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Notice Proposing the Granting of an Exemption to Midwest Division of National Steel Corporation for the Continued Injection of Hazardous Waste Subject to the Land Disposal Restrictions of the Hazardous and Solid Waste Amendments of 1984 (HSWA)

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of Intent to Grant an Exemption to the Midwest Division of National Steel Corporation of Portage. Indiana for the Continued Injection of Waste Pickle Liquor.

SUMMARY: The Environmental Protection Agency (EPA or Agency) today is proposing to grant an exemption from the ban on disposal of hazardous wastes through injection wells to the Midwest Division of National Steel Corporation ("Midwesn.ofPortage.1ndiana. Midwest may continue to inject Resource Conservation and Recovery Act (RCRA) regulated hazardous waste Code K062 (Waste Pickle Liquor) in its Well No. 2. if the exemption is granted. Midwest submitted a petition to the EPA under 40 CFR part 148. which allows any person to petition the Administrator to determine whether its continued injection of certain hazardous wastes is protective of human health and the environment. After a comprehensive review, the EPA has determined that there is a reasonable degree of certainty that Midwest's injected waste will not migrate out of the injection zone over the next 10.000 years.

DATE: The EPA is requesting public comments on today's proposed decision. Comments will be accepted until February 26, 1990. Comments received after the close of the comment period will be stamped "Late". A public hearing will be scheduled for this proposed action and notice will be given in a local paper and to all people on a mailing list developed by the Underground Injection Control (UlC) program. If you wish to be notified of the date and location of the public hearing. please contact the person listed below.

ADDRESS: Submit written comments, by mail to: United States Environmental Protection Agency Region V. Underground Injection Control Section (5WD-TUB-9), 230 South Dearborn Street. Chicago. Illinois 60604. Attn: Edward P. Watters. Chief.

FOR FURTHER INFORMATION CONTACT:

Dr. Leah A. Haworth. Lead Petition Reviewer UIC Section, Water Division, Office Telephone Number: (312) 886--6556.

SUPPLEMENTARY INFORMATION:

I. Background

A. Authority

The Hazardous and Solid Waste Amendments of 1984 (HSWA), enacted on November 8, 1984, impose substantial new responsibilities on those who handle hazardous waste. The amendments prohibit the continued land disposal of untreated hazardous waste beyond specified dates, unless the Administrator determines that the prohibition is not required in order to protect human health and the environment for as long as the waste remains hazardous {Section 3004(d)(1), (e)(l), (f)(2), (g)(5) of RCRA). The statute specifically defined land disposal to include any placement of hazardous waste in an injection well (Section 3004(k) of RCRA). After the effective date of prohibition, hazardous waste can only be injected under two circumstances:

(1) When the waste has been treated in accordance with the requirements of 40 CPR part 268 pursuant to action 3004(m) of RCRA. (the EPA has adopted the same treatment standards for injected wastes in 40 CPR part 148. subpart B); or

(2) When the owner/operator has demonstrated that there will be no migration

of hazardous constituents from the injection zone for as long as the waste remains hazardous. Applicants seeking an exemption from the ban must demonstrate either:

(a) That the waste undergoes a chemical transformation so as to no longer pose a threat to human health and the environment; or

(b) That fluid flow is such that injected fluids would not migrate vertically upward out of the injection zone or to a point of discharge in a period of 10.000 years by use of mathematical models (40 CFR 148.20(a)).

EPA promulgated final regulations on July 26, 1988, (53 PR 28118) which govern the submission of petitions for exemption from the injection prohibition (40 CPR part 148). The preamble discussed the justification for basing determinations on 10,000 years. The 10,000 year demonstration strikes an appropriate balance between the need to demonstrate "no migration" with a reasonable degree of certainty and the limits of the technological means of making that demonstration. The Agency's standard does not imply that leakage will occur at some time after 10.000 years; rather, it is a showing that leakage will not occur in that time frame.

