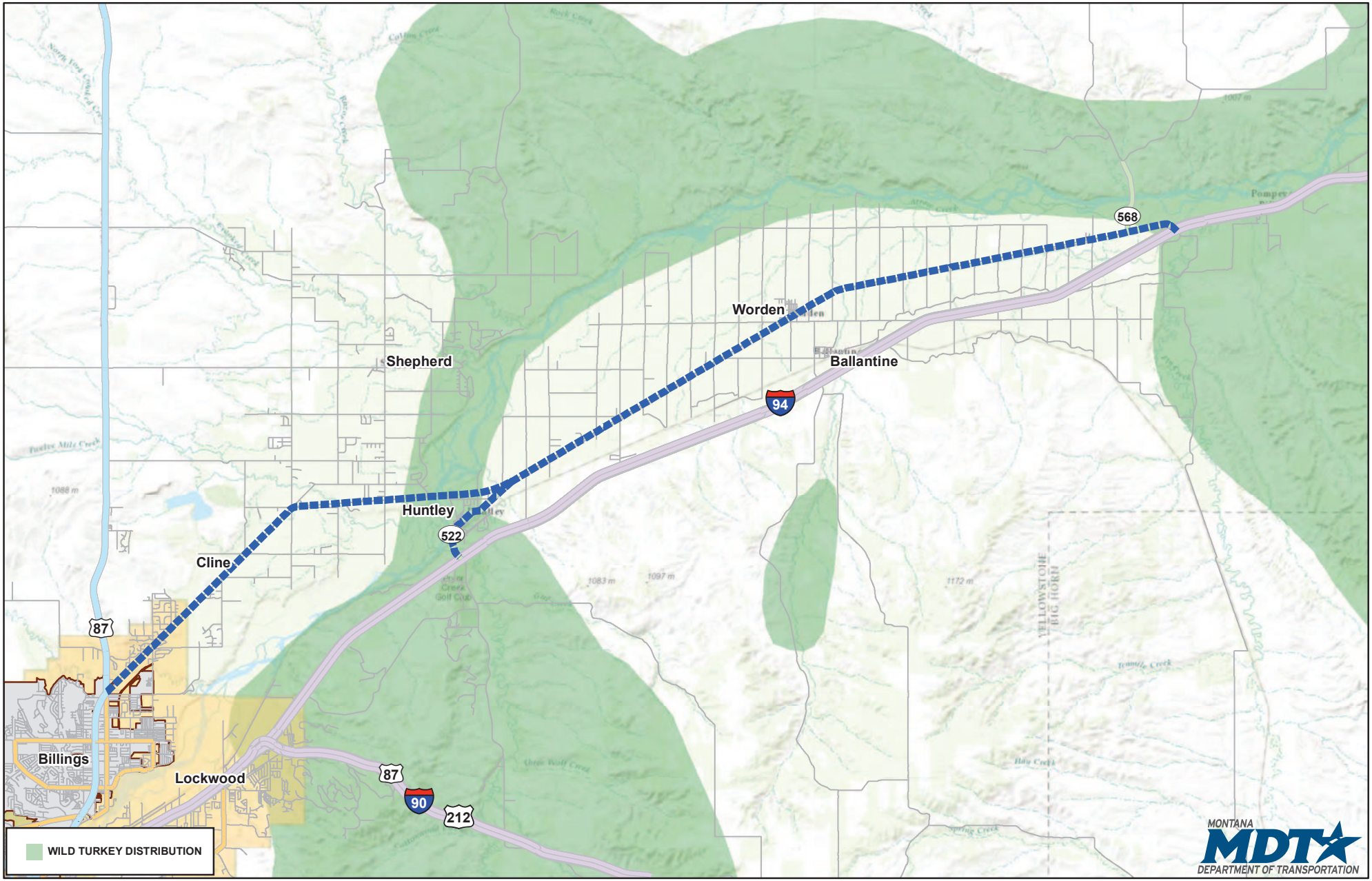
EXHIBIT 10C - PHEASANT DISTRIBUTION (HABITAT)
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

- STUDY AREA
- CITY BOUNDARY
- URBAN BOUNDARY
- NHS INTERSTATE
- NHS NON-INTERSTATE
- SECONDARY
- URBAN
- OFF SYSTEM ROUTE

Date: 4/3/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT10C_OLD_HWY_312_PHEASANT_DISTRIBUTION.mxd



0 1.25 2.5 5 Miles

Scale: 1:175,000

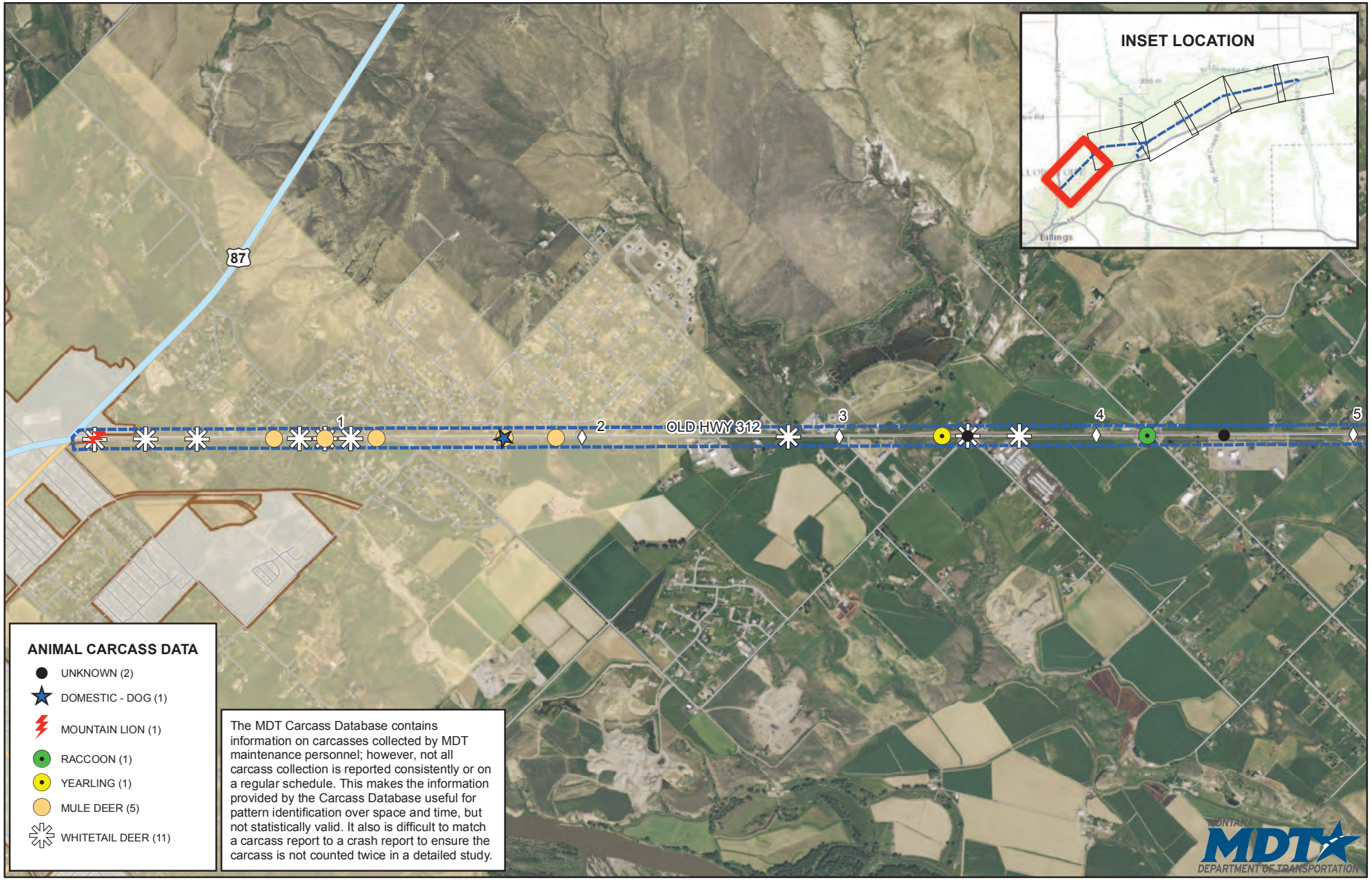
Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Fish, Wildlife, and Parks (FWP)
Wildlife Distribution dataset 2015,
ArcGIS Online ESRI World Topo Basemap

N W E S

EXHIBIT 10D - WILD TURKEY DISTRIBUTION
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

- STUDY AREA
- CITY BOUNDARY
- URBAN BOUNDARY
- NHS INTERSTATE
- NHS NON-INTERSTATE
- SECONDARY
- URBAN
- OFF SYSTEM ROUTE

Date: 4/3/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT10D_OLD_HWY_312_TURKEY_DISTRIBUTION.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: MDT Animal Carcass Dataset 2015,
Aerial Imagery - NAIP 2013

EXHIBIT 11A - ANIMAL CARCASS DATA
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
CITY BOUNDARY
URBAN BOUNDARY
NHS NON-INTERSTATE
URBAN
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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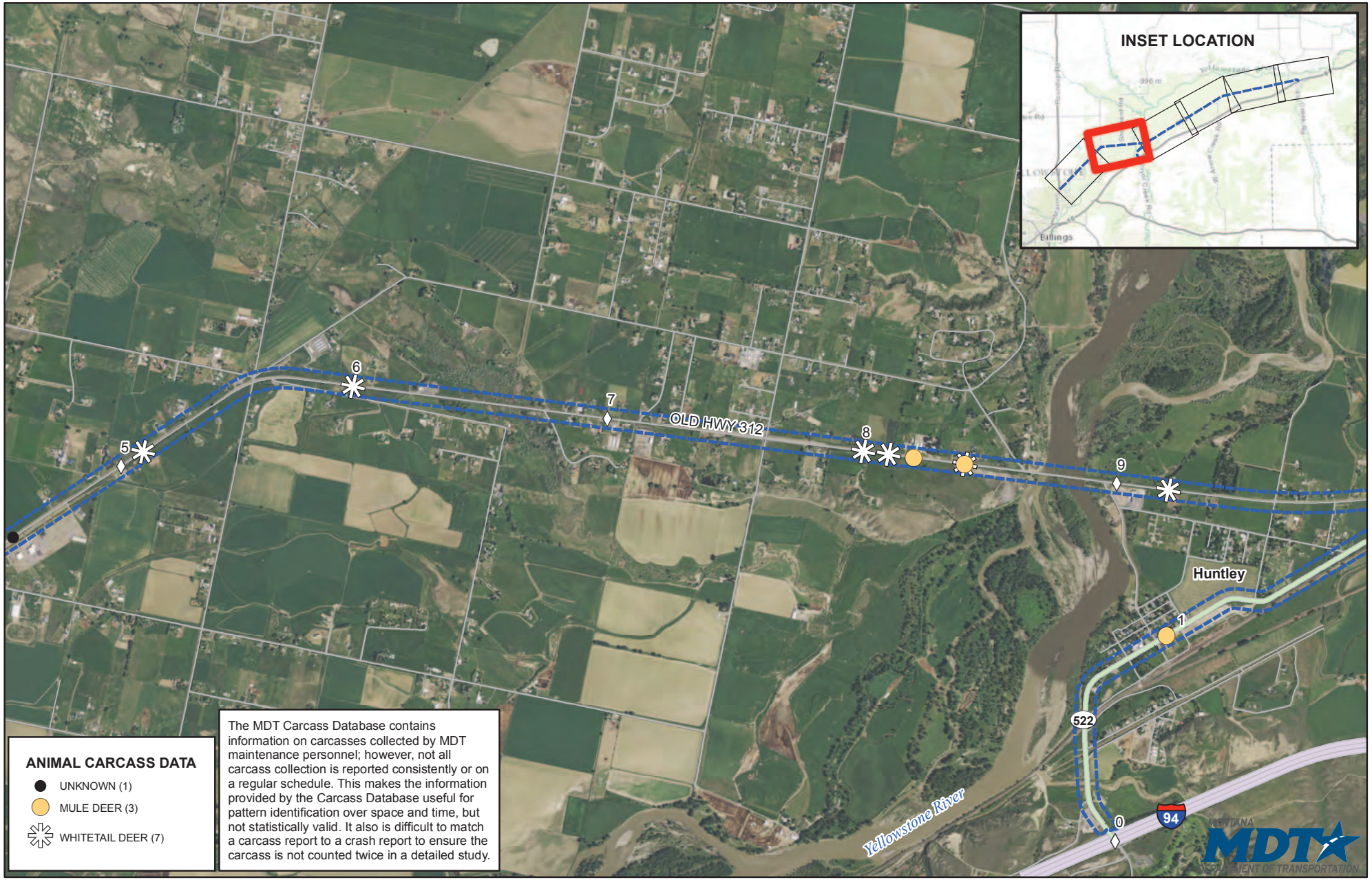
Date: 4/3/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT11A_OLD_HWY_312_ANIMAL_CARCASS.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

N W E S

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: MDT Animal Carcass Dataset 2015,
Aerial Imagery - NAIP 2013

EXHIBIT 11B - ANIMAL CARCASS DATA
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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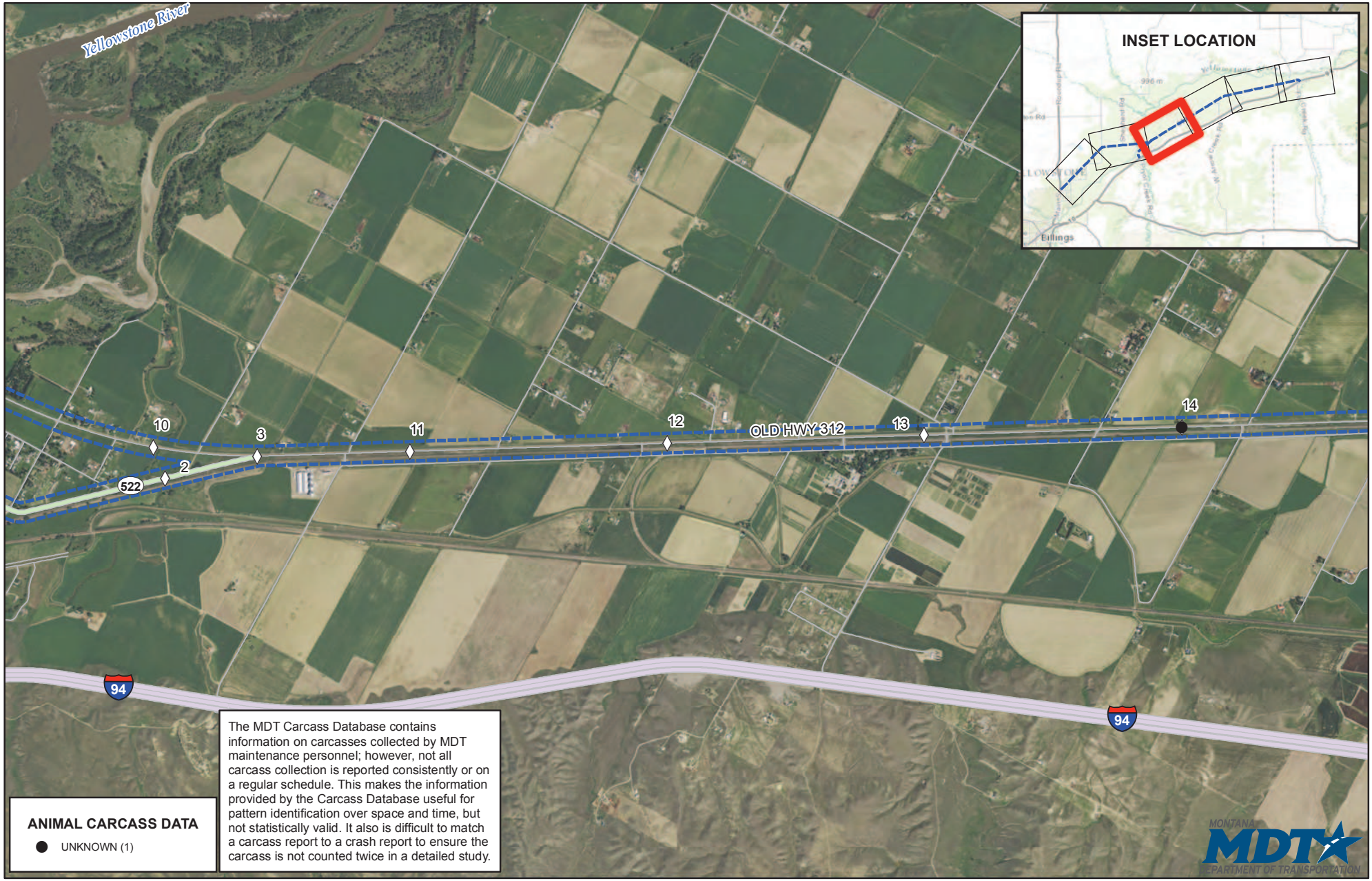

0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: MDT Animal Carcass Dataset 2015,
Aerial Imagery - NAIP 2013

EXHIBIT 11C - ANIMAL CARCASS DATA
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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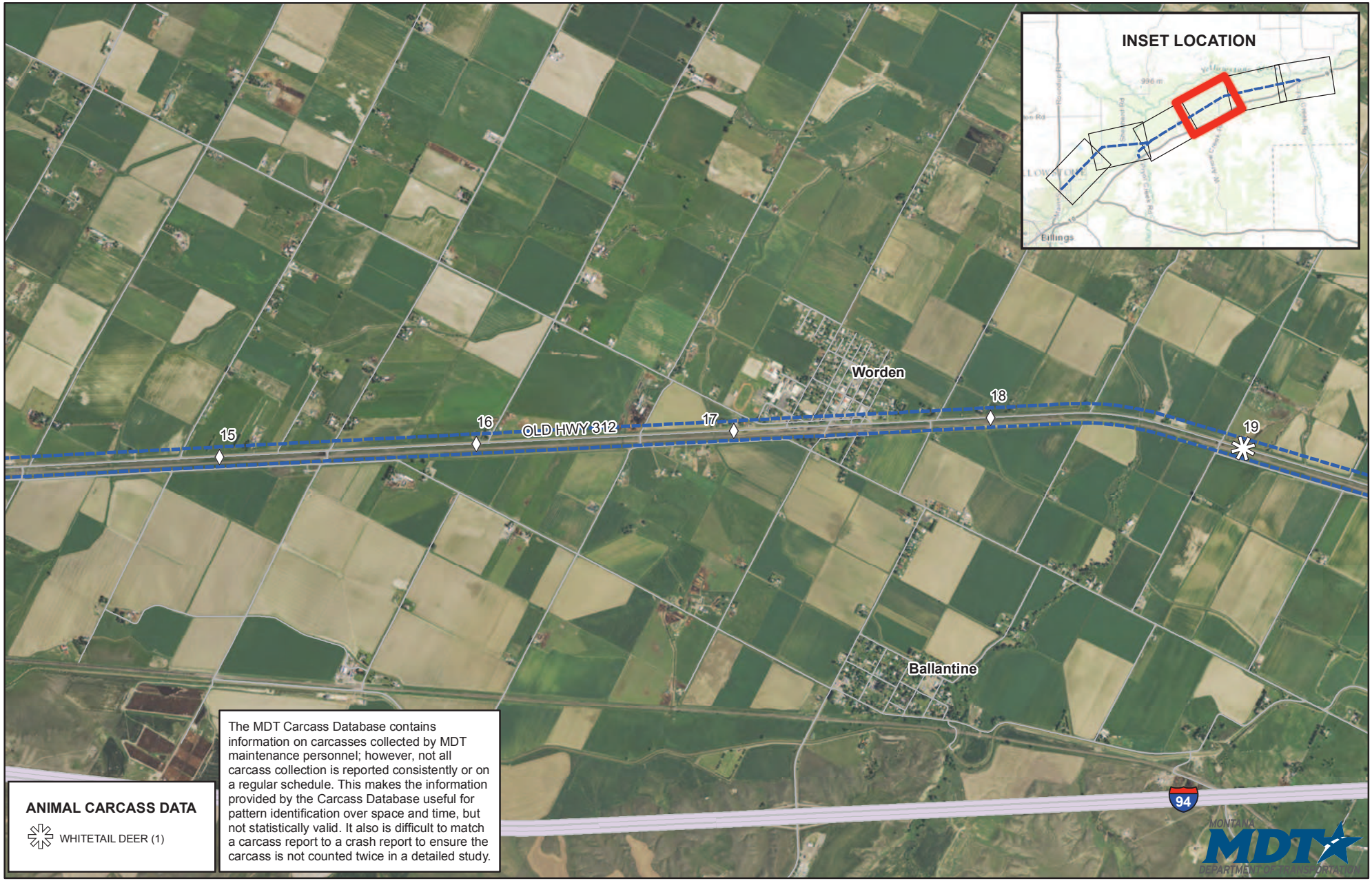

0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: MDT Animal Carcass Dataset 2015,
Aerial Imagery - NAIP 2013

EXHIBIT 11D - ANIMAL CARCASS DATA
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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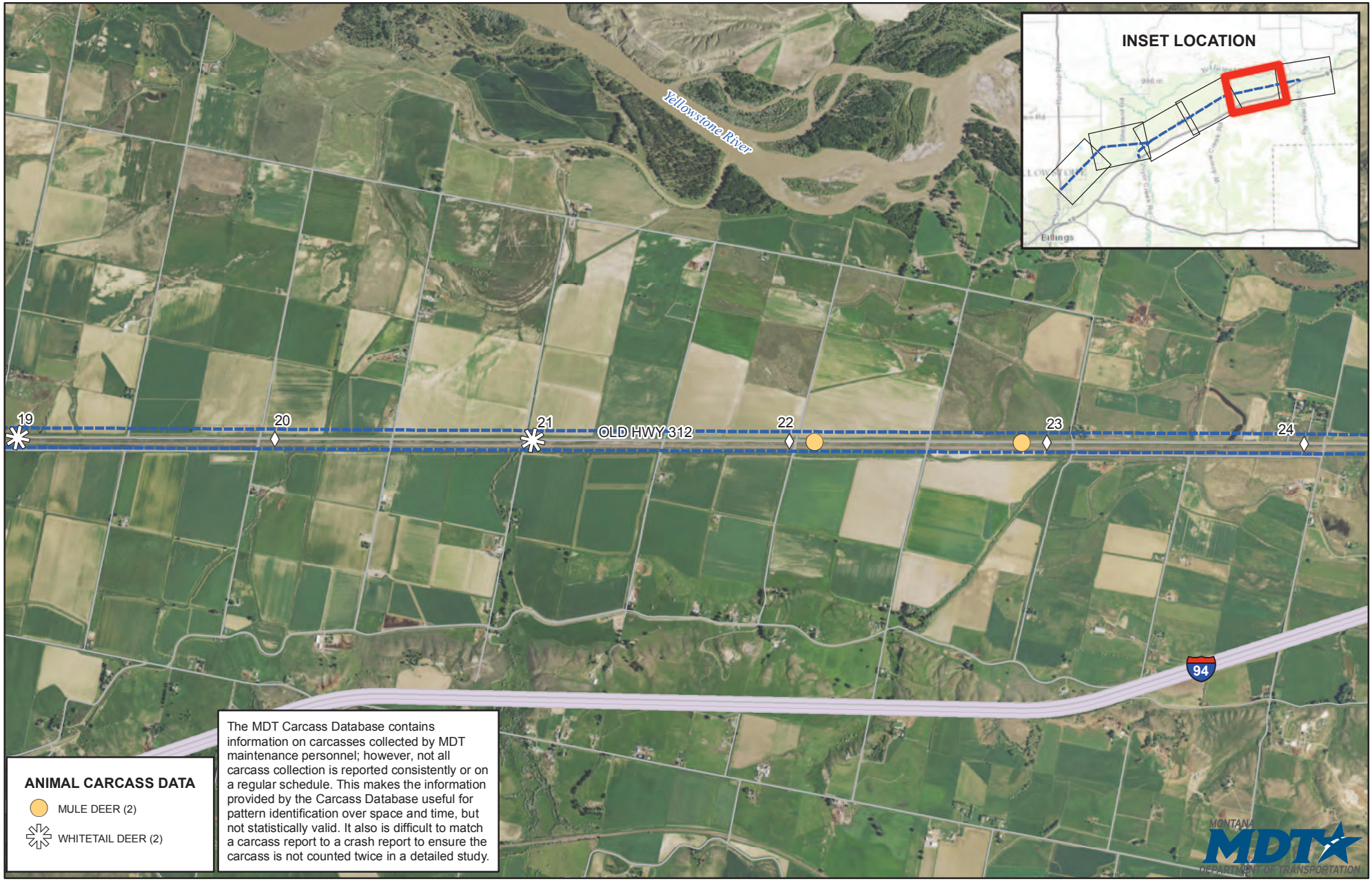
Date: 4/3/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT11D_OLD_HWY_312_ANIMAL_CARCASS.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

N
W
E
S

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: MDT Animal Carcass Dataset 2015,
Aerial Imagery - NAIP 2013

EXHIBIT 11E - ANIMAL CARCASS DATA
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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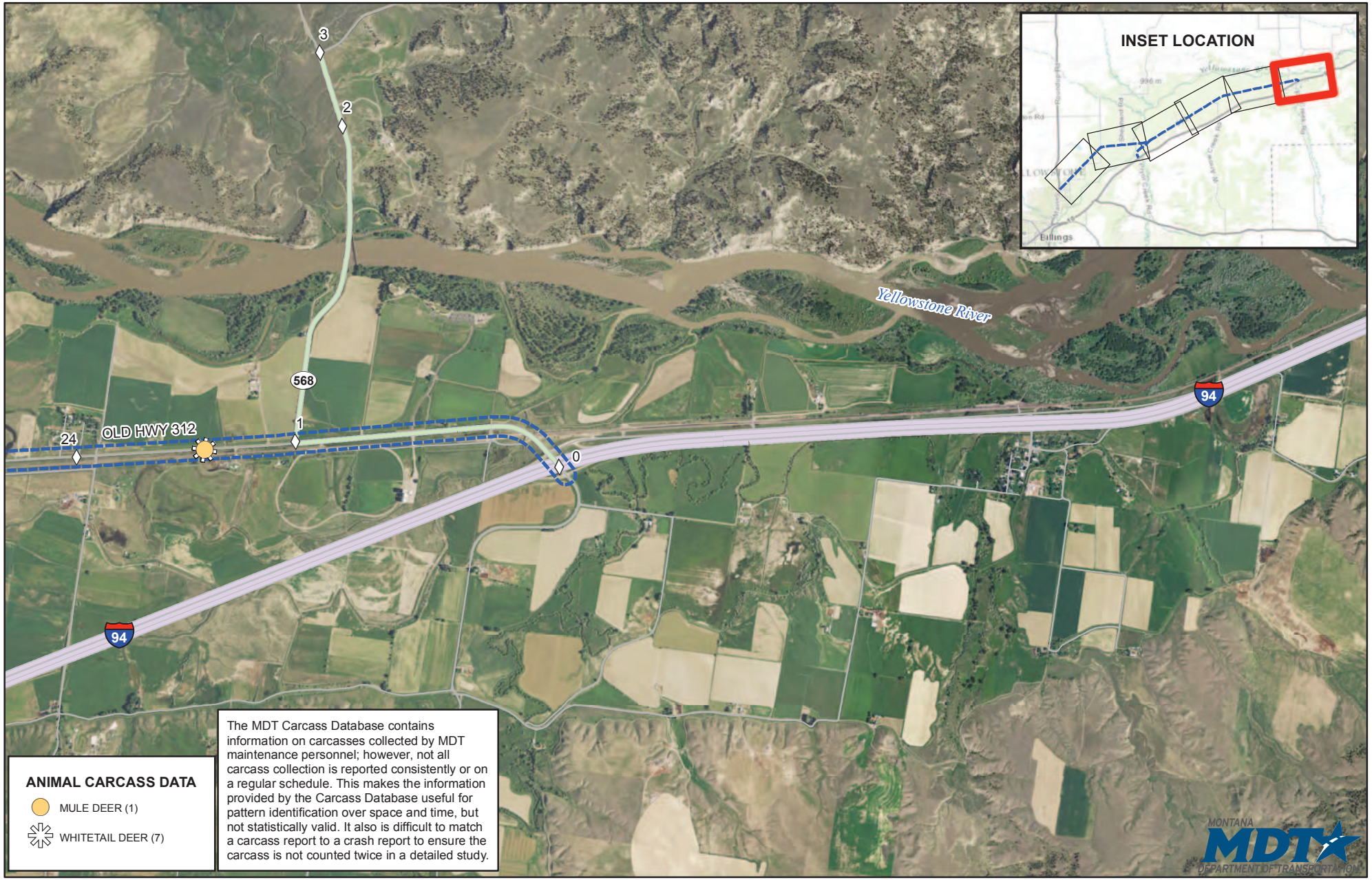
Date: 4/3/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT11E_OLD_HWY_312_ANIMAL_CARCASS.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

N W E S

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: MDT Animal Carcass Dataset 2015,
Aerial Imagery - NAIP 2013

EXHIBIT 11F - ANIMAL CARCASS DATA
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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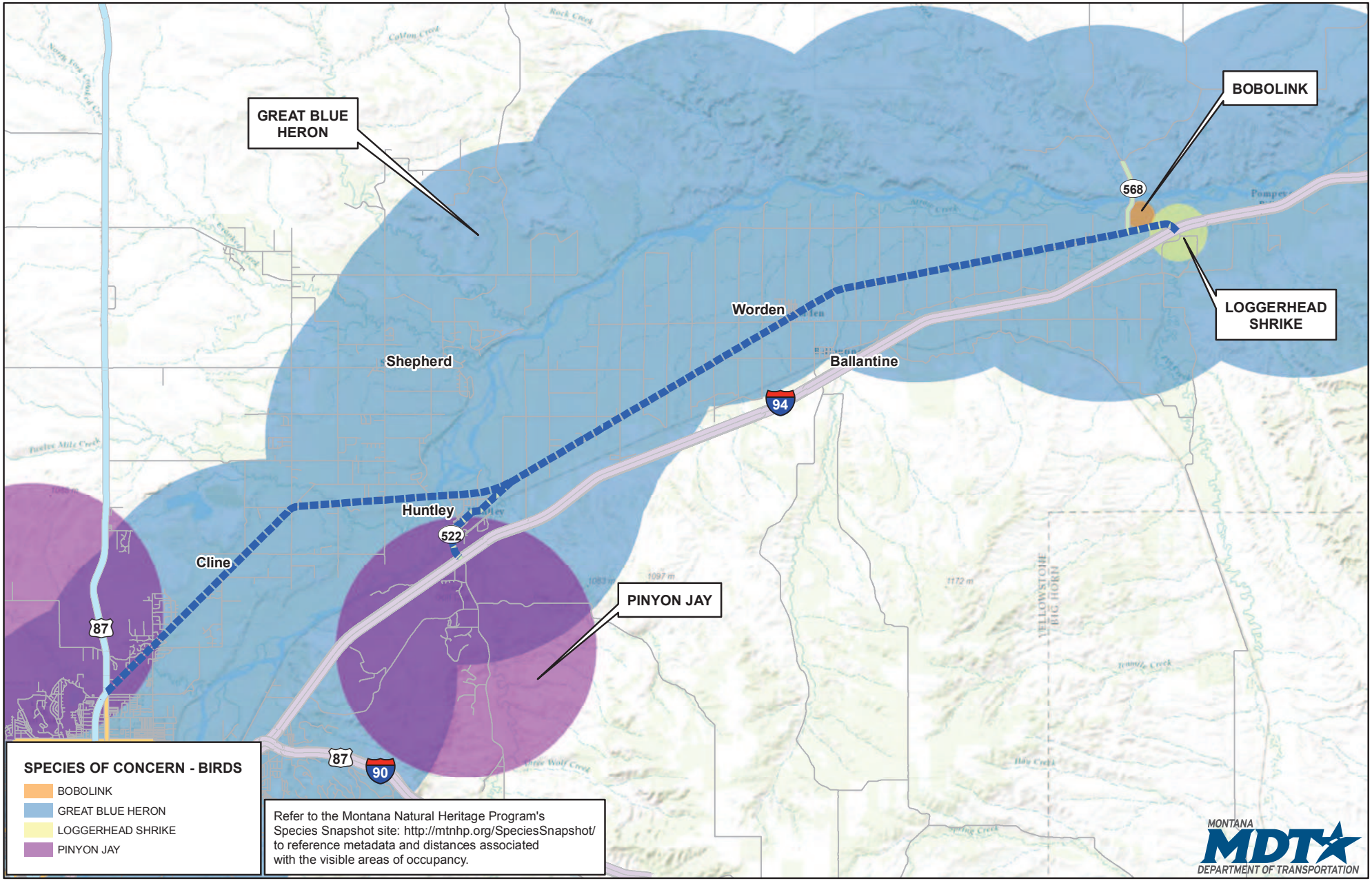
The Reference Markers shown here are for mapping and reference purrposes only.
There are existing physical Reference Markers for Secondary 522 and Secondary 568.

