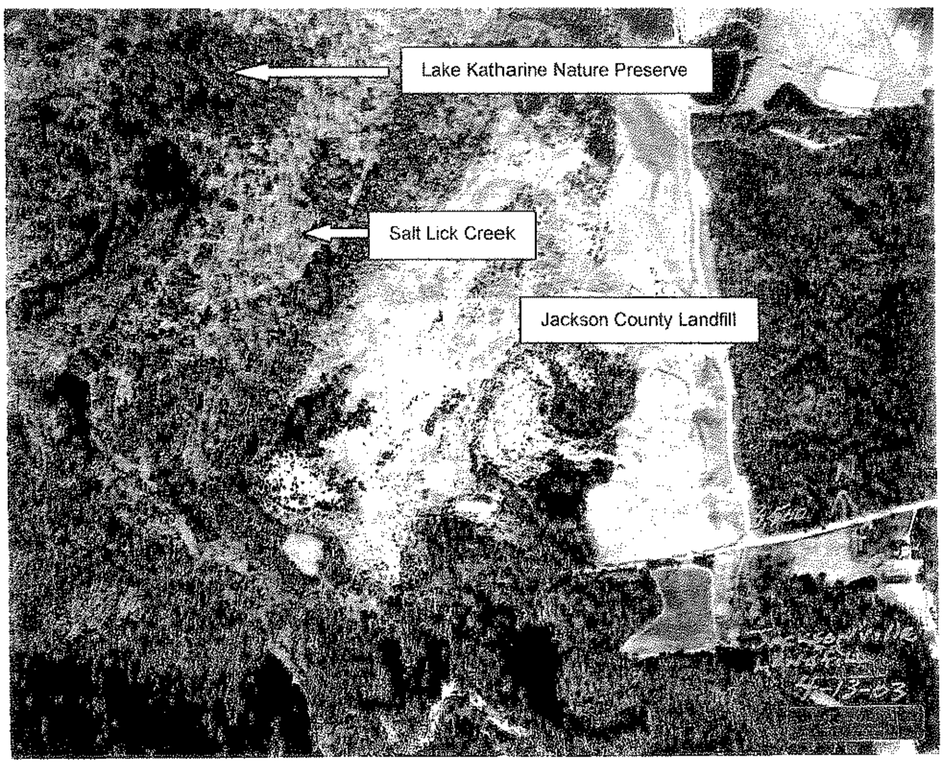
Ohio
Ohio Environmental
Protection Agency

Decision Document

FOR THE REMEDIATION OF THE JACKSON COUNTY LANDFILL CITY OF JACKSON, JACKSON COUNTY, OHIO



Ohio Environmental Protection Agency
Division of Environmental Response and Revitalization
Southeast District Office
September 2015

I certify this to be a true and accurate copy of the official documents as filed in the records of the Ohio Environmental Protection Agency.

By: [signature] Date: 9-15-15

Ohio Environmental Protection Agency Division of Environmental Response and Revitalization, ARCA Section, Remedial Response Program			Decision Document For Remediation of the Jackson County Landfill City of Jackson, Jackson County, Ohio		
The Remedial Response Process					
(1) Preliminary Assessment & Site Inspection	(2) Remedial Investigation (RI) & Feasibility Study (FS)	(3) Remedy Selection (Preferred Plan & Decision Document)	(4) Remedial Design (RD)	(5) Remedial Action (RA)	(6) Remedy Operation & Maintenance (O&M)

Ohio EPA Announces Decision Document

On February 13, 2015, Ohio EPA issued a Preferred Plan that outlined Ohio EPA's preferred alternative to remediate contamination at the Jackson County Landfill site. Ohio EPA held a public meeting on April 9, 2015 at the Jackson City Council Chambers located at 199 Portsmouth Street in Jackson, to explain the Preferred Plan. Oral and written comments were accepted at this meeting during the comment period which ran from February 17, 2015 to April 17, 2015. Section 8.0 (Response to Comments) of this Decision Document summarizes the comments and Ohio EPA's responses.

Based on the Preferred Plan and the consideration of comments received during the comment period, Ohio EPA is issuing this Decision Document identifying the selected remedial alternative for the cleanup of the contaminated soil and groundwater at the site, and providing the rationale for the selection. It also includes summaries of other remedial alternatives evaluated at this site.

Ohio EPA is issuing this Decision Document in a manner consistent with Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). It summarizes information found in detail in the RI/FS reports and other documents contained in the administrative record file for this site. Ohio EPA encourages the public to review these documents to gain a better understanding of the site and the activities that have been conducted at the site.

ERAC Appeal Period: As a final action of the Director of Ohio EPA, the Decision Document may be appealed to the Environmental Review Appeals Commission (ERAC) pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set for the action complained of and the grounds upon which the appeal is based. The appeal must be filed with ERAC (77 South High Street, 17th Floor, Columbus, OH 43215) within 30 days after notice of the Director's action.

Additional Information: Available from the Ohio EPA Southeast District Office located at 2195 E. Front St., Logan, Ohio 43138, or from the Site Coordinator, Dustin Tschudy, at (740) 380-5253 or via email at dustin.tschudy@epa.ohio.gov. Additional information is also available at the information repository located at the Jackson County Library, 21 Broadway Street, Jackson, Ohio 45640, (740) 286-4111, Monday & Wednesday 10 am – 6 pm; Tuesday & Thursday 10 am - 8 pm; Friday 10 am - 5 pm and Saturday 10 am –2 pm.

DECLARATION

SITE NAME AND LOCATION

Jackson County Landfill
1841 Smith Bridge Road
Jackson, Jackson County, Ohio

STATEMENT OF BASIS AND PURPOSE

This Decision Document presents the selected remedial action for the Jackson County Landfill in Jackson, Jackson County, Ohio, chosen in accordance with the policies of the Ohio Environmental Protection Agency, statutes and regulations of the State of Ohio, and the NCP, 40 CFR Part 300.

ASSESSMENT OF THE SITE

Actual and threatened releases of leachate with hazardous constituents and methane gas at the site, if not addressed by implementing the RA selected in the Decision Document, constitute a substantial threat to public health or safety and are causing or contributing to air or water pollution or soil contamination.

The Jackson County Landfill began operations in 1970 as a municipal solid waste landfill accepting more than 5,000 drums of industrial waste for disposal between 1974 and 1980. The landfill ceased accepting waste in 1987; however it was never properly closed, leading to outbreaks of leachate throughout the landfill.

DESCRIPTION OF THE SELECTED REMEDY

The major components of the selected remedial alternative include: a geomembrane cap, ground water monitoring, a soil gas collection system, a leachate collection system, site security, a long term operations and maintenance plan, institutional controls, and a potential contingency to evaluate and possibly install a wetland for treatment of leachate if a sufficient amount of leachate is being generated.

STATUTORY DETERMINATIONS

The selected remedial action is protective of human health and the environment, complies with legally applicable state and federal requirements, is responsive to received public input and is cost-effective. The remedy uses permanent solutions and treatment technologies to the maximum extent practicable to reduce toxicity, mobility and volume of hazardous substances at the site. The effectiveness of the remedy will be reviewed regularly.

Craig W. Butler, Director

9/14/15
Date

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1.0 EXECUTIVE SUMMARY

On April 29, 2009, the RI report was approved by Ohio EPA. The RI report documented the existence of contamination throughout the landfill which would require clean up. The primary contaminants of concern (COCs) at the site are shown in **Table 3** of this Decision Document, and include: aluminum, arsenic, manganese, tetrachloroethylene, vinyl chloride, antimony, cobalt, mercury, benzene, cadmium, chromium, selenium, barium, copper, lead, methane, zinc, di-n-butyl-phthalate, and PCBs. Additional details concerning the health risks associated with each primary COC are located in **Appendix B**.

This Decision Document summarizes information on the range of remedial alternatives evaluated, identifies Ohio EPA's selected remedial alternative, and explains the reasons for selection of the remedial alternative. The Decision Document is based on: a RI report, approved April 29, 2009; a report approved June 15, 2010, prepared by Goodyear; and the July 6, 2012 Ohio EPA approval of Goodyear's request for an exemption pursuant to Ohio Revised Code (ORC) 3734.02(G) with respect to several landfill capping requirements.

The major health and environmental risks of this site primarily result from potential future use scenarios. At present, the landfill does not meet Ohio's laws and regulations pertaining to proper closure and there is a risk from the presence and migration of soil gas, some of which contains high concentrations of methane. The primary COCs at the site are shown in **Table 3** in this Decision Document. Additional details concerning the health risks associated with each primary COC are located in **Appendix A**.

Ohio EPA's selected remedial alternative should yield a permanent solution for risks associated with the contaminated media at the site. The expectations for the selected alternative include:

- Reduction of human health risks to within or below acceptable limits, and protection of human health and the environment from exposure to COCs, which are above acceptable limits in the ground water, soil and surface water.

- Short and long-term protection of public health and the environment.

- Compliance with applicable or relevant and appropriate requirements (ARARs) through the completion of a landfill cap and the collection and appropriate treatment of landfill leachate and soil gas.

- Cost-effectiveness and limitation of expenses to what is necessary to achieve the selected alternative expectations.

The major components of the selected remedial alternative include: landfill capping, ground water monitoring, and collection of the leachate for off-site disposal.

Ohio EPA finds that these measures will protect public health and the environment by reducing risk to acceptable levels once the RA objectives have been achieved.

2.0 SUMMARY OF SITE CONDITIONS

2.1 Site History

The Jackson County Landfill site is located in a mixed area of residential properties and undeveloped rural land primarily used for hunting. The site is approximately 24 acres in size and is located at 1841 Smith Bridge Road (County Road 60), Jackson, Ohio, as shown in **Figure 1** and **Drawing 2**. Salt Lick Creek is present west and north of the landfill and Lake Katharine State Nature Preserve is located on the west side of Salt Lick Creek. Private land abuts the landfill on the southeast side. This private land is used by an excavating company for the storage and repair of equipment and by a private hunting club. There is a maintenance garage, used by the excavating company, located approximately 50 feet southeast of the landfill property line. The private hunting club's lodge is also southeast of the landfill located approximately 100 feet from the property line. The hunting lodge is occupied most weekends by the members. In addition, there is a storage shed located approximately 60 feet from the landfill property line. Although none of these structures are occupied full time, the lodge is often occupied on the weekends.

A chronological list of owners, operators and/or disposers at the site property is shown in **Table 1**.

TABLE 1. OWNERS and OPERATORS		
Owners, Operators and/or Disposers	**Property Usage**	**Period**
Donald Jenkins	Owner and operator	April 1970 - March 1972
J. Gregory Fields (Sanitation Commercial Services)	Owner	March 1972 - present
J. Gregory Fields (Sanitation Commercial Services)	Operator	March 1972 - September 1987
Shawn and Melissa Sexton	Owners	March 15, 1999 to present

Note: this is not an exhaustive list; other disposers may be identified.

During its operation between April 1970 and September 1987, the Jackson County Landfill accepted "industrial waste" and/or "other waste" as defined in ORC § 6111.01 (C) and (D), and/or "hazardous wastes" as defined in ORC § 3734.01(J), and/or "hazardous substances" as defined in Section 101(14) of the Comprehensive Environmental Response, Compensation & Liability Act / Superfund Amendment and Reauthorization Act (CERCLA/SARA). Wastes disposed of at the Jackson County Landfill included municipal waste and drummed materials, including: acetone, polyester resin mixture, cyclohexanone, dichloromethane, isobutyl alcohol, methyl ethyl ketone, methyl isobutyl ketone, toluene, xylene, and waste styrene mixture. Foundry sand containing certain metals (including arsenic, barium, cadmium, lead and mercury) was also used as daily cover at the site and was disposed of in a staging area on the property, the portion of which is currently owned by the Sextons.

According to records obtained by Ohio EPA in response to information requests, between approximately 1974 and 1980, the owner/operator of Jackson County Landfill accepted and disposed of at least 5,772 drums that contained contaminants. The landfill permanently ceased accepting waste in approximately September 1987. However, the landfill was never properly closed, nor was the minimal cap which was placed on the waste, maintained. As a result, there have been releases of hazardous wastes occurring since at least 1996. In 1996, Ohio EPA found elevated concentrations of ammonia, iron, nickel, and lead above water quality criteria in leachate originating at the landfill. In addition, three volatile organic compounds (VOCs) – benzene, xylene and 1,2,4-trimethylbenzene were found. Benzene was detected above both the screening criteria and its maximum contaminant level (MCL). The detection of these compounds and metals indicated that constituents were being released into the environment from the landfill.

Prior enforcement activities associated with the site include Director's Final Findings and Orders (DFFOs) issued August 20, 1987 ordering the proper closure of the landfill, ground water monitoring, and abatement of leachate at the Jackson County Landfill. When the DFFOs were not followed, additional enforcement was taken by the Ohio Attorney General's Office against Sanitary Commercial Services/Mr. J. Gregory Fields. This enforcement case was settled with a Consent Decree dated February 16, 1999 issued by the United States District Court for the Southern District of Ohio, Eastern Division. The Consent Decree required Sanitation Commercial Services, Inc., et al. to pay $ 225,000 into a trust fund for the purpose of closure and post-closure care of the Jackson County Landfill. However, due to the disposal of hazardous waste at the landfill constructed for the acceptance of solid waste and the extensive leachate problem, it was determined that a Remedial Investigation and Feasibility Study (RI/FS) would be conducted in order to investigate, and evaluate cleanup options for properly closing the landfill.

On August 16, 2005, Goodyear and Sanitation Commercial Services entered into DFFOs for the completion of a RI/FS for the Jackson County Landfill. This Preferred Plan describes the findings from the RI/FS and proposes a remedy based on these findings.

On December 8, 2011, Goodyear submitted a request to Ohio EPA for an exemption from landfill capping requirements pursuant to ORC 3734.02(G). Upon review of the request for an exemption, Ohio EPA found that Goodyear had made a technical demonstration that an exemption from certain capping requirements was unlikely to adversely impact human health, safety or the environment. Accordingly, Ohio EPA approved Goodyear's exemption request on July 6, 2012. The exemption allows the following modifications as part of the remedy:

- Regrade and use existing soils that have been shown through testing to have the required permeability as the minimum 18-inch thick soil barrier.
- Flexibility on placing the soil cap above all areas of waste placement due to constraints such as the slope along the western landfill boundary which will make it impracticable for the soil cap to be placed in some areas.
- Since the existing soil cover may be used instead of off-site borrow soil, pre-construction permeability testing for the soil will not be needed. Goodyear is expected to perform tests on borrow soils if needed to supplement the existing soil cover.
- The existing soil cover will not need the same testing and specification requirements as a recompacted soil barrier, so these testing and specification requirements are not required. As an alternative, Goodyear would develop construction quality controls, for Ohio EPA approval, during remedial design.

- The cap protection layers are expected to be 24 inches instead of the 30-inch freeze protection requirement. This is due to the fact that the average soil temperatures in the area of the Jackson County Landfill do not warrant a 30-inch thick cap layer for freeze protection.

2.2 Site Characteristics

Pursuant to the 2005 RI/FS DFFOs, Goodyear completed RI/FS activities and submitted RI and FS reports, which were approved by Ohio EPA DERR on April 29, 2009 and June 15, 2010, respectively. The RI/FS activities identified the nature and extent of contamination at the site, and developed alternatives to address the contamination and site specific conditions.

Additionally, the data obtained were used to conduct a baseline risk assessment, which is an evaluation of the site risks to human health and the environment. The RI and FS reports contain more detailed information. These reports, along with other site related materials, are located in the information repository at the Jackson County Library and at Ohio EPA's Southeast District Office in Logan, Ohio.

The RI report, prepared by Goodyear's consultant, Parsons, between July 7, 2007 and April 29, 2009, indicated that:

- The landfill wastes cover approximately 24 total acres with an additional one acre area, located just east of the landfilled waste, filled with foundry sand (see **Drawing 2**).

- The landfill cover and the thickness of the cover material were evaluated. The cover thickness varies from less than 12 inches to over 60 inches thick (see **Drawing 3**).

- The soils outside of the landfill boundary were impacted with metals above action levels. The metals that were above action levels were: aluminum, arsenic, iron, manganese, thallium, vanadium, and zinc (see **Drawing 4**).

- Ground water contamination has been located at three different zones, defined by the depth of the ground water zone below ground surface. The shallow upper zone, located in the Massillon Sandstone, is monitored by two wells, MW-6 and MW-9S. The shallow intermediate zone, most likely the Sciotoville Shale formation, is monitored by five wells, MW-2, MW-4, MW-6I, MW-7 and MW-9I. The third zone, referred to as the deep zone, is the Sharon Conglomerate and is monitored by seven wells, MW-1, MW-2D, MW-3, MW-5, MW-6D, MW-7D and MW-9D. The monitoring wells range in depth between 17 feet and 172 feet below ground surface. VOCs and metals were detected in all three ground water zones. However, while there were seven different VOCs found in ground water above their respective action levels; only vinyl chloride and tetrachloroethylene exceeded their MCLs. In addition, there were nine different metals detected above the action level. Of the detected metals, only arsenic and mercury were found above their respective MCLs. There have been no interim or removal actions completed on the ground water plume (see **Drawing 5**).

- Soil gas (air present in soil) sampling found an extensive number of VOCs as well as methane being released to the atmosphere. As the air migrates or travels in the subsurface along lines of least resistance it will move to locations where it can be released to the atmosphere. On the Jackson County Landfill, soil gas has been visible as air bubbles appearing in puddles of water which have accumulated on the land surface. There were 22 VOCs detected above their respective action levels in the soil gas samples which were collected. In addition, methane, an explosive gas, was detected in 13 out of 20 samples. The concentrations of methane ranged from a low of 2.6% to a high of 71% by volume of the sample. The greatest risk from methane is posed by the potential migration of the gas into a building where it can build up and cause an explosion. Sample GS-17 was collected adjacent to the storage shed; methane was detected at 48% by volume in this sample. The sample collected closest to the maintenance garage, GS-03, detected methane at 54% by volume. However, samples collected directly below the hunting lodge were non-detect for methane although one sample collected below the garage detected methane at 2.6% by volume (see **Drawing 9**).

- Leachate was sampled at 14 seeps. In addition to analyzing the leachate, the amount of leachate flowing from the landfill was also measured. There were four VOCs, one semi-volatile organic compound (SVOC) and 14 metals found above the action level. The quantity of leachate water ranged from a low of 0.83 gallons per minute (gpm) [1,195.2 gallons per day] to a high of 6.53 gpm [9,403.2 gallons per day] (see **Drawing 7**).

- Sediment (soil which is under water) was sampled at the leachate seeps and at four drainage ditches where the leachate flows off-site. The leachate sediment contained six metals above action levels while the ditch sediment samples contained one SVOC and five metals above action levels (see **Drawings 6 & 8**).

2.3 Summary of Site Risks

As part of the RI/FS, an Ecological Risk Assessment was conducted by Goodyear and approved by Ohio EPA on March 12, 2009. A human health baseline risk assessment was conducted by Goodyear and approved by Ohio EPA on April 6, 2009 (see Section 2.3.2). The baseline risk assessment evaluated current and potential risks to human health as the result of exposure to COCs present at the site. The results demonstrated that the existing COCs in environmental media pose or potentially pose unacceptable risks under a hypothetical future residential use scenario. The Ecological Risk Assessment indicated a potential risk to ecological receptors sufficient to trigger the need for remedial actions. Information on the primary COCs can be found in **Appendix A**.

2.3.1 Risks to Human Health

The baseline risk assessment for human health is an estimate of the likelihood of health problems occurring if no cleanup action is taken at the site. To estimate baseline risk, a four-step process is undertaken.

Step 1. Analyze Contamination: The concentrations of COCs at the site, as well as past scientific studies on the effects these COCs have had on people, are reviewed. Comparisons of site-specific concentrations of COCs and concentrations reported in past studies help determine which COCs are most likely to pose the greatest threat to human health.

Step 2. Estimate Exposure: The different ways that people might be exposed to the COCs (exposure pathways), the concentrations that people might be exposed to, and the potential frequency and duration of the exposure are evaluated. A reasonable maximum exposure scenario is calculated, which portrays the highest level of human exposure that could reasonably be expected to occur.

Step 3. Assess Potential Health Dangers: The information from Step 2 is combined with data on the toxicity of each COC to assess potential health risks. Two types of risk are considered: cancer risk and non-cancer hazards. The likelihood of cancer resulting from a site is expressed as an upper bound probability of 1 in 100,000, or 1x 10^{-5}. In other words, for every 100,000 people that could be exposed, one extra case of cancer may occur as a result of exposure to site COCs. For non-cancer health effects, a hazard index (HI) or hazard quotient (HQ) is calculated (quotient refers to the effects of an individual COC, whereas index refers to the combined effects of all of the COCs). The key concept is that a "threshold level" (measured as an HQ or HI of 1) exists below which non-cancer health effects are no longer expected.

Step 4. Characterize Site Risk: A determination is made as to whether site risks are great enough to cause health problems for people at or near the site. The potential risks from the individual pathways are added up to determine the total cumulative risk to human health.

A human health risk assessment for the site was prepared to evaluate potential adverse impacts to human health posed by COCs in soil, ground water, seep water (leachate), soil gas, sediment, and in the following exposure pathways: current and future on-site recreational users – adults and children, future commercial workers, future construction workers, hypothetical future residents, and hypothetical future ground water users. If site-specific data were not available, standard defaults were used.

Recreational Use

The risk assessment calculations show that the total cancer risk and total HI resulting from exposure to COCs including aluminum, arsenic, barium, cadmium, iron, manganese, mercury, thallium, vanadium, benzene, benzo(a)pyrene, 1,4-dichlorobenzene and Polychlorinated Biphenyls [PCBs] (Aroclors 1242, 1248, 1254 and 1260) in soil, sediment, and seep water for a current/future adult recreational user were calculated to be 8.7 x 10^{-6} and 0.1, respectively. Both the total cancer risk and the total HI level are below the target cancer risk level of 1 x 10^{-5} and target hazard level of 1. Therefore, exposure to the contaminants in soil, sediment and seep water should not result in adverse health effects for the current/future adult recreational user.

The risk assessment calculations show that the total cancer risk and total HI resulting from exposure to COCs including aluminum, arsenic, barium, cadmium, iron, manganese, mercury, thallium, vanadium, benzene, benzo(a)pyrene, 1,4-dichlorobenzene and PCBs (Aroclors 1242, 1248, 1254 and 1260) in soil, sediment, and seep water for a current/future adolescent recreational user were calculated to be 1.2 x 10^{-5} and 0.5, respectively. The total cancer risk is just slightly above the target cancer risk level of 1×10^{-5} while the total HI level is below the target hazard level of 1.

Commercial Use

The risk assessment calculations show that the total cancer risk and total HI resulting from exposure to COCs including aluminum, arsenic, iron, manganese, thallium, vanadium, benzene, trichloroethene, vinyl chloride, cis-1,2-dichloroethene, tetrachloroethylene, xylenes, etc. in soil, soil gas, and ground water for a future commercial worker were calculated to be 9.5×10^{-6} and 0.8, respectively. The total cancer risk and total hazard risk are both below the target cancer risk level of 1×10^{-5} and the target hazard level of 1. Therefore, potential exposure to chemicals in soil and ground water for future commercial use should not result in adverse health effects for this category of receptor.

Construction Worker

The risk assessment calculations show that the total cancer risk and total HI resulting from direct contact to COCs including aluminum, arsenic, barium, iron, lead, manganese, mercury, thallium, vanadium, benzene, trichloroethene, vinyl chloride, cis-1,2-dichloroethene, tetrachloroethylene, etc. in soil and ground water for a future construction worker were calculated to be 6×10^{-7} and 16, respectively. The total cancer risk is below the target cancer risk level of 1×10^{-5}; however, the total HI exceeds the target hazard level of 1. The primary COCs associated with the exceedance for this receptor are aluminum and manganese detected in soil and the pathway of concern is inhalation of particulates during construction activities. The highest concentration of aluminum was detected at sampling location B-2 at a depth of 0-2 feet and the highest concentration of manganese was detected at sampling location B-4 at a depth of 1-2 feet.

Residential Use

The risk assessment calculations show that the total cancer risk and total HI resulting from direct contact to COCs including aluminum, arsenic, iron, manganese, thallium, vanadium, benzene, tetrachloroethylene, trichloroethene, vinyl chloride, cis-1,2-dichloroethylene, ethylbenzene, xylene, etc. in soil, soil gas and ground water for a future hypothetical adult resident were calculated to be 3×10^{-5} and 3, respectively. Both the total cancer risk and the total HI exceed the target cancer risk level of 1×10^{-5} and the target hazard level of 1. The primary COCs associated with the exceedance for this receptor population are benzene and xylene detected in soil gas and the pathway of concern is inhalation of volatiles from soil in an enclosed space.

The risk assessment calculations show that the total cancer risk and total HI resulting from direct contact to COCs in soil and ground water for a future hypothetical child resident were calculated to be 2.0×10^{-5} and 5, respectively. Both the total cancer risk and the total HI exceed the target cancer risk level of 1×10^{-5} and the target hazard level of 1. The primary COCs associated with the exceedance for this receptor population are xylenes (detected in soil gas), and arsenic and iron (detected in soil). The pathway of concern is inhalation of volatiles from soil in an enclosed space along with the incidental ingestion of soil.

Ground Water Use

The risk assessment calculations show that for a future hypothetical adult resident the total cancer risk and total HI resulting from ingestion of ground water are 3 x 10^{-4} and 13, respectively. Both the total cancer risk and total HI exceed the target cancer risk level of 1 x 10^{-5} and the target hazard level of 1. When the risk from drinking ground water is added to the risk from soil exposure for a hypothetical adult resident, the total risk for a hypothetical adult resident increases to 3 X 10^{-4} for total cancer risk and 16 for total HI.

The risk assessment calculations show that for a future hypothetical child resident who ingests ground water the total cancer risk and total HI are 1 x 10^{-4} and 31, respectively. Both the total cancer risk and total HI exceed the target cancer risk levels of 1 x 10^{-5} and the target hazard level of 1. The primary COCs associated with this exceedance are PCE, vinyl chloride, arsenic, antimony, cobalt, iron, manganese and mercury. For a hypothetical future child resident who ingests ground water and is also exposed to contaminated soil, the risk increases to 1 x 10^{-4} for cancer risk and 36 for total HI.

These risks and hazard levels indicate that there is a potential risk to children and adults from direct exposure to contaminated soil and ground water. These risk estimates are based on current and future reasonable maximum exposure scenarios and were developed by taking into account various conservative assumptions about the frequency and duration of an individual's exposure to the soil, ground water and leachate, as well as the toxicity of the COCs including aluminum, manganese, benzene, xylenes, arsenic, iron, tetrachloroethylene, vinyl chloride, antimony, cobalt and mercury.

2.3.2 Risks to Ecological Receptors

An Ecological Risk Assessment (ERA) was conducted as part of the RI at the site. The ERA was conducted in order to assess potential impacts of COCs on ecological receptors (non-human, non-domesticated species) at the site. Specifically, a Level I scoping ERA determined that based on the history of activities at the site and the surrounding land use, the site has the potential to pose a risk to ecological receptors. Thus, a Level II screening ERA was conducted. The Level II ERA for the site includes a comparison of site-specific data to screening benchmark values and the identification of relevant and complete exposure pathways between each medium of concern and ecologically significant receptors for the site COCs.

For the chemicals that exceed the screening benchmark values and where a completed exposure pathway exists, a Level III baseline ERA was conducted. The approach for the Level III baseline ERA consisted of the calculation of HQs using site-specific exposure factors, chemical-specific and species-specific toxicity values and representative endpoint species. Upon completion of the Level III baseline ERA for the site, the following COCs in various media were determined to pose a potential risk to ecological receptors:

- **Soils/Sediments:** aluminum, antimony, barium, cadmium, cobalt, iron, lead, manganese, mercury, nickel, selenium, thallium zinc, cyclohexane, isopropylbenzene, methylcyclohexane, benzaldehyde, naphthalene, PCBs – Aroclors 1232, 1242, 1248, 1254, and 1260.

