UNIFORM ENVIRONMENTAL CHECKLIST

As the engineer that prepared the preliminary engineering report, I Andy Mefford, P.E., have reviewed the information presented in this checklist and believe that it accurately identifies the environmental resources in the area and the potential impacts that the project could have on those resources. In addition, the required state and federal agencies were provided with the required information about the project and requested to provide comments on the proposed public facility project. Their comments have been incorporated into and attached to the Preliminary Engineering Report.

Engineer's Signature: _____

Date: 11/5/2009

Key Letter: **N** – No Impact/Not Applicable **B** – Potentially Beneficial **A** – Potentially Adverse
P – Approval/Permits Required **M** – Mitigation Required

PHYSICAL ENVIRONMENT	
Key **N or A/M**	**1. Soil Suitability, Topographic and/or Geologic Constraints (e.g., soil slump, steep slopes, subsidence, seismic activity)** *Comments and Source of Information*: There are no known topographic and/or geologic constraints imposed on the subject project due to steep slopes or subsidence. The Town is located in Seismic Zone "2B" and the design of the tank and foundation will take this into consideration. Soils on the site of the new reservoir and along the pipeline route are listed by the NRCS as consisting one or more of the following soil series (see Soils Map): Grantsdale (Mapping Symbol "G21"), Corvallis (Mapping Symbol "C3u") and/or Dominic (Mapping Symbol "Da"). All of these soil types have severe limitations due to high groundwater conditions. Pipelines will be buried at a depth of 6' BLS and dewatering of pipeline trenches may be required.
Key **N**	**2. Hazardous Facilities (e.g., power lines, EPA hazardous waste sites, acceptable distance from explosive and flammable hazards including chemical/petrochemical storage tanks, underground fuel storage tanks, and related facilities such as natural gas storage facilities & propane storage tanks)** *Comments and Source of Information*: The only know facility in the project area is a high pressure natural gas main that runs north-south east of Stevensville. This gas main crosses Middle Burnt Fork Road approximately ¼ mile east of Logan Lane. This line will most likely remain undisturbed during construction. Contractors will be required to locate all existing subsurface utilities including natural gas mains and electrical lines before excavation begins in order to avoid any potential hazardous situations.
Key **A/M**	**3. Effects of Project on Surrounding Air Quality or Any Kind of Effects of Existing Air Quality on Project (e.g., dust, odors, emissions)** *Comments and Source of Information*: Intermittent fugitive dust emissions can be expected during the construction of transmission pipelines, new water lines and the new water reservoir. These emissions can be minimized with effective dust control measures such as water spraying. Exhaust emissions, odors and noise from construction vehicles can be expected during project construction. These impacts cannot be avoided. However, they can be minimized by proper maintenance of the equipment to insure that emission/noise/odor control devices such as engine mufflers are functioning properly. All these negative impacts will cease once construction is completed.

Key	
B & A/M	4. **Groundwater Resources & Aquifers (e.g., quantity, quality, distribution, depth to groundwater, sole source aquifers)** *Comments and Source of Information*: Wells in the Stevensville area yield good quality water in sufficient quantity to be excellent sources of potable water for a municipal system. Existing Well No. 1 was drilled to a depth of 460' BLS into a semi-confined aquifer and is capable of delivering approximately 270 gpm (Limited by excessive sand production). A new well field capable of producing approximately 2,000 to 2,500 gpm will be drilled into the semi-confined aquifer. Groundwater is available in sufficient abundance that depletion of the aquifer is unlikely to be a problem.
Key A/M	5. **Surface Water/Water Quality, Quantity & Distribution (e.g., streams, lakes, storm runoff, irrigation systems, canals)** *Comments and Source of Information*: Use of BMPs (best management practices), for control of storm water runoff from disturbed areas will be used during construction of the tank and pipelines to prevent any siltation into area streams or rivers. BMPs will include use of silt fences at construction sites and silt fences & check dams in roadside ditches adjacent to pipeline installations. Open cut creek crossings will be avoided when possible.
Key N	6. **Floodplains & Floodplain Management (Identify any floodplains within one mile of the boundary of the project.)** *Comments and Source of Information*: The floodplain of the Bitterroot River is within a one mile radius of the project area. However, all proposed construction actions will be conducted outside of the 100-year floodplain of the Bitterroot River and its tributaries (see attached Floodplain Map). Mill and North Swamp Creeks are tributaries of the Bitterroot River that are within the project area. These water bodies do not have designated floodplains.
Key A/P	7. **Wetlands Protection (Identify any wetlands within one mile of the boundary of the project.)** *Comments and Source of Information*: No wetlands are expected to be impacted by the construction actions. The bulk of area wetlands are associated with the floodplain of the Bitterroot River and/or with the Lee Metcalf National Wildlife Refuge west and north of the project area, respectfully. Area creeks too will have some narrow fringing wetlands within their more restrictive floodplains or stream channels. The new reservoir and well site contains wetlands, and the new water supply transmission main extending from the new reservoir to the Town distribution system may need to cross wetlands enroute or require creek crossings. Efforts will be made to minimize the impacts on wetlands and water quality. Ideally the new pipeline will be placed under existing road sections or within the existing road right-of-way. **See attached Wetlands Delineation Report (PCI, March 2008)**

Key **A/M**	**8. Agricultural Lands, Production, & Farmland Protection (e.g., grazing, forestry, cropland, prime or unique agricultural lands) (Identify any prime or important farm ground or forest lands within one mile of the boundary of the project.)** *Comments and Source of Information*: There are no forestlands within a one-mile radius of the project boundary. In addition, no properties containing soils designated by the NCRS as either "Prime Farmland Soils" or Farmland Soils of Statewide Importance" will be impacted by this project. Approximately 4-6 acres of farmland/grazing land will be used to accommodate the new reservoir and well site. Taking this small amount of land out of agricultural use and converting it to municipal use will not result in a significant negative impact on agricultural activities in the surrounding area. There is sufficient useable alternative fallow agricultural land to compensate for the minor loss. No prime or unique agricultural lands or historic ranches will be impacted by the project.
Key **N**	**9. Vegetation & Wildlife Species & Habitats, Including Fish (e.g., terrestrial, avian and aquatic life and habitats)** *Comments and Source of Information*: With the exception of the reservoir and new well site, most construction actions will take place within the rights of way of roads and often under previously paved areas of roads. Therefore, there will be no significant impacts to vegetation or wildlife species. No fish species or habitat will be disturbed as a result of the construction. A portion of the 4-6 acre reservoir site and well site will be cleared of pasture grasses and/or alfalfa or hay crops in order to build the reservoir and/or to drill the well and install the well house. Losses of these common forms of vegetation will be relatively insignificant. No sensitive or endangered plant species will be lost at these sites. Disturbed areas will be seeded with native grasses once construction is completed.
Key **N**	**10. Unique, Endangered, Fragile, or Limited Environmental Resources, Including Endangered Species (e.g., plants, fish or wildlife)** *Comments and Source of Information*: The database of the *Montana Natural Heritage Program* was checked relative to the possible presence of any unique, endangered, or fragile species or species of special concern within the project area. No unique, endangered, or fragile animal or plant species will be impacted by the project. Both the Westslope Cutthroat Trout and the Bull Trout are potentially found in area streams and rivers. These fish species are listed as being of "Special Concern." No disturbances to these fish or their habitat will occur as a result of the project.
Key **N**	**11. Unique Natural Features (e.g., geologic features)** *Comments and Source of Information*: There are no unique natural features in the project area and none will be impacted by the project construction.
Key **N**	**12. Access to, and Quality of, Recreational & Wilderness Activities, Public Lands and Waterways (including Federally Designated Wild & Scenic Rivers), and Public Open Space** *Comments and Source of Information*: The project area is remote from all designated wilderness areas. The Lee Metcalf National Wildlife Refuge is located north of the subject project area, but will not be impacted in any way by the implementation of the subject project.

HUMAN POPULATION	
Key A/M	1. **Visual Quality – Coherence, Diversity, Compatibility of Use and Scale, Aesthetics** *Comments and Source of Information*: Local residents will note the presence of construction equipment during the construction phase of the project and some will consider the presence of such equipment objectionable. Such negative aesthetic impacts are unavoidable. Associated with the equipment will be dust emissions, odors and noise, all of which are unavoidable, but can be mitigated in part by BMPs and proper maintenance of the equipment. All impacts are temporary and all adverse impacts will cease once construction work has been completed.
Key A/M	2. **Nuisances (e.g., glare, fumes)** *Comments and Source of Information*: Disruption of local residents due to construction noise, fumes, dust, etc. is unavoidable. Such effects will be mitigated wherever possible by BMPs and control measures. All such nuisances will be temporary in duration and will cease once construction is completed.
Key A/M	3. **Noise -- suitable separation between noise sensitive activities (such as residential areas) and major noise sources (aircraft, highways & railroads)** *Comments and Source of Information*: For the most part, densely populated areas will be shielded from most of the noise associated with the construction of the reservoir, the new well and the bulk of the run of the new supply transmission main, as all these actions will take place in relatively rural areas outside of the Town limits. Temporary noise impacts in more populated areas will occur due to programmed improvements to the water distribution system. Such impacts are unavoidable, but will cease once construction is completed. The new water well will be equipped with an emergency diesel generator. This unit will be tested by the water system personnel on an intermittent basis (most likely on a monthly basis) and will function continuously during power outages. The unit will be equipped with residential noise attenuation devices to minimize noise impacts to nearby residents.
Key N	4. **Historic Properties, Cultural, and Archaeological Resources** *Comments and Source of Information*: No historic properties or archaeological or cultural resources will be impacted by the subject project as virtually all the construction actions will take place in previously disturbed areas. However, should cultural or archaeological materials of significance be unearthed during construction, crews will be asked to stop construction and to notify the proper authorities so that the value of any uncovered materials can be professionally evaluated before construction work is resumed. This way, no valuable resources will be lost.
Key N	5. **Changes in Demographic (population) Characteristics (e.g., quantity, distribution, density)** *Comments and Source of Information*: The project is designed to meet the water supply and distribution needs of the Town of Stevensville for the next 20 years (to the year 2030). The construction of these improvements is not expected to result in any overt changes in population density or distribution, as the project is simply a response to normal growth and development caused principally by other factors including a net in migration of new residents to the Bitterroot Valley from other states.

Key N	**6. Environmental Justice – (Does the project avoid placing lower income households in areas where environmental degradation has occurred, such as adjacent to brownfield sites?)** *Comments and Source of Information*: No brownfield sites or remediated toxic waste sites will be impacted by the subject project. All water system users in the Stevensville community will benefit equally from the project improvements.
Key N/B	**7. General Housing Conditions - Quality, Quantity, Affordability** *Comments and Source of Information*: The project is not expected to have a pronounced effect on general housing conditions in the Stevensville Area. Such conditions are normally driven by other more profound economic and social factors beyond the scope of water system improvements projects. The upgraded and improved water system will result in better and more consistently good water quality, which will benefit local housing conditions. In addition, the improved system will afford increased fire protection for area housing.
Key N	**8. Displacement or Relocation of Businesses or Residents** *Comments and Source of Information*: The project will not require the displacement or relocation of any area businesses or residences. All construction actions will take place either within existing roadway rights of way or on land that has not been previously developed for commercial or residential use.
Key B	**9. Public Health and Safety** *Comments and Source of Information*: The health and safety of local residents are expected to be improved as a result of the project. The upgrading of Well No. 1 and the drilling of a new high capacity well field into the semi-confined aquifer will reduce the need to rely on other shallow wells that are not well protected from possible contamination. Also, reliance on the near surface infiltration gallery for the bulk of the raw water supply will be eliminated.
Key N	**10. Lead Based Paint and/or Asbestos** *Comments and Source of Information*: The proposed project will not result in the disturbance of any lead based paint or asbestos.
Key B	**11. Local Employment & Income Patterns - Quantity and Distribution of Employment, Economic Impact** *Comments and Source of Information:* The project implementation may result in the creation of temporary construction jobs for local residents. Also, construction crews will likely support local businesses during the construction of facility improvements. The increased demand for food, lodging, equipment and supplies resulting from the project will have a positive impact on the local economy.

Key	
B	**12. Local & State Tax Base & Revenues** *Comments and Source of Information*: The provision of an adequate water system will allow for prudent growth and development in Stevensville resulting in a gradually expanding tax base and sufficient revenues to sustain the system operation and maintenance at a high level.
B	**13. Educational Facilities - Schools, Colleges, Universities** *Comments and Source of Information*: The upgraded and improved water system will better serve the needs of area public schools. Stevensville District Schools, K-12, are connected to the Stevensville Municipal Water System. The improved system will provide adequate fire flow to Stevensville's schools.
B	**14. Commercial and Industrial Facilities - Production & Activity, Growth or Decline** *Comments and Source of Information*: The upgraded water system will likely have a positive effect on commercial and industrial facilities. With improved available system capacity, the Town will be in a position to attract limited compatible commercial development and/or light (non-polluting) industrial facilities which will benefit the local economy and result in prudent growth and development.
B	**15. Health Care – Medical Services** *Comments and Source of Information*: The upgrading of the existing water system will reduce the risk of water borne diseases which will have a positive impact on all system users and will reduce potential need for heath care and medical services by Town residents.
N	**16. Social Services – Governmental Services (e.g., demand on)** *Comments and Source of Information*: Improvements to the existing municipal water system will likely require additional operation and maintenance actions by local municipal employees. However, this will be offset in part by the retirement of inefficient existing systems and equipment that currently require an inordinate amount of attention by service personnel. The net demand for services related to the water system are likely to remain about the same following project construction.
N	**17. Social Structures & Mores (Standards of Social Conduct/Social Conventions)** *Comments and Source of Information*: The subject project will have no impacts whatsoever on social structures and mores.
B/P/M	**18. Land Use Compatibility (e.g., growth, land use change, development activity, adjacent land uses and potential conflicts)** *Comments and Source of Information*: The project will result in an improved water supply system for the Town of Stevensville, which will enable the Town to meet anticipated growth needs for the next 20 years (year 2030). The source of the growth is not the water system itself. Rather, it is required in order to meet both existing and projected needs, which have their origins in other more external factors. However, the improved system will likely make it easier for new subdivisions to be constructed within the Town's service area, which may provide a stimulus for new development. On the positive side of the equation is the fact that such growth will likely occur where municipal services are available making for a more efficient use of land and the reduction of "urban sprawl."

Key B	**19. Energy Resources - Consumption and Conservation** *Comments and Source of Information*: The programmed replacement of an inefficient pump at Well #1 will result in lower net energy consumption and a higher yield of water from this source. Furthermore, the repair of the leaks associated with the Middle Burnt Fork water main will result in savings of up to 350,000 GPD of lost water.
Key N	**20. Solid Waste Management** *Comments and Source of Information*: Minimal solid wastes will be developed from this project.
Key N	**21. Wastewater Treatment - Sewage System** *Comments and Source of Information*: The upgraded water system will have no adverse impacts on the Stevensville Municipal Wastewater Treatment System. The treatment plant was recently upgraded to meet projected growth demands to the year 2016.
Key N	**22. Storm Water – Surface Drainage** *Comments and Source of Information*: The Town of Stevensville does not have a municipal storm water collection system. Storm water controls consist of dry well sumps and roadside ditches/swales which either recharge the surficial aquifer or direct flows to natural drainage ways for dissipation.
Key B	**23. Community Water Supply** *Comments and Source of Information*: The project will provide adequate supplies for domestic uses and fire flows in concert with the 20 year projections for the system. The project will also bring the water system into compliance with current State and Federal (EPA) rules and regulations governing such systems.
Key A/M	**24. Public Safety – Police** *Comments and Source of Information*: Services from the local police may be required from time to time to provide adequate traffic controls during the construction work, especially those actions that will take place within public rights of way. Such impacts are deemed minimal and temporary and will cease once construction is completed.
Key B	**25. Fire Protection – Hazards** *Comments and Source of Information*: An ISO Commercial Risk Services, Inc. review of the Town of Stevensville's Water Distribution System in 1996 indicated the need for peak hydrant flows in the downtown area of 3,000 gpm @ 20 psi. Measured flows were only 1,800 gpm. Needed flows at a hydrant at the Town's schools was also 3,000 gpm, while only 1,900 gpm was found. The new improvements are designed to meet the required flows, which will improve fire protection capabilities throughout the system.

Key Letter: N – No Impact/Not Applicable **B** – Potentially Beneficial **A** – Potentially Adverse
P – Approval/Permits Required **M** – Mitigation Required

Key	
B	**26. Emergency Medical Services** *Comments and Source of Information*: The upgraded water system will likely have a positive effect on commercial and industrial facilities. With improved available system capacity, the Town will be in a position to attract limited compatible commercial development and/or light (non-polluting) industrial facilities which will benefit the local economy and result in prudent growth and development.
N	**27. Parks, Playgrounds, & Open Space** *Comments and Source of Information*: The project will have no impacts on parks, playgrounds or open space in the Stevensville area.
N	**28. Cultural Facilities, Cultural Uniqueness & Diversity** *Comments and Source of Information*: The project will have no impacts on cultural facilities or cultural uniqueness and diversity in the Stevensville area.
A/M	**29. Transportation Networks and Traffic Flow Conflicts (e.g., rail; auto including local traffic; airport runway clear zones - avoidance of incompatible land use in airport runway clear zones)** *Comments and Source of Information*: Trained personnel and temporary traffic control devices & signs will be required to control and direct vehicular and pedestrian traffic around the construction of the proposed improvement. This will result in brief traffic delays. Such impacts are unavoidable, but temporary, and will cease once the project has been completed.
B	**30. Consistency with Local Ordinances, Resolutions, or Plans (e.g., conformance with local comprehensive plans, zoning, or capital improvement plans)** *Comments and Source of Information*: The proposed improvements are in concert with the *Municipal Water Supply Study Plan for the City of Stevensville* (1993), *Stevensville Water & Sewer Facilities Plan* (1996) and with the pending *Preliminary Engineering Report, Stevensville Municipal Water System Improvements* (2009 Update).
N	**31. Is There a Regulatory Action on Private Property Rights as a Result of this Project? (consider options that reduce, minimize, or eliminate the regulation of private property rights.)** *Comments and Source of Information*: The proposed project will have no impacts whatsoever on private property rights.

Town of Stevensville NRCS Soil Map Units

- Town of Stevensville Municipal Boundary
- Proposed Well Field
- Roads

See attached NRCS Soil Map Unit Descriptions for details.

Proposed Well Field

1 inch equals 800 feet

0 0.05 0.1 0.2 Miles

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Map Unit Descriptions (MT)

Bitterroot Valley Area, Montana

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

10A--Riverwash-Water-Riverrun complex, 0 to 2 percent slopes

Mean annual precipitation: 12 to 14 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 90 to 115 days

Riverwash

Extent: about 40 percent of the unit
Landform(s): bars, flood plains, intermontain basins
Slope gradient:
Parent material: sandy and gravelly alluvium
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: frequent
Ponding hazard: none

Soil loss tolerance (T factor):
Wind erodibility group (WEG):
Wind erodibility index (WEI):
Land capability class, nonirrigated:
Drainage class:
Hydric soil: unranked
Hydrologic group:
Potential frost action:

Ecological site(s): ---

Representative soil profile:

Texture	Permeability	Available water capacity	pH	Kw	Kf

none

Water

Extent: about 30 percent of the unit
Landform(s): flood plains, intermontain basins
Slope gradient:
Parent material:
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor):
Wind erodibility group (WEG):
Wind erodibility index (WEI):
Land capability class, nonirrigated:
Drainage class:
Hydric soil: unranked
Hydrologic group:
Potential frost action:

Ecological site(s):

Representative soil profile:

Texture	Permeability	Available water capacity	pH	Kw	Kf

none

Map Unit Descriptions (MT)

Bitterroot Valley Area, Montana

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Riverrun and similar soils

Extent: about 20 percent of the unit
Landform(s): flood-plain steps, intermontain basins
Slope gradient: 0 to 2 percent
Parent material: sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: approximately 33 inches
Flooding hazard: frequent
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 2
Wind erodibility index (WEI): 86
Land capability class, nonirrigated: 6s
Drainage class: moderately well drained
Hydric soil: yes
Hydrologic group: A
Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 4 in	very gravelly loamy sand	rapid	0.1 to 0.2 in	6.1 to 7.3	.05	.17
C -- 4 to 60 in	extremely gravelly sand	very rapid	1.1 to 1.7 in	6.1 to 7.3	.02	.17

Canarway, very poorly drained and similar soils

Extent: about 10 percent of the unit
Landform(s): abandoned channels, flood plains, intermontain basins
Slope gradient: 0 to 2 percent
Parent material: sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: approximately 6 inches
Flooding hazard: frequent
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 56
Land capability class, nonirrigated: 6w
Drainage class: very poorly drained
Hydric soil: yes
Hydrologic group: D
Potential frost action: moderate

Ecological site(s): Wet Meadow (WM) 10-14" p.z.

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
Oe -- 0 to 3 in	mucky peat	rapid		4.0 to 6.0		
A -- 3 to 7 in	fine sandy loam	moderately rapid	0.4 to 0.6 in	6.6 to 7.3	.17	.17
2C1 -- 7 to 24 in	very gravelly sand	very rapid	0.3 to 0.7 in	6.6 to 7.3	.05	.17
2C2 -- 24 to 60 in	extremely gravelly sand	very rapid	0.7 to 1.4 in	6.6 to 7.3	.05	.17

Minor Components

Canarway, very poorly drained and similar soils: 10 percent of the unit
Water: 30 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

11A--Riverrun-Canarway-Fredburr complex, 0 to 2 percent slopes

Mean annual precipitation: 12 to 14 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 90 to 115 days

Riverrun and similar soils

Extent: about 40 percent of the unit
Landform(s): flood-plain steps, intermontain basins
Slope gradient: 0 to 2 percent
Parent material: sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: approximately 33 inches
Flooding hazard: occasional
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 3
Wind erodibility index (WEI): 86
Land capability class, nonirrigated: 6s
Drainage class: moderately well drained
Hydric soil: no
Hydrologic group: A
Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

Representative soil profile:

		Texture	Permeability	Available water capacity	pH	Kw	Kf
A --	0 to 6 in	sandy loam	moderately rapid	0.6 to 0.7 in	6.1 to 7.3	.20	.20
C1 --	6 to 16 in	gravelly loamy sand	very rapid	0.3 to 0.7 in	6.1 to 7.3	.10	.17
2C2 --	16 to 60 in	very gravelly loamy coarse sand	very rapid	0.9 to 1.3 in	6.1 to 7.3	.02	.17

Canarway, very poorly drained and similar soils

Extent: about 30 percent of the unit
Landform(s): abandoned channels, flood plains, intermontain basins
Slope gradient: 0 to 2 percent
Parent material: sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: approximately 6 inches
Flooding hazard: occasional
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 56
Land capability class, nonirrigated: 6w
Drainage class: very poorly drained
Hydric soil: yes
Hydrologic group: D
Potential frost action: moderate

Ecological site(s): Wet Meadow (WM) 10-14" p.z.

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
Oe -- 0 to 3 in	mucky peat	rapid		4.0 to 6.0		
A -- 3 to 7 in	fine sandy loam	moderately rapid	0.4 to 0.6 in	6.6 to 7.3	.17	.17
2C1 -- 7 to 24 in	very gravelly sand	very rapid	0.3 to 0.7 in	6.6 to 7.3	.05	.17
2C2 -- 24 to 60 in	extremely gravelly sand	very rapid	0.7 to 1.4 in	6.6 to 7.3	.05	.17

Fredburr and similar soils

Extent: about 25 percent of the unit

Landform(s): flood-plain steps, intermontain basins

Slope gradient: 0 to 2 percent

Parent material: sandy alluvium over gravelly alluvium derived from mixed

Restrictive feature(s): none

Seasonal high water table: approximately 33 inches

Flooding hazard: occasional

Ponding hazard: none

Soil loss tolerance (T factor): 2

Wind erodibility group (WEG): 3

Wind erodibility index (WEI): 86

Land capability class, nonirrigated: 4w

Drainage class: somewhat poorly drained

Hydric soil: no

Hydrologic group: A

Potential frost action: moderate

Ecological site(s): Sandy (Sy) 10-14" p.z.