Date: 4/3/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT11F_OLD_HWY_312_ANIMAL_CARCASS.mxd



0 1.25 2.5 5 Miles

Scale: 1:175,000

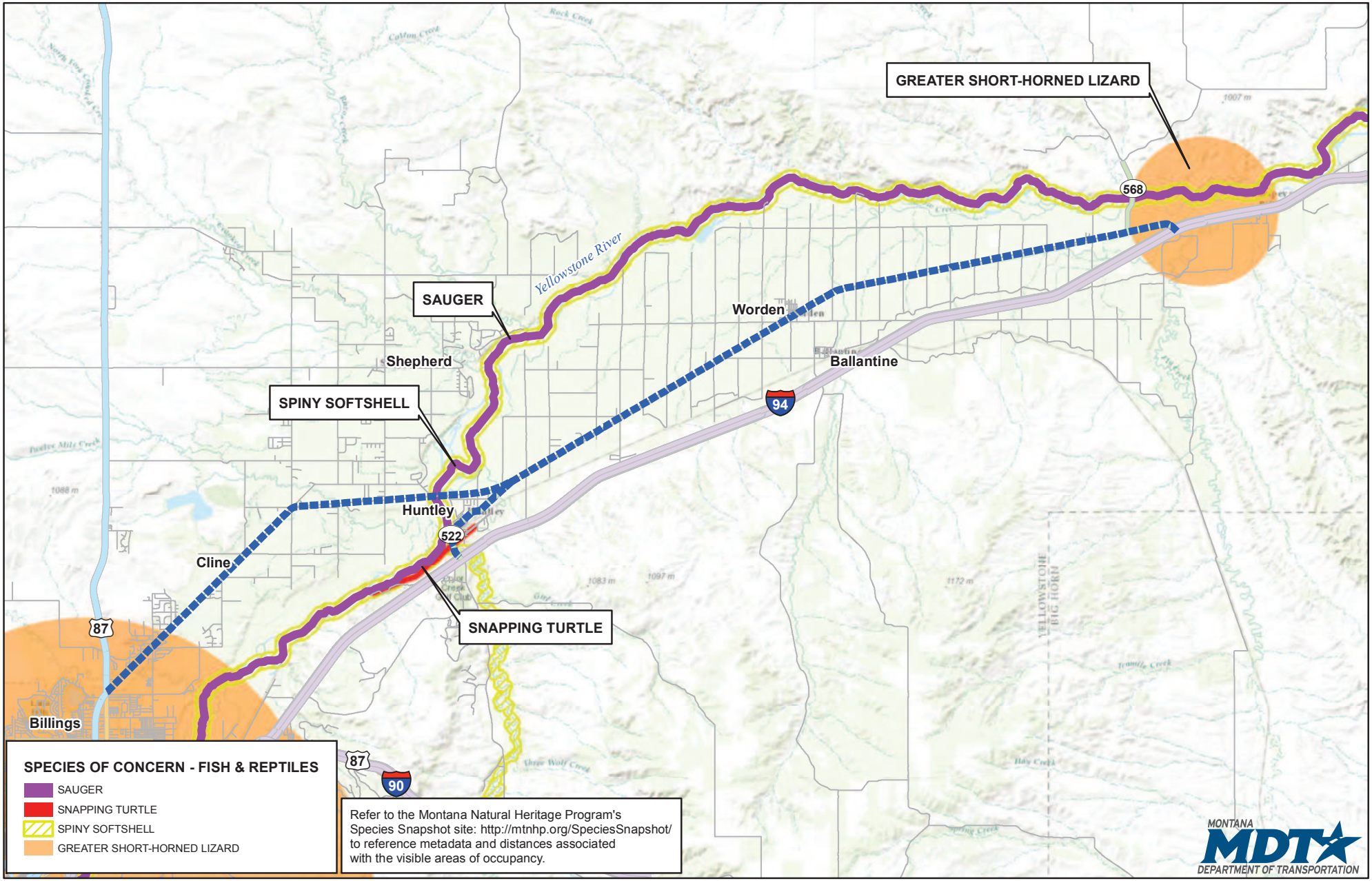
Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Natural Heritage Program
Montana Field Guide dataset 2015,
ArcGIS Online ESRI World Topo Basemap

N W E S

EXHIBIT 12A - BIRDS
SPECIES OF CONCERN
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
NHS NON-INTERSTATE
SECONDARY
URBAN
OFF SYSTEM ROUTE

Date: 4/3/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT12A_OLD_HWY_312_SOC_BIRDS.mxd



0 1.25 2.5 5 Miles

Scale: 1:175,000

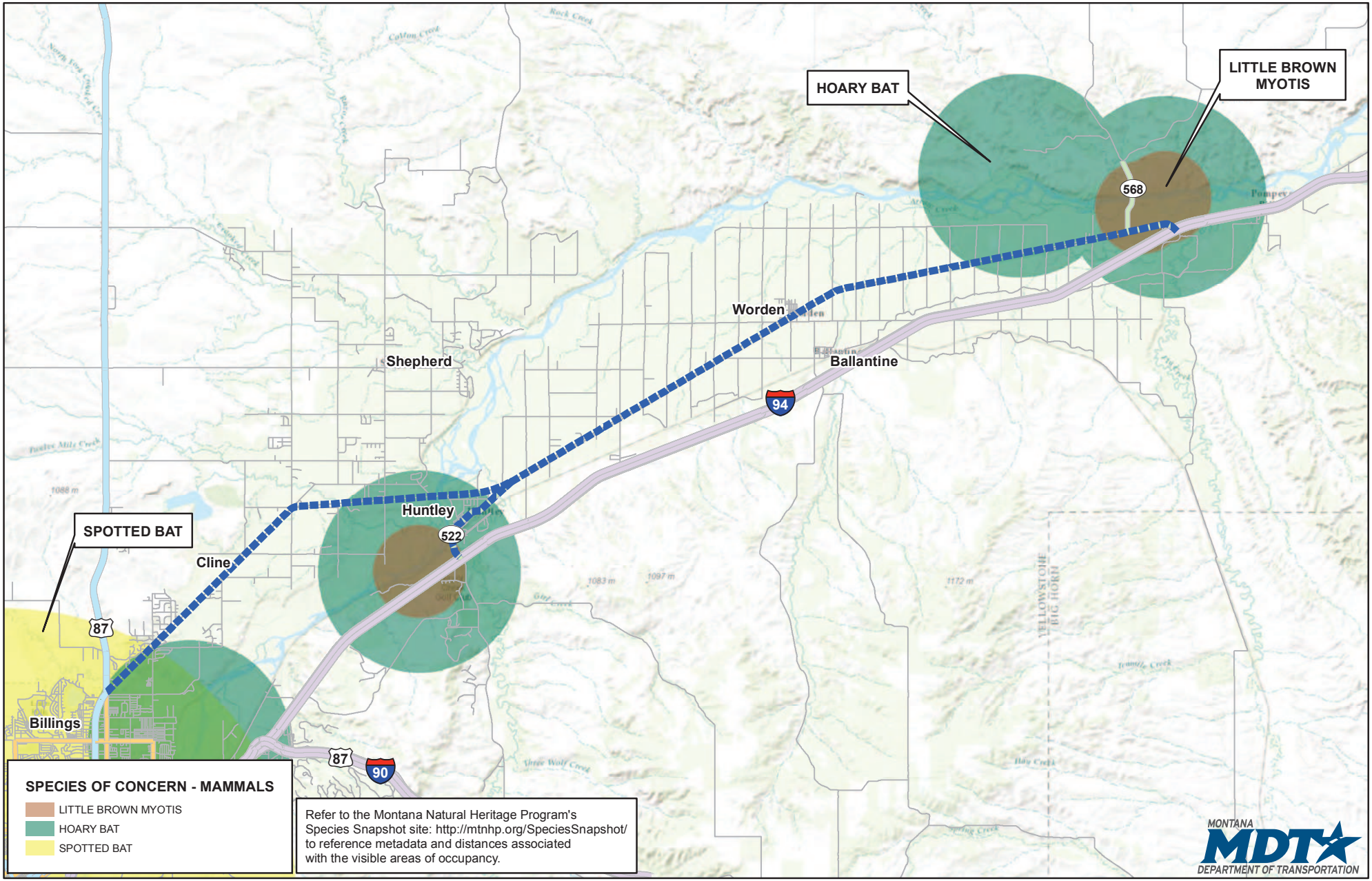
Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Natural Heritage Program
Montana Field Guide dataset 2015,
ArcGIS Online ESRI World Topo Basemap

N W E S

EXHIBIT 12B - FISH & REPTILES SPECIES OF CONCERN OLD HIGHWAY 312 CORRIDOR STUDY YELLOWSTONE COUNTY, MONTANA

- STUDY AREA
- NHS INTERSTATE
- NHS NON-INTERSTATE
- SECONDARY
- URBAN
- OFF SYSTEM ROUTE

Date: 4/3/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT12B_OLD_HWY_312_SOC_FISHREPTILES.mxd



0 1.25 2.5 5 Miles

Scale: 1:175,000

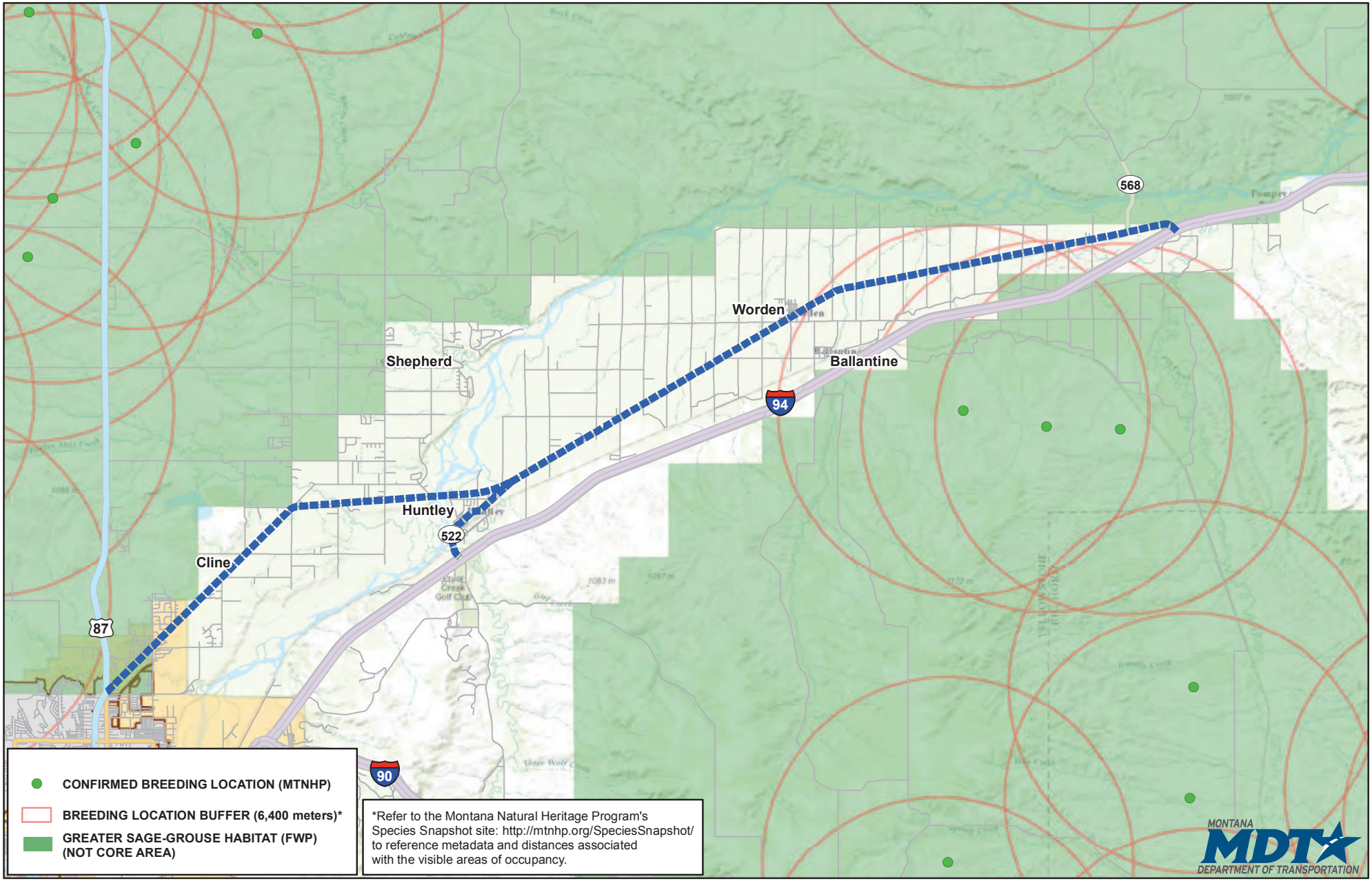
Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Natural Heritage Program
Montana Field Guide dataset 2015,
ArcGIS Online ESRI World Topo Basemap

N W E S

EXHIBIT 12C - MAMMALS
SPECIES OF CONCERN
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
NHS NON-INTERSTATE
SECONDARY
URBAN
OFF SYSTEM ROUTE

Date: 4/3/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT12C_OLD_HWY_312_SOC_MAMMALS.mxd



0 1.25 2.5 5 Miles

Scale: 1:175,000

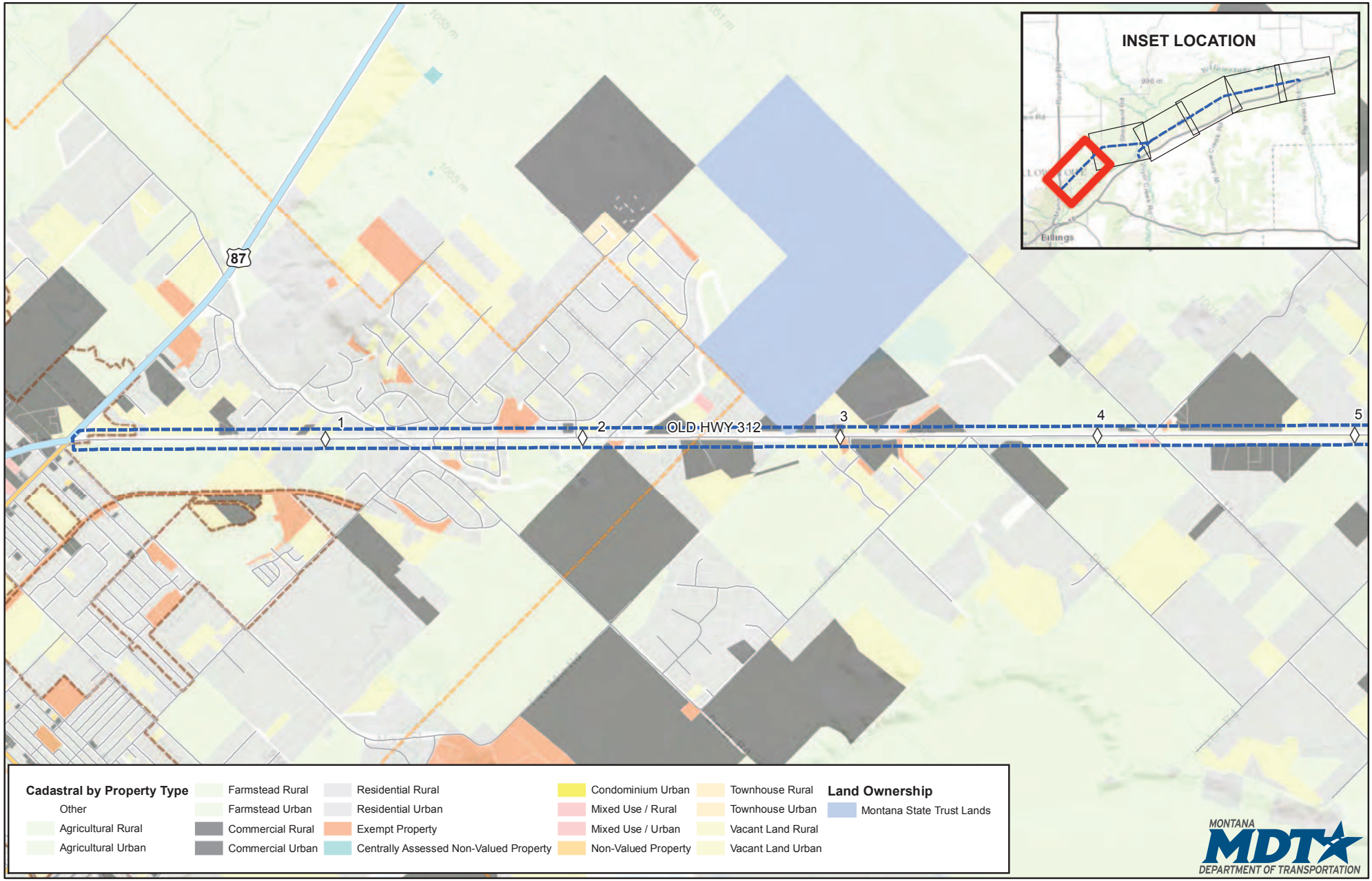
Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Natural Heritage Program Montana Field Guide dataset 2015, Montana Fish, Wildlife, and Parks Greater Sage-grouse dataset 2015, ArcGIS Online ESRI World Topo Basemap

N W E S

EXHIBIT 13 - GREATER SAGE-GROUSE THREATENED AND ENDANGERED SPECIES OLD HIGHWAY 312 CORRIDOR STUDY YELLOWSTONE COUNTY, MONTANA

- STUDY AREA
- CITY BOUNDARY
- URBAN BOUNDARY
- NHS INTERSTATE
- NHS NON-INTERSTATE
- SECONDARY
- URBAN
- OFF SYSTEM ROUTE

Date: 4/3/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT13_OLD_HWY_312_GREATERSAGEGROUSE.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Cadastral Framework (DOR/MSL) 2015,
Montana Public Lands Dataset (DOR/MSL) 2015,
ESRI ArcGIS Online - World Topographic Map

EXHIBIT 14A - PUBLIC LANDS & CADASTRAL BY PROPERTY TYPE OLD HIGHWAY 312 CORRIDOR STUDY YELLOWSTONE COUNTY, MONTANA

STUDY AREA
CITY BOUNDARY
URBAN BOUNDARY
NHS NON-INTERSTATE
URBAN
OFF SYSTEM ROUTE
REFERENCE MARKERS*

*There are no existing physical Reference Markers on Old Highway 312.
The Reference Markers shown here are for mapping and reference purposes only.
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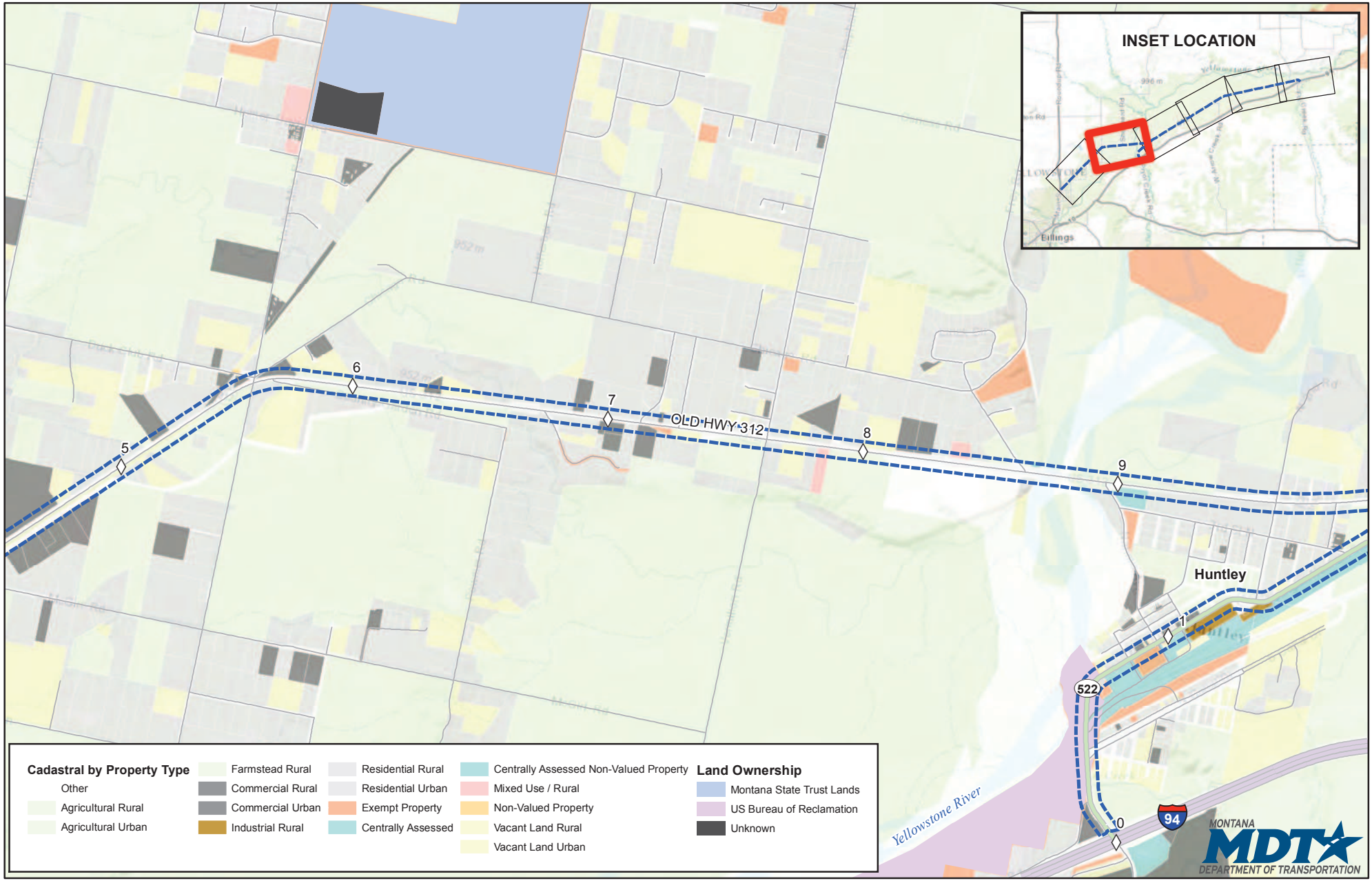
Date: 4/3/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT14A_OLD_HWY_312_CADASTRAL_PUBLICLANDS.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Cadastral Framework (DOR/MSL) 2015,
Montana Public Lands Dataset (DOR/MSL) 2015,
Aerial Imagery - NAIP 2013

N
W
E
S

EXHIBIT 14B - PUBLIC LANDS & CADASTRAL BY PROPERTY TYPE OLD HIGHWAY 312 CORRIDOR STUDY YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE MARKERS*

*There are no existing physical Reference Markers on Old Highway 312.
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0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Cadastral Framework (DOR/MSL) 2015,
Montana Public Lands Dataset (DOR/MSL) 2015,
ESRI ArcGIS Online - World Topographic Map

EXHIBIT 14C - PUBLIC LANDS & CADASTRAL BY PROPERTY TYPE OLD HIGHWAY 312 CORRIDOR STUDY YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE MARKERS*

*There are no existing physical Reference Markers on Old Highway 312.
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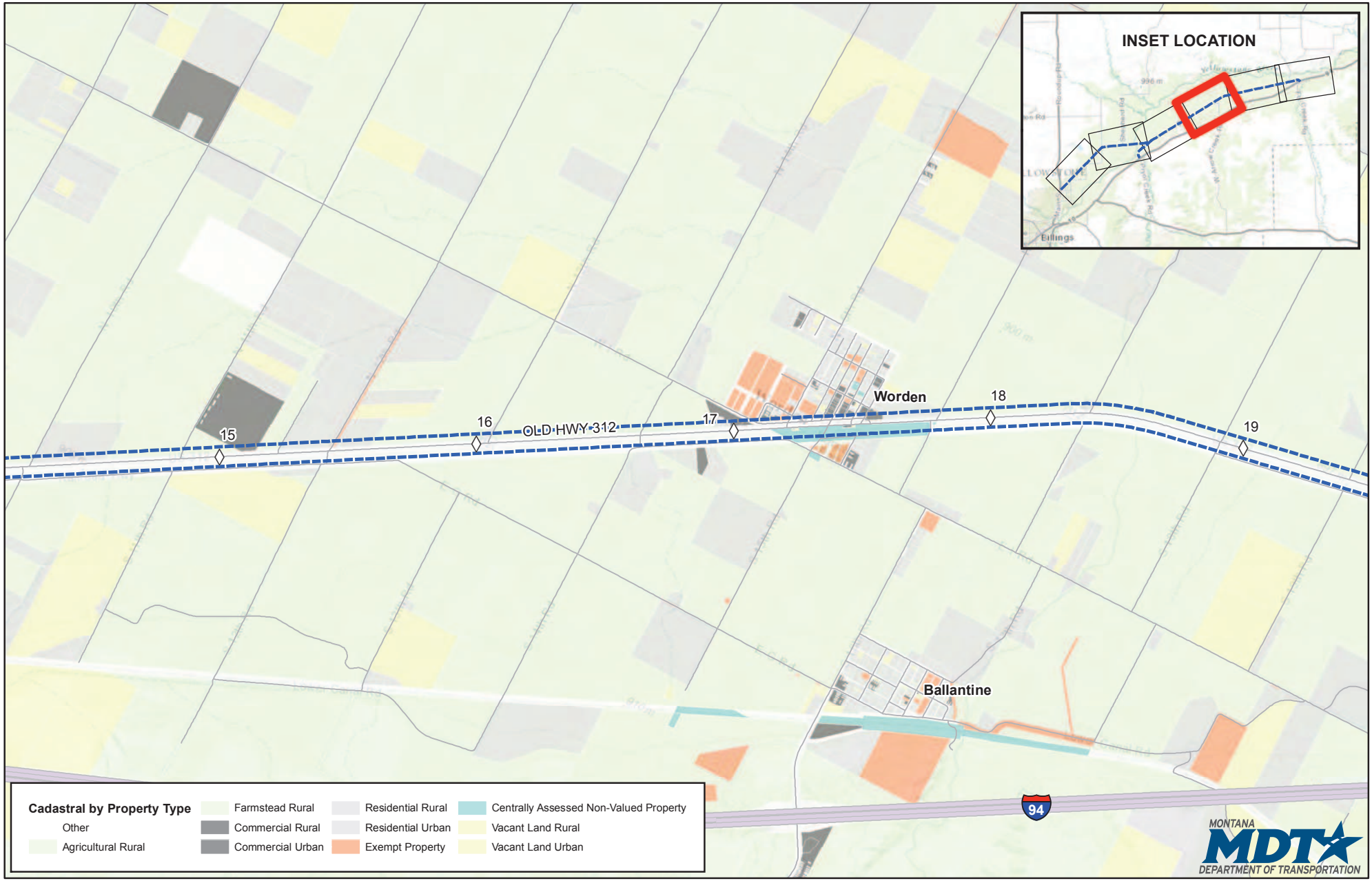
Date: 4/3/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT14C_OLD_HWY_312_CADASTRAL_PUBLICLANDS.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Cadastral Framework (DOR/MSL) 2015,
Montana Public Lands Dataset (DOR/MSL) 2015,
ESRI ArcGIS Online - World Topographic Map

EXHIBIT 14D - PUBLIC LANDS & CADASTRAL BY PROPERTY TYPE OLD HIGHWAY 312 CORRIDOR STUDY YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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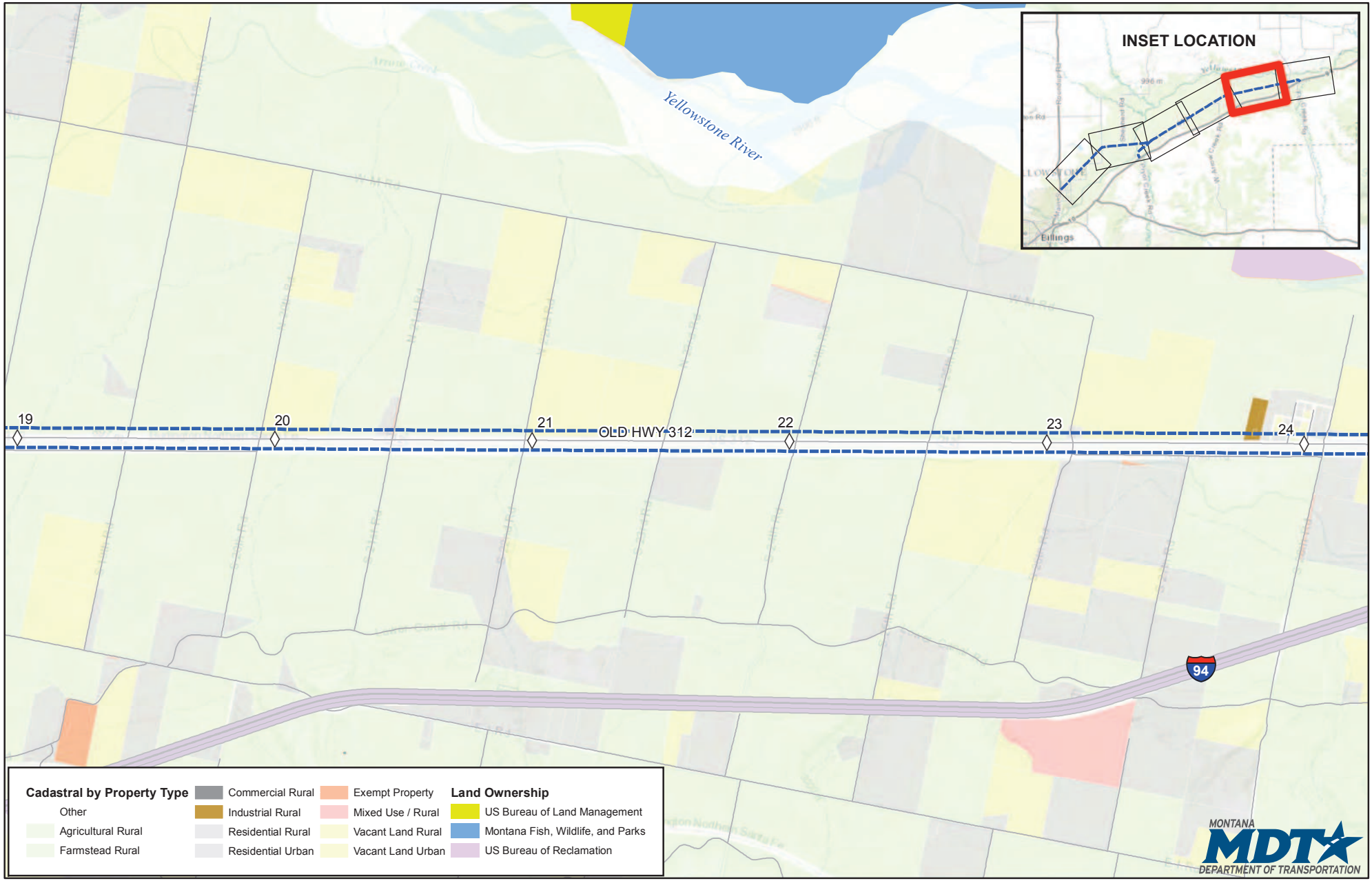
Date: 4/3/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT14D_OLD_HWY_312_CADASTRAL_PUBLICLANDS.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

N W E S

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Cadastral Framework (DOR/MSL) 2015,
Montana Public Lands Dataset (DOR/MSL) 2015,
ESRI ArcGIS Online - World Topographic Map

EXHIBIT 14E - PUBLIC LANDS & CADASTRAL BY PROPERTY TYPE OLD HIGHWAY 312 CORRIDOR STUDY YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
OFF SYSTEM ROUTE
REFERENCE MARKERS*

*There are no existing physical Reference Markers on Old Highway 312.
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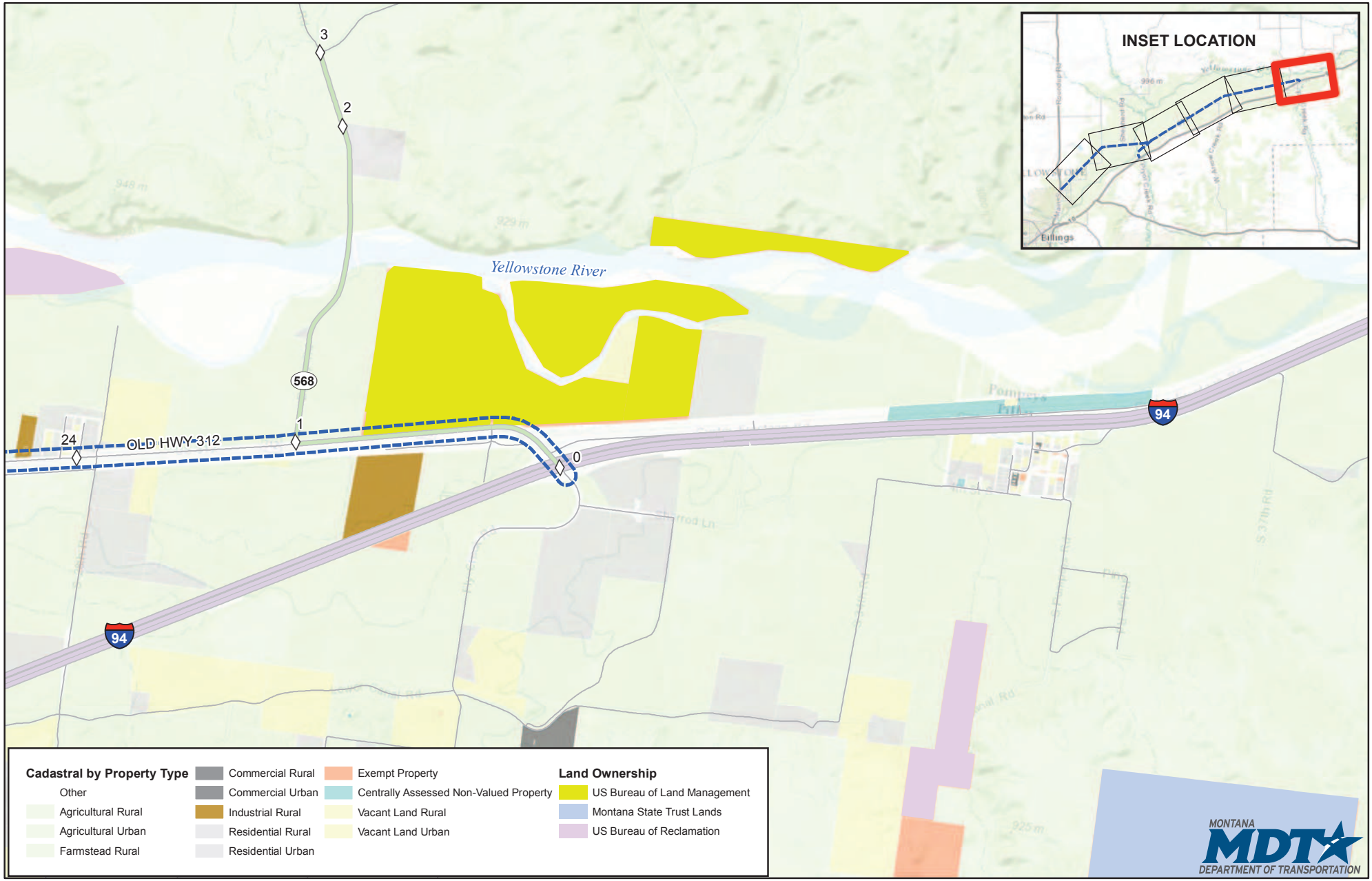
Date: 4/3/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT14E_OLD_HWY_312_CADASTRAL_PUBLICLANDS.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Cadastral Framework (DOR/MSL) 2015, Montana Public Lands Dataset (DOR/MSL) 2015, ESRI ArcGIS Online - World Topographic Map

N W E S

EXHIBIT 14F - PUBLIC LANDS & CADASTRAL BY PROPERTY TYPE OLD HIGHWAY 312 CORRIDOR STUDY YELLOWSTONE COUNTY, MONTANA

STUDY AREA
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE MARKERS*

*There are no existing physical Reference Markers on Old Highway 312.
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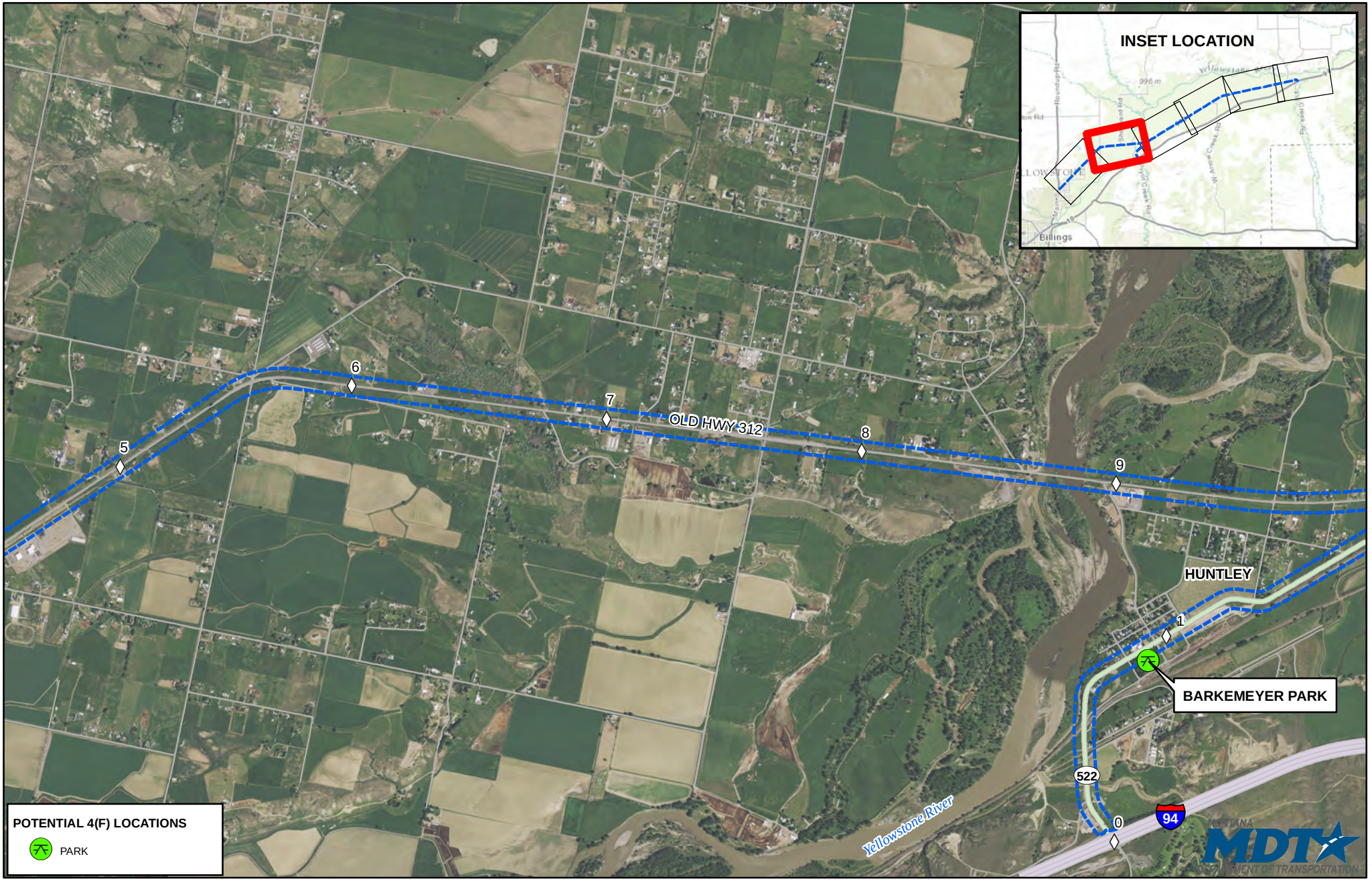
Date: 4/3/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT14F_OLD_HWY_312_CADASTRAL_PUBLICLANDS.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

