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LEGISLATIVE ENVIRONMENTAL POLICY OFFICE

Montana Department of
ENVIRONMENTAL QUALITY

Brian Schweitzer, Governor

P.O. Box 200901 • Helena, MT 59620-0901 • (406) 444-2544 • www.deq.mt.gov

February 26, 2008

City of Wolf Point, 201 4th Avenue South, Wolf Point, MT 59201-1514
Honorable John Morales, Jr., Chairman, Fort Peck Tribal Executive Board, P.O. Box 1027, Poplar, MT 59255
Stephanie L. Wallace, U.S. EPA, Region 8, Montana Office, 10 West 15th Street, Suite 3200, Helena, MT 59626
FNB Land and Livestock, Inc., 417 Benton Street, Wolf Point, MT 59201-1526
Bertha & Leroy Schultz, 420 Cascade Street, Wolf Point, MT 59201-1302
Will Living Trust, 416 Johnson Street, Wolf Point, MT 59201-1816
Tribal Trust Land, Real Estate Division, BIA, Fort Peck Agency, P.O. Box 637 Poplar, MT 59255
Roosevelt County Public Library, 220 2nd Avenue South, Wolf Point, MT 59201
Roosevelt County Commissioners, 400 2nd Avenue South, Wolf Point, MT 59201
Dr. Mark Zilkoski, MD, Roosevelt County Health Officer, 315 Knapp Street, Wolf Point, MT 59201
Ron Smith, R.S., County Sanitarian, Roosevelt Courthouse, #10 West Laurel Avenue, Plentywood, MT 59254
Fort Peck Community College, 605 Indian Avenue, Poplar, Montana 59255
U.S. Army Corps of Engineers, Jean Ramer, 10 W. 15th St., Suite 2200 Helena, MT 59626
Director, Department of, Fish, Wildlife & Parks, 1420 E 6th Avenue, Helena, MT 59620
Tom Ellerhoff, DEQ, Director's Office, Helena, MT 59620
Jeff Ryan, DEQ, Water Protection Bureau, Helena, MT 59620
Environmental Quality Council, Capitol Complex, Helena, MT 59620
Documents Section, State Library, Capitol Complex, Helena, MT 59620
State Historic Preservation Office, 225 N. Roberts, Helena, MT 59620
Montana Natural Heritage Program, P.O. Box 201800, Helena, MT 59620-1800
Barry Damschen, Damschen Consulting, L.L.C., 5531 York Rd., Helena, MT 59602
Bruce Siegmund, Great West Engineering, P.O. Box 4817, Helena, MT 59604

Ladies and Gentlemen:

To comply with the Administrative Rules of Montana (ARM), specifically ARM 17.4.607(2), 608, 609 and 610, the Department of Environmental Quality (Department) has prepared the enclosed Environmental Assessment (EA). This EA addresses the proposed licensure of a new City of Wolf Point Class II landfill. The proposed 80-acre area is located approximately one mile northwest of Wolf Point, north of U.S. Highway 2 and west of Cascade Street, in the E½ of the SW¼ of Section 9, Township 27 North, Range 47 East, Montana Principal Meridian (M.P.M.). The City proposes to license this 80-acre tract of City-owned land immediately north of the existing facility, but will use

only 31.2-acres for the disposal of approximately 1,628,000 cubic yards (945,000 tons) of municipal solid waste over 95 years.

The purpose of this EA is to inform all interested governmental agencies, tribal nations, public groups and individuals of the proposed action and to determine whether or not the action may have a significant effect on human health and the environment. The Department will not make a licensing decision until at least thirty (30) days after publication of the EA. A complete color copy of the EA may be viewed on the Department's website at *http://www.deq.mt.gov/ea/WasteMgt.asp*.

If you wish to comment on this proposed action within the 30-day period, please do so in writing by mailing your comments to the Waste and Underground Tank Management Bureau, Solid Waste Program, P.O. Box 200901, Helena, MT 59620-0901, or by E-mail to the mailbox *wutbcomments@mt.gov*. In addition, if requested, a formal public meeting may be held. However, requests for a public meeting must be submitted to the Department in writing by U.S. Mail at the address above, by E-mail to the mailbox *wutbcomments@mt.gov*, or by fax to 406-444-1374.

If you have any questions or need additional information, please contact me at the Permitting and Compliance Division, Waste and Underground Tank Management Bureau, Solid Waste Program.

Sincerely,

Mary Louise Hendrickson
Project Lead
Solid Waste Licensing Program
*Phone: 406-444-1808; Fax: 406-444-1374*
*Email: mhendrickson@mt.gov*

Enclosure: Environmental Assessment—Wolf Point Class II Landfill (33 p.)
File: Roosevelt County\Wolf Point Class II Landfill\License #3\Expansion
Path: G:\WUT\SWS\EAs\sw-ea\Wolf Point\WolfPt-EA-CoverLtr.doc

DEPARTMENT OF ENVIRONMENTAL QUALITY
Permitting and Compliance Division
Solid Waste Program
P.O. Box 200901
1620 E. Sixth Avenue
Helena, MT 59620-0901

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LEGISLATIVE ENVIRONMENTAL POLICY OFFICE

# ENVIRONMENTAL ASSESSMENT (EA)

**Division/Bureau:**

Permitting and Compliance Division, Waste and Underground Tank Management Bureau, Solid Waste Program

**Project or Application:**

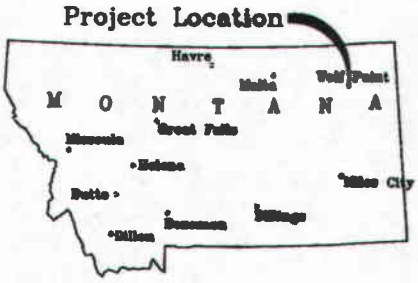
The City of Wolf Point submitted a solid waste management license application to the Montana Department of Environmental Quality (DEQ) Solid Waste Program to construct a new Class II Landfill. The proposed landfill will be developed in three phases and will have a total waste disposal capacity of 1,628,000 cubic yards (945,000 tons). The operating life of the proposed facility is 95 years at a waste acceptance rate of 10,000 tons per year.

**Description of Project:**

Proposed Class II Landfill: The City of Wolf Point proposes to license the entire 80-acre parcel for the new Class II facility, but will only use a 31.2-acre portion for active landfilling. This 80-acre City-owned parcel is adjacent to the existing City of Wolf Point Class II landfill (Figure 1) and is located approximately one-mile northwest of Wolf Point, north of U.S. Highway 2 and west of Cascade Street, in Section 9, Township 27 North, Range 47 East, Montana Principal Meridian (M.P.M.).

The closed historic City landfill is located on the northwest margin of the proposed facility within another City-owned 15-acre tract. All other adjacent land to the north, east, and southwest is privately owned, although Tribal trust lands checkerboard the area nearby and one Tribal tract lies adjacent to the west boundary of the currently active landfill facility.

On March 21, 2006, the United States Environmental Protection Agency (EPA) conditionally approved Subtitle-D flexibility for the new Wolf Point Class II landfill as presented in the Montana license application and associated documents that were submitted to the DEQ. The DEQ and the EPA have consulted with the Fort Peck Assiniboine and Sioux tribes regarding the new Class II landfill application by the City of Wolf Point. A copy of the Fort Peck Tribe's comments was provided to the DEQ by the EPA. The Class II landfill alternative liner demonstration and no-migration petition, to waive the requirements for groundwater monitoring beneath the proposed facility, was conditionally accepted by the DEQ on May 1, 2006.



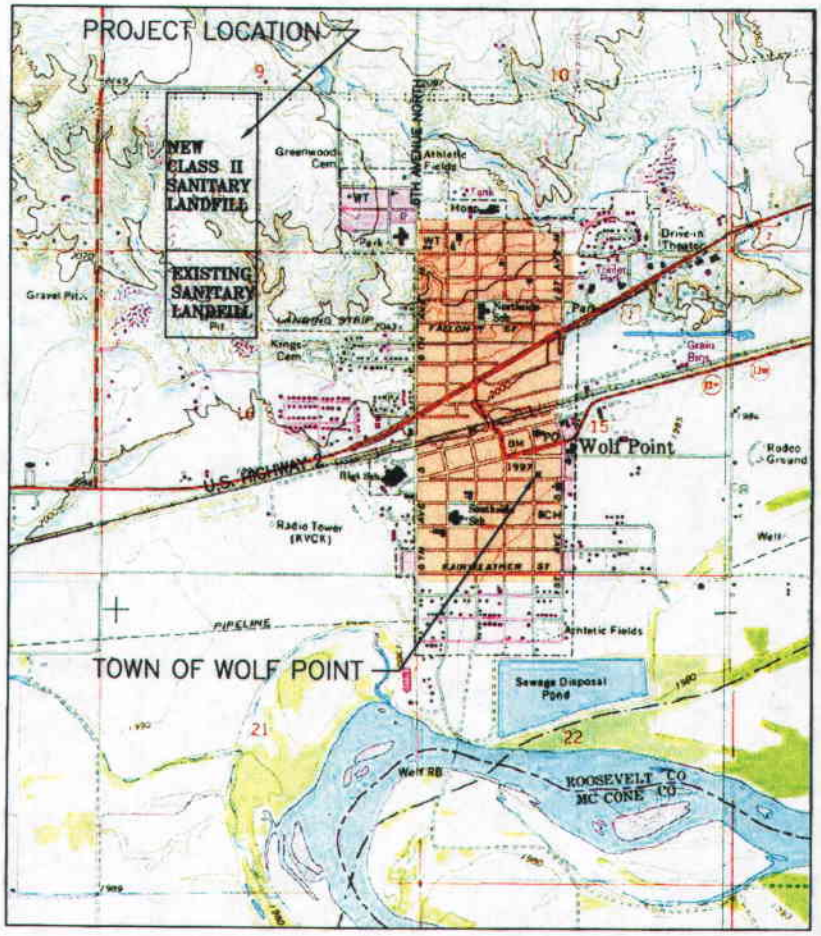




**Figure 1** - Topographic map showing the location of the proposed and existing Wolf Point Class II landfill facilities (Missouri River at bottom).

