



Brian Schweitzer, Governor
Richard H. Opper, Director

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December 21, 2012

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Mr. Ross Oakland, PO Box 592, Glendive, MT 59330
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Kubesh, Inc., 505 River Road, Glendive, MT 59330
Mr. Barry Damschen, Barry Damschen Consulting, LLC., 5531 York Road, Helena, MT 59602
Todd Hartleben, Carlson-McCain, via email
John Harris, R360, via email

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 (DEQ) has prepared the enclosed Environmental Assessment (EA). This EA addresses the proposed licensure of a new Class II landfill for the disposal of oilfield exploration and production solid waste. The proposed facility is located on private property approximately 25 miles northwest of Glendive, off Dawson County Road 448.

The purpose of this EA is to inform all interested governmental agencies, public groups and individuals of the proposed action and to present DEQ's findings on the proposal. Persons wishing to comment have until the close of business on January 21, 2013 to submit written comments concerning the proposal. DEQ will not make a licensing decision until after the comment period has ended. A complete color copy of the EA may be viewed on DEQ's website at <http://www.deq.mt.gov/ea/WasteMgt.mcp.x>.

If you wish to comment on this proposed action within the 30-day public comment 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 mailbox wutbcomments@mt.gov.

Sincerely,

Mary Louise Hendrickson
Project Lead
Solid Waste Licensing Program
Phone: 406-444-1808; Fax: 406-444-1374
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Enclosure: EA – Oaks Disposal Landfill EA

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

Permitting and Compliance Division
Waste and Underground Tank Management Bureau
Solid Waste Section
PO Box 200901
Helena, MT 59620-0901

ENVIRONMENTAL ASSESSMENT (EA)

SECTION 1.0 – PROJECT DESCRIPTION:

Mr. Ross Oakland (applicant) of Oaks Disposal, LLC., submitted a solid waste management system license application to the Department of Environmental Quality's (DEQ) Solid Waste Program (SWP) for the licensure of a proposed Class II landfill to manage oilfield solid waste. The proposed landfill is located approximately 25 miles northwest of Glendive, in the NW ¼ of Section 35, Township 18 North, Range 52 East, MPM, Dawson County, Montana. At the present time, the property is used only intermittently for livestock grazing. The proposed landfill will be developed in four separate phases with a total waste disposal capacity of 1,142,000 cubic yards (yds³) over an expected 14-year life.

Purpose of the Environmental Assessment:

In accordance with 75-1-102, Montana Code Annotated (MCA), the Montana Environmental Policy Act (MEPA) is procedural and requires the "adequate review of state actions in order to ensure that environmental attributes are fully considered by the legislature in enacting laws to fulfill constitutional obligations; and the public is informed of the anticipated impacts in Montana of potential state actions." According to MEPA, environmental assessments (EAs) are the procedural documents that communicate the process agencies follow in their decision-making. An EA does not result in a certain decision, but rather serves to identify the potential effect of a state action within the confines of existing laws and rules governing such proposed activities so that agencies make balanced decisions. The MEPA process does not provide regulatory authority beyond the authority explicitly provided in existing statute.

The Solid Waste Management Act laws and rules establish the minimum requirements for the design and operation of solid waste management systems. The EA is the mechanism that DEQ uses to: 1) Determine whether a proposed site meets the minimum requirements for compliance with the current laws and rules and is therefore licensable as proposed; 2) Assist the public in understanding the licensing laws of the SWP; 3) Identify and discuss the potential environmental effects of the proposed site if it is approved and becomes operational; 4) Discuss actions taken by the applicant and the enforceable measures and conditions designed to mitigate the effects identified by DEQ during the review of the application; and 5) Seek public input to ensure DEQ has identified the substantive environmental impacts associated with the proposed landfill.

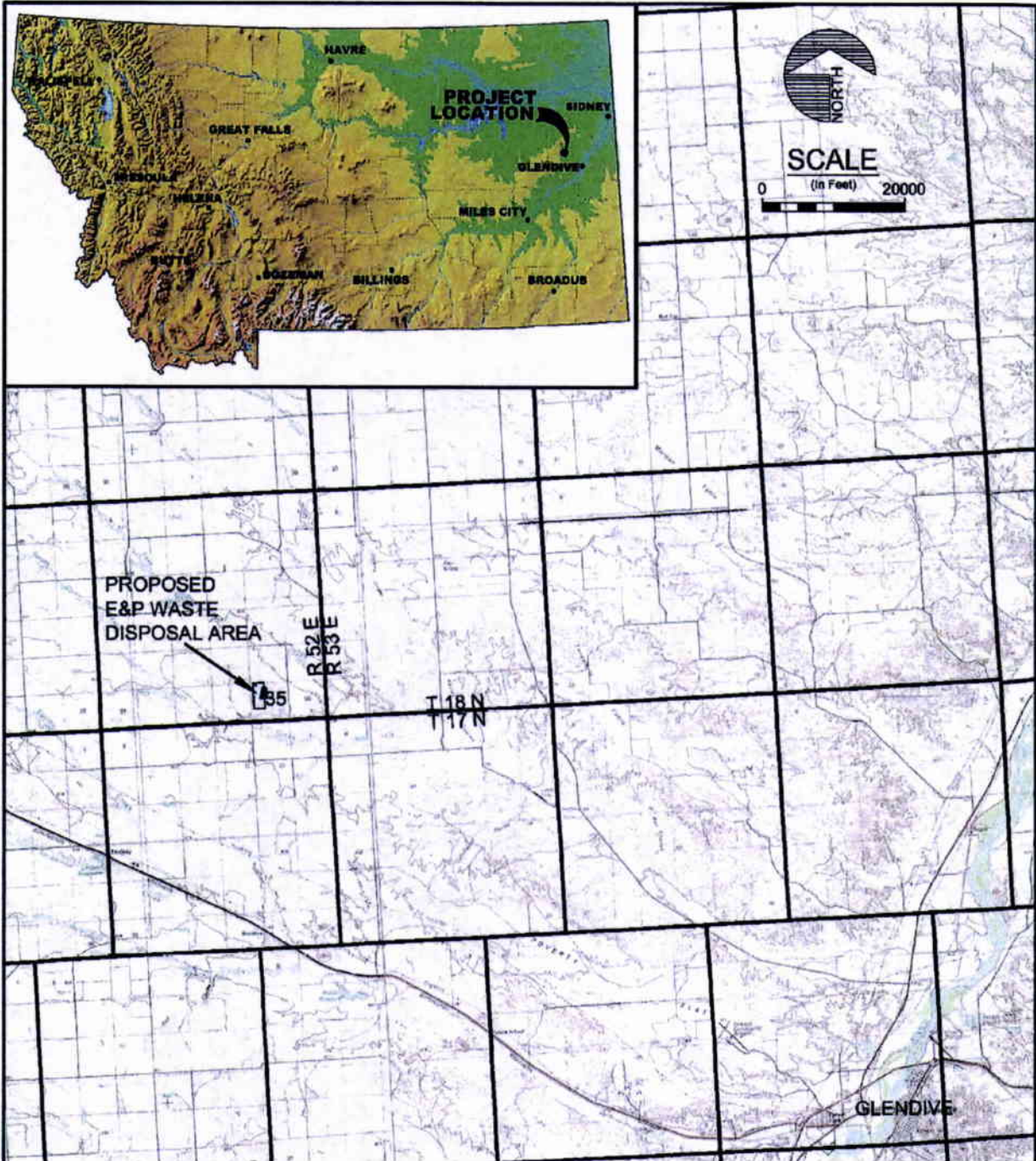
Benefits and Purpose of the Proposal

The main objective of the proposal is to provide an environmentally sound option for the disposal of oilfield solid wastes to the oil and gas exploration and production companies in the area. Oil and gas exploration and production (E&P) solid wastes will be hauled to the facility by the drilling company operators, oilfield service companies, and licensed haulers. The proposed facility will be a privately owned and operated landfill that will not be open to the public. In Montana, E&P wastes may be managed at currently licensed Class II municipal solid waste landfills only after the landfills have requested and received approval from the SWP to do so. At the present time, there are no facilities in Montana that are licensed to manage only E&P wastes; there is only one municipal solid waste landfill that is currently approved to manage a limited group of E&P wastes. Licensure of the proposed facility will provide oil and gas exploration and production companies a legal option for the management of E&P wastes, by so doing, the potential rapid reduction in the capacity at publicly owned landfills in the region can be averted.