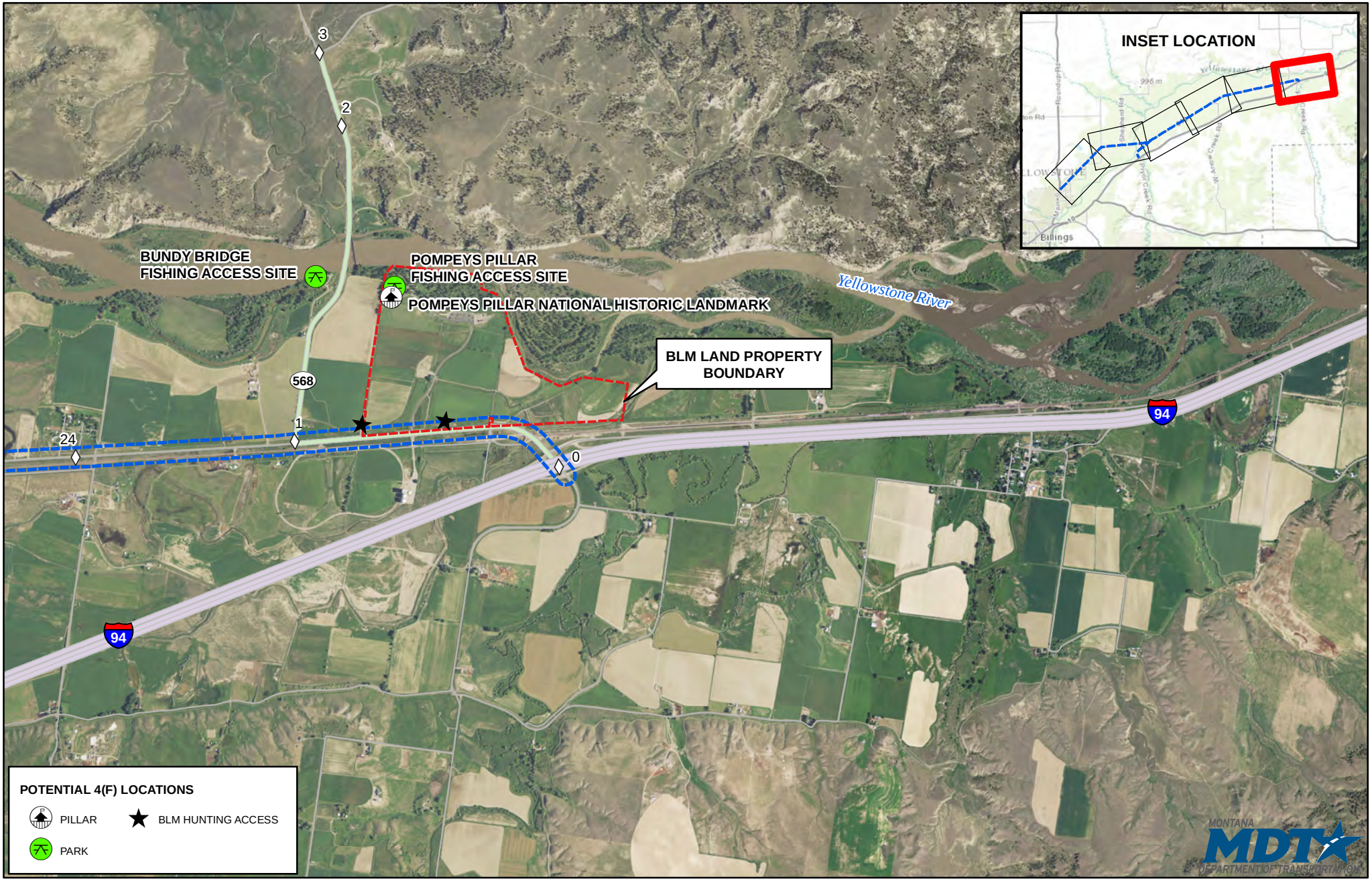
Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Geographic Names Information System (GNIS) 2015,
Aerial Imagery - NAIP 2013

N W E S

EXHIBIT 15A - POTENTIAL 4(F) & 6(F) LOCATIONS
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY CORRIDOR
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE POST

Date: 8/17/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT15B_OLD_HWY_312_GNIS_4F6F_PARKS.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

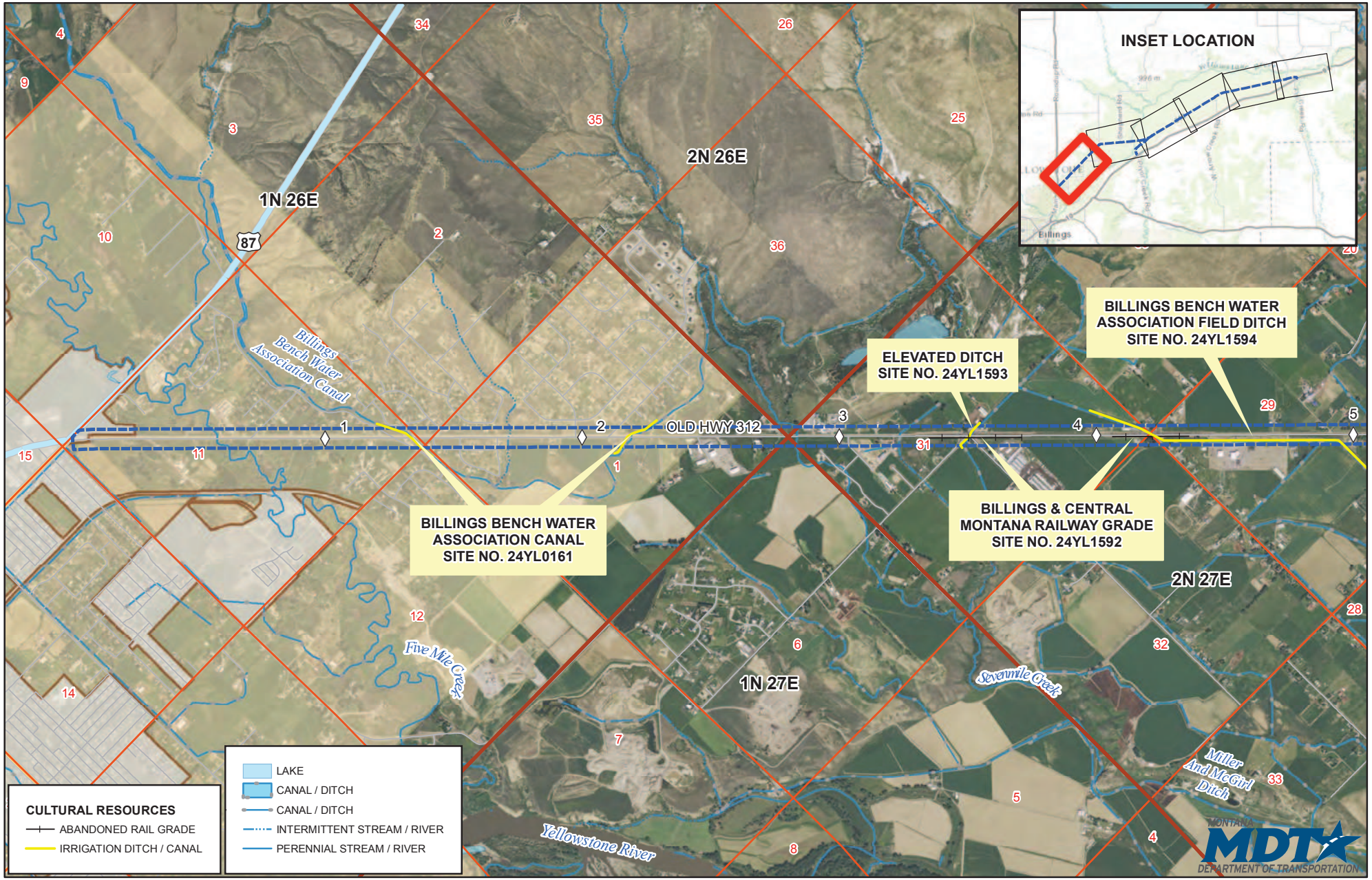
Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Geographic Names Information System (GNIS) 2015,
Aerial Imagery - NAIP 2013

N W E S

EXHIBIT 15B - POTENTIAL 4(F) & 6(F) LOCATIONS
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
BLM BOUNDARY
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE POST

Date: 8/17/2015 Path: C:\MDTDATA\RIM_FUNCTIONS\CUSTOM_MAPS\CORRIDOR_STUDIES\PROPOSED_2015\OLD_HWY_312\ARCMAP\EXHIBIT15F_OLD_HWY_312_GNIS_4F6F_PARKS.mxd



0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Cultural Resources Information System 2015,
Aerial Imagery - NAIP 2013

EXHIBIT 16A - CULTURAL RESOURCES OLD HIGHWAY 312 CORRIDOR STUDY YELLOWSTONE COUNTY, MONTANA

STUDY AREA
CITY BOUNDARY
URBAN BOUNDARY
NHS NON-INTERSTATE
URBAN
OFF SYSTEM ROUTE
PLSS TOWNSHIP / RANGE
PLSS SECTION

*There are no existing physical Reference Markers on Old Highway 312.
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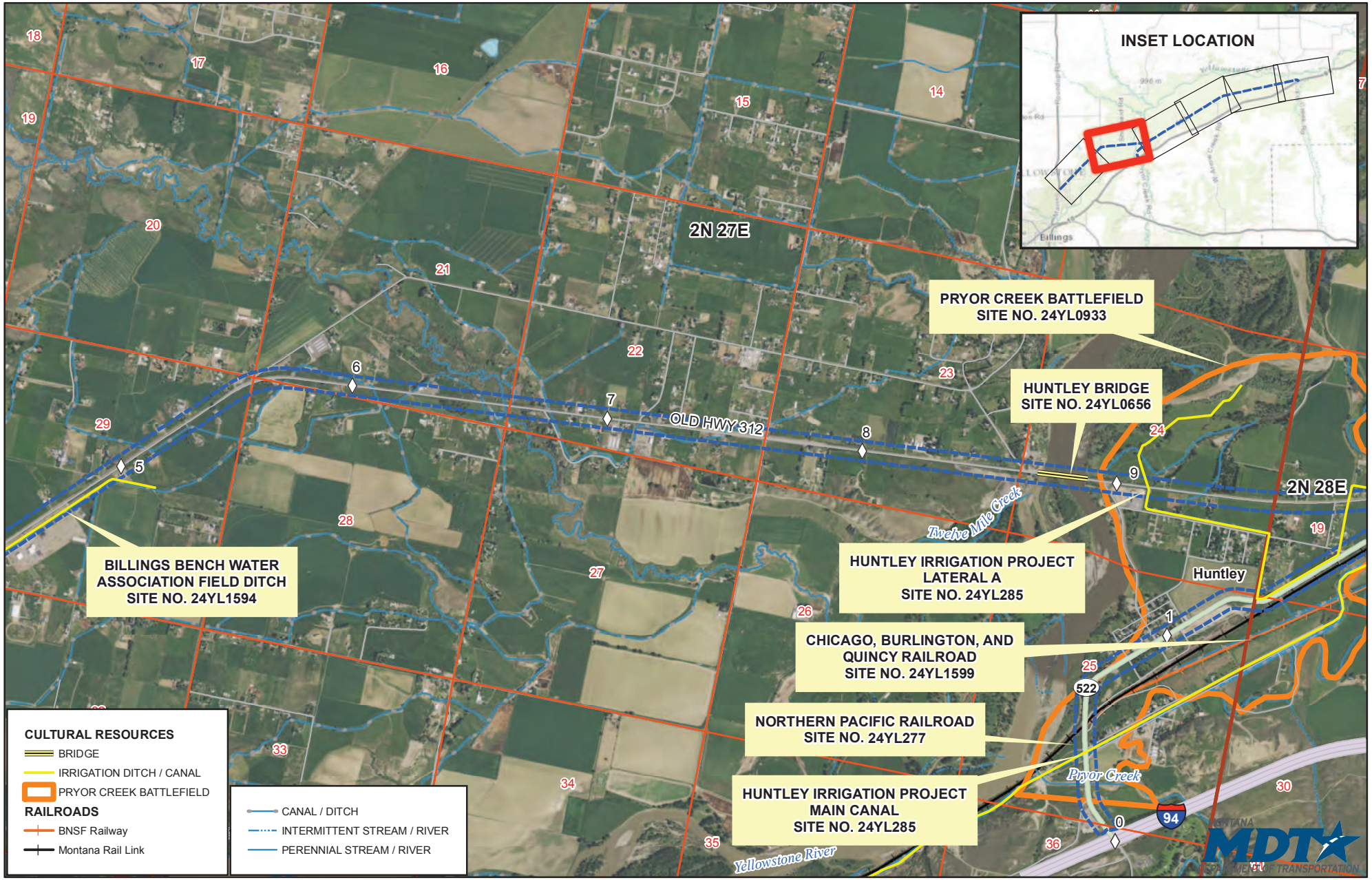

0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Cultural Resources Information System 2015,
Aerial Imagery - NAIP 2013

N W E S

EXHIBIT 16B - CULTURAL RESOURCES
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
PLSS TOWNSHIP / RANGE
PLSS SECTION
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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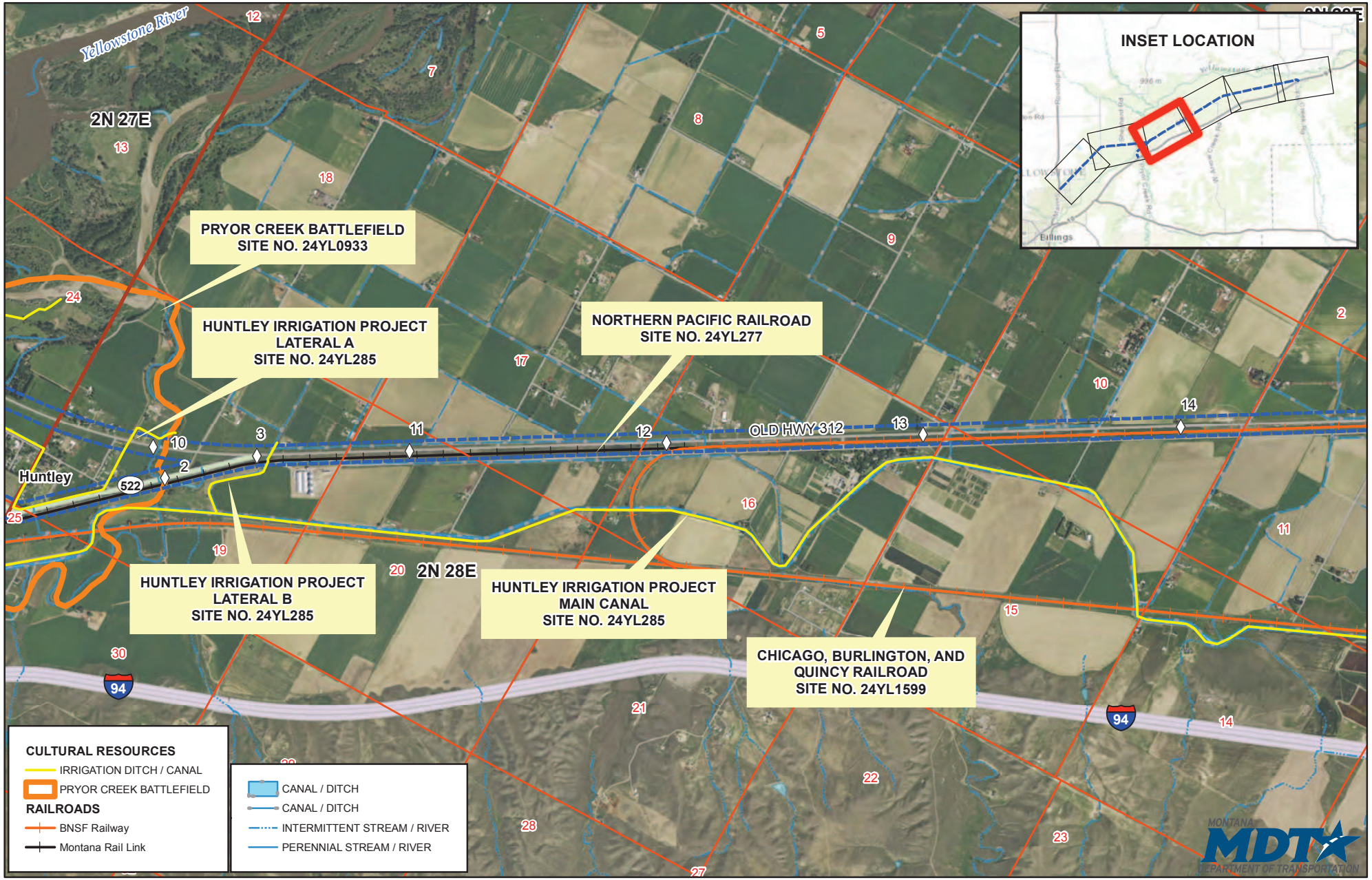

0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Cultural Resources
Information System 2015,
Aerial Imagery - NAIP 2013

EXHIBIT 16C - CULTURAL RESOURCES OLD HIGHWAY 312 CORRIDOR STUDY YELLOWSTONE COUNTY, MONTANA

STUDY AREA
PLSS SECTION
PLSS TOWNSHIP / RANGE
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE

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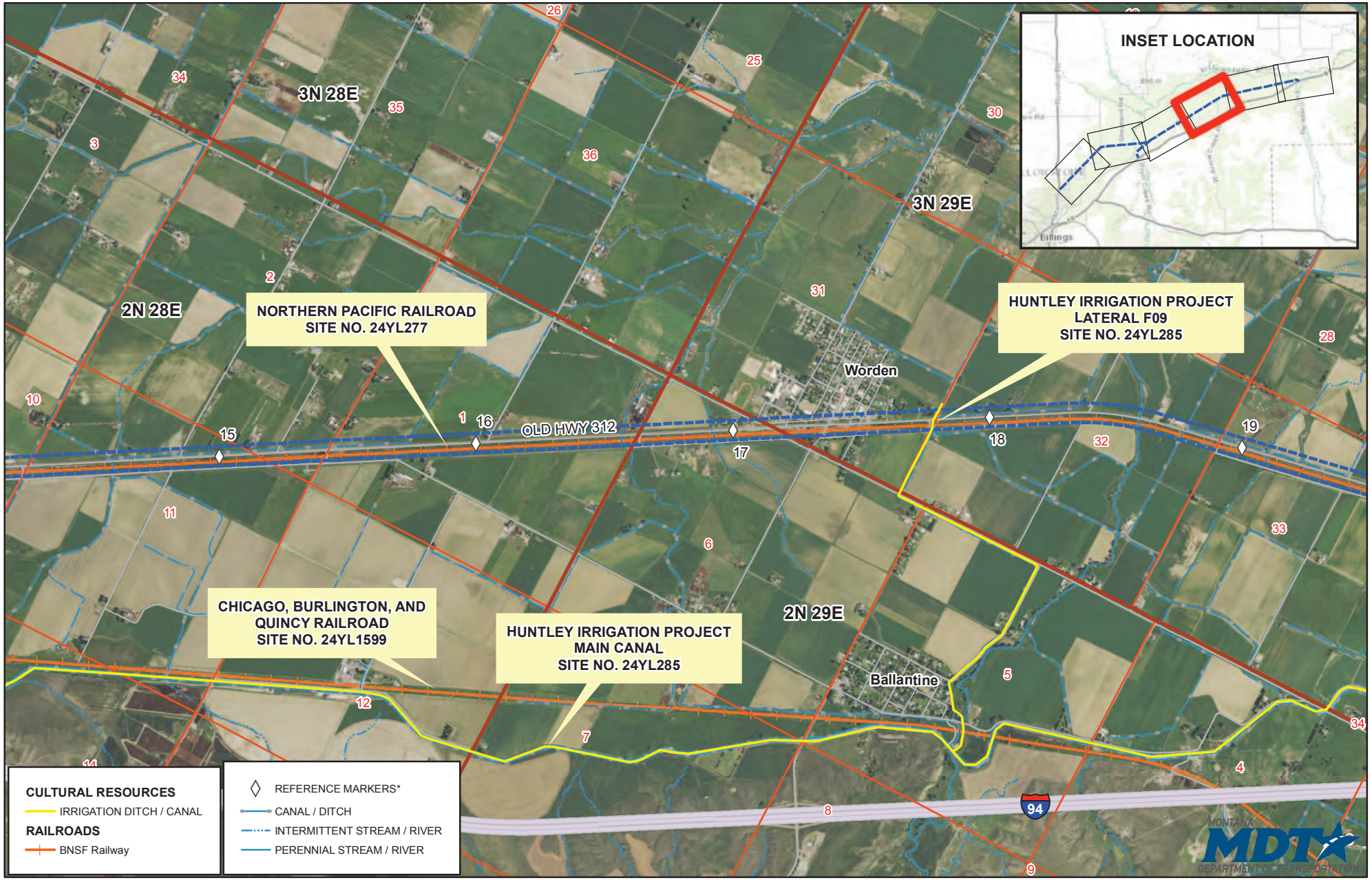

0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Cultural Resources Information System 2015,
Aerial Imagery - NAIP 2013

EXHIBIT 16D - CULTURAL RESOURCES OLD HIGHWAY 312 CORRIDOR STUDY YELLOWSTONE COUNTY, MONTANA

STUDY AREA
PLSS TOWNSHIP / RANGE
PLSS SECTION
NHS INTERSTATE
OFF SYSTEM ROUTE
REFERENCE MARKERS*

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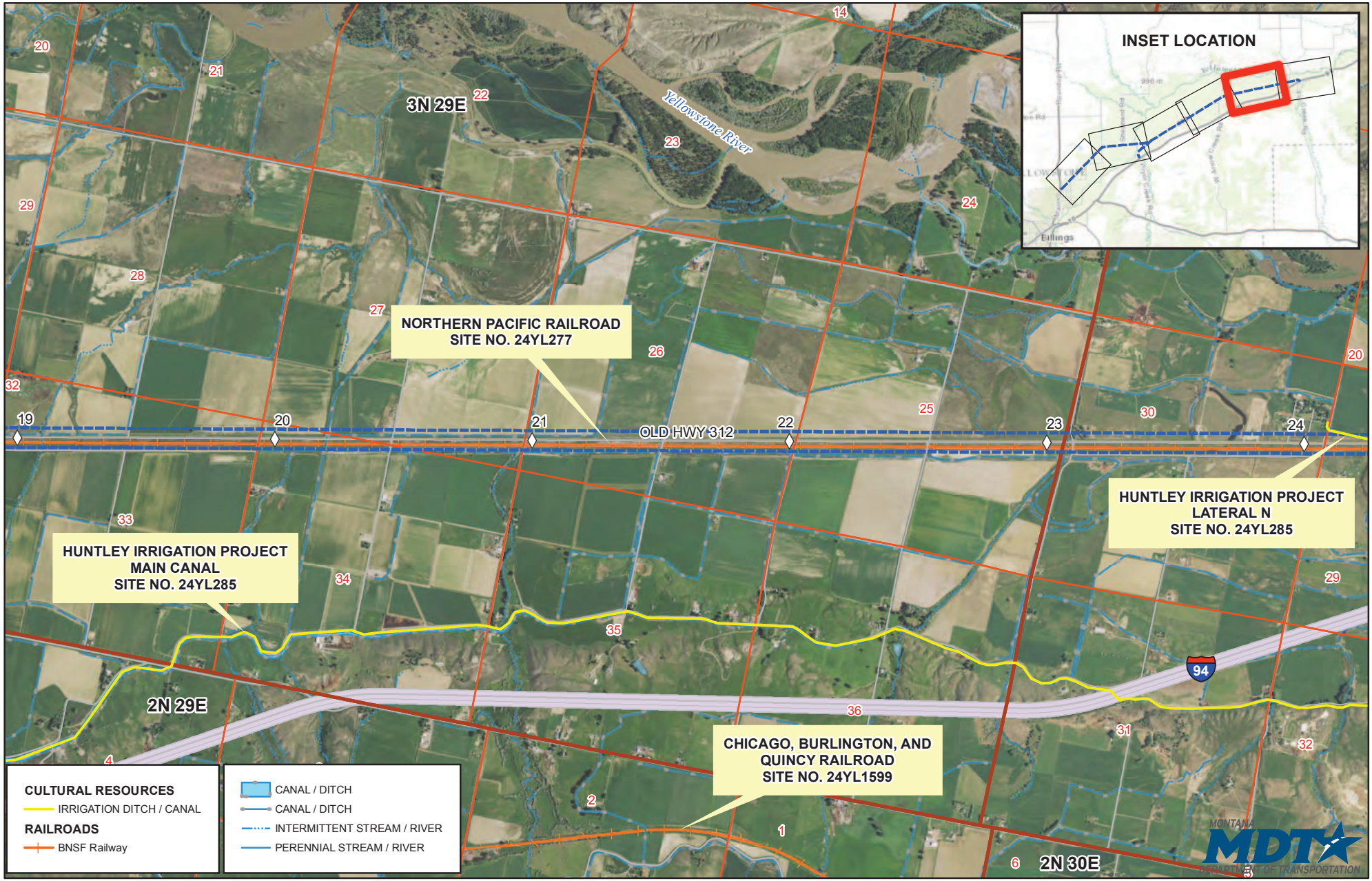

0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Cultural Resources Information System 2015,
Aerial Imagery - NAIP 2013

N W E S

EXHIBIT 16E - CULTURAL RESOURCES OLD HIGHWAY 312 CORRIDOR STUDY YELLOWSTONE COUNTY, MONTANA

STUDY AREA
PLSS TOWNSHIP / RANGE
PLSS SECTION
NHS INTERSTATE
OFF SYSTEM ROUTE
REFERENCE MARKERS*

*There are no existing physical Reference Markers on Old Highway 312.
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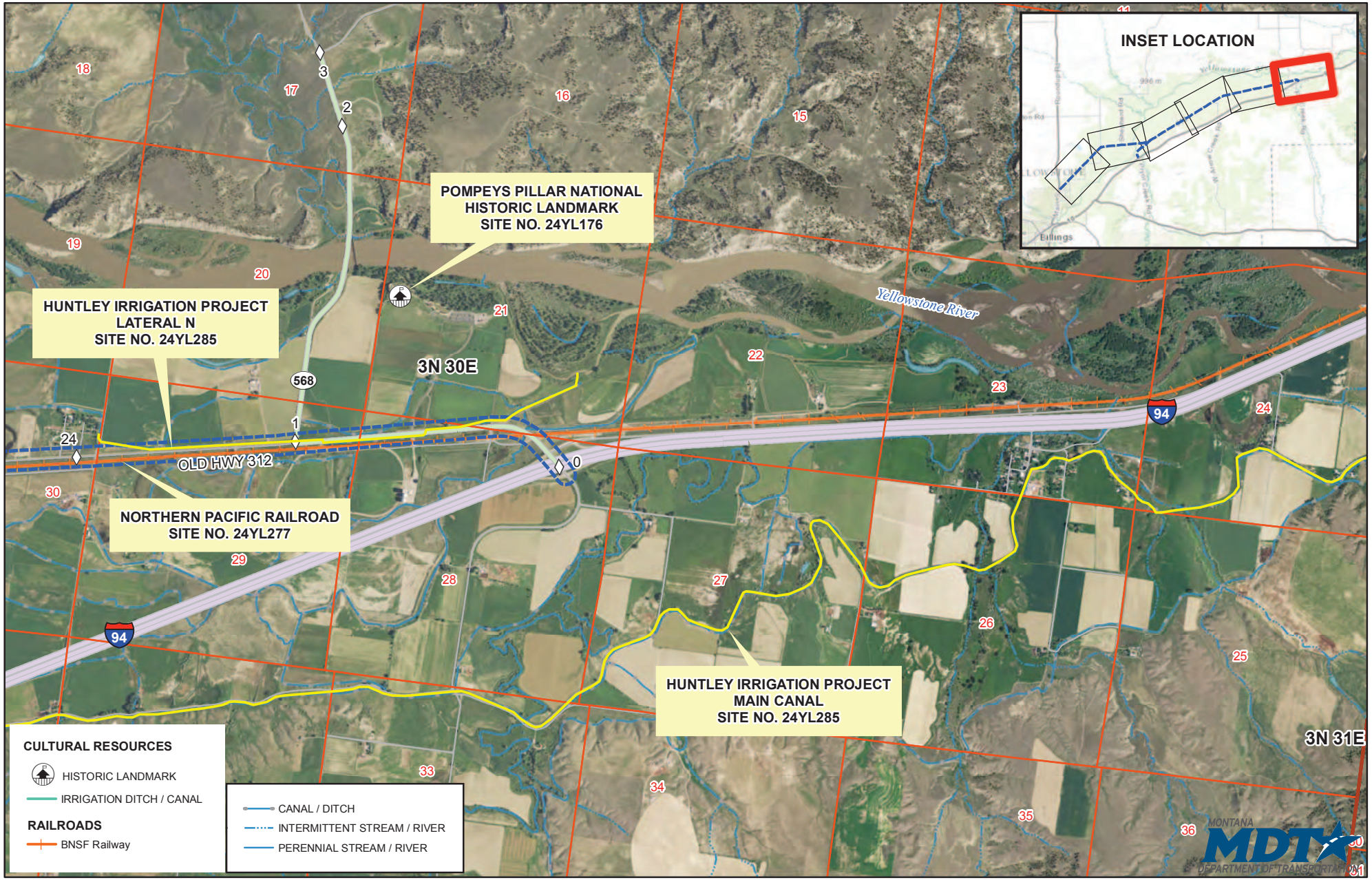

0 0.25 0.5 1 Miles

Scale: 1 inch = 0.5 miles

Projection: NAD 1983 StatePlane Montana FIPS 2500
Sources: Montana Cultural Resources Information System 2015,
Aerial Imagery - NAIP 2013

N W E S

EXHIBIT 16F - CULTURAL RESOURCES
OLD HIGHWAY 312 CORRIDOR STUDY
YELLOWSTONE COUNTY, MONTANA

STUDY AREA
PLSS TOWNSHIP / RANGE
PLSS SECTION
NHS INTERSTATE
SECONDARY
OFF SYSTEM ROUTE
REFERENCE MARKERS*

*There are no existing physical Reference Markers on Old Highway 312.
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ATTACHMENT 2

Crucial Area Planning System Data

Crucial Areas Planning System (CAPS) Information

Source: Montana Department of Fish, Wildlife, & Parks - Crucial Areas Planning System Website: http://fwp.mt.gov/gis/maps/caps/

In 2008, as a part of a Western Governors' Association initiative, Montana Fish, Wildlife & Parks (MTFWP) took the lead in conducting a statewide Crucial Areas Assessment. The Assessment evaluated the fish, wildlife and recreational resources of Montana in order to identify crucial areas and fish and wildlife corridors. The ratings vary from Class 1 to Class 4, with Class 1 being the highest and Class 4 being the lowest. This database is not at a fine enough scale for accurate assessment of potential impacts associated with MDT projects because of the section level (one mile square) scale and use of models for the output. Coordination with MTFWP wildlife and fisheries biologists should occur on any projects brought forward from this corridor study.

Terrestrial Layers

The Terrestrial Conservation Species layer represents the cumulative expected occurrence of 85 of Montana's vertebrate species. Species inclusion was based on the State Species of Concern (SOC) list. The corridor study area contains ratings from Class 1 to Class 4. The study corridor rates areas of highest value on the east and west portions of the project. Those areas toward the center of the study area are a mix of Class 2 and Class 3.

The Terrestrial Species Richness layer represents species richness of all native land-based species in Montana, including amphibians, reptiles, birds, and mammals. Included are species found year round or breed in the state. The metric presented is the average number of species associated with all cover types (habitats) in each section. The sections containing the Yellowstone River and Sevenmile Creek have a Class 1 rating (highest), with a Class 2 rating for the sections containing Arrow Creek. The higher species richness in these areas is likely associated with the availability of both upland and riparian habitats as a contributing factor.

The Terrestrial Game Quality layer depicts areas considered valuable to 12 native game species and their specific habitat requirements. Terrestrial Game Quality rates as Class 3 and Class 4 throughout the study area.

Aquatic Layers

Aquatic Connectivity describes important stream corridors for fish species that required connected waterways and, hence, diverse habitats to complete all or a portion of their life history. The Yellowstone River is rated as Class 1 for Aquatic Connectivity in the corridor. Arrow, Twelve Mile, and Five Mile Creeks are rated as Class 3 for this same metric.

Fish Native Species Richness depicts biodiversity using counts of native fish species to assist in identifying ecological stability and resiliency. The study area contains Class 2 and Class 4 ranked drainages for this category. The Yellowstone River is ranked the highest, Class 2, of all of the waterways along the study corridor.

ATTACHMENT 3

Greater Sage-Grouse Habitat Conservation Strategy

GREATER SAGE-GROUSE HABITAT CONSERVATION STRATEGY

Prepared by

Montana's Greater Sage-grouse Habitat Conservation Advisory Council

January 29, 2014

Contents

I. INTRODUCTION

The Greater Sage-Grouse, a prairie species that depends on sagebrush habitat and open lands, has been the subject of significant discussion, litigation, collaboration and debate in the 11 western states that form its range. Montana has managed and regulated Greater Sage-Grouse (hereafter sage-grouse) for well over a century, but habitat loss and sage-grouse population declines in Montana and throughout the birds' range have prompted federal Endangered Species Act (ESA) petitions and litigation that seek to add the sage-grouse to the Endangered Species List.

These legal and procedural processes continue to move forward, and as they do they threaten Montana's ability to manage sage-grouse. The US Fish and Wildlife Service (Service) is cooperating with states – individually and collectively – on habitat conservation plans in advance of a court-ordered September 2015 decision on a potential ESA listing for this species. If the sage-grouse is added to the ESA List, the Service, a federal agency, would replace existing state authority and assume management responsibility for sage-grouse.

History shows loss of sage-grouse habitat and populations has occurred across all land management types, including federal land managed by the Service, Bureau of Land Management (BLM), and U.S. Forest Service. This plan calls on cooperation from federal, state, tribal, and private landowners and managers to conserve and protect sage-grouse.

In 2005, Montana created its first sage-grouse conservation plan, *Management Plan and Conservation Strategies for Sage-Grouse in Montana*. Since then, this plan has guided sage-grouse management in Montana. However, new research and science, coupled with new or expanded potential threats to sage-grouse habitat and populations, have combined with new court decisions to create a need for Montana to update its state sage-grouse conservation plan, policies and actions.

Early in 2013, following efforts in Wyoming and other states with sage-grouse populations, Montana Governor Steve Bullock issued Executive Order 2-2013 (Appendix A), creating a citizen-based Greater Sage-Grouse Habitat Conservation Advisory Council (Advisory Council). This Advisory Council was directed to "gather information, furnish advice, and provide to the Governor recommendations on policies and actions for a state-wide strategy to preclude the need to list the Greater Sage-Grouse under the ESA." In addition, the 2013 Montana State Legislature overwhelmingly passed HB 580 (Appendix B), legislation that funded the Governor's Advisory Council and supported its purpose to recommend policies and actions for a state wide sage-grouse strategy. Paramount in the Executive Order and the legislation was a directive to the Advisory Council to craft a strategy that will serve to preclude the need to add sage-grouse to the Endangered Species List.

In April 2013, the Governor appointed the 12-member Greater Sage-Grouse Habitat Conservation Advisory Council (Appendix C). Since then the Advisory Council has held nine comprehensive meetings. A full list of Advisory Council meeting agendas, minutes, presentations, documents, and more is available on Montana Fish, Wildlife and Parks (FWP) website at http://fwp.mt.gov/fishAndWildlife/management/sageGrouse/habitatConservation/.

Public Comment

This *Greater Sage-Grouse Habitat Conservation Strategy* forms the basis of recommendations from the Advisory Council to Governor Bullock. The Advisory Council held seven public hearings in Montana in primary sage-grouse areas, and well over 450 people attended the public hearings. During the hearings the draft

strategy was outlined by FWP personnel at the start of the hearing, copies of the strategy were available for the public, and the public had the opportunity to ask questions about the draft strategy or offer opinions on the draft strategy. The public hearings were held at the locations below:

CITY	LOCATION	TIME
Dillon	U of M – Western, Lewis & Clark Room, Mathews Hall	November 13 – 6 – 8 pm
Billings	FWP Region 5 Headquarters	November 18 – 6 – 8 pm
Baker	Senior Citizens Center	November 19 – 1 – 3 pm
Miles City	Miles Community College, James P Lucas Bldg, Rm 106	November 19 – 7 – 9 pm
Glasgow	Cottonwood Inn and Suites	November 20 – 6 – 8 pm
Malta	First State Bank	November 21 – 12 – 2 pm
Lewistown	FWP Lewistown Area Office	November 21 – 6 – 8 pm

In addition, the Advisory Council created a 34-day comment period for the public to offer written comments on the draft strategy. The Advisory Council received close to 380 comments during that period. During a December 18, 2013 video conference and during a January 14-15, 2014 meeting, the Advisory Council reviewed public comment and modified and finalized its recommendations to the Governor. Because the Advisory Council serves to advise the Governor, the Governor will accept, modify or reject the Advisory Council's recommendations. After finalizing Montana's sage-grouse strategy and developing an implementation plan, the Governor will submit Montana's sage-grouse conservation strategy to the Service for its review. After reviewing the strategy, it is anticipated that the Service will notify the Governor about the strategy's adequacy.

Throughout the Advisory Council's deliberations, the Service has made it clear that for the Service to consider Montana's *Greater Sage-Grouse Habitat Conservation Strategy* (*Montana Strategy*) as an effective mechanism for sage-grouse conservation in their final listing decision, the strategy must pass two critical tests: (1) the Service must have certainty the *Montana Strategy* will be implemented; and (2) once the *Montana Strategy* is implemented, the Service must have certainty the plan will be effective in protecting sage-grouse habitat and conserving sage-grouse populations. This document and Montana's sage-grouse conservation plan are built upon Montana's need to successfully address this two-part test.

Readers will note that the report is organized into major sections based on the primary threats facing sage-grouse. First, the main threats identified by the Service are addressed. Second, additional threats identified by the Advisory Council, are addressed. Each section contains a series of recommendations to address identified threats.

Readers will also note that this current Advisory Council ends its duties in early 2014. However, this Advisory Council is recommending that the Governor appoint a new citizen and agency-based working group to oversee sage-grouse conservation in Montana, the Montana Sage-Grouse Oversight Team. With significant amounts of emerging research and other information anticipated to be available in the near future, the Advisory Council believes it is essential that the State of Montana retain a sharp focus on the status of sage-grouse habitat, populations, threats and science. Wyoming has found the use of an established sage-grouse working group particularly effective and valuable in addressing ongoing sage-grouse issues. Montana's Advisory Council also believes creation of a new citizen and agency-based working group will be helpful in ensuring this *Greater Sage-Grouse Habitat Conservation Strategy* is successfully and effectively implemented now and into the future.