Site Geography. The proposed landfill facility is situated within the boundaries of the Fort Peck Indian Reservation at the southwest corner of Roosevelt County. It will continue to serve the residents of the City of Wolf Point and the surrounding areas of Roosevelt County.

The proposed landfill site lies two miles north of the Missouri River, which flows just south of Wolf Point and heads east toward its confluence with the Yellowstone River. The proposed facility is surrounded by gently rolling hills located on scoured uplands. The uplands are adjacent to breaks rising north of the Missouri River floodplain, just east of the Wolf Creek drainage (Figure 2). Consequently, the elevation at the proposed landfill site only ranges from about 2070 to 2140 feet, rising from the southern boundary towards the northern boundary where the natural grade flattens. On the southeastern and western flanks of the facility, the bedrock breaks encroach on the uplands where two dry coulees drain runoff through the breaks to the margin of the Missouri River floodplain, one-half mile south of the site.

Landfill Features. The 31.2-acre disposal area will be the dominant feature of the proposed 80-acre facility (Figure 3). Areas located adjacent to the waste disposal units will be developed for the storm-water detention ponds, borrow excavation, and cover or topsoil stockpiles. Upon closure of the proposed facility, a single continuous, earthen landfill cap will cover the entire landfill footprint. Erosion and infiltration of water on the cap will be minimized by re-vegetation of the final cover.

*Waste Disposal Units* — According to the proposed facility master plan, the area-fill landfill will consist of two waste disposal units, an 8-acre south unit and a 23.2-acre north unit. Phase I will be the 8-acre southern unit and will be constructed as one cell in the western one-third of the south half of the proposed facility area. Phase II is the 23.2-acre northern unit and will be constructed as three cells that are tied together on a contiguous base to form a single unit. The largest open disposal area at any time during the life of the facility will be 16-acres. Waste fill in both Phases I and II will ultimately tie together into a single waste mound that will rise almost 100-feet above the surrounding natural grade.

*Cell Construction* —Each landfill cell will be excavated to an average depth 25-feet below natural surface grade. The top two-feet of shale exposed beneath each disposal cell will be scarified and recompacted to construct a base liner. The floor of each cell will have an average slope of 2% toward the leachate removal system that will be installed at the toe of each cell. The material excavated from the base of each landfill cell during construction will be placed on the side slopes of the cell and recompacted in lifts to form an 8-ft thick slope liner.

Waste will be placed and compacted in the cells in 8- to 10-ft lifts and covered with six-inches of daily cover or twelve-inches of intermediate cover. Waste fill will be placed so that that the north and south units tie together into a mound that will achieve 4:1 exterior slopes on all final exterior grades. Maximum fill thickness will reach approximately 65 feet.

**Figure 2** - Aerial photo showing land use in the area surrounding the proposed Class II Wolf Point landfill facility.

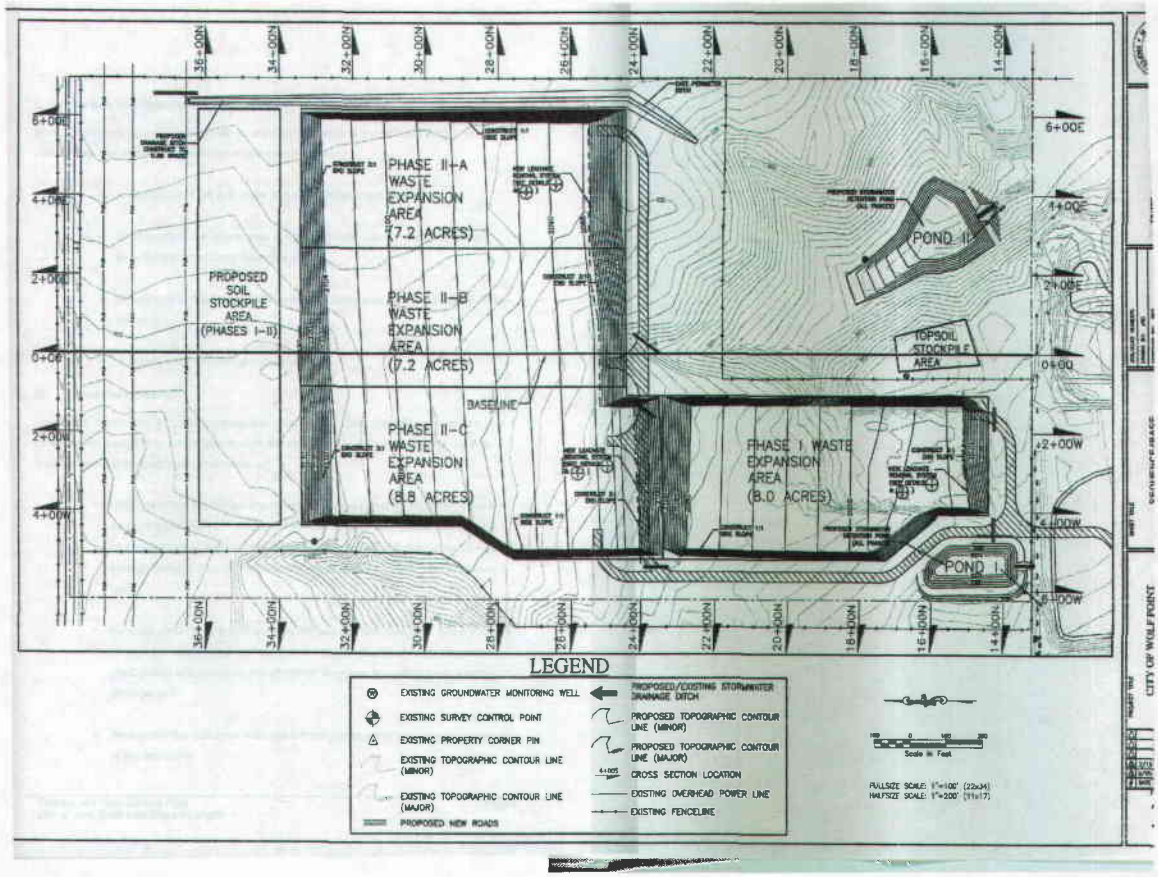



**Figure 3 -** Engineering plans showing the layout and surface features for the phased development of the landfill disposal cells (base contours dark, topographic contours light.) *Note: North is to the left.*

*Leachate Removal System* — A leachate collection system is not required when a no-migration petition is approved for a landfill site. All leachate generated in both landfill units will be removed by the leachate removal system at the toe, or lowest point, of each individual unit.

The leachate removal system will consist of a single six-inch diameter, slotted, high-density polyethylene (HDPE) lateral collection pipe. The six-inch pipe will be bedded in a mounded gravel conduit that is surrounded by an 8-ounce nonwoven geotextile filter fabric. Gravel bedding will consist of 3-inch minus pit run gravel. The leachate collection pipe will be installed along the entire break in the cut slope at the toe of each landfill cell, with the three cells of Phase II joined together to form a single leachate removal system for the entire unit. Two 12-inch diameter, solid HDPE riser pipes will be connected to both ends of the leachate collection pipe. These riser pipes will provide access for cleanout of the collection pipe, for monitoring of leachate levels, and for pumping leachate during removal. Landfill leachate will be collected and analyzed prior to the DEQ's approval of its haulage offsite for treatment.

*Storm Water Detention Ponds, Drainage, and Sediment Control* — The storm water control system is designed to capture all runoff and sediment, and to prevent the co-mingling of clean runoff with leachate. Water flowing through or contacting waste is considered leachate and will not be allowed to mix with storm water. All leachate will be retained at the working face. Ditches, swales, and berms will be constructed around the perimeter of the disposal area to divert storm water runon away from the active landfill cells. Suitable vegetation will be encouraged wherever it will minimize flow, erosion, and sediment transport.

All storm water drainage from disturbed areas of the facility will flow to two permanent storm water and sediment detention ponds that will be located at the head of the coulee on the southeast corner and at the southwest corner of the proposed licensed area. The detention ponds will be built to contain all sediment and runoff generated by a single 25-year, 24-hour storm event. These ponds are designed with an earthen dam, spillway, and a valved drain line for use in the event that the pond is overtopped or an emergency discharge of water is necessary.

Sediment and erosion control will include installation of silt fences, check dams, fiber matt, geofabrics, aggregate rip-rap, tri-lock blocks, down drains, or other features where appropriate. Long-term intermediate- and final-covered disposal areas will have positive drainage so that surface runoff will not pond over the waste or infiltrate the area where waste is being placed. Surface runoff from the covered disposal areas, borrow areas, soil stockpiles, and materials handling areas will be routed to the storm water detention ponds where it will be held for evaporation, dust control, or irrigation of final cover vegetation on closed areas. Interior roads will have bar ditches and culverts to aid in surface water control.