- **Surface Water:** aluminum, barium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, silver, vanadium, zinc, chloroethane, chloromethane, cyclohexane, methylcyclohexane, xylenes, 2,4,6-trichlorophenol, anthracene, benzaldehyde, caprolactam, carbazole, dibenzofuran, di-n-butyl phthalate, fluoranthene, pyrene, PCBs – Aroclors 1232, 1242, 1248, 1254, and 1260.

While cyclohexane and xylene are identified as a potential risk to ecological receptors, the ERA concluded that these contaminants of potential concern did not pose a significant risk to ecological receptors at or near the site.

3.0 REMEDIAL ACTION OBJECTIVES

An FS was conducted by Goodyear to define and analyze appropriate remedial alternatives. The study was conducted with Ohio EPA oversight and was approved on June 15, 2010.

As part of the RI/FS process, remedial action objectives (RAOs) were developed in accordance with the NCP, pursuant to the federal CERCLA, 42 U.S.C. §9601, as amended, and U.S. EPA guidance. The RAOs are goals that a remedy should achieve in order to ensure protection of human health and the environment.

The RAOs for the site include:

TABLE 2. REMEDIAL ACTION OBJECTIVES	
Landfill Cover	
Human Health and Ecological Risk	Prevent exposure (i.e. incidental ingestion) to soil with concentrations of chemicals of concern (COCs) in excess of risk based standards or calculated site background concentrations. See Table 3. See the Soil (Human) Section of Table 3. Prevent direct contact with contaminated surface soils and consumption of contaminated food. See Table 3. See the Soil (Ecological) Section of Table 3.
Ground Water	
Human Health Risk	Prevent direct contact and ingestion of ground water with concentrations of COCs in excess of risk based standards, background levels or Maximum Contaminant Levels. See Table 3. See the Ground Water (Human) Section of Table 3.
Soil Gas	
Human Health Risk	Prevent exposure (i.e. inhalation) to soil gas with concentrations of COCs in excess of risk based standards. See Table 3. See the Soil Gas (Human) Section of Table 3.
Leachate	

Ecological Risk	Prevent direct contact with contaminated seeps/surface water containing contaminant levels that exceed the Remediation Levels listed in Table 3. See the Seep Water (Ecological) Section of Table 3.

Many of the remediation levels (RLs) for protection of human health were established using the acceptable excess lifetime cancer risk and non-cancer hazard goals identified in the DERR Technical Decision Compendium (TDC) document "Human Health Cumulative Carcinogenic Risk and Non-carcinogenic Hazard Goals for DERR Remedial Response and Federal Facility Oversight," dated August 21, 2009. These goals are given as 1×10^{-5} (i.e., 1 in 100,000) excess lifetime cancer risk and a HI of 1, and were established using the default exposure parameters provided by U.S. EPA or site-specific information. This TDC can be found at http://www.epa.ohio.gov/portals/30/rules/riskgoal.pdf. Some of the RLs were established through a determination of the site-specific background concentration of the chemical of concern. The ground water RLs are based either on the legally permissible level for a drinking water supply, MCL, on a calculated level for the protection of human health, or on a site specific background concentration.

The Ecological Preliminary RLs are either from established Ohio EPA Surface Water Quality Criteria, a calculated site-specific background level unique to this site, or from an established literary source.

The numerical RLs for the site are shown below in **Table 3**.

Table 3. Contaminants of Concern and Remediation Levels

Media (Pathway)	Contaminant of Concern	Maximum Level Detected *(Location/Date)*	Remediation Levels	Target Level Basis
Soil (Human)	Aluminum	8,970 mg/kg *(Boring B-2; 12/13/06)*	8,270 mg/kg	Calculated Site Background
	Arsenic	11.9 B mg/kg *(seep soil 10-1; 1/11/07)*	8.8 mg/kg	Calculated Site background
	Manganese	5,860 J mg/kg *(seep soil 22-3; 1/11/07)*	678 mg/kg	Calculated Site background
	Iron	757,000 mg/kg *(seep soil 10-1; 1/11/07)*	25,245 mg/kg	Calculated Site background
Ground Water (Human)	Tetrachloroethylene	0.015 mg/l *(MW-6D; 3/20/08)*	0.005 mg/l	MCL
	Vinyl Chloride	0.0025 mg/l *(MW-6D; 3/20/08)*	0.002 mg/l	MCL
	Arsenic	0.020 mg/l *(MW-4; 3/28/07)*	0.010 mg/l	MCL
	Antimony	0.0023 mg/l *(MW-7; 3/18/08)*	0.006 mg/l	MCL
	Cobalt	0.284 mg/l *(MW-2; 3/27/07)*	0.317 mg/l	Calculated Human Health level

Table 3. Contaminants of Concern and Remediation Levels				
Media (Pathway)	**Contaminant of Concern**	**Maximum Level Detected** *(Location/Date)*	**Remediation Levels**	**Target Level Basis**
	Iron	69.5 mg/l *(MW-4; 3/28/07)*	115.650 mg/l	Calculated Site background
	Manganese	18.8 mg/l *(MW-2; 3/27/07)*	3.252 mg/l	Calculated Site background
	Mercury	0.0122 J mg/l *(MW-1; 3/27/07)*	0.002 mg/l	MCL
Soil Gas (Human)	Benzene	1,700 μg/m^3 *(GS-08; 3/30/2007)*	1,133 μg/m^3	Calculated Human Health Level
	Xylenes	56,000 μg/m^3 *(GS-08; 3/30/2007)*	40,000 μg/m^3	Calculated Human Health Level
Soil (Ecological)	Cadmium	8.7 mg/kg *(seep soil 10-1; 1/11/07)*	4 mg/kg	Efroymson, 1997a*
	Chromium	35.5 mg/kg JE 22 *(boring B-3; 12/12/06)*	26 mg/kg	Eco SSL for avian invertivores
	Cobalt	25.1 mg/kg JE54 *(boring B-3 12/12/06)*	120 mg/kg	Eco SSL for avian invertivores
	Lead	37.4 mg/kg JS72 *(boring B-3; 12/12/06)*	40.5 mg/kg	Efroymson, 1997a
	Manganese	5,860 mg/kg J *(seep soil 22-3; 1/11/07)*	678 mg/kg	Site-specific calculated background value
	Selenium	4.6 mg/kg B *(seep soil 10-1; 1/11/07)*	0.52 mg/kg	Terrestrial plant benchmark value (Efroymson, 1997c)[#]
	Thallium	10.2 mg/kg B G *(seep soil 10-2; 1/11/07)*	1.3 mg/kg	Maximum detected site-specific background value
	PCBs	230 μg/kg *(seep soil 8-2; 1/16/07)*	0.0003 mg/kg	Soil invertebrate benchmark value (Efroymson, 1997b)**
Seep Water (Ecological)	Aluminum (total)	219,000 μg/l *(Seep-03; 10/19/06)*	53,259 μg/l	Site-specific calculated background value
	Barium – (total)	6,180 μg/l *(Seep-03; 10/19/06)*	220 μg/l	Ohio EPA Surface Water Criteria (OMZA)
	Barium – dissolved	380 μg/l *(Seep 9; 1/15/07)*	85.3 μg/l	Ohio EPA Surface Water Criteria (OMZA)
	Cobalt - total	262 μg/l *(Seep-03; 10/19/06)*	42.5 μg/l	Site-specific calculated background value
	Copper – total	327 J μg/l *(Seep-03; 10/19/06)*	27.5 μg/l	Ohio EPA Surface Water Criteria (OMZA)
	Copper - dissolved	10.4 B μg/l *(Seep 5; 1/16/07)*	27 μg/l	

Table 3. Contaminants of Concern and Remediation Levels				
Media (Pathway)	**Contaminant of Concern**	**Maximum Level Detected** *(Location/Date)*	**Remediation Levels**	**Target Level Basis**
	Iron – total	1,260,000 µg/l *(Seep-03; 10/19/06)*	115,650 µg/l	Site-specific calculated background value
	Iron – dissolved	51,900 µg/l *(Seep 6; 1/17/07)*	5,990 µg/l	Maximum detected site-specific background value
	Lead – total	336 µg/l *(seep-03; 10/19/06)*	32.8 µg/l	Ohio EPA Surface Water Criteria (OMZA)
	Lead - dissolved	Non-detect	25.9 µg/l	
	Manganese – total	17,400 J µg/l *(seep-03; 10/19/06)*	3,252 µg/l	Site-specific calculated background values
	Manganese – dissolved	2,480 J µg/l *(seep-6; 1/17/07)*	1,759 µg/l	
	Mercury – total	1.9 µg/l *(seep-5; 1/17/07)*	0.91 µg/l	Ohio EPA Surface Water Criteria (OMZA)
	Mercury - dissolved	0.25 µg/l *(seep-5; 1/16/07)*	0.77 µg/l	
	Vanadium	467 µg/l *(seep-03; 10/19/06)*	44 µg/l	Ohio EPA Surface Water Criterion (OMZA)
	Zinc – total	1,360 µg/l *(seep-03; 10/19/06)*	355 µg/l	Ohio EPA Surface Water Criteria (OMZA)
	Zinc - dissolved	61.8 µg/l *(seep-5; 1/16/07)*	347 µg/l	
	Xylenes	100 µg/l *(seep-2; 1/18/07)*	27 µg/l	Ohio EPA Surface Water Criteria (OMZA)
	Di-n-butyl-phthalate	10 µg/l *(seep-2; 10/19/06)*	1 µg/l	Efroymson, 1997a
	PCBs	0.24 µg/l *(seep-4; 1/17/07)*	0.001 µg/l	Ohio EPA Surface Water Criteria (OMZA)

*Efroymson, et. al., 1997a. Preliminary Remediation Goals for Ecological Endpoints.
**Efroymson, et.al., 1997b. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 revision.
#Efroymson, et.al., 1997c. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision.

4.0 SUMMARY OF REMEDIAL ALTERNATIVES

A total of seven remedial alternatives were considered in the FS, as identified in **Table 4** below. A brief description of the major features of each of the remedial alternatives follows. More detailed information about these alternatives can be found in the FS. The proposed remedy in this Preferred Plan includes modifications pursuant to the ORC 3734.02(G) exemption approved on July 6, 2012.

Alternative	Table 4. Summary Description of Remedial Alternatives
1	**No Action** – site conditions remain unchanged
2 a	**Soil Cap with Leachate Treatment in On-site Wetland** – existing soil cap would be enhanced with additional soil; leachate would be treated in a created wetland on-site; landfill gas would be vented; and restoration of ground water to beneficial reuse through monitored natural attenuation.
2 b	**Soil Cap with Leachate collection and Off-site Leachate Disposal** - existing soil cap would be enhanced with additional soil; leachate would be collected and transported to off-site treatment facility; landfill gas would be vented; and restoration of ground water to beneficial reuse through monitored natural attenuation.
3 a & Modified 3 a	**Geomembrane Cap system with Leachate Treatment in On-site Wetland** – existing landfill cap would be reworked, and a geomembrane cap system would be placed over current soils; leachate would be directed to a created wetland on-site; landfill gas would be vented; and restoration of ground water to beneficial reuse through monitored natural attenuation.
3 b & Modified 3 b	**Geomembrane Cap system with Leachate Collection and Off-site Leachate Disposal** - existing landfill cap would be reworked, and a geomembrane cap system would be placed over current soils; leachate would be collected and transported to off-site treatment facility; landfill gas would be vented; and restoration of ground water to beneficial reuse through monitored natural attenuation.
4 a & Modified 4 a	**Dual Layer Cap with Leachate Treatment in On-site Wetland** – a dual layer cap system would be placed over the existing soil cover after it has been recompacted and regraded for proper drainage; leachate would be treated in a created wetland on-site; landfill gas would be vented; and restoration of ground water to beneficial reuse through monitored natural attenuation.
4 b & Modified 4 b	**Dual Layer Cap with Leachate Collection and Off-site Leachate Disposal** - a dual layer cap system would be placed over the existing soil cover after it has been recompacted and regraded for proper drainage; leachate would be collected and transported to off-site treatment facility; landfill gas would be vented; and restoration of ground water to beneficial reuse through monitored natural attenuation.

4.1 No Action Alternative

The "no action alternative" is a required remedial alternative. The NCP requires evaluation of a no action alternative to establish a baseline for the comparison of other remedial alternatives. Under this option, no remedial activities or monitoring are conducted at the site.

Potential exposure to contaminated media is not controlled or prevented. There are no costs associated with this remedy since there is no action to be taken.

4.2 Remedial Alternatives

The FS proposed six potential active remedial alternatives for the Jackson County Landfill. The alternatives vary based on possible capping enhancements and the proposed treatment alternative for the leachate. All alternatives with an "a" designation propose treatment of the leachate in an on-site constructed wetland. All "b" alternatives propose the collection and transportation of the leachate to an off-site location for treatment and proper disposal. All of the alternatives include several common elements. In order to minimize duplication of the same information, all of the common elements are summarized here rather than under each different alternative.

Landfill Gas: Pipe vents (approximately one per acre) will be installed within the landfill limits to passively vent gas from the landfill. Whether there is a need to burn the soil gas will be evaluated during the design, along with any applicable permitting requirements.

Access: Gates will be installed at the access roads and fences will be extended approximately 20 feet on each side to limit human access to the property. Warning signs will be installed around the landfill as determined in the remedial design. The gates will comply with the requirement of Ohio Administrative Code (OAC) 3745-27-11(H)(7) to block the access road from unauthorized entry to the site.

Institutional Controls: Institutional controls and land use restrictions following the Ohio Uniform Environmental Covenants Act (UECA) of 2004 will be implemented to prohibit residential occupation of the site. The restrictions also will prohibit the use of ground water beneath the landfill for potable and/or agricultural purposes. Lastly, the restrictions will prohibit building or placing any permanently occupied structure on the landfill itself.

Maintenance: The cap system will be maintained and monitored in accordance with the Operation and Maintenance Plan prepared during remedial design to meet the requirements of OAC 3745-27-12, 3745-27-14, and 3745-27-19 for ground water monitoring, explosive gas monitoring, post-closure care, surface water management, and leachate management.

Ground Water: An active ground water treatment system is not being proposed. Instead, the ground water below the site will be restored to beneficial reuse through natural attenuation, and monitored to evaluate the ground water quality and natural attenuation of contaminants over time after the landfill cap is installed until the ground water RLs listed in Table 3 are demonstrated to be met. The details of the ground water monitoring plan will be determined during the design phase of the remedy.

<u>Alternative 2a: Soil Cap with Leachate Treatment in On-site Wetland</u>

In addition to the common elements listed above, this alternative consists of the repair of the existing soil cap to provide a minimum two foot thick compacted soil cover. After clearing and grubbing of the surface vegetation, the existing topsoil will be removed and set aside for reinstallation over the repaired cap. The existing cap soils will be regraded or supplemented to provide a minimum two foot thick soil cap with proper drainage. The existing surface of the cap will be recompacted. The entire surface may not require regrading or compaction if the existing grade and compaction meets design requirements. The capital cost estimate is based on the entire surface requiring regrading and compaction. In addition, the soil cap will be designed to provide a minimum of two feet of soil cover over the existing soil in the seep (leachate) flow channels on the landfill.

A leachate collection system will be installed to capture leachate from the landfill. The leachate will be pumped or transported by gravity, if possible, to an on-site constructed wetland for treatment. The required wetland area will be approximately 4 acres. The discharge from the wetland will flow to Salt Lick Creek. The inflow to the wetland will incorporate a holding/equalization structure to provide for minimum flow through the treatment wetland during periods of low flow. Additionally, a surface water pond may be added to provide water to maintain a minimum flow; the need for this potential element will be determined during design. After the holding/equalization structure, the leachate water will pass through a filter system to remove suspended solids before entering the treatment wetland. The filter system will serve to remove PCBs detected in the seep water. A tall fence will be installed around the treatment wetland to deter deer from grazing on the wetland vegetation.

It will take approximately five years to establish the wetland. Prior to the wetland becoming fully functional, the leachate will need to be collected and hauled off-site for proper treatment and disposal. The yearly estimated cost to haul the leachate off-site is $ 1,170,000. Note that the purpose of the cap under this alternative is to prevent direct contact with the waste. This proposed capping alternative will not prevent the development of leachate.

Estimated Capital Cost: $ 3,718,000
Estimated Annual O&M Cost: $ 1,372,000
Estimated Present Worth Cost of O&M: $ 8,171,000
Estimated Construction Time: 8 months

<u>Alternative 2b: Soil Cap with Leachate Treatment with Offsite Leachate Disposal</u>

In addition to the common elements listed above, Alternative 2b consists of the repair of the landfill cap in the same manner as described in alternative 2a. However, the proposed treatment of the leachate differs.

A leachate collection system will be installed to capture leachate from the landfill. The leachate will be pumped or transported by gravity to an on-site holding structure. Once the holding structure is full, or based on a pre-scheduled date, the leachate will be transported to the local publicly owned treatment works (POTW – wastewater treatment plant) for treatment and disposal. The estimated yearly cost for hauling the leachate is $ 1,170,000. Leachate will be collected and hauled from the site for 30 years. Note that the purpose of the cap under this alternative is to prevent direct contact with the waste. This proposed capping alternative will not prevent the development of leachate.

Estimated Capital Cost: $ 3,818,000
Estimated Annual O&M Cost: $ 1,332,000

Estimated Present Worth Cost of O&M: $ 20,477,000
Estimated Construction Time: 8 months

Alternative 3a: Geomembrane Cap with Leachate Treatment in On-Site Wetland

In addition to the common elements listed above, this alternative consists of placing a geomembrane cap system over the existing soil cap after it has been recompacted and regraded for proper drainage. The existing soil will be reworked and compacted to achieve permeability of 1×10^{-6} cm/sec or as low of permeability as can be reasonably achieved (goal of 1×10^{-6} cm/sec). Any added soil to this layer will be clay soil that can achieve a compaction of 1×10^{-6} cm/sec. The cap system will consist of (from bottom to top):

- A recompacted soil layer (soil already on site with additional soil added if needed to achieve minimum of 18 inch base) to serve as a bedding and low permeability layer.
- A geocomposite (consisting of a geonet and geotextile filters) to capture and transport venting gas to passive vents and to capture and transport leachate to a collection piping system.
- A 40 mil geomembrane liner.
- A geocomposite to collect and transport surface water infiltration to a perimeter drainage system.
- A 24 inch thick protective cover soil layer.
- A 6 inch thick topsoil layer (using existing topsoil and supplemented with additional soil as required).

The final surface grade will be designed to provide for surface drainage to eliminate any low lying areas on the cap that would retain surface water.

The leachate collection system is the same as described in alternative 2a except that the piping will be incorporated into the geocomposite system. It will take approximately five years to establish the wetland. Prior to the wetland becoming fully functional, the leachate will need to be collected and hauled off-site for proper treatment and disposal. However, the capping system for this alternative incorporates a geocomposite layer which will help prevent leachate. As a result, during the 5 years in which the wetland is becoming established, the cost for hauling the leachate off-site for treatment and disposal is estimated to be $ 272,500 per year instead of the estimated $ 1,170,000 as described in alternative 2a and 2b.

Estimated Capital Cost: $ 7,669,000
Estimated Annual O&M Cost: $ 453,500
Estimated Present Worth Cost of O&M: $ 3,130,000
Estimated Construction Time: 8 months

Subsequent to the submittal and approval of the FS, Goodyear evaluated a modification to alternatives 3a, 3b, 4a and 4b. The modification proposed the elimination of the geosynthetic gas venting/leachate collection layer as proposed in the FS. The removal of this layer, which is not required by OAC 3745-27-08, results in an overall reduction in the amount of leachate which is generated and reduces the overall costs of these remedial alternatives by $588,000. Ohio EPA reviewed the proposed modification for these alternatives and agrees with Goodyear's changes. Therefore, Modified Alternatives 3a, 3b, 4a and 4b, which were not included in the original FS, are included within this Preferred Plan.

Modified Alternative 3a: Geomembrane Cap with Leachate Treatment in On-Site Wetland

In addition to the common elements listed above, this alternative consists of placing a geomembrane cap system over the existing soil cap after it has been recompacted and regraded for proper drainage. The existing soil will be reworked and compacted to achieve permeability of 1×10^{-6} cm/sec or as low of permeability as can be reasonably achieved (goal of 1×10^{-6} cm/sec). Any added soil to this layer will be clay soil that can achieve a compaction of 1×10^{-6} cm/sec. The cap system will consist of (from bottom to top):

- A recompacted soil layer (soil already on site with additional soil added if needed to achieve minimum of 18 inch base) to serve as a bedding and low permeability layer.
- A 40 mil geomembrane liner.
- A geocomposite to collect and transport surface water infiltration to a perimeter drainage system.
- A 24 inch thick protective cover soil layer.
- A 6 inch thick topsoil layer (using existing topsoil and supplemented with additional soil as required). The 6 inch topsoil layer is included in the 24 inches required for the protective cover soil layer.

The final surface grade will be designed to provide for surface drainage to eliminate any low lying areas on the cap that would retain surface water.

It will take approximately five years to establish the wetland. Prior to the wetland becoming fully functional, the leachate will need to be collected and hauled off-site for proper treatment and disposal. During the 5 years in which the wetland is becoming established, the cost for hauling the leachate off-site for treatment and disposal is estimated to be $ 272,500 per year instead of the estimated $ 1,170,000 as described in alternatives 2a and 2b.

Estimated Capital Cost: $ 7,081,000
Estimated Annual O&M Cost: $ 453,500
Estimated Present Worth Cost of O&M: $ 3,130,000
Estimated Construction Time: 8 months

Alternative 3b: Geomembrane Cap with Leachate Treatment at POTW

In addition to the common elements listed above, Alternative 3b consists of the same proposed capping alternative as described in Alternative 3a. The leachate collection system is the same as described in alternative 2b. In summary, the cap will consist of a new geomembrane capping system while the leachate will be collected on-site and transported to the local POTW for proper treatment and disposal. Note that the capping system for this alternative incorporates a geocomposite layer which will help prevent leachate. As a result, much less leachate is anticipated and the associated operation and maintenance costs are lower.

Estimated Capital Cost: $ 7,644,000
Estimated Annual O&M Cost: $ 433,500
Estimated Present Worth Cost of O&M: $ 3,071,000
Estimated Construction Time: 9 months

Modified Alternative 3b: Geomembrane Cap with Leachate Treatment at POTW

In addition to the common elements listed above, Modified Alternative 3b consists of the same proposed capping alternative as described in Modified Alternative 3a. The difference between this alternative and alternative 3a is that the leachate will be collected and hauled off-site for treatment. Under this alternative, a wetland will not be established.

Estimated Capital Cost: $ 7,056,000
Estimated Annual O&M Cost: $ 433,500
Estimated Present Worth Cost of O&M: $ 3,071,000
Estimated Construction Time: 9 months

Alternative 4a: Dual Layer Cap with Leachate Treatment in On-site Wetlands

In addition to the common elements listed above, Alternative 4a consists of placing a dual layer cap system over the existing soil cover after it has been recompacted and regraded for proper drainage. The dual layer cap system would consist of (from bottom to top):

- A recompacted soil layer to serve as a bedding layer.
- A geocomposite (consisting of a geonet and geotextile filters) to capture and transport venting gas to passive vents and to capture and transport leachate to a collection piping system.
- An 18 inch thick clay layer compacted to a permeability of 1 x 10^{-6} cm/sec. A potential alternative to the clay layer will be a geosynthetic clay liner (GCL). The GCL would consist of a bentonite mat either separate or attached to the 40 mil geomembrane liner and would provide the same dual layer of low permeability protection as the clay layer and geomembrane. During the design phase, a final decision will be made on whether 18 inches of clay or the GCL will be used for the cap.
- A 40 mil geomembrane liner.
- A geocomposite to collect and transport surface water infiltration to a perimeter drainage system.
- A 24 inch thick protective cover soil layer (18 inch required with GCL).
- A 6 inch thick topsoil layer (using existing topsoil and supplemented as required).

The existing cap surface will be recompacted and then regraded or supplemented to provide proper drainage. No minimum thickness for this soil layer is required as long as the thickness provides adequate protection of the geofabrics against penetration from materials in the waste. The final surface grade will be designed to provide for surface drainage to eliminate any low lying areas on the cap that would retain surface water.

Under this scenario, the wetland will be constructed to treat leachate. See alternative 2a for details.

Estimated Capital Cost: $ 8,844,000
Estimated Annual O&M Cost: $ 431,250
Estimated Present Worth Cost for O&M: $ 3,034,000
Estimated Construction Time: 9 months

Modified Alternative 4a: Dual Layer Cap with Leachate Treatment in On-site Wetland

In addition to the common elements listed above, Modified Alternative 4a consists of placing a dual layer cap system over the existing soil cover after it has been recompacted and regraded for proper drainage. However, as mentioned earlier, the **modified** alternatives 4a and 4b eliminate the installation of the geosynthetic gas venting/leachate collection layer. The dual layer cap system would consist of (from bottom to top):

- A recompacted soil layer to serve as a bedding layer.
- An 18 inch thick clay layer compacted to a permeability of 1×10^{-6} cm/sec. A potential alternative to the clay layer will be a GCL. The GCL would consist of a bentonite mat either separate or attached to the 40 mil geomembrane liner and would provide the same dual layer of low permeability protection as the clay layer and geomembrane. During the design phase, a final decision will be made on whether 18 inches of clay or the GCL will be used for the cap.
- A 40 mil geomembrane liner.
- A geocomposite to collect and transport surface water infiltration to a perimeter drainage system.
- A 24 inch thick protective cover soil layer (18 inch required with GCL).
- A 6 inch thick topsoil layer (using existing topsoil and supplemented as required).

The existing cap surface will be recompacted and then regraded or supplemented to provide proper drainage. No minimum thickness for this soil layer is required as long as the thickness provides adequate protection of the geofabrics against penetration from materials in the waste. The final surface grade will be designed to provide for surface drainage to eliminate any low lying areas on the cap that would retain surface water.

Under this scenario, the wetland will be constructed to treat leachate. See alternative 2a for details.

Estimated Capital Cost: $ 8,256,000
Estimated Annual O&M Cost: $ 431,250
Estimated Present Worth Cost for O&M: $ 3,034,000
Estimated Construction Time: 9 months

Alternative 4b: Dual Layer Cap with Leachate Treatment at POTW

In addition to the common elements listed above, the capping alternative under this scenario is the same as the cap described for alternative 4a, above.

The leachate collection and treatment system is the same as described under alternative 2b.

Estimated Capital Cost: $ 8,816,000
Estimated Annual O&M Cost: $ 411,250
Estimated Present Worth Cost for O&M: $ 2,729,000
Estimated Construction Time: 9 months

Modified Alternative 4b: Dual Layer Cap with Leachate Treatment at POTW

In addition to the common elements listed above, the capping alternative under this scenario is the same as the cap described for modified alternative 4a, above.

Estimated Capital Cost: $ 8,228,000
Estimated Annual O&M Cost: $ 411,250
Estimated Present Worth Cost for O&M: $ 2,729,000
Estimated Construction Time: 9 months

5.0 COMPARISON AND EVALUATION OF ALTERNATIVES

5.1 Evaluation Criteria

Ohio EPA considers eight criteria, as outlined in the NCP, to evaluate the various remedial alternatives individually and against each other in order to select a remedy. A more detailed analysis of the remedial alternatives can be found in the FS report. The eight evaluation criteria are listed and discussed below.