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 5 in	fine sandy loam	moderately rapid	0.5 to 0.7 in	6.1 to 7.3	.20	.20
C1 -- 5 to 28 in	sand	very rapid	0.5 to 1.8 in	6.1 to 7.3	.17	.17
C2 -- 28 to 60 in	extremely gravelly sand	very rapid	0.6 to 1.0 in	6.1 to 7.3	.02	.17

Minor Components

Water: 0 to 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

12A--Riverrun-Curlew complex, 0 to 2 percent slopes

Mean annual precipitation: 12 to 14 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 90 to 115 days

Riverrun and similar soils

Extent: about 70 percent of the unit
Landform(s): flood-plain steps, intermontain basins
Slope gradient: 0 to 2 percent
Parent material: sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: approximately 33 inches
Flooding hazard: rare
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 3
Wind erodibility index (WEI): 86
Land capability class, nonirrigated: 6s
Drainage class: moderately well drained
Hydric soil: no
Hydrologic group: A
Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 6 in	sandy loam	moderately rapid	0.6 to 0.7 in	6.1 to 7.3	.20	.20
C1 -- 6 to 16 in	gravelly loamy sand	very rapid	0.3 to 0.7 in	6.1 to 7.3	.10	.17
2C2 -- 16 to 60 in	very gravelly loamy coarse sand	very rapid	0.9 to 1.3 in	6.1 to 7.3	.02	.17

Curlew and similar soils

Extent: about 20 percent of the unit
Landform(s): abandoned channels, flood plains, intermontain basins
Slope gradient: 0 to 2 percent
Parent material: sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: approximately 8 inches
Flooding hazard: rare
Ponding hazard: none

Soil loss tolerance (T factor): 3
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 56
Land capability class, nonirrigated: 5w
Drainage class: very poorly drained
Hydric soil: yes
Hydrologic group: D
Potential frost action: moderate

Ecological site(s): Wet Meadow (WM) 10-14" p.z.

Map Unit Descriptions (MT)

Bitterroot Valley Area, Montana

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 11 in	silt loam	moderately rapid	1.7 to 2.0 in	6.6 to 7.4	.24	.24
C1 -- 11 to 24 in	sandy loam	moderately rapid	1.2 to 1.7 in	6.6 to 7.4	.10	.20
2C2 -- 24 to 29 in	very gravelly loamy sand	rapid	0.2 to 0.4 in	6.6 to 7.4	.05	.24
2C3 -- 29 to 60 in	very gravelly sand	very rapid	0.6 to 0.9 in	5.6 to 7.4	.05	.20

Minor Components

Fredburr and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

13A--Fredburr fine sandy loam, 0 to 2 percent slopes

Mean annual precipitation: 12 to 14 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 90 to 115 days

Fredburr and similar soils

Extent: about 85 percent of the unit
Landform(s): flood-plain steps, intermontain basins
Slope gradient: 0 to 2 percent
Parent material: sandy alluvium over gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: approximately 33 inches
Flooding hazard: occasional
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 3
Wind erodibility index (WEI): 86
Land capability class, nonirrigated: 6w
Drainage class: somewhat poorly drained
Hydric soil: no
Hydrologic group: A
Potential frost action: moderate

Ecological site(s): Sandy (Sy) 10-14" p.z.

Representative soil profile:

		Texture	Permeability	Available water capacity	pH	Kw	Kf
A --	0 to 5 in	fine sandy loam	moderately rapid	0.5 to 0.7 in	6.1 to 7.3	.20	.20
C1 --	5 to 28 in	sand	very rapid	0.5 to 1.8 in	6.1 to 7.3	.17	.17
C2 --	28 to 60 in	extremely gravelly sand	very rapid	0.6 to 1.0 in	6.1 to 7.3	.02	.17

Minor Components

Riverrun and similar soils: 10 percent of the unit
Canarway and similar soils: 5 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

14F--Chereete-Curlew complex, 0 to 45 percent slopes

Mean annual precipitation: 12 to 14 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 90 to 115 days

Chereete and similar soils

Extent: about 65 percent of the unit
Landform(s): escarpments, intermontain basins
Slope gradient: 8 to 45 percent
Parent material: sandy and gravelly outwash derived from granite and gneiss
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 3
Wind erodibility index (WEI): 48
Land capability class, nonirrigated: 6e
Drainage class: excessively drained
Hydric soil: no
Hydrologic group: A
Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

Representative soil profile:

		Texture	Permeability	Available water capacity	pH	Kw	Kf
A	0 to 6 in	very gravelly coarse sandy loam	rapid	0.3 to 0.4 in	5.6 to 7.3	.05	.20
Bw	6 to 14 in	gravelly sandy loam	moderately rapid	0.7 to 0.9 in	5.1 to 7.0	.10	.20
C1	14 to 18 in	very gravelly coarse sandy loam	moderately rapid	0.2 to 0.3 in	5.1 to 7.0	.05	.20
C2	18 to 25 in	very gravelly loamy coarse sand	rapid	0.2 to 0.3 in	5.1 to 7.0	.05	.17
C3	25 to 60 in	extremely gravelly coarse sand	very rapid	0.4 to 1.1 in	5.1 to 6.5	.02	.17

Curlew and similar soils

Extent: about 25 percent of the unit
Landform(s): flood plains, intermontain basins
Slope gradient: 0 to 2 percent
Parent material: sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: approximately 8 inches
Flooding hazard: rare
Ponding hazard: none

Soil loss tolerance (T factor): 3
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 56
Land capability class, nonirrigated: 5w
Drainage class: very poorly drained
Hydric soil: yes
Hydrologic group: D
Potential frost action: moderate

Ecological site(s): Wet Meadow (WM) 10-14" p.z.

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 11 in	silt loam	moderately rapid	1.7 to 2.0 in	6.6 to 7.4	.24	.24
C1 -- 11 to 24 in	sandy loam	moderately rapid	1.2 to 1.7 in	6.6 to 7.4	.10	.20
2C2 -- 24 to 29 in	very gravelly loamy sand	rapid	0.2 to 0.4 in	6.6 to 7.4	.05	.24
2C3 -- 29 to 60 in	very gravelly sand	very rapid	0.6 to 0.9 in	5.6 to 7.4	.05	.20

Minor Components

Perma and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

16E--Riverside-Tiechute-Curlew complex, 0 to 40 percent slopes

Mean annual precipitation: 12 to 15 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 90 to 115 days

Tiechute and similar soils

Extent: about 40 percent of the unit
Landform(s): intermontain basins, stream terraces
Slope gradient: 0 to 4 percent
Parent material: sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 3
Wind erodibility index (WEI): 56
Land capability class, nonirrigated: 6e
Drainage class: somewhat excessively drained
Hydric soil: no
Hydrologic group: A
Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 7 in	cobbly sandy loam	moderately rapid	0.6 to 0.9 in	6.6 to 7.3	.10	.20
AC -- 7 to 10 in	very cobbly sandy loam	rapid	0.1 to 0.2 in	6.6 to 7.3	.05	.20
C -- 10 to 60 in	extremely cobbly loamy sand	very rapid	0.5 to 1.0 in	6.6 to 7.3	.02	.17

Riverside and similar soils

Extent: about 40 percent of the unit
Landform(s): escarpments, intermontain basins
Slope gradient: 15 to 40 percent
Parent material: sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 3
Wind erodibility index (WEI): 56
Land capability class, nonirrigated: 6e
Drainage class: excessively drained
Hydric soil: no
Hydrologic group: A
Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 7 in	cobbly sandy loam	moderately rapid	0.6 to 0.9 in	6.6 to 7.3	.10	.20
BC -- 7 to 12 in	gravelly sandy loam	moderately rapid	0.3 to 0.5 in	6.6 to 7.8	.10	.20
C1 -- 12 to 25 in	very gravelly loamy sand	rapid	0.4 to 0.7 in	6.6 to 7.8	.05	.17
C2 -- 25 to 60 in	extremely gravelly coarse sand	very rapid	0.3 to 1.0 in	6.6 to 7.8	.02	.17

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Curlew and similar soils

Extent: about 20 percent of the unit
Landform(s): flood plains, intermontain basins
Slope gradient: 0 to 2 percent
Parent material: sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: approximately 8 inches
Flooding hazard: very rare
Ponding hazard: none

Soil loss tolerance (T factor): 3
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 56
Land capability class, nonirrigated: 5w
Drainage class: very poorly drained
Hydric soil: yes
Hydrologic group: D
Potential frost action: moderate

Ecological site(s): Wet Meadow (WM) 10-14" p.z.

Representative soil profile:

		Texture	Permeability	Available water capacity	pH	Kw	Kf
A --	0 to 11 in	silt loam	moderately rapid	1.7 to 2.0 in	6.6 to 7.4	.24	.24
C1 --	11 to 24 in	sandy loam	moderately rapid	1.2 to 1.7 in	6.6 to 7.4	.10	.20
2C2 --	24 to 29 in	very gravelly loamy sand	rapid	0.2 to 0.4 in	6.6 to 7.4	.05	.24
2C3 --	29 to 60 in	very gravelly sand	very rapid	0.6 to 0.9 in	5.6 to 7.4	.05	.20

Minor Components

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

20E--Losthorse, rubbly-Poverty-Riverrun, stony, complex, 1 to 35 percent slopes

Mean annual precipitation: 13 to 17 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 85 to 105 days

Losthorse, rubbly and similar soils

Extent: about 70 percent of the unit
Landform(s): escarpments, intermontain basins, moraines
Slope gradient: 12 to 35 percent
Parent material: sandy and gravelly till derived from granite and gneiss
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 3
Wind erodibility index (WEI): 48
Land capability class, nonirrigated: 7s
Drainage class: somewhat excessively drained
Hydric soil: no
Hydrologic group: A
Potential frost action: low

Ecological site(s): ---

Representative soil profile:

		Texture	Permeability	Available water capacity	pH	Kw	Kf
A --	0 to 3 in	very stony sandy loam	moderately rapid	0.2 to 0.3 in	4.5 to 6.5	.05	.20
Bw --	3 to 15 in	very cobbly coarse sandy loam	moderately rapid	0.6 to 1.2 in	4.5 to 6.5	.05	.20
C1 --	15 to 25 in	very cobbly loamy coarse sand	very rapid	0.2 to 0.3 in	4.5 to 6.0	.05	.17
C2 --	25 to 60 in	extremely gravelly coarse sand	very rapid	0.3 to 1.0 in	4.5 to 6.0	.02	.17

Riverrun, stony and similar soils

Extent: about 15 percent of the unit
Landform(s): flood plains, intermontain basins
Slope gradient: 2 to 6 percent
Parent material: sandy and gravelly alluvium derived from granite and gneiss
Restrictive feature(s): none
Seasonal high water table: approximately 33 inches
Flooding hazard: rare
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 3
Wind erodibility index (WEI): 48
Land capability class, nonirrigated: 7s
Drainage class: moderately well drained
Hydric soil: no
Hydrologic group: A
Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 4 in	very cobbly coarse sandy loam	moderately rapid	0.3 to 0.4 in	5.6 to 7.3	.10	.17
AC -- 4 to 7 in	very cobbly coarse sandy loam	moderately rapid	0.2 to 0.3 in	5.6 to 7.3	.10	.17
C1 -- 7 to 17 in	very gravelly loamy coarse sand	rapid	0.3 to 0.5 in	5.6 to 7.3	.05	.17
C2 -- 17 to 60 in	very gravelly loamy coarse sand	very rapid	0.9 to 1.3 in	6.1 to 7.3	.02	.17

Poverty and similar soils

Extent: about 15 percent of the unit

Landform(s): intermontain basins, outwash terraces

Slope gradient: 0 to 4 percent

Parent material: sandy and gravelly alluvium derived from granite

Restrictive feature(s): none

Seasonal high water table: approximately 18 inches

Flooding hazard: none

Ponding hazard: none

Soil loss tolerance (T factor): 2

Wind erodibility group (WEG): 5

Wind erodibility index (WEI): 48

Land capability class, nonirrigated: 6w

Drainage class: poorly drained

Hydric soil: yes

Hydrologic group: D

Potential frost action: moderate

Ecological site(s): Wet Meadow (WM) 10-14" p.z.

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
Oe -- 0 to 1 in	mucky peat	rapid		4.0 to 6.0		
A -- 1 to 5 in	cobbly sandy loam	moderately rapid	0.4 to 0.5 in	5.1 to 7.3	.20	.20
Bw -- 5 to 10 in	cobbly sandy loam	moderately rapid	0.4 to 0.6 in	5.1 to 7.3	.20	.20
C1 -- 10 to 14 in	cobbly coarse sandy loam	rapid	0.0 to 0.4 in	5.1 to 6.5	.10	.17
C2 -- 14 to 19 in	very cobbly loamy coarse sand	very rapid	0.0 to 0.1 in	5.1 to 6.5	.05	.17
C3 -- 19 to 60 in	extremely gravelly coarse sand	very rapid	0.4 to 1.2 in	5.1 to 6.5	.02	.17

Minor Components

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

26B--Grayhorse silt loam, 0 to 4 percent slopes

Mean annual precipitation: 12 to 15 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 90 to 115 days

Grayhorse and similar soils

Extent: about 85 percent of the unit
Landform(s): inset fans, intermontain basins, stream terraces
Slope gradient: 0 to 4 percent
Parent material: fine-loamy alluvium over sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: approximately 28 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 4
Wind erodibility group (WEG): 4L
Wind erodibility index (WEI): 86
Land capability class, nonirrigated: 3w
Drainage class: somewhat poorly drained
Hydric soil: no
Hydrologic group: B
Potential frost action: moderate

Ecological site(s): Subirrigated (Sb) 10-14" p.z.

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A1 -- 0 to 12 in	silt loam	moderate	1.7 to 2.1 in	6.6 to 8.4	.37	.37
A2 -- 12 to 18 in	loam	moderate	0.9 to 1.1 in	6.6 to 7.8	.37	.37
C1 -- 18 to 29 in	gravelly loam	moderate	1.2 to 1.8 in	6.6 to 7.8	.24	.37
2C2 -- 29 to 34 in	very cobbly sandy loam	moderately rapid	0.3 to 0.5 in	6.6 to 7.8	.10	.20
2C3 -- 34 to 60 in	extremely gravelly loamy sand	very rapid	0.5 to 0.8 in	6.6 to 7.3	.02	.17

Minor Components

Sweathouse and similar soils: 10 percent of the unit
Fairway and similar soils: 5 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

27B--Curlew-Groff silt loams, 0 to 4 percent slopes

Mean annual precipitation: 12 to 14 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 90 to 115 days

Curlew and similar soils

Extent: about 75 percent of the unit
Landform(s): drainageways, intermontain basins
Slope gradient: 0 to 2 percent
Parent material: sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: approximately 8 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 3
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 56
Land capability class, nonirrigated: 5w
Drainage class: very poorly drained
Hydric soil: yes
Hydrologic group: D
Potential frost action: moderate

Ecological site(s): Wet Meadow (WM) 10-14" p.z.

Representative soil profile:

		Texture	Permeability	Available water capacity	pH	Kw	Kf
A --	0 to 11 in	silt loam	moderately rapid	1.7 to 2.0 in	6.6 to 7.4	.24	.24
C1 --	11 to 24 in	sandy loam	moderately rapid	1.2 to 1.7 in	6.6 to 7.4	.10	.20
2C2 --	24 to 29 in	very gravelly loamy sand	rapid	0.2 to 0.4 in	6.6 to 7.4	.05	.24
2C3 --	29 to 60 in	very gravelly sand	very rapid	0.6 to 0.9 in	5.6 to 7.4	.05	.20

Groff and similar soils

Extent: about 15 percent of the unit
Landform(s): drainageways, intermontain basins
Slope gradient: 0 to 4 percent
Parent material: coarse-loamy alluvium over sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: approximately 33 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 4
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 56
Land capability class, nonirrigated: 5w
Drainage class: somewhat poorly drained
Hydric soil: no
Hydrologic group: A
Potential frost action: moderate

Ecological site(s): Subirrigated (Sb) 10-14" p.z.

Map Unit Descriptions (MT)

Bitterroot Valley Area, Montana

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A1 -- 0 to 8 in	silt loam	moderately rapid	1.2 to 1.4 in	6.6 to 7.8	.32	.32
A2 -- 8 to 18 in	loam	moderately rapid	1.5 to 1.9 in	5.1 to 7.3	.24	.32
A3 -- 18 to 28 in	sandy loam	moderately rapid	0.9 to 1.3 in	5.1 to 7.3	.10	.20
2C1 -- 28 to 33 in	gravelly loamy coarse sand	very rapid	0.2 to 0.3 in	5.1 to 6.5	.10	.17
2C2 -- 33 to 60 in	very gravelly coarse sand	very rapid	0.3 to 0.8 in	5.1 to 6.5	.02	.17

Minor Components

Blossberg and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

30D18--Leighcan family, steep mountain slopes, moist

Mean annual precipitation: 18 to 47 inches
Mean annual temperature: 34 to 39 degrees F
Frost-free period: 45 to 70 days

Leighcan and similar soils

Extent: about 80 percent of the unit
Landform(s): mountain slopes
Slope gradient: 40 to 60 percent
Parent material: colluvium derived from granite
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 5
Wind erodibility group (WEG): 4
Wind erodibility index (WEI): 86
Land capability class, nonirrigated: 7e
Drainage class: well drained
Hydric soil: no
Hydrologic group: A
Potential frost action: moderate

Ecological site(s): ---

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
Oi -- 0 to 2 in	slightly decomposed plant material	very rapid		4.0 to 5.8		
A -- 2 to 4 in	gravelly sandy loam	moderately rapid	0.1 to 0.2 in	4.5 to 6.5	.10	.20
Bw1 -- 4 to 9 in	gravelly sandy loam	moderately rapid	0.2 to 0.5 in	4.5 to 6.5	.10	.24
Bw2 -- 9 to 27 in	very gravelly sandy loam	moderately rapid	0.7 to 1.3 in	4.5 to 6.0	.10	.24
BC -- 27 to 60 in	very gravelly sandy loam	moderately rapid	1.0 to 2.3 in	4.5 to 6.0	.05	.28

Minor Components

Crawfish and similar soils: 0 to 10 percent of the unit
Leighcan, lesser slopes and similar soils: 0 to 10 percent of the unit
Lolopeak and similar soils: 0 to 10 percent of the unit
Tolby and similar soils: 0 to 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

31B19--Kadygulch-Sharrott families complex, dissected mountain slopes

Mean annual precipitation: 20 to 38 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 70 to 95 days

Kadygulch and similar soils

Extent: about 70 percent of the unit
Landform(s): mountain slopes
Slope gradient: 30 to 60 percent
Parent material: colluvium derived from granite
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 5
Wind erodibility group (WEG): 4
Wind erodibility index (WEI): 86
Land capability class, nonirrigated: 7e
Drainage class: well drained
Hydric soil: no
Hydrologic group: A
Potential frost action: moderate

Ecological site(s): ---

Representative soil profile:

		Texture	Permeability	Available water capacity	pH	Kw	Kf
Oi	0 to 1 in	slightly decomposed plant material	very rapid		4.0 to 5.8		
A	1 to 5 in	gravelly sandy loam	moderately rapid	0.3 to 0.4 in	5.6 to 6.5	.10	.20
Bw	5 to 11 in	gravelly sandy loam	moderately rapid	0.4 to 0.6 in	5.6 to 6.5	.10	.17
BC	11 to 19 in	very gravelly sandy loam	moderately rapid	0.2 to 0.6 in	5.6 to 6.5	.05	.17
C	19 to 60 in	very gravelly sandy loam	moderately rapid	1.2 to 2.9 in	5.6 to 6.5	.02	.17

Sharrott and similar soils

Extent: about 15 percent of the unit
Landform(s): mountain slopes
Slope gradient: 30 to 60 percent
Parent material: colluvium over residuum weathered from granite and gneiss
Restrictive feature(s): lithic bedrock at 10 to 20 inches
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 1
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 56
Land capability class, nonirrigated: 7e
Drainage class: well drained
Hydric soil: no
Hydrologic group: D
Potential frost action: moderate

Ecological site(s): ---

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
Oi -- 0 to 1 in	slightly decomposed plant material	very rapid		4.0 to 5.8		
E -- 1 to 6 in	very gravelly sandy loam	moderately rapid	0.2 to 0.4 in	5.6 to 7.3	.05	.20
Bw -- 6 to 15 in	very gravelly sandy loam	moderately rapid	0.4 to 0.7 in	5.6 to 7.3	.10	.24
BC -- 15 to 19 in	very gravelly sandy loam	rapid	0.1 to 0.2 in	5.6 to 7.3	.05	.24
R -- 19 to 60 in	bedrock	impermeable				

Minor Components

Macmeal and similar soils: 0 to 10 percent of the unit
Totelake and similar soils: 0 to 10 percent of the unit
Rock outcrop: 0 to 5 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

31K56--Holter-Whitlash families complex, dissected mountain slopes

Mean annual precipitation: 18 to 37 inches
Mean annual temperature: 41 to 45 degrees F
Frost-free period: 75 to 105 days

Holter and similar soils

Extent: about 65 percent of the unit
Landform(s): mountain slopes
Slope gradient: 30 to 60 percent
Parent material: colluvium over residuum weathered from granite
Restrictive feature(s): lithic bedrock at 20 to 60 inches
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 56
Land capability class, nonirrigated: 7e
Drainage class: well drained
Hydric soil: no
Hydrologic group: C
Potential frost action: moderate

Ecological site(s): ---

Representative soil profile:

		Texture	Permeability	Available water capacity	pH	Kw	Kf
A --	0 to 4 in	very gravelly sandy loam	moderately rapid	0.2 to 0.4 in	6.1 to 7.4	.10	.32
Bt1 --	4 to 9 in	very gravelly sandy clay loam	moderate	0.3 to 0.5 in	6.1 to 7.4	.10	.32
Bt2 --	9 to 26 in	very gravelly sandy clay loam	moderate	1.2 to 1.7 in	5.6 to 7.3	.10	.32
R --	26 to 60 in	bedrock	impermeable				

Whitlash and similar soils

Extent: about 20 percent of the unit
Landform(s): mountain slopes
Slope gradient: 30 to 60 percent
Parent material: colluvium over residuum weathered from granite and gneiss
Restrictive feature(s): lithic bedrock at 10 to 20 inches
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 1
Wind erodibility group (WEG): 4
Wind erodibility index (WEI): 86
Land capability class, nonirrigated: 7s
Drainage class: well drained
Hydric soil: no
Hydrologic group: D
Potential frost action: moderate

Ecological site(s): ---

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 7 in	stony sandy loam	moderately rapid	0.6 to 0.7 in	6.1 to 7.3	.10	.17
Bw -- 7 to 13 in	very cobbly sandy loam	moderately rapid	0.2 to 0.4 in	6.1 to 7.3	.05	.20
BC -- 13 to 17 in	very cobbly sandy loam	moderately rapid	0.1 to 0.3 in	6.1 to 7.3	.05	.24
R -- 17 to 60 in	bedrock	impermeable				

Minor Components

Holter, lesser slopes and similar soils: 0 to 10 percent of the unit
Kadygulch and similar soils: 0 to 10 percent of the unit
Rock outcrop: 0 to 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

120B--Holloron loam, 0 to 4 percent slopes

Mean annual precipitation: 12 to 14 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 90 to 115 days

Holloron and similar soils

Extent: about 85 percent of the unit
Landform(s): intermontain basins, stream terraces
Slope gradient: 0 to 4 percent
Parent material: coarse-loamy alluvium over sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 4
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 56
Land capability class, nonirrigated: 3e
Drainage class: well drained
Hydric soil: no
Hydrologic group: B
Potential frost action: moderate

Ecological site(s): Silty (Si) 10-14" p.z.