*Temporary Storage Areas* — A burn pit will continue to be operated at the existing adjacent facility where clean, untreated, unpainted, and unglued wood wastes are burned. Areas will also be maintained for the temporary storage and periodic crushing of scrap metal and white goods.

*Gate House & Equipment Storage Buildings* — The existing access road, entrance, gate house and new scale, and equipment storage and maintenance buildings for the currently active Class II landfill will be used during operation of the proposed new Class II landfill facility.

*Soil Stockpiles* — The facility master plan calls for the excavation of approximately 972,000 cubic yards of earthen materials during cell construction. Landfill construction and operation activities will use 774,000 cubic yards of borrow material. The material excavated during landfill cell construction will be stockpiled on 5-acres along the northern boundary of the licensed area and will be used for daily and intermediate cover. Material suitable for topsoil will be stockpiled separately east of the south unit above the storm water pond. All stockpiles will be seeded to prevent runoff and erosion. Other Best Management Practices (BMPs) will be used at the soil stockpiles, as needed, to control sediment erosion.

*Other Landfill Features* — At least four methane monitoring probes will be located at the four margins of the proposed disposal area. The probes will be monitored quarterly to assure that the regulatory standards for a release of landfill gas is not exceeded. If methane standards are exceeded at the license boundary, a DEQ approved methane control system will be installed.

*Landfill Unit Cap* — Phased closure of the landfill will proceed as needed when each landfill cell reaches its design capacity. Upon final closure, a four-foot thick final cover will be placed over the entire landfill. The final-cover, from the bottom upward, will consist of three layers: an 18-inch barrier of compacted clay, 24-inches of borrow material for frost protection, and six (6) inches of topsoil at the surface. In-place saturated hydraulic conductivity of the compacted clay barrier layer will not exceed $1 \times 10^{-7}$ cm/sec.

Upon completion of landfilling, the average elevation of the site will only increase by approximately 40-feet. The maximum elevation increase will be 100-feet at the toe of Cell I. The moderate slope of the largest area of the top deck will average 5%, but will reach a local maximum of 25% (4:1 slope) on the side slopes. The cap surface will be graded for drainage, shaped to blend into the existing topography, and vegetated with native plant species similar to the surrounding grassland habitat. Vegetated benches and drainage swales, fiber matt, geofabric, check dams, aggregate rip-rap, tri-lock blocks, down chutes, or equivalent erosion control features may be installed, as necessary, to control erosion by storm water runoff from the cap.

<u>Operation and Maintenance Plan.</u> Operations at the facility will follow an updated Operations and Maintenance (O&M) Plan describing DEQ-approved procedures for all landfill activities.

*Personnel* — The City of Wolf Point will be responsible for the administration of the new Wolf Point Class II landfill and the closure and post-closure care of the currently active adjacent Class II landfill. The day-to-day administration and operation of the landfill will be the responsibility of the City Public Works Director. The City currently employs one full-time staff to operate equipment at the facility and two part-time gate attendants. Other City employees are trained to fill in as necessary. Landfill employees will continue to attend training courses on solid waste management funded by the DEQ and the Montana Association of Counties (MACo).

*Operating Hours* — The proposed Class II landfill facility will be open to the public from 8 a.m. to 5 p.m. Monday through Friday, and 9:00 a.m. to 1:00 p.m. on Saturdays. The proposed facility will be closed on Sundays and legal Holidays.

*Access Control* — Operators will be on duty when the site is open to the public. The gate will be locked when the facility is closed. Signs will also be used throughout the landfill to direct people to dumping areas and to the burn or recycling areas.

*Acceptable Wastes* — Signs at the facility entrance will list the acceptable wastes and fees. Group II wastes include decomposable wastes and mixed solid wastes containing decomposable materials, but exclude regulated hazardous waste. Group III wastes include wood wastes and other clean non-water soluble or inert solids. This category includes, but is not limited to, brick, rock, dirt, concrete, unpainted and unglued wood materials, and tires. Group IV wastes include construction and demolition wastes and asphalt, but exclude regulated hazardous wastes. All incoming solid wastes will be commingled and placed in the Class II landfill.

*Resource Recycling and Recovery* — Some materials, such as appliances, scrap metal, yard wastes, and various recyclables, will be segregated in designated areas and either recycled or recovered for beneficial uses. The white goods and scrap metal will be crushed and recycled.

All appliances using chlorofluorocarbons or hydro-chlorofluorocarbons (CFC/HCFC) refrigerants must have the CFC/HCFCs removed in compliance with federal EPA regulations. Landfill personnel will ensure that all incoming CFC/HCFC containing appliances are properly evacuated and appropriately certified prior to being accepted at the facility as scrap metal or for disposal.

Yard waste may, in the future, be collected for composting on site. At the present time however, tree limbs and clean, untreated, unglued, unpainted wood wastes are collected in a pile at the currently active landfill for burning. Staff will monitor and remove any burn pile contamination. Prior to conducting open burning, the pile will be inspected by the County Sanitarian. A conditional open burning permit is required from the DEQ for each event. Open burning of approved piles will continue at the proposed facility.

*Special and Hazardous Wastes* — The landfill staff is trained to implement a waste screening program. Waste screening includes conducting and documenting random load inspections to assure landfill compliance with regulations prohibiting the disposal of regulated hazardous waste and polychlorinated-biphenyl (PCB) in solid waste landfills.

The DEQ must be notified if prohibited hazardous wastes are found during waste screening activities at the facility. If the hazardous waste is discovered at the scale, the customer is instructed to remove the material from the load and dispose of it at an appropriate facility. Any non-acceptable waste discovered by the equipment operators at the working face will be segregated for handling and disposal by a qualified consultant.

Junk vehicles, liquid waste, infectious waste, PCB waste, fuel contaminated waste or radioactive waste will not be accepted. The current landfill accepts regulated asbestos wastes and uses a

separate cell for asbestos waste disposal. This practice will continue at the proposed facility. The current landfill is closing the landfarm for petroleum contaminated soils. There are no current plans to continue landfarming, but that may change in the future. Future landfarming will require DEQ's review and approval of the designs and operation and maintenance plans.

*Landfill Equipment* — An 816 Caterpillar compactor will be used for spreading and compacting waste at the working face. A 621 Case rubber-tired front-end loader will be used to place daily and intermediate cover over the waste disposal areas.

*Daily Landfill Operations* — A gatekeeper will record weights and inspect all incoming loads. Spotters will assist the public at the tipping pad where they will direct the placement of waste at the working face. The compactor operator will inspect each load for excluded waste as it is spread and compacted at the working face. The loader operator will cover the working face with at least six-inches of earthen material at the end of each day. The operators will maintain intermediate cover by placing at least 12-inches of earthen material on all landfill lifts that will not receive waste for 90 days.

*Waste Disposal Capacity* —Planned disposal at the proposed new landfill is sequenced in two phases: Phase I (one landfill cell) and Phase II (three landfill cells). Cell I provides for the disposal of 189,000 tons (367,000 cubic yards) of waste over 18.9 years of life, Cell IIA for 159,000 tons (265,000 cubic yards) over 15.9 years, Cell IIB for 317,000 tons (529,000 cubic yards) over 31.7 years, and Cell IIC for 280,000 tons (467,000 cubic yards) over 28 years. The total projected landfill life is 95 years.

*Soil Excavation and Budget* — Phased excavation for construction of the north and south landfill units will progress in four cells. Excavation for Phase I will provide about 204,000 cubic yards of soils and weathered shale. Approximately 768,000 cubic yards will be excavated for the three cells in Phase II. Excavated material that is suitable for topsoil and plant growth will be stockpiled separately. Other excavated material will be stockpiled and used for daily and intermediate cover. Ultimately, about 573,000 cubic yards of material will be used for daily and intermediate cover and 201,000 cubic yards for final cover, leaving a soil surplus of 198,000 cubic yards.

*Litter Control* — All incoming loads are required to be tarped and workers regularly patrol the area to gather litter that is blowing free or caught by the fences. For several years, as the active landfill cell expands during each new disposal phase, much of the filling will occur below grade, out of the prevailing southwesterly wind. This early advantage in litter control is lost as the lifts progress upward toward final grade and ultimate capacity. Windblown litter will be minimized, however, by building cells from west to east and sequencing each new lift so that a small working face advances on the lee side, away from the prevailing wind. In addition, portable screens and the fence surrounding the site will catch windblown litter. The perimeter fence surrounding the licensed area will be constructed of hog-wire on the bottom with two strands of barbed wire above. The lower hog wire portion will catch much of the wind-blown litter. Additional portable screens and higher perimeter fencing will be utilized, if necessary, during high wind events.

*Storm Water Control* — The facility will follow erosion, drainage control, and sediment BMPs. Regular inspection and maintenance of the storm water control system by the operators will ensure that the BMPs are being maintained to function as designed. Sources of potential pollution to storm water will be controlled. The City must apply for a Storm Water General Discharge Permit for Industrial Activity from the DEQ's Water Protection Bureau (WPB). The application will require an erosion control plan and storm water pollution prevention plan (SWPPP).

Leachate must not commingle with storm water runoff. If any leachate contamination of runoff occurs, all such wastewater must be pumped from the contaminated detention pond for DEQ approved on- or off-site treatment.