Site Location:

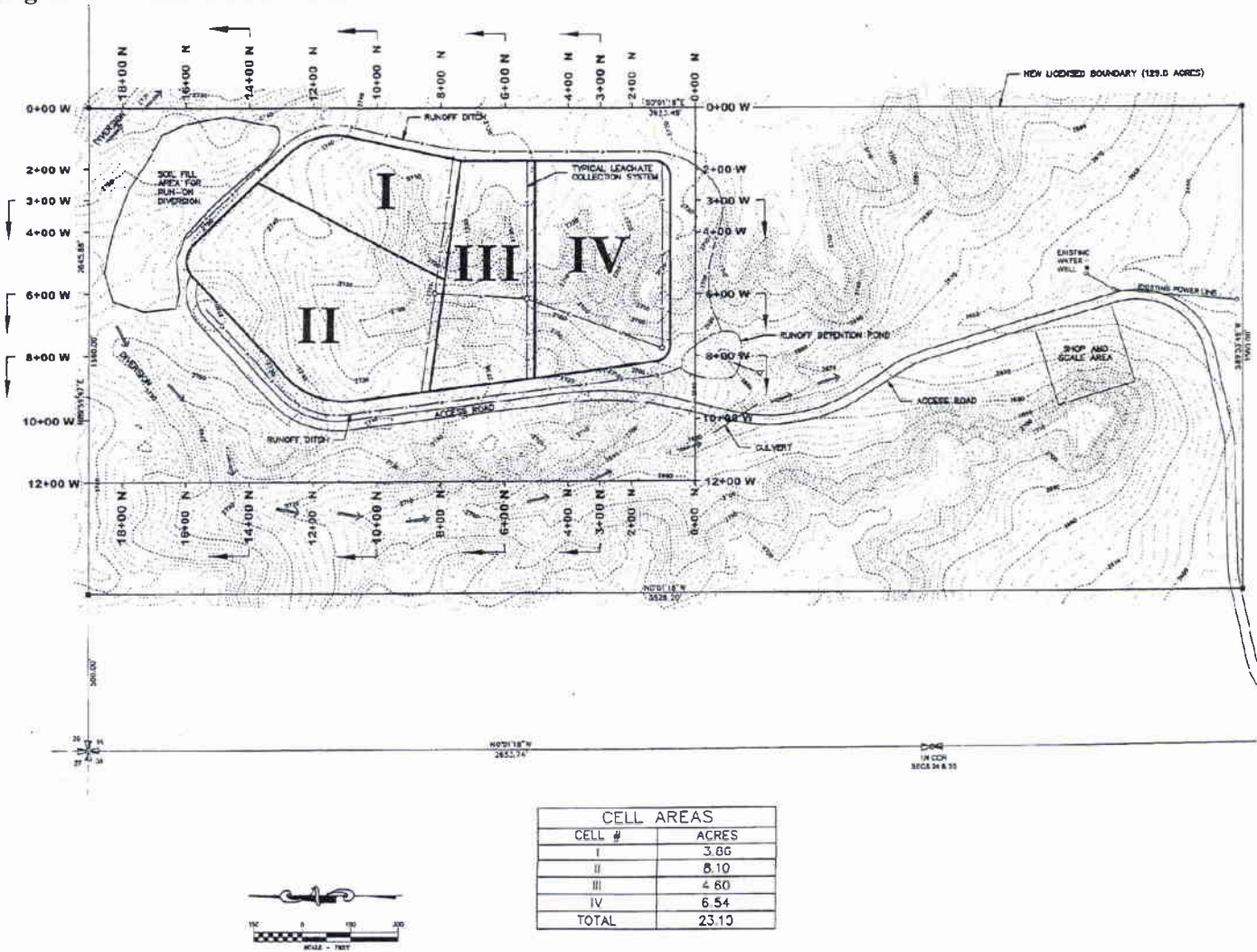
The proposed landfill is located on private property just off Dawson County Road 448 in the NW ¼ of Section 35, Township 18 North, Range 52 East, MPM, Dawson County, Montana (Figure 1.1). Of the 129.8 acres proposed for the solid waste management facility, only 23.1 acres are proposed for active landfilling activities (Figure 1.2).

Figure 1.1: Location of Proposed Site



From: Hydrometrics, Inc., New Oaks Disposal Landfill Application, 2012

Figure 1.2: Landfill Site Plan



From: Barry Damschen Consulting, LLC., New Oaks Disposal Landfill Application, 2012

Site Geography – Topography, Vegetation, and Climate:

The proposed landfill site is located in the Missouri Plateau Level IV ecoregion of the Northwestern Great Plains. The area is characterized as mostly treeless with rolling hills and gravel covered benches that were mostly unmodified by continental glaciation. Some areas in the region are subject to wind erosion, especially those areas that are overgrazed. The region is comprised of Quaternary terrace deposits underlain by the Tertiary Fort Union Formation and Flaxville Gravels. Soils in the area are typically Entisols derived from residuum and are not as naturally fertile as the till-based soils that are found in Northwestern Glaciated Plains ecoregion further north of Dawson County. The primary natural vegetation in and around the area is consistent with the vegetation characterizing the Great Plains Mixedgrass Prairie, and consists of thickspike wheatgrass and green needlegrass. Land use in the area is a mosaic of rangeland and farmland. Spring wheat, oats, hay, and barley are common crops.

The climate is typical of mid-continental regions, with long severe winters and hot summers. Precipitation in the area ranges from 11 to 16 inches annually, with most of the precipitation occurring during the late spring and early summer months. The growing season averages 115 days.

Landfill Features – Design, Construction, Operations, Closure, and Post-Closure Care:

The general landfill design features and layout of the proposed Oaks Disposal Landfill are depicted in the previous Figure 1.2. The proposed facility consists of several key components including the scale and landfill shop building, facility access road, disposal units, leachate collection and removal system, and storm water control features.

Alternative Liner Demonstration (ALD) – As part of the application for the proposed facility, the applicant submitted an ALD, according to the Administrative Rules of Montana (ARM) 17.50.1204(2), certifying the performance of the proposed alternative composite liner (ACL). The proposed ACL consists of an upper 60-mil, high-density polyethylene (HDPE) geomembrane placed over a lower needle-punched and laminated geosynthetic clay liner (GCL). The material specifications for the upper and lower components of the ACL will be selected for landfill unit construction based on their conformance with the approved ALD design parameters.

The ALD primarily depends upon the established results of comparisons between the performance of the proposed 1-cm thick GCL with a saturated hydraulic conductivity (Ks) of 1.0×10^{-9} cm/s versus the maximum Ks of 1.0×10^{-7} cm/s for the 2-ft thick compacted clay layer (or CCL) component of the prescriptive standard-composite-liner (PSCL). The standard PSCL is comprised of a minimum 30-mil flexible membrane liner placed over at least a two-foot thick clay layer with a Ks of no more than 1.0×10^{-7} cm/sec. The proposed ALD design is functionally equivalent to the PSCL. This was validated using various documented studies and tests conducted under lab and field conditions that sufficiently match those proposed for installation of the composite liner at the Oaks facility.