II. PERFORMANCE STANDARD

As of January 31, 2014, the State of Montana shall adopt a sage-grouse population target based on the number of displaying males. Displaying males are an index to sage-grouse abundance and distribution trends over time. This index to sage-grouse populations will be estimated regularly using a consistent protocol and will serve as a primary metric for quantifying the success or failure of this *Greater Sage-Grouse Habitat Conservation Strategy*. Sage-grouse populations vary naturally over time and across regions, which means numbers of birds counted in a given year or a given area could be higher or lower than average but are still within a sustainable range for the species. Between 2004 and 2013, the average number of displaying males in a given year in Montana ranged from 6.98 – 18.71 males/lek (NOTE: these numbers may change based on an ongoing evaluation of lek monitoring data by FWP). This range shall serve as the baseline for future regular population monitoring and will serve to determine sage-grouse population growth or loss as determined by a statistically-valid analysis over a 10-year period, and will also serve to guide future modifications of the *Montana Strategy* by the Montana Sage-Grouse Oversight Team and other state and federal entities. Deviations from historical or statewide trends in a given region of the state will also be taken into account when evaluating modifications to the *Montana Strategy*.

III. GENERAL PROVISIONS

Governor Bullock's Greater Sage-Grouse Habitat Conservation Advisory Council recommends the following *Montana Strategy* to address threats to the sage-grouse in Montana. The goal of the *Montana Strategy* is to conserve sage-grouse populations and habitats and to preclude the need to list the bird under the Endangered Species Act. To achieve this goal, the following stipulations were developed to conserve sage-grouse populations and habitats while concurrently achieving substantive economic and social growth. Primary threats that led to the Service's warranted but precluded finding in 2010 include fragmentation and alteration of sagebrush systems, and a lack of regulatory mechanisms to conserve sage-grouse habitat. Specific threats identified by the Service include wildfire, non-native plant species, energy development, sagebrush removal, improper grazing, range management structures, pinyon-juniper expansion, agricultural conversion, mining, recreation, ex-urban development, infrastructure, and fences. Predation and hunting were also identified by the Advisory Council as threats to sage-grouse and are included in this strategy. In its final form, the *Montana Strategy* will be presented to Governor Bullock for consideration as the primary regulatory mechanism to conserve sage-grouse and preclude the need for listing the bird as a threatened or endangered species pursuant to the Endangered Species Act of 1973. The following are general overarching provisions intended to convey how this strategy will be implemented and how agencies will work in concert to achieve effective conservation of sage-grouse in Montana:

1. Management by all Montana state agencies should focus on the maintenance and enhancement of sage-grouse habitats, populations and connectivity areas, including inter-state and international Connectivity Areas, identified in Section IV. Core Areas play a critical role and General Habitat plays an important role in sage-grouse conservation. Because regulatory certainty is important, it is important that scientifically defensible, mapped Core Areas be retained unless substantial and compelling information indicates that boundaries may need to be changed.
2. All valid and existing land uses and rights in sage-grouse Core Areas, Connectivity Areas and General Habitat should be recognized and respected. State trust lands have valid and existing rights and responsibilities under the Enabling Act at Statehood, November 8, 1889.
3. A Montana Stewardship and Conservation Fund will be established to create and fund voluntary and incentive-based non-regulatory conservation programs designed to conserve sagebrush habitat and

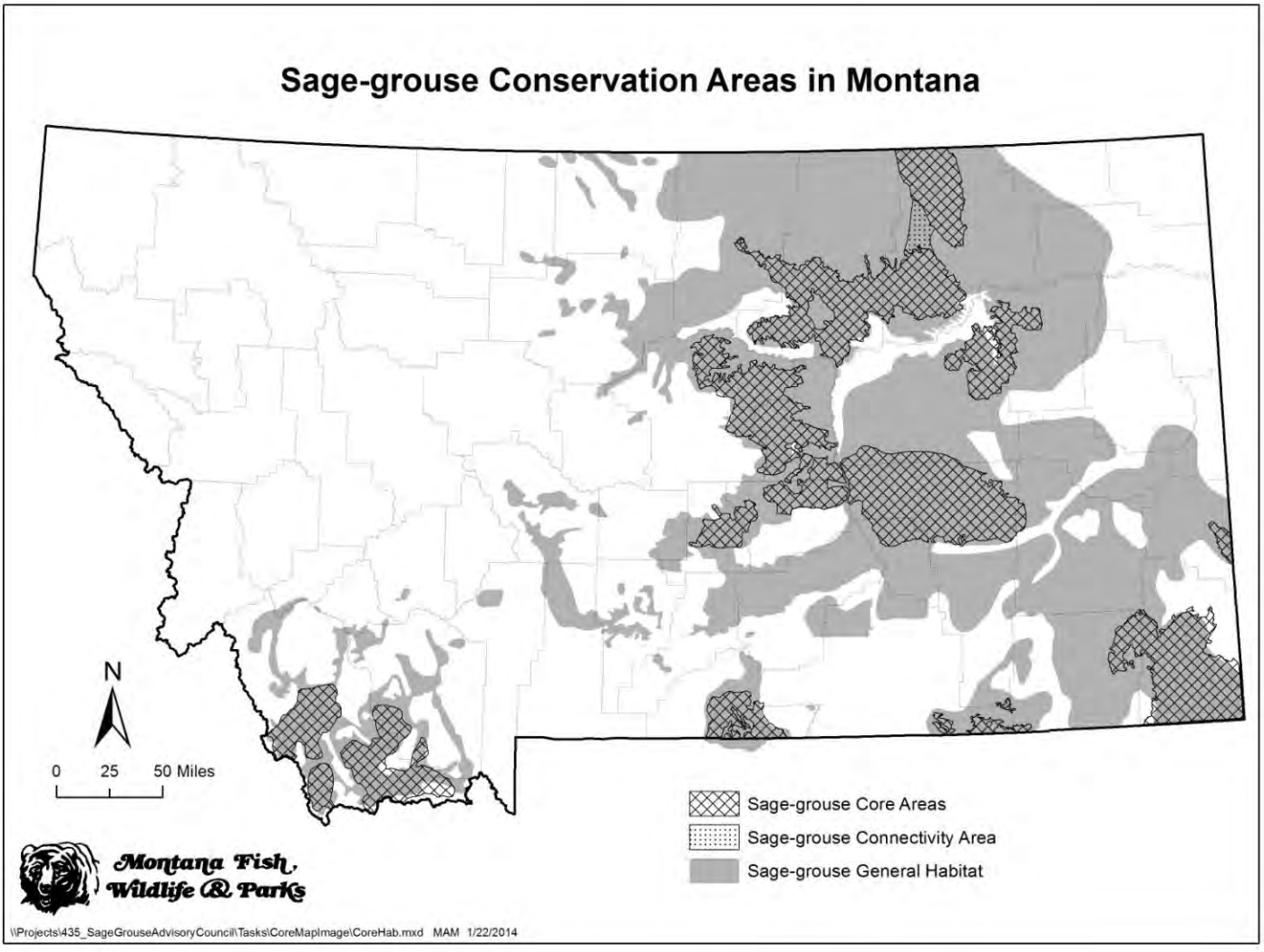
grazing lands within identified sage-grouse Core Areas, Connectivity Areas, and General Habitat areas on private lands (Section V).

4. The Governor shall direct and prioritize an appropriate amount of all state funds available for conservation of habitats for protection, enhancement, and restoration of sage-grouse habitat in Core Areas, Connectivity Areas, and General Habitat.
5. Activities conducted pursuant to a permit or permit application prior to January 31, 2014 will not be managed under the stipulations found in this strategy. Examples of existing activities include oil and gas, mining, agriculture, overhead power lines, processing facilities, housing and other uses that were in place prior to the development of this policy. Provided these activities are within a defined project boundary (such as a recognized state or federal oil and gas unit, drilling and spacing unit, mine plan, subdivision plat, etc.) they should be allowed to continue within the existing boundary, even if the use exceeds recommended stipulations (see Section VI), recognizing that all applicable state and federal actions shall continue. New development associated with existing activities may be subject to these stipulations (Section VI).
6. This strategy in no way adds or expands the review or approval authority of any state agency. Section VIII contains a list of land uses and landowner activities that do not require review for consistency.
7. New development or land uses requiring a permit or other authorizations within sage-grouse Core Areas should be authorized or conducted only when it can be reasonably demonstrated that the activity (factoring in mitigation) will not cause declines in sage-grouse populations. Activities that exceed recommended stipulations may require compensatory mitigation (Section VIII).
8. Development consistent with the stipulations set forth in Section VI shall be deemed sufficient to demonstrate that the activity will not cause declines in sage-grouse populations.
9. Core and Connectivity Areas and General Habitat will receive priority by state agencies for all sage-grouse funding, land management agreements (including Candidate Conservation Agreements and Candidate Conservation Agreements with Assurances), habitat enhancement projects, reclamation efforts, mapping projects, and other associated proactive efforts designed to assure viability of sage-grouse in Montana.
10. Incentives to accelerate or enhance reclamation in habitats in and adjacent to Core and Connectivity Areas and General Habitat should be developed, including but not limited to stipulation waivers, funding for enhanced reclamation, and other strategies. Any incentives developed will result in net benefit to and not cause declines in sage-grouse populations.
11. Immediate suppression of wildfire in Core and Connectivity Areas and General Habitat will be prioritized by all fire-fighting units under the jurisdiction of the state, recognizing that other local, regional, and national suppression priorities may take precedent. Coordination among all fire-fighting units, including federal, state, regional, and local units, is necessary to implement fire prevention, suppression, and rehabilitation management as detailed in Section X. However, public and firefighter safety remains the number one priority for all fire management activities. Reclamation and restoration of sage-grouse habitat burned by wildfire will be a primary mitigation opportunity under this plan.
12. State agencies shall work collaboratively and in cooperation with federal and local governments and private landowners to ensure a uniform and consistent application of this strategy to maintain and enhance sage-grouse habitats and populations.
13. A Montana Sage-grouse Oversight Team (MSGOT) will be established (Section XI). This body will be responsible for providing oversight for the implementation of Montana's *Greater Sage-grouse Habitat Conservation Strategy*.
14. State agencies shall strive to maintain consistency with the items outlined in this strategy, but it should be recognized that adjustments to the stipulations may be necessary based upon local conditions and limitations. Any adjustments to these stipulations must be recommended for approval by the MSGOT

and subsequently approved by the appropriate agency. The goal is to minimize future disturbance by co-locating proposed disturbances within areas already disturbed or naturally unsuitable.

15. The protective stipulations outlined in this Strategy should be reevaluated on a continuous basis and at a minimum annually, as new science, information, and data emerge regarding the habitats and behaviors of sage-grouse.
16. The State of Montana will implement a policy of yearly surveys of sage-grouse and leks statewide using biologists, wardens, and applicable public.
17. The State of Montana shall commit funding for the implementation of this Strategy as described in Section XI). This Strategy supersedes the 2005 *Management Plan and Conservation Strategies for Sage-grouse in Montana – Final*.
18. State agencies shall report to the Office of the Governor, Montana Environmental Quality Council, State Land Board, and Montana Fish and Wildlife Commission detailing their actions to comply with this Strategy.

IV. SAGE-GROUSE CONSERVATION AREAS



Geographic Information System layers of Montana's Greater Sage-Grouse Conservation Areas are available from Montana Fish, Wildlife and Parks upon request.

A. **Core Areas –** areas of highest conservation value for sage-grouse. Core Areas were delineated by Montana Fish, Wildlife and Parks (FWP) in cooperation with federal and non-governmental partners to encompass the areas with the greatest number of displaying males and associated habitat. FWP estimates the Core Areas include approximately 76% of the displaying males in Montana, as of 2013. Male counts at lek sites are assumed to represent the overall sage-grouse population.
B. **General Habitat –** areas that provide habitat for sage-grouse in Montana but are not considered Core Areas.
C. **Connectivity Areas –**areas that provide important linkages among populations of sage-grouse, particularly between Core Areas or priority populations in adjacent states and across international borders. Additional Connectivity Areas may be mapped when more information becomes available.

V. MONTANA STEWARDSHIP AND CONSERVATION FUND

Approximately 64% of sage-grouse habitat in Montana is in private ownership. The ongoing stewardship of private landowners is critical to successful conservation of sage-grouse habitat and providing additional opportunities to support land stewardship is fundamental to this strategy. The Advisory Council recommends the creation of the Montana Stewardship and Conservation Fund (Fund) to provide immediate and ongoing annual funding to:

1) Conserve sage-grouse habitat and populations until sage-grouse populations are stable and the sage-grouse is no longer vulnerable to an Endangered Species Act listing.
2) Create and fund voluntary and incentive-based non-regulatory conservation programs on private land.
3) Conserve key wildlife connectivity areas to help diminish potential future ESA listings of other species.
4) Target appropriate funding to conserve riparian and wetland areas to help diminish potential future ESA listings.
5) Improve habitat health to reduce threat of catastrophic fire, including projects designed to address conifer encroachment and invasive species.
6) Promote and support mitigation and conservation plans and measures. Funds cannot be used directly for compensatory mitigation but can be used to leverage existing compensatory mitigation projects to maximize sage-grouse conservation benefit.

In addition, this Fund would:

1) Be housed in the Montana Department of Natural Resources and Conservation.
2) Be managed by a citizen's board (with legislative representation) that would have authority to award funding through a competitive grant process to entities based on Fund guidelines, legislative intent, rule-making, and other specific provisions.
3) Allow entities such as watershed groups, conservation districts, nonprofit organizations, state agencies, and others to be eligible for grant funding.
4) Be used as a matching source of funds to ensure that Fund dollars are maximized for on-the-ground projects. The Fund could be used as match for mitigation programs, federal programs, private donations, other state programs, and more.
5) Be part of the governor's budget submission in late 2014 with a defined and identified dollar amount contained within the budget. The Advisory Council recommends funding for the *Montana Strategy* in the Governor's budget. To ensure transparency, the Fund would regularly report to the

Legislature, the Governor, the Montana Environmental Quality Council, and the Montana Fish and Wildlife Commission.

VI. STIPULATIONS FOR DEVELOPMENT

The goal of this Strategy is to conserve sage-grouse populations and habitats and to preclude the need to list the bird under the Endangered Species Act. To achieve this goal, the following stipulations were developed to conserve sage-grouse populations and habitats while concurrently achieving substantive economic and social growth. New development projects in sage-grouse Core Areas that require any state or federal permits will be required to follow the permitting process and stipulations outlined below. Development projects in sage-grouse Connectivity Areas and General Habitat may also be required to follow certain stipulations (see below). Activities exempt from these stipulations can be found in Section VIII. The permitting entity (e.g., Bureau of Land Management, Department of Environmental Quality) will have ultimate responsibility for compliance with these stipulations.

a) Core Area Stipulations

i. Core Area – Basic Stipulations

The stipulations in this section apply to all new activities in Core Areas with the exception of exempt activities defined in Section VIII. Additional stipulations that apply to specific industries and activities are described in Section VI.a.ii. Where there is a conflict between the basic and the specific stipulations for any given activity, the more specific will apply.

Sage-grouse Core Areas have been designated as areas of highest conservation priority. These stipulations are designed to maintain existing suitable sage-grouse habitat by regulating activities in Core Areas to ensure the maintenance of sage-grouse abundance and distribution in Montana.

1. **Sequence of Decisions for Surface Disturbance Activities:** State-approved projects that result in more than minimal adverse impacts to sage-grouse and/or their habitat will follow the following sequence of decisions:
    a. **Avoid Impacts**. The best way to protect sage-grouse habitat is to avoid impacts that fragment or otherwise damage or destroy sage-grouse habitat. To accomplish this, project developers should consider alternative locations for their project located outside sage-grouse habitat (i.e., consider locations outside Core Areas, outside suitable habitat, and/or in areas already considered disturbed). To meet this provision, the project developer needs to show authorizing agencies rationale as to why a given proposed surface disturbance in sage-grouse habitat is unavoidable.
    b. **Minimize the Size of the Impact**. If impacts to sagebrush habitat cannot be avoided, they should be minimized by limiting the magnitude of the proposed surface disturbance. Reducing impacts can preserve at least portions of the habitats' important functions, including limiting fragmentation. Impacts can be minimized by reducing the project footprint, constructing fewer structures, clustering features, shifting the development pattern to use topographical screening, timing restrictions, or similar measures. In order to meet this requirement, the project developer should be able to show that the project minimizes the impact to sage-grouse habitat, while continuing to meet the purpose of the development.

c. **Compensation for Impacts**. If project impacts are unavoidable and Core Area stipulations cannot be met, mitigation measures shall be required, following the Mitigation Framework outlined in Section IX.[1] Mitigation can include enhanced reclamation.

2. **Surface Occupancy Active Leks:** There will be a No Surface Occupancy (NSO) buffer within 1.0 mile of active sage-grouse leks within Core Areas. NSO, as used in these recommendations, means no surface facilities, including roads, shall be placed within the NSO area. Other activities may be authorized with the application of appropriate seasonal stipulations, provided the resources protected by the NSO are not adversely affected. For example, underground utilities may be permissible if installation is completed outside applicable seasonal stipulation periods and significant resource damage does not occur. Similarly, geophysical exploration may be permissible in accordance with seasonal stipulations. See Appendix D for the definition of an active lek.
3. **Surface Disturbance**: Surface disturbance will be limited to an average of 5% of suitable sage-grouse habitat within the Density and Disturbance Calculation Tool (DDCT) examination area (or other suitable term for Montana's density and disturbance analysis process; see Appendix E). The calculation method for this disturbance density will follow Wyoming's DDCT process that is described in Appendix E. The calculation of total percent disturbance will include:
    a. All existing disturbance (anthropogenic);
    b. Authorized but yet to be implemented activities; and
    c. Proposed activities;

    but will not include areas that are naturally unsuitable for sage-grouse (e.g., bodies of water). A definition of unsuitable habitat is provided in Appendix D. Distribution of proposed disturbance may be considered and approved on a case-by-case basis with a goal of consolidating disturbance. Unsuitable and disturbed habitat should be identified in a seasonal and landscape context, on a case-by-case basis, outside the NSO buffer around leks. This will incentivize proponents to locate projects, where technically feasible, in unsuitable and disturbed habitat to avoid creating additional disturbance acres. Acres of development in unsuitable habitat are not considered disturbance acres. The primary focus should be on protection of undisturbed suitable habitats and protection from habitat fragmentation. See Appendix D for a description of suitable habitat and surface disturbance.
4. **Seasonal Use**: As authorized by permitting agency or agencies, activities (production, maintenance, and emergency activity exempted) will typically be prohibited from March 15 – July 15 outside of the NSO perimeter of an active lek in Core Areas where breeding, nesting, and early brood-rearing habitat is present. Allowed maintenance and production activity will not occur between the hours of 4:00 - 8:00 am and 7:00 - 10:00 pm between March 15 – July 15. In areas used as winter concentration areas, exploration and development activity will be prohibited December 1 – March 15. Activities may be allowed during seasonal closure periods as determined on a case-by-case basis. Activities in unsuitable habitat also may be approved year round on a case-by-case basis.
5. **Noise**: New noise levels, at the perimeter of a lek, should not exceed 40 dBA above ambient noise (existing activity included) from 6:00 pm - 8:00 am during the breeding season (March 15 – July 15) with the exception of those sites identified under Special Management Core Areas.[2] Ambient noise levels should be determined by measurements taken at the perimeter of a lek at sunrise. The MSGOT should follow Wyoming's review and litigation discussion of this stipulation and amend the strategy accordingly.

[1] A Minority Committee Report has been written for the Compensation for Impacts stipulation, see Appendix H.

[2] A Minority Committee Report has been written for the Noise stipulation, see Appendix H.

6. **Vegetation Removal:** Vegetation removal as part of permitted activities will be limited to the minimum disturbance required by the project. All topsoil stripping and vegetation removal in suitable habitat will occur between July 16 – March 14 in areas that are within 4.0 miles of an active lek. Disturbance in unsuitable habitat between March 15 and July 15 may be approved on a case-by-case basis.
7. **Reclamation**: Reclamation should re-establish native grasses, forbs, and shrubs during interim and final reclamation. The goal of reclamation is to achieve cover, species composition, and life form diversity commensurate with the surrounding plant community or desired ecological condition to benefit sage-grouse and replace or enhance sage-grouse habitat to the degree that environmental conditions allow. Seed mixes should include at least two native forbs and two native grasses with at least one native bunchgrass species. Where sagebrush establishment is prescribed, establishment is defined as meeting the standard prescribed in the individual reclamation plan. Landowners should be consulted on the desired plant mix on private lands. The operator is required to control noxious and invasive plant species, especially cheatgrass (*Bromus tectorum*) and Japanese brome (*Bromus japonicus*).
8. **Existing Activities**: Areas already disturbed or approved for development within Core Areas prior to January 31, 2014 are not subject to new sage-grouse stipulations with the exception that existing operations may not initiate activities resulting in new surface occupancy within 1.0 mile of an active sage-grouse lek. Any existing disturbance will be counted toward the calculated disturbance cap for a new proposed activity. The level of disturbance for existing activities may exceed 5%.

ii. Core Area - Specific Stipulations

The stipulations in this section apply to specific activities and/or industries. They should be followed in addition to the basic stipulations described above. Where there is a conflict between the basic and the specific stipulations for any given activity, the more specific will apply.

1. **Transportation***:* Locate main roads used to transport production and/or waste products a minimum of 2.0 miles from the perimeter of active sage-grouse leks. Locate other roads used to provide facility site access and maintenance a minimum of 1.0 mile from the perimeter of active sage-grouse leks. Construct roads to minimum design standards needed for production activities.
2. **Pipelines**: Bury pipelines and restore disturbed area with native plant species that are compatible with the surrounding ecological site conditions. Co-locate pipelines with roads, transmission lines, and other linear features when possible. Compensatory mitigation for temporary loss of habitat will be required by the applicable permitting agency.
3. **Overhead Power lines and Communication Towers**: Locate new overhead power lines and communication towers a minimum of 1.0 mile from the perimeter of active sage-grouse leks. Use topographic screening and bury lower voltage transmission lines where economically feasible. Follow the Service's Best Management Practices for tall structures when erecting new communication towers. Burying of local distribution lines should be encouraged where economically feasible. Co-locate all new power lines with roads, existing power lines, or other linear features, when possible. Burying existing overhead lines that have been identified as contributing to a decline in sage-grouse populations will be considered as a mitigation option. Anti-collision measures should be installed within 1.0 mile of the perimeter of known sage-grouse concentration areas such as leks, winter ranges, etc. where icing conditions are unlikely to occur. Raptor-proofing poles is encouraged when proven effective. Industry and their suppliers are encouraged to continue efforts to develop effective perch preventers. If effective perch preventers are identified, they should be installed within 1.0 mile of known concentration areas such as leks, winter ranges, etc. Electric utilities, including electric cooperatives, are working with the Avian Power Line Interaction Committee (APLIC), which includes

federal agencies (including the Service and BLM), and state wildlife agencies (including FWP) to develop a set of Best Management Practices (BMPs) to guide construction, operation, and maintenance activities in sage-grouse habitats. This document will not be completed until after the Advisory Council submits their recommendations to the Governor. Until the BMP document is reviewed and approved by the Service, BLM, and other appropriate state and federal agencies, it will be referenced as "Best Management Practices for Electric Utilities in Sage-Grouse Habitat**".** It will be added to the Montana *Greater Sage-grouse Habitat Conservation Strategy* when the BMP document is finalized.

4. **Oil and Gas Development**: Well pad densities are not to exceed an average of one pad per square mile (640 acres) within the DDCT examination area (or other suitable term for Montana's density and disturbance analysis process; see Appendix E). As an example, the number of well pads within a 2.0 mile radius of the perimeter of an active sage-grouse lek should not exceed 11, distributed preferably in a clumped pattern in one general direction from the lek.
5. **Coal Mining**: Conservation measures will be developed for and imposed on coal mining operations on a case-by-case basis via the terms and conditions included in permits issued by the Montana Department of Environmental Quality (MDEQ) under the authority of the Montana Strip and Underground Mine Reclamation Act (MSUMRA), and in compliance with the federal Surface Mining Control and Reclamation Act (SMCRA). The Administrative Rule components of the MSUMRA can be accessed at http://www.deq.mt.gov/wqinfo/Laws/StripMiningReclamatio.mcpx. The associated coal permitting rules and standard of the Montana Department of Environmental Quality can be accessed at http://.deq.mt.gov/CoalUranium/Coalpermitting.mcpx. Links to SMCRA and the enabling components of the Code of the Federal Regulations can be found at http://www.osmre.gov/lrg.shtm.

    a. Coal mining will first try to avoid operating in sage-grouse habitat.
    b. To avoid potentially significant impacts to sage-grouse, coal companies will delineate the area that will be disturbed. They will report baseline vegetation surveys of the permit area, four season sage-grouse baseline surveys of the permit area and periphery, along with population density and habitat delineations. They will show pre-mine land use conditions, capacity, productivity, and history (per ARM 17.24.304). The sage-grouse plan (per ARM 17.24.312) will include:
        i. An operations plan (per ARM 17.24.308) that includes a plan to prevent the establishment of, or to effect the control of, noxious weeds (including cheatgrass and Japanese brome) in the proposed permit/amendment area.
        ii. A sage-grouse plan (per ARM 17.24.312) will include:
            1. A plan to minimize disturbances and impacts on sage-grouse and related environmental values during mining and reclamation;
            2. Details on how enhancement of sage-grouse values will be achieved;
            3. Descriptions of sage-grouse enhancement features to be established; and
            4. Statements of impact control measures, management techniques, and annual monitoring methods to protect or enhance sage-grouse or habitats identified through the consultation process as important and/or high value.
        iii. A reclamation plan to reclaim mined area back to suitable habitat (per ARM 17.24.313) will include:

            1. The proposed post-mining land use;
            2. A timetable for each reclamation step;
            3. A map of the proposed post-mining topography;

4. Demonstration that the post-mining topography can be achieved;
5. Details on reestablishment of hydrologic balance;
6. Details on topsoil salvage, protection, and replacement methods;
7. A narrative on the details of the revegetation methods to be applied;
8. Details on the reclaimed vegetation monitoring to be conducted; and
9. Mine and reclamation plan reviews by the Service relative to threatened, endangered, and candidate species through Section 7 consultation processes.

iv. The establishment of vegetation to protect sage-grouse (per ARM 17.24.711) will require that:

1. Vegetation must be reestablished on the disturbed areas and it must be diverse, effective, and permanent;
2. Vegetation cover must be comprised of native species or approved alternatives and be compatible with post-mine land uses;
3. Reclamation vegetation must be equivalent in cover to natural vegetation and be capable of self-regeneration and plant succession;
4. There is compliance with noxious weed restrictions; and
5. For sage-grouse habitat, shrubs must be established to achieve cover and stocking rates as approved by MDEQ after consultation and approval by FWP.

v. Shrub species (per ARM 17.24.717) must be adapted to local conditions and meet the post-mining land use.

vi. Monitoring (per ARM 17.24.723) requirements include:

1. Periodic vegetation, soils, and wildlife monitoring with coverage and frequency as approved by MDEQ; and
2. Submittal of detailed monitoring reports to MDEQ.

If monitoring data indicates corrective measures are needed, then adaptive management practices need to be applied.

The requirements for monitoring shall terminate at the same time that the MDEQ has determined that phase III reclamation, as defined in ARM 17.24.1116(6)(c), has been completed

vii. Revegetation success criteria (per ARM 1724.724) requirements include:

1. Determination of success will be via comparison to un-mined reference areas or through approved technical standards.

viii. Vegetation measurement (per ARM 17.24.726) requirements include:

1. Use of MDEQ-approved methods;
2. Demonstration of equivalent production, cover, and density per MDEQ-approved standards;
3. Minimum shrub density standards; and

4. Demonstration of compliance with noxious weed restrictions.

6. **Bentonite, Scoria, Peat, and Sand and Gravel Mining**[3]: Conservation measures will be developed for and imposed on opencut mining operations on a case-by-case basis via the terms and conditions included in permits issued by the Montana DEQ under the authority of the Montana Opencut Mining Act (83-4-401, Montana Code Annotated (MCA)), which can be accessed at http://deq.mt.gov/opencut/forms/2013-Title82Chapter4Part4.pdf .

    a. Opencut mining operations will first try to avoid operating in sage-grouse habitat.
    b. To avoid potentially significant impacts to sage-grouse, opencut mining companies will delineate the area that will be disturbed. They will report baseline vegetation surveys of the permit area, four season sage-grouse baseline surveys of the permit area and periphery, along with population density and habitat delineations (Per ARM 17.24.222). They will show pre-mine land use conditions, capacity, productivity, and history (per ARM 17.24.217). The sage-grouse plan will include:
        i. An operations plan (per ARM 17.24.218 and 219) that includes a plan to prevent the establishment of, or to effect the control of, noxious weeds (including cheatgrass and Japanese brome) in the proposed permit/amendment area.
        ii. A sage-grouse plan (per ARM 17.24.219) will include:

            1. A plan to minimize disturbances and impacts on sage-grouse and related environmental values during mining and reclamation;
            2. Details on how enhancement of sage-grouse values will be achieved;
            3. Descriptions of sage-grouse enhancement features that will be established; and
            4. Statements of impact control measures, management techniques, and annual monitoring methods to protect or enhance sage-grouse or habitats identified through the consultation process as important and/or high value

        iii. A reclamation plan (per ARM 17.24.219) to reclaim mined area back to suitable habitat will include:

            1. The proposed post-mining land use;
            2. Timetable for each reclamation step;
            3. A map of the proposed post-mining topography;
            4. Demonstration that the post-mining topography can be achieved;
            5. Details on reestablishment of hydrologic balance;
            6. Details on topsoil salvage, protection, and replacement methods;
            7. A narrative on the details of the revegetation methods to be applied;
            8. Details on the reclaimed vegetation monitoring to be conducted; and
            9. Mine and reclamation plan reviews by the Service relative to threatened, endangered, and candidate species through Section 7 consultation processes.

        iv. The establishment of vegetation to protect sage-grouse (per ARM 17.24.219) will require that:

[3] A Minority Committee Report has been written for the Bentonite, Scoria, Peat, and Sand and Gravel Mining stipulation, see Appendix H.

1. Vegetation must be reestablished on the disturbed areas and it must be diverse, effective and permanent;
2. Vegetation cover must be comprised of native species or approved alternatives and be compatible with post-mine land uses;
3. Reclamation vegetation to be equivalent in cover to natural vegetation and be capable of self-regeneration and plant succession;
4. There is compliance with noxious weed restrictions; and
5. For sage-grouse habitat, shrubs must be established to achieve cover and stocking rates as approved by MDEQ after consultation and approval by FWP.

v. Shrub species (per ARM 17.24.219) must be adapted to local conditions and meet the post-mining land use.

vi. Monitoring (per ARM 17.24.219) requirements include:

1. Periodic vegetation, soils, and wildlife monitoring with coverage and frequency as approved by MDEQ; and
2. Submittal of detailed monitoring reports to MDEQ

If monitoring data indicates corrective measures are needed, then adaptive management practices need to be applied.

The requirements for monitoring shall terminate upon bond release (per ARM 17.24.203)

vii. Revegetation success criteria (per ARM 1724.219) requirements will include:

1. Success to be determined via comparison to un-mined reference areas or through approved technical standards.

viii. Vegetation measurements (per ARM17.24.219) requirements include:

1. Use of MDEQ-approved methods;
2. Demonstration of equivalent production, cover, and density per MDEQ-approved standards;
3. Minimum shrub density standards; and
4. Demonstration of compliance with noxious weed restrictions.

7. **Other Mining**:

a. For development drilling or ore body delineation drilling on tight centers (approximately 50’ x 50’), the disturbance area will be delineated by the external limits of the development area. Assuming a more widely-spaced disturbance pattern, the actual footprint will be considered the disturbance area.
b. Sage-grouse monitoring results will be reported in the mine permit annual report. This document will be given to FWP and the regulating body. Pre-disturbance surveys will be conducted as required by the appropriate regulatory agency.
c. The number of active mining development areas (e.g., operating equipment and significant human activity) is not to exceed an average of one project per square mile (640 acres).

d. Surface disturbance and surface occupancy stipulations will be waived within the Core Area when implementing underground mining practices that are necessary to protect the health, welfare, and safety of miners, mine employees, contractors, and the general public. The mining practices include but are not limited to bore holes or shafts necessary to: 1) provide adequate oxygen to an underground mine; 2) supply inert gases or other substances to prevent, treat, or suppress combustion or mine fires; 3) inject mine roof stabilizing substances; and 4) remove methane from mining areas. Any surface disturbance or surface occupancy necessary to access the sites to implement these mining practices will also be exempt from any stipulation.
e. Mining permits will include requirements for mitigation that enhances or promotes genetic diversity, critical habitat, connectivity, and population viability.

8. **Wind Energy**: Wind energy development will be excluded from sage-grouse Core Areas. This provision will be reevaluated on a continuous basis as new science, information, and data emerges.
9. **Sagebrush Treatments**: Sagebrush eradication and treatment programs aimed at reducing or eliminating sagebrush will be prohibited on state and discouraged on private lands unless those treatments are approved by MSGOT and can be satisfactorily shown to result in no loss of habitat or be beneficial to sage-grouse habitat. Sagebrush treatments are considered disturbance and will contribute to the 5% disturbance factor. Sagebrush treatments that have been approved by MSGOT will not contribute to the 5% disturbance factor. Sagebrush canopy cover should be maintained at present levels. Treatments to enhance sagebrush-grassland will be evaluated based upon the existing habitat quality and the functional level post-treatment. Restored sagebrush grassland habitats that provide effective cover and food for sage-grouse should be recognized as part of the habitat base; this provision serves as an incentive for restoring and protecting converted habitats. For government agencies managing sagebrush in Core Areas, there should be a "no net conifer expansion" policy adopted, with criteria for approve waivers. This policy can be enacted through management plans and their implementation; stipulations in permits, leases, and licenses; and similar mechanisms. Conifer removal in sage-grouse Core Areas should be done manually, unless other methods can be shown to remove conifers without significantly impacting sagebrush. Where conifer encroachment is an issue near leks, land managers should ensure that all conifers are removed within at least 0.6 miles (1,000 meters) of leks.
10. **Conversion to Cropland Agriculture**: The Advisory Council recommends that the Montana Board of Land Commissioners enact a prohibition of conversion of native range to cropland on state land in Core Areas, with criteria for approved waivers. If enacted, prohibition details and criteria for approved waivers will be incorporated in to the *Montana Strategy* as an Addendum. The Advisory Council also requests that federal agencies prohibit the conversion of native range to cropland on lands that they control surface rights. State and federal agencies are also encouraged to work cooperatively with Tribal governments to adopt policies that prevent conversion of sage-grouse habitat to agricultural cropland.
11. **Range Management**: Rangelands on state lands will be managed in accordance with the recommendations in Section X.a, whenever possible, taking into consideration the existing management practices of the lessee on surrounding non-state lands. State agencies are encouraged to collaborate with federal agencies and private landowners to craft grazing management plans that adhere to the concepts included in this document.
12. **Wildfire and Prescribed Fire**: Immediate suppression of wildfire in Core Areas will be prioritized by all fire-fighting units under the jurisdiction of the state. Prescribed burns will be prohibited in sagebrush habitat in Core Areas unless those prescribed burns are approved by MSGOT and can be satisfactorily shown to result in no loss of habitat or be beneficial to sage-grouse habitat. Although lands burned by

wildfire are excluded from the disturbance cap, these lands require a management plan resulting in a trend to reestablish functional sage-grouse habitat as soon as possible. Burnouts, backfires, and all other public safety measures are appropriate for fighting wildfires.