1. **Overall Protection of Public Health and the Environment** - determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.
2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)** - evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.
3. **Long-Term Effectiveness and Permanence** – evaluates the ability of an alternative to maintain protection of human health and the environment over time.
4. **Reduction of Toxicity, Mobility, or Volume of Contaminants Through Treatment** – evaluates the amount of contamination present, the ability of the contamination to move in the environment, and the use of treatment to reduce harmful effects of the principal contaminants.
5. **Short-Term Effectiveness** – evaluates the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.
6. **Implementability** – evaluates the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.

7. Cost – includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.
8. Community Acceptance – considers whether the local community agrees with Ohio EPA's analyses and preferred alternative. Comments received on the Preferred Plan are an important indicator of community acceptance.

Evaluation Criteria 1 and 2 are threshold criteria required for acceptance of an alternative that has accomplished the goal of protecting human health and the environment and has complied with the law. Any acceptable remedy must comply with both of these criteria. Evaluation Criteria 3 through 7 are the balancing criteria used to select the best remedial alternative(s) identified in the Preferred Plan. Evaluation Criterion 8, community acceptance, is a modifying criterion that will be evaluated through public comment on the alternatives received during the comment period.

5.2 Analysis of Evaluation Criteria

This section examines how each of the evaluation criteria is applied to each of the remedial alternatives found in Section 4.2 and compares how the alternatives achieve the evaluation criteria.

Overall Protection of Human Health and the Environment

Evaluation of the overall protectiveness of the alternatives focuses on whether each alternative achieves adequate protection of human health and the environment and identifies how site risks posed through each pathway being addressed are eliminated, reduced or controlled by the alternative. This evaluation also includes consideration of whether the alternative poses any unacceptable short-term or cross-media impacts.

No Action Alternative: The "no action alternative" is not protective of human health and the environment. There are potential contaminants and exposures that need to be addressed. Because this alternative is not protective of human health and the environment it has been eliminated from consideration under the remaining seven criteria.

Alternative 2a: Exposure to soil gas and contaminated soil is eliminated. Ground water exposure is controlled through Use Restrictions and monitored natural attenuation.

Alternative 2b: Exposure to soil gas and contaminated soil is eliminated. Ground water exposure is controlled through Use Restrictions and monitored natural attenuation.

Alternative 3a & Modified Alternative 3a: Exposure to soil gas and contaminated soil is eliminated. Ground water exposure is controlled through Use Restrictions and monitored natural attenuation.

Alternative 3b & Modified Alternative 3b: Exposure to soil gas and contaminated soil is eliminated. Ground water exposure is controlled through Use Restrictions and monitored natural attenuation.

Alternative 4a & Modified Alternative 4a: Exposure to soil gas and contaminated soil is eliminated. Ground water exposure is controlled through Use Restrictions and monitored natural attenuation.

Alternative 4b & Modified Alternative 4b: Exposure to soil gas and contaminated soil is eliminated. Ground water exposure is controlled through Use Restrictions and monitored natural attenuation.

Compliance with ARARs

ORC 3734.02(G) is an ARAR. Accordingly, the issuance of the ORC 3734.02(G) Exemption renders the modified alternatives 3a, 3b, 4a, and 4b ARAR compliant as to landfill capping design and is protective of human health and the environment.

Alternative 2a: Does not comply with the current landfill capping regulations but does comply with air pollution, prohibition against open dumping, well design, closure and explosive gas monitoring regulations.

Alternative 2b: Does not comply with the current landfill capping regulations but does comply with air pollution, open dumping, well design, closure and explosive gas monitoring regulations.

Alternative 3a & Modified Alternative 3a: With the issuance of the ORC 3734.02(G) Exemption, this modified alternative complies with capping ARARs. In addition, the location of the gas collection layer will be moved to accommodate the alternative capping design. This alternative complies with other applicable regulations including control of air pollution, open dumping, well design, closure and explosive gas monitoring regulations.

Alternative 3b & Modified Alternative 3b: With the issuance of the ORC 3734.02(G) Exemption, this modified alternative complies with capping ARARs. In addition, the location of the gas collection layer will need to be moved to accommodate the alternative capping design. However, OAC 3745-27-08(D)(27) does not require a specific location for this layer so moving it to accommodate an alternative capping design does not violate any ARARs. This alternative complies with other applicable regulations including control of air pollution, open dumping, well design, closure and explosive gas monitoring regulations.

Alternative 4a & Modified Alternative 4a: Complies with all applicable or relevant and appropriate requirements after the issuance of the ORC 3734.02(G) Exemption.

Alternative 4b & Modified Alternative 4b: Complies with all applicable or relevant and appropriate requirements after the issuance of the ORC 3734.02(G) Exemption.

Long-Term Effectiveness and Permanence

Alternative 2a: The source of the contaminants is not removed. Exposure to contaminants is controlled through a variety of mechanisms including an augmented soil cap, soil gas vents and management of the leachate through the creation of a wetland. However, long term maintenance is required. The wetland may need additional management as the efficiency of this remedy element is linked to the weather and adequate water.

Alternative 2b: The source of the contaminants is not removed. Exposure to contaminants is controlled through a variety of mechanisms including an augmented soil cap, soil gas vents and a leachate management system. However, long term maintenance is required. The leachate collection system must be carefully monitored to ensure that the collection system does not become too full.

Alternative 3a & Modified Alternative 3a: The source of the contaminants is not removed. However, the quality of the landfill cap should significantly reduce the quantity of leachate produced. Soil gas vents and a leachate management system included in the remedy will control exposure to these two potential sources of contaminants. Long term maintenance is required for all of the remedy components. The wetland may need additional management as the efficiency of this remedy element is linked to the weather and adequate water.

Alternative 3b & Modified Alternative 3b: The source of the contaminants is not removed. However, the quality of the cap should significantly reduce the quantity of leachate produced. Soil gas vents and the leachate management system included in the remedy will control exposure to these two potential sources of contaminants. Long term maintenance is required for all of the remedy components. The leachate collection system must be carefully monitored to ensure that the collection tank does not become too full.

Alternative 4a & Modified Alternative 4a: The source of the contaminants is not removed. However, the proposed landfill cap should result in the least amount of leachate produced compared to the other potential remedies. Soil gas vents and the leachate management system included in the remedy will control exposure to these two potential sources of contaminants. Long term maintenance is required for all of the remedy components. The wetland may need additional management as the operational efficiency of this remedy element is linked to the weather and adequate water.

Alternative 4b & Modified Alternative 4b: The source of the contaminants is not removed. However, the proposed landfill cap should result in the least amount of leachate produced compared to the other potential remedies. Soil gas vents and the leachate management system included in the remedy will control exposure to these two potential sources of contaminants. Long term maintenance is required for all of the remedy components. The leachate collection system must be carefully monitored to ensure that the collection tank does not become too full.

Reduction of Toxicity, Mobility or Volume by Treatment

Alternative 2a: Wastes are left in place so there is no reduction in volume, toxicity or mobility. However, the wastes are covered, the leachate is collected and transported to an on-site wetland, and the soil gas collection system is designed to prevent migration of the soil gas to an adjacent property. If the soil gas is flared, exposure will be prevented. Absent flaring, the soil gas is transferred from the soil to the atmosphere.

Alternative 2b: Wastes are left in place so there is no reduction in volume, toxicity or mobility. However, the wastes are covered, the leachate is collected and transported off-site to the local wastewater treatment plant and the soil gas collection system is designed to prevent migration of the soil gas to an adjacent property. If the soil gas is flared, exposure will be prevented. Absent flaring, the soil gas is transferred from the soil to the atmosphere.

Alternative 3a & Modified Alternative 3a: Wastes are left in place so there is no reduction in volume, toxicity or mobility. However, the wastes are covered, the leachate is collected and transported to an on-site wetland (Modified Alternative 3a produces significantly less leachate), and the soil gas collection system is designed to prevent migration of the soil gas to an adjacent property. If the soil gas is flared, exposure will be prevented. Absent flaring, the soil gas is transferred from the soil to the atmosphere.

Alternative 3b & Modified Alternative 3b: Wastes are left in place so there is no reduction in volume, toxicity or mobility. However, the wastes are covered, the leachate is collected and transported off-site to the local wastewater treatment plant (Modified Alternative 3b produces significantly less leachate) and the soil gas collection system is designed to prevent migration of the soil gas to an adjacent property. If the soil gas is flared, exposure will be prevented. Absent flaring, the soil gas is transferred from the soil to the atmosphere.

Alternative 4a & Modified Alternative 4a: Wastes are left in place so there is no reduction in volume, toxicity or mobility. However, the wastes are covered, the leachate is collected and transported to an on-site wetland, and the soil gas collection system is designed to prevent migration of the soil gas to an adjacent property. If the soil gas is flared, exposure will be prevented. Absent flaring, the soil gas is transferred from the soil to the atmosphere.

Alternative 4b & Modified Alternative 4b: Wastes are left in place so there is no reduction in volume, toxicity or mobility. However, the wastes are covered, the leachate is collected and transported off-site to the local wastewater treatment plant and the soil gas collection system is designed to prevent migration of the soil gas to an adjacent property. If the soil gas is flared, exposure will be prevented. Absent flaring, the soil gas is transferred from the soil to the atmosphere.

Short-Term Effectiveness

Alternative 2a: The greatest short term risk will be exposure to dust during the construction/augmentation of the soil cover. Dust can be controlled during construction. Gas vents will not provide immediate mitigation of gas migration and leachate may need to be temporarily collected until the wetland is constructed and fully operational. Construction workers may need to wear appropriate protective clothing or other protective gear during construction. Estimated construction time is eight months although the wetland may take up to five years to become established.

Alternative 2b: The greatest short term risk will be exposure to dust during the construction/augmentation of the soil cover. Dust can be controlled during construction. Gas vents will not provide immediate mitigation of gas migration. Construction workers may need to wear appropriate protective clothing or other protective gear during construction. Estimated construction time is 8 months.

Alternative 3a & Modified Alternative 3a: The greatest short term risk will be exposure to dust during the construction of the landfill cap. There is approximately six times more soil movement and dust generation expected with this alternative than with alternative 2a. However, dust can be controlled during construction. Gas vents will not provide immediate mitigation of gas migration and leachate may need to be temporarily collected until the wetland is constructed and fully operational. Construction workers may need to wear appropriate protective clothing or other protective gear during construction. Estimated construction time is nine months although the wetland may take up to five years to become established.

Alternative 3b & Modified Alternative 3b: The greatest short term risk will be exposure to dust during the construction of the landfill cap. There is approximately six times more soil movement and dust generation expected with this alternative than with alternative 2b. Dust can be controlled during construction. Gas vents will not provide immediate mitigation of gas migration. Construction workers may need to wear appropriate protective clothing or other protective gear during construction. Estimated construction time is nine months.

Alternative 4a & Modified Alternative 4a: The greatest short term risk will be exposure to dust during the construction of the landfill cap. There is approximately eight times more soil movement and dust generation expected with this alternative than with alternative 2a. However, dust can be controlled during construction. Gas vents will not provide immediate mitigation of gas migration and leachate may need to be temporarily collected until the wetland is constructed and develops. Construction workers may need to wear appropriate protective clothing or other protective gear during construction. Estimated construction time is nine months although the wetland may take up to five years to become established.

Alternative 4b & Modified Alternative 4b: The greatest short term risk will be exposure to dust during the construction of the landfill cap. There is approximately eight times more soil movement and dust generation expected with this alternative than with alternative 2b. Dust can be controlled during construction. Gas vents will not provide immediate mitigation of gas migration. Construction workers may need to wear appropriate protective clothing or other protective gear during construction. Estimated construction time is nine months.

Implementability

Alternative 2a: All components of the remedy are well known and readily constructed. Materials required to construct the cap include approximately 20,000 cubic yards (CY) of fill to augment existing cover soil. Once constructed, the wetland is easy to operate, but it will require time to reach maturity. During the time needed for the wetland to mature, leachate may need to be collected and transported off-site for treatment. In addition, wetlands do not work as efficiently during colder weather. An NPDES permit is required for discharge from treatment wetlands. Long term sampling of the discharge will be required under an NPDES permit.

Alternative 2b: All components of the remedy are well known and readily constructed. Materials required to construct the cap include approximately 20,000 CY of fill to augment existing cover soil. The leachate collection system does not require any special considerations other than a possible pumping system to the holding tank. Disposal at a POTW must be coordinated and preapproved. Sampling of leachate will be required to ensure that the leachate concentrations meet the POTW's limits.

Alternative 3a & Modified Alternative 3a: All components of the remedy are well known and readily constructed although the construction is more complex than for remedy 2a. Materials required to construct the cap include 20,000 CY of soil to augment the existing cover soil; 120,000 square yards (SY) of geocomposite for gas collection / leachate collection (not included in Modified Alternative 3a); 120,000 SY of 40 mil HDPE geosynthetic layer; 120,000 SY of geocomoposite for a drainage layer; 78,000 CY of protective cover soil and 19,400 CY of topsoil. Once constructed, the wetland is easy to operate but it will require time to reach maturity. During the time needed for the wetland to mature, leachate may need to be collected and transported off-site for treatment. In addition, wetlands do not work as efficiently during colder weather so additional maintenance may be needed. An NPDES permit is required for discharge from treatment wetlands. Long term sampling of the discharge will be required under an NPDES permit.

Alternative 3b & Modified Alternative 3b: All components of the remedy are well known and readily constructed although the construction is more complex than for remedy 2b. Materials required to construct the cap include 20,000 CY of soil to augment the existing cover soil; 120,000 SY of material for the geocomposite for gas collection / leachate collection (not included in Modified Alternative 3b); 120,000 SY of 40 mil HDPE geosynthetic material; 120,000 SY of geocomposite material for drainage layer; 78,000 CY of protective cover soil and 19,400 CY of topsoil. The leachate collection system does not require any special considerations other than a possible pumping system to the holding tank. Disposal of the leachate at the POTW must be coordinated and preapproved. Sampling of the leachate will be required to ensure that the leachate concentrations meet the POTW's limits.

Alternative 4a & Modified Alternative 4a: All components of the remedy are well known and readily constructed although the construction is more complex than for remedy 3a. Materials required to construct cap include 10,000 CY of soil to augment existing cover soil; 120,000 SY of a geocomposite for gas collection / leachate collection (not included in Modified Alternative 4a); 58,000 CY of clean clay (1 x 10^{-6} permeability) or 120,000 SY of GCL – low permeability layer; 120,000 SY of 40 mil HDPE geosynthetic material; 120,000 SY of geocomposite material for drainage layer; 78,000 CY [or 58,000 CY with GCL] of protective cover soil and 19,400 CY of topsoil. Once constructed, the wetland is easy to operate, but it will require time to reach maturity. During the time needed for the wetland to mature, leachate may need to be collected and transported off-site for treatment. In addition, wetlands do not work as efficiently during colder weather so additional maintenance may be needed. An NPDES permit is required for discharge from treatment wetlands. Long term sampling of the discharge will be required under an NPDES permit.

Alternative 4b & Modified Alternative 4b: All components of the remedy are well known and readily constructed although the construction is more complex than for remedy 3b. Materials required to construct the cap includes 10,000 CY of soil to augment existing cover soil; 120,000 SY of geocomposite for gas collection / leachate collection (not included in Modified Alternative 4b); 58,000 CY of clean clay (1 x 10^{-6} permeability) or 120,000 SY of GCL – low permeability layer; 120,000 SY of 40 mil HDPE geosynthetic material; 120,000 SY of geocomposite material for drainage layer; 78,000 CY [or 58,000 CY with GCL] of protective cover soil and 19,400 CY of topsoil. The leachate collection system does not require any special considerations other than a possible pumping system to the holding tank. Disposal at the POTW must be coordinated and preapproved. The leachate will be sampled to ensure that any chemicals in the leachate meet the POTW's limits.

Cost

The total cost of the potential remedies, including construction costs and the present estimated cost of operation and maintenance (O&M) [present worth costs are based on 30 years of O&M minus a discount rate of 5% to account for the decreased value of the dollar in the future] are summarized below.

Alternative 2a: Total cost including capital construction costs and O&M is $ 11,889,000.

<u>Alternative 2b:</u> Total cost including capital construction costs and O&M is $ 24,295,000. This remedy is the most expensive alternative due to the very high O&M costs.

<u>Alternative 3a:</u> Total cost including capital construction costs and O&M is $ 10,799,000.

<u>Modified Alternative 3a:</u> Total cost including capital construction costs and O&M is $10,211,000.

<u>Alternative 3b:</u> Total cost including capital construction costs and O&M is $ 10,715,000.

<u>Modified Alternative 3b:</u> Total cost including capital construction costs and O&M is $10,127,000. This remedy is the least expensive alternative.

<u>Alternative 4a:</u> Total cost including capital construction costs and O&M is $ 11,878,000.

<u>Modified Alternative 4a:</u> Total cost including capital construction costs and O&M is $11,290,000.

<u>Alternative 4b:</u> Total cost, including capital construction costs and O&M is $ 11,545,000.

<u>Modified Alternative 4b:</u> Total cost including capital construction costs and O&M is $10,957,000.

Community Acceptance

Ohio EPA received comments from interested parties at the public meeting held April 9, 2015 at the Jackson City Council Chambers located at 199 Portsmouth Street in Jackson, Ohio, and during the public comment period, which ran between February 17, 2015 and April 17, 2015. Those comments and Ohio EPA's responses are included in Section 8.0 (Response to Comments) of this Decision Document.

5.3 Summary of Evaluation Criteria

A summary of the evaluation of the site remedial alternatives is included in **Table 5** below.

Table 5. Evaluation of Site Remedial Alternatives

Remedial Alternatives	Threshold Criteria		Balancing Criteria					
	1. Protects Human Health & Environment	2. Compliance with ARARs	3. Long Term Effectiveness	4. Reduces Toxicity, Mobility and/or Volume by Treatment	5. Short Term Effectiveness	6. Implementable	7. Costs (Capital + O&M)	8. Community Acceptance
2a	■	□	▣	▣	▣	■	$11,889,000	
2b	■	□	▣	▣	▣	■	$24,295,000	

3a	■	■	■	▣	▣	■	$10,799,000	
Modified 3a	■	■	■	▣	▣	■	$10,211,000	
3b	■	■	■	▣	▣	■	$10,715,000	
Modified 3b	■	■	■	▣	▣	■	$10,127,000	
4a	■	■	■	▣	▣	■	$11,878,000	
Modified 4a	■	■	■	▣	▣	■	$11,290,000	
4b	■	■	■	▣	▣	■	$11,545,000	
Modified 4b	■	■	■	▣	▣	■	$10,957,000	
■ = Fully Meets Criteria ▣ = Partially Meets Criteria □ = Does Not Meet Criteria								

6.0 OHIO EPA'S SELECTED REMEDIAL ALTERNATIVE

During the time when Ohio EPA was reviewing the possible clean-up alternatives, a modification to alternatives 3 and 4 was evaluated by Goodyear. On January 26, 2012, Goodyear submitted to Ohio EPA a proposal to modify alternatives 3a, 3b, 4a and 4b. The modification consisted of eliminating the geosynthetic gas venting / leachate collection layer. Based on the analysis which was performed for this site, the removal of this layer results in less leachate being generated than when this layer is left in place. Ohio EPA's review of the modified alternatives found that the modification was beneficial for the site remedial alternatives. The elimination of this layer results in a decrease in the amount of leachate generated, resulting in a better environmental alternative and, ultimately, a slightly less expensive alternative as the modification resulted in a decrease of $588,000 compared with the original costs. Prior to the installation of the cap, the effects of eliminating the geosynthetic gas venting/leachate collection layer will be evaluated to ensure that hydrostatic pressure does not develop beneath the geomembrane liner which could result in liner failure. If the evaluation shows that a liner failure could occur then a geosynthetic gas venting/leachate collection layer may be installed.

Based upon the selection criteria, the selected remedial alternative for addressing the exposure pathways and the lack of an adequate cap at the Jackson County Landfill site is **Modified Alternative 3b**. Initially, this alternative did not fully comply with applicable ARARs, specifically, OAC 3745-27-08(D), (Sanitary Landfill facility construction). Goodyear submitted a request for an exemption from specific requirements of OAC 3745-27-08(D) in a letter dated December 8, 2011. After evaluating the exemption request, and looking at the site specific conditions which exist at the Jackson County Landfill, the Director of Ohio EPA granted the exemption request on July 6, 2012.

The selected remedial alternative will achieve the goal of protecting human health and the environment while costing less than the other remedial alternatives. In addition, while Ohio EPA prefers natural alternatives such as a wetland for the treatment of leachate, the current modeling predicts that there will be insufficient leachate generated to maintain a wetland within a couple of years of cap construction. Therefore, the selected alternative includes the collection and off-site disposal of any generated leachate. The selected alternative reduces risk within a reasonable time frame at less cost than any other combination of alternatives, and provides for long-term reliability of the remedy. However, if there is still a significant quantity of leachate being produced after the remedy has been operational for at least two years, then the wetland alternative will be reevaluated by Goodyear based on the environmental conditions which exist at that time. If the evaluation indicates that adequate conditions for a wetland exist and will be sustained over time, then with review and approval by the Ohio EPA, a wetland may replace the collection and hauling of leachate off site for disposal.

Based on information presently available, Ohio EPA believes the selected remedial alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to balancing criteria in that it: 1) is protective of human health and the environment; 2) complies with ARARs; 3) is cost-effective; 4) uses permanent solutions and alternative treatment technologies (*e.g.*, innovative) to the maximum extent practicable; and 5) satisfies the preference for treatment as a principal element.

Further description of each aspect of Ohio EPA's Selected Remedial Alternative is contained in the following sections:

6.1 LANDFILL COVER

Modified Alternative 3b consists of placing a geomembrane cap system over the existing soil cap after it has been regraded for proper drainage. The existing soil will be reworked to achieve a permeability of 1×10^{-6} cm/sec or as low as can be reasonably achieved. Any added soil to this layer will be clay soil that can achieve a compaction of 1×10^{-6} cm/sec. The cap system will consist of (from bottom to top):

- A soil layer (soil already on site with additional soil added if needed to achieve minimum of 18 inch base) to serve as a bedding and low permeability layer.
- A 40 mil geomembrane liner.
- A geocomposite drainage system to collect and transport surface water infiltration to a perimeter drainage system.
- A 24 inch thick protective cover soil layer.
- A 6 inch thick topsoil layer (using existing topsoil and supplemented with additional soil as required). The 6 inch topsoil layer is included in the 24 inches required for the protective cover soil layer.

The final surface grade will be designed to provide for surface drainage to eliminate any low lying areas on the cap that would retain surface water.

The cap system will be maintained and monitored in accordance with the O&M Plan prepared during remedial design to meet the requirements of OAC 3745-27-12, 3745-27-14, and 3745-27-19.

In addition to the cap system described above, gates will be installed at the access roads and fences will be extended approximately 20 feet on each side to limit human access to the property. Warning signs will be installed around the landfill as determined during remedial design.

Institutional controls and land use restrictions following the Ohio UECA of 2004 will be implemented to prohibit residential occupation of the site. The restrictions will prohibit building or placing any permanently occupied structure on the landfill itself.

The performance standards are met when:

- Cap installation as described above is completed to prevent exposure to waste and migration of the chemicals of concern from the waste (See Drawings 2 and 3) to the surrounding environmental media. The cap will pass an Ohio EPA inspection to ensure that each improvement has been implemented.

- A long-term O&M plan for the cap is implemented to ensure that exposure to contaminated environmental media is prevented (See Table 2: Remedial Action Objectives) and the cap passes Ohio EPA inspections during the O&M period.

- Site access controls (*i.e.*, fencing and signage) to prevent exposure to contaminated media (See Table 2: Remedial Action Objectives) are established and pass periodic compliance inspections, until such time that such access controls are no longer necessary.

- Environmental covenants, including restrictions to prevent intrusive activities on-site, have been recorded in the Jackson County Recorder's Office and copies are provided to Ohio EPA. On-site intrusive activities could increase exposure to contaminated environmental media (See Table 2: Remedial Action Objectives).

6.2 GROUND WATER

The ground water will be monitored to ensure that the chemicals present in the ground water decrease over time through natural attenuation, with the goal of achieving drinking water standards for those chemicals with a drinking water standard, calculated health based clean-up standards for those chemicals without a drinking water standard or background concentrations for those chemicals which occur naturally. The current contaminants which exceed drinking water standards are: vinyl chloride, tetrachloroethylene, mercury and arsenic (See Table 3 Contaminants of Concern and Remediation Levels).

Institutional controls will be established on the site to prevent extraction and use of ground water (except for investigative and cleanup purposes) to prevent exposure to contaminated ground water.

The performance standards are met when:

- A ground water monitoring program capable of detecting contaminant level trends is established. A ground water monitoring plan will be developed during the remedial design phase of the project and will remain in place until ground water at the site achieves the RLs listed in Table 3 for a minimum of eight consecutive sampling events collected quarterly over a period of two years.

- Ground water sample analyses in all the monitoring wells in the site monitoring well network (see Appendix B, Drawing 5) must meet the numerical performance standards in Table 3 before the ground water monitoring program can be terminated. The ground water must meet the RLs listed in Table 3 for a minimum of eight consecutive sampling events collected quarterly over a period of two years.

- Environmental covenants, including restrictions on the use of ground water, have been recorded in the Jackson County Recorder's Office and copies are provided to Ohio EPA. These restrictions apply in perpetuity, subject to amendment or termination.

6.3 SOIL GAS

Elevated methane levels and a variety of VOCs have been detected in the soil gas on the property adjacent to the site, but still within the landfill limits (See Appendix E, Drawing 9). Pipe vents (approximately one per acre) will be installed within the landfill limits to passively vent gas from the landfill. Whether there is a need to burn the soil gas will be evaluated during the remedial design.

Institutional controls will be established on the site property to control future construction of occupied structures, unless it can be documented that these structures meet applicable standards. This will help prevent exposure to contaminated soil gas and protect human health. Property owner concurrence will be necessary for establishment of the institutional controls.

The performance standard is met when:

- A soil gas collection system to prevent migration of soil gas, which contains contaminants exceeding the RLs listed in Table 3, to adjacent properties is installed. After the gas collection system is installed, the soil gas present in the area outside of the gas collection system must be sampled in order to demonstrate that the migration of contaminated soil gas to the adjacent property has been prevented by the soil gas collection system. A soil gas monitoring plan will be developed during the remedial design phase of the project to ensure continued compliance.

- Soil gas collection can be terminated when all soil gas monitoring points (See Appendix B, Drawing 9) are demonstrated to be below the values in Table 3 for a minimum of eight consecutive sampling events collected quarterly over a period of two years.

- Environmental covenants, including restrictions on the construction of occupied structures unless the indoor air in these structures can be demonstrated to meet the RLs listed in Table 3, have been recorded in the Jackson County Recorder's Office and copies are provided to Ohio EPA.

6.4 LEACHATE CONTROL

A leachate collection system will be installed to capture leachate from the landfill. The leachate will be pumped or transported by gravity to an on-site holding structure. Once the holding structure is full, or based on a pre-scheduled date, the leachate will be transported to the local POTW for treatment and disposal. The capping system for the preferred remedial alternative incorporates a geocomposite layer which will help prevent leachate. As a result, much less leachate is anticipated and the associated O&M costs are lower.

The performance standard is met when:

- The leachate collection system construction is completed such that leachate emanating from the landfill is collected and properly disposed of, which will prevent exposure to contaminants exceeding the RLs listed in Table 3.

- A leachate monitoring plan will be developed during remedial action. This plan will include periodic reporting of leachate generation amounts and leachate sampling results.

- Leachate sample analysis at the site must be demonstrated to meet the numerical standards in Table 3 before the leachate monitoring program can be terminated.

- Evaluate and possibly install a wetland for the treatment of leachate if more leachate is generated than is currently predicted after the cap has been installed. If the wetland is a viable alternative, it will eliminate the need to collect, store and then transport leachate off-site for treatment and disposal.

7.0 Documentation of Significant Changes

Ohio EPA received comments on the Preferred Plan, but no significant changes have been made to the selected remedial alternative. The Agency's responses to the comments are provided in Section 8.0 (Response to Comments).