*Leachate Control* — Any water that contacts refuse, or any liquid that drains from refuse, is leachate. Operators will manage leachate by capturing it at the working face for disposal in the active landfill cell. Leachate levels will be monitored through the riser pipe of the leachate removal system. If the leachate level reaches a depth of one foot, leachate will be pumped out of the removal system for off-site treatment. Landfill leachate could be hauled for acceptance and treatment by the City of Wolf Point wastewater treatment plant (POTW) or by other DEQ approved methods. Calculations from standard numerical models predict that minor quantities of leachate will be produced in the proposed landfill over its life.

*Severe Weather Operation* —A wet-weather area for dumping during muddy conditions will be established. The location of this area will vary during landfill operations. If the area is located outside the active disposal cell, the waste will be buried at the active face after conditions improve.

*Contingency Planning* — The landfill O&M Plan contains contingency plans for unusual situations. Incoming loads containing hot materials will be directed to a dumping area where the load can be extinguished before being placed in the landfill. If a landfill fire occurs, the burning wastes will be pushed away from the working face and extinguished by covering it with soil. The City of Wolf Point Fire Department will be notified immediately in the event of an uncontrolled fire.

Any rejected wastes not sent back with the customer will be set aside. A specialty firm dealing in the handling of that type of waste will be contracted to remove and dispose or treat the material. In the event of any hazardous waste spills, the area will be isolated and a specialty contractor called to remediate the spill. The City is responsible for keeping such contractors on call for emergencies.

*Post-Closure Care* — The final cover will be monitored periodically for effectiveness, repair of erosion, and to ensure vegetative success through at least 30-years of post-closure care. The effectiveness and maintenance of the leachate removal system and storm water control system will be monitored likewise. Leachate will be sampled, removed, and treated as needed without release. The methane gas monitoring system will be evaluated and maintained during post-closure. Methane gas will be monitored quarterly. If there is a violation of the methane

protection standard at the points of compliance, a DEQ approved methane gas control plan will be implemented. This may require the construction of a methane gas extraction system.

**Benefits and Purpose of Proposal**

The main objective of the proposal is to continue to provide cost-effective municipal solid-waste disposal for area residents while also protecting human health and the environment. The currently active City of Wolf Point Class II landfill is nearing capacity. Licensure of the new landfill with an approved no-migration petition and composite liner waiver should result in considerable savings in avoided ground-water monitoring costs, liner and leachate collection system construction costs, and their associated maintenance costs

The site is close enough to Wolf Point to keep hauling costs down, but far enough away to reduce or eliminate citizen complaints that might arise from a municipal landfill operation. Historically, because of the somewhat remote location of the currently active landfill, few complaints have been raised concerning litter, odors, dust, or operations.

**Description and analysis of reasonable alternatives whenever alternatives are reasonably available and prudent to consider**

The DEQ considered two alternatives in the preparation of this EA:

Alternative A. The "no action alternative". This means that the DEQ takes no action either approving or denying the application. If this alternative were chosen, the applicant could:

1. Continue to dispose of waste at the existing licensed facility that has a predicted remaining operational life of no more than five years if the Phase 3 cell is constructed as approved.
2. Haul solid waste to another landfill when the current landfill reaches capacity. The Valley County landfill at Glasgow is the nearest Class II facility. Disposal at Valley County landfill will involve transportation costs as well as tipping fees. This could likely cause a significant increase in disposal cost to Roosevelt County residents.
3. If the no-migration petition were denied, the City of Wolf Point could submit another application for a lined landfill at the currently proposed site.
4. Locate, study, and apply for a license at another site suitable for a Class II landfill in Roosevelt County.

Alternative B. Approve the license as proposed by the applicant. Several factors support the viability of this option:

1. The 31.2 acre disposal area proposed on the City-owned site will allow for the additional disposal of 950,000 tons of waste over 95 additional years of operation.
2. The proposed site has specific subsurface characteristics that satisfy the no-migration and alternative liner requirements.
3. The City has a 28-year history of waste disposal in compliance with the Montana solid waste laws and rules
4. There is an ongoing need for economical disposal services for the area residents.

5. After consulting with the Fort Peck Assiniboine and Sioux Tribes, EPA has conditionally approved the site flexibility request based on the design submitted to the State.
6. The population, land use, and development of land surrounding the landfill facility are sparse, so the potential effects on human health from the potential release of pollutants to the environment are minimized.

In consideration of these alternatives, the DEQ reviewed various site-specific documents submitted to the Solid Waste Program by the City of Wolf Point, Barry Damschen Consulting, and Entranco, Inc. These were: (i) , *New Class II Sanitary Landfill License Application and Operation and Maintenance Plan, City of Wolf Point*: Prepared by Entranco Engineers, Inc., Helena, Montana, (ii) *Hydrological and Soils Study and No-Migration Demonstration for the Proposed Landfill, City of Wolf Point, Montana*: Prepared by Entranco Engineers, Inc., Helena, Montana, (iii) facility design documents and alternative liner demonstration, and (iv) the current facility compliance history in the DEQ files. Based on the information provided, previous investigations for the adjacent City landfill, and DEQ research on the area surrounding the proposed site, the potential environmental impacts of Alternative B were evaluated for the proposed project. The results of the DEQ's evaluation are summarized in Tables I and II. A detailed discussion of the site-specific environmental impact analysis for Alternative B is provided in the Appendix.

**A listing and appropriate evaluation of mitigation, stipulations and other controls enforceable by the agency or another government agency**

The proposed Wolf Point Class II landfill will meet the minimum requirements of the Montana Solid Waste Management Act and administrative rules regulating solid waste disposal. Along with the Solid Waste Management System license issued by the DEQ, and as validated by the local Roosevelt County Health Officer, the licensee must adhere to the following license conditions. License conditions (1) and (2) address the collective DEQ, EPA, and Tribal comments:

(1) Compliance with the conditions of the no-migration demonstration and approvals and those stipulated by the EPA's flexibility approval, including (i) construction of the alternative slope liner along the entire landfill slope, (ii) adequate conformance testing to verify alternative slope liner and basal liner compaction, and (iii) installation and monitoring of water levels in two piezometers perforated in the perched ground water zone at the shale-till contact.

(2) Compliance with the conditions for a landfill composite liner waiver and alternative soil liner approvals, including those stipulated by the EPA's flexibility approval. Leachate may not be recirculated to the landfill due to the composite liner waiver.

(3) Documentation of refrigerant removal for each unit according to U.S. EPA CFC/HCFC regulations for disposal.

(4) No release of leachate to the storm-water detention pond or State waters unless approved and permitted by the DEQ Water Protection Bureau.

(5) No release of storm water from the detention ponds, except for approved on-site irrigation or dust control, without the appropriate permit from the DEQ Water Protection Bureau.

(6) No construction or disturbance of areas more than one acre unless approved and permitted the DEQ Water Protection Bureau.

(7) No burning of materials without a Conditional Open Burning Permit from the DEQ Air Resources Management Bureau, and any other permits that may be required locally.

**Recommendations**

The recommendation of the DEQ is to request comments from the public regarding the proposal. In the absence of adverse public comments identifying significant issues or impacts that have not been heretofore identified, the DEQ proposes to license the proposed site as a Class II Solid Waste Management System.

**If an EIS is needed, and if appropriate, explain the reasons for preparing the EA**

The DEQ finds that an Environmental Impact Statement (EIS) is not needed. Any potential impacts to the physical or human environment are expected to be minor due to the sparse development and low human population surrounding the facility, the extended thickness of highly impermeable material directly beneath the proposed landfill, the low average annual precipitation for the area, the extensive depth to the uppermost aquifer beneath the site, and the site-specific engineering controls. The DEQ therefore finds that an EA is the appropriate document to address potential impacts of the proposed landfill.

**If an EIS is not required, explain why the EA is an appropriate level of analysis**

The DEQ finds that construction and operation of the newly proposed Wolf Point Class II landfill will not significantly affect the quality of the human environment. Potential impacts to terrestrial and aquatic life, vegetation and other aspects of the physical and human environment are expected to be minor. Potential impacts to the ground water and surface water resources will be minimal due to the low average annual precipitation, the extended thickness of highly impermeable material directly beneath the proposed landfill, the extensive depth to the uppermost aquifer, and engineering controls. Thus, an Environmental Assessment is the appropriate document to address potential impacts of the proposed landfill.

**Other groups or agencies contacted or which may have overlapping jurisdiction**

Fort Peck Assiniboine and Sioux Tribes
United States Environmental Protection Agency (U.S. EPA)
City of Wolf Point City Council and Public Works Department

Roosevelt County Board of County Comissioners
Montana State Historic Preservation Office
Montana Natural Heritage Program

**Individuals or groups contributing to this EA**

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**EA prepared by**

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Waste & Underground Tank Management Bureau
Solid Waste Program

**Date** February 26, 2008

**TABLE I. Potential Impacts on the Physical Environment**
Proposed Wolf Point Class II Landfill
[See Appendix as indicated for a specific resource analysis]

| RESOURCE | LEVEL OF IMPACT | | | | | |
|---|---|---|---|---|---|---|
| | Major | Moderate | Minor | None | Unknown | Appendix |
| 1. Terrestrial and Aquatic Life and Habitat | | | X | | | X |
| 2. Geology and Soil Quality, Stability and Moisture | | | X | | | X |
| 3. Water Quality, Quantity, and Distribution | | | X | | | X |
| 4. Vegetation Cover, Quantity and Quality | | | X | | | X |
| 5. Aesthetics | | | X | | | X |
| 6. Air Quality | | | X | | | X |
| 7. Unique, Endangered, Fragile or Limited Environmental Resources | | | | | X | X |
| 8. Demands on Environmental Resources of Water, Air, and Energy | | | X | | | X |
| 9. Historical and Archaeological Sites | | | | | X | X |

CUMULATIVE AND SECONDARY IMPACTS — The cumulative impacts from the proposed Class II Solid Waste Management Facility are minor. The proposed facility is adjacent to the existing landfill and exhibits similar physical, terrestrial, and aquatic characteristics. The proposed facility would extend the term of the impacts of the current facility for an additional 95 years. An additional 1,628,000 cubic yards of refuse will be placed adjacent to the existing facility. Additional ground disturbance will occur if the proposed facility is licensed. There are no recognized secondary impacts.