Representative soil profile:

		Texture	Permeability	Available water capacity	pH	Kw	Kf
A	0 to 8 in	loam	moderate	1.2 to 1.5 in	6.6 to 7.8	.32	.32
Bw	8 to 14 in	loam	moderate	0.9 to 1.2 in	6.6 to 7.8	.32	.32
C	14 to 32 in	sandy loam	moderate	2.5 to 3.2 in	6.6 to 7.8	.32	.32
2C	32 to 60 in	very gravelly loamy sand	very rapid	0.3 to 1.1 in	6.6 to 7.3	.05	.17

Minor Components

Tiechute and similar soils: 10 percent of the unit
Overwhich and similar soils: 5 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

122B--Holloron-Tiechute complex, 0 to 4 percent slopes

Mean annual precipitation: 12 to 14 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 90 to 115 days

Holloron and similar soils

Extent: about 50 percent of the unit
Landform(s): inset fans, intermontain basins, stream terraces
Slope gradient: 0 to 4 percent
Parent material: coarse-loamy alluvium over sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 4
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 48
Land capability class, nonirrigated: 3e
Drainage class: well drained
Hydric soil: no
Hydrologic group: B
Potential frost action: moderate

Ecological site(s): Silty (Si) 10-14" p.z.

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 8 in	cobbly loam	moderate	0.8 to 1.2 in	6.6 to 7.8	.17	.32
Bw -- 8 to 14 in	loam	moderate	0.9 to 1.2 in	6.6 to 7.8	.32	.32
C -- 14 to 32 in	sandy loam	moderate	2.5 to 3.2 in	6.6 to 7.8	.32	.32
2C -- 32 to 60 in	very gravelly loamy sand	very rapid	0.3 to 1.1 in	6.6 to 7.3	.05	.17

Tiechute and similar soils

Extent: about 40 percent of the unit
Landform(s): inset fans, intermontain basins, stream terraces
Slope gradient: 0 to 4 percent
Parent material: sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 48
Land capability class, nonirrigated: 6e
Drainage class: somewhat excessively drained
Hydric soil: no
Hydrologic group: B
Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 7 in	cobbly loam	moderate	0.7 to 1.1 in	6.6 to 7.8	.17	.32
AC -- 7 to 10 in	very cobbly sandy loam	rapid	0.1 to 0.2 in	6.6 to 7.3	.05	.20
C -- 10 to 60 in	extremely cobbly loamy sand	very rapid	0.5 to 1.0 in	6.6 to 7.3	.02	.17

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Minor Components

Owenfort and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

123B--Overwhich-Tiechute complex, 0 to 4 percent slopes

Mean annual precipitation: 12 to 14 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 90 to 115 days

Overwhich and similar soils

Extent: about 55 percent of the unit
Landform(s): intermontain basins, stream terraces
Slope gradient: 0 to 4 percent
Parent material: coarse-loamy alluvium over sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: approximately 33 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 4
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 56
Land capability class, nonirrigated: 3w
Drainage class: somewhat poorly drained
Hydric soil: no
Hydrologic group: B
Potential frost action: moderate

Ecological site(s): Subirrigated (Sb) 10-14" p.z.

Representative soil profile:

		Texture	Permeability	Available water capacity	pH	Kw	Kf
A	0 to 11 in	loam	moderate	1.7 to 2.1 in	6.6 to 7.8	.32	.32
Bw	11 to 17 in	loam	moderate	0.9 to 1.1 in	6.6 to 7.8	.32	.32
C1	17 to 33 in	fine sandy loam	moderately rapid	1.8 to 2.4 in	6.6 to 7.8	.20	.20
2C2	33 to 60 in	extremely gravelly loamy sand	very rapid	0.5 to 0.8 in	6.1 to 7.3	.02	.17

Tiechute and similar soils

Extent: about 35 percent of the unit
Landform(s): intermontain basins, stream terraces
Slope gradient: 0 to 4 percent
Parent material: sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 48
Land capability class, nonirrigated: 6e
Drainage class: somewhat excessively drained
Hydric soil: no
Hydrologic group: B
Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 7 in	gravelly loam	moderately rapid	0.8 to 1.1 in	6.6 to 7.3	.17	.32
AC -- 7 to 12 in	gravelly sandy loam	moderately rapid	0.3 to 0.5 in	6.6 to 7.8	.10	.20
C1 -- 12 to 24 in	very gravelly loamy sand	rapid	0.4 to 0.6 in	6.6 to 7.8	.05	.17
C2 -- 24 to 60 in	extremely gravelly coarse sand	very rapid	0.4 to 1.1 in	6.6 to 7.3	.02	.17

Minor Components

Holloron, sodic overwash and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

130B--Hamilton silt loam, 0 to 4 percent slopes

Mean annual precipitation: 12 to 14 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 90 to 115 days

Hamilton and similar soils

Extent: about 90 percent of the unit
Landform(s): intermontain basins, stream terraces
Slope gradient: 0 to 4 percent
Parent material: coarse-silty alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 5
Wind erodibility group (WEG): 6
Wind erodibility index (WEI): 48
Land capability class, nonirrigated: 3e
Drainage class: well drained
Hydric soil: no
Hydrologic group: C
Potential frost action: moderate

Ecological site(s): Silty (Si) 10-14" p.z.

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 8 in	silt loam	moderate	1.1 to 1.4 in	6.6 to 7.8	.37	.37
Bk -- 8 to 20 in	silt loam	moderate	1.7 to 2.2 in	7.4 to 8.2	.37	.37
C1 -- 20 to 54 in	silt loam	moderately rapid	4.7 to 6.1 in	6.6 to 8.4	.37	.37
2C2 -- 54 to 60 in	gravelly loamy fine sand	rapid	0.4 to 0.6 in	6.6 to 7.8	.10	.17

Minor Components

Overwhich and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

132A--Hamilton-Overwhich complex, 0 to 2 percent slopes

Mean annual precipitation: 12 to 14 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 90 to 115 days

Hamilton and similar soils

Extent: about 60 percent of the unit
Landform(s): intermontain basins, stream terraces
Slope gradient: 0 to 2 percent
Parent material: coarse-silty alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: approximately 51 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 5
Wind erodibility group (WEG): 6
Wind erodibility index (WEI): 48
Land capability class, nonirrigated: 3e
Drainage class: well drained
Hydric soil: no
Hydrologic group: C
Potential frost action: moderate

Ecological site(s): Silty (Si) 10-14" p.z.

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 8 in	silt loam	moderate	1.1 to 1.4 in	6.6 to 7.8	.37	.37
Bk -- 8 to 20 in	silt loam	moderate	1.7 to 2.2 in	7.4 to 8.2	.37	.37
C1 -- 20 to 54 in	silt loam	moderately rapid	4.7 to 6.1 in	6.6 to 8.4	.37	.37
2C2 -- 54 to 60 in	gravelly loamy fine sand	rapid	0.4 to 0.6 in	6.6 to 7.8	.10	.17

Overwhich and similar soils

Extent: about 30 percent of the unit
Landform(s): intermontain basins, stream terraces
Slope gradient: 0 to 2 percent
Parent material: coarse-loamy alluvium over sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: approximately 33 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 4
Wind erodibility group (WEG): 6
Wind erodibility index (WEI): 48
Land capability class, nonirrigated: 3w
Drainage class: somewhat poorly drained
Hydric soil: no
Hydrologic group: C
Potential frost action: moderate

Ecological site(s): Subirrigated (Sb) 10-14" p.z.

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 11 in	silt loam	moderate	1.5 to 2.0 in	6.6 to 7.8	.37	.37
Bw -- 11 to 17 in	loam	moderate	0.9 to 1.1 in	6.6 to 7.8	.32	.32
C1 -- 17 to 33 in	fine sandy loam	moderately rapid	1.8 to 2.4 in	6.6 to 7.8	.20	.20
2C2 -- 33 to 60 in	extremely gravelly loamy sand	very rapid	0.5 to 0.8 in	6.1 to 7.3	.02	.17

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Minor Components

Sweathouse and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

143A--Fairway-Grayhorse complex, 0 to 2 percent slopes

Mean annual precipitation: 12 to 15 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 90 to 115 days

Fairway and similar soils

Extent: about 75 percent of the unit
Landform(s): inset fans, intermontain basins, stream terraces
Slope gradient: 0 to 2 percent
Parent material: fine-loamy alluvium over sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: approximately 33 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 4
Wind erodibility group (WEG): 6
Wind erodibility index (WEI): 48
Land capability class, nonirrigated: 3w
Drainage class: somewhat poorly drained
Hydric soil: no
Hydrologic group: C
Potential frost action: moderate

Ecological site(s): Subirrigated (Sb) 10-14" p.z.

Representative soil profile:

		Texture	Permeability	Available water capacity	pH	Kw	Kf
A --	0 to 8 in	silt loam	moderate	1.1 to 1.4 in	6.6 to 7.8	.37	.37
Bw --	8 to 13 in	loam	moderate	0.7 to 0.9 in	7.4 to 8.4	.37	.37
Bk --	13 to 21 in	loam	moderate	1.0 to 1.3 in	7.4 to 8.4	.37	.37
C1 --	21 to 40 in	loam	moderate	2.3 to 3.1 in	7.4 to 8.4	.37	.37
2C2 --	40 to 60 in	extremely gravelly sand	very rapid	0.4 to 0.6 in	6.6 to 7.3	.02	.17

Grayhorse and similar soils

Extent: about 15 percent of the unit
Landform(s): inset fans, intermontain basins, stream terraces
Slope gradient: 0 to 2 percent
Parent material: fine-loamy alluvium over sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: approximately 28 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 4
Wind erodibility group (WEG): 4L
Wind erodibility index (WEI): 86
Land capability class, nonirrigated: 3w
Drainage class: somewhat poorly drained
Hydric soil: no
Hydrologic group: B
Potential frost action: moderate

Ecological site(s): Subirrigated (Sb) 10-14" p.z.

Map Unit Descriptions (MT)

Bitterroot Valley Area, Montana

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A1 -- 0 to 12 in	silt loam	moderate	1.7 to 2.1 in	6.6 to 8.4	.37	.37
A2 -- 12 to 18 in	loam	moderate	0.9 to 1.1 in	6.6 to 7.8	.37	.37
C1 -- 18 to 29 in	gravelly loam	moderate	1.2 to 1.8 in	6.6 to 7.8	.24	.37
2C2 -- 29 to 34 in	very cobbly sandy loam	moderately rapid	0.3 to 0.5 in	6.6 to 7.8	.10	.20
2C3 -- 34 to 60 in	extremely gravelly loamy sand	very rapid	0.5 to 0.8 in	6.6 to 7.3	.02	.17

Minor Components

Allwit and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

146A--Curlew-Riverrun complex, 0 to 2 percent slopes

Mean annual precipitation: 12 to 14 inches

Mean annual temperature: 39 to 45 degrees F

Frost-free period: 90 to 115 days

Curlew and similar soils

Extent: about 65 percent of the unit

Landform(s): abandoned channels, flood plains, intermontain basins

Slope gradient: 0 to 2 percent

Parent material: sandy and gravelly alluvium derived from mixed

Restrictive feature(s): none

Seasonal high water table: approximately 8 inches

Flooding hazard: rare

Ponding hazard: none

Soil loss tolerance (T factor): 3

Wind erodibility group (WEG): 5

Wind erodibility index (WEI): 56

Land capability class, nonirrigated: 5w

Drainage class: very poorly drained

Hydric soil: yes

Hydrologic group: D

Potential frost action: moderate

Ecological site(s): Wet Meadow (WM) 10-14" p.z.

Representative soil profile:

Texture	Permeability	Available water capacity	pH	Kw	Kf
A -- 0 to 11 in	silt loam	moderately rapid	1.7 to 2.0 in	6.6 to 7.4	.24	.24
C1 -- 11 to 24 in	sandy loam	moderately rapid	1.2 to 1.7 in	6.6 to 7.4	.10	.20
2C2 -- 24 to 29 in	very gravelly loamy sand	rapid	0.2 to 0.4 in	6.6 to 7.4	.05	.24
2C3 -- 29 to 60 in	very gravelly sand	very rapid	0.6 to 0.9 in	5.6 to 7.4	.05	.20

Riverrun and similar soils

Extent: about 15 percent of the unit

Landform(s): flood-plain steps, intermontain basins

Slope gradient: 0 to 2 percent

Parent material: sandy and gravelly alluvium derived from mixed

Restrictive feature(s): none

Seasonal high water table: approximately 33 inches

Flooding hazard: rare

Ponding hazard: none

Soil loss tolerance (T factor): 2

Wind erodibility group (WEG): 3

Wind erodibility index (WEI): 86

Land capability class, nonirrigated: 6s

Drainage class: moderately well drained

Hydric soil: no

Hydrologic group: A

Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 6 in	fine sandy loam	moderately rapid	0.6 to 0.8 in	6.1 to 7.3	.20	.20
C1 -- 6 to 16 in	gravelly loamy sand	very rapid	0.3 to 0.7 in	6.1 to 7.3	.10	.17
2C2 -- 16 to 60 in	very gravelly loamy coarse sand	very rapid	0.9 to 1.3 in	6.1 to 7.3	.02	.17

Minor Components

Groff and similar soils: 10 percent of the unit

Fredburr and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

147A--Histic Endoaquolls-Curlew-Water complex, 0 to 2 percent slopes

Mean annual precipitation: 12 to 14 inches

Mean annual temperature: 39 to 45 degrees F

Frost-free period: 90 to 115 days

Histic Endoaquolls and similar soils

Extent: about 45 percent of the unit

Landform(s): abandoned channels, flood plains, intermontain basins

Slope gradient: 0 to 2 percent

Parent material: coarse-loamy alluvium over sandy and gravelly alluvium derived from mixed

Restrictive feature(s): none

Seasonal high water table: approximately 3 inches

Flooding hazard: rare

Ponding hazard: occasional

Soil loss tolerance (T factor): 4

Wind erodibility group (WEG): 5

Wind erodibility index (WEI): 56

Land capability class, nonirrigated: 5w

Drainage class: very poorly drained

Hydric soil: yes

Hydrologic group: D

Potential frost action: high

Ecological site(s): Wet Meadow (WM) 10-14" p.z.

Representative soil profile:

		Texture	Permeability	Available water capacity	pH	Kw	Kf
Oe --	0 to 14 in	mucky peat	rapid		4.0 to 6.0		
A --	14 to 24 in	silt loam	moderately rapid	1.5 to 1.8 in	6.6 to 7.8	.32	.32
C1 --	24 to 39 in	sandy loam	moderately rapid	1.4 to 1.7 in	6.6 to 7.8	.20	.20
2C2 --	39 to 55 in	very gravelly sandy loam	rapid	0.6 to 1.1 in	6.6 to 7.8	.05	.20
2C3 --	55 to 60 in	extremely gravelly sand	very rapid	0.1 to 0.1 in	5.6 to 7.3	.02	.17

Curlew and similar soils

Extent: about 35 percent of the unit

Landform(s): abandoned channels, flood plains, intermontain basins

Slope gradient: 0 to 2 percent

Parent material: sandy and gravelly alluvium derived from mixed

Restrictive feature(s): none

Seasonal high water table: approximately 8 inches

Flooding hazard: rare

Ponding hazard: none

Soil loss tolerance (T factor): 3

Wind erodibility group (WEG): 5

Wind erodibility index (WEI): 56

Land capability class, nonirrigated: 5w

Drainage class: very poorly drained

Hydric soil: yes

Hydrologic group: D

Potential frost action: moderate

Ecological site(s): Wet Meadow (WM) 10-14" p.z.

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 11 in	silt loam	moderately rapid	1.7 to 2.0 in	6.6 to 7.4	.24	.24
C1 -- 11 to 24 in	sandy loam	moderately rapid	1.2 to 1.7 in	6.6 to 7.4	.10	.20
2C2 -- 24 to 29 in	very gravelly loamy sand	rapid	0.2 to 0.4 in	6.6 to 7.4	.05	.24
2C3 -- 29 to 60 in	very gravelly sand	very rapid	0.6 to 0.9 in	5.6 to 7.4	.05	.20

Water

Extent: about 15 percent of the unit

Landform(s): flood plains, intermontain basins

Slope gradient:

Parent material:

Restrictive feature(s): none

Seasonal high water table: greater than 60 inches

Flooding hazard: none

Ponding hazard: none

Soil loss tolerance (T factor):

Wind erodibility group (WEG):

Wind erodibility index (WEI):

Land capability class, nonirrigated:

Drainage class:

Hydric soil: unranked

Hydrologic group:

Potential frost action:

Ecological site(s): ---

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
none						

Minor Components

Blossberg and similar soils: 5 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

148A--Grayhorse-Allwit complex, 0 to 2 percent slopes

Mean annual precipitation: 12 to 15 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 90 to 115 days

Grayhorse and similar soils

Extent: about 70 percent of the unit
Landform(s): inset fans, intermontain basins
Slope gradient: 0 to 2 percent
Parent material: fine-loamy alluvium over sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: approximately 28 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 4
Wind erodibility group (WEG): 4L
Wind erodibility index (WEI): 86
Land capability class, nonirrigated: 3w
Drainage class: somewhat poorly drained
Hydric soil: no
Hydrologic group: B
Potential frost action: moderate

Ecological site(s): Subirrigated (Sb) 10-14" p.z.

Representative soil profile:

		Texture	Permeability	Available water capacity	pH	Kw	Kf
A1 --	0 to 12 in	silt loam	moderate	1.7 to 2.1 in	6.6 to 8.4	.37	.37
A2 --	12 to 18 in	loam	moderate	0.9 to 1.1 in	6.6 to 7.8	.37	.37
C1 --	18 to 29 in	gravelly loam	moderate	1.2 to 1.8 in	6.6 to 7.8	.24	.37
2C2 --	29 to 34 in	very cobbly sandy loam	moderately rapid	0.3 to 0.5 in	6.6 to 7.8	.10	.20
2C3 --	34 to 60 in	extremely gravelly loamy sand	very rapid	0.5 to 0.8 in	6.6 to 7.3	.02	.17

Allwit and similar soils

Extent: about 20 percent of the unit
Landform(s): inset fans, intermontain basins
Slope gradient: 0 to 2 percent
Parent material: fine-loamy alluvium over sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: approximately 18 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 3
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 48
Land capability class, nonirrigated: 4w
Drainage class: poorly drained
Hydric soil: yes
Hydrologic group: D
Potential frost action: high

Ecological site(s): Subirrigated (Sb) 10-14" p.z.

Map Unit Descriptions (MT)

Bitterroot Valley Area, Montana

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 14 in	cobbly loam	moderately rapid	1.5 to 1.8 in	6.6 to 7.3	.17	.32
2BC -- 14 to 22 in	very cobbly loam	moderate	0.6 to 0.9 in	6.6 to 7.8	.15	.37
2C1 -- 22 to 32 in	very cobbly sandy loam	moderately rapid	0.6 to 1.1 in	6.6 to 7.8	.10	.20
3C2 -- 32 to 60 in	extremely gravelly loamy sand	very rapid	0.6 to 0.8 in	6.6 to 7.3	.02	.17

Minor Components

Blossberg and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

149A--Grayhorse-Owenfort complex, 0 to 2 percent slopes

Mean annual precipitation: 12 to 15 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 90 to 115 days

Owenfort and similar soils

Extent: about 45 percent of the unit
Landform(s): inset fans, intermontain basins
Slope gradient: 0 to 2 percent
Parent material: cobbly loamy alluvium over cobbly and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: approximately 72 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 3
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 48
Land capability class, nonirrigated: 4e
Drainage class: somewhat excessively drained
Hydric soil: no
Hydrologic group: B
Potential frost action: moderate

Ecological site(s): Silty-Droughty (SiDr) 10-14" p.z.

Representative soil profile:

		Texture	Permeability	Available water capacity	pH	Kw	Kf
A1 --	0 to 5 in	cobbly loam	moderate	0.5 to 0.8 in	6.6 to 7.8	.17	.32
A2 --	5 to 10 in	very cobbly loam	moderately rapid	0.3 to 0.5 in	6.6 to 7.3	.10	.32
BC --	10 to 42 in	very cobbly sandy loam	moderately rapid	1.9 to 3.5 in	6.6 to 7.3	.05	.20
C --	42 to 60 in	extremely gravelly loamy sand	very rapid	0.4 to 0.5 in	6.6 to 7.3	.02	.17

Grayhorse and similar soils

Extent: about 45 percent of the unit
Landform(s): inset fans, intermontain basins
Slope gradient: 0 to 2 percent
Parent material: fine-loamy alluvium over sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: approximately 28 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 4
Wind erodibility group (WEG): 4L
Wind erodibility index (WEI): 86
Land capability class, nonirrigated: 3w
Drainage class: somewhat poorly drained
Hydric soil: no
Hydrologic group: B
Potential frost action: moderate

Ecological site(s): Subirrigated (Sb) 10-14" p.z.

Map Unit Descriptions (MT)

Bitterroot Valley Area, Montana

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A1 -- 0 to 12 in	silt loam	moderate	1.7 to 2.1 in	6.6 to 8.4	.37	.37
A2 -- 12 to 18 in	loam	moderate	0.9 to 1.1 in	6.6 to 7.8	.37	.37
C1 -- 18 to 29 in	gravelly loam	moderate	1.2 to 1.8 in	6.6 to 7.8	.24	.37
2C2 -- 29 to 34 in	very cobbly sandy loam	moderately rapid	0.3 to 0.5 in	6.6 to 7.8	.10	.20
2C3 -- 34 to 60 in	extremely gravelly loamy sand	very rapid	0.5 to 0.8 in	6.6 to 7.3	.02	.17

Minor Components

Groff and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

150A--Riverrun complex, 0 to 2 percent slopes

Mean annual precipitation: 12 to 14 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 90 to 115 days

Riverrun and similar soils

Extent: about 65 percent of the unit
Landform(s): flood-plain steps, intermontain basins
Slope gradient: 0 to 2 percent
Parent material: sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: approximately 33 inches
Flooding hazard: rare
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 3
Wind erodibility index (WEI): 86
Land capability class, nonirrigated: 6s
Drainage class: moderately well drained
Hydric soil: no
Hydrologic group: A
Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

Representative soil profile:

Texture	Permeability	Available water capacity	pH	Kw	Kf
A -- 0 to 6 in	fine sandy loam	moderately rapid	0.6 to 0.8 in	6.1 to 7.3	.20	.20
C1 -- 6 to 16 in	gravelly loamy sand	very rapid	0.3 to 0.7 in	6.1 to 7.3	.10	.17
2C2 -- 16 to 60 in	very gravelly loamy coarse sand	very rapid	0.9 to 1.3 in	6.1 to 7.3	.02	.17

Riverrun and similar soils

Extent: about 20 percent of the unit
Landform(s): flood-plain steps, intermontain basins
Slope gradient: 0 to 2 percent
Parent material: sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: approximately 33 inches
Flooding hazard: rare
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 2
Wind erodibility index (WEI): 86
Land capability class, nonirrigated: 6s
Drainage class: moderately well drained
Hydric soil: no
Hydrologic group: A
Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

Representative soil profile:

Texture	Permeability	Available water capacity	pH	Kw	Kf
A -- 0 to 4 in	very gravelly loamy sand	rapid	0.1 to 0.2 in	6.1 to 7.3	.05	.17
C -- 4 to 60 in	extremely gravelly sand	very rapid	1.1 to 1.7 in	6.1 to 7.3	.02	.17

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Minor Components

Canarway and similar soils: 5 percent of the unit
Gash and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

153A--Gash-Riverrun complex, 0 to 2 percent slopes

Mean annual precipitation: 12 to 14 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 90 to 115 days

Gash and similar soils

Extent: about 60 percent of the unit
Landform(s): drainageways, intermontain basins
Slope gradient: 0 to 2 percent
Parent material: coarse-loamy alluvium over sandy and gravelly alluvium
Restrictive feature(s): none
Seasonal high water table: approximately 51 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 4
Wind erodibility group (WEG): 3
Wind erodibility index (WEI): 86
Land capability class, nonirrigated: 4e
Drainage class: moderately well drained
Hydric soil: no
Hydrologic group: A
Potential frost action: moderate

Ecological site(s): Overflow (Ov) 10-14" p.z.