Landfill Unit Construction - The ACL will be installed according to the manufacturer's guidelines for each geosynthetic component and tested for conformance with the approved design. The ACL consists of the following components from top to bottom:

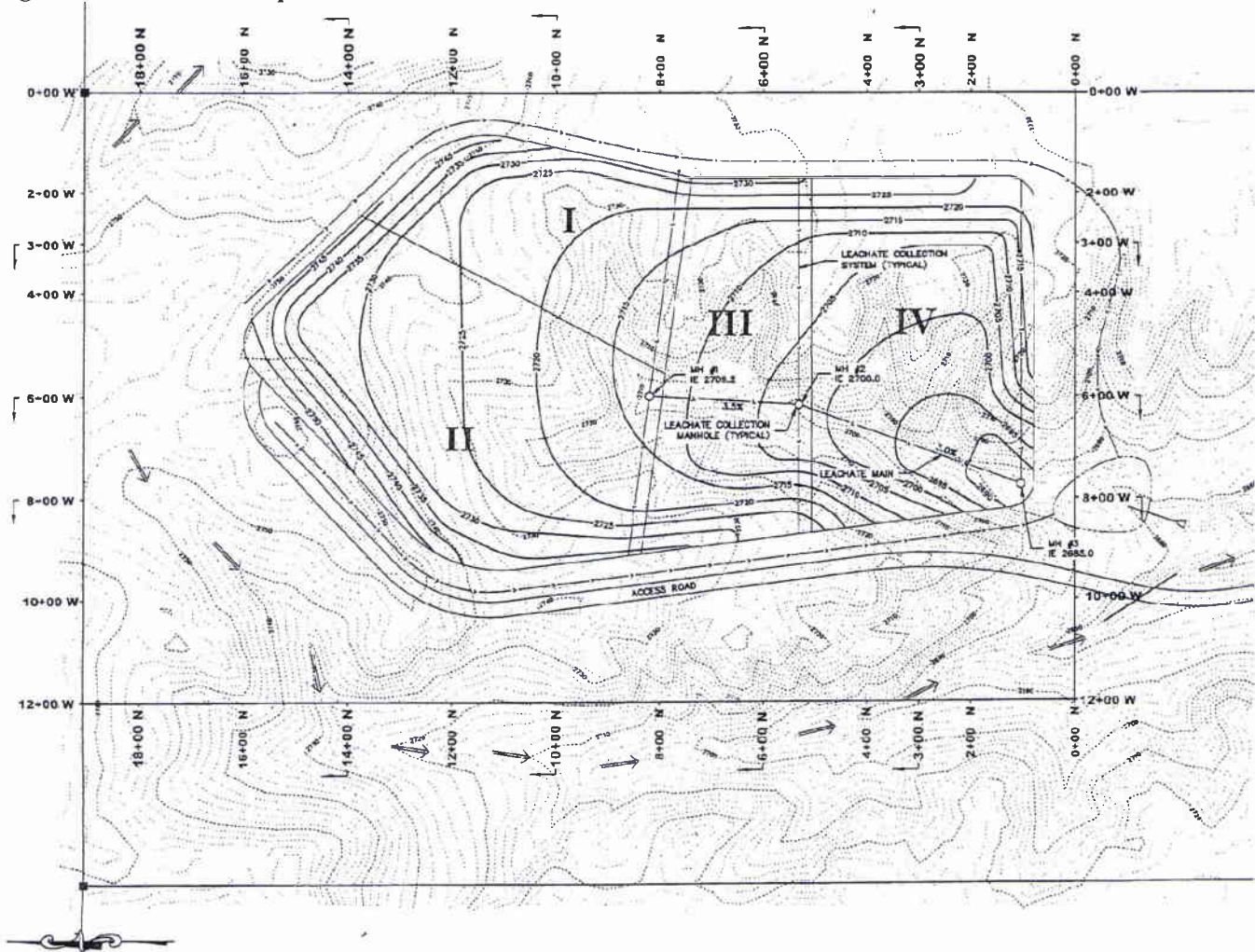
- HDPE geomembrane (60-mil)
- Geosynthetic clay liner (GCL needle-punched laminate with geotextile carrier and cap)
- Basal cushion layer (6-in thick compacted clay soils or CCL)

The HDPE geomembrane will be installed in direct and uniform contact with the GCL component that will be placed over a smooth basal cushion layer. Soils of the cushion layer shall be compacted in a single lift to an appropriate density such that Ks, as noted above, will not exceed 5.0×10^{-6} cm/s. The in-place density and moisture content, gradation, and remolded Ks of the cushion layer soils will be tested during construction for their conformance to the ALD parameters. Construction quality assurance and quality control (CQA/QC) will be performed during ACL construction according to all project plans approved by the DEQ.

According to the proposed design plan, a single landfill unit will be constructed in four phases expanding from north to south within the 23.1-acre disposal footprint with an average basal slope of 3.5 percent and side slopes of 5:1 (Figure 1.3). The average cut removes 8.2 feet of the weathered bedrock including some layers where groundwater seepage was noted during the initial field investigation. During construction of each phased unit, the location of these seeping layers relative to the base of the composite liner will be evaluated. Additional subdrain structures at the top of the subgrade will be required where the seeping layer is not completely removed.

The average waste fill depth is 33 feet. Utilization of the 1,440,000 yds³ landfill capacity will provide for the disposal of at least 1,142,000 yds³ of waste over an estimated 14-yr life with a proposed annual waste acceptance rate of 80,000 yds³/yr. Total landfill excavation will provide 354,000 yds³ of soil for utilization as intermediate and final cover.

Figure 1.3: Landfill Sequence and Base Contour Plan



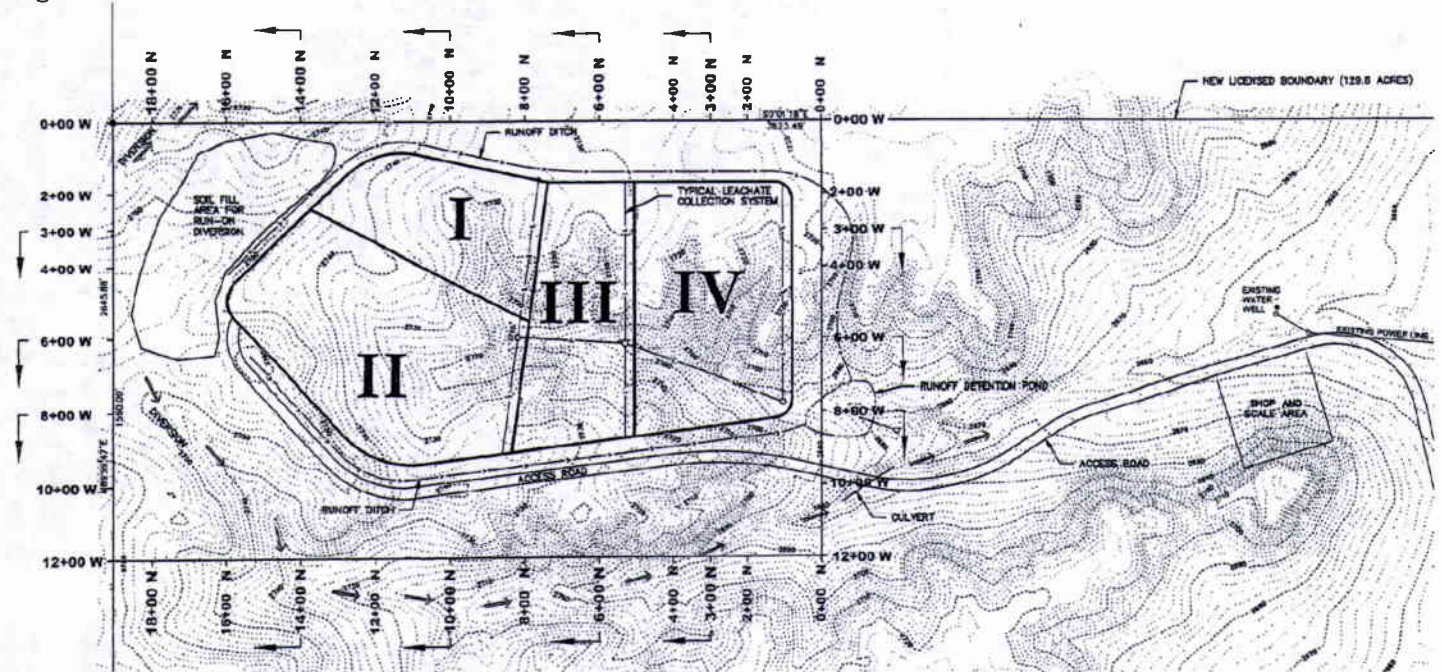
From: Barry Damschen Consulting, LLC., New Oaks Disposal Landfill Application, 2012

Leachate Collection and Removal System - Leachate is generated as a result of internal liquids draining from waste or external liquids contacting or flowing through waste. Although the quantity of leachate generated from large-volume disposal of mixed E&P wastes has not yet been documented, the proposed solidification of selected waste-stream components with the addition of stabilizers will likely impede the production of leachate. Leachate will be collected over the base of the landfill units within a 15-in thick gravel blanket that drains to 6-in perforated leachate removal pipes located in gravel-bedded 2x2-ft trenches and connected to manhole sumps aligned along the coulee axis at the toe of each phase (see Figure 1.3). Leachate levels within the manhole sumps will be measured at least quarterly, and after significant precipitation events (rainfall greater than 0.25 inches). The manhole sumps will be pumped as necessary to ensure leachate depths do not exceed one-foot. Leachate will be sampled and analyzed before being transported to an approved wastewater treatment facility for disposal.