**TABLE II. Potential Impacts on the Human Environment**
Proposed Wolf Point Class II Landfill
[See Appendix as indicated for a specific resource analysis]

| RESOURCE | LEVEL OF IMPACT | | | | | |
|---|---|---|---|---|---|---|
| | Major | Moderate | Minor | None | Unknown | Appendix |
| 1. Social Structure and Mores | | | | X | | |
| 2. Cultural Uniqueness and Diversity | | | | | X | X |
| 3. Local and State Tax Base and Tax Revenue | | | X | | | X |
| 4. Agricultural or Industrial Production | | | X | | | X |
| 5. Human Health | | | | X | | X |
| 6. Access to and Quality of Recreational and Wilderness Activities | | | | X | | |
| 7. Quantity and Distribution of Employment | | | X | | | X |
| 8. Distribution of Population | | | | X | | |
| 9. Demands for Government Services | | | X | | | X |
| 10. Industrial and Commercial Activity | | | X | | | X |
| 11. Locally Adopted Environmental Plans and Goals | | | | X | | |

CUMULATIVE AND SECONDARY IMPACTS — The cumulative impacts recognized from the proposed licensing of the Class II Solid Waste Management Facility are minor. The proposed facility would extend the term of the impacts of the current facility for an additional 95 years with some minor changes that are addressed in the Appendix. There are no recognized secondary impacts.

## APPENDIX
## COMMENTS REGARDING THE POTENTIAL IMPACTS OF THE PROPOSED WOLF POINT CLASS II SOLID WASTE MANAGEMENT SYSTEM (ALTERNATIVE B)

### I. POTENTIAL IMPACTS ON THE PHYSICAL ENVIRONMENT

1. Terrestrial and Aquatic Life and Habitats

The upper Missouri River basin is in the rain shadow of the Cascade and Rocky Mountains on the northern Great Plains. The area has a semiarid continental climatic regime where evaporation typically exceeds precipitation. The total supply of moisture is low and hail, blizzards, tornadoes, and dust storms are frequent. Winters are cold and dry, summers warm to hot. The maximum rainfall occurs during the spring and early summer periods.

The vegetation community is mostly steppe type, sometimes called shortgrass prairie, with lesser semi-desert type. Steppe vegetation consists mainly of numerous species of short grasses that typically grow in sparsely distributed bunches. Scattered shrubs and low trees sometimes grow in the steppe, but all gradations of cover are also present, from semidesert (only 10-30% cover) to plains woodland. Because ground cover is generally sparse, large areas of soil are often exposed. The semi-desert shrubs are usually sagebrush and juniper. In this climatic regime, the dominant soil forming process is calcification, with salinization on poorly drained sites. Vegetation cover is more continuous in the glaciated plains region.

The proposed Wolf Point Class II landfill site lies within the central grasslands ecoregion of the northern glaciated high plains. This region is characterized by gentle undulating to rolling till plains with strongly rolling and locally steep slopes bordering the major streams. The site is surrounded by predominantly grassy rangeland and considerable cultivated cropland. Local land cover and use consists of 47% grasslands (native rangeland), 43% agriculture, 4% shrubland, 3% forest, 2% pasture or hay, and 1% surface water. Precipitation is a consistent source of water for principally dryland wheat farming. Water for livestock is stored in small reservoirs on the uplands, and although shallow bedrock aquifers are widespread, supplies are often inadequate for significant upland irrigation. Irrigation water in quantity is available from the rivers. Potable ground water is abundant in the low areas due to the occurrence of a major shallow aquifer hosted by the extensive alluvial and glacio-fluvial sediments that fill the nearby Missouri River valley.

Wildlife forage and habitat is typical of grassland steppe found on the extensive open rolling high plains of glaciated northeastern Montana. This community type is associated with more terrestrial species in greatest need of conservation than any other community type in Montana. Of the 364 known terrestrial species found, 202 species are essentially associated with the community. One amphibian, four reptiles, ten mammals, and eight birds are identified as essential and in greatest conservation need. Loss of the 80-acre proposed facility acreage as wildlife habitat will not be considered critical, as it is not a unique or rare wildlife environment. Due to the sparse development and human population surrounding the proposed site, there is

adequate acreage of similar habitat available in the vicinity to accommodate any terrestrial or avian species that may be forced to relocate.

Transient populations of grazing large game might include pronghorn antelope, mule deer, white-tailed deer, and elk. Wandering predators like the coyote and red fox may occasionally inhabit the landfill area and surrounding rangeland. Permanent residence by burrowing small mammals like hares, jackrabbits, rodents; reptiles like turtles and snakes; frequent residence by various avian species including waterfowl, crows, ravens, and opportunist raptors like eagles, merlins, falcons, and burrowing owls are more likely.

A search of the Montana Natural Heritage Program website found records of 11 animal species of concern in Roosevelt County: Baird's sparrow (*Ammodramus bairdii*), Grasshopper Sparrow (*Ammodramus savannarum*), Sprague's Pipit (*Anthus spragueii*), Lark Bunting (*Calamospiza melanocorys*), Chestnut-collared Longspur (*Calcarius ornatus*), Piping Plover (*Charadrius melodus*), Sedge Wren (*Cistothorous platensis*), Bobolink (*Dolichonyx oryzivorus*), Franklin's Gull (*Larus pipixcan*), Red-headed Woodpecker (*Melanerpes erythrocephalus*) and Interior Least Tern (*Sternula antillarum athalasos*). Two of these species of concern, the Piping Plover and Interior Least Tern, have been detected in the 36 square miles of T. 27 N, R. 47 E that surrounds the site.

Most terrestrial species currently inhabiting the proposed area will be displaced by the landfill during the period of operation. After closure, the area will be re-seeded to native plant species typical of the surrounding grassland habitat. The impacts of landfill construction and operation will be minor due to the abundance of surrounding habitat.

There are no wetlands or permanent surface water bodies located on the proposed site. Because no continuously active aquatic systems exist within the boundary of the proposed facility, it is unlikely that there is any significant aquatic life or habitat anywhere on the site. Lacustrine and riparian habitats and the associated aquatic species or waterfowl that might occupy the existing storm-water detention pond at the licensed facility will not be disturbed by development of the area any more than by current operations at the adjacent active landfill site. The required storm water control systems, including two detention ponds, will prevent any discharge of runoff from the landfill facility to the adjacent coulees. There is no potential for water exiting these coulees at the northern margin of the flood plain to impact the impaired Missouri River habitat that is located two miles south of the proposed facility. Thus, any impacts to aquatic life and habitat due to the proposed facility will likely be very minor.

Proper operation of modern sanitary landfills using appropriate daily and intermediate cover minimizes scavenging by birds and mammals. The current landfill does not have elevated problems with scavengers and it is anticipated that by continuing good operational practices, the new landfill will also not have problems with scavenging by gulls, crows, ravens, or birds of prey. By adhering to these practices, impacts to raptors and other birds will be maintained at the current level.

Insects are seldom a problem at a properly operated landfill. Improperly covered and compacted waste may cause increases of nuisance insects and disease vectors, such as mosquitoes and flies.

However, the facility's operation plan requiring the placement of daily cover should continue to control any potential insect problems.

2. Geology and Soil Quality, Stability and Moisture.

The unique characteristics of the proposed Wolf Point Class II landfill site allow the DEQ to consider the petitions for waiver from the standard Class II ground water monitoring and composite liner typically required for less protective sites.

**Quaternary Geology**

Unconsolidated Upper Pleistocene (Figure 4) glacial sediments blanket the bedrock surface at the proposed landfill site. The mixed glacial till and outwash layer varies in thickness, up to a maximum of 16-feet on site. The glacial sediments are often saturated by perched groundwater found either in the base of the till layer above impermeable bedrock or within outwash lenses in the till. Perched groundwater may be partially recharged by lateral seepage of groundwater from adjacent bedrock aquifers that are covered by the glacial sediments.

Mixed glacial till and outwash gravels also cover the terraces and fill much of the lower alluvial valleys near the Missouri River. The ancestral Missouri River followed the same river valley at Wolf Point as it does today. Therefore, extensive water well drilling in the valley surrounding Wolf Point often penetrates older pre-glacial gravel deposits beneath the dominant glacial fill. Gravels of the Missouri River valley provide a major shallow unconfined aquifer that yields most of the water supplies for residents of the Wolf Point area.

A strong parallel pattern of northwest trending drainages follows the jointing of the sedimentary rocks in the region surrounding Wolf Point. Recent gravels that fill those drainages provide a local shallow aquifer that is principally confined to the coulees on the uplands adjacent to the proposed landfill facility.

