UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:
WU-16J

PROPOSAL TO REISSUE AN EXEMPTION TO ARCELORMITTAL BURNS HARBOR, LLC FOR THE CONTINUED INJECTION OF HAZARDOUS WASTE SUBJECT TO THE LAND DISPOSAL RESTRICTIONS OF THE HAZARDOUS AND SOLID WASTE AMENDMENTS OF 1984

Action: Notice of Intent to Grant an Exemption for the Injection of Certain Hazardous Wastes to ArcelorMittal Burns Harbor, LLC for three Injection Wells located at 250 West U.S. Highway 12, Burns Harbor, Indiana.

Summary: The United States Environmental Protection Agency (EPA), Region 5, Chicago office, proposes (through this notice) to grant an exemption from the ban on disposal of hazardous wastes (land ban) to ArcelorMittal Burns Harbor, LLC (ArcelorMittal) for three injection wells in Burns Harbor, Indiana. If the exemption is granted, ArcelorMittal may continue to inject Resource Conservation and Recovery Act (RCRA, codified at 42 USC §§ 6901-6992k) regulated hazardous wastes, defined at Title 40 of the Code of Federal Regulations (40 CFR) Part 261 and designated by waste codes D010, D018, D038 and K062, through waste disposal wells Spent Pickle Liquor #1 (SPL #1), Waste Ammonia Liquor #1 (WAL #1) and Waste Ammonia Liquor #2 (WAL #2).

On March 15, 2007, ArcelorMittal submitted a petition to the EPA, seeking an exemption from the land ban. The petition is based on a showing under 40 CFR § 148.20(a)(1)(i) that any fluids injected will not migrate vertically out of the injection zone or laterally to a point of discharge or interface with an underground source of drinking water (USDW) within 10,000 years. EPA has conducted a comprehensive review of the petition, its revisions, and other materials submitted and has determined that the petition submitted by ArcelorMittal, as revised on July 31, 2008 and December 18, 2008, meets the requirements of 40 CFR Part 148, Subpart C.

Supplementary Information:

I. Background

A. Regulatory Requirements – Section 3004 of the RCRA prohibits the land disposal of untreated hazardous waste. RCRA specifically defines land disposal to include any placement of hazardous waste into an injection well (RCRA Section 3004(k)). Under 40 CFR § 148.20, any person seeking an exemption from that prohibition must submit a petition demonstrating that, to a reasonable degree of certainty, there will be no migration of hazardous constituents from the injection zone for as long as the waste remains hazardous. These petitions, commonly referred to as “no-migration” petitions, must meet the regulatory standards promulgated in 40 CFR Part 148 Subpart C.

The demonstration of no-migration requires a showing that either 1) injected fluids will not migrate, within 10,000 years, upwards out of the injection zone or laterally to a point of contact with a USDW, or 2) before such migration occurs, the injected fluids will no longer be hazardous.

B. Facility Information – The ArcelorMittal injection wells are located at 250 West U.S. Highway 12 in the City of Burns Harbor in Porter County, Indiana. EPA previously issued permits to the ArcelorMittal facility to dispose of liquid wastes by deep well injection. The operator has three existing wells. The proposed exemption is based on a long term average injection rate of 175 gallons per minute (gpm; for SPL #1) and 300 gpm (for WAL #1 and #2 combined) averaged over one-month periods, for a total of 92,043,000 gallons per year (for SPL#1) and 157,788,000 gallons per year (for WAL #1 and WAL #2 combined). The long term average rate limit is used to bound the area of the waste plume so that the plume will be no larger than the area estimated in the petition. The rate at which ArcelorMittal may inject is also limited by the maximum allowable surface injection pressure.

C. Today's Proposed Decision – On March 15, 2007, ArcelorMittal submitted a petition for exemption from the land disposal restrictions of hazardous waste injection under the Hazardous Solid Waste Amendment of RCRA. EPA reviewed this submission and requested additional information. Based on the additional supporting documents received on July 31, 2008 and December 18, 2008, EPA has determined that ArcelorMittal has demonstrated, to a reasonable degree of certainty, that any fluids injected will not migrate vertically out of the injection zone or laterally to a point of discharge or interface with a USDW within 10,000 years.