C. Facility Operation and Process

The Midwest facility in Portage, Indiana, (See Figure 1) is a steel finishing plant which produces finished steel for industrial uses. The facility generates one liquid hazardous waste. Waste Pickle Liquor, which is produced as a by-product of steel pickling operations. This waste is injected into one on-site Class I hazardous waste injection well. Well No.2, completed in the lower Mt. Simon Sandstone. Between 1965 and 1980, Midwest injected approximately 400 million gallons of waste pickle liquor into Well No.1 which was completed in the lower Eau Claire Formation and the Mt. Simon Sandstone. In 1980, the upper injection interval was closed off and this well was recompleted to allow injection only into the lower Mt. Simon. In 1987, the current injection well was drilled and completed. At the same time, Well No.1 was plugged back to the Galesville Sandstone, the first aquifer above the confining zone, and converted to a monitoring well. The Galesville Sandstone has been monitored weekly for changes in water level (an indicator of pressure change) and sampled for water quality intermittently. Improvements in construction and operational improvements for this monitoring well are included in a new Groundwater Monitoring Plan, which was submitted by Midwest in support of the petition demonstration. These improvements include, but are not limited to, enhanced testing for mechanical integrity and quarterly water quality sampling. Compliance with the new Groundwater Monitoring Plan is a condition of this proposed petition decision.

C. Waste Minimization

RCRA emphasizes the preeminence of waste minimization through source reduction and recycling as a strategy for managing solid waste. Midwest has recently implemented three process changes which reduce waste. The steel pickling lines were converted from sulfuric to hydrochloric acid, and concurrent operational changes added a cascade system with counter-current flow and a system of indirect heating through heat exchangers. These changes have substantially reduced the volume of Waste Pickle Liquor produced at Midwest. During the months preceding December, 1989, Waste Pickle Liquor was produced and injected at a rate of approximately 2 million gallons per month. During December, 1989, the first month after the process changes, 140,000 gallons of waste was produced and injected. As the system equilibrates, further reductions in waste production and injection rate are expected.

D. Submission

On August 8, 1988, Midwest submitted a petition for exemption from the land disposal restrictions' on hazardous waste injection under the HSWA Amendments to RCRA pursuant to the regulations set forth at 40 CPR Part 148. This submission was reviewed and revision documents are dated May 19, 1989, July 25,1989, August 4, 1989, and November 29, 1989. Several supplemental submissions were made during this period and thereafter to resolve minor deficiencies. The total submission was reviewed by staff at the EPA and the initial submission was evaluated by consultants hired by the Agency to assist in its review.

II. Basis for Determination

A. Waste Description and Analysis

The waste being injected is Waste Pickle Liquor and is defined under 40 CFR part 261 as Waste Code K062. This waste is listed as a hazardous waste because it is corrosive (i.e. , it has a pH less than or equal to 2.0) and because it contains a toxic concentration of chromium (i.e., above 0.32 mg/l). The injected waste at Midwest has an average pH of less than 1.0 and an average chromium content of approximately 15 mg/1.

B. Well Construction and Operation

The Midwest injection well was constructed in 1987 with three strings of casing (See Figure 2). Each string is cemented to the surface. Injection takes place through tubing set on a packer and waste within the injection tubing is isolated from the casing by a fluid-filled annulus which is continuously monitored. The monitoring system is designed to trigger alarms and warn an operator to shut off injection if the injection or annulus pressure exceeds the maximum permitted levels, or if the annulus pressure falls below the minimum permitted level. Midwest was issued Proposed Administrative Order #UlC-A0-88-15 from the EPA for failure to maintain the required minimum annulus pressure on various days during the period November, 1987, to February, 1988. Some of this failure could be attributed to the fact that the new well was still undergoing final adjustments. Since February, 1988, the required pressure has been maintained. During 1989, Midwest experienced recurring leaks in the annulus system of the injection well, although the mechanical integrity of the well was not compromised and no waste was released. The injection tubing, annulus pump, and above-ground fittings were replaced in order to solve this problem. This work was completed in November, 1989.

Injection pressure at Midwest is limited to 700 pounds per square inch gauge (psig) at the surface, which is below the value yielded by the equation in 40 CPR 147.1153. This equation is designed to be conservative and to assure that the injection pressure provides insufficient energy to initiate or propagate fractions in the injection zone. Midwest has never exceeded the permitted injection pressure. Average injection pressure during the past two years has been 0 psig. Although the well is designed for a maximum injection rate of 84 gallons per minute (gpm), the historical average is approximately 50 gpm. The recent waste minimization efforts have further reduced the average flow rate to approximately 4 gpm.