**Bedrock Geology**

The Williston Basin is located on the western margin of the Paleozoic North American craton where sedimentary strata of Cambrian through Tertiary age have accumulated to a maximum thickness of greater than 16,000 ft. during episodic subsidence in a shallow seaway. An ever-shifting marine coastline is exhibited in Upper Cretaceous sedimentary rocks (Figure 4) at the surface near the Wolf Point landfill facility, where a transition from coal beds to sandstones with dinosaur fossils to marine shales is evident as elevation decreases from the uplands on the north down to the Missouri River valley on the south. The shallow Cretaceous formations host the upper bedrock aquifers (Figure 4) beneath the proposed site.

The downward transition begins with the coal-bearing sandstones and siltstones of the Paleocene Fort Union formation at the top of the hills. The underlying Upper Cretaceous Hell Creek formation consists of interbedded sandstone, siltstone, claystone, and local thin beds of coal or lignite, associated with numerous dinosaur fossils. The Upper Cretaceous Fox Hills sandstone lies beneath the Hell Creek and over the Bearpaw Shale at the base of the hills. Due to the lack

## Figure 4 - CRETACEOUS-TERTIARY STRATIGRAPHY
## WILLISTON BASIN
## WOLF POINT REGION, MONTANA

| | | EQUIVALENTS |
|---|---|---|
| Holocene | Alluvium | |
| Pleistocene | Bull Run glacial till (16 ft thick)<br>Wiota gravel* | * eroded at site |
| Pliocene | Flaxville gravel* | |
| Miocene | Wood Mountain Formation* | |
| Oligocene | Cypress Hills Formation* | |
| Paleocene | Fort Union Formation* | |
| UPPER CRETACEOUS | Hell Creek Formation* | |
| | Fox Hills Sandstone* | |
| | Bearpaw Shale (1100 ft thick) | Pierre Shale |
| | Judith River Formation<br>(uppermost aquifer at 1100 ft depth) | |
| | Eagle Sandstone | |
| | Niobrara Formation | Colorado Group |
| | Carlile shale | |
| | Greenhorn Formation | |
| | Belle Fourche Shale | |
| LOWER CRETACEOUS | Mowry Shale<br>Muddy (Newcastle/Dakota) Sandstone | |
| | Skull Creek Shale | |
| | Fall River Sandstone<br>(deep aquifer) | Inyan Kara Group |
| | Fusion Formation | |
| | Lakota Formation | |

of extensive shaly confining units, sandy units of the Fox Hills, Hell Creek, and Fort Union formations host a connected unconfined complex of shallow bedrock aquifers in the region surrounding Wolf Point, but they are eroded from the proposed site and lie immediately uphill outside the northern boundary of the proposed landfill facility.

The uppermost bedrock beneath the proposed landfill site consists of the Upper Cretaceous Pierre Shale (Figure 4), which forms an important confining unit separating the upper aquifers from the deeper aquifers in the Williston Basin. The Pierre Shale (upper Montana Group equivalent) consists of a thick marine sequence of clay-rich Bearpaw Shale overlying the two sandstones of the Judith River Formation and Eagle Sandstone. These porous sandstones host two confined aquifers that lie beneath the proposed facility, with the Judith River aquifer closer to the surface.

The Bearpaw Shale will play an important role in retarding the vertical movement of leachate below the proposed alternative landfill liner and in confining the uppermost Judith River aquifer from the potential effects of leachate migration. Maximum depth to the top of the Judith River aquifer is at 1,208 feet, and to the underlying Eagle Sandstone at 1,686 feet, according one geologic log from an oil well (API #25-085-21126-00-00) located north of the current Wolf Point landfill (Sec 20, T. 28 N., R. 47 E.).

Shallow oil wells produce from the Judith River and Eagle formations west of the Wolf Point area, but no drilling leases or oil production activities are located on the City property where the landfill site is located. Therefore, the oil resources of the area will not be affected by the proposed landfill facility.

**Geologic Hazards and Constraints**

A seismic stability demonstration is not required because the Wolf Point region is located east of the Montana intermountain seismic belt, well outside the area where there exists a ten percent or greater probability that ground acceleration will exceed one-tenth of the acceleration of gravity at the surface in a 250-year period. The proposed Wolf Point landfill site is also not located near any active Holocene faults. Natural instabilities, like ground subsidence or landslides due to unstable slopes, are not known to affect the proposed landfill site.

**Site Soil Resources**

According to the U.S. Natural Resources Conservation Service (NRCS) two common soil types are mapped in the proposed landfill licensed area. The soil type mapped in the gentle uplands where the disposal footprint is located is classified as Williams-Zahill loams. This complex grades into the Zahill-Tinsley complex soils on the breaks of the dry coulees to the west and southeast of the proposed facility.

Together, these soils make up about thirty-seven percent of the soils in Roosevelt County. They form deep, well drained, moist soil profiles in glacial till on nearly level to moderately sloping uplands. They are medium textured in the surface layer, moderately fine textured in the substratum, and calcareous throughout on gentle to moderate slopes.

The restricted permeability of the soils will provide a good source of borrow for landfill liner and cover construction. They also have a high available water capacity, but limitations include low potential strength, potential for frost heave, and shrink-swell potential. The effective rooting depth is 60-inches, but the average annual wetting depth for native species is 30-inches. Runoff is medium and the hazard of water erosion or blowing is moderate.

**Site Soils Investigation**

Six shallow air rotary, seven shallow solid-stem auger well borings, and nineteen backhoe test pits were evenly placed throughout the proposed 31.2-acre landfill disposal footprint area during the 2003 site investigation. Seven samples were selected for qualified laboratory analyses from a suite of those collected.

Evaluation of all drilling logs, test pit logs, and sample analyses indicate a surface layer of brown heterogeneous, unconsolidated, poorly sorted, massive silty clays with variable matrix supported clasts ranging up to cobbles. Local lenses of well sorted sand and gravel were observed in the test pits and could indicate potential for lenses of glacial outwash. Thickness of the glacial sediments varied from 4- to 16-feet, thickening toward the southwest. Four representative samples were taken from the unconsolidated glacial sediments exposed in the test pits. The samples were tested for standard properties required for engineered soils. Properties of the recompacted composite glacial drift are suitable for landfill or pond liner.

Thin light-brown calcareous shale to limestone interbeds were sometimes encountered over the dark grey, carbonaceous, fissile shale (Bearpaw Shale) below the unconsolidated sediments. Such variation probably indicates nearby uphill contact with the overlying Fox Hills Formation. The shale contact slopes toward the south-southwest and was consistently damp. Four representative samples were selected from borings of the grey shale where it was encountered below the base grade of the landfill units. These samples were tested for hydraulic conductivity and grain size distribution, respectively. Laboratory tests on the samples show that the shale has a very low saturated hydraulic conductivity. Sieve and hydrometer tests indicate that grain size in the shale consists of 98-percent fines and 18-percent clay particles. These results indicate that the properties of the in-place uncompacted shale are suitable for landfill liner and will be improved further by compaction.

Two of the air rotary boreholes (WPE-TB-1 and WPE-TB-2) were drilled to depths of 100-feet within the proposed Phase I footprint area to determine the potential for migration of leachate to any uppermost aquifer within the landfill during the active life plus 30-years post-closure. Grey Bearpaw Shale was encountered below about 37 feet in both locations, confirming the presence of the confining unit and the absence of a bedrock aquifer to that depth beneath the proposed site.

Previous site investigations were completed in 1989 and provided four shallow (28 to 50-ft) groundwater monitoring wells (WP-M-1 to WP-M-4) that were sporadically monitored until 1994, when only wells WP-M-3 and -4 were retained in the sampling network of the currently active landfill. The wells encountered at least 15-feet of mixed unconsolidated sediments (Quaternary glacial sediments) overlying brown- to dark-grey fissile shale bedrock. A perched groundwater zone was interpreted at the sediment-shale contact after waiting thirty days for groundwater recovery to establish the water levels. Abandoned wells WP-M-1 and -2 were

completed to a depth of 28-feet on the uplands adjacent to the proposed landfill facility, the first at the head of the coulee on the southeast corner and the second at the head of the coulee on the western margin below the historic landfill. Water levels within these two wells rose to within 9 to 13 feet from the ground surface within the saturated zone of the weathered Bearpaw Shale and lower glacial sediments. Ongoing groundwater monitoring at the adjacent active landfill facility confirms the persistance of the perched groundwater zone, suggesting some form of recharge other than direct infiltration of meteoric water through the glacial drift during several years of regional drought.

**Overall Impact**

Because of the types of rock and soils at the site, the low saturated hydraulic conductivity of the sediments, and the presence of the confining unit beneath the site, the overall impact of locating a Class II landfill at this site is minor.

3. Water Quality, Quantity and Distribution.

The primary impact associated with Class II landfill facilities is the potential for the release of leachate to ground water beneath the facility. A combination of proper site conditions and design of the proposed Wolf Point Class II landfill will reduce such potential impacts to a minor level as described in the following sections on hydrogeology and groundwater impacts.

**Climate**

At Wolf Point (Station #249103), the annual average high temperature is 57.5° F and the average low is 30.3° F. Annual precipitation averages 12.59 inches, with the rainfall during May through August making up nearly half the annual long-term total precipitation at Wolf Point. Average annual snowfall is 16.1 inches during November to March when average annual snow depth peaks at 5 inches in January. The growing season (freeze-free period) averages 105 to 125 days at Wolf Point.