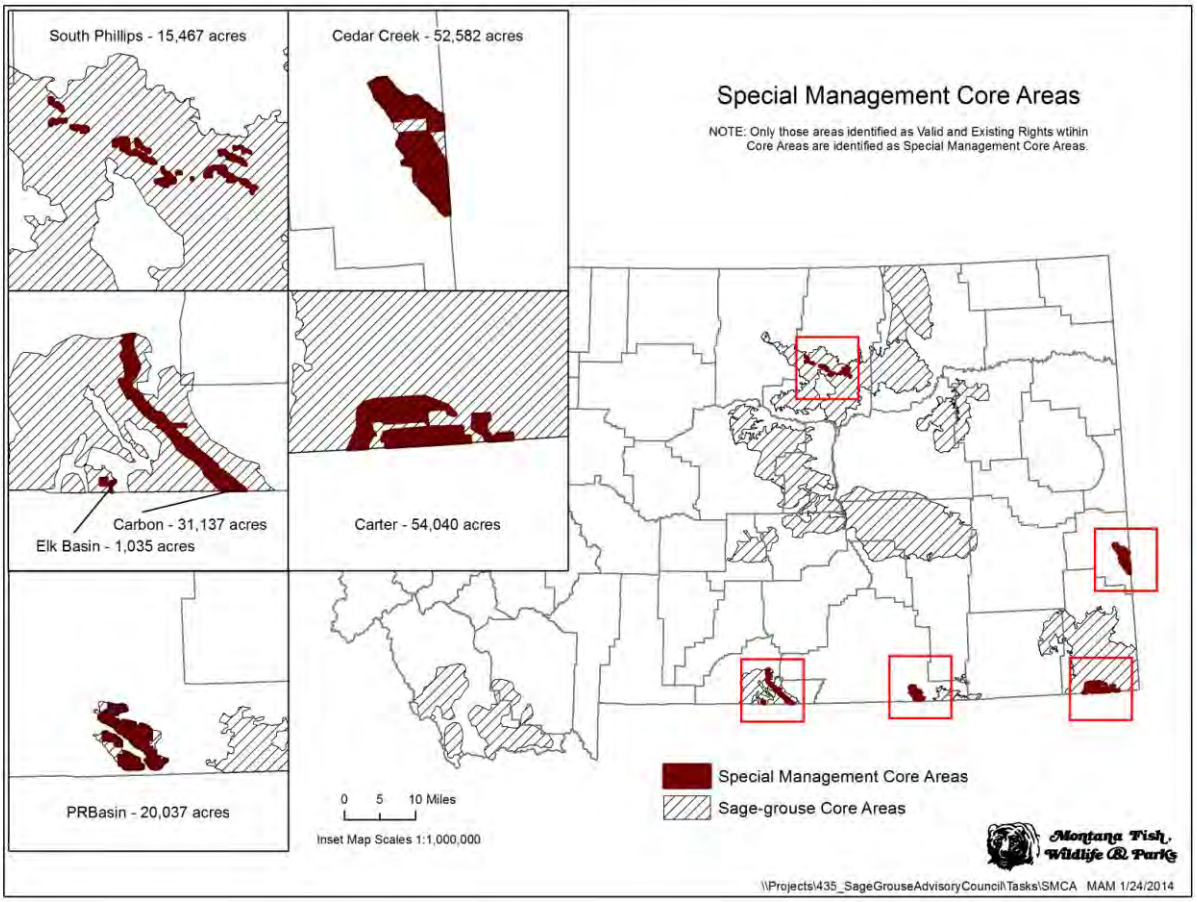
13. **Monitoring/Adaptive Response**: For all activities allowed in Core Areas, sage-grouse monitoring will be conducted to evaluate the response of active leks within 4.0 miles of the project footprint to permitted activity, excluding underground utilities such as pipelines and buried utility lines. Monitoring plans submitted by project proponents will be coordinated and modified by the permitting agency with input from FWP. Monitoring will include the evaluation of affected leks and at least three reference leks (one control area) located a minimum of more than 4 miles from the disturbance. If declines in affected leks (using a three-year running average during any five-year period relative to trends on reference leks) are determined to be caused by the project, the operator will propose adaptive management responses to increase the number of sage-grouse. If the operator cannot demonstrate a restoration of sage-grouse numbers to baseline levels (established by pre-disturbance surveys, reference surveys, and taking into account regional and statewide trends) within three years, operations will cease until such numbers are achieved. However, in the interim, the operator, permitting agency, FWP, and the MSGOT will create additional adaptive management efforts to restore sage-grouse population numbers and baseline numbers, as well as restore project operations. Natural occurrences and their effects on sage-grouse and sagebrush habitat will be considered in all cases.
14. **Exceptions**: Any exceptions to these stipulations will be considered on a case-by-case basis and must show that the exceptions are not expected to cause declines in sage-grouse populations. Operations necessary to provide essential services like delivery of electricity will be excluded from requirements to cease activity if it is shown to have caused a decline in sage-grouse after three years. Any departures from these stipulations must be recommended for approval by MSGOT and subsequently approved by the appropriate agency.

b) Special Management Core Areas

Special Management Core Areas (SMCA) are defined as a subset of Core Areas in which special consideration has been given to valid existing rights and the fact that it is recognized that existing and planned development in these areas cannot be implemented within the constraints outlined in this document. SMCAs are as follows:

Location	Resource[4]	Acres
Cedar Creek Anticline	Oil and gas, wind	62,857
Carter County	Bentonite	54,039
Powder River Basin	Coal	20,653
Carbon County	Bentonite	31,110
Elk Basin	Oil and gas	1,035
South Phillips County	Bentonite	15,466

[4] Documentation of valid existing rights for these SMCAs will be provided to the Governor's office.



Each developer (those with the valid, existing rights) in a SMCA shall develop a conservation plan in cooperation with FWP. All applicable Core Area stipulations will apply to the SMCA until the conservation plan has been recommended for approval by MSGOT and subsequently approved by the appropriate agency. The conservation plan will follow the mitigation framework outlined in Section IX that will include a noise abatement stipulation, and will also include a strategy for restoration/reclamation within the Core Area, which results in a long-term reduction in surface disturbance. In addition, conservation plans must have a monitoring component using peer-reviewed scientific methods that is designed to monitor sage-grouse populations, the impact of development, and restoration efforts on sage-grouse populations, and provide feedback if adjustments are needed in the conservation plan to reduce impacts on sage-grouse populations. The mitigation plan will also include plans for off-set mitigation. The conservation goal of these areas is to maintain and restore seasonal sage-grouse habitats that support viable sage-grouse populations. As industrial activities subside, these populations are expected to expand into vacant functional habitats.

1. Petitions may be submitted to MSGOT to create a new SMCA. The petition shall contain a geographic description of the area proposed to be created and a detailed description of the number and location of the sage-grouse lek(s) within the area. The petition must also contain an evaluation of how the creation of the proposed SMCA would impact the Core Area function relative to the sage-grouse. The petition must also contain an explanation of the rationale for the creation of the SMCA. In evaluating whether to recommend approval of the creation of the new SMCA, the MSGOT shall consider how the creation of a SMCA will impact the habitat and population of sage-grouse both within the Core Area and on a statewide basis. The petition must include a proposal for off-set mitigation.
2. Petitions may be made to MSGOT for additional SMCA designation, but in no case will SMCA total acreage encapsulate more than 3% of the state's sage-grouse Core Areas. In addition, the Advisory

Council recommends that the MSGOT develop a population threshold that cannot be exceeded within SMCAs (i.e., the population of sage-grouse impacted by all SMCAs may not exceed a specific population, measured by the number and size of leks impacted or a similar population metric).

3. The MSGOT must develop a process where designated SMCAs can be reclassified as Core Areas. This process should be based on metrics measuring the quantity and quality of sage-grouse habitat restored and/or reclaimed, as well as the documented use of that habitat by sage-grouse.

c) General Habitat Stipulations

General sage-grouse habitats are areas that provide sage-grouse nesting, brood-rearing and wintering habitat but are not identified as Core Areas. General Habitat was mapped by FWP biologists using lek locations, telemetry, and other available data. The health of General Habitat areas is a critical element in the effort to maintain the abundance and distribution of sage-grouse in Montana. Development scenarios in General Habitat are more flexible than in Core Areas, but should still be designed and managed to maintain populations, habitats, and essential migration routes. The goal in General Habitat is to maintain habitat conditions by implementing appropriate management practices that minimize sagebrush loss and disturbance. Applicable standard and sage-grouse management practices should be applied to development within both Core Areas and General Habitat to achieve the goals of this conservation strategy (Section X). In all General Habitat areas, the following stipulations apply:

1. **Sequence of Decisions for Surface Disturbance Activities:** State-approved projects that result in more than minimal adverse impacts to sage-grouse and/or their habitat will follow the following sequence of decisions:
    a. **Avoid Impacts**. The best way to protect sage-grouse habitat is to avoid impacts that fragment or otherwise damage or destroy sage-grouse habitat. To accomplish this, project developers should consider alternative locations for their project located outside sage-grouse habitat (i.e., consider locations outside General Habitat, outside suitable habitat, and/or in areas already considered disturbed). To meet this provision, the project developer needs to show authorizing agencies rationale as to why a given proposed surface disturbance in sage-grouse habitat is unavoidable.
    b. **Minimize the Size of the Impact**. If impacts to sagebrush habitat cannot be avoided, they should be minimized by limiting the magnitude of the proposed surface disturbance. Reducing impacts can preserve at least portions of the habitats' important functions, including limiting fragmentation. Impacts can be minimized by reducing the project footprint, constructing fewer structures, clustering features, shifting the development pattern to use topographical screening, timing restrictions, or similar measures. In order to meet this requirement, the project developer should be able to show that the project minimizes the impact to sage-grouse habitat, while continuing to meet the purpose of the development.
    c. **Compensation for Impacts**. If project impacts are unavoidable and General Habitat stipulations cannot be met, mitigation measures may be required, following the Mitigation Framework outlined in Section IX.[5]
2. **Surface Occupancy**: Within 0.25 miles of the perimeter of an active sage-grouse lek there will be no surface occupancy (NSO).[6]

[5] A Minority Committee Report has been written for the Compensation for Impacts stipulation, see Appendix H.

[6] A Minority Committee Report has been written for the No Surface Occupancy stipulation for General Habitat, see Appendix H.

3. **Surface Disturbance**: There are no specific surface disturbance limits in General Habitat. However, standard management practices will be required to minimize surface disturbance, such as co-locating new and existing structures. Structures and associated infrastructure will be removed and areas reclaimed to the standards found in item #16 (below) when a project is completed.
4. **Seasonal Use**: As authorized by the permitting agency or agencies, activities (production and maintenance activity exempted) will be prohibited from March 15 – July 15 within 2.0 miles of an active lek where breeding, nesting, and early brood-rearing habitat is present. Allowed maintenance and production activity will not occur between the hours of 4:00 - 8:00 am and 7:00 - 10:00 pm between March 15 – July 15. In areas used as winter concentration areas, exploration and development activity will be prohibited December 1 – March 15. Activities may be allowed during seasonal closure periods as determined on a case-by-case basis. This stipulation may be modified or waived for areas of unsuitable habitat. Any deviations from this stipulation for unsuitable habitat will be determined by the applicable permitting agency in coordination with FWP and the MSGOT.
5. **Noise**: New noise levels, at the perimeter of a lek, should not exceed 40 dBA above ambient noise (existing activity included) from 6:00 pm to 8:00 am during the breeding season (March 15 – July 15). [7] Ambient noise levels should be determined by measurements taken at the perimeter of a lek at sunrise. The MSGOT should follow Wyoming's review and litigation discussion of this stipulation and amend the strategy accordingly.
6. **Pipelines**: Bury pipelines and restore disturbed area with native plant species that are compatible with the surrounding ecological site conditions. Co-locate pipelines with roads, transmission lines, and other linear features when possible.
7. **Overhead Power Lines and Communication Towers**: New overhead power lines and communication towers will be located outside sage-grouse habitat whenever possible. Where avoidance of General Habitat is not possible, develop a route or siting location – with agencies, utilities, and landowners cooperating – that uses topography, vegetative cover, site distance, etc. to effectively protect identified sage-grouse habitat in a cost efficient manner. If siting of overhead power lines is required within 2 miles of important breeding, brood-rearing, and winter habitat, follow the most current version of the Avian Power Line Interaction Committee guidelines to minimize collision potential and raptor perch sites or bury a portion of the line. Site new lines in existing corridors wherever practicable. The pending "Best Management Practices for Electric Utilities in Sage-Grouse Habitat**"** will be added to this Strategy when it is finalized (see Section VI.a.ii.3).
8. **Oil and Gas, Mining**: Encourage development in incremental stages to stagger disturbance and design schedules that include long-term strategies to localize disturbance and recovery within established zones over a staggered time frame. Use off-set mitigation as described in Section IX. Remove facilities and infrastructure and reclaim to the standards found in item #16 (below) when use is completed, including for exploration activities.
9. **Coal Mining**: Conservation measures will be developed for and imposed on coal mining operations on a case-by-case basis via the terms and conditions included in permits issued by MDEQ under the authority of the Montana Strip and Underground Mine Reclamation Act (MSUMRA) and in compliance with the federal Surface Mining Control and Reclamation Act (SMCRA). The Administrative Rule components of the MSUMRA can be accessed at http://www.deq.mt.gov/wqinfo/Laws/StripMiningReclamatio.mcpx. The associated coal permitting rules and standard of the Montana Department of Environmental Quality can be accessed at http://.deq.mt.gov/CoalUranium/Coalpermitting.mcpx. Links to SMCRA and the enabling components of the Code of the Federal Regulations can be found at http://www.osmre.gov/lrg.shtm.

[7] A Minority Committee Report has been written for the Noise stipulation, see Appendix H.

a. Coal mining will first try to avoid operating in sage-grouse habitat.
b. To avoid potentially significant impacts to sage-grouse, coal companies will delineate the area that will be disturbed. They will report baseline vegetation surveys of the permit area, four season sage-grouse baseline surveys of the permit area and periphery along with population density and habitat delineations. They will show pre-mine land use conditions, capacity, productivity, and history (per ARM 17.24.304). The sage-grouse plan (per ARM 17.24.312) will include:
    i. An operations plan (per ARM 17.24.308) that includes a plan to prevent the establishment of, or to effect the control of, noxious weeds (including cheatgrass and Japanese brome) in the proposed permit/amendment area.
    ii. A sage-grouse plan (per ARM 17.24.312) will include:
        1. A plan to minimize disturbances and impacts on sage-grouse and related environmental values during mining and reclamation;
        2. Details on how enhancement of sage-grouse values will be achieved;
        3. Descriptions of sage-grouse enhancement features to be established; and
        4. Statements of impact control measures, management techniques and annual monitoring methods to protect or enhance sage-grouse or habitats identified through the consultation process as important and/or high value.
    iii. A reclamation plan to reclaim mined area back to suitable habitat including (per ARM 17.24.313) will include:

        1. The proposed post-mining land use;
        2. A timetable for each reclamation step;
        3. A map of the proposed post-mining topography;
        4. Demonstration that the post-mining topography can be achieved;
        5. Details on reestablishment of hydrologic balance;
        6. Details on topsoil salvage, protection and replacement methods;
        7. A narrative on the details of the revegetation methods to be applied;
        8. Details on the reclaimed vegetation monitoring to be conducted; and
        9. Mine and reclamation plan reviews by the Service relative to threatened, endangered, and candidate species through Section 7 consultation processes.

    iv. The establishment of vegetation to protect sage-grouse (per 17.24.711) will require that:

        1. Vegetation must be reestablished on the disturbed areas and it must be diverse, effective and permanent;
        2. Vegetation cover must be comprised of native species or approved alternatives and be compatible with post-mine land uses;
        3. Reclamation vegetation must be equivalent in cover to natural vegetation and be capable of self-regeneration and plant succession;
        4. There is compliance with noxious weed restrictions; and
        5. For sage-grouse habitat, shrubs must be established to achieve cover and stocking rates as approved by MDEQ after consultation and approval by MFWP.

    v. Shrub species (per ARM 17.24.717) must be adapted to local conditions and meet the post-mining land use.

vi. Monitoring (per ARM17.24.723) requirements include:

1. Periodic vegetation, soils, and wildlife monitoring with coverage and frequency as approved by MDEQ; and
2. Submittal of detailed monitoring reports to MDEQ.

If monitoring data indicates corrective measures are needed, then adaptive management practices needs to be applied.

The requirements for monitoring shall terminate at the same time that the MDEQ has determined that phase III reclamation, as defined in ARM 17.24.1116(6)(c), has been completed.

vii. Revegetation success criteria (per ARM1724.724) requirements include:

1. Determination of success will be via comparison to un-mined reference areas or through approved technical standards

viii. Vegetation measurements (per ARM17.24.726) requirements include:

1. Use of MDEQ-approved methods;
2. Demonstration of equivalent production, cover and density per MDEQ-approved standards;
3. Minimum shrub density standards; and
4. Demonstration of compliance with noxious weed restrictions.

9. **Bentonite, Scoria, Peat, and Sand and Gravel Mining**[8]: Conservation measures will be developed for and imposed on opencut mining operations on a case-by-case basis via the terms and conditions included in permits issued by MDEQ under the authority of the Montana Opencut Mining Act (83-4-401, MCA) which can be accessed at http://deq.mt.gov/opencut/forms/2013-Title82Chapter4Part4.pdf .

a. Opencut mining operations will first try to avoid operating in sage-grouse habitat.
b. To avoid potentially significant impacts to sage-grouse, opencut mining companies will delineate what area will be disturbed. They will report baseline vegetation surveys of the permit area, four season sage-grouse baseline surveys of the permit area and periphery along with population density and habitat delineations (Per ARM 17.24.222). They will show pre-mine land use conditions, capacity, productivity, and history (per ARM 17.24.217). The sage-grouse plan will include:
   i. An operations plan (per ARM 17.24.218 and 219) that includes a plan to prevent the establishment of, or to effect the control of, noxious weeds (including cheatgrass and Japanese brome) in the proposed permit/amendment area.
   ii. A sage-grouse plan (per ARM 17.24.219) will include:

1. A plan to minimize disturbances and impacts on sage-grouse and related environmental values during mining and reclamation;

[8] A Minority Committee Report has been written for the Bentonite, Scoria, Peat, and Sand and Gravel Mining stipulation, see Appendix H.

2. Details on how enhancement of sage-grouse values will be achieved;
3. Descriptions of sage-grouse enhancement features to be established; and
4. Statements of impact control measures, management techniques and annual monitoring methods to protect or enhance sage-grouse or habitats identified through the consultation process as important and/or high value.

iii. A reclamation plan (per 17.24.219) to reclaim mined area back to suitable habitat will include:

1. The proposed post-mining land use;
2. A timetable for each reclamation step;
3. A map of the proposed post-mining topography;
4. Demonstration that the post-mining topography can be achieved;
5. Details on reestablishment of hydrologic balance;
6. Details on topsoil salvage, protection, and replacement methods;
7. A narrative on the details of the revegetation methods to be applied;
8. Details on the reclaimed vegetation monitoring to be conducted; and
9. Mine and reclamation plan reviews by the Service relative to threatened, endangered, and candidate species through Section 7 consultation processes.

iv. The establishment of vegetation to protect sage-grouse (per 17.24.219) will require that:

1. Vegetation must be reestablished on the disturbed areas and it must be diverse, effective and permanent;
2. Vegetation cover must be comprised of native species or approved alternatives and be compatible with post-mine land uses;
3. Reclamation vegetation must be equivalent in cover to natural vegetation and be capable of self-regeneration and plant succession;
4. There is compliance with noxious weed restrictions; and
5. For sage-grouse habitat, shrubs must be established to achieve cover and stocking rates as approved by MDEQ after consultation and approval by FWP.

v. Shrub species (per ARM 17.24.219) must be adapted to local conditions and meet the post-mining land use.

vi. Monitoring (per ARM17.24.219) requirements include:

1. Periodic vegetation, soils and wildlife monitoring with coverage and frequency as approved by MDEQ; and
2. Submittal of detailed monitoring reports to MDEQ.

If monitoring data indicates corrective measures are needed, then adaptive management practices needs to be applied.

These requirements for monitoring shall terminate upon bond release (per ARM 17.24.203).

vii. Revegetation success criteria (per ARM1724.219) requirements include:

1. Determination of success will be via comparison to un-mined reference areas or through approved technical standards

viii. Vegetation measurements (per ARM17.24.219) requirements include:

1. Use of MDEQ-approved methods;
2. Demonstration of equivalent production, cover and density per MDEQ-approved standards;
3. Minimum shrub density standards; and
4. Demonstration of compliance with noxious weed restrictions.

10. **Other Mining**:
    a. For development drilling or ore body delineation drilling on tight centers, (approximately 50' x 50') the disturbance area will be delineated by the external limits of the development area. Assuming a more widely-spaced disturbance pattern, the actual footprint will be considered the disturbance areas.
    b. Sage-grouse monitoring results will be reported in the mine permit annual report. This document will be given to FWP and the regulating body. Pre-disturbance surveys will be conducted as required by the appropriate regulatory agency.
    c. The number of active mining development areas (e.g., operating equipment and significant human activity) is not to exceed an average of one project per square mile (640 acres).
    d. Surface disturbance and surface occupancy stipulations will be waived within the Core Area when implementing underground mining practices that are necessary to protect the health, welfare, and safety of miners, mine employees, contractors and the general public. The mining practices include but are not limited to bore holes or shafts necessary to: 1) provide adequate oxygen to an underground mine; 2) supply inert gases or other substances to prevent, treat, or suppress combustion or mine fires; 3) inject mine roof stabilizing substances; and 4) remove methane from mining areas. Any surface disturbance or surface occupancy necessary to access the sites to implement these mining practices will also be exempt from any stipulation.
    e. Mining permits will include requirements for mitigation that enhances or promotes genetic diversity, critical habitat, connectivity, and population viability.
11. **Wind Energy**: New wind energy facilities are not recommended within 4.0 miles of the perimeter of active sage-grouse leks. Work cooperatively with agencies, utilities, and landowners to use topography, vegetative cover, site distance, etc. to effectively protect identified sage-grouse habitat. Wind energy projects in sage-grouse habitat will adhere to the *U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines*.
12. **Vegetation Removal**: Vegetation removal as part of permitted activities will be limited to the minimum disturbance required by the project.
13. **Sagebrush Treatments**: Sagebrush eradication and treatment programs aimed at reducing or eliminating sagebrush will be prohibited on state lands, and discouraged on private lands unless those treatments are approved by MSGOT and can be satisfactorily shown to result in no loss of habitat or be beneficial to sage-grouse habitat. The MSGOT should develop specification as to how case-by-case exceptions will be determined, including how a risk assessment will be conducted. The Advisory Council also requests federal agencies prohibit sagebrush eradication and treatment programs aimed at reducing or eliminating sagebrush on lands that they control surface rights. Sagebrush canopy cover should be maintained at optimum levels, as described above. Treatments to enhance sagebrush-grassland will be evaluated based upon the existing habitat quality and the functional level post-

treatment. Restored sagebrush grassland habitats that provide effective cover and food for sage-grouse should be recognized as part of the habitat base; this provision serves as an incentive for restoring and protecting converted habitats.

For government agencies managing sagebrush in General Habitat where conifer encroachment is an issue near leks, land managers should ensure that encroaching conifers are removed within at least 0.6 miles (1,000 meters) of leks. Conifer removal in sage-grouse General Habitat should be done manually, unless other methods can be shown to remove conifers without significantly impacting sagebrush.

14. **Conversion to Agricultural Cropland**: The sage-grouse Advisory Council recommends that the Montana Board of Land Commissioners enact a prohibition of conversion of suitable sage-grouse native range to cropland on state lands, while providing for approved waivers. The State will develop criteria describing when it is appropriate to break unsuitable sage-grouse native range in General Habitat. The Advisory Council also requests that federal agencies prohibit the conversion of native range to cropland on land where they hold surface rights. State and federal agencies are encouraged to work cooperatively with Tribal governments to adopt policies that prevent conversion of sage-grouse habitat to agricultural cropland.
15. **Range Management**: Rangelands on state lands will be managed in accordance with the recommendations in Section X.a, whenever possible, taking into consideration the existing management practices of the lessee on surrounding non-state lands. State agencies are encouraged to collaborate with federal agencies and private landowners to craft grazing management plans that adhere to the concepts included in this document.
16. **Reclamation**: Reclamation should re-establish native grasses, forbs, and shrubs during interim and final reclamation. The goal of reclamation is to achieve cover, species composition, and life form diversity commensurate with the surrounding plant community or desired ecological condition to benefit sage-grouse and replace or enhance sage-grouse habitat to the degree that environmental conditions allow. Seed mixes should include at least two native forbs and two native grasses with at least one native bunchgrass species. Where sagebrush establishment is prescribed, establishment is defined as meeting the standard prescribed in the individual reclamation plan. Landowners should be consulted on the desired plant mix on private lands. The operator is required to control noxious and invasive plant species, including cheatgrass (*Bromus tectorum*) and Japanese brome (*Bromus japonicus*).
17. **Wildfire and Prescribed Burns**: Immediate suppression of wildfire in General Habitat will be prioritized by all fire-fighting units under the jurisdiction of the state. Federal agencies are also strongly encouraged to comply. Prescribed burns should be prohibited in General Habitat unless those prescribed burns are approved by MSGOT and can be satisfactorily shown to result in no loss of habitat or be beneficial to sage-grouse habitat. Burnouts, backfires, and all other public safety measures are appropriate for fighting wildfires.

d) Connectivity Area Stipulations

Connectivity habitat includes those areas that provide important linkages among populations of sage-grouse, particularly between Core Areas or priority populations in adjacent states and across international borders. Within the context of this report, only one sage-grouse connectivity area has been scientifically identified and mapped (see Sage-grouse Conservation Areas map, Section IV). This Montana-Saskatchewan Connectivity Area represents the largest known Greater Sage-Grouse annual migration and is an historic pathway for this important international population of sage-grouse, as well as an important link between two critical sage-grouse Core Areas.

Research continues, based on genetics work, to help better define the composition of priority Connectivity Areas. Connectivity Areas will be identified and additional stipulations may be established by the MSGOT when more informed science becomes available. A public review process on proposed stipulations for Connectivity Areas is required before the stipulations can be adopted by the State. The goal of conserving Connectivity Areas is to maintain those areas that are critical for facilitating movement and genetic exchange among individuals and populations.

Stipulations within this section of the *Montana Strategy* for the Montana-Saskatchewan Connectivity Area, as indicated on the Conservation Area map (Section IV), shall be identical to Core Area stipulations contained within this document. The connectivity stipulations within this strategy apply only to the Montana-Saskatchewan Connectivity Area and future stipulations for additional Connectivity Areas will be determined on a case-by-case basis by MSGOT with technical assistance from FWP.

VII. PERMITTING PROCESS

During the application process to any state agency, project proponents (proponents) must provide a thorough description of their project as it relates to sage-grouse (details such as draft project area, habitat maps, and any other information will help to expedite the project). FWP has a role of consultation, recommendation, and facilitation.

Maximum Density and Surface Disturbance Process: All activities will be evaluated within the context of maximum allowable density (e.g., location and number of well pads) and surface disturbance (disturbance percentages). The maximum density and surface disturbance allowed (see Section VI.A – VI.C) will be analyzed via a standardized mapping tool process conducted by the land management agency on federal land and the project proponent on non-federal (private, state) land. The MSGOT will oversee the implementation of a standardized density and disturbance analysis that follows Wyoming's Density and Disturbance Calculation Tool (DDCT; Appendix E).

Process Deviation: Master development plans proposing alternatives to the Core Area, Connectivity Area, and General Habitat stipulations and corresponding plans for offset mitigation should be evaluated by the MSGOT and approving agency on a case-by-case basis. Development that is not covered by these stipulations may be considered depending on site-specific circumstances. Any proposals for deviations from these stipulations or undefined activities must reasonably demonstrate that the proposed activities will not cause declines in sage-grouse populations in Core Areas.

Exempt Activities: A list of land uses and landowner activities that do not require state agency review or federal oversight is provided in Section VIII.

VIII. EXEMPT ACTIVITIES

The following existing land uses and landowner activities are exempt from compliance with this strategy:

A. Existing animal husbandry practices (including branding, docking, herding, trailing, etc.).
B. Existing farming practices (excluding conversion of sagebrush/grassland to cropland agriculture).

C. Existing grazing operations that meet rangeland health standards or utilize recognized rangeland management practices (for example, allotment management plans, Natural Resource and Conservation Service (NRCS) grazing plans, prescribed grazing plans, etc.).
D. Construction of agricultural reservoirs and **aquatic** habitat improvements less than 10 surface acres and drilling of agriculture and residential water wells (including installation of tanks, water windmills, and solar water pumps) more than 1.0 mile from the perimeter of a lek in Core and Connectivity Areas and more than 0.25 miles from a lek in General Habitat. Within 1.0 mile of a lek in Core and Connectivity Areas and within 0.25 miles of a lek in General Habitat, no review is required if construction does not occur March 15 – July 15 and construction does not occur on the lek. All water tanks shall have bird escape ramps.
E. Agricultural and residential electrical distribution lines more than 1.0 mile from leks in Core and Connectivity Areas and 0.25 miles from leks in General Habitat. Within 1.0 mile of a lek in Core and Connectivity Areas and within 0.25 miles of a lek in General Habitat, no review is required if construction does not occur between March 15 – July 15 and construction does not occur on the lek. Raptor perching deterrents shall be installed on all poles within 1.0 or 0.25 miles, respectively, from leks, if they are proven to be effective according to Avian Power Line Interaction Committee guidance. Other management practices, such as vegetation screening and anti-collision measures, should be applied to the extent possible. Routine maintenance of existing power lines conducted between July 16 – March 14 is also an exempt activity.
F. Pole fences. Wire fences if fitted with visibility markers where high potential for sage-grouse collisions has been documented.
G. Irrigation (excluding the conversion of sagebrush/grassland to new irrigated lands). Tribal lands under existing and future state water compacts.
H. Spring development if the spring is protected with fencing and enough water remains at the site to provide mesic (wet) vegetation.
I. Herbicide and pesticide use except for in the control of sagebrush and associated native forbs. Grasshopper/Mormon cricket control following Reduced Agent-Area Treatments (RAATS) protocol.
J. Existing county road maintenance.
K. Production and maintenance activities associated with existing oil, gas, communication towers, and power line facilities in compliance with approved authorizations.
L. Cultural resource pedestrian surveys.
M. Emergency response.

IX. MITIGATION FRAMEWORK

In Core Areas and General Habitat, the Service's hierarchy shall be adopted as the mitigation framework for implementation of this strategy. In General Habitat, reclamation and off-set mitigation (steps 3 and 4 below) will only be required under specified circumstances. The MSGOT or designated working group will define a mitigation strategy for adoption under this strategy and will reference the forthcoming Service's Compensatory Mitigation Guidance, BLM Mitigation Guidance, and other viable approaches, such as Oregon's Mitigation Framework, the Lesser Prairie Chicken Business Plan, or Habitat Exchanges (see Appendix D). Elements of the framework will include (in order):

1. **Avoid**: Avoid new disturbance to habitat (e.g., exclude wind development from Core Areas).
2. **Minimize**: If avoidance is not possible, minimize the extent of the disturbance to reduce or eliminate negative impacts to sage-grouse and their habitat (e.g., surface disturbance limits, timing stipulations, lek buffers, etc.).
3. **Reclamation**: Reclaim, restore and enhance habitat that is disturbed (e.g., reclamation after mining activities or pipeline construction). Typically, on-site reclamation is implemented by the entity responsible for the impact.
4. **Off-set mitigation**: When temporary or permanent impacts will occur, protect, restore, and enhance important sage-grouse habitat within a defined service area. Off-set mitigation can be used to reduce the existing human footprint that will allow for additional development activities in the future, especially in those areas already heavily impacted by development. Mitigation ratios will be developed by the MSGOT; those ratios will differ depending on the nature and location of a disturbance. A variety of tools may be used for off-set mitigation such as conservation banks, habitat exchanges, and approved conservation plans. Mitigation will occur prior to the impacts that are being mitigated. The standards that successful mitigation must meet (functionality demonstrated by sage-grouse use) will be defined by the MSGOT. Off-set mitigation would be implemented within a service area and prioritized as:
    a. Within impacted Core Area;
    b. Within Core Areas predicted to be at high risk of conversion from grazing to farming or non-native grasses or forbs;
    c. Within Connectivity Areas; then
    d. Within Core Areas or General Habitat adjacent to Core Areas with good restoration potential.

X. MANAGEMENT RECOMMENDATIONS (non-development activities)

The following recommendations outline voluntary management practices designed on private lands and regulatory practices on state lands to maintain or enhance sage-grouse populations and habitats for non-development activities. Some of these practices may be required as part of a conservation plan and/or serve as mitigation tools. Whenever possible, adherence to these recommendations is encouraged.

The Advisory Council encourages the Governor to direct the Montana Department of Natural Resources and Conservation to develop additional lease evaluation criteria to be used for school trust grazing lands in Core Areas and the Montana-Saskatchewan Connectivity Area. The criteria should establish rangeland characteristics that should be considered and evaluated, with a goal of ensuring responsible grazing management practices that are consistent with maintaining and improving habitat for sage-grouse, while still providing for working rangelands.

a) Range Management

Livestock grazing is the most widespread type of land use across the sagebrush biome. Although improper livestock management, as determined by local ecological conditions, may have negative impacts on sage-grouse seasonal habitats, proper livestock management is a critical tool for providing and maintaining high quality sage-grouse habitat. Range management structures and fences necessary for proper grazing management can also be placed or designed to be neutral or beneficial to sage-grouse. The following recommendations are intended to support grazing management as a tool for providing quality sage-grouse habitat.

a. Grazing management: The State of Montana will collaborate with relevant federal agencies on appropriate site-based action to achieve sage-grouse conservation objectives outlined herein.
    i. On private lands, landowners in sage-grouse Core, General and Connectivity Areas are encouraged to adopt the Sage-Grouse Initiative grazing practices and range management recommendations, including:
        1. Rotating livestock to different pastures, while resting others to establish a diversity of habitat types.
        2. Changing seasons of use within pastures to ensure all plants have the ability to reproduce.
        3. Leaving residual cover (grass from the past season) to increase hiding and nesting cover for sage-grouse.
        4. Managing the frequency and intensity of grazing to sustain native grasses, wildflowers, and shrubs.
        5. Managing livestock access to water to ensure healthy livestock and healthy watersheds.
    ii. The State of Montana will collaborate with appropriate federal agencies in defining a framework for evaluating situations to determine if a causal relationship exists between improper grazing (by wildlife or livestock) and Greater Sage-Grouse conservation objectives where conservation objectives are not being achieved on federal land.
    iii. On state lands, the Advisory Council recommends that DNRC work cooperatively with lessees to maintain healthy sagebrush shrub, native grass, and forb communities on state grazing lands in Core and Connectivity Areas. For leases that fail to meet DNRC standards, staff should consider corrective alternatives such as: development and implementation of grazing or weed management plans; adjustment or rotating season of use; requiring annual reporting of livestock numbers and period of use; or shorter lease terms. Follow-up monitoring should be conducted as determined necessary and as workloads allow. If a lessee fails to implement or follow required corrective actions, lease non-renewal or cancellation should be considered.
    iv. Given limited agency resources, priority should be given to Core Areas and then sage-grouse habitats adjacent to Core Areas.
b. Range structures:
    i. Range management structures should be designed and placed to be neutral or beneficial to sage-grouse.
    ii. Structures that are currently contributing to negative impacts to either sage-grouse or their habitats should be removed or modified to remove the threat.
c. Fences:
    i. Mark fences that are in high risk areas for collision with permanent flagging or other suitable device to reduce sage-grouse collisions.
    ii. Identify and remove unnecessary fences.
    iii. Placement of new fences and livestock management facilities (including corrals, loading facilities, water tanks, and windmills) should consider their impact on sage-grouse and, to the extent practicable, be placed at least 0.6 miles from active leks.

b) Wildfire Response

Wildfire temporarily or permanently eradicates sagebrush habitat. Fire, both lightning-caused and human-caused, is a primary risk to sage-grouse, not only by deteriorating and often eliminating habitat, but also by

increasing future fire frequencies through the promotion of fire-prone vegetation, especially invasive grasses. The replacement of native perennial bunchgrass communities by invasive annuals is a primary contributing factor to increasing fire frequencies in the sagebrush ecosystem. The following recommendations are designed to reduce the potential for fire in sagebrush systems, suppress fires that do ignite, and (re)establish sagebrush and native species in areas that do burn. State agencies should be directed to adopt these recommendations to the maximum extent possible:

a. Prevention (Pre-fire):
    i. Broaden DNRC, Volunteer Fire Departments, and all fire-fighting unit awareness by providing maps of sage-grouse habitat and copies of the *Montana Strategy*.
    ii. Place sage-grouse habitat maps in every county fire-fighting office.
    iii. Prioritize eradication of cheatgrass and Japanese brome and/or address management practices, acquire funding for appropriate herbicide treatments, and explore biological controls.
    iv. Examine feasibility of establishing fire breaks outside Core Areas if possible.
    v. During high-risk fire seasons, reduce risk of human caused fires as authorized in 7-33-2212 MCA, 77-1-804 MCA and other applicable statutes.
b. Suppression (Fire):
    i. Prioritize initial attack with the goal of immediate suppression in Core Areas, and secondarily in Connectivity Areas and General Habitat, including use of fire retardants and other appropriate tools.
        1. Improve coordination between state agencies (e.g., DNRC) and Montana Association of Counties on all fire suppression activities.
        2. Request federal partners mirror the initial attack program of DNRC.
    ii. Prioritize outreach from DNRC to private operators regarding initial attack in sagebrush areas.
    iii. Review liability of Good Samaritan role of private operators/private landowners.
    iv. Carefully consider the use of backfires within Core and Connectivity Areas and General Habitat to minimize the potential for escape and further damage to sage-grouse and sagebrush habitats (tactical decision).
    v. Identify and establish defensible fire lines in areas where: (i) effectiveness is high, (ii) fire risk is likely, and (iii) negative impacts from these efforts (e.g., fragmentation) are minimized. Avoid use of any vegetative stripping in healthy, unfragmented habitats, unless fire conditions and local ecological conditions so warrant.
c. Rehabilitation (Post-fire):

    i. The State of Montana will request cooperation and collaboration from federal agencies on rehabilitation projects after wildfire.
    ii. Use available tools to prevent (re)establishment of cheatgrass and Japanese brome, as necessary.
    iii. Ensure most successful restoration strategies are being implemented that (re)establish native sage-grouse habitat; develop handbook of methods for most appropriate restoration strategies.
    iv. Identify funding options for restoration implementation.
    v. Use locally available seeds where it is most likely to be effective and in areas of high need.
    vi. Prioritize Core Areas over sagebrush areas outside of Core Areas for restoration efforts.

vii. Verify that all seeding in Core Areas is certified by an independent contractor as weed-free and free of cheatgrass and Japanese brome.
viii. Establish a seed bank managed by state, if viability of seeds can be maintained; evaluate use of local seed sources (i.e., seed orchards).
ix. Ensure post-fire monitoring for successful reestablishment of sagebrush communities.

c) Invasive Plant Species

Exotic annual grasses and other invasive plants alter habitat suitability for sage-grouse by reducing or eliminating native forbs and grasses essential for food and cover. Non-native annual grasses also facilitate an increase in mean fire frequency. The following management recommendations are designed to control the spread of invasive species and reduce or eliminate established non-natives to provide better quality habitat for sage-grouse. State agencies should be directed to adopt these recommendations to the maximum extent possible.

a. Retain all remaining large intact sagebrush patches, particularly at low elevations.
b. Reduce or eliminate disturbances that promote the spread of invasive plant species, such as reducing fires to a "normal range" of fire activity for the local ecosystem, employing grazing management that maintains the perennial native grass and shrub community appropriate to the local site, reducing impacts from any source that allows for the invasion by these species into undisturbed sagebrush habitats, and precluding the use of treatments intended to remove sagebrush.
c. Restore altered ecosystems by reducing non-native invasive plants to levels that do not put the area at risk of conversion if a catastrophic event were to occur.
d. Recommend to Montana Department of Agriculture that Japanese brome (*Bromus japonicus*) be listed as a regulated species (priority #3) in Montana.
e. Prioritize eradication of cheatgrass and Japanese brome and/or address management practices, acquire funding for Plateau treatments, and explore biological controls.

d) Predators

The Advisory Council believes predators can be a threat to sage-grouse conservation. Although predation is one of five specific ESA listing criteria, the Service did not identify predation as a significant threat to sage-grouse populations in their 2010 decision to list the species as warranted for protection under the Endangered Species Act, but precluded by higher priorities. Predators are part of the ecosystem and they have always preyed upon sage-grouse. Habitat fragmentation, infrastructure, weather, urban development, and improper grazing can increase predation pressure on sage-grouse. The Advisory Council believes anthropogenic actions have, in places, altered the historic predator-prey relationship with sage-grouse and that this alteration is at least partially responsible for diminishment of some local sage-grouse populations. The Advisory Council also believes good quality and quantity of habitat reduces predation pressure and that quality habitat is essential for sage-grouse population stability. While predator control may not be a long-term solution to a general range-wide decline in populations of sage-grouse, it can be an effective tool to gain increased survival of specific populations. Predator management can provide important and beneficial short-term relief to localized decreases in sage-grouse populations. While federal laws, such as the Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act, restrict options for managing avian predators, the Advisory Council recommends predator control be managed cooperatively by Animal and Plant Health Inspection Service (U.S. Department of Agriculture) Wildlife Service, FWP, and the Service.