8.0 Response to Comments

A public meeting/hearing was held on April 9, 2015 to present the Agency's Preferred Plan for the Jackson County Landfill site and to solicit public comment. Additionally, oral and written comments were accepted at this meeting and during the comment period which ran from February 17, 2015 to April 17, 2015.

Ohio EPA received comments at the public hearing and during the public comment period. A stenographic record of the public hearing portion of the meeting is attached. For those comments received by the Agency, a summation of each comment (in bold) followed by the Agency's response (in plain text) is presented below.

All written comments received are available for review at Ohio EPA's Southeast District Office located at 2195 E. Front Street, Logan, Ohio 43138, and at the site's public repository, located at the Jackson County Library, 21 Broadway Street, Jackson, Ohio 45640.

Comments from The Goodyear Tire and Rubber Company

Comment 1: In the Site History section of the Preferred Plan, Table 1, Ohio EPA acknowledges that the Site was an operational landfill from approximately April 1970 until September 1987. The Site History, however, does not accurately depict the nature of the waste that was disposed of at the Site or the large number of generators, arrangers, and transporters whose waste was disposed of at the Site. In the Decision Document, the Site History section should be amended as follows:

- Table 1: Owners, Operators and/or Disposers – The title of this table should be revised to "Owners and Operators" and the table row listing Goodyear should be deleted; unless the Decision Document lists all waste generators, it should not include Goodyear in a manner that suggests Goodyear was the sole "disposer" at the Site.

- Section 2.1: The first paragraph directly below Table 1 should be deleted and replaced with the following:

During its operation between April 1970 and September 1987, the Jackson County Landfill accepted "industrial waste" and/or "other waste" as defined in Ohio Revised Code (ORC) § 6111.01 (C) and (D), and/or "hazardous wastes" as defined in ORC § 3734.01(J), and/or "hazardous substances" as defined in Section 101(14) of the Comprehensive Environmental Response, Compensation & Liability Act / Superfund Amendment and Reauthorization Act (CERCLA/SARA) (Ohio EPA, August 2005). Wastes disposed of at the Jackson County Landfill included municipal waste and drummed materials, including: acetone, polyester resin mixture, cyclohexanone, dichloromethane, isobutyl alcohol, methyl ethyl ketone, methyl isobutyl ketone, toluene, xylene, and waste styrene mixture. Foundry sand containing certain metals (including arsenic, barium, cadmium, lead and mercury) that OSCO Industries, Inc. sent to the Site was also used as daily cover at the Site and was disposed of in a staging area on the Sexton property of the Site.

According to records provided by Goodyear in response to Ohio EPA information requests, between approximately 1974 and 1980, the owner/operator of Jackson County Landfill accepted and disposed of approximately 5,772 drums that contained contaminants from Goodyear. The landfill permanently ceased accepting waste in approximately September 1987. However, the landfill was never properly closed, nor was the minimal cap which

was placed on the waste, maintained. As a result, there have been releases of hazardous wastes occurring since at least 1996. In 1996, Ohio EPA found elevated concentrations of ammonia, iron, nickel, and lead above water quality criteria in leachate originating at the landfill. In addition, three volatile organic compounds (VOCs) – benzene, xylene and 1,2,4-trimethylbenzene were found. The benzene was detected above both the screening criteria and its maximum contaminant level (MCL). The detection of these compounds and metals indicated that constituents were being released into the environment from the landfill.

Response 1: Table 1 has been modified to reflect the requested changes.

Section 2.1 has been modified to incorporate some of the requested changes. The first two paragraphs in Section 2.1 have been modified with the following language:

During its operation between April 1970 and September 1987, the Jackson County Landfill accepted "industrial waste" and/or "other waste" as defined in Ohio Revised Code (ORC) § 6111.01 (C) and (D), and/or "hazardous wastes" as defined in ORC § 3734.01(J), and/or "hazardous substances" as defined in Section 101(14) of the Comprehensive Environmental Response, Compensation & Liability Act / Superfund Amendment and Reauthorization Act (CERCLA/SARA) (Ohio EPA, August 2005). Wastes disposed of at the Jackson County Landfill included municipal waste and drummed materials, including: acetone, polyester resin mixture, cyclohexanone, dichloromethane, isobutyl alcohol, methyl ethyl ketone, methyl isobutyl ketone, toluene, xylene, and waste styrene mixture. Foundry sand containing certain metals (including arsenic, barium, cadmium, lead and mercury) was also used as daily cover at the Site and was disposed of in a staging area on the property, the portion of which is currently owned by the Sextons.

According to records obtained by Ohio EPA in response to information requests, between approximately 1974 and 1980, the owner/operator of Jackson County Landfill accepted and disposed of at least 5,772 drums that contained contaminants. The landfill permanently ceased accepting waste in approximately September 1987. However, the landfill was never properly closed, nor was the minimal cap which was placed on the waste, maintained. As a result, there have been releases of hazardous wastes occurring since at least 1996. In 1996, Ohio EPA found elevated concentrations of ammonia, iron, nickel, and lead above water quality criteria in leachate originating at the landfill. In addition, three volatile organic compounds (VOCs) – benzene, xylene and 1,2,4-trimethylbenzene were found. Benzene was detected above both the screening criteria and its maximum contaminant level (MCL). The *detection of these compounds and metals indicated that constituents were being released into the environment from the landfill.*

Comment 2: **Section 2.3.1 describes the Human Health Risk Assessment that was performed for the Site. It should be noted that the Residential Use scenario is not a realistic complete exposure pathway at the Site. There is not currently a residential receptor, and because an institutional control will be placed on the landfill cap area of the Site, there will not be a future residential receptor. The Decision Document and selected remedy should not be based in whole or in part on the residential use considerations from the risk assessment.**

Response 2: Ohio EPA agrees. However, when selecting a remedy, Ohio EPA must evaluate all potential exposure pathways to both current and potential future receptors. Due to the risks associated with a residential use of the Site, Ohio EPA has selected institutional controls to restrict residential use of the Site. Therefore, it was deemed inappropriate to exclude a residential use consideration.

Comment 3: **Section 2.3.2 describes the Ecological Risk Assessment (ERA) that was conducted at the Site to assess potential impacts of contaminants of concern (COCs) on ecological receptors at and surrounding the Site. At the April 9, 2015 public meeting, a question was posed about potential impacts to Salt Lick Creek from leachate generated at the Site. It should be noted that in 2004 a biological and water quality survey of Salt Lick Creek was conducted, and the resulting Ohio EPA report concluded that "[l]eachate associated with the Jackson County Landfill is not having a negative influence on fish and macroinvertebrate communities of Salt Lick Creek." Page 1, *Biological and Water Quality Study of Salt Lick Creek, Jackson County Landfill, Ohio* (Ohio EPA, Division of Surface Water, February 25, 2005).**

The list of COCs posing a potential risk to ecological receptors in the Preferred Plan is also misleading and should be clarified in the Decision Document, as the current description conflicts with the findings and conclusions of the approved ERA.

For example, the Preferred Plan lists cyclohexane as a potential risk to ecological receptors in both soils and surface water. Cyclohexane, however, is listed as a contaminant of potential ecological concern (COPEC) in the ERA only because there was no screening level to which to compare concentrations. In addition, cyclohexane was only detected in 7 of the 63 soil samples analyzed and 8 of the 16 seep samples analyzed. Section 5.0 of the ERA ("Conclusions"), does not list cyclohexane as a COPEC.

Similarly, the Preferred Plan lists xylene as a potential risk to ecological receptors, but xylene was only detected in 3 of the 16 leachate seep samples above the COPEC screening level. Section 4.17 of the ERA ("Discussion") concluded that "since there were only three detections of xylene that were above the promulgated OMZA [Outside Mixing Zone Average] and no detection of xylenes above the OMZM [Outside Mixing Zone Maximum], the concentrations of xylenes detected in the leachate seeps do not appear to pose a significant risk to site aquatic life."

The Decision Document should clearly state that the ERA did not find these COPECs to pose a significant risk to ecological receptors at or near the Site.

Response 3: Section 2.3.2 has been modified to reflect the conclusions made in the Ecological Risk Assessment. The following sentence was added to Section 2.3.2:

While cyclohexane and xylene are identified as a potential risk to ecological receptors the ERA concluded that these contaminants of potential concern did not pose a significant risk to ecological receptors at or near the site.

Comment 4: **Although the Hydrologic Evaluation of Landfill Performance (HELP) model concluded that less leachate would be generated if a geosynthetic gas venting/leachate collection layer was not installed as a cap component, a remedial design engineer should perform a thorough evaluation of the feasibility of eliminating this component of the cap to ensure that hydrastatic pressure does not develop beneath the geomembrane liner which could result in liner failure.**

Response 4: Ohio EPA agrees that the effects of eliminating the geosynthetic gas venting/leachate collection layer should be evaluated to ensure that hydrostatic pressure does not develop beneath the geomembrane liner which could result in liner failure. The Decision Document reflects this suggestion.

Comment 5: **Section 6.1 of the Preferred Plan states the "existing soil will be reworked and <u>*compacted*</u>...." (Emphasis added). Pursuant to ORC 3734.02(G), however, the Agency's July 6, 2012 Director's Final Findings and Orders ("3734.02(G) DFFO") approved an exemption from OAC 3745-27-08(D)(21)(g)(i)-(iv) (regarding re-compacted soil barriers). Paragraph 8(d) of 3734.02(G) DFFO concluded that "[a] re-compacted soil barrier would not be placed on the landfill; therefore, adherence to the specifications in (D)(21)(g)(i)-(iv) is not warranted." In the Decision Document, this language should be**

corrected to delete reference to a requirement to compact existing soil as part of the remedy.

In describing the components of the cap system for the preferred remedy, the first bullet in Section 6.1 of the Preferred Plan also states a "recompacted soil layer (soil already on site with additional soil added if needed to achieve minimum of 18 inch base) to serve as a bedding and low permeability layer...." However, Paragraph 8(a) of the 3734.02(G) DFFO approved "an exemption from the requirement to construct an eighteen-inch thick soil barrier in order to allow the use of existing re-graded soil cover as the soil barrier with the intent to achieve an *average* of at least 18 inches of soil cover over the entire landfill." Emphasis added. The Decision Document should include the correct cover requirements pursuant to the 3734.02(G) DFFO.

Finally, the fourth and fifth bullets in Section 6.1 state that the landfill cap will include a "24 inch thick protective cover soil layer" and a "6 inch thick topsoil layer (using existing topsoil and supplemented with additional soil as required)." The 3734.02(G) DFFO, however, found that the minimum cap thickness of 30 inches in OAC 3745-27-08(D)(26)(b) was not required because the average soil temperatures in the area of the Site do not warrant a thirty-inch thick cap protection layer for freeze protection. Pursuant to OAC 3745-27-08(D)(26)(d), the top soil layer is considered a part of the protective cover (i.e. the cap protection layer should "have sufficient fertility in the uppermost portion to support vegetation"). Thus, it is important that the Decision Document confirms that the 6 inch thick topsoil layer is included in the 24 inch protective cover. If not, the selected remedy protective cover is not consistent with the less than 30 inch protective cover as approved in the 3734.02(G) DFFO.

Response 5: The Decision Document has been modified so that it is consistent with the Agency's July 6, 2012, Director's Final Findings and Orders referenced above.

Comments from Wendy Stewart

Comment 6: The Preferred Plan (PP) discusses groundwater (and other environmental media) contamination at the site, but given that the wastes have been present at the site for over 30 years and leaking/leaching into the groundwater and soils without any controls in place, more discussion (and possibly investigation) is

warranted so that the residents are made aware of the full extent of the contaminated groundwater plume, soils, and local streams. Explain the full extent of contamination to environmental media and offsite properties. How far would one have to be from the site so that the total cancer risk and total hazard index are not exceeded for groundwater use and soil exposure; how far has the contamination been spread to unacceptable levels? Based on the answers to these questions, if additional hazards are present in adjacent properties, none of the preferred alternatives are adequate because they don't address all of the contamination created by the wastes in the landfill. What is going to be done to remediate offsite properties?

Response 6: The Remedial Investigation (RI) explains the full extent of contamination in detail, a copy of this can be found at Ohio EPA's Southeast District Office in Logan, Ohio. Based on sample results from the RI, remediation of offsite properties has been determined to be unnecessary, as the investigation did not find any contaminants that exceed standards at offsite locations that were sampled.

Comment 7: **What are the acceptable rates for natural attenuation of the contaminants in groundwater? What if the rates are not met? The PP should address this.**

Response 7: There is not an identified or established "acceptable rate" for the natural attenuation of the contaminants in the groundwater. The attenuation of groundwater contaminants is typically assessed via the five-year review of the selected site remedy, to ensure that the contaminants are degrading at a rate so that the remedial action objectives (RAOs) will be met in a reasonable timeframe. If Ohio EPA determines that natural attenuation is not occurring in a reasonable timeframe, then additional work may be required at the site so that the RAOs are achieved in a shorter period of time. Public health is a primary consideration in all remedy decisions and evaluations of timeframes to reach RAOs. If concerns would arise at any time indicating an unacceptable threat to public health or the environment, then immediate actions would be required to address this threat.

Comment 8: **A 40 mil geomembrane liner is not sufficient enough to prevent tearing and destruction of the liner during construction. A 60 mil (or preferably 80 mil liner) is more suited for use especially because the local soils are going to be used and will contain very large rocks, etc. that will tear the liner.**

Response 8: Tearing of the liner due to large rocks at the Site is unlikely, because according to the December 8, 2011approved exemption request submitted by Goodyear, if the existing soils at the Site are found to contain large rocks that would compromise the geomembrane liner, then granular material or a geotextile underlay will be added to protect the liner.

Comment 9: **The typical compaction rate for soils is 1×10^{-7} cm/sec; however, the PP goes even further to make allowance for "as low of a permeability as can be reasonably achieved". The compaction rate should be 10^{-7}, without exception.**

Response 9: According to OAC Rule 3745-27-08 (D)(21)(g), cap soil barrier layers shall have a maximum permeability of 1×10^{-6} cm/s . The requirement to achieve a maximum permeability of 1×10^{-6} cm/s was exempted by Ohio EPA as set forth in the July 6, 2012 Director's Final Findings and Orders. The exemption was granted because existing soils at the Site are going to be regraded and used as the soil barrier layer.

Comment 10: **How often will the Ohio EPA monitor the site to ensure that all systems are being maintained, especially the leachate collection system (trucking of leachate for offsite treatment) to ensure that the responsible party is removing the leachate properly?**

Response 10: During and after the cap installation, Ohio EPA will maintain a regular presence at the site (e.g. a typical Ohio EPA response is usually a minimum of once every two weeks during active field construction activities and a minimum of bimonthly thereafter to observe remedy performance until stabilization has occurred) to ensure that the reduction in leachate has stabilized and to ensure that the cap is working effectively. Once this has occurred, Ohio EPA will reduce its onsite monitoring frequency appropriately (e.g. annual operation and maintenance inspections are typically conducted by Ohio EPA at sites like the Jackson County Landfill). If a reduction in leachate values has not occurred, Ohio EPA will investigate the reason behind the lack of reduction and determine what additional actions could be taken at the Site to reduce the leachate. As a part of Ohio EPA's regular initial inspections, we will also be checking to make sure that the collected leachate is being handled in accordance with the Site's approved work plan.

Comment 11: **The only remedy, which was not considered as a part of this PP, that meets all of the evaluation criteria is to remove the waste. Why was this not considered and evaluated?**

Response 11: Ohio EPA considers several factors (criteria) when deciding on a certain remedy for a site. The first and foremost criterion is protection of human health and the environment. Other criteria take into account the following factors: whether the remedy can meet clean-up standards; compliance with environmental laws; controlling sources of contamination; reduction or elimination of future releases; long-term reliability and effectiveness; reduction in toxicity, mobility or volume of waste; short-term effectiveness; implementability; and cost. Upon consideration of all of these factors, the removal of waste was determined to not be a feasible option, as the landfill has contamination throughout, not just in one particular location. Therefore, removing certain portions of the landfill where manifests may indicate that certain contaminants were disposed of is not possible, as the entire landfill would need to be excavated to reduce leachate, not just portions of it. To dig, characterize and haul away waste in its entirety at the site is infeasible as it would cost an exorbitant amount, and be a significant undertaking to complete, which is why it was not included as a remediation option.

Comment 12: **Goodyear was approved for an exemption request to OAC 3745-27-08(D). There are many requirements in this rule - what requirements are being exempted and why?**

Response 12: In a letter dated Dec. 8, 2011, Goodyear submitted a request, pursuant to ORC 3734.02(G), exempting them from several of the requirements contained within OAC Rules 3745-27-08(D)(21) and (26), associated with the construction of a dual layer, low permeability cap on the Jackson County Landfill. Specifically, Goodyear requested that the landfill be exempted from:

a) OAC rule 3745-27-08(D)(21)(a)(i) requires that the re-compacted soil barrier layer in the composite cap system be at least eighteen (18) inches thick, or include a geosynthetic clay liner that complies with paragraph (D)(9) of the rule with an engineered sub-base, constructed in accordance with paragraph (D)(22) of the rule. Goodyear requested an exemption to the requirement to construct an eighteen-inch thick soil barrier in order to allow the use of existing re-graded soil cover as the soil barrier with the intent to achieve an average of at least 18 inches of soil cover over the entire landfill.

b) OAC rule 3745-27-08(D)(21)(d) requires that the soil cap be placed above all areas of waste placement. Goodyear stated that there may be constraints such as the slope along the western landfill boundary which will make it impracticable for the agreed upon cap to be placed in some areas. The actual constraints will be determined during the remedial design of the landfill cap.

c) OAC rule 3745-27-08(D)(21)(f)(iii) requires that pre-construction testing of the borrow soils include performing a re-compacted laboratory permeability test using ASTM D5084-00e1 (falling head) as a frequency of no less than once for every ten thousand cubic yards. Goodyear proposes to use the existing soil cover for the landfill's borrow soil, consequently borrow soils should not be needed. If borrow soils are needed, Goodyear will perform the tests specified in (D)(21)(f)(i) and (ii) but not in (iii) as the borrow soils, if needed, will only be used to supplement the existing soil cover.

d) OAC rule 3745-27-08(D)(21)(g)(i-iv) requires that the re-compacted soil barrier layer in the composite cap system be constructed in lifts and to certain specifications, and be compacted to certain specifications. Goodyear requested an exemption from these requirements as the re-graded existing soil cover would be used for the soil barrier. A re-compacted soil barrier would not be placed on the landfill, therefore adherence to the specifications in (D)(21)(g)(i-iv) is not warranted.

e) OAC rule 3745-27-08(D)(21)(i) requires quality control testing of the constructed lifts be performed to determine the density and moisture content according to certain specifications. Goodyear requested an exemption from these requirements as the re-graded existing soil cover would be used for the soil barrier. As an alternative, Goodyear would develop construction quality controls, for Ohio EPA approval, during remedial design.

f) OAC rule 3745-27-08(D)(26)(b) requires that cap protection layers be a minimum of thirty (30) inches thick in the area of the Jackson County Landfill. Goodyear requested an exemption from this requirement, as the average soil temperatures in the area of Jackson County Landfill do not warrant a thirty-inch thick cap protection layer for freeze protection.

Ohio EPA approved the exemption request on July 6, 2012.

Comment 13: **A soil gas collection system is discussed in Section 6.3 of the PP, but there is no soil gas collection layer as a part of the selected alternative. Shouldn't this be added to the alternative?**

Response 13: On Jan. 26, 2012, Goodyear submitted to Ohio EPA a proposal to modify alternatives 3a, 3b, 4a and 4b. The modification consisted of eliminating the geosynthetic gas venting / leachate collection layer. Based on the analysis that was performed for this site the removal of this layer results in less leachate being generated than if this layer is left in place. Ohio EPA's review of the modified alternatives found that the modification was beneficial for the site remedial alternatives. The elimination of this layer results in a decrease in the amount of leachate generated resulting in a better environmental alternative and, ultimately, a slightly less expensive alternative as the modification resulted in a decrease of $588,000 over the original costs. As noted in the response to Comment 4, the effects of eliminating the geosynthetic gas venting/leachate collection layer will be evaluated to ensure that hydrostatic pressure does not develop beneath the geomembrane liner which could result in liner failure. Depending on the results of the evaluation, a geosynthetic gas venting/leachate collection layer may be necessary to protect the landfill liner integrity.

Comments from William Martin

**Comments generated via transcript from the April 9, 2015, public meeting*

Comment 14: **All of the focus for remediating the landfill has been on the cap. What about the floor of the landfill? What about the clay liner that was put in before they put in the waste? Is that clay liner impervious?**

Response 14: The permeability of the liner under the landfill is not known. Therefore, our goal is to prevent water from entering the landfill and thus creating leachate which could migrate out of a poorly lined landfill. This is achieved through the proposed remedy by enhancing the existing landfill cover and preventing the generation and uncontrolled migration of leachate through the prevention of direct contact with buried waste materials. As a part of the proposed remedy for the site, the ground water will be monitored to evaluate ground water quality and the natural attenuation of contaminants at the site over the long term in order to verify that the remedy is in fact preventing permeation of water into the landfill and creating leachate.

Comment 15: **Where is the water table? Is that water table high enough so that the waste is sitting in the water? And if it is, if the bottom of the landfill is soddened, it doesn't make a lot of difference what they do with the cap at the top, it leaks out the bottom.**

Response 15: The uppermost water table at the site is located in a sandstone unit, at an approximate elevation of 750 feet above mean sea level (see Geologic Cross Section D –D', drawing No. 15 of the Remedial Investigation Report Revision 3, April 2009). The water level in this sandstone unit dissects the elevation of landfill waste and water likely flows into the waste. Precipitation also contributes to water going into the waste. At this time, it is not known what percentage of water going into the waste is from the sandstone unit and what percentage is from precipitation. The construction of the landfill cap will reduce infiltration of water into the waste and help minimize water or leachate being released from the landfill waste. After the cap is installed, required Operation and Maintenance inspections will be conducted as well as groundwater monitoring. This will allow us to determine if any leachate outbreaks are occurring and allow the evaluation of cap performance. Should these inspections and monitoring reveal that additional corrective measures are needed, they can be addressed in the required Five-Year Review of facility conditions, or sooner if necessary.

Comment 16: **Why was digging the drums up and disposing of them at an approved hazardous waste landfill not considered as an alternative?**

Response 16: See Response # 11. Also, it was stated by the landfill operator during past interviews, that the standard practice during the time period that the landfill was in operation, was to drive a bulldozer over the drums to crush them. Therefore, it is believed that the bulk of any contaminants contained within the drums have previously been dispersed into the landfill area and any attempts to remove drums would not provide any additional environmental benefit. In fact, excavation within the landfill would likely result in other issues such as strong odors released in the area and/or contaminant runoff issues.

Comment 17: **Could landfill records show where the drums were placed or could subsurface imaging be used to locate the drum? Could the areas showing the highest contamination concentrations be evaluated to see if drums would be located in those areas?**

Response 17: See above response to Comment #16. Ohio EPA has been unable to locate many of the landfill's historical operating records due to the sale of Sanitary Commercial Services to Mid-American Waste Management Systems, Inc. Ohio EPA has contacted Mid-American Waste Management Systems Inc. in regard to the historical records, and the company has not been able to locate these records. It is Ohio EPA's understanding, from past interviews of site owners/employees, that the common practice at the site was to crush the drums prior to placing them in the landfill, so excavating the drums would not provide any additional environmental benefit.

Comment 18: **Why will on-site soils used for cover on the cap not be required to have preconstruction permeability testing conducted to ensure that the soil is impermeable?**

Response 18: On-site soils will not be required to have preconstruction permeability testing prior to use, due to the approved exemption to the requirements in OAC Rule 3745-27-08(D)(21)(f) as set forth in Ohio EPA's July 6, 2012 Directors Final Findings and Orders. OAC Rule 3745-27-08(D)(21)(f) pertains to pre-construction testing of borrow soils used for the landfill's soil barrier; this exemption was approved because the borrow soils will only be used to supplement the existing soil cover, if in fact they are needed at all. In the event that borrow soils are needed, the testing specified in paragraphs (i) and (ii) of OAC Rule 3745-27-08(D)(21)(f) will be performed on borrow soils, but the testing specified in paragraph (iii) will not be performed.

Comment 19: **Why was the freeze protection layer reduced from 30 inches to 24 inches? Reducing the thickness of the freeze protection layer based on average temperatures is irrelevant. The thickness of the freeze protection layer should be based on the deepest freeze you get that can tear up the permeability of those soils in the cap.**

Response 19: Ohio EPA approved the reduced freeze protection layer thickness as set forth in Ohio EPA's July 6, 2012 Directors Final Findings and Orders. In the December 8, 2011 exemption request, Goodyear provided sufficient evidence to Ohio EPA to document that the temperatures in Jackson County did not warrant a 30-inch freeze protection layer. The Ohio Agricultural Research and Development Center maintains a weather station in Jackson, Ohio which records soil temperatures at 2 inches and 4 inches below the ground surface (BGS). A review of the soil temperature data at 4 inches found that the soil temperature was below 32 degrees Fahrenheit less than 11 days per year on average since 2006, with a maximum of 32 consecutive days occurring in 2007. The lowest recorded temperature since 2006 at four inches BGS was 25.2 degrees Fahrenheit. Based on this information, a 30-inch cover is not necessary to freeze protection of the Landfill.

Comment 20: **Why not require the dual cover, which is Alternative 4? It costs a little more but not that much more. I would think that you'd get more benefit than the cost is.**

Response 20: The primary issues at the Site are the generation and uncontrolled migration of leachate, and the prevention of direct contact with buried waste materials. Leachate generation was modeled for both the geomembrane cap system and the dual layer cap system using the Hydrologic Evaluation of Landfill Performance (HELP) Model. The results of the model showed that the dual layer cap system would result in a 99.99 percent efficiency in reducing water percolation through the landfill cap while the geomembrane cap system would result in a 99.67 percent efficiency in reducing water percolation through the landfill cap. Based on the results of the HELP Model, Ohio EPA does not feel that requiring a dual layer cap system would provide a significant additional benefit to the overall effectiveness of the remedy at the Site.

Comment 21: **I don't think the taxpayers should be paying any of this. It's someone else's drums, somebody else's hazardous waste. They ought to be responsible for it.**

Response 21: Remedial work at the Site will not be funded by tax dollars. Ohio EPA has identified responsible parties who contributed to the contamination issues at the Site that will be responsible for paying for all of the clean-up and remediation activities and additional responsible parties may be brought in at a future date to share in funding the remediation.

Comment 22: **What financial responsibility requirement is there to assure performance in the future? Is there a bond? Will there be a bond required as part of this?**

Response 22: As a part of the RD/RA process, the respondent is required to secure and maintain a mechanism in which to assure the ability to complete work, also known as financial assurance (FA). The amount required to be maintained by the respondent is directly related to the estimated cost of the preferred remedial alternative that is identified in the preferred plan and, ultimately the selected remedy within the decision document. FA is required for long-term operation and maintenance and monitoring of the selected remedy. FA can be any one of four mechanisms which are available for respondents to meet their FA obligations: a trust fund; letter of credit; escrow agreement; or a certificate of insurance for an insurance policy. If the respondent fails to maintain the remedy after notification from the Agency, the program has the right to have immediate access to, and benefit of, the FA provided pursuant to the 'Assurance of Ability to Complete Work' provision of the RD/RA orders.

9.0 References

Efroymson, et. al., 1997a. Preliminary Remediation Goals for Ecological Endpoints.

Efroymson, et.al., 1997b. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 revision.

Efroymson, et.al., 1997c. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision.