C. *Mechanical1ntegrity Test 1nformation*

To assure that the waste does not leak prior to reaching the injection zone, Mechanical Integrity Tests (MITs) of the well are required. Section 148.20(a)(2)(iv) requires submission of satisfactory MITs performed within one year of petition submission, including Radioactive Tracer Survey results. The Midwest injection well passed its annual MITs in 1987 and 1988, and was most recently tested in November of 1989, following the installation of the new injection tubing. The Standard Pressure Test as described in 40 CFR 146.8, a Radioactive Tracer Survey, a Casing Inspection Log and an Oxygen Activation Log were performed. Results of these tests demonstrated that the well has mechanical integrity and confirmed the positive results recorded on continuous monitoring equipment. Test results and monitoring reports for this well are part of the Administrative Record for Midwest's injection permit on file at the EPA. From both a construction and operation standpoint, the Midwest injection well ensures, with a reasonable degree of certainty, transmission of the injected fluid-to the injection zone without leakage.

D. Site Description

As part of the "no migration" demonstration under part 148, subpart. C, any Class I hazardous waste injection well must identify the strata within the injection zone which will confine fluid movement above the injection interval and the strata which act as a confining zone. In evaluating the confinement properties of these strata and the geologic suitability of the site for hazardous waste injection, the Agency used the standards set forth in 40 CFR part 146.

1. Regional Geology

The Midwest facility lies on the northern flank of the Kankakee Arch, a structural high that separates the Michigan Basin to the northeast from the Illinois Basin to the southwest. At the site, glacial deposits overlie approximately 4000 feet of sedimentary rocks (e.g., sandstones, carbonates, and shales) which dip gently southeastward at 5 to 7 feet per mile. These units, in turn, overlie granitic basement rocks. The injection and confining zones for the Midwest injection well are at the bottom of the sedimentary sequence. The lowermost underground source of drinking water, or USDW (defined as less than 10,000 mg/l total dissolved solids), beneath the Midwest site, is located 720 feet below the surface. Approximately 1740 feet of alternating permeable and less permeable rock layers separate the lowermost USDW and the injection zone at the Midwest site and provide for secondary confinement and pressure reduction.

A review of the geologic literature demonstrates that all known faults are more than 30 miles distant from the Midwest facility. In terms of seismicity, the region generally is stable. Only non-damaging, small intensity seismic events have been recorded within a 75 mile radius of the site. Higher intensity events which might damage the mechanical integrity of the well or confining zone are extremely unlikely in this area. The recorded earthquake closest to the Midwest facility occurred in 1938; its epicenter was 9 miles east southeast of the Midwest site and it had a magnitude of 4.2 on the Richter scale. The highest magnitude seismic event (4.7 on the Richter scale) recorded within 75 miles of this site occurred in 1912, 70 miles to the west. Should an earthquake of similar magnitude occur closer to Midwest in the future, it would not be expected to cause structural damage to the injection well or a release of waste from the injection zone.

The potential for earthquakes induced by injection is low due to the absence of faults at the site. A pressure study showed that even if unknown faults existed beneath the Midwest site, the critical pressure required to cause slippage is more than the conservatively estimated maximum pressure buildup due to injection. In addition, local seismic networks, which are capable of detecting small intensity earthquakes, provide no indication of seismic activity induced by injection in this area. An existing seismic network, operated by the University of Michigan, includes stations sensitive enough to detect an earthquake near the Midwest site of magnitude 2.0 on the Richter scale, or greater.

2. Injection Zone Description

The injection zone must have sufficient permeability, porosity, thickness and areal extent to prevent migration of hazardous fluids out of this zone. The injection zone at Midwest consists of the entire thickness (1788 feet) of the Mt. Simon Sandstone at a depth of 2460 to 4248 feet below surface (Figure 2). This formation extends over much of the midwestern United States and reaches the surface approximately 200 miles away, in Wisconsin. At the Midwest site, the Mt. Simon Sandstone is laterally extensive and undisturbed by faults or significant fractures, as documented by a suite of openhole logs, including a Microscanner Log, cores, and geologic literature. In northwestern Indiana, the Mt. Simon Sandstone is divided into an upper and a lower unit, each of which is capped by shale-rich strata. These shale-rich strata are also laterally extensive and have been correlated on geophysical logs in a 15 mile area surrounding Midwest.