Actions the Advisory Council believes should be taken within this strategy include:

a. Eliminate or minimize external food sources for ravens and small mammals, particularly dumps, landfills, waste transfer facilities, and road kill.
b. Remove abandoned farmhouses, barns, building debris piles, and other structures that harbor mammalian predators.
c. Provide adequate buffers (4.0 miles from leks) between placement of new tall structures and nesting and brood-rearing habitat to minimize influence of predators. Bury power lines, when feasible.
d. Remove abandoned tall structures, such as fence posts, power line poles, and cell towers that can serve as perching structures for aerial predators.
e. Apply habitat management practices (e.g., grazing management and vegetation treatments) that improve sage-grouse nesting habitat thus decreasing the effectiveness of predators.
f. Develop strategies for specific, selective, and if needed, assertive short-term predator control based on biological assessments appropriate to local conditions, especially in instances where a sage-grouse population has declined from exotic conditions, such as West Nile Virus.
g. Request the State use localized predator control when permanent anthropogenic features are documented to contribute to unnatural numbers of predators that are reducing local sage-grouse populations, and where the impacts from these permanent features will not be eliminated or minimized enough to stabilize the local sage-grouse population.
h. Research and monitor the effects of predator control to determine causal connections with Greater Sage-Grouse survival; modify control strategies accordingly.
i. When research on sage-grouse population dynamics confirms that a local sage-grouse population is declining and predators may be a cause for the decline, undertake a public-private cooperative research project, under the direction of FWP and MSGOT. This research project should measure the level of predation and its impact on local sage-grouse population stability and include a public outreach/involvement component to landowners, hunters, bird recreationists, local government, and other interested parties. The research should examine sage-grouse population dynamics, anthropogenic changes, conifer encroachment and predator populations and impacts, and determine if creation of and implementation of a predator plan would assist in long-term stability of specific and localized sage-grouse populations.
j. Encourage local government to help with small mammal predator control during sage-grouse breeding, nesting, and brood-rearing season.

e) Disease (West Nile virus)

West Nile virus was a new source of mortality for sage-grouse, particularly in low and mid-elevation populations, from 2003 – 2007. Elimination of anthropogenic-created habitat for the mosquito vectors of West Nile virus is an important conservation measure for sage-grouse.

a. Construct ponds to reduce prevalence of mosquitoes that transmit West Nile virus per BLM guidance (Appendix F).
b. Manage ponds to reduce prevalence of mosquitoes that transmit West Nile virus.
c. Other management actions to reduce prevalence of mosquitoes that transmit West Nile virus include erection of bat houses, and managing containers, wood piles, and tire storage facilities that harbor breeding or overwintering mosquitoes and/or larvae.

d. If there is a West Nile virus outbreak that significantly reduces sage-grouse populations, the MSGOT should look at a local site-specific strategy for enhancing the sage-grouse population.

f) Hunting

Hunting sage-grouse in Montana is a regulated activity that involves scientific population monitoring and the ability to adjust seasons as appropriate, including season dates, season length, bag limit, and area restrictions.

a. Hunting will continue to be managed by FWP through the Montana Fish and Wildlife Commission.
b. A framework of hunting bag limits and area closures was originally outlined in the *Management Plan and Conservation Strategies for the Greater Sage-Grouse in Montana – Final.* FWP will continue to annually monitor sage-grouse population fluctuations and work with the Commission to adopt appropriate hunting season regulations.
c. FWP will re-evaluate and further adapt this season-setting approach including re-examining closure (and opening) criteria, hunting districts, season length, and season dates. Establishment of hunting districts/zones will be considered during the annual season setting process.

XI. IMPLEMENTATION

a) **Authority of Executive Order**: It is the Advisory Council's recommendation that the Governor of the State of Montana issue an Executive Order that requires full compliance with this strategy by all state agencies. This includes actions conducted by the Montana Department of Environmental Quality, Montana Department of Transportation, Department of Natural Resource and Conservation and associated governing boards, Montana Fish, Wildlife and Parks, and other state agencies. The Advisory Council's goal is this strategy can be coordinated with federal land managers.
b) **Existing Regulatory Mechanisms**: The stipulations in this strategy apply to all activities within sage-grouse habitat that require a state permit or lease. Permits affected might include, but are not limited to, those issued under the Major Facilities Siting Act, Board of Oil and Gas Conservation, Water Quality Discharge Permits, and State Trust Land leases. All new development projects in Core Areas will be required to work through the standardized disturbance analysis process that will be developed by the MSGOT.
c) **Non-regulated activities**: State agencies shall adhere to the stipulations and management recommendations outlined in this strategy when providing consultation, technical, financial, or other assistance for non-regulated activities (e.g., livestock grazing, wind development).
d) **Montana Sage-grouse Oversight Team (MSGOT):** A Montana Sage-grouse Oversight Team (MSGOT) shall be appointed by Governor Bullock within 60 days of issuance of an Executive Order. The MSGOT will be responsible for providing oversight for the implementation of the *Montana Strategy*. MSGOT duties will include, but are not limited to, developing the surface disturbance analysis process and overseeing its implementation, identifying additional connectivity areas based on emerging science, approving deviations from this strategy, addressing policy questions that arise from implementation, identifying adequate mitigation strategies, and integrating new science and other information into the strategy. MSGOT shall consist, at a minimum, of executive level representatives from state and federal agencies, tribes, conservation groups, and local government; and from the oil and gas, coal mining, mining (non-coal), electrical distribution and transmission, and agriculture industries. The Advisory Council recommends that the MSGOT meet at least on a quarterly basis. The MSGOT shall provide all

permit-related recommendations to agencies and issue all permit-related decisions within 120 days of receiving completed applications.

e) Compliance Monitoring and Reporting: State agencies issuing permits or leases shall be responsible for ensuring compliance with the stipulations in this strategy. The MSGOT will establish a compliance monitoring framework to track projects. This framework will allow for annual reporting to the Service and will correspond with their forthcoming conservation metrics database.

f) **Staffing Required for Implementation:** The State of Montana shall commit to providing funding to support at least 6 new Full-Time Equivalent (FTE) positions as outlined below. These positions will be located in a state agency or academic institution, to be determined. The State of Montana shall also commit to fund travel and other related expenses incurred by representatives to the MSGOT.

i) Mapping application development – 0.5 FTE (new, temporary).
ii) Database development and analysis tool; database administration – 2 FTE (new, permanent).
iii) Disturbance calculation and compliance; project review – 2.5 FTE (new, permanent). Capacity needs may vary depending on the number and complexity of projects proposed.
iv) MSGOT and Policy Review; supervision of project reviews – 1 FTE (new, permanent) to serve as MSCOT coordinator.
v) Compliance Monitoring and Reporting – fulfilled by MSGOT coordinator.

g) **Population Monitoring and Additional Science Needs:** The Council recognizes that the MSGOT may identify additional monitoring and research projects necessary for the conservation of sage-grouse and ongoing implementation of this strategy. Staff and funding required for newly identified needs will likely exceed existing staff capacity and will require additional funding support from the State of Montana. This support will be in addition to the 6 FTE request in Section XI.f.

APPENDIX A: Governor Bullock's Executive Order 2-2013

STATE OF MONTANA
OFFICE OF THE GOVERNOR
EXECUTIVE ORDER No. 2-2013

Establishing a Greater Sage-grouse Habitat Conservation Advisory Council

WHEREAS, the Greater Sage-grouse (*Centrocercus urophasianus*) is an iconic species that inhabits much of the sagebrush-grassland habitats in Montana;

WHEREAS, the State of Montana currently enjoys viable and widespread populations of the species, the second largest abundance of Greater Sage-grouse among western states;

WHEREAS, the United States Fish and Wildlife Service (USFWS) has determined that the Greater Sage-grouse species is warranted for listing as a threatened or endangered species under the Endangered Species Act (ESA), but is precluded by other higher priority species;

WHEREAS, the United States District Court for the District of Idaho ruled on February 2, 2012 that the USFWS must re-evaluate the status of the Greater Sage-grouse by September 30, 2015;

WHEREAS, the United States Secretary of the Interior has invited Montana and other western states impacted by the potential listing of the Greater Sage-grouse to develop state-specific regulatory mechanisms to conserve the species and preclude the need to list under the ESA;

WHEREAS, the development of a state-specific strategy in Montana will be critical in demonstrating to the USFWS that the species does not warrant federal protection under the ESA;

WHEREAS, the Bureau of Land Management (BLM) and U.S. Forest Service (USFS) are currently implementing national Instruction Memoranda to guide interim management of public lands and to develop Greater Sage-grouse conservation measures for incorporation into the agencies' respective land use plans;

WHEREAS, the development of a state-specific strategy will enable the BLM and USFS to incorporate relevant elements from the strategy into their land use plans and environmental analyses;

WHEREAS, approximately half of Greater Sage-grouse habitat in Montana involves private property, and maintaining the species will require effective conservation strategies across property ownerships;

WHEREAS, the State of Montana has management authority over Greater Sage-grouse populations in Montana;

WHEREAS, the State of Montana in collaboration with stakeholders developed and adopted a state Greater Sage-grouse plan in 2004, pertaining to sage-grouse population responses to large-scale changes in habitat;

WHEREAS, the State of Montana has identified and will update, as appropriate, Greater Sage-grouse Core Areas, which include priority habitats for conservation;

WHEREAS, it is in the interest of this State to bring stakeholders and experts together to recommend a course of action that will provide for conservation measures sufficient to preclude the need to list the Greater Sage-grouse;

WHEREAS, the listing of the Greater Sage-grouse could have a significant adverse effect on the economy of the State of Montana; and

WHEREAS, it is appropriate and beneficial to establish the Governor's Greater Sage-grouse Habitat Conservation Advisory Council ("Council").

PURPOSE

1. The purpose of the Council is to gather information, furnish advice, and provide to the Governor recommendations on policies and actions for a state-wide strategy to preclude the need to list the Greater Sage-grouse under the ESA, by no later than January 31, 2014.

DUTIES

2. In preparing its recommendations, the Council shall review the 2004 Montana Sage-grouse Conservation Plan, BLM Interim Memorandum Guidance, National Technical Team Report, relevant scientific information, and other existing strategies and information.
3. The recommendations of the Council must be based on the following objectives and/or criteria:

    a. Conserve the species and its habitat based on the most current scientific information, with input from a variety of stakeholders, and maintaining public trust management of Greater Sage-grouse and predictable and multiple uses of private, state, and public lands;
    b. Tailor the management recommendations to the importance of the habitat, considering the interests of the State;
    c. Address the following primary threats to the species as identified by the USFWS:

        i. Habitat fragmentation caused by energy development and mineral extraction;
        ii. Conversion of habitat for agriculture and urbanization; and
        iii. Lack of effective regulatory mechanisms to conserve Greater Sage-grouse habitats.

d. Address the secondary threats to the species as identified by the USFWS, as appropriate:

   i. Disease/West Nile virus;
   ii. Management issues related to livestock grazing;
   iii. Collisions with fences and power lines;
   iv. Prescribed fire and range treatments; and
   iv. Conifer expansion.

e. Identify opportunities for pro-active Greater Sage-grouse habitat conservation projects;

f. Recognize, encourage, and incentivize land use practices that are actively maintaining or improving Greater Sage-grouse habitat as evidenced by improvements in habitat quality and quantity, and monitoring which indicates stable/increasing populations of the species; and

g. Identify a long-term adaptive management structure that engages landowners and local working groups, and ensures the effective implementation of these recommendations.

4. The duties of the Council are solely advisory.

5. The Council will provide its recommendations to the Governor no later than January 31, 2014.

COMPOSITION AND ORGANIZATION

6. The Council members shall be appointed by and serve at the pleasure of the Governor until January 31, 2014.

7. The Council shall be comprised of 8-12 members, representing the various geographic areas, non-governmental organizations, and industries of the State within the range of the species.

8. The Office of the Governor will assist in staffing this Council. My office may rely on the services of other Governors or any member of my Cabinet in staffing this Committee.

9. The Council members shall be appointed from the following categories:

   a. Agriculture and Ranching;
   b. Conservation and Sportsmen;
   c. Energy, Mining, and Power Transmission;
   d. Tribal;
   e. Local Government; and

f. Legislature.

10. The Council may establish procedural bylaws to aid it in the performance of its duties.

11. The Council may establish subcommittees comprised of members of the Committee to aid it in the performance of its duties.

12. The Council is attached to the Department of Fish, Wildlife and Parks for administrative purposes. The Director of the Montana Department of Fish, Wildlife and Parks shall retain an independent contractor to provide assistance to the Council.

13. Local Greater Sage-grouse working groups are encouraged to continue in their efforts to conserve the sage-grouse in the State of Montana and are advised to participate in the development of the recommendations here ordered.

OTHER

14. The Council may request consultation, information, and technical expertise from Directors or their designees of state agencies, including but not limited to, the members of the Montana Legislature, the Montana Department of Fish, Wildlife, and Parks, the Montana Department of Natural Resources and Conservation, the Montana Department of Agriculture, the Montana Department of Environmental Quality, and the Montana Board of Oil and Gas, regarding: the biological needs of the species; activities on state, federal and private lands potentially impacted by the status of the species; and, requirements of the ESA and other relevant statutory requirements.

15. The Council may request comments, information, and technical expertise from such other sources as it deems necessary, including the university system, federal agencies, and members of the public including members of existing local sage-grouse working groups.

COMPENSATION

16. Council members eligible for compensation under section 2-15-122(5) MCA, shall be compensated in an amount to be determined by the Director of the Department of Fish, Wildlife and Parks, not to exceed $50 for each day in which the member is actually and necessarily engaged in the performance of Council duties. All Council members shall be reimbursed for travel expenses pursuant to section 2-15-122(5), MCA.

DURATION

17. The Council shall cease to exist on January 31, 2014.

NOW, THEREFORE, I, STEVE BULLOCK, Governor of the State of Montana, by the authority vested in me by under the laws and Constitution of the State of Montana, do hereby establish the Governor's Greater Sage-grouse Habitat Conservation Advisory Council.

This Order is effective immediately.

Given under my hand and the Great Seal of the State of Montana, this 20th day of February, 2013.

STEVE BULLOCK, Governor

ATTESTED:

LINDA McCULLOCH, Secretary of State

APPENDIX B: House Bill 580

AN ACT PROVIDING AN APPROPRIATION FOR THE GREATER SAGE-GROUSE HABITAT CONSERVATION ADVISORY COUNCIL ESTABLISHED BY THE GOVERNOR; AND PROVIDING AN IMMEDIATE EFFECTIVE DATE.

WHEREAS, the greater sage-grouse (Centrocercus urophasianus) is an iconic species that inhabits much of the sagebrush-grassland habitats in Montana; and

WHEREAS, the State of Montana currently enjoys viable and widespread populations of the species, the second largest abundance of greater sage-grouse among western states; and

WHEREAS, the United States Fish and Wildlife Service (USFWS) has determined that the greater sage-grouse species is warranted for listing as a threatened or endangered species under the Endangered Species Act (ESA) but is precluded by other higher priority species; and

WHEREAS, the United States District Court for the District of Idaho ruled on February 2, 2012, that the USFWS must reevaluate the status of the greater sage-grouse by September 30, 2015; and

WHEREAS, the United States Secretary of the Interior has invited Montana and other western states impacted by the potential listing of the greater sage-grouse to develop state-specific regulatory mechanisms to conserve the species and preclude the need to list it under the ESA; and

WHEREAS, the development of a state-specific strategy in Montana will be critical in demonstrating to the USFWS that the species does not warrant federal protection under the ESA; and

WHEREAS, the United States Bureau of Land Management (BLM) and the United States Forest Service (USFS) are currently implementing national instruction memoranda to guide interim management of public lands and to develop greater sage-grouse conservation measures for incorporation into the agencies' respective land use plans; and

WHEREAS, the development of a state-specific strategy will enable the BLM and USFS to incorporate relevant elements from the strategy into their land use plans and environmental analyses; and

WHEREAS, approximately half of greater sage-grouse habitat in Montana involves private property, and maintaining the species will require effective conservation strategies across property ownerships; and

WHEREAS, the State of Montana has management authority over greater sage-grouse populations in Montana; and

WHEREAS, the State of Montana in collaboration with stakeholders developed and adopted a state greater sage-grouse plan in 2004, pertaining to sage-grouse population responses to large scale changes in habitat; and

WHEREAS, the State of Montana has identified and will update, as appropriate, greater sage-grouse core areas, which include priority habitats for conservation; and

WHEREAS, it is in the interest of this state to bring stakeholders and experts together to recommend a course of action that will provide for conservation measures sufficient to preclude the need to list the greater sage-grouse; and

WHEREAS, the listing of the greater sage-grouse could have a significant adverse effect on the economy of the state of Montana; and

WHEREAS, it is appropriate and beneficial to fund the Greater Sage-Grouse Habitat Conservation Advisory Council established by Governor Steve Bullock in Executive Order No. 2-2013.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MONTANA:

Section 1. Appropriation. (1) There is appropriated a total of $75,000 from the state special revenue fund oil and gas ERA account to the governor's office for the bienniums beginning July 1, 2011, and July 1, 2013, for the purpose of funding the greater sage-grouse habitat conservation advisory council established by the governor in Executive Order No. 2-2013.

(2) The legislature recommends that the greater sage-grouse habitat conservation advisory council develop its proposed recommendations on policies and actions for a statewide strategy to preclude the need to list the greater sage-grouse under the Endangered Species Act of 1973 by October 31, 2013, so that the public may review and comment on the proposed recommendations and the council may make any necessary changes prior to the recommendations being delivered to the governor by the established deadline of January 31, 2014.

Section 2. Effective date. [This act] is effective on passage and approval.

- END -

APPENDIX C: Sage-grouse Habitat Advisory Council representatives

Name	Street/PO Box	City	Zip	Email
Mr. Paul Callahan	3015 Martinwood	Missoula	59802	pcallahan@swca.com
Rep. Pat Connell	567 Tiffany Lane	Hamilton	59840	connell4HD87@yahoo.com
Ms. Janet Ellis	703 Breckenridge St	Helena	59601	jellis@mtaudubon.org
Mr. Gary Forrester	2527 Gardiner	Billings	59101	Gary.forrester@mduresources.com
Mr. Jay Gore	127 Crestview	Missoula	59803	tealdux@hotmail.com
Sen. Brad Hamlett	PO Box 49	Cascade	59421	senatorhamlett@gmail.com
Mr. Robert Lee	P O Box 1123	Forsyth	59327	rlee@rosebudcountymt.com
Mr. Glenn Marx	P O Box 892	Helena	59624	montanamalt@q.com
Rep. Bill McChesney	316 Missouri Ave	Miles City	59301	macwilly66@hotmail.com
Curtis Monteau, Jr.	5627 Lower Box Elder Rd	Box Elder	59521	curtismonteau@yahoo.com
Rep. Ray Shaw	251 Bivens Creek Road	Sheridan	59749	shaw@3rivers.net
Mr. Carl Wambolt	3300 Graf #86	Bozeman	59715	cwambolt@montana.edu

APPENDIX D: Definitions

Suitable Habitat – is within the mapped occupied range of sage-grouse, and:

1) Generally has 5% or greater canopy cover of sagebrush, where "sagebrush" includes all species and sub-species of the genus *Artemisia*. This excludes mat-forming sub-shrub species such as *A. frigida* (fringed sagewort) and *A. pedatifida* (birdfoot sage). Sagebrush canopy cover may be less than 5% when complimented by other shrubs suitable for sage-grouse cover requirements; OR
2) Is moist meadow containing forbs suitable for brood-rearing within 300 yards of suitable sagebrush cover (as defined above). Introduced species such as alfalfa may be very important on these sites where native forbs are not available.

Vegetation monitoring to determine habitat suitability will follow the Habitat Assessment Framework, available at http://www.blm.gov/pgdata/etc/medialib/blm/wo/Communications_Directorate/public_affairs/sage-grouse_planning/documents.Par.23916.File.dat/SG_HABITATASESSMENT0000669.pdf

Unsuitable Habitat – is land within the historic range of sage-grouse that did not, does not, nor will not provide sage-grouse habitat due to natural ecological conditions such as badlands or canyons.

Surface Disturbance – includes any conversion of formerly suitable habitat to grasslands, croplands, mining, well pads, roads, or other physical disturbance that renders the habitat unusable for sage-grouse.

Lek Status -

- Active - Data supports existence of lek. Supporting data defined as 1 year with 2 or more males lekking on site followed by evidence of lekking within 10 years of that observation.
- Inactive - A confirmed active lek with no evidence of lekking for the last 10 years. Requires a minimum of 3 survey years with no evidence of lekking during a 10 year period.
- Extirpated - Habitat changes have caused birds to permanently abandon a lek as determined by the biologists monitoring the lek.
- Unconfirmed - Possible lek. Sage-grouse activity documented. Data insufficient to classify as active status.

Valid Existing Right(s) – legal "rights" or interest that are associated with land or mineral estate and that cannot be divested from the estate until that interest expires, is relinquished, or acquired.

Habitat Exchange - an efficient, effective approach to wildlife conservation in America, developed in partnership by private landowners, industry, environmental groups, academics and government. In a Habitat Exchange, landowners and industry are given financial incentives to conserve wildlife habitat. Landowners benefit by earning revenue from credit sales and developers benefit by meeting conservation objectives or regulatory requirements with less red tape.

APPENDIX E: Wyoming's Density and Disturbance Calculation Tool Process

The Montana Sage-grouse Oversight Team will oversee the implementation of a standardized disturbance analysis in Montana that follows Wyoming's Density and Disturbance Calculation Tool (described below).

All activities will be evaluated within the context of maximum allowable disturbance (disturbance percentages, location and number of disturbances) of suitable sage-grouse habitat within the area affected by the project. The maximum disturbance allowed will be analyzed via a Density/Disturbance Calculation Tool (DDCT) process conducted by the Federal Land Management Agency on federal Land and the project proponent on non-federal (private, state) land. Unsuitable habitat occurring within the project area will not be included in the disturbance cap calculations.

1. Density/Disturbance Calculation Tool (DDCT): Determine all occupied leks within a core population area that may be affected by the project by placing a 4 mile boundary around the project boundary (as defined by the proposed area of disturbance related to the project). All occupied leks located within the 4 mile boundary and within a core population area will be considered affected by the project.

   A four-mile boundary will then he placed around the perimeter of each affected lek. The core population area within the boundary of affected leks and the 4 mile boundary around the project boundary creates the DDC'I' for each individual project. Disturbance will be analyzed for the DDCT as a whole and for each individual affected lek within the DDCT. Any portion of the DDCT occurring outside of Core Area will be removed from the analysis.

   If there are no affected leks within the 4 mile boundary around the project boundary, the DDCT area will be that portion of the 4 mile project boundary within the core population area.

2. Disturbance analysis: Total disturbance acres within the DDCT will he determined through an evaluation of:
   i. Existing disturbance (sage-grouse habitat that is disturbed due to existing anthropogenic activity and wildfire).
   ii. Approved permits (that have approval for on the ground activity) not yet implemented.

3. Habitat Assessment:
   a. A habitat assessment is not needed for the initial DDCT area provided that the entire DDCT area is considered suitable.
   b. A habitat assessment should be conducted when the initial DDCT indicates proposed project will cause density/disturbance thresholds to be exceeded, to see whether siting opportunities exist within unsuitable or disturbed areas that would reduce density/disturbance effects.
   c. When a habitat assessment is conducted it should create a baseline survey identifying:
      i. Suitable and unsuitable habitat within the DDCT area
      ii. Disturbed habitat within the DDCT area
      iii. Sage-grouse use of suitable habitat (seasonal, densities, etc.)
      iv. Priority restoration areas (which could reduce the 5% cap)
         A. Areas where plug and abandon activities will eliminate disturbance
         B. Areas where old reclamation has not produced suitable habitat
      v. Areas of invasive species
      vi. Other assurances in place (CCAA, easements, habitat, contracts, etc.)

4. Determination of existing and allowable suitable habitat disturbance: Acres of disturbance within suitable habitat divided by the total suitable habitat within the DDCT area times 100 equals the percent of disturbed suitable habitat within the DDCT area. Subtracting the percentage of existing disturbed suitable habitat from 5% equals new allowable suitable habitat disturbance until plant regeneration or reclamation reduces acres of disturbed habitat within the DDCT area.

APPENDIX F: BLM guidance for pond construction

The following guidance is copied from A Report on National Sage-grouse Conservation Measures, Appendix C: BMPs for how to make a pond that won't produce mosquitoes that transmit West Nile virus (from Doherty (2007)). The entire report is available at http://sagemap.wr.usgs.gov/docs/rs/GrSG%20Tech%20Team%20Report.pdf.

The following are seven distinct site modifications that if adhered to, would minimize exploitation of Coal Bed Natural Gas ponds by *Culex tarsalis*:

1. Increase the size of ponds to accommodate a greater volume of water than is discharged. This will result in un-vegetated and muddy shorelines that breeding *Cx. tarsalis* avoid (De Szalay and Resh 2000). This modification may reduce *Cx. tarsalis* habitat but could create larval habitat for *Culicoides sonorensis*, a vector of blue tongue disease, and should be used sparingly (Schmidtmann et al. 2000). Steep shorelines should be used in combination with this technique whenever possible (Knight et al. 2003).
2. Build steep shorelines to reduce shallow water (>60 cm) and aquatic vegetation around the perimeter of impoundments (Knight et al. 2003). Construction of steep shorelines also will create more permanent ponds that are a deterrent to colonizing mosquito species like *Cx. tarsalis* which prefer newly flooded sites with high primary productivity (Knight et al. 2003).
3. Maintain the water level below that of rooted vegetation for a muddy shoreline that is unfavorable habitat for mosquito larvae. Rooted vegetation includes both aquatic and upland vegetative types. Avoid flooding terrestrial vegetation in flat terrain or low lying areas. Aquatic habitats with a vegetated inflow and outflow separated by open water produce 5-10 fold fewer Culex mosquitoes than completely vegetated wetlands (Walton and Workman 1998). Wetlands with open water also had significantly fewer stage III and IV instars which may be attributed to increased predator abundances in open water habitats (Walton and Workman 1998).
4. Construct dams or impoundments that restrict down slope seepage or overflow by digging ponds in flat areas rather than damming natural draws for effluent water storage, or lining constructed ponds in areas where seepage is anticipated (Knight et al. 2003).
5. Line the channel where discharge water flows into the pond with crushed rock, or use a horizontal pipe to discharge inflow directly into existing open water, thus precluding shallow surface inflow and accumulation of sediment that promotes aquatic vegetation.
6. Line the overflow spillway with crushed rock, and construct the spillway with steep sides to preclude the accumulation of shallow water and vegetation.
7. Fence pond site to restrict access by livestock and other wild ungulates that trample and disturb shorelines, enrich sediments with manure and create hoof print pockets of water that are attractive to breeding mosquitoes.

Literature Cited:

De Szalay, F.A. and V.H. Resh. 2000. Factors influencing macroinvertebrate colonization of seasonal wetlands: responses to emergent plant cover. Freshwater Biology. 45: 295-308.

Doherty, M.K. 2007. Mosquito populations in the Powder River Basin, Wyoming: a comparison of natural, agricultural and effluent coal bed natural gas aquatic habitats. M.S. Thesis. Montana State University, Bozeman, U.S.A.

Knight, R.L., W.E. Walton, G.F. Meara, W.K. Riesen and R. Wass. 2003. Strategies for effective mosquito control in constructed treatment wetlands. Ecological Engineering. 21: 211-232.

Schmidtmann, E.T., R.J. Bobian, R.P. Beldin. 2000. Soil chemistries define aquatic habitats with immature populations of the *Culicoides variipennis* complex (Diptera: *Ceratopogonidae*). Journal of Medical Entomology. 37: 38-64.

Walton, W.E., and P.D. Workman. 1998. Effect of marsh design on the abundance of mosquitoes in experimental constructed wetlands in Southern California. Journal of the American mosquito control Association 14:95-107.

APPENDIX G: Summary of Relevant Science Considered by Council

The following summary briefly details the published literature that was presented to and considered by the Sage-grouse Advisory Council during the crafting of this Strategy. It is not an exhaustive list of sage-grouse related research. Specific presentations and handouts provided to Council throughout the process are available for download at http://fwp.mt.gov/fishAndWildlife/management/sageGrouse/habitatConservation/

Sage-grouse General Ecology and Habitat Use

Connelly et al. 2011 – sage-grouse population characteristics, range-wide summary

- General dependence on big and silver sagebrush species; can use other shrub species at times but they are not critical for sage-grouse persistence
- Three seasonal habitats – breeding, summer, winter
- Male displaying grounds (leks) are usually traditional locations but temporary satellite leks can form in years of relatively high abundance
- Average nest distance from lek is 3.2 – 5 km (2 – 3.1 miles)
- Nestlings fed primarily invertebrates; juveniles change to eating forbs in late summer; sagebrush dominates diet in winter
- Highest mortality for juveniles is probably hatching to brood break up
- Adult survival tends to be relatively high over winter
- Some populations migratory (move >10 km [6.2 miles] among 2 or more seasons); other populations non-migratory
- Birds disperse ~4 – 5.5 miles from place of hatch to place of breeding
- Large, interconnected expanses of sagebrush are required by sage-grouse;
- Range-wide habitat loss and degradation is threatening populations

Taylor et al. 2012 – vital rates of sage-grouse

- Three rates were important for population growth, in order: female survival, chick survival and nest success.

Sika 2006 – central Montana

- 97% of nests were within 3 miles of an active lek

Holloran and Anderson 2005, Holloran 2005 - western WY:

- Sage-grouse nest locations are spatially related to lek locations and a 5 km (3.1 mi.) buffer included 64% of known nests. Moynahan's (2004) work in north central MT supports this finding.
- The substantial number of females nesting > 5 km (3.1 mi.) from a lek could be important for population viability.
- Observed lek to nest distances was not related to lek size.
- Successful nests were generally located further from leks than destroyed nests.
- Nests located $\leq$ 1 km (0.6 mi.) from another known nest tended to have lower success probabilities.

Tack 2009 – northern Valley County and southern Saskatchewan

- Average distance from lek of capture to nest site was 5.3 km (3.3. mi.). Seventy-five and 95% of nests were within 6.8 and 12.3 km (4.3 and 7.7 mi.) of lek of capture, respectively.
- All radio-collared individuals moved >20km in consecutive years to winter habitat

Smith 2013 – long-distance migration in sage-grouse

- Sage-grouse moved as far as 240-km (149 mi.) from breeding habitat in north-central Montana/southern Saskatchewan to winter habitat north of the Missouri River.
- Grouse migrated through gently rolling sagebrush flats (<5% slope), using native sagebrush rangeland in proportion to its availability, and avoiding cropland and badlands where food was scarce.

Montana Sage Grouse Working Group 2005 – state management plan

- Sage-grouse populations demonstrate annual and cyclic fluctuations
- Montana populations appear to cycle over approximately a 10-year period under existing habitat conditions and the current combination of weather and predators.

Table 1. Range-wide and Montana-specific vital rates for sage-grouse compiled by Fish, Wildlife and Parks.

Vital Rate	Range-wide rates[1]	Montana rates	Years of MT study	Location	Reference
Nest success	15 – 86%	64%	1969 - 1972	Petroleum Co.	Wallestad and Pyrah 1974
		28 - 43%	2004 - 2005	Musselshell and Golden Valley Co.	Sika 2006
		35 – 61%	2001 - 2003	S. Phillips Co.	Moynahan et al. 2007
		53 – 61%	2007 - 2008	Milk River Basin	Tack 2009
		59%	2011 - 2012	Musselshell and Golden Valley Co.	Berkeley, unpubl. data[2]
Chick survival	12 – 50%	33 – 38%	2007 - 2008	Milk River Basin	Tack 2009
		12%	2011 - 2012	Musselshell and Golden Valley Co.	Berkeley, unpubl. data[2]
Hen survival	37 – 78%	25 – 96%[3]	2001 – 2003	S. Phillips Co, Montana	Moynahan et al. 2006
		94% (nesting season) 84 – 93% (late summer)	2004 - 2005	Musselshell and Golden Valley Co.	Sika 2006
		55 – 91% (spring/summer) 84 – 92% (over winter)	2007 - 2008	Milk River Basin	Tack 2009
		59%	2011 - 2012	Musselshell and Golden Valley Co.	Berkeley, unpubl. data

[1] Range-wide stimates from Connelly et al. 2011.

[2] Spring and early summer weather during 2011 and 2012 were subject to historic extremes of high precipitation in 2011 and severe drought in 2012, which likely affected nest and chick survival rates.

[3] 25% annual survival in 2003 was attributed to a WNv outbreak and severe winter conditions; annual survival in 2001-2002 averaged 96%.

Coates et al. 2013 – Seasonal Space Use, Bi-state population (California & Nevada border)

- 5% of sage-grouse seasonal use area encompassed within a 0.25 mile buffer around leks
- 28% of sage-grouse seasonal use area encompassed within a 0.60 mile buffer around leks
- 90% of sage-grouse seasonal use area encompassed within a 3 mile buffer around leks
- Buffers up to 7.5 km (4.7 miles) around leks will encompass most seasonal space use; managers should consider buffers between 5.0 and 7.5 km (3.1 – 4.7 miles)

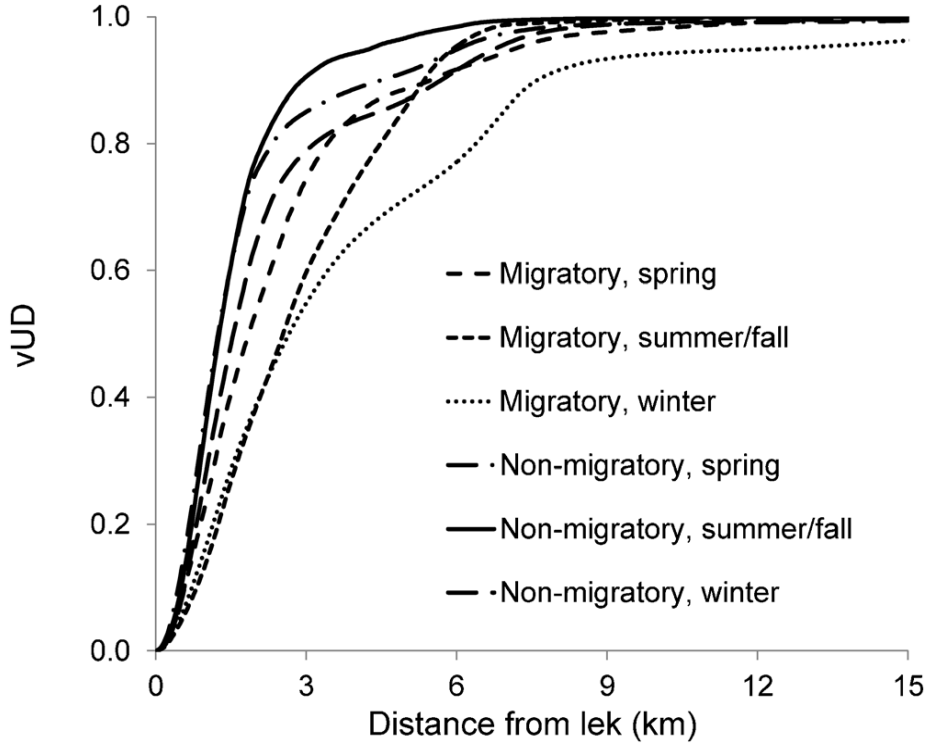


Figure 1. Response curves of volume of utilization distribution (vUD) for sage-grouse grouped by migratory status and season as a function of distance to leks. We collected these data in the Bi-State Distinct Population Segment in Mono County, California, during 2002–2009. *Copied directly from Coates et al. (2013).*

FWP note: This graphical representation from the Coates et al. research shows the percentage of estimated animal use area (vUD) encompassed by increasing distances from the lek. The vUD can be loosely interpreted as the total area used by sage-grouse in this population. The authors report that at 0.25, 0.60, and 3 mile distances from the lek, approximately 5%, 28%, and 90%, of the total area used by sage-grouse was encompassed, respectively. The graph suggests that at 1 mile (1.6 km) from the lek, approximately 50-60% of the total area used by sage-grouse was encompassed.