Parsons, May 2010, Feasibility Study

Parsons, April 2009, Human Health Risk Assessment

Parsons, April 2009, Remedial Investigation Report

Parsons, February 2009, Ecological Risk Assessment,

APPENDIX A
Glossary of Terms

GLOSSARY OF TERMS

Action Level	A concentration for a contaminant of concern that has been determined by regulation or through a risk assessment to be protective of human health or ecological receptors. This concentration value could be based on a preliminary remediation goal (PRG); a drinking water maximum contaminant level (MCL); or a background concentration (background).
Adsorb	The adhesion in an extremely thin layer of molecules (as of gases, solutes, or liquids) to the surfaces of solid bodies or liquids with which they are in contact.
Aquifer	An underground geological formation capable of holding and yielding water.
ARARs	Applicable or relevant and appropriate requirements. Those rules that strictly apply to remedial activities at the site or those rules whose requirements would help achieve the remedial goals for the site.
Baseline Risk Assessment	An evaluation of the risks to humans and the environment posed by a site in the absence of any remedial action, which also determines the extent of cleanup needed to reduce potential risk levels to within acceptable ranges.
Carcinogen	A chemical that causes cancer.
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, 42 U.S.C. 9601 et seq. A federal law that regulates cleanup of hazardous substances sites under the U.S. EPA Superfund Program.
Contaminants of Concern (COCs)	Chemicals identified at the site that are present in concentrations that may be harmful to human health or the environment.
Decision Document	A statement issued by the Ohio EPA giving the director's selected remedy for a site and the reasons for its selection.
Ecological Receptor	Animals or plant life exposed or potentially exposed to chemicals released from a site.
Environmental Covenant	A servitude arising under an environmental response action that imposes activity and use limitations and that meets the requirements established in ORC Section 5301.82.
Exposure Pathway	Route by which a chemical is transported from the site to a human or ecological receptor.
Feasibility Study	A study conducted to ensure that appropriate remedial alternatives are developed and evaluated such that relevant information concerning the remedial action options can be presented to a decision-maker and an appropriate remedy selected.
Final Cleanup Levels	Final cleanup levels identified in the Decision Document along with the RAOs and performance standards.

Hazardous Substance	A chemical that may cause harm to humans or the environment.
Hazardous Waste	A waste product listed or defined by RCRA that may cause harm to humans or the environment.
Human Receptor	A person/population exposed to chemicals released at a site.
Leachate	Water contaminated by contact with landfill wastes.
Maximum Contaminant Level (MCL)	The highest level of a contaminant that is allowed in a public drinking water supply. The level is established by U.S. EPA and incorporated into OAC 3745-81-11 and 3745-81-12.
NCP	National Oil and Hazardous Substances Pollution Contingency Plan, codified at 40 C.F.R. Part 300 (1990), as amended. A framework for remediation of hazardous substance sites specified in CERCLA.
O&M	Operation and maintenance. Long-term measures taken at a site, after the initial remedial actions, to assure that a remedy remains protective of human health and the environment.
Performance Standard	Measures by which Ohio EPA determines if RAOs are met.
Remediation Levels (RLs)	Initial clean-up levels that (1) are protective of human health and the environment and (2) comply with ARARs. They are developed early in the process (scoping) based on readily available information and are modified to reflect the results of the baseline risk assessment. They are also used during the analysis of remedial alternatives in the RI/FS.
Present Worth Cost	Estimated current cost, or value, of the future remedial costs to be expended, typically discounted at the current market rate. Provides a solid basis for comparing costs of each of the remedial alternatives.
RCRA	Resource Conservation and Recovery Act of 1976, codified at 42 U.S.C. 6901 et seq. (1988), as amended. A federal law that regulates the handling of hazardous wastes.
Remedial Action Objectives (RAOs)	Specific goals of the remedy for reducing risks posed by the site.
Remedial Investigation	A study conducted to collect information necessary to adequately characterize the site for the purpose of developing and evaluating effective remedial alternatives.
Response to Comments	A summary of all comments received concerning the Preferred Plan and Ohio EPA response to the comments.
Site	A site is defined as the property which is being investigated and wherever the contamination from the property has come to be located. A "site" is not limited by property boundaries but includes wherever the waste from the property has migrated or been placed.

Water Quality Criteria	Chemical, physical and biological standards that define whether a body of surface water is unacceptably contaminated. These standards are intended to ensure that a body of water is safe for fishing, swimming and as a drinking water source. These standards can be found in OAC Chapter 3745-1.

APPENDIX B
Primary Contaminants of Concern

Primary Contaminants of Concern

A total of 19 primary contaminants of concern (COCs) have been identified that pose the greatest potential risk to human health and the environment at this site. Details from the Agency for Toxic Substances and Disease Registry (ATSDR Toxicological Profiles are provided below on each primary COC (except for the information on methane)).

Aluminum is the most abundant metal in the earth's crust. It is always found combined with other elements such as oxygen, silicon, and fluorine. Aluminum as the metal is obtained from aluminum-containing minerals. Small amounts of aluminum can be found dissolved in water. Aluminum metal is light in weight and silvery-white in appearance. Aluminum is used for beverage cans, pots and pans, airplanes, siding and roofing, and foil. Aluminum is often mixed with small amounts of other metals to form aluminum alloys, which are stronger and harder. Aluminum compounds have many different uses, for example, as alums in water-treatment and alumina in abrasives and furnace linings. They are also found in consumer products such as antacids, astringents, buffered aspirin, food additives, and antiperspirants.

Antimony is a silvery-white metal that is found in the earth's crust. Antimony ores are mined and then mixed with other metals to form antimony alloys or combined with oxygen to form antimony oxide. Little antimony is currently mined in the United States. It is brought into this country from other countries for processing. However, there are companies in the United States that produce antimony as a by-product of smelting lead and other metals. Antimony isn't used alone because it breaks easily, but when mixed into alloys, it is used in lead storage batteries, solder, sheet and pipe metal, bearings, castings, and pewter. Antimony oxide is added to textiles and plastics to prevent them from catching fire. It is also used in paints, ceramics, and fireworks, and as enamels for plastics, metal, and glass.

Arsenic is a naturally occurring element widely distributed in the earth's crust. In the environment, arsenic can combine with oxygen, chlorine and sulfur to form inorganic arsenic compounds. The main use of inorganic arsenic compounds is to preserve wood. Organic arsenic compounds are used primarily as pesticides. Breathing high levels of inorganic arsenic can cause throat and lung irritation. Ingesting high levels of arsenic can result in death, while at lower levels it can result in nausea, decreased red and white blood cell production, and damage to blood vessels. Skin contact can cause redness and swelling. Arsenic is a known human carcinogen.

Barium is a silvery-white metal which exists in nature only in ores containing mixtures of elements. It combines with other chemicals such as sulfur or carbon and oxygen to form barium compounds. Barium compounds are used by the oil and gas industries to make drilling muds. Drilling muds make it easier to drill through rock by keeping the drill bit lubricated. They are also used to make paint, bricks, ceramics, glass, and rubber. Barium sulfate is sometimes used by doctors to perform medical tests and to take x-rays of the gastrointestinal tract.

Benzene is a natural part of crude oil and gasoline. It evaporates quickly, dissolves lightly in water, and is highly flammable. It is in the top 20 chemicals for production volume in the U.S. It is used to help make plastics, resins, nylon, rubber, lubricants, dyes, detergents, drugs and pesticides. Breathing very high levels can result in death, while high levels can cause drowsiness, dizziness, headaches, tremors, and unconsciousness. Ingestion of high levels can cause vomiting, dizziness, convulsions, rapid heart rate and death. The major affect of benzene from long term exposure is on the blood. It causes harmful effects on bone marrow, and can cause a decrease in red blood cells leading to anemia and immune system issues. Benzene is a known human carcinogen.

Cadmium is a natural element in the earth's crust. All soils and rocks contain some cadmium. Most cadmium used in the U.S. is extracted during production of metals like zinc, lead and copper. It does not corrode easily and is used primarily in batteries, pigments, metal coatings and plastics. Breathing high levels can severely damage the lungs. Ingesting high levels severely irritates the stomach, leading to vomiting and diarrhea. Long-term exposure to lower levels can lead to a build up in the kidneys and subsequent kidney disease. Other long-term effects are lung damage and fragile bones. Cadmium is a known human carcinogen.
Chromium is an odorless and tasteless naturally occurring element found in rocks, animals, plants and soils. It can be liquid, solid or gas. The most common forms are chromium (0), also known as elemental chromium, used for steel-making, chromium (III), also known as trivalent chromium, and chromium (VI), also known as hexavalent chromium, used for chrome plating, dyes, pigments, leather tanning and wood preserving. Chromium (III) is an essential nutrient that helps the body use sugar, protein and fat. Breathing high levels of chromium (VI) can cause irritation to the lining of the nose, nose ulcers and breathing problems. Ingestion of chromium (VI) can cause irritation and ulcers in the stomach and small intestine, and anemia. Damage to the male reproductive system has been seen in animals exposed to chromium (VI). In workers, inhalation has been shown to cause lung cancer. U.S. EPA has determined that chromium (VI) compounds are a known human carcinogen.
Cobalt is a naturally occurring element found in rocks, soil, water, plants, and animals. It is used to produce alloys used in the manufacture of aircraft engines, magnets, grinding and cutting tools, artificial hip and knee joints. Cobalt compounds are also used to color glass, ceramics and paints, and used as a drier for porcelain enamel and paints. Radioactive cobalt is used for commercial and medical purposes. ^{60}Co (read as cobalt sixty) is used for sterilizing medical equipment and consumer products, radiation therapy for treating cancer patients, manufacturing plastics, and irradiating food. ^{57}Co is used in medical and scientific research. It takes about 5.27 years for half of ^{60}Co to give off its radiation and about 272 days for ^{57}Co; this is called the half-life.
Copper is a reddish material that occurs naturally in the environment, in rocks, soil, water, and at low levels in air, and is an essential element in plants and animals. Copper is used to make wire, plumbing pipes and sheet metal, and is combined with other metals to make brass and bronze pipes and faucets. Long-term exposure to copper dust can irritate the nose, mouth and eyes, and cause headaches, dizziness, nausea and diarrhea. Ingestion of high levels can cause nausea, diarrhea, vomiting and stomach issues. Very high levels can cause kidney and liver damage, and even death. U.S. EPA has not classified copper as a human carcinogen because there are no adequate human or animal cancer studies.
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Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust. Lead can be found in all parts of the environment, but much of it comes from human activities including the burning of fossil fuels, mining and manufacturing. Lead is used in the production of batteries, ammunition, metal products (solder and pipes), and devices to shield X-rays, and was a common additive to gasoline in the U.S. until it was banned in 1996. The effects of lead are the same whether exposure is through ingestion or inhalation. It affects almost every organ in the body, though the main target is the nervous system. Long term exposure can result in decreased nervous system functionality, and it may cause weakness in fingers, wrists and ankles. Exposure to high levels can severely damage the brain and kidneys, and ultimately cause death. U.S. EPA has determined that lead is a probable human carcinogen.

Manganese is a naturally occurring metal that is found in many types of rocks. Pure manganese is silver-colored, but does not occur naturally. It combines with other substances such as oxygen, sulfur, or chlorine. Manganese can also be combined with carbon to make organic manganese compounds. Common organic manganese compounds include pesticides, such as maneb or mancozeb, and methylcyclopentadienyl manganese tricarbonyl (MMT), a fuel additive in some gasoline. Manganese is an essential trace element and is necessary for good health. Manganese can be found in several food items, including grains and cereals, and is found in high amounts in other foods, such as tea.
Mercury is a naturally occurring metal which has several forms. The metallic mercury is a shiny, silver-white odorless liquid. If heated, it is an odorless, colorless gas. Metallic mercury is used to produce chlorine gas and caustic soda, and is also used in thermometers, dental fillings, and batteries. The nervous system is very sensitive to all forms of mercury. High level exposure to metallic, organic and inorganic mercury can permanently damage the brain, kidneys and developing fetuses. Effects on brain functioning may result in irritability, tremors, vision or hearing changes, and memory problems. There are inadequate human cancer data available for all forms of mercury. U.S. EPA has determined that mercury chloride and methylmercury are possible human carcinogens.
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Vinyl Chloride is a colorless gas that burns easily and that is not stable at high temperatures. It is a manufactured substance that does not occur naturally. It can be formed when other substances such as trichloroethane, trichloroethylene, and tetrachloroethylene are broken down. Vinyl chloride is used to make polyvinyl chloride (PVC), which is used to make a variety of plastic products including pipes, wire and cable coatings, and packaging materials. Breathing very high levels can cause you to pass out, while extremely high levels can cause death. Studies in workers who have breathed vinyl chloride over many years showed an increased risk of liver, brain and lung cancer, and some cancers of the blood. The U.S. Department of Health and Human Services has determined that vinyl chloride is a known human carcinogen.
Zinc, a bluish-gray shiny metal, is one of the most common elements in the earth's crust. It is found in air, soil, water and in all foods. Zinc has many commercial uses as coatings to prevent rust, in dry cell batteries, and mixed with other metals to make alloys like brass and bronze. Zinc combines with other elements to form zinc compounds including zinc chloride, zinc oxide, zinc sulfate and zinc sulfide. Zinc compounds are widely used in industry to make paint, rubber, dyes, wood preservatives, and ointments. Zinc is an essential element in our diet, but generally becomes harmful at levels 10-15 times the amount needed for good health. The ingestion of large does in a short period can cause stomach cramps, nausea, and vomiting. Taken longer term, it can cause anemia. Inhaling large amounts of zinc can cause a specific short-term disease called metal fume fever. Long-term effects of breathing zinc are unknown. Based on incomplete information from human and animal studies, U.S. EPA has determined that zinc is not classifiable as to its human carcinogenicity.

APPENDIX A
Glossary of Terms

GLOSSARY OF TERMS

Action Level	A concentration for a contaminant of concern that has been determined by regulation or through a risk assessment to be protective of human health or ecological receptors. This concentration value could be based on a preliminary remediation goal (PRG); a drinking water maximum contaminant level (MCL); or a background concentration (background).
Adsorb	The adhesion in an extremely thin layer of molecules (as of gases, solutes, or liquids) to the surfaces of solid bodies or liquids with which they are in contact.
Aquifer	An underground geological formation capable of holding and yielding water.
ARARs	Applicable or relevant and appropriate requirements. Those rules that strictly apply to remedial activities at the site or those rules whose requirements would help achieve the remedial goals for the site.
Baseline Risk Assessment	An evaluation of the risks to humans and the environment posed by a site in the absence of any remedial action, which also determines the extent of cleanup needed to reduce potential risk levels to within acceptable ranges.
Carcinogen	A chemical that causes cancer.
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, 42 U.S.C. 9601 et seq. A federal law that regulates cleanup of hazardous substances sites under the U.S. EPA Superfund Program.
Contaminants of Concern (COCs)	Chemicals identified at the site that are present in concentrations that may be harmful to human health or the environment.
Decision Document	A statement issued by the Ohio EPA giving the director's selected remedy for a site and the reasons for its selection.
Ecological Receptor	Animals or plant life exposed or potentially exposed to chemicals released from a site.
Environmental Covenant	A servitude arising under an environmental response action that imposes activity and use limitations and that meets the requirements established in ORC Section 5301.82.
Exposure Pathway	Route by which a chemical is transported from the site to a human or ecological receptor.
Feasibility Study	A study conducted to ensure that appropriate remedial alternatives are developed and evaluated such that relevant information concerning the remedial action options can be presented to a decision-maker and an appropriate remedy selected.
Final Cleanup Levels	Final cleanup levels identified in the Decision Document along with the RAOs and performance standards.

Hazardous Substance	A chemical that may cause harm to humans or the environment.
Hazardous Waste	A waste product listed or defined by RCRA that may cause harm to humans or the environment.
Human Receptor	A person/population exposed to chemicals released at a site.
Leachate	Water contaminated by contact with landfill wastes.
Maximum Contaminant Level (MCL)	The highest level of a contaminant that is allowed in a public drinking water supply. The level is established by U.S. EPA and incorporated into OAC 3745-81-11 and 3745-81-12.
NCP	National Oil and Hazardous Substances Pollution Contingency Plan, codified at 40 C.F.R. Part 300 (1990), as amended. A framework for remediation of hazardous substance sites specified in CERCLA.
O&M	Operation and maintenance. Long-term measures taken at a site, after the initial remedial actions, to assure that a remedy remains protective of human health and the environment.
Performance Standard	Measures by which Ohio EPA determines if RAOs are met.
Remediation Levels (RLs)	Initial clean-up levels that (1) are protective of human health and the environment and (2) comply with ARARs. They are developed early in the process (scoping) based on readily available information and are modified to reflect the results of the baseline risk assessment. They are also used during the analysis of remedial alternatives in the RI/FS.
Present Worth Cost	Estimated current cost, or value, of the future remedial costs to be expended, typically discounted at the current market rate. Provides a solid basis for comparing costs of each of the remedial alternatives.
RCRA	Resource Conservation and Recovery Act of 1976, codified at 42 U.S.C. 6901 et seq. (1988), as amended. A federal law that regulates the handling of hazardous wastes.
Remedial Action Objectives (RAOs)	Specific goals of the remedy for reducing risks posed by the site.
Remedial Investigation	A study conducted to collect information necessary to adequately characterize the site for the purpose of developing and evaluating effective remedial alternatives.
Response to Comments	A summary of all comments received concerning the Preferred Plan and Ohio EPA response to the comments.
Site	A site is defined as the property which is being investigated and wherever the contamination from the property has come to be located. A "site" is not limited by property boundaries but includes wherever the waste from the property has migrated or been placed.

Water Quality Criteria	Chemical, physical and biological standards that define whether a body of surface water is unacceptably contaminated. These standards are intended to ensure that a body of water is safe for fishing, swimming and as a drinking water source. These standards can be found in OAC Chapter 3745-1.

APPENDIX B
Primary Contaminants of Concern

Primary Contaminants of Concern

A total of 19 primary contaminants of concern (COCs) have been identified that pose the greatest potential risk to human health and the environment at this site. Details from the Agency for Toxic Substances and Disease Registry (ATSDR Toxicological Profiles are provided below on each primary COC (except for the information on methane)).

Aluminum is the most abundant metal in the earth's crust. It is always found combined with other elements such as oxygen, silicon, and fluorine. Aluminum as the metal is obtained from aluminum-containing minerals. Small amounts of aluminum can be found dissolved in water. Aluminum metal is light in weight and silvery-white in appearance. Aluminum is used for beverage cans, pots and pans, airplanes, siding and roofing, and foil. Aluminum is often mixed with small amounts of other metals to form aluminum alloys, which are stronger and harder. Aluminum compounds have many different uses, for example, as alums in water-treatment and alumina in abrasives and furnace linings. They are also found in consumer products such as antacids, astringents, buffered aspirin, food additives, and antiperspirants.
Antimony is a silvery-white metal that is found in the earth's crust. Antimony ores are mined and then mixed with other metals to form antimony alloys or combined with oxygen to form antimony oxide. Little antimony is currently mined in the United States. It is brought into this country from other countries for processing. However, there are companies in the United States that produce antimony as a by-product of smelting lead and other metals. Antimony isn't used alone because it breaks easily, but when mixed into alloys, it is used in lead storage batteries, solder, sheet and pipe metal, bearings, castings, and pewter. Antimony oxide is added to textiles and plastics to prevent them from catching fire. It is also used in paints, ceramics, and fireworks, and as enamels for plastics, metal, and glass.
Arsenic is a naturally occurring element widely distributed in the earth's crust. In the environment, arsenic can combine with oxygen, chlorine and sulfur to form inorganic arsenic compounds. The main use of inorganic arsenic compounds is to preserve wood. Organic arsenic compounds are used primarily as pesticides. Breathing high levels of inorganic arsenic can cause throat and lung irritation. Ingesting high levels of arsenic can result in death, while at lower levels it can result in nausea, decreased red and white blood cell production, and damage to blood vessels. Skin contact can cause redness and swelling. Arsenic is a known human carcinogen.
Barium is a silvery-white metal which exists in nature only in ores containing mixtures of elements. It combines with other chemicals such as sulfur or carbon and oxygen to form barium compounds. Barium compounds are used by the oil and gas industries to make drilling muds. Drilling muds make it easier to drill through rock by keeping the drill bit lubricated. They are also used to make paint, bricks, ceramics, glass, and rubber. Barium sulfate is sometimes used by doctors to perform medical tests and to take x-rays of the gastrointestinal tract.
Benzene is a natural part of crude oil and gasoline. It evaporates quickly, dissolves lightly in water, and is highly flammable. It is in the top 20 chemicals for production volume in the U.S. It is used to help make plastics, resins, nylon, rubber, lubricants, dyes, detergents, drugs and pesticides. Breathing very high levels can result in death, while high levels can cause drowsiness, dizziness, headaches, tremors, and unconsciousness. Ingestion of high levels can cause vomiting, dizziness, convulsions, rapid heart rate and death. The major affect of benzene from long term exposure is on the blood. It causes harmful effects on bone marrow, and can cause a decrease in red blood cells leading to anemia and immune system issues. Benzene is a known human carcinogen.

Cadmium is a natural element in the earth's crust. All soils and rocks contain some cadmium. Most cadmium used in the U.S. is extracted during production of metals like zinc, lead and copper. It does not corrode easily and is used primarily in batteries, pigments, metal coatings and plastics. Breathing high levels can severely damage the lungs. Ingesting high levels severely irritates the stomach, leading to vomiting and diarrhea. Long-term exposure to lower levels can lead to a build up in the kidneys and subsequent kidney disease. Other long-term effects are lung damage and fragile bones. Cadmium is a known human carcinogen.

Chromium is an odorless and tasteless naturally occurring element found in rocks, animals, plants and soils. It can be liquid, solid or gas. The most common forms are chromium (0), also known as elemental chromium, used for steel-making, chromium (III), also known as trivalent chromium, and chromium (VI), also known as hexavalent chromium, used for chrome plating, dyes, pigments, leather tanning and wood preserving. Chromium (III) is an essential nutrient that helps the body use sugar, protein and fat. Breathing high levels of chromium (VI) can cause irritation to the lining of the nose, nose ulcers and breathing problems. Ingestion of chromium (VI) can cause irritation and ulcers in the stomach and small intestine, and anemia. Damage to the male reproductive system has been seen in animals exposed to chromium (VI). In workers, inhalation has been shown to cause lung cancer. U.S. EPA has determined that chromium (VI) compounds are a known human carcinogen.

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Copper is a reddish material that occurs naturally in the environment, in rocks, soil, water, and at low levels in air, and is an essential element in plants and animals. Copper is used to make wire, plumbing pipes and sheet metal, and is combined with other metals to make brass and bronze pipes and faucets. Long-term exposure to copper dust can irritate the nose, mouth and eyes, and cause headaches, dizziness, nausea and diarrhea. Ingestion of high levels can cause nausea, diarrhea, vomiting and stomach issues. Very high levels can cause kidney and liver damage, and even death. U.S. EPA has not classified copper as a human carcinogen because there are no adequate human or animal cancer studies.

Di-n-butyl-phthalate is a manufactured chemical that does not occur naturally. It is an odorless and oily liquid that is colorless to faint yellow in color. It is slightly soluble in water and does not evaporate easily. Di-*n*-phtalate is used to make plastics more flexible and is also in carpet backings, paints, glue, insect repellents, hair spray, nail polish, and rocket fuel.

Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust. Lead can be found in all parts of the environment, but much of it comes from human activities including the burning of fossil fuels, mining and manufacturing. Lead is used in the production of batteries, ammunition, metal products (solder and pipes), and devices to shield X-rays, and was a common additive to gasoline in the U.S. until it was banned in 1996. The effects of lead are the same whether exposure is through ingestion or inhalation. It affects almost every organ in the body, though the main target is the nervous system. Long term exposure can result in decreased nervous system functionality, and it may cause weakness in fingers, wrists and ankles. Exposure to high levels can severely damage the brain and kidneys, and ultimately cause death. U.S. EPA has determined that lead is a probable human carcinogen.

Manganese is a naturally occurring metal that is found in many types of rocks. Pure manganese is silver-colored, but does not occur naturally. It combines with other substances such as oxygen, sulfur, or chlorine. Manganese can also be combined with carbon to make organic manganese compounds. Common organic manganese compounds include pesticides, such as maneb or mancozeb, and methylcyclopentadienyl manganese tricarbonyl (MMT), a fuel additive in some gasoline. Manganese is an essential trace element and is necessary for good health. Manganese can be found in several food items, including grains and cereals, and is found in high amounts in other foods, such as tea.
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Methane is a naturally occurring chemical compound with the chemical formula CH_4. It is the simplest alkane, and the principal component of natural gas (about 87% by volume). It is flammable over a narrow range of concentrations (5–15%) in air. Methane is not toxic; however, it is extremely flammable and may form explosive mixtures with air. Methane is also an asphyxiant and may displace oxygen in an enclosed space. The concentration of methane where asphyxiation risk becomes significant is much higher than the 5–15% concentration that forms flammable or explosive mixtures. When structures are built on or near landfills, methane off-gas can penetrate the buildings' interiors and expose occupants to significant levels of methane.
Polychlorinated Biphenyls (PCBs) are mixtures of up to 209 individual chlorinated compounds (known as congeners). There are no known natural sources of PCBs. Historically, PCBs have been used as coolants and lubricants in transformers, capacitors, and other electrical equipment because they don't burn easily and are effective insulators. PCB manufacturing was stopped in the U.S. in 1977 because of evidence that they build up in the environment and can cause harmful health effects. Studies in exposed workers have shown changes in blood and urine that may indicate liver damage. Animals ingesting large amounts of PCBs for short periods had liver damage and some died. Animals ingesting smaller amounts over several weeks or months developed anemia; skin conditions; and liver, stomach, and thyroid gland injuries. U.S. EPA has determined that PCBs are a probable human carcinogen.
Selenium is a naturally occurring mineral element found in most rocks and soil. Most processed selenium is used in the electronics industry. But it is also used in the glass industry; as a component of pigments in plastics, paints, enamels, inks and rubber; in the preparation of pharmaceuticals; in pesticide formulations; in rubber products; and as a constituent of fungicides. Short-term exposure to high concentrations may cause nausea, diarrhea and vomiting. Chronic oral exposure to high concentrations of selenium compounds can produce selenosis, with symptoms such as hair loss, nail brittleness and neurological abnormalities. U.S. EPA has determined that one specific form of selenium, selenium sulfide, is a probable human carcinogen.
Tetrachloroethylene (PERC or PCE) is a manufactured chemical that is widely used for dry cleaning of fabrics and for metal degreasing. It is a non-flammable liquid at room temperature and readily evaporates into the air. High concentrations of PERC can cause dizziness, headache, sleepiness, confusion, nausea, unconsciousness and death. The health effects of inhaling and ingesting low levels of PERC are not known. Results of animal studies involving high levels of PERC show that it can cause liver and kidney damage. The U.S. Department of Health and Human Services has determined that PERC may reasonably be anticipated to be a carcinogen.

Vinyl Chloride is a colorless gas that burns easily and that is not stable at high temperatures. It is a manufactured substance that does not occur naturally. It can be formed when other substances such as trichloroethane, trichloroethylene, and tetrachloroethylene are broken down. Vinyl chloride is used to make polyvinyl chloride (PVC), which is used to make a variety of plastic products including pipes, wire and cable coatings, and packaging materials. Breathing very high levels can cause you to pass out, while extremely high levels can cause death. Studies in workers who have breathed vinyl chloride over many years showed an increased risk of liver, brain and lung cancer, and some cancers of the blood. The U.S. Department of Health and Human Services has determined that vinyl chloride is a known human carcinogen.
Zinc, a bluish-gray shiny metal, is one of the most common elements in the earth's crust. It is found in air, soil, water and in all foods. Zinc has many commercial uses as coatings to prevent rust, in dry cell batteries, and mixed with other metals to make alloys like brass and bronze. Zinc combines with other elements to form zinc compounds including zinc chloride, zinc oxide, zinc sulfate and zinc sulfide. Zinc compounds are widely used in industry to make paint, rubber, dyes, wood preservatives, and ointments. Zinc is an essential element in our diet, but generally becomes harmful at levels 10-15 times the amount needed for good health. The ingestion of large does in a short period can cause stomach cramps, nausea, and vomiting. Taken longer term, it can cause anemia. Inhaling large amounts of zinc can cause a specific short-term disease called metal fume fever. Long-term effects of breathing zinc are unknown. Based on incomplete information from human and animal studies, U.S. EPA has determined that zinc is not classifiable as to its human carcinogenicity.