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 6 in	fine sandy loam	moderately rapid	0.6 to 0.8 in	6.1 to 7.3	.20	.20
C1 -- 6 to 26 in	sandy loam	moderately rapid	1.4 to 2.6 in	6.1 to 7.3	.20	.20
2C2 -- 26 to 60 in	very gravelly sand	very rapid	0.7 to 1.0 in	6.1 to 7.3	.02	.17

Riverrun and similar soils

Extent: about 25 percent of the unit
Landform(s): flood-plain steps, intermontain basins
Slope gradient: 0 to 2 percent
Parent material: sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: approximately 33 inches
Flooding hazard: rare
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 3
Wind erodibility index (WEI): 86
Land capability class, nonirrigated: 6s
Drainage class: moderately well drained
Hydric soil: no
Hydrologic group: A
Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 6 in	sandy loam	moderately rapid	0.6 to 0.7 in	6.1 to 7.3	.20	.20
C1 -- 6 to 16 in	gravelly loamy sand	very rapid	0.3 to 0.7 in	6.1 to 7.3	.10	.17
2C2 -- 16 to 60 in	very gravelly loamy coarse sand	very rapid	0.9 to 1.3 in	6.1 to 7.3	.02	.17

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Minor Components

Fredburr and similar soils: 10 percent of the unit
Canarway and similar soils: 5 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

154A--Overwhich-Bandy complex, 0 to 2 percent slopes

Mean annual precipitation: 12 to 14 inches

Mean annual temperature: 39 to 45 degrees F

Frost-free period: 90 to 115 days

Overwhich and similar soils

Extent: about 80 percent of the unit

Landform(s): flood-plain steps, intermontain basins, stream terraces

Slope gradient: 0 to 2 percent

Parent material: coarse-loamy alluvium over sandy and gravelly alluvium derived from mixed

Restrictive feature(s): none

Seasonal high water table: approximately 33 inches

Flooding hazard: very rare

Ponding hazard: none

Soil loss tolerance (T factor): 4

Wind erodibility group (WEG): 5

Wind erodibility index (WEI): 56

Land capability class, nonirrigated: 3w

Drainage class: somewhat poorly drained

Hydric soil: no

Hydrologic group: B

Potential frost action: moderate

Ecological site(s): Subirrigated (Sb) 10-14" p.z.

Representative soil profile:

			Texture	Permeability	Available water capacity	pH	Kw	Kf
A	--	0 to 11 in	loam	moderate	1.7 to 2.1 in	6.6 to 7.8	.32	.32
Bw	--	11 to 17 in	loam	moderate	0.9 to 1.1 in	6.6 to 7.8	.32	.32
C1	--	17 to 33 in	fine sandy loam	moderately rapid	1.8 to 2.4 in	6.6 to 7.8	.20	.20
2C2	--	33 to 60 in	extremely gravelly loamy sand	very rapid	0.5 to 0.8 in	6.1 to 7.3	.02	.17

Bandy and similar soils

Extent: about 20 percent of the unit

Landform(s): flood plains, intermontain basins

Slope gradient: 0 to 2 percent

Parent material: sandy and gravelly alluvium

Restrictive feature(s): none

Seasonal high water table: approximately 8 inches

Flooding hazard: none

Ponding hazard: none

Soil loss tolerance (T factor): 3

Wind erodibility group (WEG): 5

Wind erodibility index (WEI): 56

Land capability class, nonirrigated: 5w

Drainage class: poorly drained

Hydric soil: yes

Hydrologic group: D

Potential frost action: moderate

Ecological site(s): Wet Meadow (WM) 10-14" p.z.

Map Unit Descriptions (MT)

Bitterroot Valley Area, Montana

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
Oe -- 0 to 3 in	mucky peat	rapid		4.0 to 6.0		
A1 -- 3 to 7 in	loam	moderately rapid	0.6 to 0.7 in	5.1 to 7.3	.32	.32
A2 -- 7 to 15 in	gravelly sandy loam	moderately rapid	0.7 to 1.0 in	5.1 to 6.5	.15	.24
2C1 -- 15 to 18 in	very gravelly sandy loam	rapid	0.1 to 0.2 in	5.1 to 6.5	.05	.20
2C2 -- 18 to 60 in	extremely gravelly sand	very rapid	0.8 to 1.3 in	5.1 to 6.5	.02	.17

Minor Components

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

157B--Owenfort complex, 1 to 4 percent slopes

Mean annual precipitation: 12 to 15 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 90 to 115 days

Owenfort and similar soils

Extent: about 75 percent of the unit
Landform(s): inset fans, intermontain basins, stream terraces
Slope gradient: 1 to 4 percent
Parent material: cobbly loamy alluvium over cobbly and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 3
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 48
Land capability class, nonirrigated: 4e
Drainage class: somewhat excessively drained
Hydric soil: no
Hydrologic group: B
Potential frost action: moderate

Ecological site(s): Silty-Droughty (SiDr) 10-14" p.z.

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A1 -- 0 to 5 in	cobbly loam	moderate	0.5 to 0.8 in	6.6 to 7.8	.17	.32
A2 -- 5 to 10 in	very cobbly loam	moderately rapid	0.3 to 0.5 in	6.6 to 7.3	.10	.32
BC -- 10 to 42 in	very cobbly sandy loam	moderately rapid	1.9 to 3.5 in	6.6 to 7.3	.05	.20
C -- 42 to 60 in	extremely gravelly loamy sand	very rapid	0.4 to 0.5 in	6.6 to 7.3	.02	.17

Owenfort and similar soils

Extent: about 15 percent of the unit
Landform(s): inset fans, intermontain basins, stream terraces
Slope gradient: 1 to 4 percent
Parent material: very cobbly loamy alluvium over cobbly and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 3
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 38
Land capability class, nonirrigated: 6s
Drainage class: somewhat excessively drained
Hydric soil: no
Hydrologic group: B
Potential frost action: moderate

Ecological site(s): Silty-Droughty (SiDr) 10-14" p.z.

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 10 in	very cobbly loam	moderately rapid	0.7 to 1.1 in	6.6 to 7.3	.10	.32
BC -- 10 to 42 in	very cobbly sandy loam	moderately rapid	1.9 to 3.5 in	6.6 to 7.3	.05	.20
C -- 42 to 60 in	extremely gravelly loamy sand	very rapid	0.4 to 0.5 in	6.6 to 7.3	.02	.17

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Minor Components

Tiechute and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

160A--Riverrun-Gash-Curlew complex, 0 to 2 percent slopes

Mean annual precipitation: 12 to 14 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 90 to 115 days

Riverrun and similar soils

Extent: about 40 percent of the unit
Landform(s): flood-plain steps, intermontain basins
Slope gradient: 0 to 2 percent
Parent material: sandy and gravelly alluvium derived from mixed
Restrictive feature(s): none
Seasonal high water table: approximately 33 inches
Flooding hazard: very rare
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 3
Wind erodibility index (WEI): 56
Land capability class, nonirrigated: 6s
Drainage class: moderately well drained
Hydric soil: no
Hydrologic group: A
Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 7 in	gravelly sandy loam	moderately rapid	0.5 to 0.8 in	6.1 to 7.3	.10	.20
C1 -- 7 to 16 in	gravelly loamy sand	very rapid	0.3 to 0.6 in	6.1 to 7.3	.10	.17
2C2 -- 16 to 60 in	very gravelly loamy coarse sand	very rapid	0.9 to 1.3 in	6.1 to 7.3	.02	.17

Gash and similar soils

Extent: about 35 percent of the unit
Landform(s): drainageways, intermontain basins
Slope gradient: 0 to 2 percent
Parent material: coarse-loamy alluvium over sandy and gravelly alluvium
Restrictive feature(s): none
Seasonal high water table: approximately 51 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 4
Wind erodibility group (WEG): 3
Wind erodibility index (WEI): 86
Land capability class, nonirrigated: 4e
Drainage class: moderately well drained
Hydric soil: no
Hydrologic group: A
Potential frost action: moderate

Ecological site(s): Overflow (Ov) 10-14" p.z.

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 6 in	fine sandy loam	moderately rapid	0.6 to 0.8 in	6.1 to 7.3	.20	.20
C1 -- 6 to 26 in	sandy loam	moderately rapid	1.4 to 2.6 in	6.1 to 7.3	.20	.20
2C2 -- 26 to 60 in	very gravelly sand	very rapid	0.7 to 1.0 in	6.1 to 7.3	.02	.17

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Curlew and similar soils

Extent: about 25 percent of the unit

Landform(s): abandoned channels, flood plains, intermontain basins

Slope gradient: 0 to 2 percent

Parent material: sandy and gravelly alluvium derived from mixed

Restrictive feature(s): none

Seasonal high water table: approximately 8 inches

Flooding hazard: rare

Ponding hazard: none

Soil loss tolerance (T factor): 3

Wind erodibility group (WEG): 5

Wind erodibility index (WEI): 56

Land capability class, nonirrigated: 5w

Drainage class: very poorly drained

Hydric soil: yes

Hydrologic group: D

Potential frost action: moderate

Ecological site(s): Wet Meadow (WM) 10-14" p.z.

Representative soil profile:

		Texture	Permeability	Available water capacity	pH	Kw	Kf
A --	0 to 11 in	silt loam	moderately rapid	1.7 to 2.0 in	6.6 to 7.4	.24	.24
C1 --	11 to 24 in	sandy loam	moderately rapid	1.2 to 1.7 in	6.6 to 7.4	.10	.20
2C2 --	24 to 29 in	very gravelly loamy sand	rapid	0.2 to 0.4 in	6.6 to 7.4	.05	.24
2C3 --	29 to 60 in	very gravelly sand	very rapid	0.6 to 0.9 in	5.6 to 7.4	.05	.20

Minor Components

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

304D--Chereete cobbly coarse sandy loam, 8 to 15 percent slopes

Mean annual precipitation: 13 to 17 inches

Mean annual temperature: 39 to 45 degrees F

Frost-free period: 80 to 100 days

Chereete and similar soils

Extent: about 90 percent of the unit

Landform(s): intermontain basins, outwash fans

Slope gradient: 8 to 15 percent

Parent material: sandy and gravelly grus derived from granite and gneiss

Restrictive feature(s): none

Seasonal high water table: greater than 60 inches

Flooding hazard: none

Ponding hazard: none

Soil loss tolerance (T factor): 2

Wind erodibility group (WEG): 3

Wind erodibility index (WEI): 56

Land capability class, nonirrigated: 6e

Drainage class: excessively drained

Hydric soil: no

Hydrologic group: A

Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 6 in	cobbly coarse sandy loam	moderately rapid	0.5 to 0.6 in	5.1 to 7.2	.10	.20
Bw -- 6 to 14 in	gravelly sandy loam	moderately rapid	0.7 to 0.9 in	5.1 to 7.0	.10	.20
C1 -- 14 to 18 in	very gravelly coarse sandy loam	moderately rapid	0.2 to 0.3 in	5.1 to 7.0	.05	.20
C2 -- 18 to 25 in	very gravelly loamy coarse sand	rapid	0.2 to 0.3 in	5.1 to 7.0	.05	.17
C3 -- 25 to 60 in	extremely gravelly coarse sand	very rapid	0.4 to 1.1 in	5.1 to 6.5	.02	.17

Minor Components

Sheafman and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

305C--Victor gravelly coarse sandy loam, 4 to 8 percent slopes

Mean annual precipitation: 13 to 17 inches

Mean annual temperature: 39 to 45 degrees F

Frost-free period: 80 to 100 days

Victor and similar soils

Extent: about 90 percent of the unit

Landform(s): intermontain basins, outwash terraces

Slope gradient: 4 to 8 percent

Parent material: gravelly coarse-loamy outwash over sandy and gravelly outwash derived from granite and gneiss

Restrictive feature(s): none

Seasonal high water table: greater than 60 inches

Flooding hazard: none

Ponding hazard: none

Soil loss tolerance (T factor): 3

Wind erodibility group (WEG): 3

Wind erodibility index (WEI): 56

Land capability class, nonirrigated: 4e

Drainage class: somewhat excessively drained

Hydric soil: no

Hydrologic group: A

Potential frost action: low

Ecological site(s): Sandy (Sy) 10-14" p.z.

Representative soil profile:

		Texture	Permeability	Available water capacity	pH	Kw	Kf
A --	0 to 12 in	gravelly coarse sandy loam	moderately rapid	0.9 to 1.5 in	5.1 to 7.2	.10	.20
BC --	12 to 30 in	gravelly sandy loam	moderately rapid	1.4 to 2.5 in	5.1 to 7.0	.10	.20
C1 --	30 to 48 in	very gravelly loamy coarse sand	rapid	0.5 to 0.9 in	5.1 to 7.0	.05	.17
C2 --	48 to 60 in	extremely gravelly coarse sand	very rapid	0.1 to 0.4 in	5.1 to 7.0	.02	.17

Minor Components

Sheafman and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

306B--Sheafman gravelly coarse sandy loam, 1 to 4 percent slopes

Mean annual precipitation: 13 to 17 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 80 to 100 days

Sheafman and similar soils

Extent: about 80 percent of the unit
Landform(s): intermontain basins, outwash fans
Slope gradient: 1 to 4 percent
Parent material: coarse-loamy outwash over very gravelly, very cobbly or extremely gravelly sandy outwash derived from granite and gneiss
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 3
Wind erodibility group (WEG): 3
Wind erodibility index (WEI): 56
Land capability class, nonirrigated: 4e
Drainage class: excessively drained
Hydric soil: no
Hydrologic group: A
Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 10 in	gravelly coarse sandy loam	moderately rapid	0.8 to 1.2 in	5.1 to 7.2	.10	.20
Bw -- 10 to 14 in	cobbly coarse sandy loam	moderately rapid	0.3 to 0.5 in	5.1 to 7.0	.10	.20
C1 -- 14 to 30 in	very gravelly loamy coarse sand	rapid	0.5 to 0.8 in	5.1 to 6.5	.05	.17
C2 -- 30 to 60 in	extremely gravelly coarse sand	very rapid	0.3 to 0.9 in	5.1 to 6.5	.02	.17

Minor Components

Victor and similar soils: 10 percent of the unit
Chereete and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

306C--Sheafman gravelly coarse sandy loam, 4 to 8 percent slopes

Mean annual precipitation: 13 to 17 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 80 to 100 days

Sheafman and similar soils

Extent: about 80 percent of the unit
Landform(s): intermontain basins, outwash fans
Slope gradient: 4 to 8 percent
Parent material: coarse-loamy outwash over very gravelly, very cobbly or extremely gravelly sandy outwash derived from granite and gneiss
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 3
Wind erodibility group (WEG): 3
Wind erodibility index (WEI): 56
Land capability class, nonirrigated: 4e
Drainage class: excessively drained
Hydric soil: no
Hydrologic group: A
Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 10 in	gravelly coarse sandy loam	moderately rapid	0.8 to 1.2 in	5.1 to 7.2	.10	.20
Bw -- 10 to 14 in	cobbly coarse sandy loam	moderately rapid	0.3 to 0.5 in	5.1 to 7.0	.10	.20
C1 -- 14 to 30 in	very gravelly loamy coarse sand	rapid	0.5 to 0.8 in	5.1 to 6.5	.05	.17
C2 -- 30 to 60 in	extremely gravelly coarse sand	very rapid	0.3 to 0.9 in	5.1 to 6.5	.02	.17

Minor Components

Chereete and similar soils: 10 percent of the unit
Victor and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

308E--Chereete very cobbly sandy loam, 15 to 35 percent slopes

Mean annual precipitation: 13 to 17 inches

Mean annual temperature: 39 to 45 degrees F

Frost-free period: 95 to 120 days

Chereete and similar soils

Extent: about 85 percent of the unit

Landform(s): escarpments, intermontain basins

Slope gradient: 15 to 35 percent

Parent material: sandy and gravelly alluvium derived from mixed

Restrictive feature(s): none

Seasonal high water table: greater than 60 inches

Flooding hazard: none

Ponding hazard: none

Soil loss tolerance (T factor): 2

Wind erodibility group (WEG): 3

Wind erodibility index (WEI): 56

Land capability class, nonirrigated: 6e

Drainage class: excessively drained

Hydric soil: no

Hydrologic group: A

Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 6 in	cobbly sandy loam	moderately rapid	0.5 to 0.6 in	5.1 to 7.2	.10	.20
Bw -- 6 to 14 in	gravelly sandy loam	moderately rapid	0.7 to 0.9 in	5.1 to 7.0	.10	.20
C1 -- 14 to 18 in	very gravelly coarse sandy loam	moderately rapid	0.2 to 0.3 in	5.1 to 7.0	.05	.20
C2 -- 18 to 25 in	very gravelly loamy coarse sand	rapid	0.2 to 0.3 in	5.1 to 7.0	.05	.17
C3 -- 25 to 60 in	extremely gravelly coarse sand	very rapid	0.4 to 1.1 in	5.1 to 6.5	.02	.17

Minor Components

Brid and similar soils: 5 percent of the unit

Burnt Fork and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

310D--Losthorse very stony sandy loam, 8 to 15 percent slopes

Mean annual precipitation: 17 to 22 inches

Mean annual temperature: 39 to 45 degrees F

Frost-free period: 55 to 75 days

Losthorse, extremely stony and similar soils

Extent: about 85 percent of the unit

Landform(s): intermontain basins, moraines

Slope gradient: 8 to 15 percent

Parent material: stony, cobbly, and gravelly sandy till derived from granite and gneiss

Restrictive feature(s): none

Seasonal high water table: greater than 60 inches

Flooding hazard: none

Ponding hazard: none

Soil loss tolerance (T factor): 2

Wind erodibility group (WEG): 7

Wind erodibility index (WEI): 0

Land capability class, nonirrigated: 7s

Drainage class: somewhat excessively drained

Hydric soil: no

Hydrologic group: A

Potential frost action: low

Ecological site(s): ---

Representative soil profile:

		Texture	Permeability	Available water capacity	pH	Kw	Kf
Oi	0 to 1 in	slightly decomposed plant material	very rapid		4.0 to 6.0		
A	1 to 3 in	very stony sandy loam	moderately rapid	0.1 to 0.2 in	4.5 to 6.5	.05	.20
E	3 to 6 in	stony sandy loam	moderately rapid	0.2 to 0.3 in	4.5 to 6.5	.10	.20
Bw	6 to 15 in	very cobbly coarse sandy loam	moderately rapid	0.5 to 0.9 in	4.5 to 6.5	.05	.20
C1	15 to 25 in	very cobbly loamy coarse sand	very rapid	0.2 to 0.3 in	4.5 to 6.0	.05	.17
C2	25 to 60 in	extremely gravelly coarse sand	very rapid	0.3 to 1.0 in	4.5 to 6.0	.02	.17

Minor Components

Chereete, stony and similar soils: 10 percent of the unit

Repkie, bouldery and similar soils: 5 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

310E--Losthorse very stony sandy loam, 15 to 35 percent slopes

Mean annual precipitation: 17 to 22 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 55 to 75 days

Losthorse, extremely stony and similar soils

Extent: about 85 percent of the unit
Landform(s): escarpments, intermontain basins, moraines
Slope gradient: 15 to 35 percent
Parent material: stony, cobbly, and gravelly sandy till derived from granite and gneiss
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 7
Wind erodibility index (WEI): 0
Land capability class, nonirrigated: 7s
Drainage class: somewhat excessively drained
Hydric soil: no
Hydrologic group: A
Potential frost action: low

Ecological site(s): ---

Representative soil profile:

		Texture	Permeability	Available water capacity	pH	Kw	Kf
Oi	0 to 1 in	slightly decomposed plant material	very rapid		4.0 to 6.0		
A	1 to 3 in	very stony sandy loam	moderately rapid	0.1 to 0.2 in	4.5 to 6.5	.05	.20
E	3 to 6 in	stony sandy loam	moderately rapid	0.2 to 0.3 in	4.5 to 6.5	.10	.20
Bw	6 to 15 in	very cobbly coarse sandy loam	moderately rapid	0.5 to 0.9 in	4.5 to 6.5	.05	.20
C1	15 to 25 in	very cobbly loamy coarse sand	very rapid	0.2 to 0.3 in	4.5 to 6.0	.05	.17
C2	25 to 60 in	extremely gravelly coarse sand	very rapid	0.3 to 1.0 in	4.5 to 6.0	.02	.17

Minor Components

Chereete, stony and similar soils: 10 percent of the unit
Repkie, bouldery and similar soils: 5 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

314D--Sheafman-Chereete cobbly coarse sandy loams, 8 to 15 percent slopes, stony

Mean annual precipitation: 13 to 17 inches

Mean annual temperature: 39 to 45 degrees F

Frost-free period: 80 to 100 days

Sheafman, stony and similar soils

Extent: about 50 percent of the unit

Landform(s): eroded fan remnants, intermontain basins, outwash fans

Slope gradient: 8 to 15 percent

Parent material: coarse-loamy outwash over very gravelly, very cobbly or extremely gravelly sandy outwash derived from granite and gneiss

Restrictive feature(s): none

Seasonal high water table: greater than 60 inches

Flooding hazard: none

Ponding hazard: none

Soil loss tolerance (T factor): 3

Wind erodibility group (WEG): 3

Wind erodibility index (WEI): 56

Land capability class, nonirrigated: 4e

Drainage class: excessively drained

Hydric soil: no

Hydrologic group: A

Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

Representative soil profile:

		Texture	Permeability	Available water capacity	pH	Kw	Kf
A --	0 to 10 in	cobbly coarse sandy loam	moderately rapid	0.8 to 1.2 in	5.1 to 7.2	.10	.20
Bw --	10 to 14 in	cobbly coarse sandy loam	moderately rapid	0.3 to 0.5 in	5.1 to 7.0	.10	.20
C1 --	14 to 30 in	very gravelly loamy coarse sand	rapid	0.5 to 0.8 in	5.1 to 6.5	.05	.17
C2 --	30 to 60 in	extremely gravelly coarse sand	very rapid	0.3 to 0.9 in	5.1 to 6.5	.02	.17

Chereete, stony and similar soils

Extent: about 40 percent of the unit

Landform(s): eroded fan remnants, intermontain basins, outwash fans

Slope gradient: 8 to 15 percent

Parent material: sandy and gravelly outwash derived from granite and gneiss

Restrictive feature(s): none

Seasonal high water table: greater than 60 inches

Flooding hazard: none

Ponding hazard: none

Soil loss tolerance (T factor): 2

Wind erodibility group (WEG): 3

Wind erodibility index (WEI): 56

Land capability class, nonirrigated: 6e

Drainage class: excessively drained

Hydric soil: no

Hydrologic group: A

Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

Map Unit Descriptions (MT)

Bitterroot Valley Area, Montana

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 6 in	cobbly coarse sandy loam	moderately rapid	0.5 to 0.6 in	5.1 to 7.2	.10	.20
Bw -- 6 to 14 in	gravelly sandy loam	moderately rapid	0.7 to 0.9 in	5.1 to 7.0	.10	.20
C1 -- 14 to 18 in	very gravelly coarse sandy loam	moderately rapid	0.2 to 0.3 in	5.1 to 7.0	.05	.20
C2 -- 18 to 25 in	very gravelly loamy coarse sand	rapid	0.2 to 0.3 in	5.1 to 7.0	.05	.17
C3 -- 25 to 60 in	extremely gravelly coarse sand	very rapid	0.4 to 1.1 in	5.1 to 6.5	.02	.17

Minor Components

Victor and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

314E--Sheafman-Chereete cobbly coarse sandy loams, 15 to 35 percent slopes, stony

Mean annual precipitation: 13 to 17 inches

Mean annual temperature: 39 to 45 degrees F

Frost-free period: 95 to 120 days

Sheafman, stony and similar soils

Extent: about 50 percent of the unit

Landform(s): eroded fan remnants, escarpments, intermontain basins

Slope gradient: 15 to 35 percent

Parent material: coarse-loamy outwash over very gravelly, very cobbly or extremely gravelly sandy outwash derived from granite and gneiss

Restrictive feature(s): none

Seasonal high water table: greater than 60 inches

Flooding hazard: none

Ponding hazard: none

Soil loss tolerance (T factor): 3

Wind erodibility group (WEG): 3

Wind erodibility index (WEI): 56

Land capability class, nonirrigated: 6e

Drainage class: excessively drained

Hydric soil: no

Hydrologic group: A

Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

Representative soil profile:

		Texture	Permeability	Available water capacity	pH	Kw	Kf
A --	0 to 10 in	cobbly coarse sandy loam	moderately rapid	0.8 to 1.2 in	5.1 to 7.2	.10	.20
Bw --	10 to 14 in	cobbly coarse sandy loam	moderately rapid	0.3 to 0.5 in	5.1 to 7.0	.10	.20
C1 --	14 to 30 in	very gravelly loamy coarse sand	rapid	0.5 to 0.8 in	5.1 to 6.5	.05	.17
C2 --	30 to 60 in	extremely gravelly coarse sand	very rapid	0.3 to 0.9 in	5.1 to 6.5	.02	.17

Chereete, stony and similar soils

Extent: about 40 percent of the unit

Landform(s): eroded fan remnants, escarpments, intermontain basins

Slope gradient: 15 to 35 percent

Parent material: sandy and gravelly outwash derived from granite and gneiss

Restrictive feature(s): none

Seasonal high water table: greater than 60 inches

Flooding hazard: none

Ponding hazard: none

Soil loss tolerance (T factor): 2

Wind erodibility group (WEG): 3

Wind erodibility index (WEI): 56

Land capability class, nonirrigated: 6e

Drainage class: excessively drained

Hydric soil: no

Hydrologic group: A

Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

Map Unit Descriptions (MT)

Bitterroot Valley Area, Montana

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 6 in	cobbly coarse sandy loam	moderately rapid	0.5 to 0.6 in	5.1 to 7.2	.10	.20
Bw -- 6 to 14 in	gravelly sandy loam	moderately rapid	0.7 to 0.9 in	5.1 to 7.0	.10	.20
C1 -- 14 to 18 in	very gravelly coarse sandy loam	moderately rapid	0.2 to 0.3 in	5.1 to 7.0	.05	.20
C2 -- 18 to 25 in	very gravelly loamy coarse sand	rapid	0.2 to 0.3 in	5.1 to 7.0	.05	.17
C3 -- 25 to 60 in	extremely gravelly coarse sand	very rapid	0.4 to 1.1 in	5.1 to 6.5	.02	.17

Minor Components

Victor and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

321C--Poverty sandy loam, 4 to 8 percent slopes

Mean annual precipitation: 13 to 17 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 80 to 100 days

Poverty and similar soils

Extent: about 85 percent of the unit
Landform(s): intermontain basins, outwash terraces
Slope gradient: 4 to 8 percent
Parent material: sandy and gravelly alluvium derived from granite
Restrictive feature(s): none
Seasonal high water table: approximately 18 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 48
Land capability class, nonirrigated: 6w
Drainage class: poorly drained
Hydric soil: yes
Hydrologic group: D
Potential frost action: moderate

Ecological site(s): Wet Meadow (WM) 10-14" p.z.