II. Basis for Determination

A. Waste Identification and Analysis (40 CFR § 148.22(a)) – ArcelorMittal has petitioned the EPA, Region 5, to grant an exemption to allow injection of wastes from the processes of coking and steel pickling bearing the RCRA waste codes D010, D018, D038 and K062 (spent pickle liquor)[1]. RCRA waste codes D010, D018, D038 will only be injected into the WAL injection wells and waste code K062 will only be injected into SPL #1 injection well. Under the proposed exemption, ArcelorMittal can inject only these wastes. (Other fluids necessary for well testing, stimulation, etc. may be injected when approved by EPA.) Waste analyses were performed and submitted as supplementary information to the no-migration petition. These analyses were conducted in accordance with the quality assurance standards required by 40 CFR § 148.21(a), and adequately describe the characteristics of the waste.

B. Mechanical Integrity Test Information (40 CFR § 148.20(a)(2)(iv)) – In order to confirm that all injected fluids are entering the approved injection interval and not channeling up the well bore out of the injection zone, 40 CFR § 148.20(a)(2)(iv) requires the petitioner to submit the results of a successful annulus pressure test and a radioactive tracer survey. These tests demonstrate the mechanical integrity of a well's long string casing, injection tubing, annular seal, and bottom hole cement. The three wells at ArcelorMittal passed these tests successfully in June of 2008.

[1] Description of the RCRA waste codes used in this document can be found at 40 CFR §§ 261.24 and 261.32.

C. Local and Regional Geology (40 CFR § 148.21(b)) – Class I hazardous waste injection wells must be located in areas that are geologically suitable. ArcelorMittal provided site-specific geologic, hydrologic, and geochemical information, including descriptions of the depositional environments of the formations, well logs, cross-sections, well and formation tests, and geologic maps, to support the demonstration of no-migration. EPA's evaluation of the structural geology and stratigraphy of the local and regional area determined that the ArcelorMittal facility is located at a geologically suitable site.

1. Identification of Underground Sources of Drinking Water – The lowermost USDW at the site is the Silurian/Devonian aquifer, with a base at 726 feet (Figure 1). (All depths in this document are referenced from a 13-foot Kelly Bushing unless labeled as referenced from ground surface.) There are approximately 2,008 feet of separation between the lowermost USDW and the Injection Interval, where the waste is emplaced. This separation zone is composed of dolomite, sandy shale, and shale interbedded with siltstone and sandstone, which are predominantly characterized by low permeability at this location, as well as overlying sandstone units.

2. Injection Zone – The injection zone must have sufficient permeability, porosity, thickness, and extent to contain the injected fluids. The injection zone for the ArcelorMittal facility is composed of the lower Eau Claire Formation and Mount Simon Sandstone, between 2180 and 4297 feet. The injection zone is composed of the injection interval, into which the waste is placed, and the overlying arrestment interval (Figure 1) into which the waste may diffuse. Waste is directly emplaced at depths between 2734 and 4297 feet into the Mt. Simon Sandstone, which consists predominantly of very fine- to coarse-grained sandstone. It can accept the volume of waste proposed by ArcelorMittal because it has high permeability and porosity.

The arrestment interval, between 2180 to 2734 feet, is composed of the lower Eau Claire and the upper Mt. Simon Sandstone. This is a continuous rock formation of low vertical permeability, which is free of transecting, transmissive faults or fractures over an area sufficient to prevent the upward movement of waste.

3. Confining Zone – (40 CFR § 146.62) – The regulations which specify the minimum criteria for siting Class I hazardous waste injection wells require that the injection zone must be overlain by at least one additional formation which can confine the injected fluids. This formation is known as the confining zone, and it must be (1) laterally continuous, (2) free of transecting, transmissive faults or fractures over an area sufficient to prevent fluid movement, and (3) of sufficient thickness and lithologic and stress characteristics to prevent vertical propagation of fractures. The confining zone at the ArcelorMittal facility is the upper Eau Claire Formation, which is found between 1936 and 2180 feet (Figure 1). It is a 244-foot thick, laterally extensive shale interval interspersed with sand and silt layers. It has no known transmissive faults or fractures within the Area of Review (AOR), and will resist vertical migration because of its low natural permeability.