At Midwest, the injection interval, or the interval into which waste is directly emplaced, is the lower Mt. Simon Sandstone, located at depth of 2700 to 4248 feet below ground surface, with a thickness of 1548 feet. Analysis of well logs and cores from the Midwest site shows that the main rock unit through this interval is a moderately well sorted, fine-grained to medium-grained sandstone with minor siltstone, dolomite and gypsum.[1] Both the permeability and porosity of the injection interval are suitable for waste injection. The major constituents of the injection interval are resistant to chemical degradation by the waste, and little, if any, compatibility problems are expected.

The upper injection zone, or "containment interval", includes the shale-rich strata immediately above the injection interval known as the "B" Cap, and the upper Mt. Simon Sandstone. This "containment interval" is located at a depth of 2460 to 2700 feet below ground surface and has a total thickness of 240 feet (Figure 2). The "B" Cap acts as the first barrier to the vertical flow of injected waste. Well logs and on-site core data indicate that the "B" Cap consists of thinly interbedded shales, siltstones and silty sandstones, and has a thickness of 56 feet, Confidential whole-core tests of the "B" Cap report very low permeability to waste acids and low porosity, which will substantially inhibit the movement of waste through this unit. The upper Mt. Simon Sandstone is a 184 foot thick, moderately well-sorted sandstone with minor siltstone and dolomite. It has average permeability and porosity. The upper 26 feet of the Mt. Simon Sandstone contain thinly interbedded siltstones referred to as the Mt. Simon "Cap". Confidential core analyses of this unit report low porosity and very low permeability to waste acids. Because such characteristics inhibit fluid flow, the Mt. Simon "Cap" would serve as a secondary barrier to vertical flow of injected waste if flow breached underlying units.

3. Confining Zone Description

The confining zone must be (1) laterally continuous, (2) free of transecting, transmissive faults and 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 for the Midwest injection operation if the Eau Claire Formation, which is laterally extensive and free of

[1] The detailed core analyses for the injection and confining zones, including porosity and whole-core tests of permeability to waste acids. are not par! of the Administrative Record available for public comment because they were accorded Confidentia1 Business Information status on March 28.,1988.

transmissive faults and fractures throughout the: area of review, as documented by correlation of geophysical logs, a borehole Microscanner Log, and geologic literature. At Midwest, it is located at a depth below ground surface between 1934 and 2460 feet and has a thickness of 526 feet (Figure 2). Net shale thickness of the confining zone is at least 200 feet. It is separated from the lowermost USDW by more than 1200 feet of alternating permeable and less permeable strata.

Like the Mt. Simon Sandstone, the Eau Claire Formation is divided into an upper and lower unit. Well logs and confidential core data for both units show that the 290 foot thick lower Eau Claire Formation is a dolomitic sandstone with a few thin siltstone interbeds. Overall, it has moderate porosity and permeability. Any increase in permeability of this unit due to contact with acidic waste would lead to lateral dispersal of waste and pressure reduction. The 236foot thick upper Eau Claire Formation is composed of interbedded fine-grained sandstones, siltstones and shales. Confidential core data demonstrate very low permeability to waste acid at this site. The upper Eau Claire Formation would serve as the major hydraulic barrier to vertical movement of injected waste, if it escaped the injection zone. Its location above the lower Eau Claire strata, with their pressure reduction characteristics, enhances the upper Eau Claire's adequacy as a confining unit.

Based on a review of on available information, the Agency has concluded that the Eau Claire Formation is an adequate confining zone for Midwest's injection operation. Midwest's monitoring well, completed in the first aquifer above the confining zone, provides assurance that a breach of the confining zone would be detected. Data from the monitoring well support the Agency's judgment that confinement is adequate at Midwest. Water level measurements (an indicator of pressure change) and water quality sampling have indicated no breach of the confining zone. The 1200 foot thick zone which separates the confining zone from the lowermost USDW provides additional assurance that contaminants would not reach drinking water sources.

4. Area of Review

The Area of Review (AOR) is the area within which the petitioner must identify all wells which penetrate the confining zone and demonstrate that they have been properly completed or plugged. For the Midwest facility, the EPA has designated the area shown on Figure 1. extending 8.8 miles east, and 6 miles north. south, and west of the injection well. This. area is based on a cone-of-influence calculation and a lateral pressure model which show that, within this area, the pressure buildup caused by injection would be sufficient to drive fluids into a USDW. The lateral pressure model conservatively assumed that future injection would occur at maximum permitted rates and that the top of the injection interval was impermeable. There are three wells within the AOR which penetrate the confining zone. Each of these is an injection well operating under a permit from the EPA. Accordingly no corrective action under 40 CFR 146.64 is required for this facility.