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
Oe -- 0 to 1 in	mucky peat	rapid		4.0 to 6.0		
A -- 1 to 5 in	cobbly sandy loam	moderately rapid	0.4 to 0.5 in	5.1 to 7.3	.20	.20
Bw -- 5 to 10 in	cobbly sandy loam	moderately rapid	0.4 to 0.6 in	5.1 to 7.3	.20	.20
C1 -- 10 to 14 in	cobbly coarse sandy loam	rapid	0.0 to 0.4 in	5.1 to 6.5	.10	.17
C2 -- 14 to 19 in	very cobbly loamy coarse sand	very rapid	0.0 to 0.1 in	5.1 to 6.5	.05	.17
C3 -- 19 to 60 in	extremely gravelly coarse sand	very rapid	0.4 to 1.2 in	5.1 to 6.5	.02	.17

Minor Components

Nirling and similar soils: 10 percent of the unit
Bandy and similar soils: 5 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

324B--Victor-Chereete complex, 1 to 4 percent slopes

Mean annual precipitation: 13 to 17 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 85 to 105 days

Victor and similar soils

Extent: about 55 percent of the unit
Landform(s): intermontain basins, outwash terraces
Slope gradient: 1 to 4 percent
Parent material: gravelly coarse-loamy outwash over sandy and gravelly outwash derived from granite and gneiss
Restrictive feature(s): none
Seasonal high water table: approximately 72 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 3
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 56
Land capability class, nonirrigated: 3e
Drainage class: somewhat excessively drained
Hydric soil: no
Hydrologic group: A
Potential frost action: low

Ecological site(s): Silty (Si) 10-14" p.z.

Representative soil profile:

		Texture	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A --	0 to 12 in	loam	moderately rapid	1.7 to 2.1 in	5.1 to 7.3	.32	.32
BC --	12 to 30 in	gravelly sandy loam	moderately rapid	1.4 to 2.5 in	5.1 to 7.0	.10	.20
C1 --	30 to 48 in	very gravelly loamy coarse sand	rapid	0.5 to 0.9 in	5.1 to 7.0	.05	.17
C2 --	48 to 60 in	extremely gravelly coarse sand	very rapid	0.1 to 0.4 in	5.1 to 7.0	.02	.17

Chereete and similar soils

Extent: about 40 percent of the unit
Landform(s): intermontain basins, outwash terraces
Slope gradient: 1 to 4 percent
Parent material: sandy and gravelly outwash derived from granite and gneiss
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 3
Wind erodibility index (WEI): 56
Land capability class, nonirrigated: 6e
Drainage class: excessively drained
Hydric soil: no
Hydrologic group: A
Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

Map Unit Descriptions (MT)

Bitterroot Valley Area, Montana

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 6 in	gravelly sandy loam	moderately rapid	0.5 to 0.7 in	6.6 to 7.3	.10	.20
Bw -- 6 to 14 in	gravelly sandy loam	moderately rapid	0.7 to 0.9 in	5.1 to 7.0	.10	.20
C1 -- 14 to 18 in	very gravelly coarse sandy loam	moderately rapid	0.2 to 0.3 in	5.1 to 7.0	.05	.20
C2 -- 18 to 25 in	very gravelly loamy coarse sand	rapid	0.2 to 0.3 in	5.1 to 7.0	.05	.17
C3 -- 25 to 60 in	extremely gravelly coarse sand	very rapid	0.4 to 1.1 in	5.1 to 6.5	.02	.17

Minor Components

Bandy and similar soils: 5 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

325C--Chereete gravelly coarse sandy loam, 4 to 8 percent slopes

Mean annual precipitation: 13 to 17 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 80 to 100 days

Chereete and similar soils

Extent: about 85 percent of the unit
Landform(s): intermontain basins, outwash terraces
Slope gradient: 4 to 8 percent
Parent material: sandy and gravelly outwash derived from granite and gneiss
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 3
Wind erodibility index (WEI): 56
Land capability class, nonirrigated: 6e
Drainage class: excessively drained
Hydric soil: no
Hydrologic group: A
Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 6 in	gravelly coarse sandy loam	moderately rapid	0.5 to 0.6 in	5.1 to 7.2	.10	.20
Bw -- 6 to 14 in	gravelly sandy loam	moderately rapid	0.7 to 0.9 in	5.1 to 7.0	.10	.20
C1 -- 14 to 18 in	very gravelly coarse sandy loam	moderately rapid	0.2 to 0.3 in	5.1 to 7.0	.05	.20
C2 -- 18 to 25 in	very gravelly loamy coarse sand	rapid	0.2 to 0.3 in	5.1 to 7.0	.05	.17
C3 -- 25 to 60 in	extremely gravelly coarse sand	very rapid	0.4 to 1.1 in	5.1 to 6.5	.02	.17

Minor Components

Victor and similar soils: 5 percent of the unit
Sheafman and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

325D--Chereete gravelly coarse sandy loam, 8 to 15 percent slopes

Mean annual precipitation: 13 to 17 inches

Mean annual temperature: 39 to 45 degrees F

Frost-free period: 80 to 100 days

Chereete and similar soils

Extent: about 90 percent of the unit

Landform(s): intermontain basins, outwash terraces

Slope gradient: 8 to 15 percent

Parent material: sandy and gravelly outwash derived from granite and gneiss

Restrictive feature(s): none

Seasonal high water table: greater than 60 inches

Flooding hazard: none

Ponding hazard: none

Soil loss tolerance (T factor): 2

Wind erodibility group (WEG): 3

Wind erodibility index (WEI): 56

Land capability class, nonirrigated: 6e

Drainage class: excessively drained

Hydric soil: no

Hydrologic group: A

Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 6 in	gravelly coarse sandy loam	moderately rapid	0.5 to 0.6 in	5.1 to 7.2	.10	.20
Bw -- 6 to 14 in	gravelly sandy loam	moderately rapid	0.7 to 0.9 in	5.1 to 7.0	.10	.20
C1 -- 14 to 18 in	very gravelly coarse sandy loam	moderately rapid	0.2 to 0.3 in	5.1 to 7.0	.05	.20
C2 -- 18 to 25 in	very gravelly loamy coarse sand	rapid	0.2 to 0.3 in	5.1 to 7.0	.05	.17
C3 -- 25 to 60 in	extremely gravelly coarse sand	very rapid	0.4 to 1.1 in	5.1 to 6.5	.02	.17

Minor Components

Sheafman and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

326B--Sheafman-Chereete gravelly coarse sandy loams, 1 to 4 percent slopes

Mean annual precipitation: 13 to 17 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 85 to 105 days

Sheafman and similar soils

Extent: about 55 percent of the unit
Landform(s): intermontain basins, outwash fans
Slope gradient: 1 to 4 percent
Parent material: coarse-loamy outwash over very gravelly, very cobbly or extremely gravelly sandy outwash derived from granite and gneiss
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 3
Wind erodibility group (WEG): 3
Wind erodibility index (WEI): 56
Land capability class, nonirrigated: 4e
Drainage class: excessively drained
Hydric soil: no
Hydrologic group: A
Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

Representative soil profile:

		Texture	Permeability	Available water capacity	pH	Kw	Kf
A --	0 to 10 in	gravelly coarse sandy loam	moderately rapid	0.8 to 1.2 in	5.1 to 7.2	.10	.20
Bw --	10 to 14 in	cobbly coarse sandy loam	moderately rapid	0.3 to 0.5 in	5.1 to 7.0	.10	.20
C1 --	14 to 30 in	very gravelly loamy coarse sand	rapid	0.5 to 0.8 in	5.1 to 6.5	.05	.17
C2 --	30 to 60 in	extremely gravelly coarse sand	very rapid	0.3 to 0.9 in	5.1 to 6.5	.02	.17

Chereete and similar soils

Extent: about 35 percent of the unit
Landform(s): intermontain basins, outwash terraces
Slope gradient: 1 to 4 percent
Parent material: sandy and gravelly outwash derived from granite and gneiss
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 3
Wind erodibility index (WEI): 56
Land capability class, nonirrigated: 6e
Drainage class: excessively drained
Hydric soil: no
Hydrologic group: A
Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

Map Unit Descriptions (MT)

Bitterroot Valley Area, Montana

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 6 in	gravelly coarse sandy loam	moderately rapid	0.5 to 0.6 in	5.1 to 7.2	.10	.20
Bw -- 6 to 14 in	gravelly sandy loam	moderately rapid	0.7 to 0.9 in	5.1 to 7.0	.10	.20
C1 -- 14 to 18 in	very gravelly coarse sandy loam	moderately rapid	0.2 to 0.3 in	5.1 to 7.0	.05	.20
C2 -- 18 to 25 in	very gravelly loamy coarse sand	rapid	0.2 to 0.3 in	5.1 to 7.0	.05	.17
C3 -- 25 to 60 in	extremely gravelly coarse sand	very rapid	0.4 to 1.1 in	5.1 to 6.5	.02	.17

Minor Components

Victor and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

327D--Losthorse, extremely stony-Chereete, stony, complex, 8 to 15 percent slopes

Mean annual precipitation: 13 to 17 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 80 to 100 days

Losthorse, extremely stony and similar soils

Extent: about 70 percent of the unit
Landform(s): intermontain basins, moraines, outwash terraces
Slope gradient: 8 to 15 percent
Parent material: stony, cobbly, and gravelly sandy till derived from granite and gneiss
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 7
Wind erodibility index (WEI): 0
Land capability class, nonirrigated: 7s
Drainage class: somewhat excessively drained
Hydric soil: no
Hydrologic group: A
Potential frost action: low

Ecological site(s): ---

Representative soil profile:

		Texture	Permeability	Available water capacity	pH	Kw	Kf
Oi	0 to 1 in	slightly decomposed plant material	very rapid		4.0 to 6.0		
A	1 to 3 in	stony coarse sandy loam	moderately rapid	0.2 to 0.3 in	4.5 to 6.5	.10	.20
E	3 to 6 in	stony sandy loam	moderately rapid	0.2 to 0.3 in	4.5 to 6.5	.10	.20
Bw	6 to 15 in	very cobbly coarse sandy loam	moderately rapid	0.5 to 0.9 in	4.5 to 6.5	.05	.20
C1	15 to 25 in	very cobbly loamy coarse sand	very rapid	0.2 to 0.3 in	4.5 to 6.0	.05	.17
C2	25 to 60 in	extremely gravelly coarse sand	very rapid	0.3 to 1.0 in	4.5 to 6.0	.02	.17

Chereete, stony and similar soils

Extent: about 25 percent of the unit
Landform(s): eroded fan remnants, escarpments, intermontain basins
Slope gradient: 8 to 15 percent
Parent material: sandy and gravelly outwash derived from granite and gneiss
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 3
Wind erodibility index (WEI): 56
Land capability class, nonirrigated: 6e
Drainage class: excessively drained
Hydric soil: no
Hydrologic group: A
Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

Map Unit Descriptions (MT)

Bitterroot Valley Area, Montana

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 6 in	cobbly coarse sandy loam	moderately rapid	0.5 to 0.6 in	5.1 to 7.2	.10	.20
Bw -- 6 to 14 in	gravelly sandy loam	moderately rapid	0.7 to 0.9 in	5.1 to 7.0	.10	.20
C1 -- 14 to 18 in	very gravelly coarse sandy loam	moderately rapid	0.2 to 0.3 in	5.1 to 7.0	.05	.20
C2 -- 18 to 25 in	very gravelly loamy coarse sand	rapid	0.2 to 0.3 in	5.1 to 7.0	.05	.17
C3 -- 25 to 60 in	extremely gravelly coarse sand	very rapid	0.4 to 1.1 in	5.1 to 6.5	.02	.17

Minor Components

Nirling and similar soils: 5 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

327E--Losthorse, extremely stony-Chereete, stony, complex, 15 to 25 percent slopes

Mean annual precipitation: 13 to 17 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 80 to 100 days

Losthorse, extremely stony and similar soils

Extent: about 70 percent of the unit
Landform(s): intermontain basins, moraines, outwash terraces
Slope gradient: 15 to 25 percent
Parent material: stony, cobbly, and gravelly sandy till derived from granite and gneiss
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 7
Wind erodibility index (WEI): 0
Land capability class, nonirrigated: 7s
Drainage class: somewhat excessively drained
Hydric soil: no
Hydrologic group: A
Potential frost action: low

Ecological site(s): ---

Representative soil profile:

		Texture	Permeability	Available water capacity	pH	Kw	Kf
Oi	0 to 1 in	slightly decomposed plant material	very rapid		4.0 to 6.0		
A	1 to 3 in	stony coarse sandy loam	moderately rapid	0.2 to 0.3 in	4.5 to 6.5	.10	.20
E	3 to 6 in	stony sandy loam	moderately rapid	0.2 to 0.3 in	4.5 to 6.5	.10	.20
Bw	6 to 15 in	very cobbly coarse sandy loam	moderately rapid	0.5 to 0.9 in	4.5 to 6.5	.05	.20
C1	15 to 25 in	very cobbly loamy coarse sand	very rapid	0.2 to 0.3 in	4.5 to 6.0	.05	.17
C2	25 to 60 in	extremely gravelly coarse sand	very rapid	0.3 to 1.0 in	4.5 to 6.0	.02	.17

Chereete, stony and similar soils

Extent: about 25 percent of the unit
Landform(s): eroded fan remnants, escarpments, intermontain basins
Slope gradient: 15 to 25 percent
Parent material: sandy and gravelly outwash derived from granite and gneiss
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 3
Wind erodibility index (WEI): 56
Land capability class, nonirrigated: 6e
Drainage class: excessively drained
Hydric soil: no
Hydrologic group: A
Potential frost action: low

Ecological site(s): Shallow to Gravel (SwGr) 10-14" p.z.

Map Unit Descriptions (MT)

Bitterroot Valley Area, Montana

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A -- 0 to 6 in	cobbly coarse sandy loam	moderately rapid	0.5 to 0.6 in	5.1 to 7.2	.10	.20
Bw -- 6 to 14 in	gravelly sandy loam	moderately rapid	0.7 to 0.9 in	5.1 to 7.0	.10	.20
C1 -- 14 to 18 in	very gravelly coarse sandy loam	moderately rapid	0.2 to 0.3 in	5.1 to 7.0	.05	.20
C2 -- 18 to 25 in	very gravelly loamy coarse sand	rapid	0.2 to 0.3 in	5.1 to 7.0	.05	.17
C3 -- 25 to 60 in	extremely gravelly coarse sand	very rapid	0.4 to 1.1 in	5.1 to 6.5	.02	.17

Minor Components

Nirling and similar soils: 5 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

345C--Victor-Bandy complex, 0 to 8 percent slopes

Mean annual precipitation: 13 to 17 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 80 to 100 days

Victor and similar soils

Extent: about 60 percent of the unit
Landform(s): intermontain basins, outwash terraces
Slope gradient: 2 to 8 percent
Parent material: gravelly coarse-loamy outwash over sandy and gravelly outwash derived from granite and gneiss
Restrictive feature(s): none
Seasonal high water table: approximately 72 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 3
Wind erodibility group (WEG): 3
Wind erodibility index (WEI): 56
Land capability class, nonirrigated: 3e
Drainage class: somewhat excessively drained
Hydric soil: no
Hydrologic group: A
Potential frost action: low

Ecological site(s): Silty (Si) 10-14" p.z.

Representative soil profile:

		Texture	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
A --	0 to 12 in	gravelly loam	moderately rapid	1.7 to 2.1 in	5.1 to 7.3	.32	.32
BC --	12 to 30 in	gravelly sandy loam	moderately rapid	1.4 to 2.5 in	5.1 to 7.0	.10	.20
C1 --	30 to 48 in	very gravelly loamy coarse sand	rapid	0.5 to 0.9 in	5.1 to 7.0	.05	.17
C2 --	48 to 60 in	extremely gravelly coarse sand	very rapid	0.1 to 0.4 in	5.1 to 7.0	.02	.17

Bandy and similar soils

Extent: about 30 percent of the unit
Landform(s): intermontain basins, outwash terraces
Slope gradient: 0 to 4 percent
Parent material: sandy and gravelly outwash
Restrictive feature(s): none
Seasonal high water table: approximately 8 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 3
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 56
Land capability class, nonirrigated: 5w
Drainage class: poorly drained
Hydric soil: yes
Hydrologic group: D
Potential frost action: moderate

Ecological site(s): Wet Meadow (WM) 10-14" p.z.

Map Unit Descriptions (MT)

Bitterroot Valley Area, Montana

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
Oe -- 0 to 3 in	mucky peat	rapid		4.0 to 6.0		
A1 -- 3 to 7 in	loam	moderately rapid	0.6 to 0.7 in	5.1 to 7.3	.32	.32
A2 -- 7 to 15 in	gravelly sandy loam	moderately rapid	0.7 to 1.0 in	5.1 to 6.5	.15	.24
2C1 -- 15 to 18 in	very gravelly sandy loam	rapid	0.1 to 0.2 in	5.1 to 6.5	.05	.20
2C2 -- 18 to 60 in	extremely gravelly sand	very rapid	0.8 to 1.3 in	5.1 to 6.5	.02	.17

Minor Components

Sheafman and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

349C--Losthorse, extremely stony-Poverty complex, 1 to 8 percent slopes

Mean annual precipitation: 13 to 17 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 85 to 105 days

Losthorse, extremely stony and similar soils

Extent: about 65 percent of the unit
Landform(s): intermontain basins, moraines, outwash terraces
Slope gradient: 2 to 8 percent
Parent material: stony, cobbly, and gravelly sandy till derived from granite and gneiss
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 7
Wind erodibility index (WEI): 0
Land capability class, nonirrigated: 6s
Drainage class: somewhat excessively drained
Hydric soil: no
Hydrologic group: A
Potential frost action: low

Ecological site(s): ---

Representative soil profile:

		Texture	Permeability	Available water capacity	pH	Kw	Kf
Oi	0 to 1 in	slightly decomposed plant material	very rapid		4.0 to 6.0		
A	1 to 3 in	stony sandy loam	moderately rapid	0.2 to 0.3 in	4.5 to 6.5	.10	.20
E	3 to 6 in	stony sandy loam	moderately rapid	0.2 to 0.3 in	4.5 to 6.5	.10	.20
Bw	6 to 15 in	very cobbly coarse sandy loam	moderately rapid	0.5 to 0.9 in	4.5 to 6.5	.05	.20
C1	15 to 25 in	very cobbly loamy coarse sand	very rapid	0.2 to 0.3 in	4.5 to 6.0	.05	.17
C2	25 to 60 in	extremely gravelly coarse sand	very rapid	0.3 to 1.0 in	4.5 to 6.0	.02	.17

Poverty and similar soils

Extent: about 25 percent of the unit
Landform(s): intermontain basins, outwash terraces
Slope gradient: 1 to 4 percent
Parent material: sandy and gravelly alluvium derived from granite
Restrictive feature(s): none
Seasonal high water table: approximately 18 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 48
Land capability class, nonirrigated: 6w
Drainage class: poorly drained
Hydric soil: yes
Hydrologic group: D
Potential frost action: moderate

Ecological site(s): Wet Meadow (WM) 10-14" p.z.

Map Unit Descriptions (MT)

Bitterroot Valley Area, Montana

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Representative soil profile:	*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
Oe -- 0 to 1 in	mucky peat	rapid		4.0 to 6.0		
A -- 1 to 5 in	cobbly loam	moderately rapid	0.4 to 0.5 in	5.1 to 7.3	.20	.20
Bw -- 5 to 10 in	cobbly sandy loam	moderately rapid	0.4 to 0.6 in	5.1 to 7.3	.20	.20
C1 -- 10 to 14 in	cobbly coarse sandy loam	rapid	0.0 to 0.4 in	5.1 to 6.5	.10	.17
C2 -- 14 to 19 in	very cobbly loamy coarse sand	very rapid	0.0 to 0.1 in	5.1 to 6.5	.05	.17
C3 -- 19 to 60 in	extremely gravelly coarse sand	very rapid	0.4 to 1.2 in	5.1 to 6.5	.02	.17

Minor Components

Nirling and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

367C--Hartbench loam, wet, 4 to 8 percent slopes

Mean annual precipitation: 13 to 17 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 80 to 100 days

Hartbench, wet and similar soils

Extent: about 85 percent of the unit
Landform(s): intermontain basins, outwash fans
Slope gradient: 4 to 8 percent
Parent material: fine-loamy outwash over sandy and gravelly outwash derived from granite and gneiss
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 4
Wind erodibility group (WEG): 6
Wind erodibility index (WEI): 48
Land capability class, nonirrigated: 3e
Drainage class: somewhat poorly drained
Hydric soil: no
Hydrologic group: C
Potential frost action: moderate

Ecological site(s): Silty (Si) 10-14" p.z.