The confining zone must be separated from the lowermost USDW by at least one sequence of permeable and less permeable strata that will provide added layers of protection by either allowing pressure bleed-off (high permeability units), or by providing additional confinement (low permeability units). Between the confining zone and the lowermost USDW there is 1210 feet of sedimentary rock to further block injected contaminants from reaching drinking water sources. These rock formations are laterally continuous for hundreds of square miles and provide the required additional layers of protection. The monitoring well that will detect any migration while it is still many hundreds of feet below the USDW further enhances the Agency's confidence.

4. Absence of Known Transmissive Faults (40 CFR § 148.20(b)) – There are no known transmissive faults in the lower Eau Claire and the upper Mt. Simon Sandstone, the layers of rock within the injection zone that will confine fluid movement, or in the overlying upper Eau Claire Formation. In addition, a cross-formation pressure test was conducted at the nearby United States Steel Corporation Midwest Plant in 1987, which indicated that there was no communication between the injection interval through the arrestment interval and the confining zone.

5. Seismicity – The petitioner has submitted information demonstrating that Indiana is an area of very low seismic risk. Midwestern earthquakes are infrequent, generally of low magnitude, and have epicenters deep within the Precambrian granitic rocks far below the injection reservoir. There is virtually no possibility of damage to the ArcelorMittal well or leakage of waste from the injection zone as a result of seismic activity.

6. Geochemical Conditions (40 CFR § 148.21(b)(5)) – The petitioner must adequately characterize the injection and confining zone fluids and rock types to determine the waste stream's compatibility with these zones. The injection zone is composed mainly of permeable sandstone, with some sections of shale and arkosic sandstone, while the confining zone is composed of interfingering shales, fine- to medium-grained micaceous sandstones, and sandy dolomites. These rock types are generally resistant to alteration by fluids. Flow analyses of Mt. Simon core samples from the United States Steel WPL-2 well showed that the Mt. Simon has consistent permeability over a wide range of salinity. Tests of Mt. Simon core samples taken from a different location show that the Mt. Simon undergoes no changes in permeability or porosity that would reduce its ability to contain the waste. The formation brine in the injection zone has a neutral pH. The injected fluid is compatible with these conditions.

D. Wells in Area of Review - Under 40 CFR § 146.63, the AOR of Class I hazardous waste wells is a two-mile radius around the well bore or a larger area specified by EPA based on the calculated cone of influence of the well. The cone of influence is the area within which pressure in the injection interval can raise a column of formation fluid or injected fluid sufficiently to cause contamination of a USDW. Using extremely conservative assumptions, the maximum radius of the cone of influence for the ArcelorMittal injection well is less than four and a half miles from the well bore. To be more conservative ArcelorMittal used an AOR for the wells that extends five miles from the wells.

Under 40 CFR § 148.20(a)(2)(ii), a petitioner must locate, identify, and ascertain the condition of all wells within the injection well's AOR that penetrate the injection zone or the confining zone. ArcelorMittal conducted a well search over the AOR and found that there are five wells penetrating the top of the confining zone within this distance. Because these five wells are properly completed, plugged, or abandoned, a corrective action plan is not required under 40 CFR § 148.20(a)(2)(iii).

E. Quality Assurance and Quality Control (40 CFR § 148.21(a)) – ArcelorMittal has demonstrated that adequate quality assurance and quality control plans were followed in preparing the petition. Data collected prior to 1988 (before the requirements for the no-migration demonstration were promulgated) were collected in accordance with well-established industry standards, including those for quality control. Procedures for testing carried out since the requirements were promulgated were reviewed and given approval. ArcelorMittal followed an appropriate protocol for locating records for penetrations in the AOR, for collection and analyses of geologic and hydrogeologic data, for waste characterization, and for all tasks associated with the modeling demonstration.

III. No-Migration Demonstration

ArcelorMittal chose to demonstrate that waste injected at the facility will remain in the injection zone and will not migrate to a point of discharge or interface with an USDW for a period of at least 10,000 years. This demonstration was based on a showing that a geological model representative of the disposal reservoir and the overlying rock strata would contain the waste constituents within the disposal reservoir for a period of at least 10,000 years under the conditions of the simulation.