During the first year of operations, the liquid collected in the leachate sump will be sampled on a semi-annual basis and analyzed for total metals, radionuclides (Ra-226, Ra-228, U-238, or Th-232) and selected organic hydrocarbon compounds (GRO, TPH, EPH, VPH, and BTEX). Any proposed demonstration for a site-specific waiver from the existing requirement for a permanent leachate removal system will be based on the amount of leachate generated and the contaminant concentrations measured during the first year of operations.

Scale and Shop Building — The facility will be accessed by a gravel road at the southwest gated entrance where the scale and shop building will be located (Figure 1.4). Once constructed, the disposal units and shop building will be the dominant features of the site. The shop design, layout, and construction details will be reviewed and approved by the SWP in advance of the construction of these features on site.

Figure 1.4: Site Features

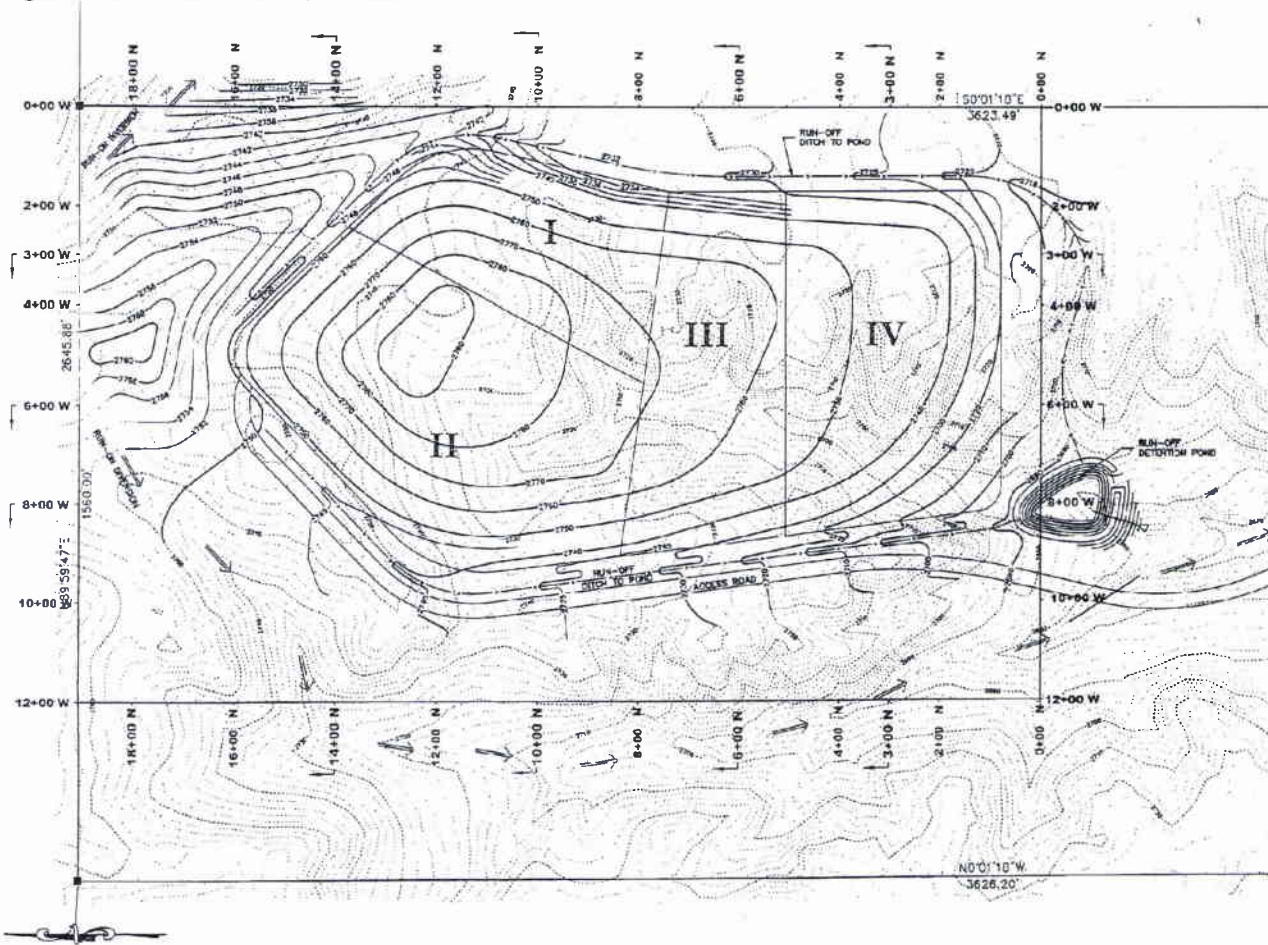


From: Barry Damschen Consulting, LLC., *New Oaks Disposal Landfill Application*, 2012

Soil Stockpiles — The topsoil removed during site development will be used to construct a berm on the northeast corner of the site within the licensed boundary. This berm will divert stormwater around the perimeter of the active landfill unit, as depicted in Figure 1.4, and will be seeded to prevent erosion of the stockpiled soils. The additional earthen-materials removed during excavation of each landfill unit will be stockpiled on the subsequent unit and will be used as-needed for daily, intermediate, and final soil cover. Other best management practices (BMP's) or features that may include erosion control mats, screens, wattles, or berms will be used to control erosion from the stockpiles as needed.

Final Closure — Once each of the four phased landfill units have been filled to final grade, the waste units will be capped as a single, mounded disposal unit by a continuous composite final cover (Figure 1.5). The final cover will be installed upon landfill closure according to the manufacturer's guidelines for each geosynthetic component and tested for conformance with the design.

Figure 1.5: Final Contour Plan



From: Barry Damschen Consulting, LLC., New Oaks Disposal Landfill Application, 2012

The barrier characteristics of the composite final cover (CFC) must at least match those of the alternative composite liner. The proposed CFC shall contain the following components from top to bottom:

- Topsoil (12-in thick)
- Frost protection layer (12-in thick)
- Geotextile filter fabric
- Gravel drainage layer (6-in thick)
- Geotextile filter fabric
- PVC geomembrane (30-mil)
- Geosynthetic clay liner (GCL)
- Geotextile filter fabric
- Gas venting layer (6-in thick gravel) penetrated by 6-in perforated PVC pipe vents
- Geotextile filter fabric
- Intermediate soil cover over waste

The intermediate cover surface and contours will be smoothed adequately prior to installation of the CFC components. The PVC geomembrane (FML) will be installed in direct and uniform contact with the GCL component to form a composite barrier that functions like the basal composite liner system.

According to the proposed Closure Plan, the landfill final elevation will not be more than 30 feet above the surrounding grade. The composite final cover contours will attain an 8.5 percent average grade from north to south with maximum side slopes not to exceed a 5:1 grade. The potential need for storm water drainage benches will be evaluated prior to construction of the final cover. The topsoil will be fertilized and seeded according to recommendations by the USDA Natural Resources Conservation Service. Construction quality assurance and quality control will be maintained during final cover construction according to all project plans approved by DEQ.

Post-Closure Care — The final cover will be monitored periodically for drainage performance, erosion, and vegetative cover to ensure successful performance of the cap through the 30-year post-closure care period. The effectiveness and maintenance of the storm water control system will also be monitored. Repairs to the storm water control system and the cap will be made as necessary.