Representative soil profile:

		Texture	Permeability	Available water capacity	pH	Kw	Kf
A --	0 to 8 in	loam	moderate	1.1 to 1.4 in	5.1 to 7.2	.37	.37
Bt --	8 to 22 in	clay loam	moderate	2.0 to 2.7 in	5.1 to 7.0	.32	.32
BC --	22 to 30 in	gravelly sandy loam	moderately rapid	0.6 to 1.1 in	5.1 to 7.0	.15	.24
2C --	30 to 60 in	extremely gravelly coarse sand	very rapid	0.3 to 0.9 in	5.1 to 6.5	.02	.17

Minor Components

Blossberg and similar soils: 5 percent of the unit
Victor and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

391D--Losthorse-Repkie complex, 8 to 15 percent slopes, bouldery

Mean annual precipitation: 17 to 22 inches
Mean annual temperature: 39 to 45 degrees F
Frost-free period: 55 to 75 days

Losthorse, bouldery and similar soils

Extent: about 60 percent of the unit
Landform(s): intermontain basins, moraines, outwash terraces
Slope gradient: 8 to 15 percent
Parent material: stony, cobbly, and gravelly sandy till derived from granite and gneiss
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 2
Wind erodibility group (WEG): 7
Wind erodibility index (WEI): 0
Land capability class, nonirrigated: 7s
Drainage class: somewhat excessively drained
Hydric soil: no
Hydrologic group: A
Potential frost action: low

Ecological site(s): ---

Representative soil profile:

		Texture	Permeability	Available water capacity	pH	Kw	Kf
Oi	0 to 1 in	slightly decomposed plant material	very rapid		4.0 to 6.0		
A	1 to 3 in	stony coarse sandy loam	moderately rapid	0.2 to 0.3 in	4.5 to 6.5	.10	.20
E	3 to 6 in	stony sandy loam	moderately rapid	0.2 to 0.3 in	4.5 to 6.5	.10	.20
Bw	6 to 15 in	very cobbly coarse sandy loam	moderately rapid	0.5 to 0.9 in	4.5 to 6.5	.05	.20
C1	15 to 25 in	very cobbly loamy coarse sand	very rapid	0.2 to 0.3 in	4.5 to 6.0	.05	.17
C2	25 to 60 in	extremely gravelly coarse sand	very rapid	0.3 to 1.0 in	4.5 to 6.0	.02	.17

Repkie, bouldery and similar soils

Extent: about 30 percent of the unit
Landform(s): moraines on glacial-valley floors
Slope gradient: 8 to 15 percent
Parent material: till derived from granite and gneiss
Restrictive feature(s): none
Seasonal high water table: greater than 60 inches
Flooding hazard: none
Ponding hazard: none

Soil loss tolerance (T factor): 4
Wind erodibility group (WEG): 5
Wind erodibility index (WEI): 56
Land capability class, nonirrigated: 6s
Drainage class: well drained
Hydric soil: no
Hydrologic group: B
Potential frost action: moderate

Ecological site(s): ---

Map Unit Descriptions (MT)

Bitterroot Valley Area, Montana

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

Representative soil profile:		*Texture*	*Permeability*	*Available water capacity*	*pH*	*Kw*	*Kf*
Oe --	0 to 1 in	moderately decomposed plant material	rapid		4.0 to 6.0		
E --	1 to 2 in	bouldery sandy loam	moderate	0.1 to 0.1 in	4.5 to 6.5	.10	.32
Bw --	2 to 6 in	very bouldery ashy loam	moderate	0.4 to 0.6 in	4.5 to 6.5	.10	.32
2BC --	6 to 44 in	very stony sandy loam	moderately rapid	1.5 to 3.0 in	4.5 to 6.0	.10	.24
2C --	44 to 60 in	very cobbly loamy sand	very rapid	0.3 to 0.6 in	4.5 to 6.0	.05	.24

Minor Components

Chereete, very stony and similar soils: 10 percent of the unit

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation.]

904--Dumps, landfill

Mean annual precipitation:

Mean annual temperature:

Frost-free period:

Dumps, landfill

Extent: about 100 percent of the unit

Landform(s):

Slope gradient:

Parent material:

Restrictive feature(s): none

Seasonal high water table: greater than 60 inches

Flooding hazard: none

Ponding hazard: none

Soil loss tolerance (T factor):

Wind erodibility group (WEG):

Wind erodibility index (WEI):

Land capability class, nonirrigated:

Drainage class:

Hydric soil:

Hydrologic group:

Potential frost action:

Ecological site(s): ---

Representative soil profile:

Texture	Permeability	Available water capacity	pH	Kw	Kf

none

Minor Components

Big Sky. Big Land. Big History.
Montana
Historical Society

Historic Preservation
Museum
Outreach & Interpretation
Publications
Research Center

October 19, 2009

Chris Cobb-Taggart
Professional Consultants Inc.
1713 N. First Street
Hamilton MT 59840

RE: STEVENSVILLE PROPOSED WATER SYSTEM IMPROVEMENTS, RAVALLI CO.
SHPO Project #: 2008022512 / 2009101902

Dear Chris:

Thank you for your follow up letter regarding the above-cited projects potential route changes. I have conducted a cultural resource file search for proposed Routes 2, 3, and re-looked at Route 1. According to our records there have been a few previously recorded sites within the designated search locales. In addition to the sites there have been a few previously conducted cultural resource inventories done in the areas. If you would like any further information regarding these sites or reports you may contact me at the number listed below.

By the looks of aerial photos the proposed well field looks to have been previously disturbed by agricultural practices and as long as the project stays within the proposed routes, along existing roadways, we feel there is a low likelihood cultural properties will be impacted. We, therefore, feel that a recommendation for a cultural resource inventory is unwarranted at this time. However, should cultural materials be inadvertently discovered during this project we would ask that our office be contacted and the site investigated.

If you have any further questions or comments you may contact me at (406) 444-7767 or by e-mail at dmurdo@state.mt.us.

Sincerely,

Damon Murdo
Cultural Records Manager

File: DEQ/AIR&WATER WASTE MNG/2009

225 North Roberts Street
P.O. Box 201201
Helena, MT 59620-1201
(406) 444-2694
(406) 444-2696 FAX
montanahistoricalsociety.org

United States Department of the Interior
Fish and Wildlife Service

Ecological Services
Montana Field Office
585 Shepard Way
Helena, Montana 59601-6287
Phone: (406) 449-5225 Fax: (406) 449-5339

September 24, 2009

Ms. Chris Cobb-Taggart
Planning Technician
Professional Consultants, Inc.
P.O. Box 1750
Missoula, MT 59806

Dear Ms. Cobb-Taggart:

We have reviewed the project description and the maps submitted to us with your letter dated September 14, 2009, concerning the proposed Town of Stevensville, Water System Improvement Project, in Ravalli County, Montana. Due to the semi-urban location of the proposed improvements (primarily within the city confines), this project is unlikely to have any significant adverse effects upon fish, wildlife, or habitat resources under the purview of the U.S. fish and Wildlife Service.

Please telephone me at 406/449-5225, ext. 205, if you have any questions regarding this matter.

Sincerely,

R. Mark Wilson

R. Mark Wilson
Field Supervisor

Montana Fish, Wildlife & Parks

Region 2 Office
3201 Spurgin Road
Missoula, MT 59804-3101
406-542-5500
Fax 406-542-5529
November 6, 2009

Chris Cobb-Taggart
Professional Consultants, Inc.
1713 N. 1st Street
Hamilton, MT 59840

Reference: Proposed water system improvements for Stevensville--Phases 2 (meters and new supply transmission main) and 3 (new water supply wells and storage tank installation)

Dear Ms. Cobb-Taggart:

We have reviewed your letter requesting our review for any biological or natural resource impacts that could occur relative to this project. Potential occurrences in or near the project area of Threatened or Endangered Species (under the Federal Endangered Species Act) and Montana Species of Concern[1] can be obtained from the Montana Natural Heritage Program. Requests can be made under the data tab at http://mtnhp.org.

Based on our knowledge of the biological resources within the project area, we believe the project is not likely to have significant affects on fish or wildlife resources.

Thank you for providing the opportunity for FWP to comment on this proposal.

Sincerely,

Jeff Dana for

Mack Long
Regional Supervisor

ML/sr

[1] A native animal breeding in Montana that is considered to be "at risk" due to declining population trends, threats to its habitats, and/or restricted distribution. The purpose of Montana's SOC listing is to highlight species in decline and encourage conservation efforts to reverse population declines and prevent the need for future listing as Threatened or Endangered Species under the Federal Endangered Species Act.

WETLANDS DELINEATION REPORT

FOR
TOWN OF STEVENSVILLE WELL FIELD SITE

LOCATED ON MIDDLE BURNT FORK ROAD
IN SECTION 35, T9N, R20W, RAVALLI COUNTY,
MONTANA

March 2008

Prepared By:
Professional Consultants, Inc. (PCI)
Hamilton, MT
PCI Project # 7252-04

Professional Consultants Inc.
Unmatched Experience. Uncompromising Standards.

Wetlands Delineation Report For Town Of Stevensville Well Site

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Wetlands Delineation Report for Town of Stevensville Well Field Site

Section 1.0 Introduction & Scope of Work

This Wetland Delineation Report was prepared by Professional Consultants, Inc. (PCI), Hamilton, MT for the Town of Stevensville's proposed Well Field Site. The proposed well field property is located south of Middle Burnt Fork Road about 1000 feet west of its intersection with Logan Lane, placing it southeast of the Town of Stevensville in Section 35, Township 9 North, Range 20 West, Ravalli County, MT. **Figure 1 - Topographic Map** shows the location of the site on a pertinent segment of the USGS Quadrangle Map for the area. Also shown diagrammatically on **Figure 1** are several phases of a Water Improvements Project for the Town Of Stevensville. The well field is an integral part of an overall water system improvements project to provide an adequate water supply for the Town's future needs.

Figure 2 - Aerial Photograph shows the location of the subject well field property superimposed on an aerial photograph of the property and its immediate environs. Several photos of the property from different angles as captured during the site reconnaissance phase of the wetlands investigation are found in **Attachment A - Site Photos.**

The scope of work performed for this wetland delineation includes a preliminary data review, site reconnaissance, delineation of the wetland/upland boundary, and a functions and values assessment. The field investigations were conducted over the period of February 25 to March 7, 2008 by William E. Burnett, Environmental Scientist with PCI. It should be noted that the field investigations were able to be successfully completed; however, the vegetation survey portion of the investigation was constrained due in part to a recent history of intense livestock (cattle) grazing on the property and the fact that it was conducted at the end of the dormant season and prior to the onset of the spring growing season for vascular plants.

Wetlands with "jurisdictional status" are "Waters of the United States" (WUS) as regulated by Section 404 of the Clean Water Act (CWA) or the Swampbuster Provision under the Food Security Act, and defined by Title 33 Code of Federal Regulations Part 328 (33 CFR 328). In general, the term WUS includes all of the traditional navigable waters of the United States, which include all waters that are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce. In addition, WUS include all interstate waters, interstate wetlands, and all impoundments, tributaries or wetlands adjacent to any

water body defined as a WUS. A recent Supreme Court ruling (known as the SWANCC decision) removed "isolated wetlands" from the U. S. Army Corps of Engineers' (USACE) jurisdiction. Isolated wetlands are those that have no connection with any tributary system that flows into traditional navigable waters or interstate waters (i.e., intrastate lakes, streams, prairie potholes, etc.). However, this court decision does not alter existing state or tribal jurisdiction over wetlands. Regulatory authority over isolated wetlands varies from state to state. This delineation identifies any occurring wetlands at the site and makes professional determinations as to their status, be it isolated or jurisdictional.

This document describes the methods used to achieve the project objectives, stated above, as well as the results of the study. Supporting information, data sheets and site photographs showing key features of the property are included in attachments to this document.

Section 2.0 Methods

2.1 Preliminary Data Review

Prior to the site reconnaissance, several sources of relevant information were reviewed to assist in the wetland delineation.

National Wetlands Inventory (NWI) maps, developed by the United States Fish and Wildlife Service (USFWS) and the United States Geological Survey (USGS) were reviewed using the online Wetlands Mapper System maintained by the USFWS. This review identified previously mapped wetlands in the general vicinity of the subject property (mainly to the west of the site along the Bitterroot River). However, no previously mapped wetlands were found to be present directly on the subject site. These online maps are based on aerial photography, soil survey maps, precipitation records and other historical information, and identify areas that *appear* to have the vegetation and physical features of wetlands. They are generally considered to be a general planning tool designed to alert one to the possible presence of wetlands in an area, but are often not very site specific.

A USGS 7.5 minute topographic map for the area was used to identifying drainage patterns in and around the site. A copy of pertinent portion of the USGS topographic map of the property and its environs is shown in **Figure 1.** This map shows a segment of Robertson Creek passing through the southern portion of the property. NOTE: Although not shown on the USGS map, another branch of Robertson Creek passes through the northern portion of the property. These creeks tend to define the hydrology of the subject property.

Information on site soils was obtained from the Web-Based Soil Survey of the Bitterroot Valley Area, Montana prepared by the Natural Resource Conservation Service (NRCS). A soil survey map of the property was prepared for the subject site and is found in **Attachment B - Soil Map & Soil Descriptions**.

Site soils consist of Grayhorse silt loam, 0 to 4 percent slopes (NRCS Mapping Symbol "26B") found primarily in the southern 2/3s of the property and Grayhorse-Allwitt Complex, 0 to 2 percent slopes (NRCS Mapping Symbol "148A") in the northern 1/3 of the property nearest Middle Burnt Fork Road. These soil types were cross-referenced with Hydric Soils of the United States (NRCS 2007b). Grayhorse-Allwitt Complex soils are considered to be partially hydric, while Grayhorse silt loam is considered to be a non-hydric soil. However, site specific hydrological conditions will generally influence whether a given soil type is indeed hydric. Thus, while NRCS soil maps are useful in identifying general soil types existing in an area, on-site soil conditions were used by PCI to make the wetland determination for this property.

2.2 Site Reconnaissance

Field investigations were performed over the period of February 25 to March 14, 2008 by William E. Burnett, Environmental Scientist with PCI. These on-site investigations were designed to describe dominant plant species, hydrological characteristics and site specific soil properties as they relate to the presence of wetlands. Snow covered the property during the week of February 25th. However, by the week of March 3rd, the winter snow had mostly melted allowing soils investigations and the wetlands delineation to proceed.

Wetland identification was based on the current federal regulatory definition of wetlands as

generally defined in, and regulated under 33 CFR, and 40 CFR 230, Environmental Protection Agency (EPA). For an area to be classified as a wetland, the area must have the following positive wetland indicators in concert (i.e, present together) namely, hydrophytic (water loving) vegetation, hydric soils and wetland hydrology. Generally speaking, wetlands hydrology involves the presence of water (or indirect evidence of the presence of water) in the upper 12 inches of the soil column during the spring growing season for vascular plants.

The procedures used in this study generally followed the Routine Approach, Level 2 Onsite Inspection methodologies described in the January 1987 *Corps of Engineers Wetlands Delineation Manual* (Wetlands Research Program Technical Report Y-87-1). The simplified method was dictated by the relative small size of the property, general homogeneous conditions present across the entire property and the fact that the vegetation has been disturbed in the recent past by intensive cattle grazing.

Briefly, this simplified wetlands delineation method includes the following actions:

- Determination of site conditions;
- Selection of observation points;
- Characterization of plant community types and determination of hydrophytic vegetation status;
- Determination of whether wetland hydrology and hydric soils are present; and,
- Performance of the wetland delineation and determination of the wetlands / upland boundary and mapping of these areas on a scaled plan of the property.

2.3 Site Survey

The wetlands /uplands boundary was determined in the field mainly by using soil test pits produced in a grid pattern and using these test holes to determine prevailing soil and hydrological conditions. These results were then combined with information on plant types to complete the assessment. Once the boundary was ascertained, then the line was measured off of known features and the line was recorded on a scaled map of the property.

In the case of this property, the established wetlands / uplands boundary is considered to be conservative, in that, given the shallow topography of the land and its history of prior disturbance for cattle grazing, small isolated pockets of uplands may exist within the overall wetlands area. However, these pockets are relatively small and not worthy of detailed mapping.

2.4 Functions and Values Assessment

The Montana Department of Transportation (MDT) Montana Wetland Assessment method (Berglund 1999) was used to evaluate wetland functions and values on the project site. The MDT Wetland Assessment method assesses and assigns each of twelve (12) recognized functions and values ratings of "low", "moderate", or "high" (or, in some cases, "exceptional"), and scores each on a scale of 0.1 (lowest) to 1 (highest) "functional points." Functional points were totaled on the data form and expressed as a percentage of the possible total. Functions that do not apply to a given wetland were assigned a rank of "NA" and not included in point totals. This percentage was then used in conjunction with other criteria to provide an overall wetland ranking into one of four categories. Category I is the highest overall ranking a wetland can receive and implies that the wetland has a very high functions and values from an ecological standpoint. This rating is followed by Category II, Category III, and Category IV, with the latter category being the least valuable with highly impaired functions and values. Once tallied by this method, functional points can be multiplied by the total existing acreage in the assessment area (AA) to determine the total "functional units" existing at a given site. This is usually done to provide for some form of mitigation - be it either on or off site. However, in this case, this latter method was not employed at this particular site.

Section 3.0: Results

The preliminary investigation of the site indicated that the wetlands on this property were most likely to be found associated with the two (2) segments of Robertson Creek that traverse the property. As mentioned previously, the on-site reconnaissance of the property revealed that there are actually two (2) branches of Robertson Creek that traverse the property from east to west, but only one is shown on the area USGS map (**Figure 1**). One branch of this creek

crosses the northern portion of the property and the other is found along the southern property line of the site. Extending off of the southern branch of this creek are several relict man-made irrigation ditches that were used to flood irrigate the property in the past. These ditches now appear to be abandoned, but likely affected the near surface hydrology of the southern portion of the property in the recent past. The intent is to abandon these ditches, as the site will no longer be flood irrigated. Therefore, the periodic discharges of water from these ditches will no longer influence the near surface hydrology of relevant portions of the property.

A paved access road to the property is proposed to extend from the proposed Twin Creeks Subdivision located to the west of the subject site. Thus, the northern edge of the right of way of this road (60 - foot wide right of way) served to define the southern limit of this wetlands investigation. The northern boundary of the investigation was the southern edge of the right of way of Middle Burnt Fork Road. Thus, the area of this investigation was confined to that portion of the property that surrounds the northern branch of Robinson Creek, which traverses the northern portion of the property. Due to the proposed presence of the access road, the wetlands surrounding the southern branch of Robinson Creek were not delineated as a part of this investigation.

The locations of the wetlands on this property are shown on **Figure 3 - Wetlands Map**.

The wetlands that were delineated are classified as "riverine wetlands." This type of wetland is typically located within floodplains and/or within riparian corridors and is associated with stream channels. Water sources for the wetland plants come from overbank flow from the adjacent stream (usually during the spring snow melt period) and from subsurface hydraulic connections between the stream channel and the wetlands. These riverine wetlands on the property have ultimate connectivity with the Bitterroot River (see **Figure 1**). Thus, it is highly probable that the wetlands on this site are Waters of the US and "jurisdictional," placing them under the purview of regulations administered by the US Army Corp of Engineers.

3.1 Vegetation:

The field investigation was completed during the latter part of the dormant season for plants. Thus, plant identification was somewhat difficult due to the lack of distinguishing plant features

present. This was especially the case for the grasses and sedges in the understory layer. However, despite these limitations, the majority of plants were able to be identified at least to the genus level and in some cases to the species level. In all cases, the wetland indicator status was able to be determined for the purpose of wetland delineation. An additional factor hindering plant identification was due to impacts (extensive browsing and trampling) from recent historic livestock grazing.

The dominant vegetation within the wetland areas was dominated by bentgrass, sedge species, brome species, willow species (a few isolated clumps), reed canary grass, and cattails (in a few isolated clumps). The dominant wetlands species are listed in **Table 1.** The vegetation within the wetlands areas was determined to be hydric vegetation as a majority of the dominant plant species had a wetland indicator status of OBL, FACW, or FAC (See the notes in **Table 1** for definitions of these terms).

3.2 Soils:

The NRCS soil survey has mapped the soils on this property as consisting of Grayhorse silt loam and Grayhorse - Allwitt Complex. The former soil type is as mapped by the NRCS is found primarily in the southern 2/3s of the property and the latter type is located in the northern 1/3 of the property nearest Middle Burnt Fork Road. Both of these soil types were recently named by the NRCS and both tend to be high in organic matter and typically found within floodplains. Grayhorse - Allwitt Complex soils are considered to be partially hydric, while Grayhorse silt loam soils are considered to be non-hydric.

Several soil pits were dug within the investigated wetland area and also outside of the wetland area. The soil pits were developed to a depth of approximately 1 to 1.3 feet below the land surface or, alternately, to refusal due to extensive cobbles, whichever occurred first. Soils closest to the creek were found to be high in organic matter with few cobbles until the depth exceed 1 foot at which extensive cobbles were encountered. Soils outside of the wetland area were found to very high in cobbles at a depth of only few inches and penetrating beyond this level was very difficult. It was of interest to find that the developed soil pits tended to mirror the NRCS soils as previously described and mapped for this property (See **Attachment B**).

Excavated soils within the wetland area exhibited reduced matrix and low chroma (7.5YR2.5/1) and mottling (5YR 5/8). See **Attachment C - Data Forms** for additional field documentation. Due to the low chroma and mottling, the soils within the wetland area were determined to be hydric.

Excavated soils in the upland areas were characterized by a shallow organic layer to a depth of 3 to 4 inches and then extensive cobbles found in a matrix of lighter colored sand. No mottling was noted in these soils. Soils in this area were deemed to be non-hydric.

3.3 Hydrology:

The riverine wetlands that were delineated on this property displayed connectivity to the north branch of Robinson Creek. It was observed that the water source for these wetlands originates in part from overbank flow from the adjacent creek. In addition, there are apparent subsurface hydraulic connections between the creek channel and adjacent wetlands. The high concentration of cobbles in the soil profile likely facilitates this subsurface connection. Furthermore, the wetlands that are located to the south of the creek channel and extending from the southeast to northwest appear to have subsurface sources of water that are located farther to the east of the subject property. We did not try to further identify this source.

During the field investigation, positive indicators of wetland hydrology observed were the obvious drainage pattern of the wetlands and the subsurface connectivity of the riverine wetlands to the creek via the presence of extensive cobbles in the subsurface in concert with evidence of mottling in the soil column in pits developed within the wetlands.

4.0 Functions and Values Assessment

The functions and values assessment was completed for the delineated jurisdictional wetlands on this property. The Wetlands Assessment Form is found in **Attachment D - Wetlands Assessment Form**. These wetlands were ranked as Category III wetlands which describes the wetlands as common, generally less diverse and often smaller that Category I and II wetlands (Berglund 1999). They are also highly disturbed due to a history of intense cattle

grazing and trampling.

5.0 Conclusions and Recommendations

The field investigation resulted in the delineation of jurisdicational riverine wetlands on both the north and south sides of the north branch of Robertson Creek that traverses the northern portion of the property. Approximately 3.1 acres of jurisdicational riverine wetlands were delineated and these wetlands were ranked as Category III wetlands during the functions and values assessment. Riverine wetlands are typically located in floodplains and are associated with stream channels. Water sources come from overbank flow from the adjacent stream and subsurface hydraulic connections between the stream channel and adjacent wetlands. Category III wetlands are considered to be relatively common wetlands within the watershed basin and are generally less diverse and often smaller that Category I and II wetlands (Berglund 1999). The delineated wetlands were also highly disturbed due to intense cattle grazing and trampling in the past and so received a relatively low ranking as to functions and values.