E. Model Demonstration of No Migration

The demonstration of no migration of hazardous constituents from the injection zone at Midwest involves the use of a family of predictive mathematical models known as SWIFT II (Sandia Waste-Isolation Flow and Transport Model}. This family of models is used to predict the buildup of pressure and the vertical transport of waste from the injection well. Lateral transport of waste is modeled using volumetric and analytical methods. The SWIFT numerical code has been widely used and extensively verified, as reported in various federal publications. The long history of development and the successful use of SWIFT for sites similar to Midwest provide confidence that the model is appropriate for use at this site.

1. Model Calibration

The first step in the modeling was a calibration exercise designed to refine estimates of hydrogeologic parameter values far the lower Mt. Simon Sandstone. For this analysis, it was assumed that the lower Mt. Simon Sandstone was laterally infinite, and units above and below were impermeable. The calibration exercise reproduced the pressure response to a pressure falloff test run September 18, 1987, on the injection well, which indicates that the parameter values, taken as a group, adequately represent the injection interval. The parameter values for the lower Mt. Simon Sandstone included a permeability-thickness product of 4872 millidarcyfeet. a porosity of 0.15 and a skin factor of 0.4. These estimates are realistic. Reasonably conservative values were chosen for all other parameters used to model injection-induced pressure and waste transport: details of this are discussed below.

2. Model Predictions

Two simulation time periods were considered in the demonstration: an historical and 20-year future operational period and a 10,000 year post-operational period. The pressure buildup analysis considered injection into the Mt. Simon Sandstone and included five layers: lower Mt. Simon Sandstone, "B" Cap, upper Mt. Simon Sandstone, Mt. Simon "Cap'" and lower Eau Claire Formation. The bottom of the Mt. Simon Sandstone and the bottom of the upper Eau Claire Formation were assumed to be impermeable to fluid flow. These are realistic assumptions.

Far the operational period, a continuous injection rate of 250 gpm, a waste specific gravity of 1.3, a waste viscosity of 10 centipoise (cp), and a vertical permeability for the "B" Cap of 10^{-5} md, were used to predict vertical pressure buildup in the injection zone. The first three values conservatively exceed actual conditions; the last is realistic. The actual historical average injection rate is approximately 50 gpm, the actual waste specific gravity is 1.18 and actual viscosity is 3.5 cp. The actual current injection rate averages 4 gpm, and this rate is expected to continue or decline in the future. Thus, the model will over-predict pressure buildup. Modeling predicted that at the end of the 20-year future operational period, the maximum pressure buildup at the well bore would be 940 psi including pressure increments from nearby injection wells. The modeled pressure buildup is greatest near the injection wells and declines to near 0 psi at a distance of approximately 12 miles. If injection is maintained at or less than the present rate, as expected, then this distance, and the maximum pressure buildup, will be much smaller.

The predicted pressure buildup at the end of the operational period was used as a basis for modeling the vertical migration of waste. Sensitivity analyses using Theis solutions for pressurization and Darcy's Law for vertical waste transport were also included in the demonstration. Vertical transport at Midwest is most sensitive to injection rate and "B" Cap permeability. Based on an injection rate of 180 gpm and a permeability of 1.12×10^{-2} md,. waste movement due to pressure driven flow and hydrodynamic dispersion during the operational period is estimated at less than 56 feet. More realistic parameter values result in a shorter distance. The 56 foot estimate is reasonably conservative and over-predicts waste transport because (1) it is based on an injection rate of 180 gpm, whereas the actual injection rate is 4 gpm, and (2) a final-to-original concentration ratio of 10^{-6}.was used to define the edge of the waste plume, whereas a concentration ratio of 2×10^{-4} marks the boundary where constituent concentrations are below health-based limits (5 ppb for Chromium).

For a short period of time following the cessation of injection, transport due to advection and mechanical dispersion will continue and may produce an estimated additional 3 feet of vertical waste movement. However, during the remainder of the post-operational period, molecular diffusion is the primary transport mechanism for the vertical migration of waste. Geologic literature and log analysis were used to determine a reasonably conservative tortuosity of 0.15 and coefficient of molecular diffusion of 2×10^{-9} square meters per second. Based on these values, and a final-to-original concentration ratio of 10^{-4} the maximum vertical transport of the waste front during a 10.000 year post-operational period is 170 feet. At this distance, the concentration of all hazardous constituents will be at least five times less than health-based limits. Therefore, the total vertical migration at the Midwest site will be less than 230 feet above the permitted injection interval. Waste will be contained within the 56 foot thick "B" Cap during the operational period and within the 184 foot thick upper Mt. Simon Sandstone during the 10,000 year post-operational period. Therefore, the waste will be contained vertically within the Mt. Simon Sandstone. which is the permitted injection zone.