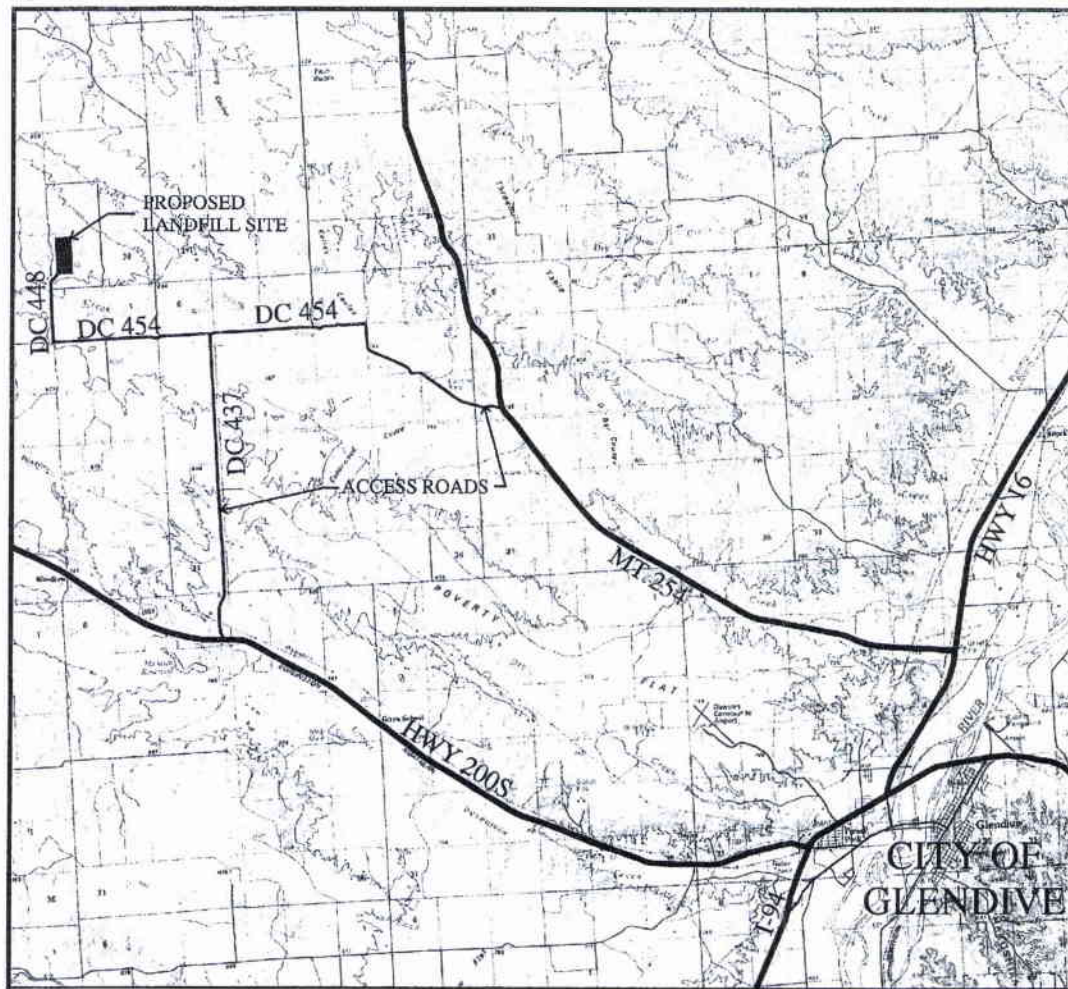
Facility Operation and Maintenance Plan: Operations at the facility will follow an Operations and Maintenance (O&M) Plan describing the DEQ-approved procedures for all solid waste management activities.

Personnel — The facility will be operated as a private landfill. The day-to-day administration and operation of the landfill will be the responsibility of the applicant. The facility will be staffed by one full-time employee. Additional personnel will be added as needed. Site personnel will inspect incoming loads, review waste manifests to ensure compliance with the waste management standards, operate landfill equipment, and apply the necessary soil cover.

Operating Hours — The hours and days of facility operation will vary depending upon the needs of the site users.

Access Control — The site is located approximately 25 miles northwest of Glendive. The site will be accessed from one of two possible routes. The first from US Highway 200, turning north onto Dawson County (DC) Road 437 for six miles, then turning west onto DC Road 454 for three miles, then a final turn on DC Road 448 for one mile to the site. The other possible route to access to the site is from MT Highway 254 turning west on DC Road 454 for ten miles then turning north onto DC Road 448 for one mile to the site. As depicted in Figure 1.6, the main entrance to the facility is located at the north end of DC Road 448. A sign will be installed at the facility entrance that indicates the hours of operation, facility contact information, and the types of acceptable wastes. The public will not access the site. The site will be fenced and gated, and the gate will be locked when the facility is closed. At least one full-time operator will be on duty when the site is open.

Figure 1.6: Site Access Route



Acceptable Wastes — The Oaks Disposal Landfill will accept only RCRA-exempt non-hazardous solid waste generated by oil and gas exploration and production activities. Waste generators will provide the facility the results of independent third-party characterization to ensure that wastes delivered to the site do not exceed 5% total petroleum hydrocarbons, do not contain free liquids, and concentrations of Ra-226, Ra-228, and Pb-210 do not exceed 30 picocuries per gram. In addition to the characterization information, the landfill operator will monitor incoming wastes for radiation levels. If hazardous wastes are discovered at the scale, or if the results of radiation monitoring indicate that radiation levels in the waste exceed twice the natural background concentration at the landfill, the facility will reject the load and instruct the customer to dispose of it at an appropriate facility. The facility operator will notify DEQ's Solid Waste Program within 24-hours when prohibited wastes are discovered or loads are rejected during waste screening activities at the facility.

Landfill Equipment — The equipment used at the landfill will include:

- A rubber-tired front loader to consolidate the waste and apply daily soil cover;
- A D6 Cat;
- A scraper for excavating and transporting soil; and,
- A motor grader for road maintenance.

Daily Landfill Operations — The facility will be accessed only by waste generators and haulers. The landfill operator will inspect all incoming waste loads and associated waste characterization information to ensure all wastes meet the criteria for disposal. All incoming loads will be directed to the scale and then to a staging area for load inspection, paperwork evaluation, and radiation monitoring. The vehicles will then be directed to the landfill for unloading once the load inspection has been completed. Empty vehicles will be directed back to the scale to weigh out before departing the facility. At the working face, the landfill operator will inspect each load for prohibited waste as it is unloaded. DEQ must be notified if prohibited wastes are found during waste screening activities at the 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.

Wastes will be landfilled in 10-ft high lifts. Each 10-ft lift will encompass an area approximately 300' x 200' and will be filled towards the landfill toe on the south end of each phase. Waste filter socks, plastic pit liners, sorbent pads, and other blowable wastes will be disposed of in a separate area within the disposal unit. These wastes will be covered with at least 6 inches of soil or drill cuttings at the end of the day on which they are received. The waste drill cuttings and produced sands will be covered with at least 6 inches of cover soil on a quarterly basis, or as each 10-ft lift is completed, whichever is sooner.

Waste Disposal Capacity — The proposed landfill will be developed in four phases, each phase consisting of one landfill unit. Phase I will provide for the disposal of 144,000 yds³ of waste; Phase II will provide for the disposal of 458,000 yds³ of waste; Phase III will provide for the disposal of 256,000 yds³ of waste; and Phase IV will provide for the disposal of 284,000 yds³ of waste. The total projected landfill life is 14 years.

Soil Excavation and Budget — Excavation for construction of the landfill units will progress in four phases. Approximately 79,000 yds³ of soil will be excavated for Phase I; 97,000 yds³ of soil will be excavated for Phase II; 72,000 yds³ of soil will be excavated for Phase III, and 106,000 yds³ will be excavated for Phase IV. As noted previously, topsoil removed during site development will be used to construct a berm on the northeast corner of the site within the licensed boundary. This berm will divert stormwater around the perimeter of the active landfill unit, as depicted in Figure 1.5, and will be seeded to prevent erosion of the stockpiled soils. The additional earthen-materials removed during excavation of each landfill unit will be stockpiled on the subsequent unit and will be used as-needed for daily, intermediate, and final soil cover. Ultimately, about 298,000 yds³ of soil will be used for daily, intermediate, and final cover, leaving a soil surplus of 56,000 yds³.