Due to the fact that the delineated wetlands are classified as jurisdictional, any crossing of the wetlands with pipelines or roads will require a permit from the US Army Corps of Engineers. However, any minor loss of wetlands due to these crossings will most likely not require any mitigation due to the fact that the wetlands rank quite low in terms of functions and values.

It is recommended that future water production wells be located outside of the delineated wetlands and that the wetlands be allowed to recover from their disturbance from cattle grazing and trampling, thereby increasing their ecological functions and values over time. In addition, avoidance of the wetlands is recommended. If pipelines from the proposed municipal wells and reservoir are placed outside of the wetlands and within existing or proposed street rights-of-way that avoid wetlands, then no permits from the US Army Corps of Engineers will be required.

6.0 References

The following published references were used in the wetlands delineation and in the preparation of this report:

Berglund, J. 1999. Montana Wetland Assessment Method. Montana Department of Transportation, Environmental Services. Helena, Montana.

Hitchcock, A. S. 1935. Manual Of The Grasses Of The United States. United States Department of Agriculture Miscellaneous Publication No. 200, United States Government Printing Office, Washington, D.C.

Hoag, J.C. 2007. Simple Identification Key to Common Willows, Cottonwoods, Alder, Birch, and Dogwood of the Intermountain West. Riparian/Wetland Project Information Series No. 19, NRCS, Plant Materials Center, Aberdeen, ID.

Lesica, P. and Husby, P. 2001. Field Guide to Montana's Wetland Vascular Plants. Montana Wetlands Trust, Helena, MT.

Munsell Soil Color Charts. 1994. Macbeth Division of Kollmorgan Instruments Corporation, New Windsor, NY.

Natural Resource Conservation Service (NRCS). 2007a. Montana Soil Survey Reports.

Natural Resource Conservation Service (NRCS). 2007b. Hydric soils list MT645 Bitterroot Valley Area, Montana Soil Survey.

Petrides, G.A. 1958. A Field Guide to Trees and Shrubs. Houghton Mifflin Company, Boston, MA.

United States Army Corps of Engineers. 1987. Wetland Delineation Manual. Waterways Experiment Station Technical Report Y-87-1, Vicksburg, MS.

United States Department of Interior, Bureau of Land Management 1994. Willows of Montana. Riparian Technical Bulletin No. 2, Billings, MT.

United States Fish and Wildlife Service (USFWS). 1988. Region 9 Plant List.

United States Fish and Wildlife Service (USFWS). National Wetland Inventory Maps.

Wetlands Delineation Report

Town of Stevensville Well Field Site

TABLES & FIGURES

Table 1

Dominant Plant Species List Identified within Riverine Wetland Area

Scientific Name	Common Name	Wetland Indicator *
Agrostis stolonifera	Bentgrass	FAC+
Bromus spp.	Brome Species	FACU
Carex spp	Sedge Species	FAC
Phalaris arundinacea	Reed Canary Grass	FACW
Salix spp.	Willow Species	FACW+
Typha latifolia	Broad-leaf cattail	OBL

Notes:

* Definition of Indicator Status (USFWS 1988):

FAC = Equally likely to occur in wetlands or non-wetlands (estimated probability 34% - 66%).

FACW = Usually occurs in wetlands (estimated probability 67% - 99%), but occasionally found in non-wetlands.

FACU = Usually occur in non-wetlands (estimated probability 67% - 99%) but occasionally found in wetlands (estimated probability 1% - 33%).

OBL = Occur almost always (estimated probability > 99%) in wetlands under natural conditions.

A plus (+) indicates a frequency towards the wetter end of the category while a minus (-) indicates a frequency towards the drier end of the category.

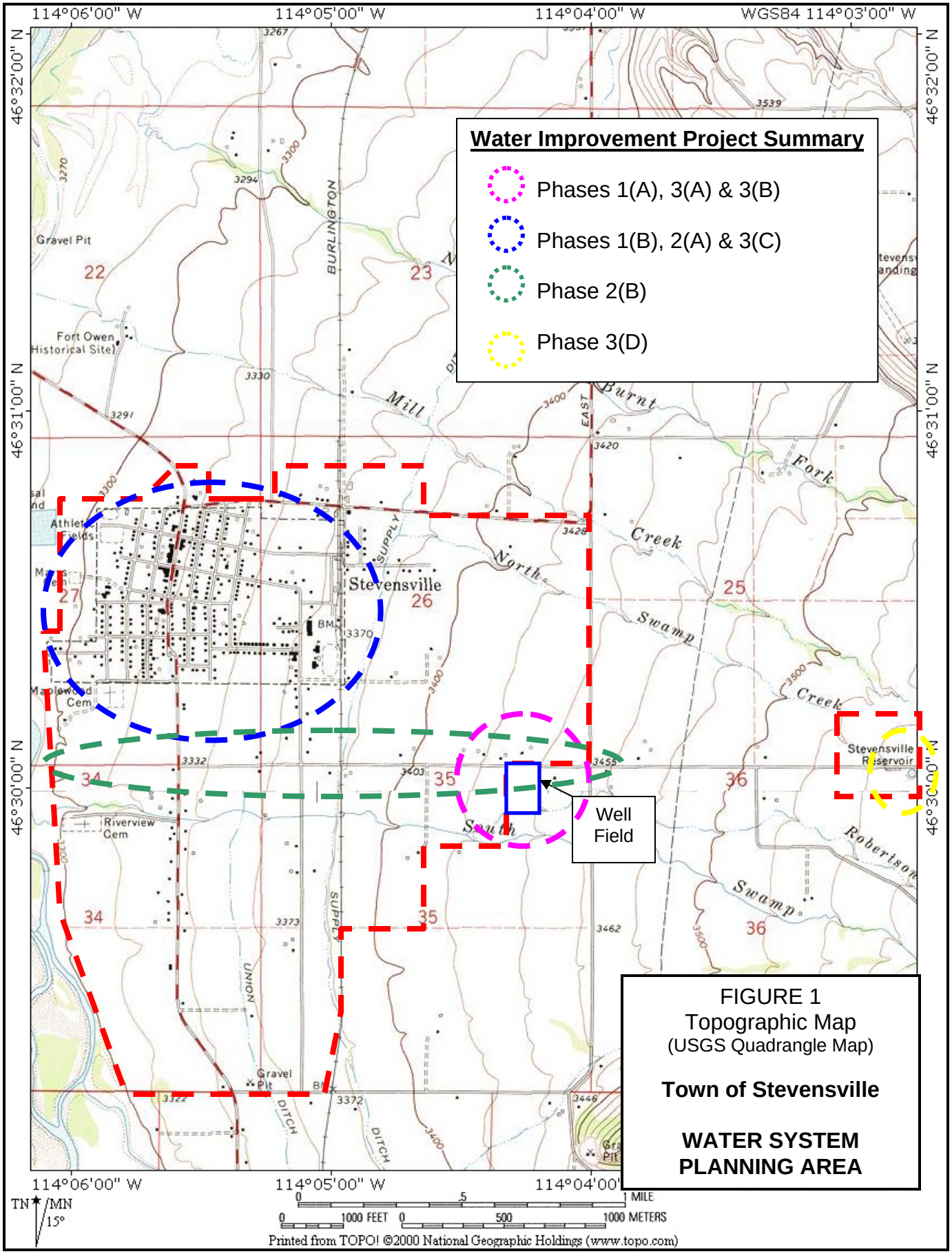
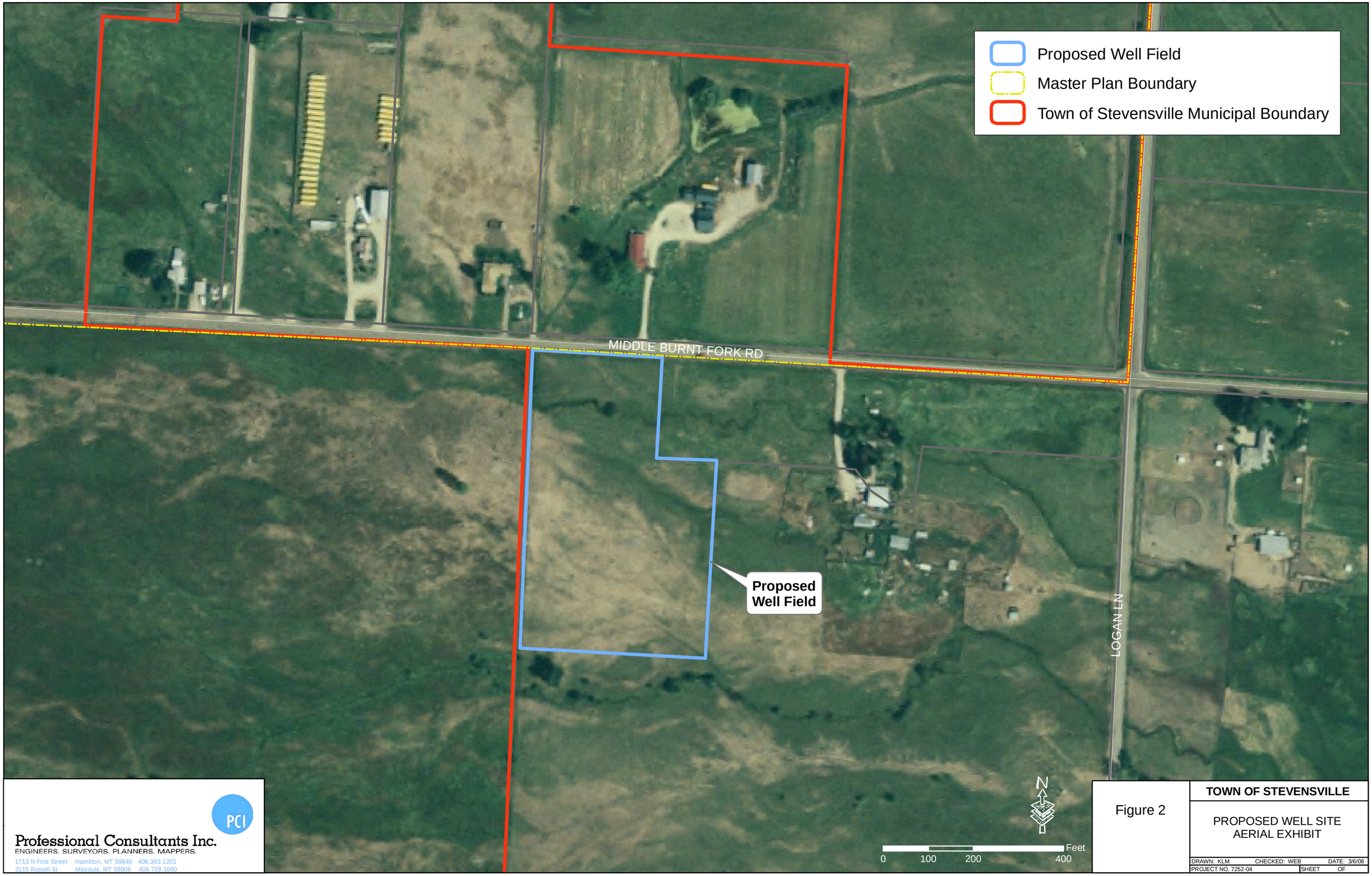


FIGURE 1
Topographic Map
(USGS Quadrangle Map)

Town of Stevensville

WATER SYSTEM PLANNING AREA



Professional Consultants Inc.
ENGINEERS. SURVEYORS. PLANNERS. MAPPERS.
1713 N First Street Hamilton, MT 59840 406.363.1201
3115 Russell St Missoula, MT 59806 406.728.1880

Figure 2

TOWN OF STEVENSVILLE

PROPOSED WELL SITE
AERIAL EXHIBIT

DRAWN: KLM CHECKED: WEB DATE: 3/6/08
PROJECT NO. 7252-04 SHEET OF

MIDDLE BURNT FORK ROAD

RM
29.85' (T)

NORTH BRANCH
ROBERTSON CREEK

SP-1

PROPOSED
TWIN CREEKS
SUBDIVISION

EXISTING
TEST WELL

SP-3

WETLANDS
UPLANDS

WETLANDS
UPLANDS

PROPOSED 60.00'
ACCESS/ROADWAY
EASEMENT

ROBERTSON CREEK

N

30 0 30 60
SCALE IN FEET

LEGEND

- DEPRESSION AREAS ON LANDSCAPE
- SP-9 SOIL PIT LOCATIONS
- RUN OF CREEK AND FLOW DIRECTION
- WETLANDS/UPLANDS BOUNDARY

WETLANDS DELINEATION MAP
1
SHEET 1 OF 1

WETLANDS DELINEATION MAP

PROPOSED MUNICIPAL WELLFIELD, TOWN OF STEVENSVILLE
Section 35, T9N, R20W, PMM,
Ravalli County, Montana

PROJECT #: 7253-04
DRAWN: GLA
CHECKED: RB
DATE: 3/11/04
REVISION:
REVISION:
REVISION:
REVISION:
REVISION:
REVISION:

Professional Consultants Inc.
Engineers, Surveyors, Planners, Mappers

Wetlands Delineation Report

Town of Stevensville Well Field Site

ATTACHMENT A

SITE PHOTOS

SITE PHOTOS, Page 1:

Photo 1: This photograph shows an overall view of the wetlands portion of the Stevensville Well Field Site as viewed from Middle Burnt Fork Road. The view here is to the southeast with the Sapphire Mountains in the background. The vegetation in the center of the photo consists of willows that define the location of the north branch of Robertson Creek that traverses the property from east to west.

SITE PHOTOS, Page 2:

Photo 2: This image shows a close up view of the north branch of Robertson Creek that traverses the northern portion of the Stevensville Well Field Site. The creek channel is well defined with a gravel bottom. Note the presence of the willow in the upper right hand corner of the photograph. The vegetation has been grazed and trampled by cattle, which until recently were allowed to graze on the property.

SITE PHOTOS, Page 3:

Photo 3: This image shows one of the depressional areas on the property that tend to pond surface water during the spring wet season, thereby providing wetlands hydrology for wetland plants. The view is to the southeast. The existing test well is visible in the far right of this photo.

SITE PHOTOS, Page 4:

Photo 4: This image shows a view of another segment of the depressional area within the jurisdictional wetlands on the property that contains remnants of cattails from the previous growing season. Grazing and trampling by cattle is clearly evident in this photo. The view here is to the north.

SITE PHOTOS, Page 5:

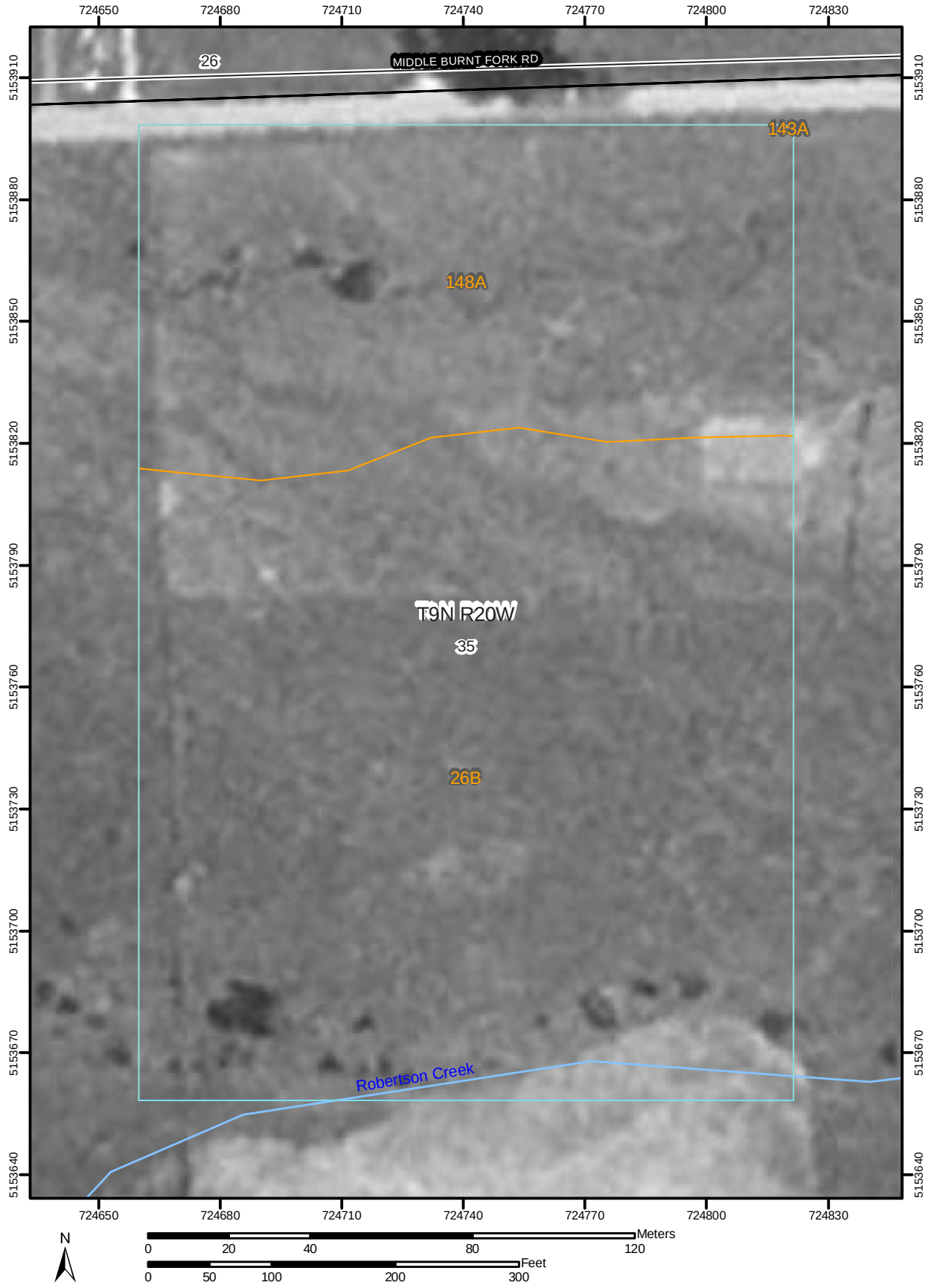
Photo 5: This image shows a close up view of the soil from the B1 horizon from Soil Pit SP-1, which was developed within the wetland area (see Figure 3 for location). The orange mottling is clearly visible in the soil indicating the presence of soil moisture within the upper 12" of the soil column and resulting in the classification of the soil as a hydric soil.

Wetlands Delineation Report

Town of Stevensville Well Field Site

ATTACHMENT B

SOIL MAP & SOIL DESCRIPTIONS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724770
724800
724830
5153910
5153880
5153850
5153820
5153790
5153760
5153730
5153700
5153670
5153640
26
MIDDLE BURNT FORK RD
143A
148A
T9N R20W
35
26B
Robertson Creek
N
Meters
0
20
40
80
120
Feet
0
50
100
200
300

MAP LEGEND

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

Soils
- Soil Map Units

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

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features

Public Land Survey
- Township and Range
- Section

Municipalities
- Cities
- Urban Areas

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails

Roads
- Interstate Highways
- US Routes
- State Highways
- Local Roads
- Other Roads

MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 11N

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

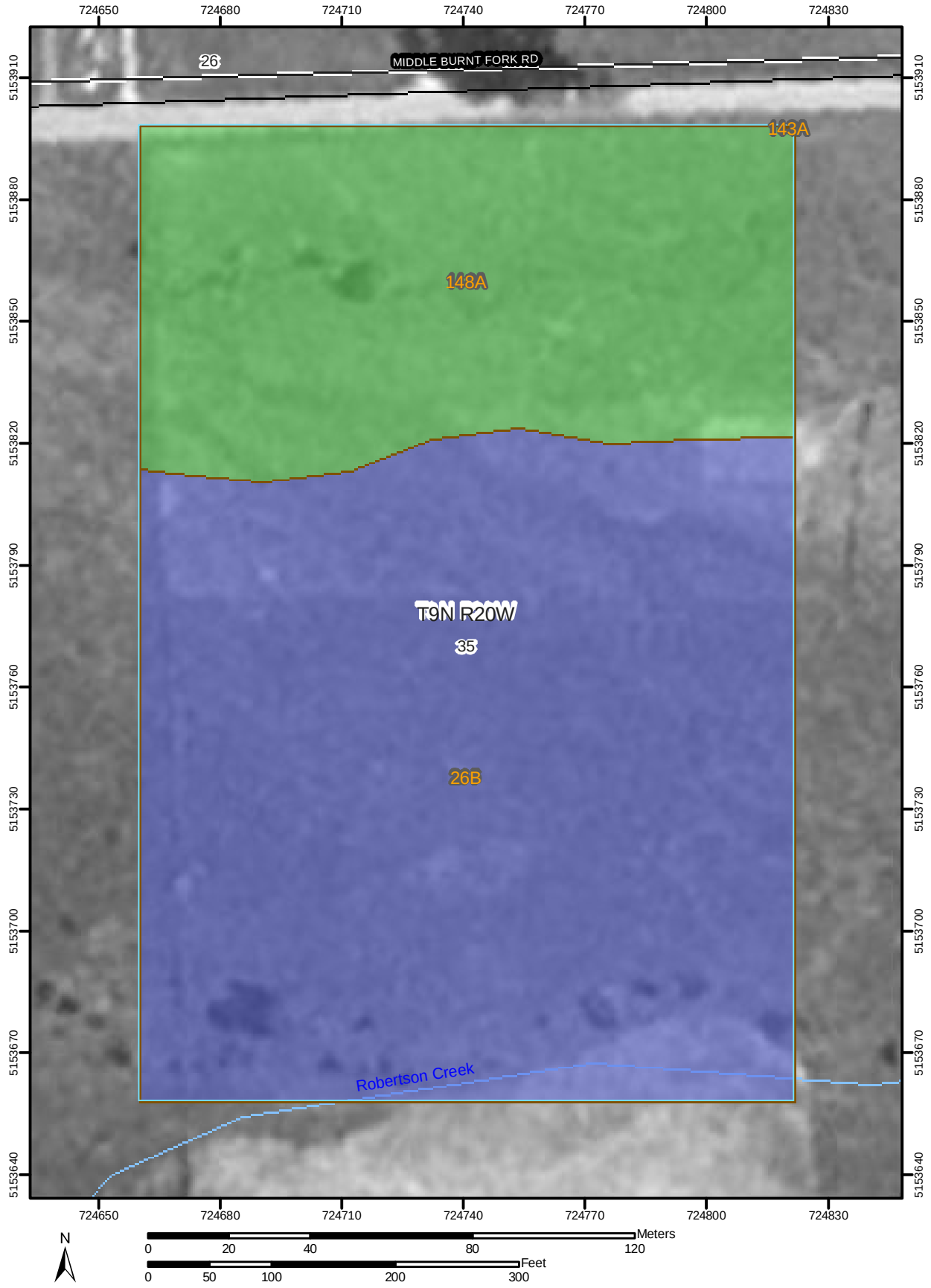
Soil Survey Area: Bitterroot Valley Area, Montana
Survey Area Data: Version 8, Feb 4, 2008

Date(s) aerial images were photographed: 7/31/1995; 8/19/1995

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

Map Unit Legend

Bitterroot Valley Area, Montana (MT645)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
26B	Grayhorse silt loam, 0 to 4 percent slopes	6.4	66.6%
143A	Fairway-Grayhorse complex, 0 to 2 percent slopes	0.0	0.0%
148A	Grayhorse-Allwit complex, 0 to 2 percent slopes	3.2	33.4%
Totals for Area of Interest (AOI)		9.6	100.0%


724650
724680
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5153760
5153730
5153700
5153670
5153640
26
MIDDLE BURNT FORK RD
143A
148A
T9N R20W
35
26B
Robertson Creek
N
Meters
0
20
40
80
120
Feet
0
50
100
200
300

MAP LEGEND

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

Soils
- Soil Map Units

Soil Ratings
- All Hydric
- Partially Hydric
- Not Hydric
- Unknown Hydric
- Not rated or not available

Political Features

Public Land Survey
- Township and Range
- Section

Municipalities
- Cities
- Urban Areas

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails

Roads
- Interstate Highways
- US Routes
- State Highways
- Local Roads
- Other Roads

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Coordinate System: UTM Zone 11N

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Hydric Rating by Map Unit

Hydric Rating by Map Unit— Summary by Map Unit — Bitterroot Valley Area, Montana				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
26B	Grayhorse silt loam, 0 to 4 percent slopes	Not Hydric	6.4	66.6%
143A	Fairway-Grayhorse complex, 0 to 2 percent slopes	Partially Hydric	0.0	0.0%
148A	Grayhorse-Allwit complex, 0 to 2 percent slopes	Partially Hydric	3.2	33.4%
Totals for Area of Interest (AOI)			9.6	100.0%

Description

This rating provides an indication of the proportion of the map unit that meets the criteria for hydric soils. Map units that are dominantly made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Rating Options

Aggregation Method: Absence/Presence

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Absence/Presence" returns a value that indicates if, for all components of a map unit, a condition is always present, never present, partially present, or whether the condition's presence or absence is unknown. The exact phrases used for a particular attribute may vary from what is shown below.