APPENDIX C
Public Hearing Transcript

BEFORE THE OHIO ENVIRONMENTAL PROTECTION AGENCY

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IN RE: :
:
JACKSON COUNTY LANDFILL :
PREFERRED PLAN. :

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Public hearing held before Ms. Darla Peelle, Public Involvement Coordinator for Ohio EPA's Public Interest Center, taken before Diane L. Schad, Court Reporter, at Jackson City Council Chambers, 199 Portsmouth Street, Jackson, Ohio 45640, commencing on Thursday, April 9, 2015, at 6:00 p.m.

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INDEX OF WITNESS

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P R O C E E D I N G S

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MS. PEELLE: The purpose of this public hearing is to accept comments on the official record regarding a draft plan to reduce toxic contamination at the former Jackson County Landfill located at 1841 Smith Bridge Road in Jackson.

The site began operations in 1970 accepting municipal solid waste and more than 5,000 drums of industrial waste. The landfill stopped accepting waste in 1987, but was never properly closed. As a result, rainwater and snow melt have mingled with industrial waste at the site. The resulting contaminated water is called leachate. The leachate contains volatile and semi-volatile compounds and metals at levels that need to be addressed.

The Goodyear Tire and Rubber Company is responsible for designing, implementing and monitoring the landfill to ensure people's health and the environment are protected. Goodyear has offered an engineering solution which Ohio EPA has evaluated to ensure contamination does not leave the site, which is what Dustin just shared.

Ohio EPA published a public notice to

announce the hearing and public comment period regarding the application in newspapers in the area. The notice was also issued in Ohio EPA's Weekly Review, which is a publication that lists, by county, all Agency activities and actions taking place in the State of Ohio.

Written and oral comments received as a part of the official record are reviewed by Ohio EPA prior to a final action of the Director. To be included in the official record, written comments must be received by Ohio EPA by the close of business April 17, 2015. Comments received after this date will be considered as time and circumstances permit but will not be a part of the official record for this hearing.

Written comments can be filed with us today or submitted to Dustin Tschudy, Site Coordinator, Ohio EPA, Southeast District Office, 2195 Front Street in Logan, Ohio 43138. You may also email comments to Dustin at dustin.tschudy@epa.ohio.gov, or fax it to area code 740-385-6490.

I've read this quickly because the information is also found in the agenda and the presentation handout.

It's important for you to know that all

comments received in writing to the Agency, all written comments submitted this evening, or all verbal comments given here this evening are given the same consideration.

If you have exhibits and refer to them in your testimony, please submit those to ensure that your testimony is complete.

A court reporter, Diane, from Fraley, Cooper in Columbus is here to make a stenographic record of tonight's proceedings.

Questions and comments made at the public hearing will be responded to in a document known as a Response to Comments. It's essentially a formal question and answer I will call it.

The Director, after taking into consideration recommendations of program staff and comments from the public, may approve or deny the preferred plan. Once a final decision is made by the Director, the decision, along with the Response to Comments, will be made available to anyone who requests a copy, and that includes anyone who's signed in this evening.

Final actions of the Director are appealable to the Environmental Review Appeals Commission, also known as ERAC. The board is separate from Ohio EPA and reviews cases in accordance with Ohio's environmental laws and rules. Any ERAC decision is appealable to the Franklin County Court of Appeals. Any order of the Court of Appeals is appealable to the Supreme Court of Ohio.

Each individual may testify once and speak for five minutes, so please use your time wisely. And also please be respectful of others whether you agree with their comments or not.

There is no cross-examination of the speaker or Ohio EPA representatives during a public hearing. They're here to listen. This affords you an opportunity to provide input.

We may ask clarifying questions of the speaker just to make sure that we understand what your comments are if there's some question.

If you have a question that was not responded to during the Q and A session, please ask it at this time on the record and we will address your concerns in writing in the Response to Comments.

So I'm going to now receive testimony. And the first name on the list, and this is in the order in which you signed in, is Ron Clark.

MR. CLARK: Pass.

MS. PEELLE: All right. Shawn Sexton.

MR. SEXTON: Pass.

MS. PEELLE: All right. Will Sexton.

MR. SEXTON: Pass.

MS. PEELLE: Kevin Aston.

MR. ASTON: I don't have any comments at this time.

MS. PEELLE: Okay. Gary Radabaugh.

MR. RADABAUGH: Pass.

MS. PEELLE: All right. Wendy Stewart.

MS. STEWART: I'll pass.

MS. PEELLE: All right. Ron Queen.

MR. QUEEN: Pass.

MS. PEELLE: All right. Bill Martin.

If you'll come up, Mr. Martin, and state and spell your name for the record so that the stenographer can get it.

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MR. MARTIN: My name is William Martin. My last name is spelled M-A-R-T-I-N. My family is a landowner somewhat south of the affected property. I'm also a taxpayer and I have an intense interest in the Lake Katherine Nature Preserve which is close by, and the fact that the hazardous waste is seeping into a creek near that state nature preserve horrifies me.

I have had occasion in the past to take some interest in these issues decades ago. Phil remembers. He and I were allies in that fight.

I think of a hazardous waste landfill, and this is a hazardous waste landfill make no mistake, as being a structure which is supposed to have impervious walls, bottom, top, sides so that whatever is inside can't get out. That's the whole idea. And I kind of think of it -- I used this image before -- as a ravioli. The walls are the crust and what's inside is poisonous; it's not supposed to get out.

Now, if you put that ravioli in a saucer half filled with water that represents the water table; then you take a sprinkling can and you sprinkle rain over that ravioli and then you do that for 5, 10, 15, 25 years, that's the stakes in which you're dealing with here.

The problem as I see it is -- we already know that this ravioli is leaking at the tops and around the sides. My Lord, thousands and thousands of gallons of leachate is filtering through. We know it's filtering through because the crud inside is coming out with it. One of my problems is in this particular case people talk about the cap of the landfill. Well, what about the floor of the landfill? What about the clay liner that was put in before they put in the waste? Is that clay liner impervious? I doubt it very much.

One of our neighbors asked a good question: Where is the water table? Is that water table high enough so that ravioli is actually sitting in the water in the saucer? And if it is, if the bottom of the landfill is soddened, it doesn't make a lot of difference what they do with the cap at the top, it leaks out at the bottom.

The design of this plan -- and I commend the EPA for its work in this case. I found the plan to be well-written, thorough, thoughtful. It was a very impressive piece of work by you and I'm sure the engineers working for Goodyear. But there was one alternative that I thought was missing.

What they did was they laid out several alternatives and then they graded those alternatives.

One of the alternatives was do nothing. Another alternative was just to do a simple cover. Another alternative was do a simple cover with an impervious membrane below it kind of like a raincoat and so on. But they didn't say dig up the drums and carry them away to an approved hazardous waste landfill.

I was wondering where that alternative was. I didn't see it.

I'm in the Historical Society. Now we hear the stories about the marvelous things you can do with subsurface imaging. There are very sophisticated metal detectors, which we are told these are drums. I would think that the landfill might have some records as to where in the landfill those drums were placed. If not, you can do subsurface imaging and have a pretty good chance of finding out where those drums are.

You can pay attention to where your contamination was found and get some idea of where that contamination came from within the broad expanse of that landfill, and then you poke a hole in the thing, you find the drums, you get them out of there and you take them out someplace.

The report in its evaluation said with respect to every one of these alternatives it was not going to affect the nature and extent of the toxicity of the material in the landfill. It wasn't going to change it, just kind of cover it up.

Why not get rid of it? That was not an

alternative. My comment is why wasn't that an alternative? Why wasn't it considered seriously?

It seems to me if you had taken one or two drums out a day over the last 30 years, hells bells, you could have finished the job ten times by now. That's a guess.

So I think that's a serious defect in your analysis and one that should be addressed. I think what you're trying to do is reframe the discussion by listing your alternatives. I think there's one alternative, obvious alternative that you missed.

There are some -- Oh, I should ask on the record for your comment how deep is the shallowest water table? Does it wash the bottom of that landfill?

There was some specific things that you're going to let Goodyear out of. One of them was they weren't going to have to do preconstruction permeability testing for the soil because they were going to use soil that's on-site to do this new cover.

Why in the world wouldn't you require them to do permeability studies of all the soil that's going to be used for cover? There's no assurance that that soil is impermeable. Certainly none was mentioned in the report.

Also, you're going to reduce the thickness of the cap protection layer from 30 inches to 24 inches.

The 30 inches is the so-called freeze protection requirement, and you said we'll just go to 24 because the average soil temperatures in the area of the Jackson County Landfill do not warrant a 30-inch.

The average temperatures are irrelevant. You don't ask average floods. You ask what's the most serious flood in the 100 years. You ask what's the deepest freeze you can get that can tear up the permeability of those soils in that cap.

So it should be a 30-inch cover if you're going to have a cover. I would like that point addressed in your responses, please.

Also, why not require the dual cover, which is Alternative 4?

Dual cover basically means you put down a layer of clay and then you put down the plastic raincoat cover, then you put more clay over it. And those two layers of clay I think are what they referred to as the dual cover. It gives you a little bit extra protection against the rainwater.

Why not do that? It doesn't cost all that much. It costs a little bit more but not that much more. I would think you'd get more benefit than the cost is.

And, again, I don't think the taxpayers should be paying any of this. It's somebody else's drums, somebody else's hazardous waste. They ought to be responsible for it.

MS. PEELLE: Please wrap up, sir.

MR. MARTIN: My last question is -- and then I'll wrap up, ma'am -- what financial responsibility requirement is there to assure performance in the future? Is there a bond? Will there be a bond required as part of this? There may well be. I just don't know. Thank you.

MS. PEELLE: All right. Thank you, sir.

next is Phil. Phil, would you like an opportunity?

MR. ZITO: No. He said what I needed to say.

MS. PEELLE: Okay. And Agnes Martin?

MS. MARTIN: I'll pass. I was just going to donate my time to Bill.

MR. MARTIN: I ran out.

MS. PEELLE: All right. Anybody else wish to provide testimony before we close?

MR. ZITO: The only thing I would like to ask --

MS. PEELLE: You can't ask except on the record, sir. Otherwise you can ask after, just in the informal. There are rules --

MR. ZITO: That's all right. I'll ask you again.

MS. PEELLE: All right. No one else? My son is an auctioneer so I always say going once, going twice?

All right. The time is now 7:03. Seeing there are no further requests to present testimony, I want to remind you that the comments will be accepted through the close of business April 17, 2015. The time is now 7:03 and this hearing is adjourned. And thank you very much for being here. We really do appreciate it.

Off the record.

- - -

Thereupon, on Thursday, April 9, 2015, at 7:03 p.m. the hearing was adjourned.

- - -

CERTIFICATE

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I do hereby certify that the foregoing is a. True and correct transcript of the proceedings taken by me in this matter before the Ohio EPA, on Thursday, April 9, 2015.

DIANE L. SCHAD,
COURT REPORTER.

\- - -

APPENDIX D
Written Public Comments

Comments: Preferred Plan for the Remediation of the Jackson County Landfill

Dustin,

The following are my comments, questions, and concerns regarding the Preferred Plan for the Remediation of the Jackson County Landfill, City of Jackson, Jackson County, Ohio:

1. The Preferred Plan (PP) discusses groundwater (and other environmental media) contamination at the site, but given that the wastes have been present at the site for over 30 years and leaking/leaching into the groundwater and soils without any controls in place, more discussion (and possibly investigation) is warranted so that the residents are made aware of the full extent of the contaminated groundwater plume, soils, and local streams. Explain the full extent of contamination to environmental media and offsite properties. How far would one have to be from the site so that the total cancer risk and total hazard index are not exceeded for groundwater use and soil exposure; how far has the contamination been spread to unacceptable levels? Based on the answers to these questions, if additional hazards are present in adjacent properties, none of the preferred alternatives are adequate because they don't address all of the contamination created by the wastes in the landfill. What is going to be done to remediate offsite properties?
2. What are the acceptable rates for natural attenuation of the contaminates in groundwater? What if the rates are not met? The PP should address this.
3. A 40 mil geomembrane liner is not sufficient enough to prevent tearing and destruction of the liner during construction. A 60 mil (or preferably 80 mil liner) is more suited for use especially because the local soils are going to be used and will contain very large rocks, etc. that will tear the liner.
4. The typical compaction rate for soils is 1 x 10-7 cm/sec; however, the PP goes even further to make allowance for "as low of a permeability as can be reasonably achieved". The compaction rate should be 10-7, without exception.
5. How often will the Ohio EPA monitor the site to ensure that all systems are being maintained, especially the leachate collection system (trucking of leachate for offsite treatment) to ensure that the responsible party is removing the leachate properly?
6. The only remedy, which was not considered as a part of this PP, that meets all of the evaluation criteria is to remove the waste. Why was this not considered and evaluated?
7. Goodyear was approved for an exemption request to OAC 3745-27-08(D). There are many requirements in this rule - what requirements are being exempted and why?
8. A soil gas collection system is discussed in Section 6.3 of the PP, but there is no soil gas collection layer as a part of the selected alternative. Shouldn't this be added to the alternative?

Thank you.

Sincerely,
Wendy Stewart

The Goodyear Tire & Rubber Company
Akron, Ohio 44316-0001

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Phone: 330.796.0578
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APR 20 2015
Ohio Environmental
Protection Agency
Southeast District

April 17, 2015

Via Certified Mail, Return Receipt Requested
Via email to Dustin.Tschudy@epa.ohio.gov

Mr. Dustin Tschudy
Site Coordinator
Ohio Environmental Protection Agency
Southeast District Office
2195 Front Street
Logan, OH 43138

Re: Comments on Preferred Plan, Jackson County Landfill, 1841 Smith Bridge Road, Jackson, Ohio

The Goodyear Tire and Rubber Company ("Goodyear") respectfully submits comments on the Ohio Environmental Protection Agency's ("Ohio EPA" or "Agency") Preferred Plan for the Jackson County Landfill ("Site") located at 1841 Smith Bridge Road, Jackson, Jackson County, Ohio. Over the past decade, Goodyear has cooperated with the Agency by conducting and funding substantial work at the Site.

As explained more fully below, Goodyear is concerned that the Preferred Plan is deficient in a number of areas, including (1) its inappropriate focus on Goodyear as the only generator when the Site accepted mixed waste from a multitude of parties over a 17 year period, and (2) technical concerns with the preferred remedial alternative and the inaccurate application of the Agency-approved exemption request regarding landfill cover specifications. Goodyear requests that these issues be addressed in the Decision Document for the Site. In submitting these comments, Goodyear reserves all rights under law with respect to the Site.

Discussion

The following comments are organized by section number of the Preferred Plan.

2.1 Site History

In the Site History section of the Preferred Plan, Table 1, Ohio EPA acknowledges that the Site was an operational landfill from approximately April 1970 until September 1987. The Site History, however, does not accurately depict the nature of the waste that was disposed of at the

Site or the large number of generators, arrangers, and transporters whose waste was disposed of at the Site. In the Decision Document, the Site History section should be amended as follows:

- Table 1: Owners, Operators and/or Disposers – The title of this table should be revised to "Owners and Operators" and the table row listing Goodyear should be deleted; unless the Decision Document lists all waste generators, it should not include Goodyear in a manner that suggests Goodyear was the sole "disposer" at the Site.
- Section 2.1: The first paragraph directly below Table 1 should be deleted and replaced with the following:

During its operation between April 1970 and September 1987, the Jackson County Landfill accepted "industrial waste" and/or "other waste" as defined in Ohio Revised Code (ORC) § 6111.01 (C) and (D), and/or "hazardous wastes" as defined in ORC § 3734.01(J), and/or "hazardous substances" as defined in Section 101(14) of the Comprehensive Environmental Response, Compensation & Liability Act / Superfund Amendment and Reauthorization Act (CERCLA/SARA) (Ohio EPA, August 2005). Wastes disposed of at the Jackson County Landfill included municipal waste and drummed materials, including: acetone, polyester resin mixture, cyclohexanone, dichloromethane, isobutyl alcohol, methyl ethyl ketone, methyl isobutyl ketone, toluene, xylene, and waste styrene mixture. Foundry sand containing certain metals (including arsenic, barium, cadmium, lead and mercury) that OSCO Industries, Inc. sent to the Site was also used as daily cover at the Site and was disposed of in a staging area on the Sexton property of the Site.

According to records provided by Goodyear in response to Ohio EPA information requests, between approximately 1974 and 1980, the owner/operator of Jackson County Landfill accepted and disposed of approximately 5,772 drums that contained contaminants from Goodyear. The landfill permanently ceased accepting waste in approximately September 1987. However, the landfill was never properly closed, nor was the minimal cap which was placed on the waste, maintained. As a result, there have been releases of hazardous wastes occurring since at least 1996. In 1996, Ohio EPA found elevated concentrations of ammonia, iron, nickel, and lead above water quality criteria in leachate originating at the landfill. In addition, three volatile organic compounds (VOCs) – benzene, xylene and 1,2,4-trimethylbenzene were found. The benzene was detected above both the screening criteria and its maximum contaminant level (MCL). The detection of these compounds and metals indicated that constituents were being released into the environment from the landfill.

2.3.1 Risks to Human Health

Section 2.3.1 describes the Human Health Risk Assessment that was performed for the Site. It should be noted that the Residential Use scenario is not a realistic complete exposure pathway at the Site. There is not currently a residential receptor, and because an institutional control will be placed on the landfill cap area of the Site, there will not be a future residential receptor. The

Decision Document and selected remedy should not be based in whole or in part on the residential use considerations from the risk assessment.

2.3.2 Risks to Ecological Receptors

Section 2.3.2 describes the Ecological Risk Assessment (ERA) that was conducted at the Site to assess potential impacts of contaminants of concern (COCs) on ecological receptors at and surrounding the Site. At the April 9, 2014 public meeting, a question was posed about potential impacts to Salt Lick Creek from leachate generated at the Site. It should be noted that in 2004 a biological and water quality survey of Salt Lick Creek was conducted, and the resulting Ohio EPA report concluded that "[l]eachate associated with the Jackson County Landfill is not having a negative influence on fish and macroinvertebrate communities of Salt Lick Creek." Page 1, *Biological and Water Quality Study of Salt Lick Creek, Jackson County Landfill, Ohio* (Ohio EPA, Division of Surface Water, February 25, 2005).

The list of COCs posing a potential risk to ecological receptors in the Preferred Plan is also misleading and should be clarified in the Decision Document, as the current description conflicts with the findings and conclusions of the approved ERA.

For example, the Preferred Plan lists cyclohexane as a potential risk to ecological receptors in both soils and surface water. Cyclohexane, however, is listed as a contaminant of potential ecological concern (COPEC) in the ERA only because there was no screening level to which to compare concentrations. In addition, cyclohexane was only detected in 7 of the 63 soil samples analyzed and 8 of the 16 seep samples analyzed. Section 5.0 of the ERA ("Conclusions"), does not list cyclohexane as a COPEC.

Similarly, the Preferred Plan lists xylene as a potential risk to ecological receptors, but xylene was only detected in 3 of the 16 leachate seep samples above the COPEC screening level. Section 4.17 of the ERA ("Discussion") concluded that "since there were only three detections of xylene that were above the promulgated OMZA [Outside Mixing Zone Average] and no detection of xylenes above the OMZM [Outside Mixing Zone Maximum], the concentrations of xylenes detected in the leachate seeps do not appear to pose a significant risk to site aquatic life."

The Decision Document should clearly state that the ERA did not find these COPECs to pose a significant risk to ecological receptors at or near the Site.

6.0 Ohio EPA's Preferred Remedial Alternative

Although the Hydrologic Evaluation of Landfill Performance (HELP) model concluded that less leachate would be generated if a geosynthetic gas venting/leachate collection layer was not installed as a cap component, a remedial design engineer should perform a thorough evaluation of the feasibility of eliminating this component of the cap to ensure that hydrastatic pressure does not develop beneath the geomembrane liner which could result in liner failure.

6.1 Landfill Cover (and other sections of Preferred Plan)

Section 6.1 of the Preferred Plan states the "existing soil will be reworked and *compacted*...." (Emphasis added). Pursuant to ORC 3734.02(G), however, the Agency's July 6, 2012 Director's Final Findings and Orders ("3734.02(G) DFFO") approved an exemption from OAC 3745-27-08(D)(21)(g)(i)-(iv) (regarding re-compacted soil barriers). Paragraph 8(d) of 3734.02(G) DFFO concluded that "[a] re-compacted soil barrier would not be placed on the landfill; therefore, adherence to the specifications in (D)(21)(g)(i)-(iv) is not warranted." In the Decision Document, this language should be corrected to delete reference to a requirement to compact existing soil as part of the remedy.

In describing the components of the cap system for the preferred remedy, the first bullet in Section 6.1 of the Preferred Plan also states a "recompacted soil layer (soil already on site with additional soil added if needed to achieve minimum of 18 inch base) to serve as a bedding and low permeability layer...." However, Paragraph 8(a) of the 3734.02(G) DFFO approved "an exemption from the requirement to construct an eighteen-inch thick soil barrier in order to allow the use of existing re-graded soil cover as the soil barrier with the intent to achieve an *average* of at least 18 inches of soil cover over the entire landfill." Emphasis added. The Decision Document should include the correct cover requirements pursuant to the 3734.02(G) DFFO.

Finally, the fourth and fifth bullets in Section 6.1 state that the landfill cap will include a "24 inch thick protective cover soil layer" and a "6 inch think topsoil layer (using existing topsoil and supplemented with additional soil as required)." The 3734.02(G) DFFO, however, found that the minimum cap thickness of 30 inches in OAC 3745-27-08(D)(26)(b) was not required because the average soil temperatures in the area of the Site do not warrant a thirty-inch thick cap protection layer for freeze protection. Pursuant to OAC 3745-27-08(D)(26)(d), the top soil layer is considered a part of the protective cover (i.e. the cap protection layer should "have sufficient fertility in the uppermost portion to support vegetation"). Thus, it is important that the Decision Document confirms that the 6 inch thick topsoil layer is included in the 24 inch protective cover. If not, the selected remedy protective cover is not consistent with the less than 30 inch protective cover as approved in the 3734.02(G) DFFO.

For Ohio EPA's reference, a copy of the 3734.02(G) request and DFFO are attached as Appendix 1 and 2 of these comments.

Conclusion

Goodyear requests that Ohio EPA make the necessary corrections and modifications in the Decision Document for the Site. These changes are necessary to accurately reflect the history of the Site, the current and future risks at and near the Site, and the approved cap remedy in the Agency's 3734.02(G) DFFO.

Thank you for your attention to these issues.

Sincerely,

Jeff Sussman
Senior Manager, Global Remediation and End of Life Tires
The Goodyear Tire and Rubber Company

Enclosures

cc: Heidi Goldstein, Thompson Hine LLP
Joel Eagle, Thompson Hine LLP
Ron Clark, Goodyear

ATTACHMENT

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ATTACHMENT 1

The Goodyear Tire & Rubber Company
Akron, Ohio 44316-0001

1144 East Market Street, D/1081
Akron, Ohio 44316-0001

December 8, 2011

Ms. Chris Osborne
Site Coordinator
Environmental Response and Revitalization
Ohio Environmental Protection Agency, SEDO
2195 Front Street
Logan, Ohio 43138

Re: Goodyear Tire & Rubber Company ORC 3734.02(G) Exemption Request for the Jackson County Landfill Cap.

Dear Ms Osborne,

Pursuant to Ohio Revised Code § 3734.02(G), The Goodyear Tire & Rubber Company ("Goodyear") requests that the Director of Ohio EPA grant an exemption from several requirements related to the dual layer low permeability cap that Goodyear understands will be proposed as one of the capping alternatives to be presented in the Preferred Plan for the Remediation of the Jackson County Landfill, located at 1841 Smith Bridge Road (County Road 60), Jackson County, Ohio.

Goodyear respectfully submits that for the reasons set forth in this request, the OAC 3745-27-08 capping requirements applicable to new solid waste landfills are not warranted for the Jackson County Landfill which has not accepted waste for over 12 years. As an alternative to those requirements, Goodyear would propose the construction of a landfill cap using the existing soil cover with the addition of a flexible membrane liner (FML). It is Goodyear's position that this approach is equally protective of human health and the environment as the dual layer low permeability cap.

OAC 3745-27-08(D) "Design, Construction, and Testing Specifications" provides the specifications for design of all engineered components of a currently operational sanitary landfill. By this letter, Goodyear is requesting that the Director grant an exemption pursuant to Ohio Revised Code § 3745.02(G) from several specifications outlined in OAC 3745-27-08(D)(21) and (26). Listed below are the design requirements set forth in those sections, along with information in support of Goodyear's exemption request.

<u>OAC 3745-27-08(D)(21):</u>

For cap soil barrier layers: design and construction of a recompacted soil barrier layer in the composite cap system shall comply with the following:

(a) *Be at least one of the following:*
- *(i)* *Eighteen inches thick.*
- *(ii)* *A geosynthetic clay liner that complies with paragraph (D)(9) of this rule with an engineered subbase, constructed in accordance with paragraph (D)(22) of this rule*

Goodyear requests an exemption from the requirement to construct an eighteen-inch soil barrier in order to allow use of the existing regraded soil cover as the soil barrier.

The Jackson County Landfill accepted solid wastes from approximately 1970 to 1999. The landfill ceased accepting waste in 1999 and has remained dormant for 12 years. Consequently, Goodyear proposes to use the existing silty-clay soil cover as an alternative to a new 18 inches thick compacted clay layer. Goodyear contends that this alternative provides equivalent protection of human health, safety, and the environment as the dual layer low permeability cap.

At Goodyear's request, Parsons conducted an investigation of the existing landfill soil cover as part of the Remedial Investigation of the landfill and issued a final report, dated April 2009. This investigation reported that more than 63% of the landfill has a soil cover of 24 inches or greater, and an average cover thickness of over 25 inches. Only one of the 22 borings installed to measure cover thickness had a cover depth of less than 12 inches. Goodyear proposes to regrade the existing soil cover in order to achieve an average of at least eighteen inches of soil cover over the entire landfill. This cover will be amended if necessary with a granular material or a geotextile underlay to protect the FML placed on top of the existing soil cover.

The principal drivers for remedial action at the Jackson County Landfill are the generation and uncontrolled migration of leachate and the prevention of direct contact with buried waste materials. Goodyear conducted an evaluation of the generation of leachate, or water percolation rates, through different landfill cap designs proposed in the Jackson County Landfill Feasibility Study. The evaluation, using the Hydrologic Evaluation of Landfill Performance (HELP) Model, determined the dual layer cap design (Alternative #4 in the FS) would allow approximately 0.530 cubic feet /year to percolate through the landfill cap, resulting in a 99.99% efficiency in reducing water percolation into the landfill. Likewise, the HELP Model determined the percolation reduction efficiency of the single FML cap design (Alternative #3 in the FS) was a comparable 99.67%. Goodyear believes that the addition of a secondary clay liner below the FML would not significantly reduce the volume of water that will percolate through the cap and generate leachate. Goodyear contents that the existing soil cover in conjunction with a FML liner will provide protection equivalent to a dual liner from water percolation through the cap. Appendix A provides a copy of the HELP calculations and summary of results.

The alternative landfill cap proposed by Goodyear is protective of human health and the environment.

(b) Be free of debris, foreign material, and deleterious material.