Storm Water Control — The facility will follow erosion, drainage control, and sediment Best Management Practices (BMP's). The BMP's, including the construction of the berm on the northeast corner of the facility, the establishment and maintenance of vegetation on closed areas as well as on soil stockpiles, will be implemented as necessary. Areas receiving final cover will be contoured for positive drainage so that surface runoff will be routed away from the active disposal area and will not pond over the waste. Runoff from fully re-vegetated and closed areas of the landfill final cover may discharge naturally off-site. Ditches, swales, and berms will be constructed around the perimeter of the disposal area to divert storm water run-on away from the active landfill unit.

Financial Assurance — In accordance with ARM 17.50.540, all Class II landfills must provide and maintain a Financial Assurance (FA) mechanism to cover costs associated with facility closure, post-closure care, and potential corrective action. FA ensures that work associated with facility closure is completed in the event the operator cannot or will not do so on his own accord. FA is required for the Oaks Landfill in an amount based on the costs associated with third-party closure of the maximum exposed landfill area and post-closure care. The FA mechanism will be approved by DEQ before it is funded and DEQ will be the fund beneficiary. The facility will update the FA cost estimates annually to ensure the mechanism is adequately funded.

SECTION 2.0 – ALTERNATIVES CONSIDERED:

Solid Waste Section Roles and Responsibilities:

DEQ's Solid Waste Section is responsible for ensuring activities proposed under the Solid Waste Management Act, the Septage Disposal Licensure Act, and the Motor Vehicle Disposal & Recycling Act are in compliance with current regulations.

The following provides a description of reasonable alternatives whenever alternatives are reasonably available and prudent to consider:

A decision by DEQ is triggered when the applicant upholds the request for licensure of the proposed activity at the proposed location. The applicants however, may at any time choose to withdraw the application by exercising the "no action" alternative. If the 'no-action' alternative is chosen, the applicant could seek to locate a similar facility elsewhere.

Alternative A: The "no action alternative". Under this alternative, a final decision by DEQ is not required because the applicant will have chosen to withdraw the application for licensure of the landfill. By withdrawing the application from consideration by the DEQ, the applicant could seek an alternative site for the proposal. Although it is plausible, the applicant's selection of this alternative is unlikely. Rather, the applicant will likely continue the request for licensure of the proposed activity at the proposed site.

In the absence of the applicant's selection of the 'no-action' alternative, and prior to DEQ's final decision, two other possible alternatives were considered during the preparation of this EA.

Alternative B: Under this alternative, DEQ denies the new landfill application because the applicant failed to provide information needed to address any deficiencies identified during the review of the application and/or the public comment phase. Deficiencies may be due to an unforeseen shortfall in meeting site requirements, licensing criteria, regulatory criteria or legal issues, or the ability of the applicant to mitigate a potentially substantial impact to human health or the environment. If denied, the applicant has the option to locate, investigate, and apply for licensure of another site suitable for the proposed activity.

Alternative C: Under this alternative, DEQ approves the application and issue a new license establishing the Oaks Disposal Landfill facility as proposed by the applicant. Several factors support the viability of this option:

1. Due to the recent increase in oil and gas exploration and production activities in the region, there is a need for the disposal of the special wastes generated from the activities.
2. The population, land use, and development of land surrounding the proposed facility are sparse, minimizing the potential risk of adverse effects on human health due to the unlikely release of pollutants to the environment from the operation of the proposed facility.
3. The site is rural private property that will be fenced and access will be controlled; and,
4. All activities will be performed in accordance with an approved Operation and Maintenance Plan (O&M) and verified by periodic inspections by DEQ and/or Dawson County personnel, so the effects on human health and the environment are minimized.

In consideration of these alternatives, the potential environmental effects of Alternative C were evaluated for the proposed project based on the information provided and DEQ research on the area surrounding the proposed site. The results of DEQ's evaluation of potential environmental impacts related to the proposed facility are summarized in Section 3.0.

SECTION 3.0: EVALUATION OF POTENTIAL EFFECTS

Tables 3.1 and 3.2 of this section identify and evaluate the potential effects that may occur to human health and the environment if the land application site is approved. The discussion of the potential impacts only includes those resources potentially affected. If there is no effect on a resource, it may not be mentioned in the appendix.

Direct and indirect impacts are those that occur in or near the proposed project area and may extend over time. Often, the distinction between direct and indirect effects is difficult to define and for the purposes of this discussion, direct and indirect impacts are combined.

The discussion of the cumulative impacts is restricted to the net effects of the proposed project because no other known projects are proposed in this area. A secondary impact is brought about by a primary impact and may occur at a later time or distance from the triggering action. No secondary impacts are expected.

TABLE 3.1 - IMPACTS TO THE PHYSICAL ENVIRONMENT

<u>PHYSICAL ENVIRONMENT</u>	Major	Moderate	Minor	None	Unknown	Attached
1. SITE TOPOGRAPHY, GEOLOGY & SOIL QUALITY, STABILITY & MOISTURE:			✓			✓
2. WATER QUALITY, QUANTITY & DISTRIBUTION:			✓			✓
3. AIR QUALITY:				✓		✓
4. DEMANDS ON ENVIRONMENTAL RESOURCES OR LAND, WATER, AIR OR ENERGY:				✓		
5. TERRESTRIAL, AVIAN, AND AQUATIC LIFE AND HABITATS:			✓			✓
6. VEGETATION COVER, QUANTITY & QUALITY:				✓		
7. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES:				✓		
8. HISTORICAL AND ARCHAEOLOGICAL SITE:				✓		
9. AESTHETICS:				✓		
10. AGRICULTURE:			✓			✓

CUMULATIVE AND SECONDARY IMPACTS —The cumulative impacts from the licensure of the proposed Class II Solid Waste Management Facility are minor. The net potential impact of the proposed facility on the physical environment is probably very minor. Development and population surrounding the proposed site is sparse. The area surrounding the site is agricultural land used primarily for crop production and livestock grazing. While the proposal will remove 129.8 acres from the landowner for crop production and livestock grazing, there is sufficient acreage in the area available to the landowner, so the impact will be minimal. There are no recognized secondary impacts.

3.1 POTENTIAL IMPACTS OF THE PROPOSED DISPOSAL SITE ON THE PHYSICAL ENVIRONMENTS (See Table 3.1)

1.0 Site Geology and Soil Quality - Stability and Moisture

The proposed Oaks Disposal Landfill is situated in the uplands northwest of Glendive where Quaternary-Tertiary age alluvial terrace deposits are present on the ridge tops at the site. These alluvial terrace deposits consist of well sorted sand and gravel that are less than 20 feet thick. Minor Quaternary alluvial deposits that are less than 10 feet thick and are comprised of sand and gravel are present in the drainage bottoms. The dominant geologic unit at the site is the Tertiary Tongue River Member of the Fort Union Formation. This unit underlies the alluvial deposits and crops out on the slopes at the site. In this area, the Tongue River unit is several hundred feet thick and consists of interlayered shale and sandstone with many small lignite coal beds. In test borings at the site, the Tongue River unit was described as layers of yellowish-brown to gray sandstone, siltstone, and shale/claystone with a few minor coal seams.

The natural soils at the site consist of the Lonna-Cambeth-Cabbart silt loam, the Subwell-Bigsheep complex, and the Lambert gravelly loam. Key soil properties are summarized in Table 3.3 and a map of the soil types are shown on Figure 3.1. The soils were developed from the alluvium present on the surface at the site or from residuum of the weathered Tongue River unit. The Subwell-Begsheep and Lambert soils on the ridges and slopes at the site are gravelly loam and the Lonna-Cambeth-Cabbart soil in the valley is silt loam.