A. Model Development (40 CFR § 148.21(a)) – A conceptual model was developed using information developed from logs, core, and other testing carried out during drilling and operation of SPL #1, WAL #1 and WAL #2 and other injection wells inside and outside of the area of review. The site-specific information used in the model includes hydrogeologic properties of the various rock layers and formation brines, as well as characteristics of the injected fluid. Where site-specific information was not available or necessary, values from peer-reviewed literature or that have been reported in similar situations were used. Where parameters were uncertain, conservative values were chosen.

Some model parameters are uncertain within a range, yet are critical to the predictions of pressure build-up and waste migration. In accordance with 40 CFR § 148.21(a)(6), a range of values for these parameters was modeled in order to determine the sensitivity of the model to the uncertainties, and to predict the "worst-case scenarios." Sensitivity analyses were conducted using less-conservative input values for specific gravity, permeability, dispersivity, porosity, among others. This sensitivity testing indicated that the range of uncertainties does not cause significant differences in the predictions of pressure build-up and waste migration, and that input parameters that underestimate the ability of the injection zone to contain the waste still lead to acceptable predictions. The use of conservative assumptions and "worst-case scenario" parameters ensures that the no-migration demonstration is conservative.

The predictions of pressurization and the vertical and lateral movement of waste constituents were made using the DuPont suite of subsurface flow and pressure models. The suite includes five different computational routines for predicting the pressure build-up caused by injection, and the lateral and vertical movement of the injected waste. The purpose of the waste transport models is to predict the outer boundary in either the horizontal or vertical direction beyond which no waste will pass during the predicted time period.

B. Model Verification, Calibration, and Validation (40 CFR § 148.21(a)(3)) – The computer codes used in the DuPont models have been verified by comparing their results with those of analytic and numerical solutions published in literature. The model was calibrated[2] by incorporating historical data from pressure fall-off tests into the representation of the Mt. Simon layer in the DuPont multilayer operational pressure model. The measured average transmissibility indicated by historical pressure fall-off tests is 103,778 millidarcy-feet/centipoise for the entire Lower Mount Simon Sandstone injection interval. This value, together with values for interval thickness and porosity as determined from geophysical well logs and cores, and model boundary conditions, are inputs to the calibration model. The model is validated by repeated success in reproducing calculated flowing bottom hole pressures.

C. Model Predictions – Two simulated time periods were considered in the demonstration: a 58-year operational period and a 10,000-year post-operational period. The operational period included actual historical injection rates through December, 2005, and a projected maximum injection rate of 175 gpm (for SPL #1) and 300 gpm (for WAL #1 and 2 combined) for 22 additional years through December 31, 2027. The rate history, together with appropriate assumptions and methods of contaminant transport, determined the distance of waste migration in the year 2027, and the maximum pressure build up in the injection zone. The post-operational period was modeled to predict the maximum vertical and horizontal migration of the waste plumes after 10,000 years.

1. Pressure – Maximum pressure buildup, which occurs at the end of the operational period, was predicted by the DuPont Multilayer Pressure Model. The model incorporates multiple layers representing stratigraphic units at the well site. The model has conservative assumptions, such as neglecting compressive storage in aquitards, which would reduce pressure in the injection interval. The maximum predicted pressure increase is 772.6 pounds per square inch at the Waste Ammonia Liquor well sites and 572.4 pounds per square inch at the SPL well site.

2. Vertical Migration – The DuPont Vertical Permeation Short-Term Model predicted the extent of pressure-driven vertical movement during the operational period. The model incorporates multiple layers representing stratigraphic units at the well site. Conservative assumptions include a high value for the permeability of the shale immediately overlying the injection interval, equal density of formation brine and the waste stream, and elevated pressure at the top of the injection interval (as determined by the pressure model described above). The maximum predicted migration distance is 0.53 feet (for the SPL waste) and 0.8 feet (for the WAL waste) into the 554-foot thick arrestment interval.