**Surface Water Resources**

The City of Wolf Point landfill and proposed Class II landfill area is situated in the Prairie Elk-Wolf Creek Sub-basin (hydrologic unit code 10060001, Montana Hydrologic Unit Map, 1974). The Prairie Elk-Wolf Watershed comprises 1,281,950 acres and spans across McCone, Roosevelt, and Valley Counties. The water shed area is a combination of rolling to nearly level plains. The topography ranges from steeply rolling plains covered by native grasses to irrigated river bottoms.

Local drainage near the proposed Wolf Point Class II facility is dominated by Wolf Creek on the west and Little Wolf Creek on the east. Typical of the area, Wolf Creek has a narrow flood plain that is entrenched 75- to 150-feet below the level of the uplands where the proposed landfill facility will be located.

Three segments of the watershed are Total Maximum Daily Load (TMDL) impaired according to the Section 305b/303d summary report:

(1) the reach of the Missouri River (ID# MT40S001_012) from the Milk River to the Poplar River drainages;
(2) the lower 37.5 miles of Prairie Elk Creek (ID # MT40S002_010); and,
(3) the lower 13.5 miles of Sand Creek (ID# MT40S002_030).

**Surface Water Impacts**

There are no known ponds or springs in the immediate area of the proposed landfill facility. Intermittent natural runoff from the area surrounding the proposed landfill facility mostly drains into two small coulees (Figure 2) that exit the upland breaks to the nearby northern margin of the Missouri River flood plain. The larger coulee meanders about one mile along the western margin from the proposed landfill area past the western flank of the active landfill facility. The smaller coulee meanders about one-half mile from the southeast corner of the proposed landfill area past the eastern flank of the active landfill facility.

Runoff from the area uphill of the facility will be routed around the disturbed landfill area by a system of vegetated swales that discharge to the dry coulees. All facility runoff from the disposal areas will be captured in the on-site detention ponds. Minor surface water impacts are anticipated because the storm water control system will be operated to meet new Phase II storm water requirements for landfills according to a Storm Water General Discharge Permit for Industrial Activity from the DEQ's Water Protection Bureau (WPB).

**Ground Water Hydrogeology and Resources**

At the surface of the proposed landfill site is the Bearpaw Shale. The Bearpaw Shale is underlain by two laterally extensive confined sandstone aquifers with depth, the Judith River formation and the Eagle Sandstone, respectively (Figure 3). Because these aquifers are confined by the overlying Bearpaw Shale, they have no hydraulic connection to the landfill. At Wolf Point, two water supply wells (GWIC #3315 and #3311) that are located approximately one mile downgradient from the proposed landfill provide an average depth to the top of the Judith River aquifer at 1,143 feet below the proposed landfill site.

Due to its depth, the Judith River aquifer is mostly tapped for water supply in the Wolf Point region by the City or local businesses. Groundwater quality from one of the downgradient supply wells (GWIC #3311) that intercepts the Judith River aquifer was sampled by the USGS (1947). The results indicate that the Judith River aquifer supplies sodium-bicarbonate type Class III groundwater.

**Site Groundwater Investigation and Impacts**

As discussed in Section 2 *Geology and Soil Quality, Stability and Moisture*, the Bearpaw Shale is blanketed by unconsolidated glacial sediments of variable thicknesses that cover the entire proposed Class II landfill footprint area. Due to local erosion of these sediments along the breaks to the Missouri River valley at Wolf Point, the Flaxville, Fort Union, and Hell Creek aquifers lie well uphill of the proposed landfill site. The lowest portion of the Fox Hills Formation, located beneath the Hell Creek Formation, may lie beneath the proposed landfill site because 10 to 25-feet of brown shale was observed overlying the grey shale of the Bearpaw

Shale. The uppermost confined aquifer beneath the site is hosted by the Judith River Formation and is found at depths of 1100- to 1200-ft below the surface.

Two 28-ft abandoned groundwater monitoring wells, WP-M-1 and WP-M-2 located adjacent to the eastern and western margins of proposed landfill facility, confirm that perched water was encountered in the glacial sediments. As typical for the area, downhill lateral seepage to the glacial sediments from the nearby uphill sandy Fox Hills aquifer probably provides interflow along the impermeable Bearpaw Shale contact that acts as a lower confining layer. The weathered zone at the top of the Bearpaw Shale enhances local storage of the perched water because of the high content of fine-grained sediments. Storage of water in this weathered zone also saturates the base of the overlying glacial till. The unconfined flow follows the topography as indicated by increased pressure head at WP-M-2 in the coulee. The impermeability of the glacial sediments and several years of drought have provided little recent opportunity for vertical recharge by meteoric water.

In order to provide a landfill unit barrier that prevents seepage of leachate to the perched zone, an 8-ft thick slope liner will be constructed in compacted lifts from the fractured Bearpaw Shale that will be removed during cell excavation. The slope liner will extend through the weathered and fractured Bearpaw Shale into the fresh shale at the base of the landfill units and will retard potential flow into the cell.

A license condition requires that two piezometers be installed upgradient and downgradient of the Phase I cell to determine the water level at the shale-glacial till contact adjacent to the in-place waste footprint. Monitoring of the perched water levels in the piezometers will be evaluated during Phase I operations to determine relative pressure heads and assess whether or not the interflow must be intercepted and drained on the uphill margin of the proposed landfill units to protect the integrity of the slope liner. As long as the slope liner remains intact, no impact is expected due to lateral migration of leachate from the proposed landfill units.

The uppermost aquifer is at least 1,100 feet below the ground surface in the Judith River formation and is overlain by the regional Bearpaw Shale, which is composed primarily of hardened clay beds that will function as a confining layer providing an effective barrier to the migration of leachate. Because the glacial drift and weathered shale will be entirely excavated from beneath all of the proposed landfill units, a base liner is not required. However, the underlying basal shale will be scarified and recompacted. Due to its apparent lack of fractures and very low saturated hydraulic conductivity, the 1,100-ft thick clay-rich shale bedrock underlying the proposed site will provide an excellent barrier to infiltration and downward migration of leachate to the permeable Judith River aquifer. The high clay and organic content of the Bearpaw Shale will also appreciably attenuate the level of potential contaminants contained in the leachate during migration. Low contaminant concentrations are expected at this site, as shown by previous sample analyses for similar wastes at the Malta landfill located 118 miles west of the Wolf Point landfill..

The speed of movement of leachate within the shale located beneath the proposed landfill was calculated. The minimum possible estimate of migration time to the uppermost aquifer is 75-years. However, the most likely estimate will be at least several thousand years for the vertical seepage of fluid through a minimum 1,100-ft thick section of consolidated Bearpaw Shale. It will take several hundred years for leachate to seep through consolidated Bearpaw Shale to the

maximum drilled depth of 100 feet. Lateral migration times along consolidated bedding planes in the Bearpaw Shale to the nearest coulee will be more than 10,000 years due to the decreased hydraulic gradient for the mostly lateral flow. More realistic, yet conservative, numerical HELP model predictions for leachate percolation indicate that only the uppermost 10 to 12-ft of Bearpaw shale could become saturated during the proposed 95-year operational life and 30-year post-closure care period of the proposed Class II facility.

The very high impermeability of the marine shale will provide an exceptional barrier to the potential migration of leachate and will probably prevent lateral and vertical migration to points of potential impact for a period well beyond the active and post-closure period of the proposed facility. The extreme length of the most probable migration times for leachate fall well below the range required to trigger the need for a contaminant fate and transport demonstration.

The DEQ has found that the facility has adequately demonstrated that there is no potential for migration of Table-I constituents to the uppermost aquifer during the proposed 95-yr operational life and 30-yr post-closure period of the proposed landfill facility.

4. Vegetation Cover, Quantity and Quality

There are approximately 397 farms and ranches situated within the Prairie Elk-Wolf Watershed. Wide open areas of rangeland provide excellent quality summer grass for an extensive livestock industry. Grazing dominates in areas of steeper slopes. Local ranches raise mostly cows and calves, cultivate hay, and manage winter pasture. Pastureland in the watershed comprises approximately 18,900 acres. Much of the pastureland consists of improved grass species such as crested wheatgrass, Russian wild rye, intermediate wheatgrass, and other dryland species.

Dryland farming of grain crops predominates in most upland areas. Dryland crops are mainly wheat, barley, oats, safflower, peas, lentils, mustard, canola, and sunflowers. Agriculture is largely supported by irrigation on scattered gravel benches and in the larger alluvial valleys. Irrigated crops grown in the Missouri River valley consist primarily of potatoes, sugar beats, sorghums, alfalfa, and many varieties of grain including corn and wheat under irrigation.

A search of the Montana Natural Heritage Program website (NRIS, 2005) found records of three vascular plant species of concern in Roosevelt County: Bractless Mentzelia (*Mentzelia nuda*), Poison Suckleya (*Suckleya suckleyana*) and Nannyberry (*Viburnum lentago*).

Soils at the proposed facility mainly support dryland cultivated crops like grass-legume hay, spring wheat, winter wheat, and barley in the region. Recently the land within the proposed facility boundary has been managed for rangeland and wildlife habitat with the native plant community consisting of mainly western wheat grass, needleandthread, green needlegrass, and winterfat. Over grazing may increase little porcupinegrass, blue grama, junegrass, and threadleaf sedge.

Most plant species will be removed from the proposed 31.2-acre disposal unit. Although the landfill will occupy forty percent of the total proposed facility area, it will be closed in phases wherein the largest open area will encompass 16 acres over the facility life. The largest soil stockpile will cover 5 acres.