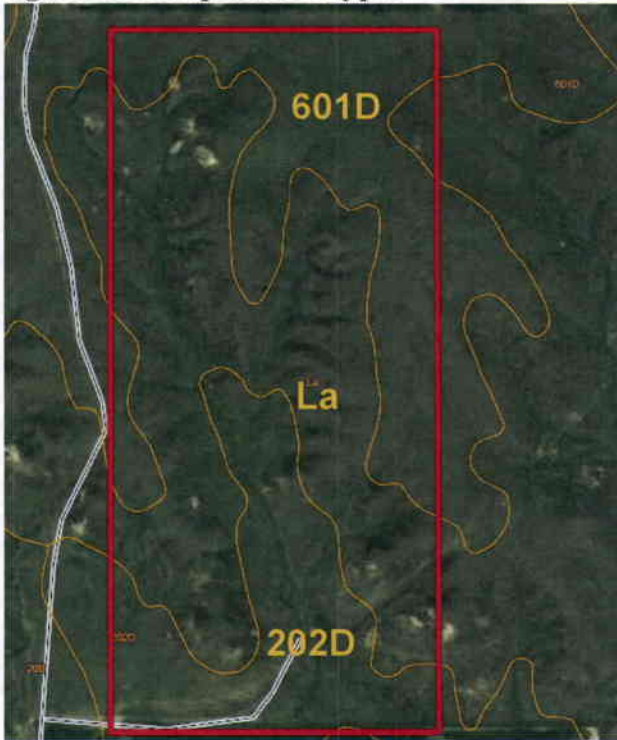
Test pits and borings dug at the site showed primarily sand and gravel with some silt. Locations in the drainage bottoms had clayey sand and gravel.

During the construction and operations of the landfill, the native soils and subsurface materials in the fill area will be removed and stockpiled on site for the construction of a stormwater diversion berm and for use as cover soil. Following closure of the landfill, the top soil will be re-placed over the closed landfill, and then revegetated to restore the site to pre-landfilling conditions.

Table 3.3: Summary of Soil Properties

Soil Type	Map Key	Depth	Drainage	Permeability	Available Water Capacity	Erosion Hazard	Compaction Characteristics
Lonna-Cambeth-Cabbart silt loams, 4-12% slopes	202D	Moderately Shallow	Well Drained	Very Low – Moderately High	Very Low – High	Medium – Medium High	Fair – Poor
Subwell-Bigsheep complex, 4-15% slopes	601D	Very Deep	Well Drained	Moderately High – High	Low – Moderate	Medium	Poor
Lambert gravelly loam, 20-40% slopes	La	Shallow	Well Drained	Very Low – Moderately High	Very Low	Medium	Very Poor

Figure 3.1: Map of Soil Types



601D: Subwell-Bigsheep complex, 4-15% slopes

La: Lambert gravelly loam, 20-40% slopes

202D: Lonna-Cambeth-Cabbart silt loams, 4-12% slopes

(from: USDA-NRCS, *Web Soil Survey, Dawson County, Montana*)

2.0 Water Quality, Quantity and Distribution

Surface Water

The proposed Oaks Disposal Landfill is located on the south side of the ridge between the Middle Fork Deer Creek and the South Fork Deer Creek, about one half mile north of the South Fork Deer Creek. An intermittent drainage is mapped on the United States Geological Survey (USGS) Johnson Reservoir 1:24,000 quadrangle map within the facility boundary. The two branches of this intermittent channel drain in a southerly direction and join just south of the proposed landfill unit running south to just beyond the facility boundary. These drainages do not extend to the South Fork Deer Creek on the USGS map however. Surface water flows would occur in these drainages only during periods of heavy rainfall or rapid snowmelt. There are no natural springs known within the immediate vicinity of the proposed landfill facility.

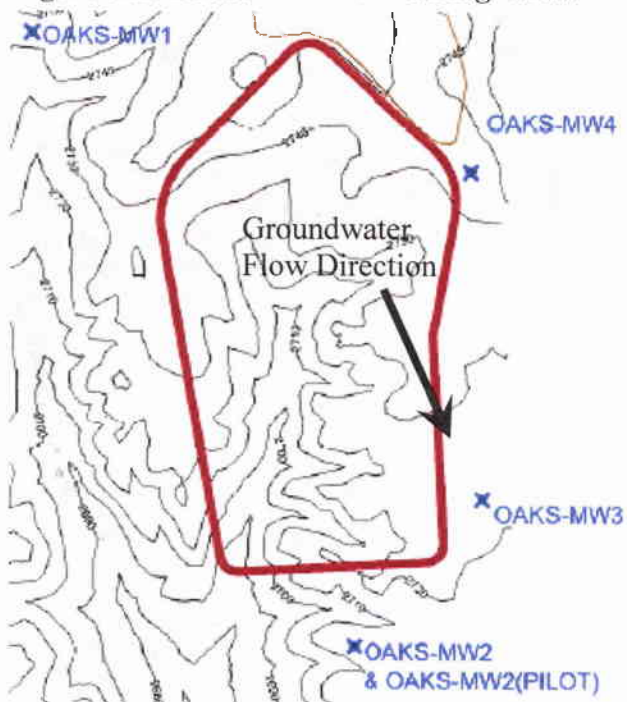
As part of the landfill construction and operation activities, the eastern branch of the intermittent drainage will be filled. The topsoil removed from the areas proposed for landfilling will be stockpiled in the northeast corner of the site and used to construct a berm to divert storm water around the facility. Ditches will be constructed on the east and west sides of the active landfill area to direct any water which would normally flow in the eastern drainage. The redirected storm water will flow around the landfill unit to a detention pond just north of the confluence with the western branch of the drainage. The pond will be constructed to contain the water from the 24-hour 25-year maximum precipitation event. If a discharge from the detention pond is necessary, the facility will first obtain a permit for storm water discharge from DEQ's Water Protection Bureau. Due to the small watershed of this intermittent drainage, the low precipitation the area receives, and the fact that the drainage does not extend to the South Fork Deer Creek, impacts to surface water are expected to be minimal.

Groundwater

A thin aquifer is hosted by the sand and silt units of the Tongue River Member of the Fort Union Formation immediately below the site. This aquifer is not continuous in lateral extent and only yielded minimal volumes (less than 0.5-gallon per minute) to the initial test borings drilled at the site. Four monitoring wells were installed in this aquifer in October 2012. The locations of the monitoring wells are depicted in Figure 3.2. Wells MW-2, MW-3, and MW-4 were completed at depths between 49 and 65 feet below ground surface (bgs), and each yielded an estimated 2 gallons per minute (gpm). Well MW-1 was drilled to a total depth of 116 feet bgs, but did not encounter free water; the well was completed from 86-116 feet bgs as a dry well.

The water table in the shallow aquifer ranges from approximately 15 feet below the base of the waste unit at the south end of the facility to approximately 50 feet below the base of the waste unit at the north end of the facility. Based on water levels in the monitoring wells, flow in this aquifer is generally towards the south-southeast. A slug test was conducted at well MW-3 and resulted in an average estimated hydraulic conductivity for the water bearing zone of 0.80 ft/day.

Figure 3.2: Location of Monitoring Wells



Groundwater Monitoring

The landfill will be designed and constructed with a synthetic liner to contain any leachate generated from disposal. A leachate collection and removal system will be installed to maintain leachate levels of less than 1-foot of depth over the liner. Based on the facility design and operation controls, impacts to groundwater are expected to be minimal. Groundwater monitoring will be conducted twice per year to ensure the liner and leachate collection system are performing as designed. The three groundwater monitoring wells which encountered water at the site, MW-2, MW-3, and MW-4, will be monitored for constituents expected to be in the waste disposed at the site. These wells will be sampled prior to the commencement of any construction activities at the site to determine background water quality conditions. During the semi-annual monitoring events, well MW-1 will be monitored for the presence of water. If ground water is detected in MW-1 during the routine monitoring events, it will be sampled and analyzed for the same constituents. If groundwater can be located up gradient of the landfill unit, an additional monitoring well will be installed to replace the dry well

MW-1 as the background well for the facility. Groundwater monitoring at the facility will ensure any unexpected groundwater impacts are detected and mitigated, and will be performed during the active life of the facility as well as during the post-closure care period.