ArcelorMittal used the DuPont Vertical Permeation Long-Term Model and the DuPont Molecular Diffusion Model to predict the extent of vertical movement of hazardous constituents during the 10,000-year post-operational period. A maximum contaminant concentration at the top of the injection interval was assumed. Because pressures relax in the post-operational period, vertical permeation is only slightly sensitive to the effects of pressure-driven permeation and anthropogenic activities (accounting for <0.9 feet of permeation). Molecular diffusion overwhelmingly accounts for contaminant transport at this time scale, and the predictions of

[2] The company compared modeled results with historical data to show that the model over predicts the pressure in the injection interval, thereby demonstrating that the model is conservative and adequately calibrated.

vertical permeation depend primarily on the effective diffusion coefficients of the contaminants in the types of rock formations represented in the model. With the conservative assumption that diffusion occurs freely in the more permeable layers, the maximum predicted vertical permeation for the waste ammonia liquor is 29 feet above the lower Mt. Simon Sandstone. The maximum predicted vertical permeation for the spent pickle liquor is 55 feet above the lower Mt. Simon Sandstone. Thus, both wastes streams will be contained well within the 554-foot arrestment interval (Figure 1).

3. Lateral Migration – Lateral migration of the waste plumes within the injection interval was modeled during both the 58-year operational period and the 10,000 year post-operational period. Several conservative assumptions were used to maximize the size of the waste plumes in order to present "worst case scenarios" of plume migration. The edge of the waste plume is defined as the horizontal distance from the wellbore at which the concentrations of both hazardous constituents (benzene and hydrogen ion) are at least 1,000 times less than their maximum concentrations at the well head. At this concentration ratio, the predicted outer edge of the plumes meets Health Based Limits even if the concentrations of hazardous constituents in the waste streams were much greater than historical values. In the model, the future injection rate is overestimated at 175 gpm for the spent pickle liquor well and 300 gpm for the waste ammonia liquor wells and the thickness of the injection interval was reduced to 270 feet. Dispersion caused by geologic heterogeneities and density differences between injectate and formation brine is incorporated by using a conservative multiplication factor, which results in an increase in the predicted lateral extent of the waste plumes. This factor was of 43.9 for spent pickle liquor and 24.2 for waste ammonia liquor. The multiplying factor acts as a scaling parameter that increases the injection rates input to the model by a constant factor. The increased lateral movement simulates the enhanced transport that would result from non-homogeneities in the formations.

ArcelorMittal used the DuPont Basic Plume Model to predict the maximum distance of lateral waste plume migration during the operational period. At the end of the projected 58-year operational period, the distance from the center of the plume to the edge (determined at the one part per thousand concentration ratio) is 14,140 feet from the waste ammonia liquor well and 11,315 feet from the spent pickle liquor well. Therefore, the plumes would be less than three miles from the well, which is within the AOR.

The DuPont 10,000-Year Waste Plume Model was used to simulate plume migration during the 10,000 year post-operational period. It considered movement caused by both density differences and the natural groundwater flow within the lower Mount Simon Sandstone, as well as hydrodynamic dispersion. Regional hydrogeologic studies of the lower Mount Simon Sandstone suggest that the rate of regional flow is less than 0.5 ft/year. A groundwater velocity of 0.5 ft/year was used in the 10,000-Year Waste Plume Model. The specific gravity of the waste ammonia liquor injectate averages 0.99. The specific gravity of the spent pickle liquor injectate averages 1.25 but for conservatism, the model was run as if it were 1.31. The specific gravity of the formation brine is 1.05. The density difference between the waste ammonia liquor and the formation brine and the formation dip of 25 feet per mile cause the injectate to "rise" (move up-dip) over time. Because the waste ammonia liquor will move up-dip, the down-dip regional groundwater flow was not included in the calculation. This maximizes the distance the waste ammonia liquor plume would travel. For the spent pickle liquor injectate, the density difference between the injectate and the formation fluid and the formation dip of 25 feet per mile cause the injectate to "sink" (move down-dip) as it flows beneath the formation brine. The dip and the regional groundwater flow are in the same direction, maximizing their effects on plume migration. Values for longitudinal and transverse dispersivities were calculated using published methods. Density and ground water movement and transport due to dispersion cause the outer edge of the waste ammonia liquor plume to migrate approximately 22,500 feet (4.26 miles) up-dip (west) from the wellbore. The additional distance due to diffusion of benzene (the most mobile constituent in the waste ammonia liquor plume) is 164 feet, for a total distance of 22,664 feet (4.29 miles). Advective and dispersive transport causes the outer edge of the spent pickle liquor plume to migrate approximately 31,000 feet (5.87 miles) from the wellbore. The additional distance due to diffusion of the hydrogen ion is 324 feet, for a total distance of 31,324 feet (5.93 miles). The operational and final plume boundaries are shown in Figure 2.