The distance of lateral migration of waste during the operational period was calculated by accounting for volumetric displacement due to the injected waste. The waste plume is assumed to migrate laterally within a 313 foot thick interval having a porosity of 0.15 and a sweep efficiency of 18 percent. The effective thickness and porosity are determined from Radioactive Tracer Surveys on the Midwest well and other neighboring wells and from core and log analysis. Both estimates are realistic. The sweep efficiency is a conservative estimate imposed for the sensitivity analysis; it accounts for geologic heterogeneity and uncertainty in effective thickness. Model results indicate that the waste will migrate laterally approximately 2300 feet from the well during the 20-year operational period. Hydrodynamic dispersion may conservatively be expected to increase the distance to the waste plume boundary (based on a concentration ratio of 10^{-6}) to 3300 feet.

During the 10,000-year post-operational period, the waste plume will migrate due to the natural flow of groundwater in the Mt. Simon Sandstone and hydrodynamic dispersion. A groundwater flow velocity in the lower Mt. Simon Sandstone of 0.5 feet per year, based on maximum published literature estimates, would result in an additional drift of the waste plume of 5000 feet in 10,000 years. Hydrodynamic dispersion during the post-operational period may result in an additional migration of 2200 feet. This is based on a dispersivity of 160 feet and a diffusion coefficient of 2×10^{-9} square meters per second (both determined from published literature values), and a waste plume boundary concentration ratio of 10^{-6}. At this waste plume boundary, all hazardous constituents will be well below health-based limits and the waste will also not have hazardous characteristics such as corrosivity. Therefore, using reasonably conservative values, the maximum predicted lateral migration of waste at the Midwest site is 10,500 feet, or less than 2 miles, in 10,000 years. This range is well within the Area of Review of 6 to 8.8 miles, as shown in Figure 2.

Therefore, Midwest has demonstrated, to a reasonable degree of certainty, that hazardous constituents will not migrate vertically more than 230 feet nor laterally more than 10,500 feet, in a 10,000 year period. Hazardous constituents will not migrate vertically out of the injection zone nor laterally to a point of discharge within this time period.

F. Quality Assurance and Quality Control

Midwest and its consultants have demonstrated that adequate quality assurance and quality control plans were followed in preparing the petition. Midwest has followed appropriate protocol for locating records for penetrations in the Area of Review, for collection and analyses of geologic and hydrogeologic data, for waste characterization, and for all tasks associated with the modeling demonstration.

III. Conditions of Petition Approval

As a condition of granting this proposed exemption from the ban on injection of waste pickle liquor (K062), the EPA requires that the following conditions be met by Midwest:

(1) The monthly average injection rate must not exceed 80 gallons per minute, consistent with well design capacity;

(2) Injection shall occur only into the lower Mt. Simon Sandstone below the "B" Cap shales; and

(3) The existing monitoring well construction and monitoring procedures must be modified to include:

(a) Installation of tubing and a packer in the monitoring well, or installation of a system which i) provides equivalent mechanical integrity protection and equivalent quality assurance for fluid sampling and ii) is approved by the Agency;

(b) Demonstration of mechanical integrity by a Standard Pressure Test at least once every twelfth month if tubing and packer are installed, or prior to each sampling event, if an equivalent system is installed; and

(c) Testing of water quality samples for i) each of the constituents and characteristics listed for monthly waste stream analysis in Midwest's Waste Analysis Plan, which is found in the Administrative Record for this proposed decision, and ii) Chloride, Calcium, Total Hardness, Total Nitrogen, and Sulfide, to be consistent with previous sampling.

Other necessary modifications are specified in the petitioner's Ground Water Monitoring Plan, which is part of the Administrative Record for this proposed decision. The modifications must be completed for a final exemption to be effective.

Dated: January 9, 1990

Charles H. Sutfin.

Director. Water Division. Region V. U.S. Environmental Protection Agency.

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