"Always present" means that the corresponding condition is present in all of a map unit's components.

"Never present" means that the corresponding condition is not present in any of a map unit's components.

"Partially present" means that the corresponding condition is present in some but not all of a map unit's components, or that the presence or absence of the corresponding condition cannot be determined for one or more components of the map unit.

"Unknown presence" means that for components where presence or absence can be determined, the corresponding condition is never present, but the presence or absence of the corresponding condition cannot be determined for one or more components.

The result returned by this aggregation method quantifies the degree to which the corresponding condition is present throughout the map unit.

Tie-break Rule: Lower

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Wetlands Delineation Report

Town of Stevensville Well Field Site

ATTACHMENT C

WETLAND DETERMINATION DATA FORMS

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: PROPOSED WELL SITE Applicant/Owner: TOWN OF STEVENSVILLE Investigator: WILLIAM E BARNETT	Date: 03/6/08 County: RAVALLI State: MT
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation)? (Yes) No Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SP-1

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. WILLOW SPP.	S	FACW+
2. BENTGRASS	H	FAC+
3. BROME SPP.	H	FACU
4. REED CANARY GRASS	H	FACW
5.		
6. BROAD-LEAF CATTAIL	H	OBL
7.		
8.		

Dominant Plant Species	Stratum	Indicator
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 80%

Remarks: PLANTS HEAVILY GRAZED & TRAMPLED BY CATTLE

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
✓ Other
___ No Recorded Data Available

Field Observations:
Depth of Surface Water: 12 (in.)
Depth to Free Water in Pit: _____ (in.)
Depth to Saturated Soil: 12 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
X Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
X Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
X Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
X Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series and Phase): GRAYHORSE – ALWITT COMPLEX, 0-2% SLOPES

Drainage Class:

Taxonomy (Subgroup):

Field Observations
Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
0-2"	A	7.5YR 2.5/1	5YR 5/6	5/0	HUMUS – ROOT MASS
2-8"	B	"	"	"	BLACK LOAM
8-12"	B_1				GRAY SANDY LOAM (MOIST)

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- X Reducing Conditions
- X Gleyed or Low-Chroma Colors
- X Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: PROPOSED WELL SITE Applicant/Owner: TOWN OF STEVENSVILLE Investigator: WILLIAM E BARNETT	Date: 03/6/08 County: RAVALLI State: MT
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation)? (Yes) No Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SP-3

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. BENTGRASS	H	FAC+
2. BROME SPP.	H	FACU
3. KNAPWEED	H	FAC-
4.		
5.		
6.		
7.		
8.		

Dominant Plant Species	Stratum	Indicator
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). <50%

Remarks: PLANTS HEAVILY GRAZED & TRAMPLED BY CATTLE

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
✓ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____(in.)

Depth to Free Water in Pit: _____(in.)

Depth to Saturated Soil: _____(in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
X Drainage Patterns in Wetlands (RELICT IRRIGATION DITCHES)
Secondary Indicators (2 or more required):
___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series and Phase): GRAYHOUSE SILT LOAM

Drainage Class: _____

Taxonomy (Subgroup): _____

Field Observations Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
0-3"	A				HUMUS WITH ROOTS
3"-6"	B	2.5YR 4/2	(NA)	(NA)	LIGHT BROWN SAND WITH 2" COBBLES

REFUSAL @ 6"-8" DUE TO EXTENSIVE COBBLES

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	Yes (No)	Is this Sampling Point Within a Wetland?	Yes (No)
Hydric Soils Present?	Yes (No)		

Remarks:

Approved by HQUSACE 3/92

Wetlands Delineation Report

Town of Stevensville Well Field Site

ATTACHMENT D

WETLANDS FUNCTIONS & VALUES ASSESSMENT FORM

MDT Montana Wetland Assessment Form (revised 5/25/1999)

1. Project Name: STEVENSVILLE WELL SITE 2. Project #: 7252-04 Control #: N/A

3. Evaluation Date: Month/ Day/Year 03/06/08 4. Evaluator(s): LEE BURNETT 5. Wetlands/Site #(s): ENTIRE SITE

6. Wetland Location(s): i. Legal: T 9 (N) or S; R 20 E or (W) S 35 ; T ____ N or S; R ____ E or W; S ____;

ii. Approx. Stationing or Mileposts: MIDDLE BURNT FORK RD 1000' WEST OF INTERSECTION OF LOGAN LANE & MIDDLE BURNT FORK ROAD

iii. Watershed: BITTERROOT RIVER GPS Reference No. (if applies): ____

Other Location Information:

7. a. Evaluating Agency: ____;

b. Purpose of Evaluation:

1. ____ Wetlands potentially affected by MDT project
2. ✓ Mitigation wetlands; pre-construction
3. ____ Mitigation wetlands; post-construction
4. ____ Other

8. Wetland size: (total acres) 3.0 Ac (visually estimated)
____ (measured, e.g. by GPS [if applies])

9. Assessment area: (AA, tot., ac., see instructions on determining AA) 5.4 Ac (visually estimated)
____ (measured, e.g. by GPS [if applies])

10. Classification of Wetland and Aquatic Habitats in AA (HGM according to Brinson, first col.; USFWS according to Cowardin [1979], remaining cols.)

HGM Class	System	Subsystem	Class	Water Regime	Modifier	% of AA
RIVERINE	RIVERINE	LOWER PERENNIAL	EM	C	F	50

(Abbreviations: **System:** Palustrine(**P**)/ **Subsyst.**: none/ **Classes:** Rock Bottom (**RB**), Unconsolidated bottom (**UB**), Aquatic Bed (**AB**), Unconsolidated Shore (**US**), Moss-lichen Wetland (**ML**), Emergent Wetland (**EM**), Scrub-Shrub Wetland (**SS**), Forested Wetland (**FO**)/ **System:** Lacustrine (**L**)/, **Subsyst.:** Limnetic (**2**)/ **Classes:** RB, UB, AB/ **Subsystem:** Littoral (**4**)/ **Classes:** RB, UB, AB, US, EM/ **System:** Riverine (**R**)/ **Subsyst.:** Lower Perennial (**2**)/ Classes: RB, UB, AB, US, EM/ **Subsystem:** Upper Perennial (**3**)/ Classes: RB, UB, AB, US/ **Water Regimes:** Permanently Flooded (**H**), Intermittently Exposed (**G**), Semipermanently Flooded (**F**), Seasonally Flooded (**C**), Saturated (**B**), Temporarily Flooded (**A**), Intermittently Flooded (**J**) **Modifiers:** Excavated (**E**), Impounded (**I**), Diked (**D**), Partly Drained (**PD**), Farmed (F), Artificial (**A**) **HGM Classes:** Riverine, Depressional, Slope, Mineral Soil Flats, Organic Soil Flats, Lacustrine Fringe

11. Estimated relative abundance: (of similarly classified sites within the same Major ~~Montana Watershed~~ Basin, see definitions)

(Circle one) Unknown Rare (Common) Abundant

Comments:

12. General condition of AA:

i. Regarding disturbance: (use matrix below to determine [circle] appropriate response)

Conditions within AA	*Predominant conditions adjacent to (within 500 feet of) AA*		
	Land managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings.	Land not cultivated, but moderately grazed or hayed or selectively logged; or has been subject to minor clearing; contains few roads or buildings.	Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density.
AA occurs and is managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings.	low disturbance	low disturbance	moderate disturbance
AA not cultivated, but moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings.	moderate disturbance	moderate disturbance	high disturbance
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density.	high disturbance	(high disturbance)	high disturbance

Comments: (types of disturbance, intensity, season, etc.): HIGHLY GRAZED & TRAMPLED BY CATTLE

ii. Prominent weedy, alien, & introduced species (including those not domesticated, feral): (list)

SCATTERED KNAPWEED

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: HIGHLY GRAZED PASTURELAND SURROUNDED BY HIGHLY GRAZED PASTURELAND & SMALL FARMS.

13. **Structural Diversity:** (based on number of "Cowardin" ***vegetated*** classes present [do not include unvegetated classes], see #10 above)

# of "Cowardin" vegetated classes present in AA (see #10)	≥ 3 vegetated classes (or ≥ 2 if one is forested)	2 vegetated classes (or 1 if forested)	≤ 1 vegetated class
Rating (circle)	High	Moderate	Low

Comments:

SECTION PERTAINING to FUNCTIONS & VALUES ASSESSMENT

14A. Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals:

I. AA is Documented (D) or Suspected (S) to contain (circle one based on definitions contained in instructions):

Primary or critical habitat (**list species**)	D S	
Secondary habitat (**list species**)	D S	
Incidental habitat (**list species**)	D (S)	BULL TROUT (JUVENILES ONLY)
No usable habitat	D S	

II. Rating (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function)

Highest Habitat Level	doc./primary	sus/primary	doc./secondary	sus./secondary	doc./incidental	sus./incidental	None
Functional Points and Rating	1 (H)	.9 (H)	.8 (M)	.7 (M)	.5 (L)	.3 (L)	0 (L)

Sources for documented use (e.g. observations, records, etc):

14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed in14A above)

i. AA is Documented (D) or Suspected (S) to contain (circle one based on definitions contained in instructions):

Primary or critical habitat (**list species**)	D S	
Secondary habitat (**list species**)	D S	
Incidental habitat (**list species**)	D (S)	WEST SLOPE CUTTHROAT TROUT (JUVENILES ONLY)
No usable habitat	D S	

II. Rating (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function)

Highest Habitat Level	doc./primary	sus/primary	doc./secondary	sus./secondary	doc./incidental	sus./incidental	None
Functional Points and Rating	1 (H)	.8 (H)	.7 (M)	.6 (M)	.2 (L)	.1 (L)	0 (L)

Sources for documented use (e.g. observations, records, etc.):

14C. General Wildlife Habitat Rating:

i. Evidence of overall wildlife use in the AA (circle substantial, moderate, or low based on supporting evidence):

Substantial (based on any of the following [check]):
- __ observations of abundant wildlife #'s or high species diversity (during any period)
- __ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- __ presence of extremely limiting habitat features not available in the surrounding area
- __ interviews with local biologists with knowledge of the AA

Low (based on any of the following [check]):
- ✓ few or no wildlife observations during peak use periods
- ✓ little to no wildlife sign
- ✓ sparse adjacent upland food sources
- __ interviews with local biologists with knowledge of the AA

Moderate (based on any of the following [check]):
- __ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- __ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- __ adequate adjacent upland food sources
- __ interviews with local biologists with knowledge of the AA

ii. Wildlife habitat features (working from top to bottom, circle appropriate AA attributes in matrix to arrive at exceptional (E), high (H), moderate (M), or low (L) rating. Structural diversity is from #13. For class cover to be considered evenly distributed, vegetated classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see instructions for further definitions of these terms].)

Structural diversity (see #13)	High								Moderate								Low			
Class cover distribution (all vegetated classes)	Even				Uneven				Even				Uneven				Even			
Duration of surface water in ≥ 10% of AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #12i)	E	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

iii. Rating (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function)

Evidence of wildlife use (i)	*Wildlife habitat features rating (ii)*			
	Exceptional	High	Moderate	Low
Substantial	1 (E)	.9 (H)	.8 (H)	.7 (M)
Moderate	.9 (H)	.7 (M)	.5 (M)	.3 (L)
Minimal	.6 (M)	.4 (M)	.2 (L)	.1 (L)

Comments: ALL VASCULAR PLANTS WERE IMPACTED BY CATTLE GRAZING

14D. General Fish/Aquatic Habitat Rating: (Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier, etc.]. If the AA is not or was not historically used by fish due to lack of habitat, excessive gradient, etc., circle **NA** here and proceed to the next function. If fish use occurs in the AA but is not desired from a resource management perspective [such as fish use within an irrigation canal], then Habitat Quality [i below] should be marked as "Low", applied accordingly in ii below; and noted ih the comments.)

i. Habitat Quality (circle appropriate AA attributes in matrix to arrive at exceptional (E), high (H), moderate (M), or low (L) quality rating.

Duration of surface water in AA	Permanent / Perennial			Seasonal / Intermittent			Temporary / Ephemeral		
Cover - % of waterbody in AA containing cover objects such as submerged logs, large rocks & boulders, overhanging banks, floating-leaved vegetation, etc.	>25%	10–25%	<10%	>25%	10–25%	<10%	>25%	10–25%	<10%
Shading - >**75%** of streambank or shoreline within AA contains riparian or wetland scrub-shrub or forested communities	E	E	H	H	H	M	M	M	M
Shading – **50 to 75%** of streambank or shoreline within AA contains rip. or wetland scrub-shrub or forested communities	H	H	M	M	M	M	M	L	L
Shading - < **50%** of streambank or shoreline within AA contains rip. or wetland scrub-shrub or forested communities	H	M	M	M	L	L	L	L	L

ii. Modified Habitat Quality (Circle the appropriate response to the following question. If answer is Y, then reduce rating in i above by one level [E = H, H = M, M = L, L = L]). *Is fish use of the AA precluded or significantly reduced by a culvert, dike, or other man-made structure or activity* ***or*** *is the waterbody included on the MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support?* Y N Modified habitat quality rating = (circle) **E H M L**

iii. Rating (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function)

Types of fish known or suspected within AA	*Modified Habitat Quality (ii)*			
	Exceptional	High	Moderate	Low
Native game fish	1 (E)	.9 (H)	.7 (M)	.5 (M)
Introduced game fish	.9 (H)	.8 (H)	.6 (M)	.4 (M)
Non-game fish	.7 (M)	.6 (M)	.5 (M)	.3 (L)
No fish	.5 (M)	.3 (L)	.2 (L)	.1 (L)

Comments: NO FISH WERE OBSERVED IN THE STREAM

14E. Flood Attenuation: (applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, circle **NA** here and proceed to next function.)

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function)

Estimated wetland area in AA subject to periodic flooding	≥ 10 acres			<10, >2 acres			≤2 acres		
% of flooded wetland classified as forested, scrub/shrub, or both	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
AA contains **no outlet or restricted outlet**	1(H)	.9(H)	.6(M)	.8(H)	.7(H)	.5(M)	.4(M)	.3(L)	.2(L)
AA contains **unrestricted outlet**	.9(H)	.8(H)	.5(M)	.7(H)	.6(M)	.4(M)	.3(L)	.2(L)	.1(L)

ii. Are residences, businesses, or other features which may be significantly damaged by floods located within 0.5 miles downstream of the AA (circle)?
(Y) N
Comments: CULVERT UNDER MIDDLE BURNT FORK ROAD WILL LIMIT FLOW & COULD CAUSE FLOODING OF WETLAND AREA

14F. Short and Long Term Surface Water Storage: (Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow. If no wetlands in the AA are subject to flooding or ponding, circle **NA** here and proceed with the evaluation.)

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see instructions for further definitions of these terms].)

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding	>5 acre feet			<5, >1 acre feet			≤1 acre foot		
Duration of surface water at wetlands within the AA	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Wetlands in AA flood or pond ≥ **5 out of 10 years**	1(H)	.9(H)	.8(H)	.8(H)	.6(M)	.5(M)	.4(M)	.3(L)	.2(L)
Wetlands in AA flood or pond **< 5 out of 10 years**	.9(H)	.8(H)	.7(M)	.7(M)	.5(M)	.4(M)	.3(L)	.2(L)	.1(L)

Comments: CULVERT UNDER MIDDLE BURNT FORK ROAD WILL LIMIT FLOW & COULD CAUSE FLOODING OF WETLAND AREA.

14G. Sediment/Nutrient/Toxicant Retention and Removal: (Applies to wetlands with potential to receive excess sediments, nutrients, or toxicants through influx of surface or ground water or direct input. If no wetlands in the AA are subject to such input, circle **NA** here and proceed with the evaluation.)

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function.

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with potential to deliver low to moderate levels of sediments, nutrients, or compounds such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants **or** AA receives or surrounding land use with potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	≥ 70%		< 70%		≥ 70%		< 70%	
Evidence of flooding or ponding in AA	Yes	No	Yes	No	Yes	No	Yes	No
AA contains **no or restricted outlet**	1 (H)	.8 (H)	.7 (M)	.5 (M)	.5 (M)	.4 (M)	.3 (L)	.2 (L)
AA contains **unrestricted outlet**	.9 (H)	.7 (M)	.6 (M)	.4 (M)	.4 (M)	.3 (L)	.2 (L)	.1 (L)

Comments: HORSE & CATTLE PASTURES LOCATED UPSTREAM CAN BE SOURCES OF NUTRIENTS TO STREAM

14H Sediment/Shoreline Stabilization: (applies only if AA occurs on or within the banks or a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action. If does not apply, circle **NA** here and proceed to next function)

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function.

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses	*Duration of surface water adjacent to rooted vegetation*		
	permanent / perennial	seasonal / intermittent	Temporary / ephemeral
≥ 65%	1 (H)	.9 (H)	.7 (M)
35-64%	.7 (M)	.6 (M)	.5 (M)
< 35%	.3 (L)	.2 (L)	.1 (L)

Comments: STREAM & WETLANDS NOT SUBJECT TO WAVE ACTION.

14l. Production Export/Food Chain Support:

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function. Factor A = acreage of vegetated component in the AA; Factor B = structural diversity rating from #13; Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P = permanent/perennial; S/I = seasonal/intermittent; T/E /A= temporary/ephemeral or absent [see instructions for further definitions of these terms].)

A	Vegetated component >5 acres						Vegetated component 1-5 acres						Vegetated component <1 acre					
B	High		Moderate		Low		High		Moderate		Low		High		Moderate		Low	
C	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
P/P	1H	.9H	.9H	.8H	.8H	.7M	.9H	.8H	.8H	.7M	.7M	.6M	.7M	.6M	.6M	.4M	.4M	.3L
S/I	.9H	.8H	.8H	.7M	.7M	.6M	.8H	.7M	.7M	.6M	.6M	.5M	.6M	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.7M	.7M	.6M	.6M	.5M	.7M	.6M	.6M	.5M	.5M	.4M	.5M	.4M	.4M	.2L	.2L	.1L

Comments:

14J. Groundwater Discharge/Recharge: (Check the indicators in i & ii below that apply to the AA)

i. Discharge Indicators

___Springs are known or observed
___Vegetation growing during dormant season/drought
___Wetland occurs at the toe of a natural slope
___Seeps are present at the wetland edge
___AA permanently flooded during drought periods
___Wetland contains an outlet, but no inlet
___Other

ii. Recharge Indicators

✓ Permeable substrate present without underlying impeding layer
___Wetland contains inlet but no outlet
___Other

iii. Rating: Use the information from i and ii above and the table below to arrive at [circle] the functional points and rating [H = high, L = low] for this function.

Criteria	*Functional Points and Rating*
AA is known Discharge/Recharge area or one or more indicators of D/R present	1 (H)
No Discharge/Recharge indicators present	.1 (L)
Available Discharge/Recharge information inadequate to rate AA D/R potential	N/A (Unknown)

Comments:

14K. Uniqueness:

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function.

Replacement potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland **or** plant association listed as "S1" by the MNHP			AA does not contain previously cited rare types **and** structural diversity (#13) is high **or** contains plant association listed as "S2" by the MNHP			AA does not contain previously cited rare types or associations **and** structural diversity (#13) is low-moderate		
Estimated relative abundance (#11)	rare	common	abundant	rare	common	abundant	rare	common	abundant
Low disturbance at AA (#12i)	1 (H)	.9 (H)	.8 (H)	.8 (H)	.6 (M)	.5 (M)	.5 (M)	.4 (M)	.3 (L)
Moderate disturbance at AA (#12i)	.9 (H)	.8 (H)	.7 (M)	.7 (M)	.5 (M)	.4 (M)	.4 (M)	.3 (L)	.2 (L)
High disturbance at AA (#12i)	.8 (H)	.7 (M)	.6 (M)	.6 (M)	.4 (M)	.3 (L)	.3 (L)	.2 (L)	.1 (L)

Comments:

14L. Recreation/Education Potential: i. Is the AA a known rec./ed. site: (circle) Y (N) (If yes, rate as [circle] High [1] and go to ii; if no go to iii)

ii. Check categories that apply to the AA: ___ Educational/scientific study; ___ Consumptive rec.; ___ Non-consumptive rec.; ___Other

iii. Based on the location, diversity, size, and other site attributes, is there strong potential for rec./ed. use? Y (N)
(If yes, go to ii, then proceed to iv; if no, then rate as [circle] Low [0.1])

iv. Rating (use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function.

Ownership	*Disturbance at AA (#12i)*		
	low	moderate	high
public ownership	1 (H)	.5 (M)	.2 (L)
private ownership	.7 (M)	.3 (L)	.1 (L)

Comments:

FUNCTION & VALUE SUMMARY & OVERALL RATING

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units; (Actual Points x Estimated AA Acreage)
A. Listed/Proposed T&E Species Habitat	L	0.3	1	
B. MT Natural Heritage Program Species Habitat	L	0.1	1	
C. General Wildlife Habitat	L	0.1	1	
D. General Fish/Aquatic Habitat	L	0.1	0.5	
E. Flood Attenuation	M	0.5	0.5	
F. Short and Long Term Surface Water Storage	L	0.3	0.4	
G. Sediment/Nutrient/Toxicant Removal	M	0.5	0.5	
H. Sediment/Shoreline Stabilization	L	0.3	1	
I. Production Export/Food Chain Support	M	0.8	1	
J. Groundwater Discharge/Recharge	L	0.1	1	
K. Uniqueness	L	0.2	1	
L. Recreation/Education Potential	L	0.1	1	
Totals:		3.4	9.9	

3.4/9.9 = 34%

OVERALL ANALYSIS AREA (AA) RATING: (Circle appropriate category based on the criteria outlined below) I II (III) IV

Category I Wetland: (Must satisfy **one** of the following criteria; if does not meet criteria, go to Category II)
___ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
___ Score of 1 functional point for Uniqueness; **or**
___ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
___ Total actual functional points > 80% (round to nearest whole #) of total possible functional points.

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; if not satisfied, go to Category IV)
___ Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; **or**
___ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
___ Score of .9 or 1 functional point for General Fish/Aquatic Habitat; **or**
___ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
___ Score of .9 functional point for Uniqueness; **or**
___ Total Actual Functional Points > 65% (round to nearest whole #) of total possible functional points.

Category III Wetland: (Criteria for Categories I, II or IV not satisfied)

Category IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; if does not satisfy criteria go to Category III)
___ "Low" rating for Uniqueness; **and**
___ "Low" rating for Production Export/Food Chain Support; **and**
___ Total actual functional points < 30% (round to nearest whole #) of total possible functional points