The nearest point of discharge into a USDW is more than 15 miles away from the facility. Therefore, ArcelorMittal has demonstrated that, to a reasonable degree of certainty, hazardous constituents will not migrate vertically out of the injection zone or laterally to a point of discharge in a 10,000 year period.

IV. Conditions of Petition Approval

This proposed reissuance of the land ban exemption for the continued injection of restricted hazardous waste is subject to the following conditions, which are necessary to assure compliance with the standard in 40 CFR § 148.20(a). Non-compliance with any of these conditions is grounds for termination of the exemption in accordance with 40 CFR § 148.24(a)(1). The facility must petition EPA for approval to change any of the following conditions. Petition modifications and reissuance should be made pursuant to 40 CFR § 148.20 (e) or (f).

1) All regulatory requirements in 40 CFR §§ 148.23 and 148.24 are incorporated by reference.

2) The exemption applies to the existing Spent Pickle Liquor #1, Waste Ammonia Liquor #1 and Waste Ammonia Liquor #2 injection wells, located at the ArcelorMittal facility at 250 West U.S. Highway 12, Burns Harbor, Indiana.

3) Injection is limited to that part of the Lower Mount Simon Sandstone at depths between 2734 and 4297 feet.

4) Only hazardous wastes denoted by the waste codes D010, D018, D038 and K062 may be injected. Other fluids necessary for well testing, stimulation, etc. may be injected when approved by EPA.

5) The chemical properties of the injectate that will be monitored are limited according to the table below:

Chemical constituent or property	Concentration Limitation at the well head (mg/L)
Benzene	220 (maximum)
pH	Minimum pH is zero
Chromium	133 (maximum)
Naphthalene	260 (maximum)
Nickel	50 (maximum)
Phenol	3780 (maximum)
Pyridine	116 (maximum)
Selenium	5 (maximum)

6) The chemical properties of the injectate that defined the edge of the plume in the demonstration are benzene for waste ammonia liquor and pH for the spent pickle liquor.

7) The volume of wastes injected in any month through the wells must not exceed 92,043,000 gal (for Spent Pickel Liquor #1) and 157,788,000 gal (for Waste Ammonia Liquor #1 and Waste Ammonia Liquor #2 combined).

8) This exemption is approved for the 21-year modeled injection period, which ends on December 31, 2027. ArcelorMittal may petition EPA for a reissuance of the exemption beyond that date, provided that a new and complete no-migration petition is received at EPA, Region 5, by July 1, 2027.

9) ArcelorMittal shall submit monthly reports to EPA containing a fluid analysis of the injected wastes which shall include the chemical and physical properties upon which the no-migration demonstration was based, including the physical and chemical properties listed in Conditions 5 and 6 of this exemption approval.

10) ArcelorMittal shall submit a report containing the results of a bottom hole pressure survey (fall-off test) performed on Spent Pickle Liquor No. 1, Waste Ammonia Liquor #1 or Waste Ammonia Liquor #2 to EPA annually. The survey shall be performed after shutting in the well for a period of time sufficient to allow the pressure in the injection interval to reach equilibrium, in accordance with 40 CFR § 146.68(e)(1). The annual report shall include a comparison of reservoir parameters determined from the fall-off test with parameters used in the approved no-migration petition.

11) The petitioner shall fully comply with all requirements set forth in Underground Injection Control Permits IN-127-1W-0001, IN-127-1W-0003, and IN-127-1W-0004 issued by the EPA; and

12) Whenever EPA determines that the basis for approval of a petition may no longer be valid, EPA may terminate this exemption and require a new demonstration in accordance with 40 CFR § 148.24.

Date: The EPA, Region 5, Chicago office, requests public comments on today's proposed decision. Comments will be accepted until November 30, 2009. Comments postmarked after the close of the comment period will be stamped **"Late"**. Late comments do not have standing and will not be considered in the decision process. To request an informational meeting or a public hearing on this proposal, submit your request in writing on or before November 2, 2009 stating the issues to be raised.

Addresses: Submit written comments and hearing requests by mail to:

Rebecca L Harvey, UIC Branch Chief
United States Environmental Protection Agency, Region 5,
Underground Injection Control Branch (WU-16J)
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Comments may be submitted by email to harvey.rebecca@epa.gov.