Summary: On a range wide scale, occurrence of sage-grouse is largely defined by sagebrush distribution. Sage-grouse require a landscape that meets different habitat requirements for breeding, brood-rearing, and winter seasons. A 5 mile buffer around active leks will typically capture most seasonal habitat with the exception of winter habitat for migratory populations. The three vital rates that tend to drive sage-grouse population dynamics are nest success, chick survival, and hen survival. In Montana, these vital rates appear to be within range-wide estimates suggesting Montana populations are relatively secure overall (Table 1). Recent declines in male lek attendance documented by Fish, Wildlife and Parks are likely representative of natural fluctuations that are influenced, in part, by weather.

Importance of Sagebrush Habitats to Sage-grouse

Johnson et al. 2011 - evaluation of anthropogenic and landscape feature influence on lek trends

- Lek trends increased modestly but steadily with the cover of all sagebrush at both 5-km and 18-km radius around leks.

Wisdom et al. 2011 – factors associated with sage-grouse extirpations

- Compared historical locations in occupied (n=239) vs extirpated (n=136) range for sage-grouse

- Historical locations in occupied range contained almost twice as much area in sagebrush as those in extirpated range (46% vs. 24% area).
- Mean patch size of sagebrush was >9 times larger, and mean core area >11 times larger, in occupied versus extirpated range. Sagebrush patches also were substantially closer to one another in occupied range.

Knick et al. 2013 – ecological similarities in sage-grouse lek characteristics

- Lek locations had approximately twice the average large-scale sagebrush cover for the study area and three times that of historic locations. 79% of area within 5km of lek was in sagebrush cover at active leks, 28% at historic but no longer occupied leks, and 35% for the study area.
- Active leks were surrounded by >40% landscape cover of sagebrush on average.

Martin 1970. Sagebrush control related to habitat and sage grouse occurrence.

- Only 4% of 415 sage grouse observations were made on sprayed strips. Sprayed strips were ~9x the area of unsprayed habitat.
- Study area in southwest Montana

Wallestad and Pyrah. 1974. Movement and nesting of sage grouse hens in central Montana

- Radio-collared 31 sage-grouse hens and located 22 nests in central Montana.
- All nests occurred in sagebrush stands with a canopy coverage that exceeded 15% and sagebrush formed the nesting cover over all of the 41 nests located.
- Successful nests had significantly greater sagebrush cover within 24 inches of nest, within a 100 ft^2 plot around nest and were located in stands of sagebrush with a higher average canopy coverage than those of unsuccessful nests.
- Wintering and nesting areas are dominated by dense stands of sagebrush and should be considered together as a wintering-nesting complex. No sagebrush control should be considered on these wintering–nesting complexes.

Baker et al. 1976. Conservation Committee report on effects of alteration of sagebrush communities on the associated avifauna.

- "…control of sagebrush in large blocks (larger than 16 ha) appears to be detrimental [to sage-grouse]."

Braun et al. 1977. Guidelines for maintenance of sage grouse habitats.

- "[Patterson] affirmed that sage grouse have not adjusted, and doubtlessly will not adjust their life processes to fit a pattern of land use that eliminates or seriously disturbs large tracts of the sagebrush-grassland types on any of their seasonal ranges."
- The authors summarized research documenting the dependence of sage-grouse on sagebrush ecosystems.
- Recommended control of vegetation be avoided on all lands within a 3km radius of occupied leks and any areas known to have supported important wintering concentrations of sage grouse within the past 10 years.

Wambolt and Sherwood. 1999. Sagebrush response to ungulate browsing in Yellowstone.

- "Ultimately, many organisms are sacrificed with the loss of quality big sagebrush habitat."

Wambolt et al. 2001. Recovery of sagebrush after burning, south-western Montana

- Big sagebrush canopy cover, density and production of winter forage were significantly greater in unburned than burned portions of a paired comparison.
- Total perennial grass cover did not differ between burned and unburned areas.
- "Managers considering prescribed burning of big sagebrush communities should be aware that herbaceous plant responses may be minimal while shrub values will likely be lost for many years."

Sowell et al. 2011. Northern, central and southern Montana and northern Wyoming

- There was little association (1% of the variation) between herbaceous vegetation cover and Wyoming big sagebrush cover
- "Removing Wyoming big sagebrush cover to increase herbaceous vegetation for any purpose, including enhancing sage-grouse brood survival, does not appear to be biologically sound."

Summary: Sage-grouse are dependent on large, intact landscapes of good quality sagebrush habitat. Removal or degradation of sagebrush is clearly detrimental to sage-grouse lek persistence and trends, nesting success, and over-winter survival.

Impacts of cropland agriculture on sage-grouse populations

Swenson et al. 1987. Decrease of sage grouse *Centrocerus urophasianus* after ploughing of sagebrush steppe.

- Number of males on leks declined by 73% in Shields River Valley (Park Co.) between 1973 and 1984. 16% of the winter habitat area was plowed by 1984. No similar trend in nearby area where plowing did not occur.
- With 84% of total area in sagebrush steppe, the population index for sage grouse declined from 241 to 65 males on leks. This equated to halving the population every seven years.
- Sagebrush loss was on a relatively small area but a relatively large portion of winter habitat (30%).

Tack 2009. Sage-grouse and the human footprint

- Large leks are 4.5 times less likely to occur than small leks when agricultural tillage fragments 21% of land within 1.0km of breeding sites.

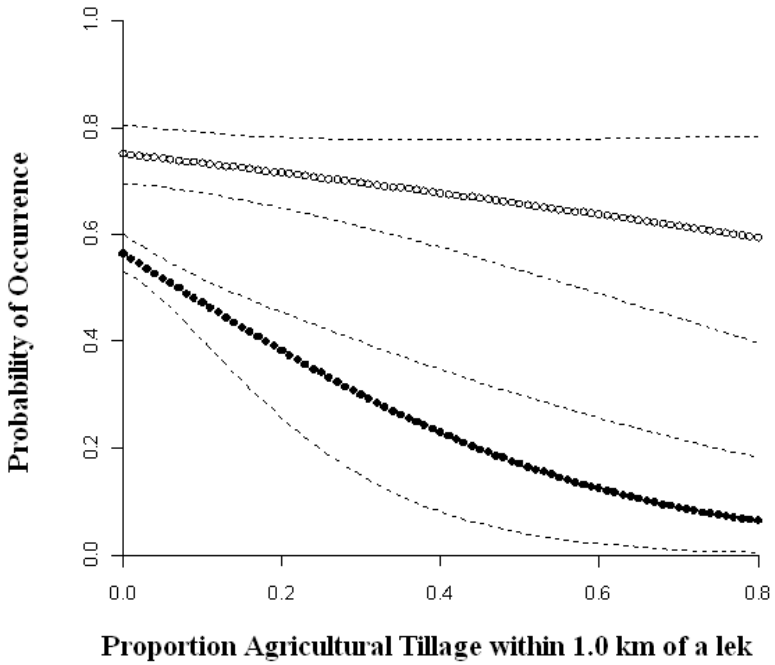


Figure 2. Probability of active lek occurrence of leks with < 25 males (open circles), and leks >25 males (closed circles) and agricultural tillage within 1.0km of a lek, values predicted for leks in big sagebrush habitat. *Copied from Tack 2009*

Knick et al. 2011. Ecological influence and pathways of land use in sagebrush.

- Agriculture, mostly mapped croplands, currently covers >230,000 km^2 (11%) of sage-grouse habitat.
- In the Great Plains (MZI), agriculture covers 18.7% and area influenced by agriculture ranges from 68.1 to 90.7% of the landscape.

Knick et al. 2013. – ecological similarities in sage-grouse lek characteristics

- <2% of leks were in areas surrounded by >25% agriculture within a 5-km radius
- 93% of leks were in areas surrounded by <10% agriculture within a 5-km radius.

Copeland et al. 2013. Measuring the effectiveness of the WY strategy

- "Targeted easements [$250 mil] averted an additional 9-11% of expected declines compared to that of the core area policy alone." In Wyoming.
- "…random placement of easements within core areas has much lower potential for benefiting sage-grouse populations."

Summary: Conversion of native range to cropland effectively removes sage-grouse habitat from the landscape. Even relatively low levels of tillage, 21-25% of the landscape, can lead to lek abandonment, especially by larger leks.

Predators and Sage-grouse

Howe et al. 2014. Nesting habitat selection by common ravens in sagebrush habitats

- "ravens were most likely to nest near edges of adjoining big sagebrush (*Artemisia tridentata*) and land cover types that were associated with direct human disturbance or fire."
- Odds of raven nesting declined by 31% for every 1km (0.6 mi) increase in distance away from a transmission line.
- For every 100-m increase in distance from the edge of big sagebrush habitat with another cover type, the odds of a raven nest decreased by 20%
- "An increase in the amount of edge by 1 km [0.6 mi] within an area of 102.1 ha [252 ac] across the study area increased the odds of nesting by 49%"

Hagen 2011 – range-wide summary

- Sage-grouse are adapted to predation and in unaltered systems will persist indefinitely with predation pressure
- Predators in altered systems can lead to decreased annual recruitment of sage-grouse
- Predators of sage-grouse tend to be generalists that take prey opportunistically
- Common predators are coyote, red fox, American Badger, bobcat, golden eagles and other raptors. Common ravens and black-billed magpies will depredate nests.
- Anthropogenic, landscape level changes have increased abundance of some predators, notably red fox and common raven, within the sage-grouse range
- Predator control programs can have localized, short-term effects, but the sustainability of predator control as a long-term management tool has not been demonstrated.

Taylor et al. 2012 – sage-grouse vital rates

- The influence of predation on sage-grouse population dynamics typically only becomes problematic when vital rates, especially nest, chick and hen survival, are consistently reduced below naturally-occurring levels. (See Table 1 for FWP's compilation of sage-grouse vital rates range-wide and in Montana).
- Recommend increasing survival and nest success rates by restoring large, intact sagebrush-steppe landscapes, reducing human-caused mortality, and eliminating anthropogenic habitat features that subsidize predators.

Baxter et al. 2007 – Strawberry Valley, Utah

- Low sage-grouse survival was attributed to unusually high density of red fox that were attracted to the area by anthropogenic activity
- Adult survival appeared to increase with fox removal; however, demographic rates were concomitantly increasing across the region during the study period, limiting inference on the success of the fox removal program.

Holloran 2005 – western Wyoming

- Increased nest predation rates were attributed to high corvid abundance; corvid abundance was influenced by anthropogenic structures associated with natural gas development

Bui 2009, Bui et al. 2010 – ravens in western Wyoming

- Ravens used road networks, fences, power lines, and other infrastructure associated with development.
- Found a negative association between raven presence and sage-grouse nest and brood fate.
- Predation was attributed primarily to territorial pairs, not groups of juveniles, sub-adults, or non-breeding birds.

Coates 2007 – nest predation in northeastern Nevada

- Raven removal resulted in short-term reductions in raven populations; however, other individuals re-populated the vacated habitat within a year
- Badger predation may have compensated somewhat for decreases in raven populations

Slater 2003 – coyote control in southwestern Wyoming

- Coyote control had no effect on nest success or chick survival

Mezquida et al. 2006 – implications of coyote control

- Removal of coyotes can lead to a release of otherwise suppressed medium-sized predators, such as red fox, which tend to be more effective predators of sage-grouse nests and individuals

Summary: Populations of some predators have increased, in large part because of anthropogenic subsidies. The ability of sage-grouse to withstand increased predation pressure is enhanced in unaltered landscapes, especially those that have been managed to provide good quality habitat for sage-grouse. Reported vital rates for sage-grouse in Montana are within range-wide estimates, suggesting Montana's populations overall are not experiencing excessive predation. However, predators could be suppressing sage-grouse populations in localized areas. Reducing the human footprint and associated anthropogenic subsidies that support predator populations, such as landfills, tall structures, abandoned buildings and other infrastructure, and road net works can help control predator populations (Leu and Hanser 2011). Predator control through lethal means is difficult to sustain, e.g., ravens re-populate vacated territories quickly after removal, and can have unintended consequences, e.g., coyote control can release numbers of medium-sized predators. Predator control options need to be evaluated on a case-by-case basis and at a local, not statewide, scale.

Sage-Grouse Breeding Activities Related to Development

Holloran 2005 – western WY radio-marking study.

- Male lek attendance declined as distance from leks to drilling rigs, producing wells and haul roads decreased and as densities of those infrastructure facilities increased. Effects were detectable out to various distances (3.0 – 6.2 km; 1.9-3.9 mi.) depending on the disturbance variable. These observations were similar to that reported for sage-grouse associated with energy development in Alberta (Aldridge and Brigham 2003) and Colorado (Remington and Braun 1991).
- Well densities exceeding 1 producing well every 283 ha (1 well/699 acres) appeared to negatively influence male lek attendance.
- Main haul roads within 3 km (1.9 mi.) of leks negatively influenced male lek attendance largely through increased traffic volume. Investigators reported a prominent drop in lek attendance when daily traffic exceeded 50 axles per day.
- Male attendance decreased with traffic volume of < 12 vehicles per day and leks became inactive when volume exceeded 75 vehicles per day.
- To maintain continued nesting for future sage-grouse generations the author recommended, at a minimum, all potential nesting habitat within 5km (3.1 miles) of an active lek be protected from development.

Walker et al. 2007a - northeast WY and southeast MT radio-marking study.

- From 2001-2005, the number of males counted on leks in coal bed natural gas (CBNG) fields declined more quickly than counts on leks outside of CBNG fields.
- By 2005, active leks within CBNG had 46% fewer males than leks outside of CBNG fields. Leks with energy development within 6.2 km experienced decreased male attendance.
- Of those leks considered active in 1997, only 38% remained active within CBNG fields by 2004-2005, compared to 84% of leks outside CBNG fields.
- CBNG development as distant as 6.4 km from a lek had a detectable impact on lek persistence.
- From 2000-2005, leks in CBNG fields had 11-55% fewer males per active lek than leks outside CBNG development. All known remaining leks with ≥25 males occurred outside CBNG fields in 2005.
- Findings showed that CBNG development is having negative effects on lek persistence over and above other habitat effects including power lines, preexisting roads, West Nile Virus mortality, or tillage agriculture, even after controlling for availability of sagebrush habitat.
- Research findings show a lag effect, with leks predicted to disappear, on average, within 4 years of CBNG development.
- Leks typically remained active when well spacing was ≥ 500 acres (1.3 wells per section), whereas leks typically were lost when spacing exceeded 4.2 wells per section.

Tack 2009 – lek analysis within eastern Montana, southwest North Dakota, northwest South Dakota, southwest Saskatchewan, and southeast Alberta.

- Showed steep decline in probability of occurrence of larger leks (> 25 males) associated with oil or gas development, even at levels of less than 1 well/640 acres within a 12.3 km (7.8 mile) radius of leks.
- Showed probability of occurrence of leks with >25 males dropped off as density of roads within 3.2 km of a lek increased.

Doherty et al. 2010 – Wyoming statewide lek survival and male attendance retrospective analysis relative to oil and gas development.

- Developed research-based matrix revealing how increases in well density within 3.2 km (2 mi) of a lek affects lek attendance and lek survival.
- The authors did not detect any impacts to male counts or lek survival with well densities of up to 1 well/640 acres.
- For Management Zone I, Well densities spanning 1.03-3.1 wells/640 acres experienced an 11.5% decline in the number of active leks and a 31.4% decline in number of males on remaining leks.
- For Management Zone II, well densities spanning 1.03-3.1 wells/640 acres experienced a 12.1% decline in the number of active leks and a 55.5% decline in number of males on remaining leks.

Harju et al. 2010 – Seven study areas in different parts of Wyoming involving a retrospective lek attendance and oil and gas development analysis.

- Leks with at least one well within a 0.4 km (0.25-mile) radius had 35-91% fewer attending males compared to leks that lacked any wells within that radius.
- In two of five project areas, negative effects of well surface occupancy was detectable out to 4.8 km (3 miles), which was the largest buffer tested.
- Analysis showed a general trend of declining male numbers with an increase in well pad densities.
- Negative impacts on male counts were first detectable at well pad densities as low as 2/640 acres on one project area, 1 /640 acres on one project area, and 0 to 1 well pad/640 acres on two project areas.
- Well pad densities of 4 /640 acres experienced male attendance that was 13-74% lower than leks that lacked well pads within 8.5. km. For those areas with a well pad density of 8/640 acres, male attendance at leks was 74-79% lower than leks that lacked well pads within 8.5 km (5.3 mi.).
- A time lag effect between the time of development and when it was detectable via male counts on leks ranged from 2-10 years.

Holloran et al. 2010 – Southwest Wyoming, investigated behavior of yearling male and female sage-grouse associated with natural gas development.

- Found leks that recruited more than the expected number of males were 2.1-2.9 times further from drilling rigs, producing wells, and main haul roads compared with leks that recruited fewer males than expected.
- Radiomarked males were 4.6 times more likely to establish on leks outside of developed areas.
- Treatment yearling males (with natal brooding areas—a radius of 1.65 km of nest site of origin—that had greater than 1 producing well pad or greater than 1 km of main haul road) were 50% less likely to establish a breeding territory compared to control yearling males.
- Annual survival of treatment yearling males associated with development areas (54%) was significantly lower than survival of yearling males that were reared outside of development (100%). In similar fashion, annual survival of treatment yearling females associated with development areas (69.4%) was significantly lower than survival of yearling females that were reared outside of development (100%).
- Concluded that yearling dispersal distances suggest the need to "manage landscapes where sagebrush-dominated regions within those landscapes remain undeveloped for sage-grouse."

Johnson et al 2011 – range-wide analysis of leks associated with a variety of anthropogenic features.

- Measured lek trends at 3 scales and found that trends of leks within 5 km (3.1 mi.) of a producing oil or natural gas well were depressed. Trends were also lower on leks with more than 10 producing wells within 5 km (3.1 mi) or more than 160 wells within 18 km (11.2 mi.) of the lek.
- Found that a density of more than one producing well/6.4 km^2 (1 well/2.5mi^2) within 18 km (11.2 mi) of leks negatively influences lek count trends.
- Declines in lek trends occurred across a Management Zones if the median human footprint score >3 regardless of the activities that contributed to the score.
- Found length of pipeline within 5-km of lek negatively influences lek count trends
- Effect of power lines on lek trends not detected

Knick et al. 2013 – minimum requirements for distribution of greater sage-grouse leks

- Found that sagebrush land cover within 5 km of the lek averaged 79% at currently occupied leks, 28% at historic but no longer occupied leks, and 35% throughout study area
- Found <2% of the leks were in areas surrounded by >25% agriculture within a 5-km radius, and 93% by <10% agriculture.
- 99% of active leks were in landscapes with <3% developed; all lands surround leks were <14% developed.
- 93% of active leks fell below 0.01 km/km^2 densities of interstate highways
- Highest habitat suitability had pipeline densities <0.01 km/km^2 and power line densities <0.06 km/km^2
- Leks were absent from areas where power lines densities exceeded 0.20km/km^2, pipeline densities exceeded 0.47 km/km^2 or communication towers exceeded 0.08 km/km^2.

Copeland et al. 2013 – measuring efficacy of sage-grouse conservation in Wyoming

- Predict WY's core area strategy plus $250 mil in targeted conservation easements reduces sage-grouse population declines from 14-29% (no conservation measures) to 9-15% (with conservation measures). This cuts anticipated losses by roughly 1/2 statewide and nearly 2/3 within sage-grouse core breeding areas.

LeBeau 2012 – wind energy in Wyoming

- Nest and brood survival negatively affected within 3 miles of wind turbines
- No effect of wind energy on female survival
- Sage-grouse selected brood habitat closer to wind facilities

Hagen et al. 2011 – lesser prairie chickens, southwestern Kansas

- Avoided power lines up to 0.45 miles
- Documented prairie chicken collisions with power lines

Ellis 1985

- Power lines influenced increased predation and sage-grouse dispersal to 0.75 miles

Summary: Impacts of anthropogenic activities on sage-grouse can vary depending on activity and local habitat conditions but cumulative impacts of multiple activities can have significant, negative impacts on sage-grouse populations. Oil and gas well densities commonly permitted in Montana and Wyoming can severely impact sage-grouse breeding populations (Naugle et al. 2011). A number of studies involving both radio-equipped birds and regional and range-wide lek analyses report declining trends of male counts where leks are associated with oil and gas developments. These associations varied by density and nearness of lek. Densities as low as 1 well/6.4 km^2 (1 well/2.5 $mi.^2$) showed negative impacts on male counts. Four studies reported declines in lek male counts associated with oil and gas development that were detectable at development distances of more than 6 km (3.8 mi.) from the lek. As development densities increase and encroach closer to leks, the impact in population trends is more severe. Drilling rigs, haul roads, and producing wells were all found to have impacts on male attendance and lek persistence. Lag times between onset of development and population response averaged 4 years but extended out to 10 years. This lag time is explained in large part by annually returning adult males (as long as they survive) but yearling males associated with gas development experienced lower survival and moved to leks outside of development areas to establish a breeding territory. Yearling females raised in the vicinity of producing wells or main haul roads also showed significantly lower survival, directly affecting annual population recruitment and trends. Current well pad placement restrictions that allow development as close as 0.4 km (0.25 mi.) of a lek are wholly inadequate for effectively conserving sage-grouse. Landscape scale set asides or incremental development that leaves large habitat expanses undeveloped may be most appropriate for assuring long term sage-grouse viability.

Sage-Grouse Nesting and Brood Rearing

Holloran and Anderson 2005, Holloran 2005 - western WY:

- Sage-grouse nest locations are spatially related to lek locations and a 5 km (3.1 mi.) buffer included 64% of known nests. Moynahan's (2004) work in north central MT supports this finding.
- The substantial number of females nesting > 5 km (3.1 mi.) from a lek could be important for population viability.
- Observed lek to nest distances was not related to lek size.
- Successful nests were generally located further from leks than destroyed nests.
- Nests located $\leq$ 1 km (0.6 mi.) from another known nest tended to have lower success probabilities.
- Nesting females strongly avoided areas with high well densities but adult females can exhibit strong nest site fidelity. Mean annual survival rates for females suggest that 5 to 9 years may be required to realize ultimate nesting population response to development activities.
- Nest and brood survival probabilities were found to be higher within developed areas but those benefits were overridden by lower hen survival rates within developed areas.
- Sage-grouse population decline in developed areas were best explained when comparing nest success and hen survival pre and post-development, which revealed lower nest survival and lower annual survival of female sage-grouse post-development.

Lyon and Anderson 2003 – western WY

- Female sage-grouse disturbed by natural gas development during the breeding season had lower nest initiation rates.

Schroeder and Robb 2003 – north central WA

- Nest distribution patterns may change as a result of habitat alteration and fragmentation and the 5 km (3.1 mi.) buffer should be considered relevant only for contiguous sagebrush habitats.

Aldridge and Boyce 2007 - southeast AB

- Sage-grouse chick survival decreased as well densities increased within 1 km (0.6 mi.) of brooding locations. These brood-rearing areas acted as habitat sinks where recruitment was poor.
- Low nest success (39%) and low brood survival (12%) characterized sage-grouse vital rates in habitat fragmented by energy development in southern Alberta.

Tack 2009 – northern Valley County and southern Saskatchewan

- Average distance from lek of capture to nest site was 5.3 km. Seventy-five and 95% of nests were within 6.8 and 12.3 km (4.3 and 7.7 mi.) of lek of capture, respectively.

Holloran et al. 2010 – Southwest Wyoming, investigated behavior of yearling male and female sage-grouse associated with natural gas development.

- Yearling females avoided nesting within 950m (0.6 mi.) of infrastructure, regardless of whether they were reared in the vicinity of development or not.

Summary: Female sage-grouse are spatially grouped around a lek or lek complex during the nesting season. Females tend to move away from leks in selecting nest locations and to an extent, those movements appear to improve their rates of nest success. However, females in developed habitat moved twice as far as females in undisturbed habitat and exhibited lower rates of nest initiation. Females also select nest locations that segregate their nests from those of adjacent hens and the probability of successfully hatching those nests increases when that distance is $\geq$ 1 km. When females have suitable and contiguous nesting habitat to select from, slightly over 60% of nests occur within 5 km (3.1 mi.) of the lek. This strategy of mutual avoidance reduces nest densities and therefore reduces probability of detection by nest predators. However, land use practices that fragment sagebrush habitat and reduce the amount of suitable nesting cover may lead to increased densities of nesting birds and lower rates of nest success. Even if 5 km (3.1 mi.) buffers are employed around existing leks, increased development and production activity in the zone beyond that buffer will impact the remaining 40% of nesting hens and potentially compromise the success of those birds nesting within that 5 km buffer based on the density dependent factors noted above. Population declines associated with development are attributable to lower hen survival. Seasonal surface use restrictions within 2 miles (3.2 km) of an active lek during the breeding and nesting period (1 March – 15 June) are inadequate to maintain sage-grouse populations within developed habitat.

Sage-Grouse Winter Habitat Use

Doherty et al. 2008 – Powder River Basin (PRB) in Montana and Wyoming

- Researchers established a predictive winter habitat use model based on key habitat features that was strongly correlated with observed sage-grouse locations ($R^2 = 0.984$).
- Sage-grouse select for large intact and relatively flat expanses of sagebrush as winter habitat and avoid more rugged terrain and conifer habitat. Given that severe winter conditions (deep snow, low temperatures) could force birds into more rugged terrain, topographic variables should be considered in regions outside the PRB.
- After controlling for vegetation and topography, the addition of a variable quantifying the extent of energy development showed that sage-grouse avoid energy development in otherwise suitable habitat. Probabilities of use decrease by ≈30% at a 32 ha well spacing (80 acre spacing). Sage-grouse were 1.3 times more likely to use winter habitat if CBNG development were not present.
- The model classified only 13% of study area as high quality winter habitat (D.E. Naugle, University of Montana, unpublished data).
- Authors concluded that breeding season timing restrictions and quarter mile no surface development around leks are insufficient for preventing infrastructure and ongoing human activity associated with producing wells from displacing sage-grouse in winter.

Tack 2009 – northern Valley County and southern Saskatchewan

- All radio-collared individuals moved >20km in consecutive years to winter habitat

Smith 2013 – long-distance migration in sage-grouse

- Sage-grouse moved 240-km from breeding habitat in north-central Montana/southern Saskatchewan to winter habitat north of the Missouri River.
- Grouse migrated through gently rolling sagebrush flats (<5% slope), using native sagebrush rangeland in proportion to its availability, and avoiding cropland and badlands where food was scarce.

Summary: Sage-grouse use connected patches of relatively flat sagebrush for migration and winter habitat. Sage-grouse are sensitive to energy development associated with winter habitat. Recent advances in modeling efficiencies provide a tool to assess important winter habitat and the spatial relationship between known leks and potential winter habitat. Sage-grouse in this region can be nonmigratory when suitable seasonal habitats occur in reasonable juxtaposition while other population segments do migrate to more distant winter habitat. In some cases, these dissimilar distribution patterns may involve birds using the same lek complex or a shared winter range. Winter habitat should be conserved at an appropriate scale and with some knowledge of sage-grouse distribution patterns. Seasonal restrictions will not be effective at mitigating infrastructure development if the level of development is moderate to intense and overlays important winter habitat.

West Nile Virus

Zou et al. 2006; Walker et al. 2007b; Walker and Naugle 2011; Doherty 2007

- West Nile Virus (WNV) was documented as an important new source of mortality in lower and mid elevation populations across the range of sage-grouse from 2003-2007, affecting all sex and age classes.
- Local and regional population declines have been attributed to WNV outbreaks.
- Research shows that CBNG ponds pose a threat to sage-grouse because they provide habitat for mosquitoes that spread WNV. Larval *Cx. Tarsalis,* the species of mosquito that spreads the disease, were produced at similar rates in CBNG and natural sites, whereas CBNG ponds produced *Cx. tarsalis* over a longer time period compared to both agricultural and natural sites.
- CBNG ponds resulted in a 75% increase in potential breeding habitat for *Cx. Tarsalis*.

Summary: West Nile Virus should be considered endemic across the northern Great Plains portion of the range of greater sage-grouse. The presence of this disease has added another stressor to sage-grouse population dynamics. The prevalence of the disease and associated level of mortality in sage-grouse appears to vary considerably from year to year based on environmental conditions. However, CBNG ponds do provide a much more consistent set of conditions favorable to the spread of WNV even in years of low natural precipitation. Conservation actions need to consider the relationship between CBNG and WNV and attempt to mitigate those conditions favorable to WNV.

SYNTHESIS

- Recent research using different techniques across many representative parts of the eastern range of sage-grouse has reached similar conclusions about the sensitivity of sage-grouse to anthropogenic disturbances, including conversion to cropland agriculture and oil and gas development. Sage-grouse avoid energy development during both breeding and wintering seasons and do so at scales that render current protective stipulations (e.g., 0.25 mile no surface occupancy buffers) ineffective. A new conservation strategy will be necessary to balance effective sage-grouse conservation with anthropogenic stressors.
- A conservation strategy that focuses on maintaining and enhancing existing sagebrush habitat and minimizing new disturbance will likely be the most effective for sage-grouse.
- A common theme among recent research is the level of impact to sage-grouse relative to placement of developments, density of developments, extent of developments, and level of activity associated with developments.
- Research on wind energy is currently inconclusive. The recent development of wind energy in sage-grouse habitats and lag effect of possible population responses may mask longer term population impacts (Knick et al 2011).

However, human activity, roads, traffic, power lines, visual obstruction, noises, and other factors may result in responses by sage-grouse similar to that found with oil and gas developments.

- Effective sage-grouse habitat conservation must be implemented in a landscape context (Doherty et al. 2011).
- Naugle et al. (2011) characterized different approaches for achieving conservation and energy development based on biological and energy values. Those areas of high biological value but low energy value should be immediately conserved. Those areas of high biological value and high energy value will need to reform policies to reduce threats. And, those areas of lower biological value but high energy potential can emphasize development as the higher priority over conservation.
- Significant fragmentation of habitat and associated loss of populations within the Powder River Basin and other areas in Management Zones 1 and 2, could have status implications to the species within the Great Plains portion of the species' range.
- Implementation of Wyoming's Core Area policy and targeted conservation easements are predicted to reduce sage-grouse population losses but are not expected not to stop population declines completely (Copeland et al. 2013).

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APPENDIX H: Minority Committee Reports

Minority Committee Report for
MITIGATION STANDARD
Greater Sage-Grouse Habitat Conservation Strategy

This Minority Committee Report on the Mitigation Standards found in the *Montana Greater Sage-Grouse Habitat Conservation Strategy* (*Montana Strategy*) was written because the final standard adopted was adopted "on the fly," and it may have unintended consequences for sage-grouse conservation.

As background, on December 18, 2013, the Council established a subcommittee to address how disturbances to sage-grouse habitat should be handled in terms of avoidance, minimization, and mitigation issues. The subcommittee was asked to review related public comments on the Draft *Montana Strategy*, including extensive comments by the U.S. Fish and Wildlife Service (Service), and make recommendations to the Governor's Greater Sage-Grouse Habitat Advisory Council (Council) on how these provisions should be modified. This subcommittee presented its recommendations to the Council on January 14, 2014, one of the last days the Council met. In discussions regarding the subcommittee recommendations, the Council revised the mitigation provisions. After further review of this section, it appears that the Council may have weakened the mitigation provisions, perhaps unintentionally.

A recommended change to the Mitigation Standard, with justification, is provided below.

APPROVED LANGUAGE. The Council included the following recommendation for mitigation in the *Montana Strategy*:

> General Provisions, Page 9, Item 7:
> New development or land uses requiring a permit or other authorizations within sage-grouse Core Areas should be authorized or conducted only when it can be reasonably demonstrated that the activity (factoring in mitigation) will not cause declines in Greater Sage-Grouse populations. Activities that exceed recommended stipulations may require compensatory mitigation (Section VIII).
>
> Core Areas, Page 15, Item 1.c.:
> Compensation for Impacts. If project impacts are unavoidable and core area stipulations cannot be met, mitigation measures shall be required, following the Mitigation Framework outlined in Section IX. Mitigation can include enhanced reclamation.
>
> General Habitat, Page 33, Item 1.c.:
> Compensation for Impacts. If project impacts are unavoidable and general stipulations cannot be met, mitigation measures may be required, following the Mitigation Framework outlined in Section IX.

RECOMMENDED CHANGE. A minority of the Council recommends the following changes to the *Montana Strategy*'s mitigation standard:

> General Provisions, Page 9, Item 7:
> New development or land uses requiring a permit or other authorizations within sage-grouse Core Areas should be authorized or conducted only when it can be reasonably demonstrated that the activity (factoring in mitigation) will not cause declines in Greater Sage-Grouse populations. Activities in Core Areas that ~~exceed~~ do not meet recommended stipulations ~~may~~ shall require compensatory mitigation (Section VIII).
>
> Core Areas, Page 15, Item 1.c.:
> Compensation for Impacts. If project impacts are unavoidable and core area stipulations cannot be met, mitigation measures shall be required, following the Mitigation Framework outlined in Section IX. In addition, if project impacts are unavoidable, their size has been minimized, Core Area stipulations have been followed, and

project impacts remain after reclamation, mitigation shall also be required following the Mitigation Framework outlined in Section IX. ~~Mitigation can include enhanced reclamation.~~

General Habitat, Page 33, Item 1.c.:
Compensation for Impacts. If project impacts are unavoidable and general stipulations cannot be met, mitigation measures may be required, following the Mitigation Framework outlined in Section IX. In addition, if project impacts are unavoidable and their size has been minimized, mitigation may also be required following the Mitigation Framework outlined in Section IX.

RATIONALE FOR RECOMMENDED CHANGE:

1. Based on comments on the Draft *Montana Strategy*, it was made clear that the Service wanted to see changes to the mitigation standard. They also specifically recommended that mitigation be required after avoidance, minimization, and reclamation. The Minority Committee's recommended change to the mitigation standard specifically addresses these issues. The Service made their request in December 9, 2013 comments on the Draft *Montana Strategy*:

Page 3: "The Strategy provides a mitigation section, but currently does not provide clear direction as to when compensatory mitigation for proposed surface disturbance activities would be required. We recommend that compensatory mitigation be required for all such projects that would result in direct, indirect, temporary, and permanent impacts to GSG [Greater Sage-Grouse] that would remain following application of avoidance, minimization, and reclamation / rectification such that neutral or positive GSG population trends and habitats would be maintained; particularly in core areas." (Service 2013b, page 3)

Page C4: "19). VI. Stipulations for Development, a) Core Area Stipulations, ii. Core Area – Specific Stipulations, p. 15: We recommend that the following overall concepts should apply to subsections 1-7:
1) Clear statement / enactment of an "avoidance first" approach to proposed surface disturbance activities to GSG habitat in core areas. The COT Report [Service 2013a] conservation objective for infrastructure, a widespread threat to most Montana GSG populations, is to avoid development of infrastructure within PACS (core areas). We recommend that such an "avoidance first" approach be enacted, and rationale be required by authorizing agencies as to why a given proposed surface disturbance to GSG habitat in core habitat is unavoidable. Clear, mandatory direction to adhere to (and document adherence to) the mitigation sequence in Section IX (avoid, minimize, reclaim, offset) should be provided.