As portions of the landfill are filled to their final grade, they will be covered with an earthen final cover and topsoil. This cap will then be re-seeded with native plant species appropriate to the area as recommended by the Natural Resource Conservation Service. The spectrum of native plant species will not be as broad as the natural grassland vegetation currently developed on site, but will gain in diversity as natural succession progresses during the 30-year post-closure period.

After final closure of the proposed landfill, such re-vegetation will then make the area suitable for wildlife habitat and livestock grazing. In order to assure the integrity of the landfill cover re-vegetation process, grazing will likely be restricted to allow the cover vegetation to become fully established. Grazing on the final cover will be monitored to prevent overgrazing.

The overall impacts of the landfill construction, operation, and closure activities on the prairie vegetation will be relatively minor (36.5-acre maximum disturbance). This will largely depend upon natural succession of species to mitigate impacts to natural plant species diversity. Because the final topsoil will be derived from soil stockpiled from the naturally developed soil already existing on site, the latent seed bank will provide a source for some natural species. Noxious weeds will be adequately controlled as needed.

5. Aesthetics

**Visual**

The proposed landfill will likely have only minor, if any, impact on aesthetics. The proposed landfill area is located about a mile north of U.S. Highway 2, adjacent to the north property boundary of the current Class II landfill.

**Litter Control**

All vehicles coming to the facility will be required to have their loads covered. Wastes placed in the landfill will be covered with earthen material on a daily basis. In addition to the requirement for hog-wire bottom on the perimeter fence and adequate portable litter screens, the landfill will use hand-picking, and possibly a mobile litter vacuum system, to further control litter on the site. The first few years of operation of the proposed Class II landfill will occur below the existing ground level, which will also serve to control litter.

This early advantage in litter control is lost as the disposal lifts progress upward toward final grade and ultimate capacity. Windblown litter will be minimized by sequencing each new lift so that a small working face advances on the lee side, away from the prevailing wind. The most effective litter control practice will be the rapid placement of adequate daily cover. More portable screens and higher perimeter fencing may be utilized, if necessary, during high wind events. The anticipated aesthetic impacts from windblown litter are minor due to the low human population and sparse development surrounding the proposed landfill and the litter control measures for the facility.

6. Air Quality

Air quality concerns related to sanitary landfills are frequently associated with increased dust from landfill traffic, construction and maintenance activities and open burning at the site.

Additional traffic on the gravel road from Highway 2 to the landfill, related to the construction of the landfill, will cause an increase in the levels of airborne dust. As this occurs, dust suppression methods such as watering the road will lessen the impact. Construction of new landfill cells will cause an increase in internal landfill traffic and will cause an increase in airborne dust during the period of excavation and construction of the base. Since the construction periods will be short in relation to the operating life of the facility, these effects will be minor. If dust from construction becomes a problem, dust control measures such as wetting the surface before working on it, will be initiated as is typical for earthwork. Normal operational traffic on the site could cause a minor increase of suspended dust particles in the air during the dry months of the year. If this becomes a problem, it will be mitigated by adequate dust control measures on the interior roads such as applying a dust palliative or water.

The excavation and placement of cover material could increase the dust in the air. If it becomes a problem, the cover material will be wetted prior to its placement so that the net effect will be minor. All long-term soil stockpiles will be seeded to prevent erosion and airborne dust.

Decomposing buried waste can produce varying amounts of methane, depending on the amount of water reaching the waste. A properly constructed cover on the landfill minimizes the amount of water that seeps down to the waste by storing the precipitation so that it may evaporate from the land surface and be transpired by the vegetation growing on it.

There will be at least four methane monitoring wells located at the corners of the proposed landfill area. These wells will be monitored quarterly to assure that standards for lateral migration of methane gas are not exceeded at the boundary.

Any open burning of clean, untreated, unglued wood will be done only after obtaining appropriate the open burning permits from the DEQ and local authorities. Since burning can only be done on days with good ventilation during the period specified on the permit, and there are no residences within close proximity to the site, it is anticipated that any impacts will be minor.

7. Unique, Endangered, Fragile or Limited Environmental Resources

A search of the Montana Natural Heritage Program website indicated there are two endangered species in the general area of Roosevelt County - the Interior Least Tern (*Sternula antillarum athalassos*) and the Pallid Sturgeon (*Scaphirhynchus albus*). The Missouri River lies about two miles south of the proposed landfill site and contains the Pallid Sturgeon (G1S1, USFWS federally endangered) and three other fish that are Montana Species of Concern: Sturgeon Chub, Sicklefin Chub, and the Blue Sucker. It also contains the globally rare sand-dwelling mayfly group. Species of Concern in Wolf Creek, and the regional community, include the Pearl Dace, Iowa Darter, Plains Minnow and Stonecat.

No intensive site survey was conducted to study the presence of sensitive, unique, endangered, or fragile species within or adjacent to the proposed new area. The impact to these resources remains unknown. Due to the low human population and sparse development surrounding the proposed site, there is adequate acreage of similar habitat available in the vicinity to accommodate any avian species that may be forced to relocate.

8. Demands on Environmental Resources of Water, Air and Energy

Energy demands related to landfill operation are primarily due to the hauling of waste to the facility. Lesser demands are from excavation and construction of new cells, and the compaction, covering and other routine landfill activities. Waste is now being hauled to the currently licensed facility and will also be hauled to the new landfill area, adjacent to the current operation. Construction and operation of the proposed landfill will cause an unavoidable minor increase in fuel use. These energy demands are not expected to impose excessive burdens on environmental resources. Continuing to use the current site will cause considerably less fuel to be used than if the waste were transported to the licensed Valley County Class II landfill in Glasgow, 49 miles away. Additionally, using this new site rather than the Sidney landfill will be a major savings in the amount of fuel used for waste disposal.

9. Historical and Archaeological Sites

The State Historical Preservation Office (SHPO) was informed of the plans to license a new landfill at this site. SHPO searched their records and found no documented historical or archaeological sites in the area proposed for landfill activities. This does not mean that there are no such sites in that location, but that no sites are known to exist, to date. The site is clearly located in a culturally rich region with known historic and pre-historic occupation by Native American tribal peoples.

The effects on these resources are not known because the applicant did not submit information on historical or archaeological sites within the proposed site boundary. Since there are many known Native American sites elsewhere in Roosevelt County, the SHPO recommended that a cultural resource survey be conducted prior to ground disturbance. SHPO also required that their office be immediately contacted if any cultural materials are inadvertently discovered during construction or operation of the facility.

## II. POTENTIAL IMPACTS ON HUMAN ENVIRONMENT

2. Cultural Uniqueness and Diversity

The effects on these resources are not fully known because the applicant did not submit information on historical or archaeological sites within the proposed site boundary. Since there are many known Native American sites elsewhere in Roosevelt County, the SHPO recommends that a cultural resource survey be conducted prior to ground disturbance. SHPO also required that their office be contacted if any cultural materials are inadvertently discovered during construction or operation of the facility.

3. Local and State Tax Base and Tax Revenue

Because construction of the proposed landfill has additional costs to the City, a future increase in the cost of waste disposal is highly probable. Thus, a minor potential impact will be the local increase in taxes for City residents and in landfill tipping fees for County residents. Since there will be a few additional workers hired during the construction phases of the proposed landfill, construction of the proposed facility could have a very minor positive effect on the local tax base.

4. Agricultural and Industrial Production

The area proposed for the landfill is currently used for grazing. Some adjacent land to the north and east is cultivated for dryland crops. Operation of the facility is anticipated to have a very minor effect on agricultural production by elimination of the 80 acres encompassed by the proposed facility boundary for cultivation. The vegetative cover of the landfill will be used as rangeland during post-closure after all closure activities are completed and the cover vegetation becomes well established. Overgrazing and development of noxious weeds will not be allowed.

5. Human Health

The most common potential for impacts to human health from the proposed landfill arise from the potential release of leachate to surface or ground water resources; air pollution from methane release and fires; and disease transmission from bird, animal and insect vectors. The criteria established for the approval of the leachate removal system protects the surface water. The criteria established for the approval of the alternative liner and no-migration petition protects the ground water. There are no close residences downwind of the facility that will be impacted by dust resulting from operations, but dust control is required to protect potential customers. DEQ Air Quality permits and local ordinances will control burning. Rules governing the application of daily and intermediate cover will control birds, rodents or other possible disease vectors by hindering their access to the waste, in addition to reducing the potential for landfill fires. The impacts to human health are minor.

7. Quantity and Distribution of Employment

During the construction phases of the landfill there could be a very minor increase in local employment due to the need for contractors and associated support personnel.

9. Demands for Governmental Services

The potential impact of the proposed facility will be minor. DEQ personnel must spend time reviewing the proposal, licensing the landfill, and performing regular compliance inspections. Contracted personnel will cause a slight increase in traffic on the roads leading to the landfill during construction. However, the impact is expected to be minor due to the relatively short time required for landfill construction.

10. Industrial and Commercial Activity

Construction of the proposed facility will cause a minor increase in the industrial activity of the area during construction due to the need for contractors and associated materials and machinery repairs. No additional secondary impact to industrial or commercial activity of the area is expected beyond the 80-acres of lost agriculture. The area immediately surrounding the proposed site is undeveloped rural land with no commercial or industrial activity other than grazing and limited farming of cereal grains, The landfill will continue to provide a legal and environmentally sound waste disposal option for industrial and commercial establishments for Wolf Point and for Roosevelt County.

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