No exemption is requested to this specification.

(c) Not be comprised of solid waste.

No exemption is requested to this specification.

(d) Be placed above all areas of waste placement.

There may be constraints (e.g. slope along western landfill boundary) that make it impractical for the placement of the agreed upon cap over all areas of waste placement. These constraints will need to be evaluated during the remedial design of the landfill cap.

(e) Not have any abrupt changes in grade that may result in damage to the geosynthetics.

No exemption is requested to this specification.

(f) Have pre-construction testing of the borrow soils performed on representative samples and the results submitted to the appropriate Ohio EPA district office no later than seven days prior to the intended use of the material in the construction of the cap soil barrier layer. The pre-construction testing shall determine the following:

- *(i) The maximum dry density and optimum moisture content according to ASTM D698-00a (standard proctor), or ASTM D1557-00 (modified proctor) at a frequency of no less than once for every one thousand five hundred cubic yards.*
- *(ii) The grain size distribution according to ASTM D422-63 (sieve and hydrometer) at a frequency of no less than once for every one thousand five hundred cubic yards.*
- *(iii) The recompacted laboratory permeability using ASTM D5084-00e1 (falling head) at a frequency of no less than once for every ten thousand cubic yards.*

Goodyear proposes to use the existing soil cover for the landfill's soil barrier. Consequently, borrow soils should not be needed. In the event borrow soils are needed, the testing specified in paragraphs (i) and (ii) will be performed on borrow soils. Testing of the recompacted soils, i.e. paragraph (iii), will not be performed, as the borrow soils will only be used to supplement the existing soil cover.

(g) Be constructed in lifts to achieve uniform compaction. Each lift shall:

- *(i) Be constructed of soil in accordance with the following:*
  - *(a) With loose lifts of eight inches or less.*
  - *(b) With a maximum clod size of three inches or half the lift thickness, whichever is less.*
  - *(c) With one hundred percent of the particles having a maximum dimension not greater than two inches.*
  - *(d) With not more than ten percent of the particles, by weight, having a dimension greater than 0.75 inches.*
  - *(e) With at least fifty percent of the particles, by weight, passing through the 200-mesh screen.*
  - *(f) Alternative soil specifications may be used provided that it is demonstrated to the satisfaction of the director or his authorized representative that the materials and techniques will result in each lift having a maximum permeability of 1x10-6 cm/sec.*
- *(ii) Be compacted to at least ninety five percent of the maximum dry density as determined by ASTM D698-00a (standard proctor) or at least ninety percent of the maximum dry density as determined by ASTM D1557-00 (modified proctor) or an alternative compaction specification approved by the director.*
- *(iii) Be placed with a minimum soil moisture content that shall not be less than the optimum moisture content as determined by ASTM D698-00a (standard proctor), or ASTM D1557-00 (modified proctor) or an alternative moisture content specification approved by the director.*
- *(iv) Have a maximum permeability of one times ten to the negative six centimeters per second (1 X 10-6 cm/sec).*

Goodyear requests an exemption from these requirements as the regraded existing soil cover will be used for the soil barrier. A recompacted soil barrier will not be placed on the landfill therefore adherence to the above specifications is not warranted.

(h) Be adequately protected from damage due to desiccation, freeze/thaw cycles, wet/dry cycles, and the intrusion of objects during construction of the cap system.

No exemption is requested to this specification.

(i) Have quality control testing of the constructed lifts performed to determine the density and moisture content according to ASTM D2922-01 and ASTM D3017-01 (nuclear methods), ASTM D1556-00 (sand cone), ASTM D2167-94 (rubber balloon) or other methods acceptable to the director or his authorized representative at a frequency of no less than five tests per acre per lift. The locations of the individual tests shall

be adequately spaced to represent the constructed area. Any penetrations shall be repaired using bentonite.

Goodyear requests an exemption from these requirements as the regraded existing soil cover will be used. As an alternative, construction quality controls will be developed in the remedial design for approval by the Ohio EPA

OAC 3745-27-08(D)(26):

For cap protection layers: a cap protection layer shall comply with the following:

(a) Be placed above the cap drainage layer.

No exemption is requested to this specification.

(b) Be a minimum of thirty-six inches thick for facilities located in the northern tier of counties in Ohio (Williams, Fulton, Lucas, Ottawa, Erie, Lorain, Cuyahoga, Lake, Geauga, and Ashtabula counties) and thirty inches thick for facilities located elsewhere in Ohio. The thickness of the drainage layer may be used to satisfy the thickness requirement of the cap protection layer.

Goodyear submits that the Jackson County Landfill does not require a thirty-inch-thick cap protection layer. Goodyear proposes, as an alternative to the requirements of this section, that the 24 inch cap protection layer installed at the Green II (Hocking County) landfill be accepted as the basis for the exemption request submitted herein. The Ohio Agricultural Research and Development Center (OARDC) maintains a weather station in Jackson, Ohio. The Jackson OARDC weather station records soil temperatures at 2 inches and 4 inches below the ground surface (BGS). A review of the soil temperature data at 4 inches BGS found that the soil temperature was below 32 degrees Fahrenheit less than 11 days per year on average since 2006, with a maximum of 32 consecutive days occurring in 2007. The lowest recorded temperature since 2006 at four inches BGS was 25.2 degrees Fahrenheit. Based on this information, a 30-inch cover is not necessary for freeze protection of the FML.

(c) Have a maximum projected erosion rate of five tons per acre per year.

No exemption is requested to this specification.

(d) Have sufficient fertility in the uppermost portion to support vegetation.

No exemption is requested to this specification.

(e) Be constructed as follows:

(i) *With best management practices for erosion control.*
(ii) *In a manner that healthy grasses or other vegetation shall form a complete and dense vegetative cover within one year of placement.*

No exemption is requested to this specification.

Goodyear believes that an alternative cover using a regraded existing cover, a geotextile underlay or equivalent liner protective layer, a 40 mil HPDE geomembrane, a geosynthetic drainage net, eighteen inches of soil cover, and six inches top soil cover would be as protective of human health, safety, and the environment as the dual layer cap outlined in OAC 3745-27-08. For the reasons presented in this submittal, Goodyear respectfully requests that the Director grant the exemption described herein from the requirements of OAC 3745-27-08(D)(21) and (26) with respect to the dual layer landfill cap.

Should the Ohio EPA have any questions regarding this request, please contact Ron Clark at 330-668-4600.

Yours truly

David L. Chapman
Director, EHS Sustainability
The Goodyear Tire & Rubber Company
1144 East Market Street, Dept 1081
Akron, Ohio 44316

cc Steve Bordenkircher
Jeff Sussman
Ron Clark
Emily Huggins, Thompson Hine

ATTACHMENT

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ATTACHMENT 2

OHIO E.P.A.

JUL -6 2012

ENTERED DIRECTOR'S JOURNAL

BEFORE THE

OHIO ENVIRONMENTAL PROTECTION AGENCY

In the matter of:	
The Goodyear Tire & Rubber Company 1144 East Market Street Akron, Ohio 44316	**Director's Final Findings and Orders**
Respondent	I certify this to be a true and accurate copy of the official documents as filed in the records of the Ohio Environmental Protection Agency.
For the Site known as:	Date: 7.6.2012
Jackson County Landfill 1841 Smith Bridge Road Liberty Township, Jackson County, Ohio	

I. JURISDICTION

These Director's Final Findings and Orders ("Orders") are issued to The Goodyear Tire & Rubber Company ("Goodyear"), pursuant to the authority vested in the Director of Ohio EPA under Ohio Revised Code ("ORC") § 3734.02(G) and Ohio Administrative Code ("OAC") Rule 3745-27-03(B).

II. PARTIES BOUND

These Orders shall apply to and be binding upon Goodyear and its successors in interest liable under Ohio law. No change in ownership of Goodyear or of the Jackson County Landfill shall in any way alter Goodyear's obligations under these Orders.

III. DEFINITIONS

Unless otherwise expressly provided herein, all terms used in these Orders shall have the same meaning as defined in ORC Chapter 3734.

IV. FINDINGS

The Director of Ohio EPA has determined the following findings:

1. The Jackson County Landfill Site ("Site") is located within the southeast quarter of Section 13, Liberty Township, Jackson County, Ohio at 1841 Smith Bridge Road (County Road 60). The Site encompasses approximately 24 acres, including the Jackson County Landfill, and is adjacent to a commercial business and a hunting club as well as the Lake Katharine Nature Preserve and Salt Lick Creek.

2. The Jackson County Landfill operated from April 1970 to at least August 1987, when the landfill ceased acceptance of waste. Sanitation Commercial Services (SCS) is the current owner of the Site. Gregory J. Fields owned, operated, and controlled SCS.

3. During its operation, the Jackson County Landfill accepted "industrial waste" and/or "other waste" as defined in ORC § 6111.01(C) and (D), and/or "hazardous wastes" as defined in ORC § 3734.01(J), and/or "hazardous substances" as defined in § 101(14) the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, 42 U.S.C. 9601(14). Wastes disposed of at the Site included municipal waste and drummed materials, including: acetone, polyester resin mixture, cyclohexanone, dichloromethane, isobutyl alcohol, methyl ethyl ketone (MEK), methyl isobutyl ketone, toluene, xylene and waste styrene mixture. Goodyear stated the company disposed of approximately 5772 drums of waste material between 1974 and 1980 at the Jackson County Landfill.

4. On August 1 and 2, 1984, Ohio EPA conducted a preliminary assessment (PA) at the Site and prepared an addendum to the PA. In June and August 2003, Ohio EPA collected samples from leachate seeps. Benzene, arsenic and lead were detected in excess of the the applicable Maximum Contaminant Levels (MCLs) as set forth in OAC Chapter 3745-81 and aluminum, iron, nickel, zinc and ammonia were detected in excess of the water quality standard.

5. Because of their quantity, concentration, physical or chemical concentrations, benzene, arsenic, lead, aluminum, iron, nickel, zinc and ammonia found at the

Site are "hazardous waste" as defined in ORC §3734.01(J), or "industrial waste" or "other wastes" as defined under ORC § 6111.01(C) and (D).

6. On August 16, 2005, Director's Final Findings and Orders were issued to Goodyear and the owners of the Jackson County Landfill property, to conduct a Remedial Investigation (RI) to define the nature and extent of contamination at the Site, and a Feasibility Study (FS) to develop and evaluate remedial alternative(s) for cleanup of the Site.

7. Ohio EPA approved the RI Report on April 29, 2009, and approved the FS Report on June 15, 2010. Within the FS report, only one capping alternative fully complied with all applicable solid waste rules. The remaining alternatives all required that an exemption be requested from one or more specific rules.

8. In a letter dated December 8, 2011, Goodyear submitted a request for an exemption, pursuant to ORC 3734.02(G), from several of the requirements, OAC Rules 3745-27-08(D)(21) and (26), associated with the construction of a dual layer, low permeability cap on the Jackson County Landfill. More specifically:

   a) OAC rule 3745-27-08(D)(21)(a)(i) requires that the re-compacted soil barrier layer in the composite cap system be at least eighteen (18) inches thick, or include a geosynthetic clay liner that complies with paragraph (D)(9) of the rule with an engineered sub-base, constructed in accordance with paragraph (D)(22) of the rule. Goodyear requested an exemption from the requirement to construct an eighteen-inch thick soil barrier in order to allow the use of existing re-graded soil cover as the soil barrier with the intent to achieve an average of at least 18 inches of soil cover over the entire landfill.

   b) OAC rule 3745-27-08(D)(21)(d) requires that the soil cap be placed above all areas of waste placement. Goodyear stated that there may be constraints such as the slope along the western landfill boundary which will make it impracticable for the agreed upon cap to be placed in some areas. The actual constraints will need to be determined during the remedial design of the landfill cap.

   c) OAC rule 3745-27-08(D)(21)(f)(iii) requires that pre-construction testing of the borrow soils include performing a recompacted laboratory permeability using ASTM D5084-00e1 (falling head) as a frequency of no less than once for every ten thousand cubic yards. Goodyear proposes to use the existing soil cover for the landfill's borrow soil, consequently borrow soils should not be needed. If borrow soils are needed, Goodyear will perform the tests specified in (D)(21)(f)(i) and (ii) but not in (iii) as the borrow soils, if needed, will only be used to supplement the existing soil cover.

d) OAC rule 3745-27-08(D)(21)(g)(i-iv) requires that the re-compacted soil barrier layer in the composite cap system be constructed in lifts and to certain specifications, and be compacted to certain specifications. Goodyear requested an exemption from these requirements as the re-graded existing soil cover would be used for the soil barrier. A re-compacted soil barrier would not be placed on the landfill; therefore, adherence to the specifications in (D)(21)(g)(i-iv) is not warranted.

e) OAC rule 3745-27-08(D)(21)(i) requires quality control testing of the constructed lifts be performed to determine the density and moisture content according to certain specifications. Goodyear requested an exemption from these requirements as the re-graded existing soil cover would be used for the soil barrier. As an alternative, Goodyear would develop construction quality controls, for Ohio EPA approval, during remedial design.

f) OAC rule 3745-27-08(D)(26)(b) requires that cap protection layers be a minimum of thirty (30) inches thick for facilities located in the area of the Jackson County Landfill. Goodyear requested an exemption from this requirement, as the average soil temperatures in the area of Jackson County Landfill do not warrant a thirty-inch thick cap protection layer for freeze protection.

9. The Director has determined that issuance of an exemption to allow the proposed alternative cap system, as further described in the December 8, 2011 exemption request, is expected to provide an adequate physical barrier between the waste mass and direct contact, and is unlikely to adversely affect the public health or safety or the environment.

V. ORDERS

The Director hereby issues the following Orders:

1. Pursuant to ORC § 3734.02(G) and OAC Rule 3745-27-03(B), Goodyear is hereby exempted from the requirements in OAC rules 3745-27-08(D)(21) and (26), as described in the Findings above, for the cap system at the Jackson County Landfill, provided that Goodyear implements the remedy selected in the Decision Document for the Site.

2. Nothing in these Orders shall be construed to authorize any waiver from the requirements of any applicable federal or state laws or regulations except as specified herein. These Orders shall not be interpreted to release Goodyear from responsibility under ORC chapters 3704, 3734 or 6111, the Federal Clean Water Act, the Resource Conservation and Recovery Act, or the Comprehensive Environmental Response, Compensation and Liability Act, or from other applicable requirements for remedying conditions resulting from any release from contaminants to the environment.

VI. OTHER APPLICABLE LAWS

All actions required to be taken pursuant to these Orders shall be undertaken in accordance with the requirements of all applicable local, state and federal laws and regulations. These Orders do not waive or compromise the applicability and enforcement of any other statutes or regulations applicable to Goodyear, any other person, firm partnership or corporation, and/or the Site.

VII. RESERVATION OF RIGHTS

Nothing contained herein shall be construed to prevent Ohio EPA from exercising its lawful authority to require Goodyear to perform additional activities pursuant to ORC 3734 or 6111 or any other applicable law in the future. Nothing herein shall restrict the right of Goodyear to raise any administrative, legal, or equitable claim or defense with respect to such further actions that Ohio EPA may seek to require of Goodyear.

VIII. EFFECTIVE DATE

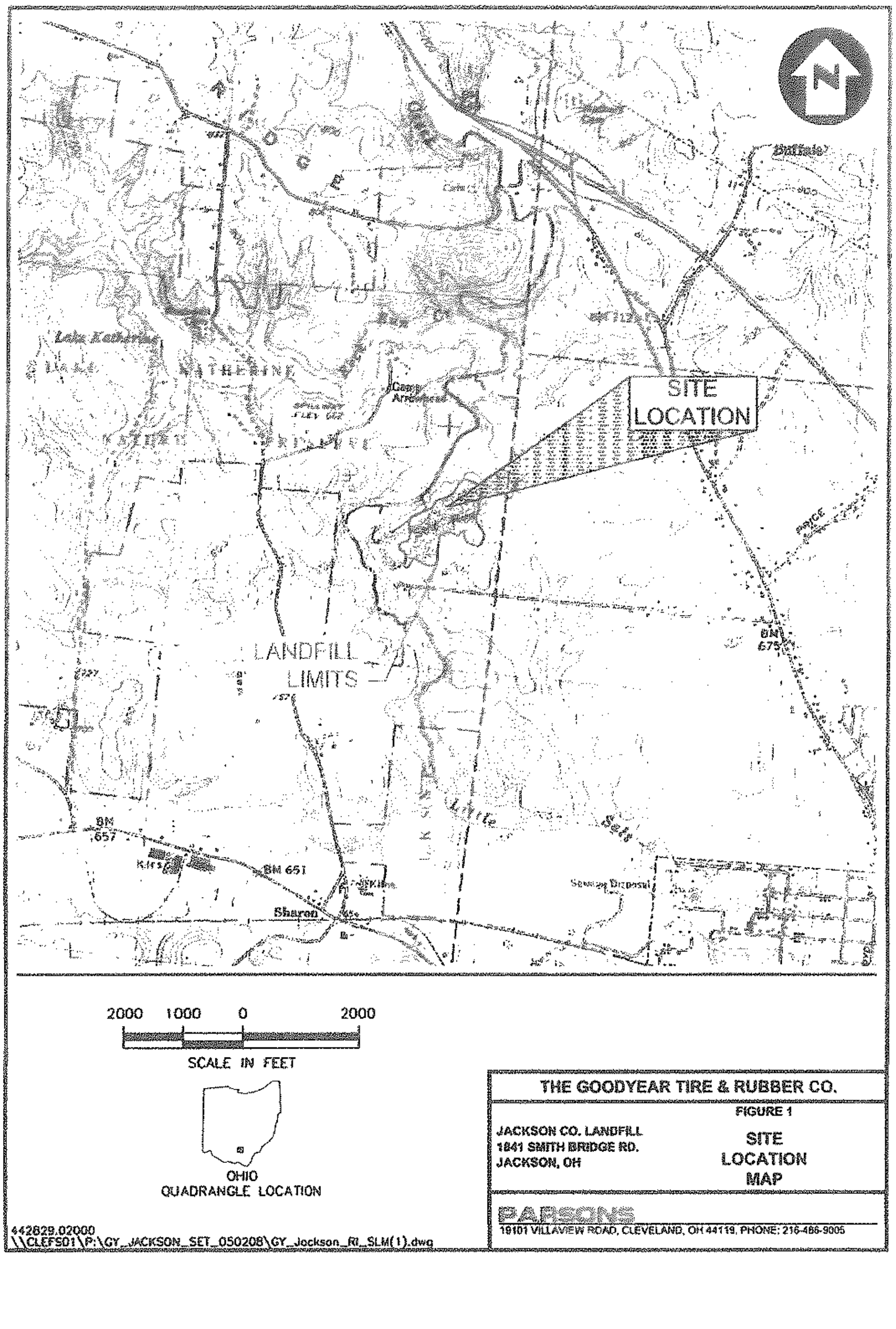
The effective date of these Orders shall be the date these Orders are entered into the Journal of the Director of Ohio EPA.

IT IS SO ORDERED:

OHIO ENVIRONMENTAL PROTECTION AGENCY

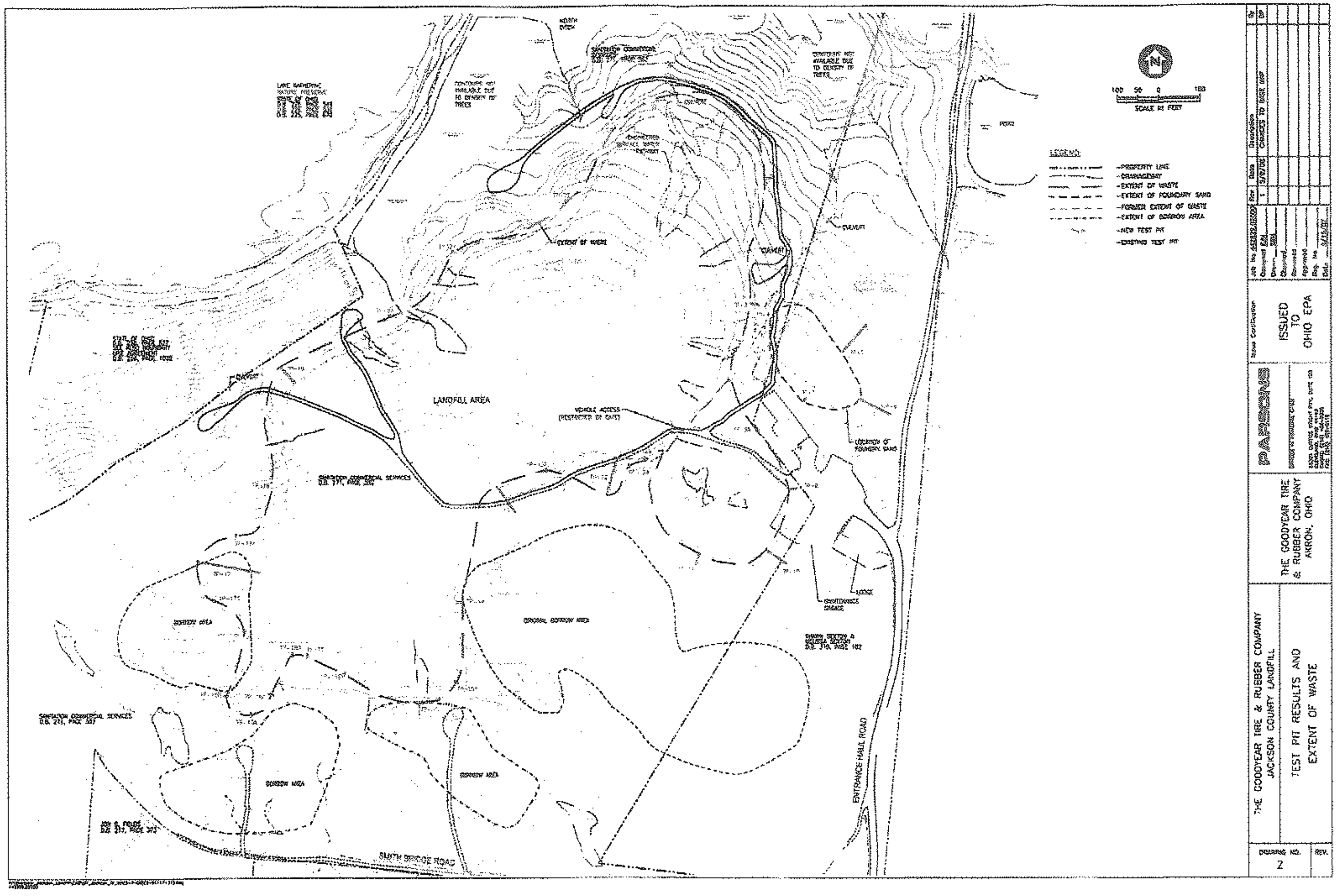
Scott J. Nally, Director	JUL 0 6 2012 Date

APPENDIX E
Figures

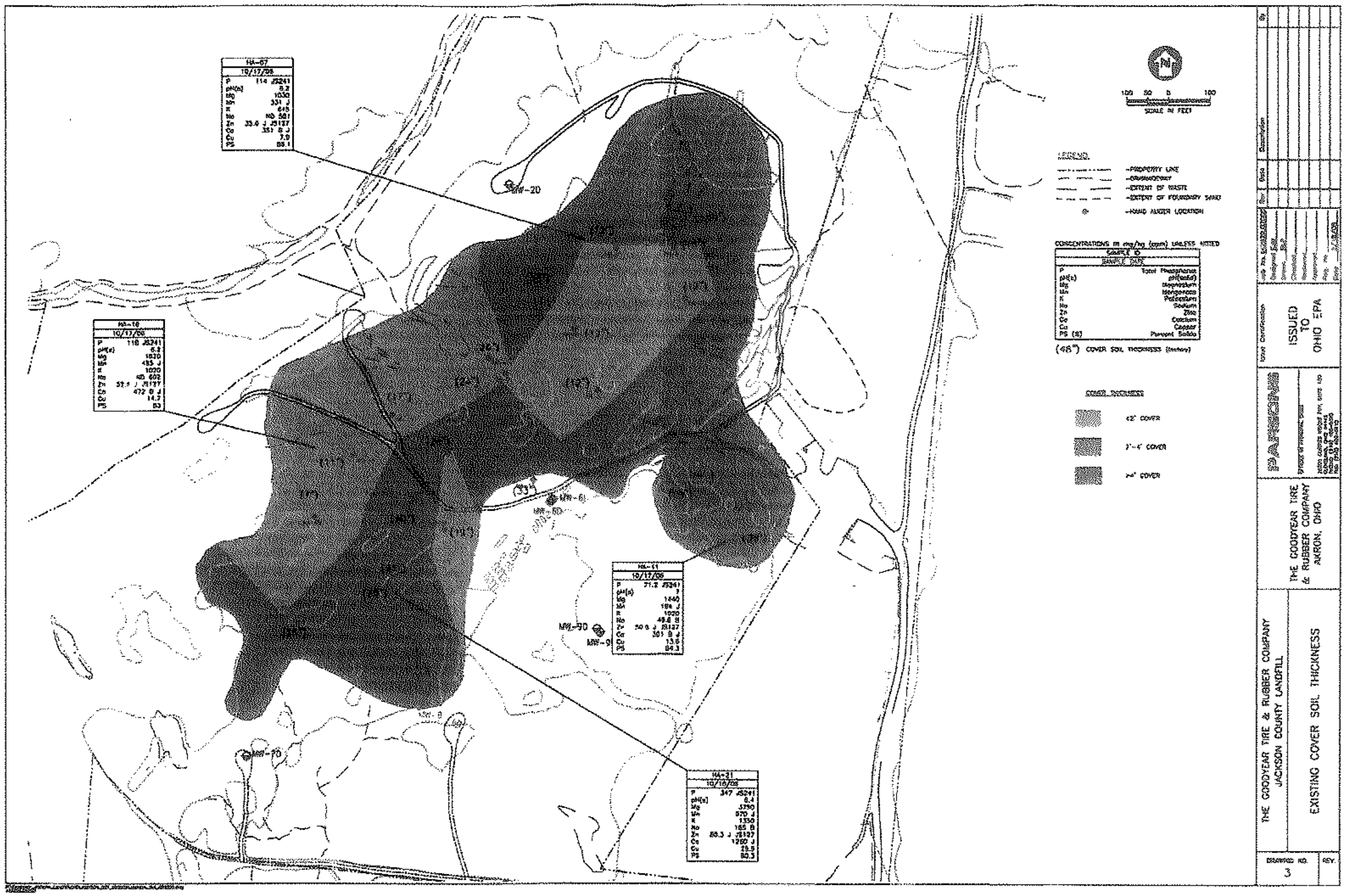


N
SITE LOCATION
LANDFILL LIMITS
Lake Katherine
Camp Arrowhead
BM 657
BM 651
BM 675
Sharon
Sewage Disposal
2000 1000 0 2000
SCALE IN FEET
OHIO
QUADRANGLE LOCATION
THE GOODYEAR TIRE & RUBBER CO.
FIGURE 1
JACKSON CO. LANDFILL
1841 SMITH BRIDGE RD.
JACKSON, OH
SITE
LOCATION
MAP
PARSONS
19101 VILLAVIEW ROAD, CLEVELAND, OH 44119, PHONE: 216-486-9005
442829.02000
\\CLEFS01\P:\GY_JACKSON_SET_050208\GY_Jackson_RI_SLM(1).dwg

DRAWING 1.