Nearby Groundwater Supply Wells

There are very few water supply wells located near the proposed landfill. Based on a review of the Montana Bureau of Mines and Geology (MBMG) database of existing wells, there are 3 water supply wells located in Fort Union Formation aquifers within a one-mile radius of the facility. The nearest water supply well is a stockwell located on the facility property. According to the MBMG database, this well is completed to a total depth of 230 feet below ground surface and yields 6 gallons per minute. The static water level in this well has not been recorded. There are 47 water supply wells within 3 miles of the facility, which are typically completed in the Fort Union Formation. The Fort Union wells are completed from 66 to 335 feet below ground surface and typically yield between 5 and 10 gallons per minute although some yield as much as 30 gallons per minute. A few wells are completed in alluvial deposits near streams in the area at depths less than 40 feet. A well nearest the site that is completed in the alluvium is located approximately 1.5 miles to the south.

3.0 Air Quality

Air quality concerns related to landfills are frequently associated with fugitive dust emissions from landfill traffic, construction activities, and day-to-day facility operations.

Additional traffic on the gravel roads to the landfill, related to the construction and operation 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 as well as 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 summer months. 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.

5.0 Terrestrial, Avian, and Aquatic Life and Habitats

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 site, it is unlikely that there is any significant aquatic life or habitat anywhere on the site. Therefore, the impact to aquatic species is negligible. An intensive survey was not performed to verify the presence of, or impact to, terrestrial or avian species in the area. However, there is adequate acreage of similar habitat available in the vicinity of the site to accommodate any species that may be forced to relocate. Consequently, any terrestrial or avian species will likely relocate to the adjacent locations.

10.0 Agriculture

Agricultural activities in the area consist primarily of farming and livestock grazing lands. Operation of the facility is anticipated to have a very minor effect on agricultural activities by eliminating approximately 123 acres currently available to the landowner for livestock grazing. The vegetation on the final landfill will be used as rangeland during post-closure. Overgrazing and growth of noxious weeds will not be allowed. Impacts to current agricultural activities in the area will be minimal.

TABLE 3.2 - IMPACTS TO THE HUMAN ENVIRONMENT

<u>HUMAN ENVIRONMENT</u>	Major	Moderate	Minor	None	Unknown	Attached
1. SOCIAL STRUCTURES & MORES:				✓		
2. CULTURAL UNIQUENESS & DIVERSITY:				✓		
3. DENSITY & DISTRIBUTION OR POPULATION & HOUSING:				✓		
4. HUMAN HEALTH & SAFETY:				✓		
5. COMMUNITY & PERSONAL INCOME:				✓		
6. QUANTITY & DISTRIBUTION OF EMPLOYMENT:			✓			✓
7. LOCAL & STATE TAX BASE REVENUES:			✓			✓
8. DEMAND FOR GOVERNMENT SERVICES:			✓			✓
9. INDUSTRIAL, COMMERCIAL, & AGRICULTURAL ACTIVITIES & PRODUCTION:			✓			✓
10. ACCESS TO & QUALITY OF RECREATIONAL & WILDERNESS ACTIVITIES:				✓		
11. LOCALLY ADOPTED ENVIRONMENTAL PLANS & GOALS:				✓		
12. TRANSPORTATION:				✓		✓

CUMULATIVE AND SECONDARY IMPACTS —The cumulative impacts recognized from the licensure of the proposed the Class II landfill are minor. The net potential impact of the proposed facility on the human environment is probably very minor. Development and population surrounding the proposed site is sparse. The increased employment that may be generated by the construction of the facility will have a very minor but positive effect on the local income and tax base of the county. There are no recognized secondary impacts.

3.2 POTENTIAL IMPACTS OF THE PROPOSED DISPOSAL SITE ON THE HUMAN ENVIRONMENTS (See Table 3.2)

6. Quantity and Distribution of Employment

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

7. Local and State Tax Base and Tax Revenue

Since there will likely 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.

8 Demand for Government Services

The Dawson County Health Department and DEQ's Solid Waste Section will conduct periodic inspections at the site. No additional government services will be required.

9 Industrial, Commercial, and Agricultural Activities and Production

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. Since the area immediately surrounding the proposed site is sparsely developed agricultural land, no additional impacts are anticipated.

12 Transportation

The site will be accessed from one of two possible routes. The first from US Highway 200, turning north onto Dawson County (DC) Road 437 for six miles, then turning west onto DC Road 454 for three miles, then a final turn on DC Road 448 for one mile to the site. The other possible route to access to the site is from MT Highway 254 turning west on DC Road 454 for ten miles then turning north onto DC Road 448 for one mile to the site. These roads are currently utilized by local area farmers and ranchers for transporting loaded trucks full of crops and livestock. While truck traffic on these roads will likely increase, the roads are capable of supporting the projected loads. While the truck traffic may impact the surface of the road, the road surface remains capable of supporting loaded waste vehicles. However, there will be a potential increase in the frequency of road maintenance activities. The applicant will work with the Dawson County Road Supervisor to develop a workable plan for maintaining the offsite roads.

SECTION 4.0 CONCLUSIONS AND RECOMMENDATIONS

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

The proposed licensure of the Oaks Disposal Landfill will meet the minimum requirements of the Montana Solid Waste Management Act and administrative rules regulating solid waste disposal. Adherence to these Department licensing criteria will mitigate the potential for harmful releases and impacts to human health and the environment by the proposed facility. Along with standard criteria for the Solid Waste Management System License as issued by the Department, and as validated by the local Dawson County Health Officer, the licensee must adhere to the following specific license conditions:

- (1) The Oaks Disposal Landfill will accept only RCRA-exempt non-hazardous solid waste generated by oil and gas exploration and production activities.
- (2) Wastes delivered to the site may not exceed 5% Total Petroleum Hydrocarbons.
- (3) Wastes delivered to the site may not contain free liquids.
- (4) The concentrations of Ra-226, Ra-228, and Pb-210 in solid wastes managed at the facility may not exceed a cumulative total of 30 picocuries per gram.
- (5) Results of radiation monitoring for wastes delivered to the site may not exceed 2-times the natural background concentration at the landfill.
- (6) The facility operator will notify DEQ within 24-hours when prohibited wastes are discovered or loads are rejected during waste screening activities at the facility.
- (7) Drill cuttings and produced sands must be covered at least quarterly with a minimum of 6-inches of soil, or upon completion of a 10-ft lift.
- (8) Dust emissions from the site must be controlled.
- (9) Site access must be controlled at all times.

Recommendation:

The DEQ recommendation is to distribute the EA to adjacent landowners and interested persons to satisfy the public notification and participation requirements of MEPA.

Findings:

DEQ finds that there would be minimal impact to the physical and human environment if the proposed facility is approved and operated in accordance with the regulations. Therefore, an EA is the appropriate level of analysis and an Environmental Impact Statement is not needed.

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

DEQ finds that an Environmental Impact Statement (EIS) is not necessary due to the mitigating factors provided by the solid waste rules and the applicant's proposal for licensure of the Oaks Disposal Landfill at the selected location. Consequently, the combined effect of all such factors at the site will ensure to a reasonable extent that any potential direct or cumulative impacts to human health and the environment from the proposed landfill are minor.

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

DEQ finds that construction, operation, and post-closure care of the proposed Oaks Disposal Landfill will not significantly affect the quality of the human environment both within and surrounding the local area. The proposed project will be reasonably expected to have minor impacts on terrestrial life, vegetation and other

aspects of the physical and human environment relative to the current use of the site. However, the site is located in a sparsely populated area used for agricultural purposes. Based upon the facility design and operational controls, the sparse population, and the separation of the waste from groundwater, there are no anticipated impacts to groundwater resources from the disposal of the special wastes. Therefore, an EA is the appropriate document to address the potentially minor impacts of the proposed licensure of the Oaks Disposal Landfill.

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

Montana Natural Heritage Program
State of Montana Historic Preservation Office
U.S. Geological Survey
Montana Bureau of Mines and Geology
U.S. Department of Agriculture - Natural Resource Conservation Service

Individuals or groups contributing to this EA:

Natural Heritage Program
State Historic Preservation Office
Barry Damschen Consulting, LLC
U.S. Geological Survey
Montana Bureau of Mines and Geology
U.S. Department of Agriculture - Natural Resource Conservation Service

EA prepared by: Mary Louise Hendrickson, Tim Stepp, and Martin Van Oort – Montana Department of Environmental Quality, Solid Waste Program

Date: December 21, 2012

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