For Further Information: Contact William Bates, Lead Petition Reviewer, at the above address, by telephone at (312) 886-6110 or toll-free at (800) 621-8431 or by email at bates.william@epa.gov.

Generalized Well Schematic with a Stratigraphic Column

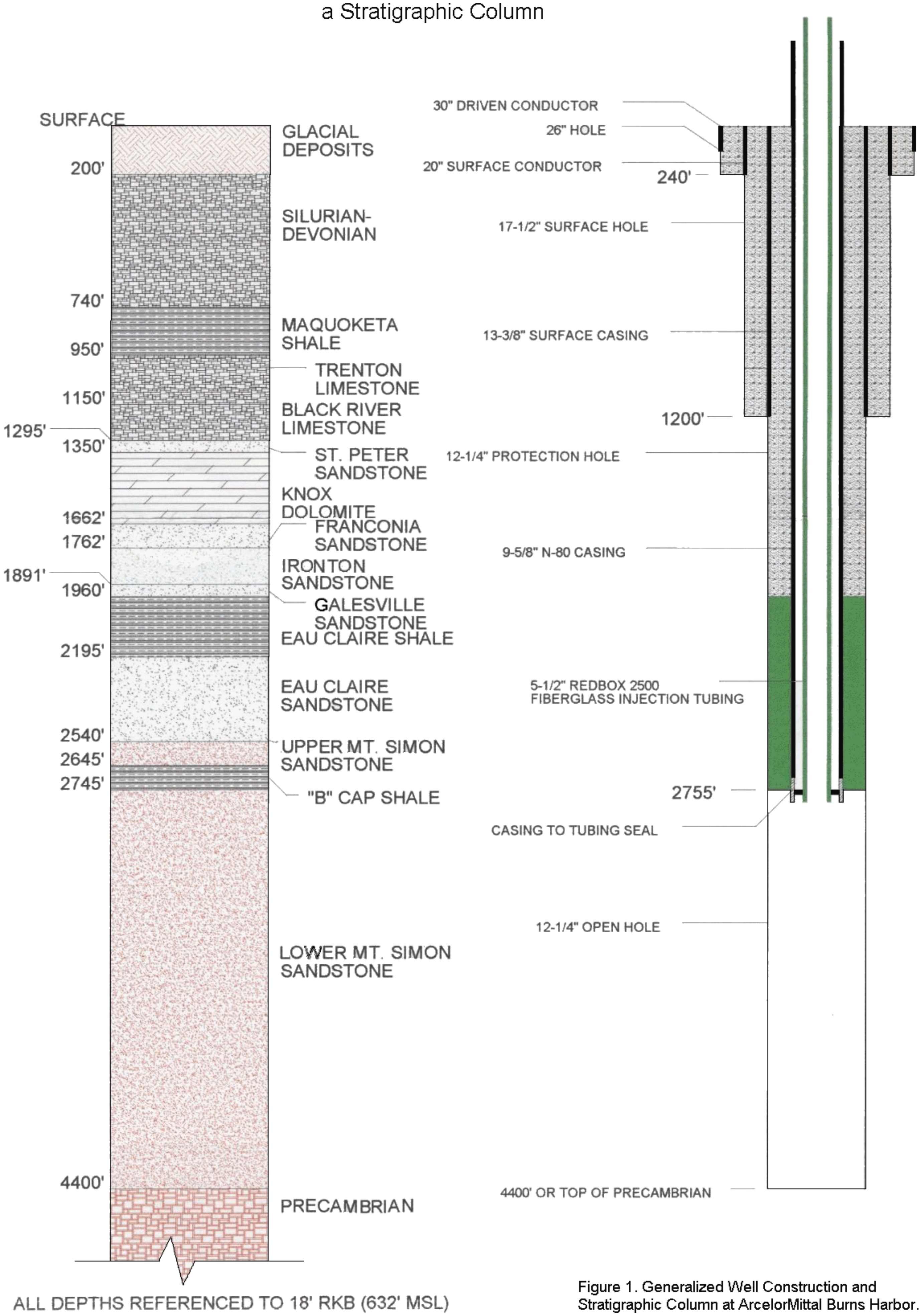

Figure 1. Generalized Well Construction and Stratigraphic Column at ArcelorMittal Burns Harbor.