2) Clear direction as to when compensatory mitigation for proposed surface disturbance activities would be required. We recommend that compensatory mitigation be required for all such projects that would result in direct, indirect, temporary, and permanent impacts to GSG that would remain following application of avoidance, minimization, and reclamation / rectification such that neutral or positive GSG population trends and habitats would be maintained. In the absence of a project-level effects analysis, approved projects that do not comply with Strategy stipulations should be subject to compensatory mitigation. We generally recommend mitigation implementation in advance of impacts; advance (functionality demonstrated by GSG use) compensatory mitigation to offset any approved proposed disturbance to suitable habitat in core areas that would exceed the 5% disturbance threshold should be required in all cases. All proposed compensatory mitigation should be subject to MSGOT review. Please also see Comments 55 and 56 regarding mitigation." (Service 2013b, page C4)

2. The Service specifically recommended no mitigation requirement when Core Area/ general habitat stipulations were not being met; instead, the Service recommended that permits should be denied when stipulations are not met. Subsequently, changes made on January 14, 2014 to the *Montana Strategy* appear to run contrary to the Service recommendation. Because the Council did not specifically discuss this issue while they were making conceptual amendments to the document on January 14, this result may have been done unintentionally. That said, the intentions of the Service were clear in their letter on the Draft *Montana Strategy*:

The Service commented about the stipulation found in Item #7, page 8 of the Draft *Montana Strategy* that stated, "*Activities that exceed recommended stipulations may require compensatory mitigation.*" The Service wrote about this stipulation: "This implies that proposed activities are not necessarily required to comply with the stipulations, and in that case compensatory mitigation only "may" be required. The Strategy should clearly convey that activities proposing to exceed the stipulations should, in the normal course of business, first be modified such that they meet the stipulations, or disallowed. Compensatory mitigation should be required for impacts remaining following application of avoidance, minimization, and rectification/reclamation measures. For projects that may be allowed to exceed stipulations on a case-by-case, site-specific basis, compensatory mitigation commensurate with the impacts should be required and subject to review by the MSGOT." (Service 2013b, page C2)

3. If mitigation is only required when Core Area/ general habitat stipulations are not met, then project sponsors may be able to develop mitigation projects that allow them to build whatever they want, wherever they want to build it, even in critical sage-grouse habitat. The stipulations found in the *Montana Strategy* were designed to minimize habitat fragmentation. If these stipulations can be avoided, as the current mitigation standard suggests, sage-grouse habitat is more likely to become fragmented. Once lost, sage-grouse habitat is difficult—if not impossible—to recover: The following studies and professional opinions support this statement:

- "…Braun (1998) reported recovery of populations in Montana, Wyoming, and Colorado may occur after initial development and subsequent reclamation of mine sites, ***although populations do not recover to pre-development sizes*** [emphasis added]. Additionally, population re-establishment may take as long as 30 years (Braun, 1998)." (Manier et al. 2013)

- "Sage-grouse populations can be significantly reduced, and in some cases locally extirpated, by non-renewable energy development activities, even when mitigative measures are implemented (Walker et al. 2007)." (Service 2013a)

- "Success is not guaranteed when conducting Greater Sage-Grouse habitat restoration projects in semiarid environments. The only guarantee is that annual weather conditions can vary widely and these often dictate success of restoration projects" (Pyke 2011, p. 544).

- "Grasses and forbs may respond within 1 to 3 years if soils and seed sources permit recovery or restoration, but return to a shrub-dominated community often requires > 20–30 years, and landscape restoration may require centuries or longer (Hemstrom et al. 2002). Even longer periods may be required for sage-grouse to use recovered or restored landscapes." (Knick et al. 2011, p. 251)

- "Due to the long period of time (years to decades) required to restore sagebrush habitat upon which sage-grouse depend and because of the uncertainty involved in the successful in-kind mitigation for any loss of sage-grouse habitat within Core Areas, both in quantity and quality, sage-grouse habitat within Core Areas with few exceptions will be considered irreplaceable (per ODFW Mitigation Policy." (Oregon Department of Fish and Wildlife 2012)

4. Sage-grouse exhibit high site fidelity, using the same leks and general breeding areas year-after-year. Colonization rates of new areas, even if suitable habitat exists, are relatively low. Therefore, it is more important to conserve existing sage-grouse habitat than to attempt to replace losses elsewhere through off-set mitigation. A strategy that allowed for off-site mitigation without first maximizing conservation on-site would not conserve sage-grouse populations adequately. The following studies and professional opinions support this statement:
"Sage-grouse exhibit strong site fidelity (loyalty to a particular area) to seasonal habitats (i.e., breeding, nesting, brood rearing, and wintering areas) (Connelly et al. 2004; Connelly et al. 2011a). Adult sage-grouse rarely switch from these habitats once they have been selected, limiting their ability to respond to changes in their local environments (Schroeder et al. 1999)." (Service 2013a)

- "Importantly, sage-grouse have demonstrated strong site fidelity suggesting resistance of individuals to adjust to changing habitat conditions (Berry and Eng, 1985; Fischer and others, 1993; Schroeder and Robb, 2003; Holloran and Anderson, 2005; Moynahan and others, 2007; Baxter and others, 2008; Doherty and others, 2010a; Holloran and others, 2010)." (Manier et al. 2013)

- "High site fidelity but low survival of adult sage-grouse combined with lek avoidance by yearlings [11] resulted in a time-lag of 3–4 years between the onset of energy development and lek loss [30]. The time-lag observed by Holloran [30] in conventional gas fields in southwest Wyoming matched that for leks that became inactive 3–4 years following coal-bed natural gas development in northeast Wyoming [19]." (Doherty et al. 2010)

- "Maintaining a local population of birds may increase the chance for a successful restoration because strong site fidelity hinders re-colonization from more distant sites and past precedence shows that translocations, while problematic, are more apt to succeed in areas with resident populations (Reese and Connelly 1997, Baxter et al. 2008)." (Taylor et al. 2012)

5. And finally, because the Montana Strategy has a 5% cap on anthropogenic disturbances within Core Areas, development projects should utilize the tools of avoidance, minimization, restoration, and mitigation to keep disturbances below this threshold. If this process is successfully done, economic development projects and sage-grouse conservation should be able to co-exist for the long-term.

MINORITY REPORT SUBMITTED BY:
Janet Ellis, Jay Gore, and Carl Wambolt

DATE: 1-24-2014

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Minority Committee Report for
NOISE STANDARD
Greater Sage-Grouse Habitat Conservation Strategy

This Minority Committee Report on the Noise Standard found in the *Montana Greater Sage-Grouse Habitat Conservation Strategy* (*Montana Strategy*) for Core Areas and General Habitat was written because the final standard adopted is not science-based.

As background, between August 2013 and January 14, 2014, the noise standard found in the Draft *Montana Strategy* was similar to that found in other states (10 decibels above ambient noise), including Wyoming (State of Wyoming 2012). However, after learning that Wyoming is currently re-examining its noise standard because they have had problems implementing their current standard, and in response to some public comment, a majority of the Governor's Greater Sage-Grouse Habitat Council (Council) voted on January 15, 2014 to change the Montana standard to one that is not based in science—and is likely detrimental to this species. Because the objective of the *Montana Strategy* is to show the U.S. Fish & Wildlife Service (Service) that Montana has a science-based plan that will lead to sage-grouse conservation, several committee members believe that it is important for the Governor to change this standard.

A recommended change to the Noise Standard, with justification, is provided below.

APPROVED LANGUAGE. The Council included the following recommendation for managing noise in the *Montana Strategy*:

Core Area Basic Stipulations, Page 16, Item 5:
Noise: New noise levels, at the perimeter of a lek, should not exceed 40 dBA above ambient noise (existing activity included) from 6:00 pm to 8:00 am during the breeding season (March 15 – July 15) with the exception of those sites identified under Special Management Core Areas. Ambient noise levels should be determined by measurements taken at the perimeter of a lek at sunrise. The MSGOT should follow Wyoming's review and litigation discussion of this stipulation and amend the strategy accordingly.

General Habitat Stipulations, Page 34, Item 5:
Noise: New noise levels, at the perimeter of a lek, should not exceed 40 dBA above ambient noise (existing activity included) from 6:00 pm to 8:00 am during the breeding season (March 15 – July 15). Ambient noise levels should be determined by measurements taken at the perimeter of a lek at sunrise. The MSGOT should follow Wyoming's review and litigation discussion of this stipulation and amend the strategy accordingly.

RECOMMENDED CHANGE. A minority of the Council recommends the following changes to the *Montana Strategy*'s noise standard, which has a basis in science:

Core Area Basic Stipulations, Page 16, Item 5:
Noise: New noise levels, at the perimeter of a lek, should not exceed 40 dBA ~~above ambient noise~~ (existing activity included) from 6:00 pm to 8:00 am during the breeding season (March 15 – July 15) with the exception of those sites identified under Special Management Core Areas. ~~Ambient noise levels should be determined by measurements taken at the perimeter of a lek at sunrise.~~ The MSGOT should follow Wyoming's review and litigation discussion of this stipulation and amend the strategy accordingly.

General Habitat Stipulations, Page 34, Item 5:
Noise: New noise levels, at the perimeter of a lek, should not exceed 40 dBA ~~above ambient noise~~ (existing activity included) from 6:00 pm to 8:00 am during the breeding season (March 15 – July 15). ~~Ambient noise levels should be determined by measurements taken at the perimeter of a lek at sunrise.~~ The MSGOT should follow Wyoming's review and litigation discussion of this stipulation and amend the strategy accordingly.

RATIONALE FOR RECOMMENDED CHANGE:

1. It is recommended that the reference to ambient noise be removed. This portion of the standard is difficult and expensive to measure. It also appears to be problematic for agencies trying to base their management on this measurement. The following professional opinions support these statements:

- "In addition, collecting measurements of ambient noise levels in quiet areas is extremely challenging and requires expensive, specialized equipment; this makes the requirement to collect ambient values at each lek difficult to implement. Unfortunately, non-ideal weather (especially wind, even at low levels) and almost all errors by the person deploying the noise meter (e.g. poor placement of the meter for long-term deployment, rustling from clothing, crunching leaves underfoot and even breathing close to the meter when handheld) will inflate ambient measures." (Patricelli et al. 2012)

- '…[W]e suggest that it is not feasible or practical to establish baseline noise levels by having agency personnel or consultants with little specialized training measure ambient at each lek prior to development." (Patricelli et al. 2012)

2. The noise standard currently found in the *Montana Strategy* is 60 (+) decibels (dBA). This number is estimated based on ambient noise levels predicted to be approximately 20 - 22 dBA in rural sagebrush habitats, and the *Montana Strategy's* recommendation of "40 dBA above ambient noise" (40 dBA + 20 dBA for ambient noise = 60 (+) dBA). This standard is not scientifically defensible. The following studies and professional opinions support these statements:

- "Based on our review of reports and empirical measurements collected in Wyoming, we estimate that true ambient values pre-development in nights and calm morning in sagebrush habitat are closer to 20-22 dBA…" (Patricelli et al, 2012)

- "Indeed, results from our experiments indicate that 49 dBA is too loud to avoid significant impacts on sage-grouse [*emphasis added*]. Our noise-playback leks (described above, Blickley et al. 2012) experienced levels that were in compliance these recommendations, i.e. less than 49 dBA across most of the lek area, except the area within ~20 meters of the speakers. Yet we found large declines in attendance, increases in stress levels and altered display behaviors across the lek (Blickley et al. in review, in prep)." (Patricelli et al, 2012)

- "Male attendance at leks would be expected to be reduced when subjected to the current standard noise limitation of 50 decibels at the lek site. Despite the protective measures used to prevent impacts from projects in sage-grouse habitat, there would be no restrictions on the total amount of habitat that could be disturbed and declines in abundance and lek losses would be expected." (BLM 2013)

- Even the State of Montana's 2005 *Management Plan and Conservation Strategies for Sage Grouse in Montana* recommended not exceeding 49 dBA:
  "Noise can disrupt breeding rituals and cause abandonment of leks.
  1) Restrict noise levels from production facilities to 49 decibels (10 dba above background noise at the lek)[1]
  2) Restrict use of heavy equipment that exceeds 49 decibels[1] within 2 miles of a lek from 4 a.m.-8 a.m. and 7 p.m. - 10 p.m. during March 1-June 15…" (Montana Sage Grouse Working Group 2005)

  [1]When the 2005 Montana Plan was written, ambient noise levels were estimated to be 39 dBA; studies done recently show that ambient noise in rural sagebrush habitat is 20 – 22 dBA.

2. Although the science is changing, 40 decibel (dBA) can be defended by at least some scientific studies. The following studies and professional opinions support these statements:

- "However, there is recent science that demonstrates the effects of noise on sage-grouse breeding behavior (Crompton and Dean 2005, Holloran 2005, Blickley and Patricelli *in press*). In brief, sound levels >40 decibels (dbA) reduced breeding activity and increased stress levels (as measured by hormone levels) in sage-grouse (Blickley and Patricelli in press)." (Oregon Department of Fish and Wildlife 2012)

4. It is important to change this standard and make it science-based because it has been well established that Greater Sage-Grouse are negatively impacted by noise, avoiding areas where anthropogenic noise from roads, oil and gas development and infrastructure, compressor stations, and more, exist on the landscape. Noise, therefore, is considered a type of habitat fragmentation for these birds. The following studies and professional opinions support these statements:

- "Functional habitat loss also contributes to habitat fragmentation, as greater sage-grouse avoid areas due to human activities, including noise, even though sagebrush remains intact (Blickley et al. 2012)." (Service 2013)

- "…[C]hanges in the number of males occupying leks situated downwind of drilling rigs were more negative than those witnessed on leks upwind of drilling rigs, supporting evidence that increased noise intensity negatively influences male lek attendance (Holloran, 2005)." (Manier et al. 2013)

- "Noise can disrupt breeding rituals and cause abandonment of leks." (Montana Sage Grouse Working Group 2005)

- "Our results suggest that males and possibly females avoid leks exposed to anthropogenic noise." (Blickley et al. 2012a)

- "Taken together, results from Blickley et al. [43] and this study suggest that noise alone can cause greater sage-grouse to avoid otherwise suitable habitat and increase the stress responses of birds that remain in noisy areas. Thus, noise mitigation may be a fruitful conservation measure for this species of concern." (Blickley et al. 2012b)

MINORITY REPORT SUBMITTED BY:
Janet Ellis, Jay Gore, and Carl Wambolt

DATE: 1-24-2014

REFERENCES:

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Minority Committee Report for
BENTONITE, PEAT, SOCRIA, AND SAND & GRAVEL STANDARD
Greater Sage-Grouse Habitat Conservation Strategy

This Minority Committee Report on the Bentonite, Peat, Scoria, and Sand & Gravel Standard found in the *Montana Greater Sage-Grouse Habitat Conservation Strategy* (*Montana Strategy*) was written because the Governor's Greater Sage-Grouse Habitat Advisory Council (Council) adopted this 2-1/2 page standard—all new material that the Council had not reviewed—late on its last meeting day. This new standard was developed and promoted by industry, with no ability for Council members to ask questions of regulators to confirm statements being made. The specifics of the standard may add conservation protection to sage-grouse habitat—or it may just solidify "business as usual," with no new requirements being placed on these industries. Because of the last minute and expedited way this standard was adopted, the Council members writing this Minority Committee Report were not able to ascertain the ramifications of the standard. Therefore, we decided to write this Minority Committee Report to the Governor, essentially "flagging" this item for increased scrutiny.

As background, on December 18, 2013, the Council established a coal subcommittee to review coal-related public comments on the Draft *Montana Strategy* and make recommendations to the Council on how these standards could be improved. This subcommittee worked hard with industry representatives and agency personnel to determine what provisions of state and federal law relating to coal should be added to the *Montana Strategy*. After a thorough review of the coal standards within the *Montana Strategy*, including a presentation by the Montana Department of Environmental Quality overseeing this program, the Council adopted the new coal standards found in the plan. Then, on the last day of our Council's meetings, late in the afternoon, the Council received a new proposal from the bentonite industry, which also applied to peat, scoria, and sand & gravel mining. This proposal closely paralleled the coal provisions already adopted, applying similar standards to these other mining sectors.

APPROVED LANGUAGE: The Bentonite, Scoria, Peat, Sand and Gravel Mining standards can be found in the *Montana Strategy* in the following locations:

- For Core Areas: pages 23 – 26, Item 6
- For General Habitat: pages 38 – 42, Item 10

RATIONALE FOR ADDITIONAL SCRUTINY OF THIS STANDARD:
Although the Council was assured that the regulatory framework that applies to the coal industry was nearly identical to the regulatory framework for the bentonite, peat, scoria, and sand & gravel industries, there were no agency personnel available to confirm this statement. In addition, one fundamental difference exists between the regulatory framework for coal and the framework for these other mining industries: coal has a significant federal law, the Surface Mining Control and Reclamation Act (SMCRA), that sets minimum standards that the state's Montana Strip and Underground Mine Reclamation Act (MSUMRA) cannot go below. There is no federal minimum standard set for bentonite, peat, scoria, and sand & gravel. Therefore, there is less assurance that strong standards that are in rule and statute today will be there long-term.

Although the Montana Strategy's stipulations for bentonite, peat, scoria, and sand & gravel might be acceptable, we have no way to confirm that. Therefore, we wanted to request that the Governor's office review this new section and make sure that it adequately protects sage-grouse.

This request is not made lightly. At least for the bentonite and sand & gravel sectors, agencies are aware of their potential impacts to sage-grouse:

> "Other forms of mining (for example, bentonite, gravel, potash, and trona) can also influence sage-grouse habitats. The magnitude of the impacts of mining activities on sage-grouse and sagebrush habitats is largely unknown (Braun, 1998), but mining of various Federal mineral resources (locatable and saleable) currently affects approximately 3.6 percent of potential sage-grouse habitat directly (across all MZs [Management Zones]) with indirect effects potentially affecting large portions (5–32 percent) of some MZs (table 17A). In addition, existing leases for

development of non-energy, leasable minerals represent a relatively small threat (spatially) but may ultimately be developed to their full, spatial extent based on existing agreements (table 17B).

Development of surface mines and associated infrastructure (such as, roads and power lines), noise, and human activity may negatively impact sage-grouse numbers in the short term (Braun, 1998), and a variety of mineral claims could result in industrial activities that would disrupt the habitat and life-cycle of sage-grouse (fig. 24). The number of displaying sage-grouse on 2 leks within 2 km (1.25 mi) of active mines in northern Colorado declined by approximately 94 percent during a 5-year period following an increase in mining activity (Remington and Braun, 1991). However, Braun (1998) reported recovery of populations in Montana, Wyoming, and Colorado may occur after initial development and subsequent reclamation of mine sites, ***although populations do not recover to pre-development sizes*** [emphasis added]. Additionally, population re-establishment may take as long as 30 years (Braun, 1998)." (Manier et al. 2013)

MINORITY REPORT SUBMITTED BY:
Janet Ellis, Jay Gore and Carl Wambolt

DATE: 1-24-2014

REFERENCE:

Manier, D.J., Wood, D.J.A., Bowen, Z.H., Donovan, R.M., Holloran, M.J., Juliusson, L.M., Mayne, K.S., Oyler- McCance, S.J., Quamen, F.R., Saher, D.J., and Titolo, A.J., 2013, Summary of science, activities, programs, and policies that influence the rangewide conservation of Greater Sage-Grouse (*Centrocercus urophasianus*): U.S. Geological Survey Open-File Report 2013–1098, 170 pp., http://pubs.usgs.gov/of/2013/1098/.

Minority Committee Report for
NO SURFACE OCCUPANCY STANDARD IN GENERAL HABITAT
Greater Sage-Grouse Habitat Conservation Strategy

This Minority Committee Report on the general habitat No Surface Occupancy (NSO) standard found in the *Montana Greater Sage-Grouse Habitat Conservation Strategy* (*Montana Strategy*) was written because the final standard adopted is not science-based.

As background, the U.S. Fish & Wildlife Service (Service) first pointed out the inadequacies of the general habitat NSO standard in informal comments submitted to the Governor's Greater Sage-Grouse Habitat Advisory Council (Council) on September 24, 2013. Previous to that, Montana Fish, Wildlife & Parks (FWP) had given the Council a handout summarizing the scientific literature behind various standards, including the NSO, dated July 29, 2013; that handout specifically concluded that, "development[s] as close as 0.4 km (0.25 mi.) of a lek are wholly inadequate for effectively conserving sage-grouse" (FWP 2013). Despite this information, the Council voted to retain the 0.25-mile standard at its January 15, 2014 meeting.

It is particularly important to change the general habitat NSO standard found in the Draft *Montana Strategy* because of the differences between the sage-grouse strategies in Montana and Wyoming. The 0.25-mile standard is nearly identical to that found in Wyoming (State of Wyoming 2012). However, Wyoming has the ability to deliver more conservation protections to sage-grouse from its Core Area stipulations (relying less on general habitat) for the reasons described below. In contrast, the *Montana Strategy* must depend more significantly on general habitat for conservation of sage-grouse populations.

Because the objective of the *Montana Strategy* is to show the U.S. Fish & Wildlife Service (SERVICE) that Montana has a science-based plan that will lead to sage-grouse conservation, several committee members believe that it is important for the Governor to change this standard.

A recommended change to the general habitat NSO Standard, with justification, is provided below.

APPROVED LANGUAGE. The Council included the following recommendation for managing NSO in the *Montana Strategy*:

> General Habitat Stipulations, Page 32, Item 2:
> Surface Occupancy: Within 0.25 miles of the perimeter of an active sage-grouse lek there will be no surface occupancy (NSO).

RECOMMENDED CHANGE. A minority of the Council recommends the following changes to the *Montana Strategy*'s NSO standard, which has a basis in science:

> General Habitat Stipulations, Page 32, Item 2:
> Surface Occupancy: Within ~~0.25~~ 1.0 miles of the perimeter of an active sage-grouse lek there will be no surface occupancy (NSO).

RATIONALE FOR RECOMMENDED CHANGE:

1. The general habitat No Surface Occupancy (NSO) standard for Greater Sage-Grouse (GSG) leks currently found in the *Montana Strategy* is 0.25 miles. This standard is not scientifically defensible. The following studies and professional opinions support these statements:

- "Current well pad placement restrictions that allow development as close as 0.4 km (0.25 mi.) of a lek are wholly inadequate for effectively conserving sage-grouse. (FWP 2013)

- "In the context of this [Montana] Strategy, the proposed 0.25-mile NSO from active GSG leks in general habitat is inadequate to achieve GSG lek protection. This measure was decreased from the originally proposed 0.6 mile NSO in the pre-draft Strategy. Studies demonstrating the inadequacy of this measure include Holloran (2005), who found that development stipulations including a 0.25-mile NSO were inadequate to maintain GSG breeding populations in natural gas fields. Walker et al. (2007) found that lease stipulations that prohibit development within 0.4 km (0.25 mi) of GSG leks on federal lands were inadequate to ensure lek persistence and may result in impacts to breeding populations over larger areas. Harju et al. (2010) found that leks with ≥1 oil or gas well within a 0.4-km (0.25-mile) radius encircling the lek had 35–91% fewer attending males than leks with no well within this radius." (SERVICE 2013b, page C10)

- "Government imposed stipulations often restricted surface occupancy within 0.4 km (0.25 mi) of a lek during the time most studies were conducted, and leks that had ≥1 pad within this radius had 35 to 92 percent fewer attending males than did leks with zero wells within this distance (Harju and others, 2010; Naugle and others, 2011)." (Manier et al. 2013)

- "Surface occupancy of oil or gas wells adjacent to leks was negatively associated with male lek attendance in 5 of 7 study areas. For example, leks that had ≥1 oil or gas well within a 0.4-km (0.25-mile) radius encircling the lek had 35–91% fewer attending males than leks with no well within this radius." (Harju et al. 2010)

2. Although the science indicates a 4.0-mile NSO would have little to no impact on sage-grouse, an NSO of 1.0 mile for general habitat can be defended by at least some research. The following studies and professional opinions support this statement:

- "As we conveyed in our September 24, 2013 informal written comments, numerous recent studies (please again refer to the July 29, 2013 technical literature summary handout provided to the Council by FWP) document a large percent of nesting, as well as adverse effects of development, out to approximately 4 miles from leks. We recommend that the general habitat NSO be increased from 0.25 mile to the extent possible to minimize potential impacts to nesting habitat and breeding activities in general habitat and add conservation benefit to the Strategy. We recommend that the general habitat NSO match the core habitat NSO of 1 mile, but at a minimum extend to 0.6 mile in order to have any discernible effect. The increased NSO should apply consistently throughout the plan where referenced." (SERVICE 2013b, page C10)

- "…Coates et al. [2013] research shows the percentage of estimated animal use area (vUD) encompassed by increasing distances from the lek. The vUD can be loosely interpreted as the total area used by sage-grouse in this population. The authors report that at 0.25, 0.60, and 3 mile distances from lek, approximately 5%, 28%, and 90%, of the total area used by sage-grouse is encompassed, respectively. The graph suggests that at 1 mile from the lek, approximately 50-60% of the total area used by sage-grouse is encompassed." (MFWP 2014)

3. It is important to change this standard and make it science-based because it has been well established that sage-grouse are significantly impacted by disturbances. The following professional opinion supports this statement:

- "The loss and fragmentation of sagebrush habitats is a primary cause of the decline of sage-grouse populations (Patterson 1952; Connelly and Braun 1997; Braun 1998; Johnson and Braun 1999; Connelly et al. 2000; Miller and Eddleman 2000; Schroeder and Baydack 2001; Johnsgard 2002; Aldridge and Brigham 2003; Beck et al. 2003; Pedersen et al. 2003; Connelly et al. 2004; Schroeder et al. 2004; Leu and Hanser 2011; 75 FR 13910). Habitat fragmentation, largely a result of human activities, can result in reductions in lek persistence, lek attendance, population recruitment, yearling and adult annual survival, female nest site selection, nest initiation, and complete loss of leks and winter habitat (Holloran 2005; Aldridge and Boyce 2007; Walker et al. 2007; Doherty et al. 2008). Functional habitat loss also contributes to habitat fragmentation, as greater sage-grouse avoid areas due to human activities, including noise, even though sagebrush remains intact (Blickley et al. 2012)." (SERVICE 2013a)

4. This standard should be changed because in Montana general habitat plays a larger role in sage-grouse conservation than in Wyoming because of the proportion of sage-grouse population occurring in Core Areas. The

following information in support of this statement was obtained from presentations given to the Governor's Greater Sage-Grouse Habitat Advisory Council:

- In Montana, Core Areas only contain approximately 76% of the state's sage-grouse population; while Core Areas in Wyoming protect 84% of the sage-grouse population. Because Core Area stipulations are much more protective of sage-grouse than general habitat stipulations, Wyoming protects a higher percentage of its sage-grouse population through Core Area stipulations than Montana.

- In Montana, approximately 9.6 million acres are designated as Cores Areas and 24 million acres are designated as general habitat (34 million acres total). in Wyoming, about 15 million acres are designated as Core Areas, with 28 million acres designated as general habitat (43 million acres total). Again, because Core Area stipulations are much more protective of sage-grouse than general habitat stipulations, Wyoming protects significantly more sage-grouse habitat with Core Area stipulations than Montana.

- In Montana, public lands (state and federal) make up approximately 29% of the Core Areas and private lands make up 64% of the Core Areas. In Wyoming, this scenario is almost reversed: public ownership makes up about 61% of Core Areas, and private land is about 37% of Core Areas. It is more effective for government agencies to protect sage-grouse on public land, than on private land, because of the limited regulations that can be applied to private land. Consequently, because of land ownership patterns, Wyoming is able to ensure that more sage-grouse habitat is protected than Montana.

- The *Montana Strategy* allows up to 3% of Core Areas to become Special Management Core Areas (SMCA) (about 290,000 acres total). These SMCAs are areas identified within Core Areas where stipulations can be relaxed in the short-term, economic development opportunities can be realized in the near-term, and conservation benefits will hopefully be realized in the long-term. In Wyoming, there is no ability to designate SMCAs. Because SMCAs can be designated in Montana, and these areas may or may not produce long-term conservation benefits to sage-grouse, the *Montana Strategy* has set up a state-specific stipulation that may be a barrier in achieving sage-grouse conservation goals. In addition to delivering long-term rather than short-term conservation, concerns have been raised about Montana's SMCAs causing significant fragmentation of large sagebrush landscapes (see SERVICE 2013b, page C9).

- Given the above-outlined factors, the conservation measures in Core Areas in Montana need to be bolstered by more substantial conservation stipulations in general habitat in order for Montana to potentially reach the overall protections in the current Wyoming strategy. A 1.0-mile NSO in general habitat would qualify as a substantial conservation stipulation for sage-grouse. This statement is backed up by the following comment from the SERVICE on the *Montana Strategy*:

  "We [the SERVICE] agree that the health of general habitat areas is a critical element in the effort to maintain the abundance and distribution of GSG in Montana. Again, discussion on Page 2 of our comment letter provides support for the currently larger proposed NSOs in core habitat and highlights the importance of and requirement for general habitat protection, including NSOs, in the Montana Strategy." (SERVICE 2013b, page C10)

5. And finally, it makes sense to change the general habitat NSO stipulation to a standard that is supported by scientific studies, because it is a stand-alone stipulation: unlike Core Area stipulations, there are no associated density standards or disturbance caps that accompany the general habitat NSO. Therefore, it is important that the general habitat NSO provides defensible conservation protection to sage-grouse as a stand-along stipulation.

MINORITY REPORT SUBMITTED BY:
Janet Ellis, Jay Gore and Carl Wambolt

DATE: 1-24-2014

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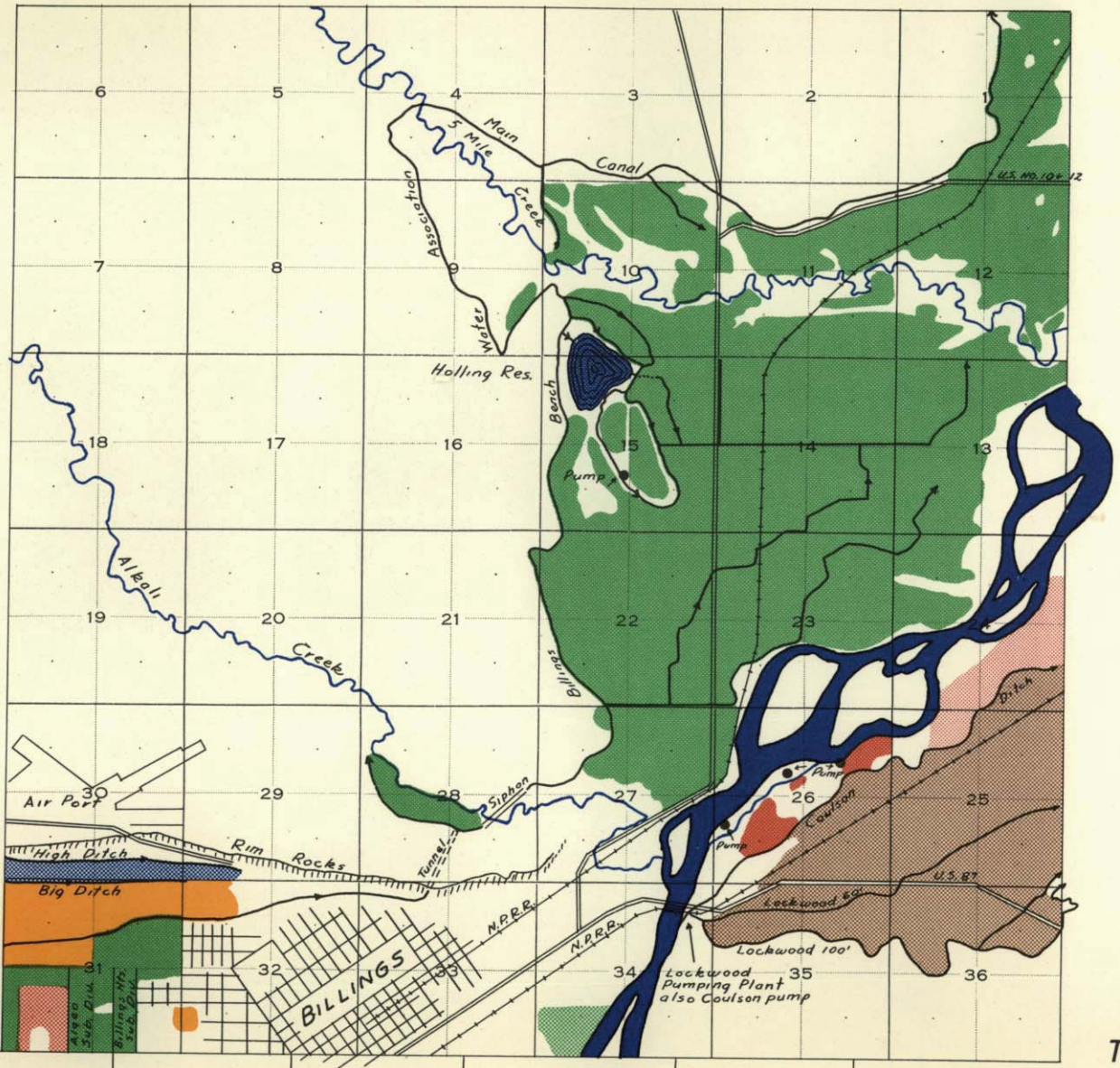
ATTACHMENT 4

Water Resource Survey Maps

Township No. 1 North Range No. 26 East County Yellowstone

T. 1 North
R. 26 East

Published by
Billings Commercial Club
1943



LEGEND

- B. B. W. A.
- Big
- Coulson
- Grey Eagle
- High
- Homestead Lateral
- Lockwood
- Private
- Streams

T1S R25E
T1S R26E

Compiled by
The State Engineers Office
As of January 1, 1943
G. J. Oravetz in Charge of Survey

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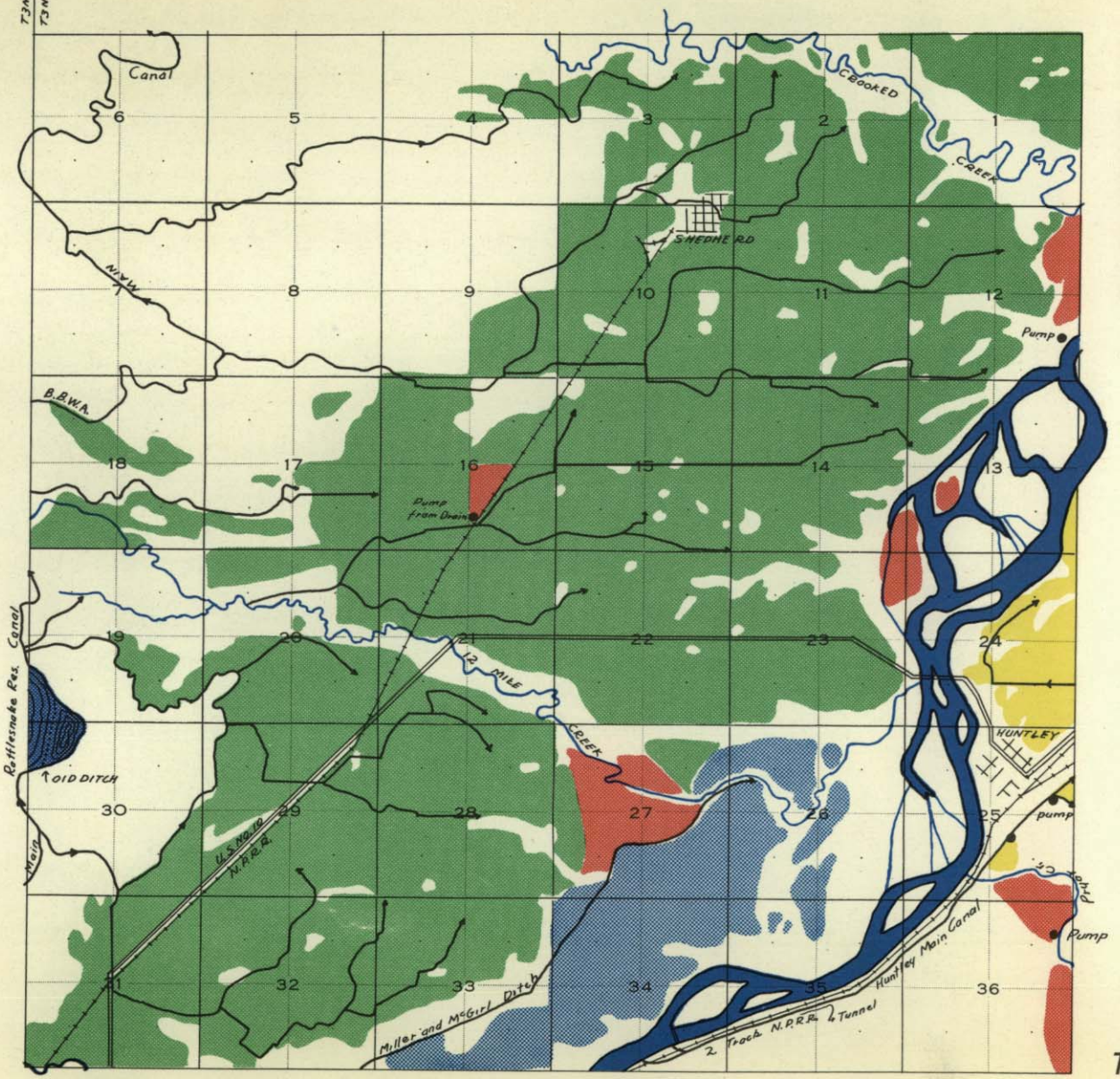
Township No. 2 North Range No. 27 East County Yellowstone

T. 2 North
R. 27 East

Published by
Billings Commercial Club
1943



LEGEND

- B. B. W. A.
- Huntley Project
- Miller and McGill
- Private
- Streams

Compiled by
The State Engineers Office
As of January 1, 1943
G. J. Oravetz in Charge of Survey

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