LAKE KATHERINE NATURE PRESERVE
CONTOURS NOT AVAILABLE DUE TO DENSITY OF TREES
LANDFILL AREA
VEHICLE ACCESS (RESTRICTED BY GATE)
EXTENT OF WASTE
CULVERT
LOCATION OF FOUNDRY SAND
SANITATION COMMERCIAL SERVICES
ORIGINAL BORROW AREA
BORROW AREA
LODGE
MAINTENANCE GARAGE
SANITATION COMMERCIAL SERVICES
SMITH BRIDGE ROAD
ENTRANCE HALL ROAD
SCALE IN FEET
LEGEND:
-PROPERTY LINE
-DRAINAGEWAY
-EXTENT OF WASTE
-EXTENT OF FOUNDRY SAND
-FORMER EXTENT OF WASTE
-EXTENT OF BORROW AREA
-NEW TEST PIT
-EXISTING TEST PIT
CHANGES TO BASE MAP
ISSUED TO OHIO EPA
PARSONS
THE GOODYEAR TIRE & RUBBER COMPANY AKRON, OHIO
THE GOODYEAR TIRE & RUBBER COMPANY JACKSON COUNTY LANDFILL
TEST PIT RESULTS AND EXTENT OF WASTE
DRAWING NO. 2
REV.

DRAWING 2.


THE GOODYEAR TIRE & RUBBER COMPANY
JACKSON COUNTY LANDFILL
EXISTING COVER SOIL THICKNESS
THE GOODYEAR TIRE
& RUBBER COMPANY
AKRON, OHIO
ISSUED
TO
OHIO EPA
DRAWING NO.
3
REV.
SCALE IN FEET
LEGEND
-PROPERTY LINE
-EXTENT OF WASTE
-HAND AUGER LOCATION
COVER THICKNESS
<2' COVER
>4' COVER
HA-07
HA-16
HA-11
HA-21
MW-20
MW-70
MW-9D

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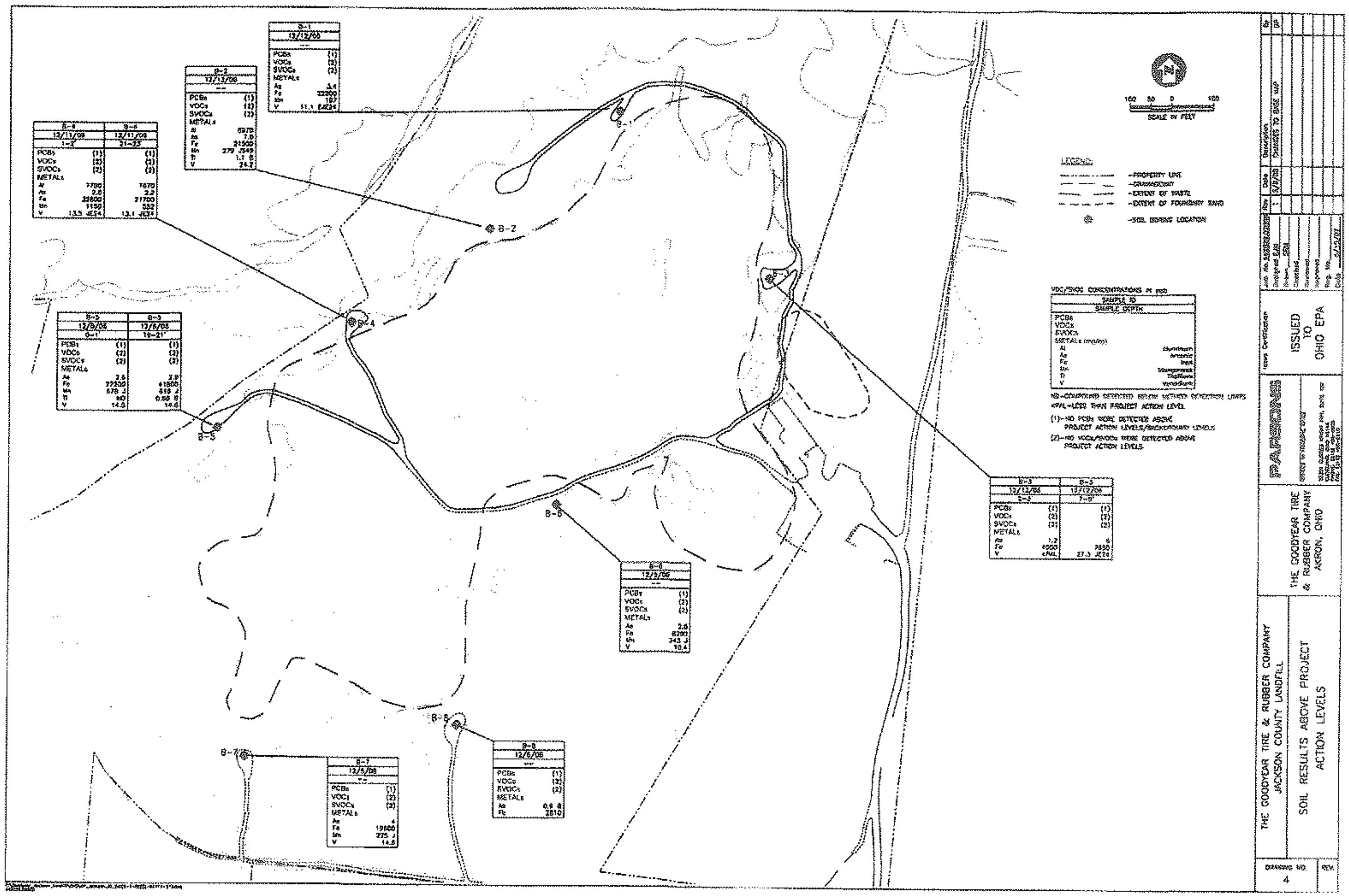
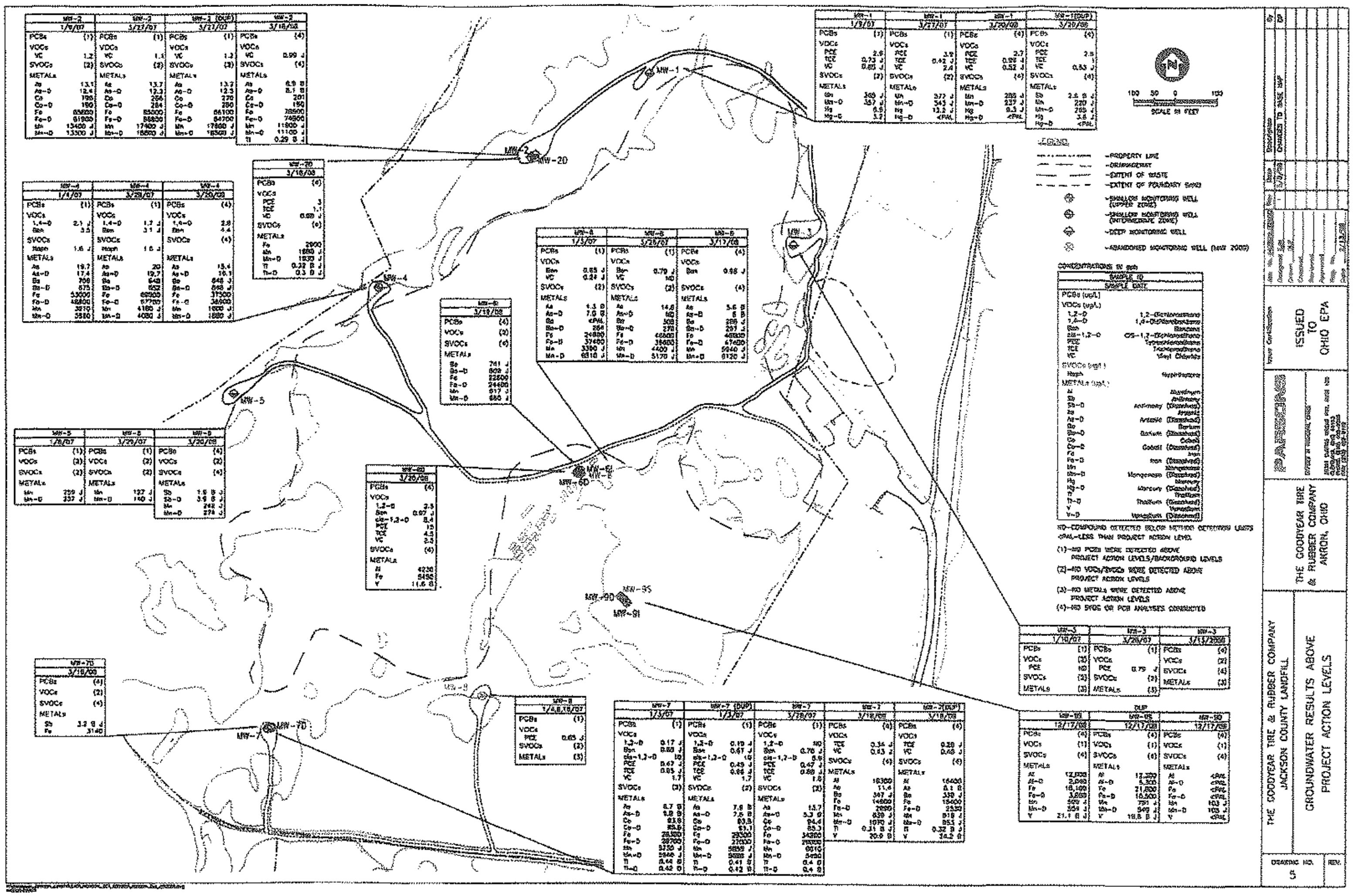

THE GOODYEAR TIRE & RUBBER COMPANY
JACKSON COUNTY LANDFILL
SOIL RESULTS ABOVE PROJECT
ACTION LEVELS
THE GOODYEAR TIRE
& RUBBER COMPANY
AKRON, OHIO
ISSUED
TO
OHIO EPA
PARSONS
DRAWING NO.
4
REV.
LEGEND:
-PROPERTY LINE
-EXTENT OF WASTE
-EXTENT OF FOUNDRY SAND
-SOIL BORING LOCATION
SCALE IN FEET
B-1
B-2
B-3
B-4
B-5
B-6
B-7
B-8

DRAWING 4.


THE GOODYEAR TIRE & RUBBER COMPANY
JACKSON COUNTY LANDFILL
GROUNDWATER RESULTS ABOVE
PROJECT ACTION LEVELS
THE GOODYEAR TIRE
& RUBBER COMPANY
AKRON, OHIO
ISSUED
TO
OHIO EPA
LEGEND
SCALE IN FEET
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MW-2
MW-4
MW-5
MW-6D
MW-7D
MW-9D
MW-9S
MW-9I

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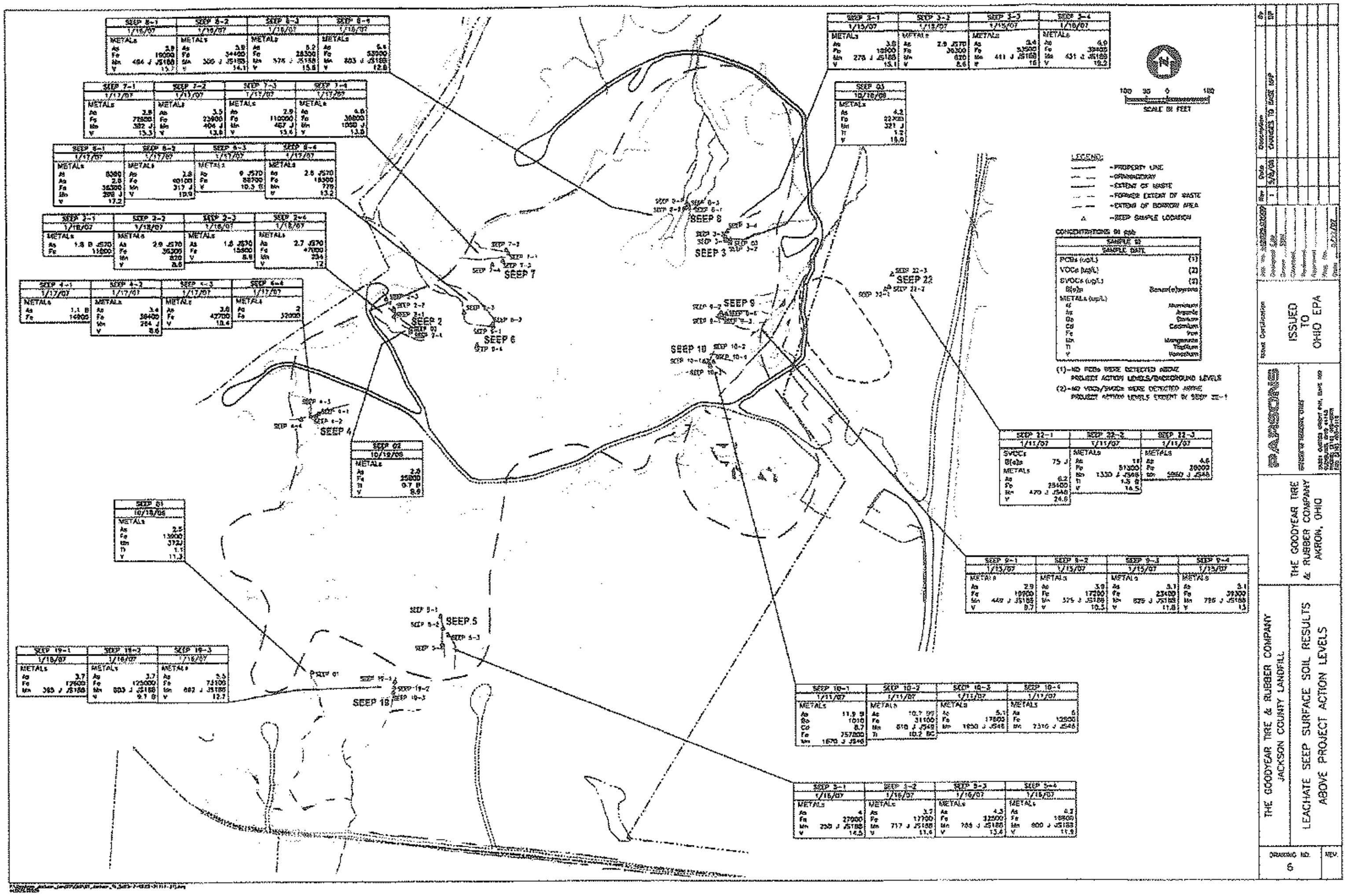
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JACKSON COUNTY LANDFILL
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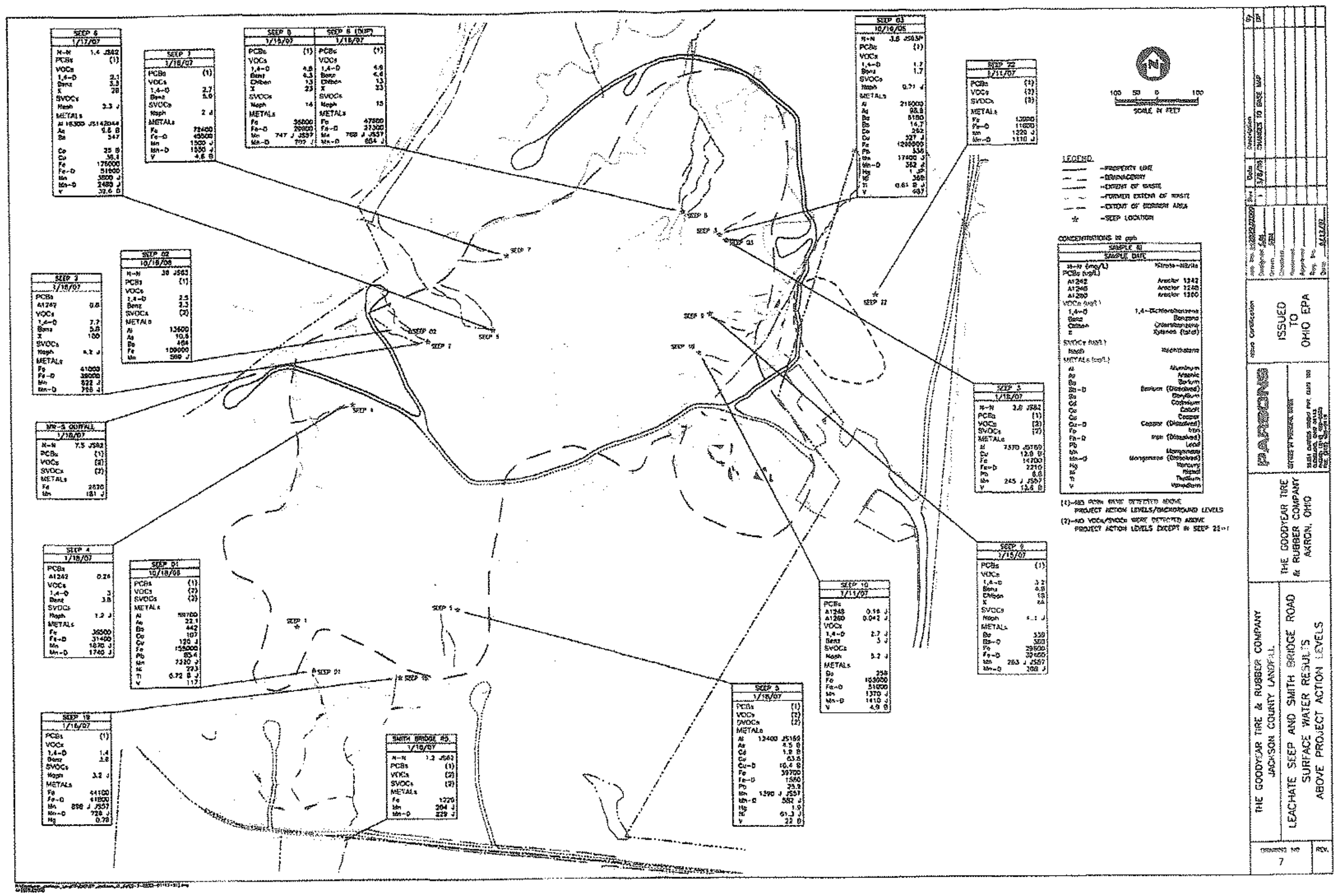
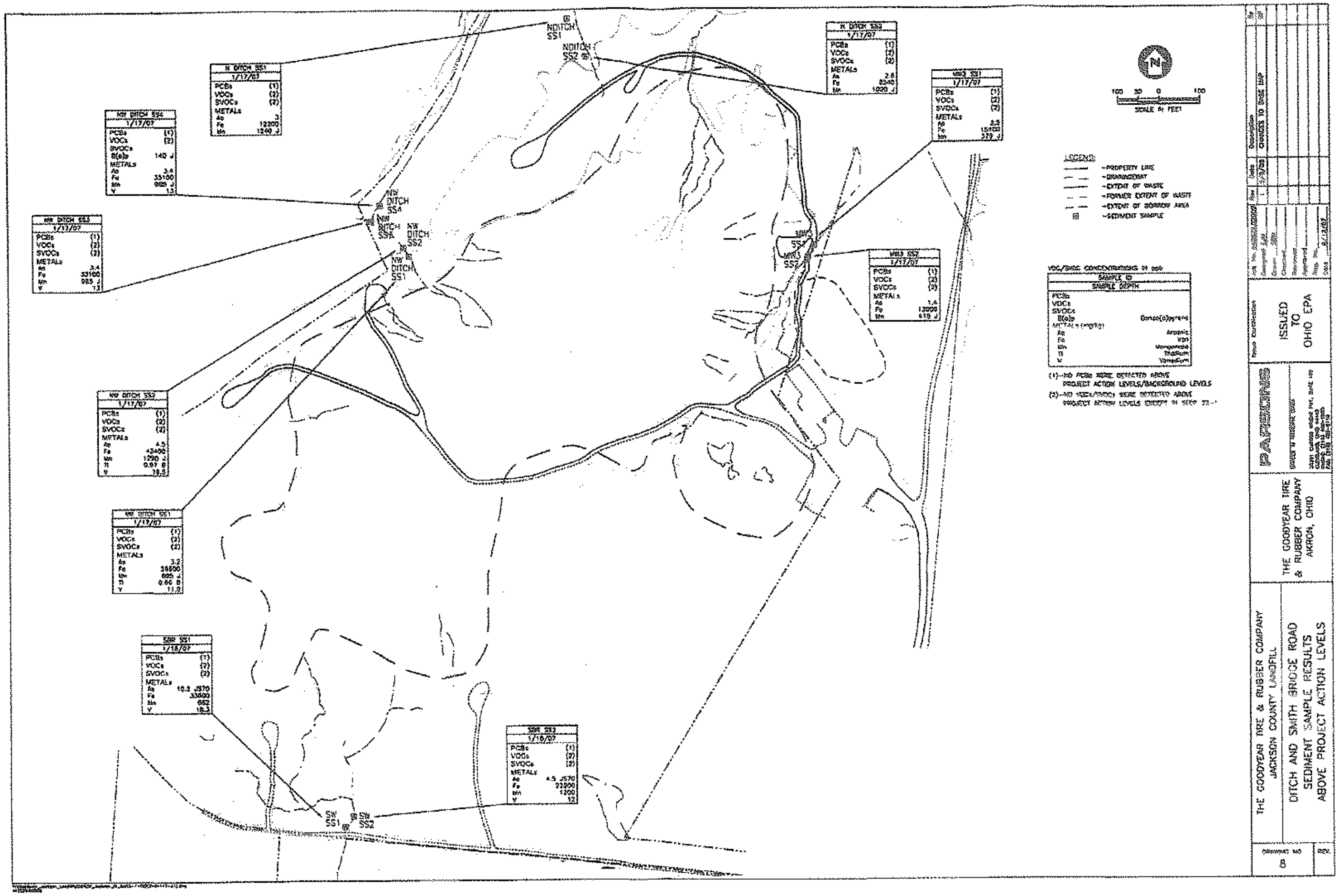
ABOVE PROJECT ACTION LEVELS
THE GOODYEAR TIRE & RUBBER COMPANY
AKRON, OHIO
PARSONS
ISSUED TO OHIO EPA
DRAWING NO. 6
CHANGES TO BASE MAP
SCALE IN FEET
LEGEND:
PROPERTY LINE
EXTENT OF WASTE
FORMER EXTENT OF WASTE
EXTENT OF BORROW AREA
SEEP SAMPLE LOCATION
SAMPLE ID
SAMPLE DATE
PCBs (ug/L)
VOCs (ug/L)
SVOCs (ug/L)
METALS (ug/L)
SEEP 2
SEEP 3
SEEP 4
SEEP 5
SEEP 6
SEEP 7
SEEP 8
SEEP 9
SEEP 10
SEEP 19
SEEP 22
METALS

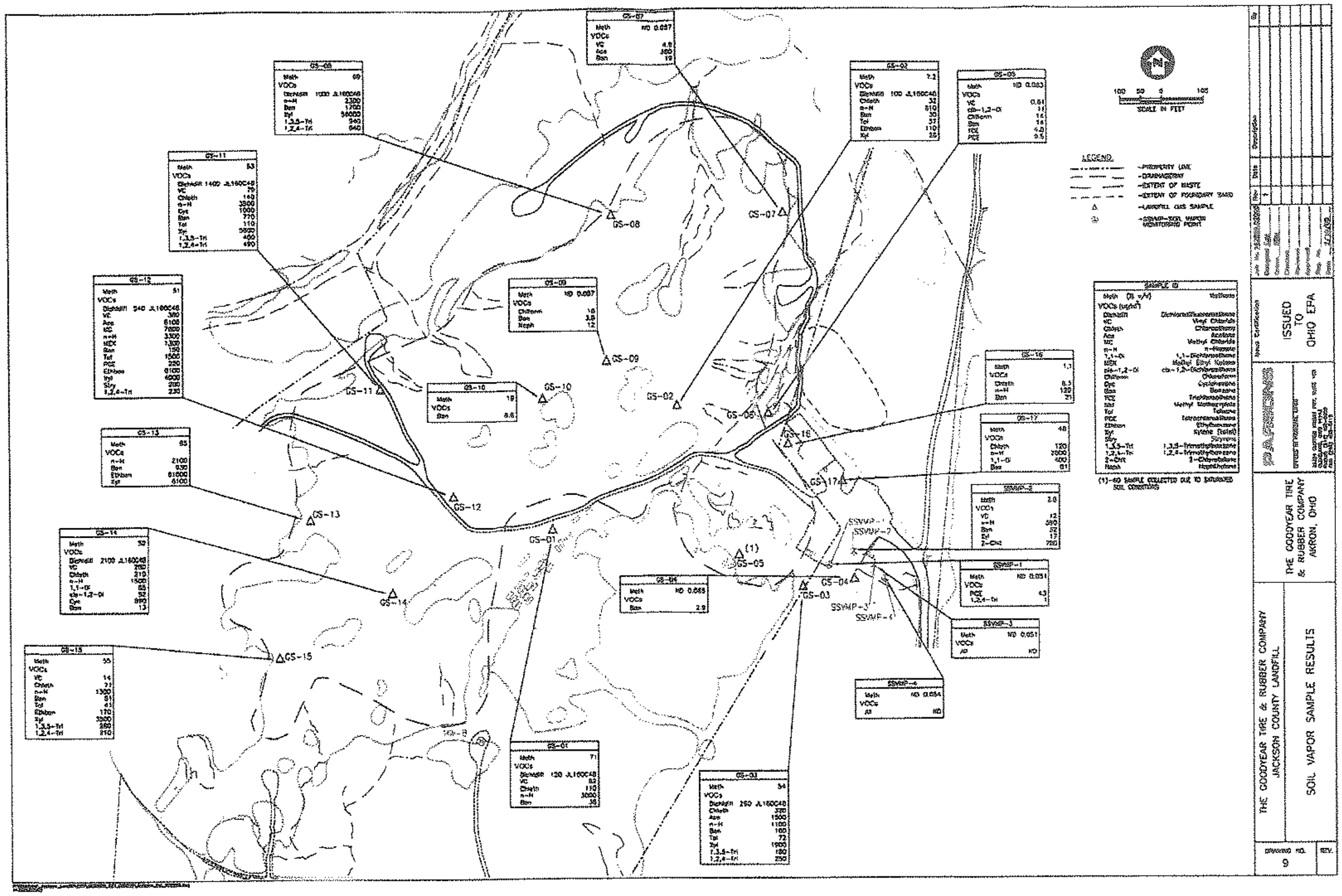
DRAWING 6.


THE GOODYEAR TIRE & RUBBER COMPANY
JACKSON COUNTY LANDFILL
LEACHATE SEEP AND SMITH BRIDGE ROAD
SURFACE WATER RESULTS
ABOVE PROJECT ACTION LEVELS
THE GOODYEAR TIRE
& RUBBER COMPANY
AKRON, OHIO
PARSONS
ISSUED
TO
OHIO EPA
LEGEND
SCALE IN FEET
CHANGES TO BASE MAP
7

DRAWING 7.


THE GOODYEAR TIRE & RUBBER COMPANY
JACKSON COUNTY LANDFILL
DITCH AND SMITH BRIDGE ROAD
SEDIMENT SAMPLE RESULTS
ABOVE PROJECT ACTION LEVELS
THE GOODYEAR TIRE & RUBBER COMPANY AKRON, OHIO
PARSONS
ISSUED TO OHIO EPA
SCALE IN FEET
LEGEND:
N DITCH SS1
N DITCH SS2
NW DITCH SS1
NW DITCH SS2
NW DITCH SS3
NW DITCH SS4
MW3 SS1
MW3 SS2
SBR SS1
SBR SS2

DRAWING 8.



THE GOODYEAR TIRE & RUBBER COMPANY
JACKSON COUNTY LANDFILL
SOIL VAPOR SAMPLE RESULTS
THE GOODYEAR TIRE & RUBBER COMPANY
AKRON, OHIO
ISSUED TO OHIO EPA
DRAWING NO. 9
SCALE IN FEET
LEGEND
GS-01
GS-02
GS-03
GS-04
GS-05
GS-06
GS-07
GS-08
GS-09
GS-10
GS-11
GS-12
GS-13
GS-14
GS-15
GS-16
GS-17
SSVMP-1
SSVMP-2
SSVMP-3
SSVMP-4

DRAWING 9.