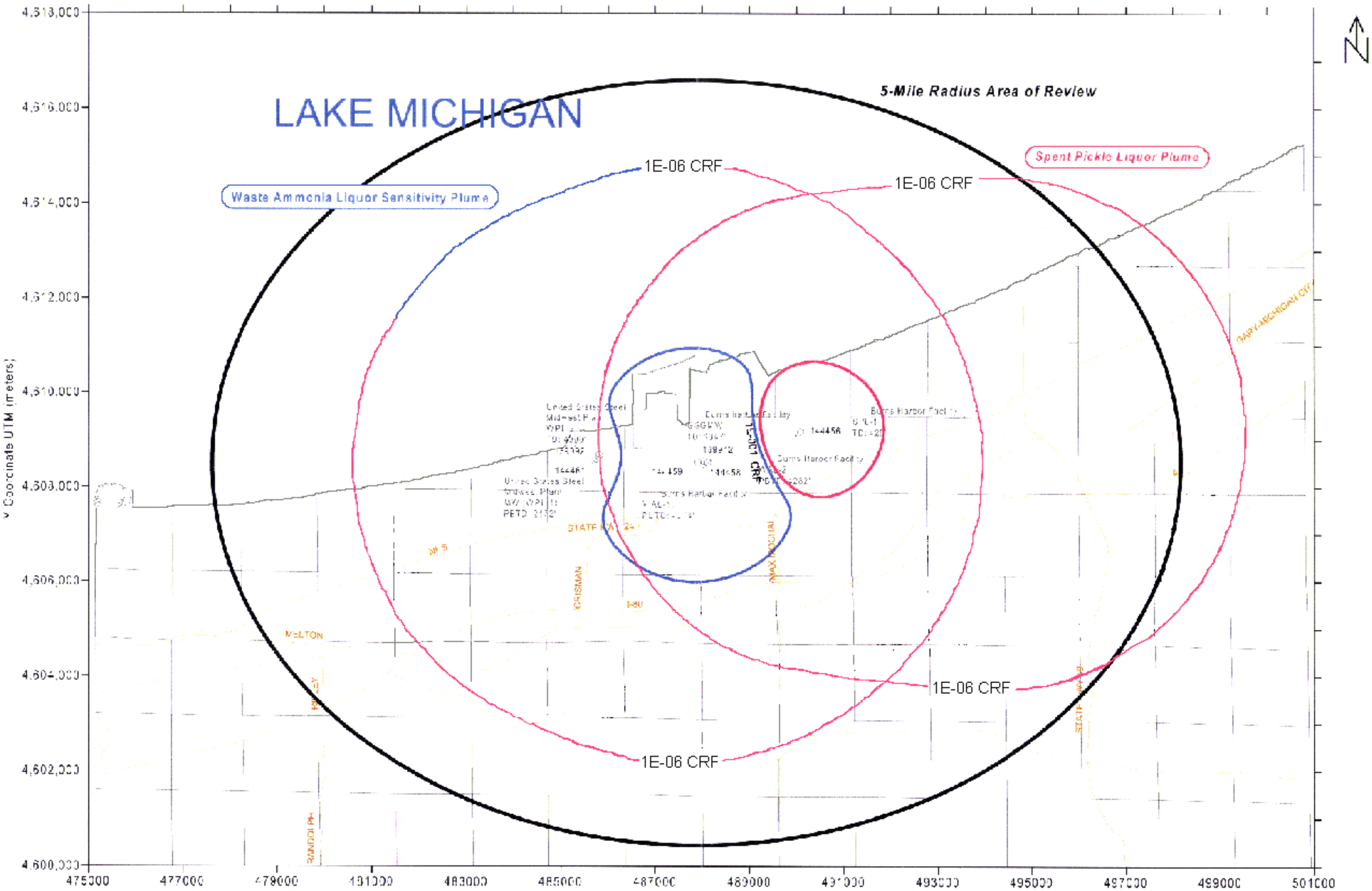

Figure 2. Composite Long-term DuPont 10,000Year Waste Plume Model for the Low-Specific Gravity Waste Ammonia Liquor Plume and High-Specific Gravity Spent Pickle Liquor Plume.
(Modified From Figure 3-63 of the No-migration Petition)