S.C. Department of Health and Environmental Control

Proposed Plan for Site Remediation
Former Ingersoll Rand
Honea Path Plant (HPP)

415 Brick Mill Road Honea Path, South Carolina

October 2020

ANNOUNCEMENT OF PROPOSED PLAN

The South Carolina Department of Health and Environmental Control (DHEC or the Department) has completed an evaluation of cleanup alternatives to address source area contamination at the former Ingersoll Rand facility (the Site) and optimizing the active groundwater pump and treat system. This Proposed Plan identifies DHEC's Preferred Alternative for cleaning up the contaminated area and provides the reasoning for this preference. In addition, this Proposed Plan includes summaries of the other cleanup alternatives evaluated. These alternatives were identified based on information gathered during environmental investigations conducted at the Site since 1990.

The Department is presenting this Proposed Plan to inform the public of our activities conducted at the Site, gain public input, and fulfill the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (National Contingency Plan or NCP). This Proposed Plan summarizes information that can be found in greater detail in the Source Area Focused Feasibility Study (July 2019) and other documents contained in the Administrative Record file. The Department encourages the public to review these documents to gain an understanding of the Site and the activities that have been completed.

The Department will select a final cleanup remedy after reviewing and considering comments submitted during the public comment period. The Department may modify the Preferred Alternative or select another response action presented in this Proposed Plan based on new information or public comments. Therefore, the public is encouraged to review and comment on all the alternatives presented in this Proposed Plan.

DHEC's Preferred Cleanup Summary
Alternative 3: Release for Unrestricted Use

DHEC's preferred remedial option includes:

- Soil Vapor Extraction in the soil source area;
- Optimized Pump and Treat for groundwater

❑ PUBLIC PARTICIPATION:

DHEC has provided a presentation online of the Proposed Plan online at:

http://www.dhec.sc.gov/IngersollRand

If requested by the public, DHEC will hold a meeting to explain the Proposed Plan and all the alternatives presented in the Remedial Alternatives Evaluation.

❑ PUBLIC COMMENT PERIOD:

October 2, 2020 through November 20, 2020

DHEC will accept written comments on the Proposed Plan during the public comment period. Please submit your written comments to:

Jan Trent, Project Manager
SC DHEC Bureau of Land & Waste Management
2600 Bull Street
Columbia, SC 29201
trentjc@dhec.sc.gov

❑ FOR MORE INFORMATION:

Call: Jan Trent, Project Manager, 803-898-0723

See: DHEC's website at:
http://www.dhec.sc.gov/IngersollRand

View: The Administrative Record is available online on the DHEC website above or through the DHEC Freedom of Information Office:

DHEC Freedom of Information Office
2600 Bull Street, Columbia, SC
(803) 898-3817
Monday - Friday: 8:30 am - 5:00 pm

The Honea Path Plant (HPP) is located on approximately 466 acres in a semi-rural area typically composed of woods and farm land at 415 Brick Mill Road, Honea Path, South Carolina.

The facility consists of a main manufacturing building, a smaller storage building to the rear of the plant, and a small wastewater treatment plant located northeast of the main plant building. Topographic features include the gullies and intermittent drainage features located on the northeastern, northern, and northwestern property boundaries.

HPP was originally owned and operated as part of Torrington. Torrington operated from 1970 to 2003. In February 2003, Ingersoll Rand sold Torrington to Timken Company, and Torrington was renamed Timken US Corporation, which was subsequently renamed Timken US LLC.

The Torrington Company manufactured steering components, universal joint assembles, and other specialty metal components at the facility from 1970 to 2003. Process wastewater was generated from metal cleaning operations. The process wastewater was treated in a pretreatment facility prior to discharge to the Town of Honea Path Chiquola Creek Treatment Plant. Prior to the construction of the pretreatment facility in 1989, process wastewaters were treated in three grit chambers and three oxidation/equalization ponds at the facility prior to discharge to Broad Mouth Creek, under National Pollutant Discharge Elimination System (NPDES) Permit. This treatment system was operated from approximately 1970 to December 1989.

Two former trichloroethene (TCE) aboveground storage tanks (ASTs) were used at the facility. The original TCE AST was located near the northern corner of the main plant building adjacent to a former methanol AST along the back-fence line. The TCE and methanol ASTs were removed in 1989. The TCE AST was then moved to the current AST tank farm until TCE was no longer used at the plant in 1992.

In 1990, HPP installed five groundwater monitoring wells in the vicinity of the pretreatment facility and treatment lagoons. Analytical results from the groundwater collected from these wells indicated the presence of trichloroethene (TCE) above drinking water standards. Additional monitoring well installation and sampling was conducted between 1992 and 2000 to define the extent of groundwater impacts.

In 1995, HPP installed recovery wells in an effort to contain groundwater at the facility. This corrective measure was implemented to prevent the movement of contaminated from the plant property by removing impacted groundwater in the vicinity of the known source areas. The impacted groundwater is then sent for treatment prior to discharge. The current system consists of fifteen (15) recovery wells.

In February 2001, DHEC issued Consent Agreement #01-145-W to HPP.

SUMMARY OF SITE RISKS

As a result of the environmental investigations, volatile organic compounds, particularly TCE, were found to be present in groundwater above Maximum Contaminant Levels (MCLs). Long-term exposure to these constituents of concern can result in harmful effects to human health and to ecological systems. This contamination is located on the facility and has not migrated off site.

Further, South Carolina has established water quality standards, which are outlined in S.C. Regulation 61-68: *Water Classifications and Standards*. This regulation establishes water quality standards that protect existing and classified uses of SC waters. Per this SC regulation, waters which meet standards, e.g., MCLs, shall be maintained. Waters which do not meet standards shall be improved, wherever attainable, to achieve those standards

Contaminants in soil continues to source the groundwater plume preventing the effective cleanup of groundwater at the facility.

CLEANUP GOALS

Remedial action objectives (RAOs) are developed in order to set goals for protecting human health and the environment. The goals should be as specific as possible, but should not unduly limit the range of remedial alternatives that can be developed. Accordingly, the following RAOs were developed for the Site:

Reducing the potential for leaching to groundwater from the vadose zone.

Reducing source area groundwater impacts to further mitigate/control impacts to downgradient groundwater and streams.

Restore groundwater to MCLs (maximum contaminant level).

SCOPE AND ROLE OF THE ACTION

The proposed action in this Proposed Plan will be the final cleanup action for the Site. The remedial action objectives for this proposed action include reducing the potential for soil leaching contamination to groundwater and to further mitigate and control the migration of contaminants through groundwater and into surface water. As contamination will remain onsite a 5-year review will be required once the remedial action is conducted.

SUMMARY OF REMEDIAL ALTERNATIVES

Based on information collected during previous investigations, *a Revised Source Area Focused Feasibility Study* (AEM, July 2019) was conducted to identify, develop, and evaluate options and remedial alternatives to address the contamination at the Site. This evaluation considered the nature and extent of contamination and associated potential human health risks developed during the remedial investigations and associated studies to determine and evaluate potential remedial alternatives and their overall protection of human health and the environment. Each remedial alternative evaluated by the Department is described briefly below. Note: A final Remedial Design will be developed prior to implementation of any alternative.

DESCRIPTION OF ALTERNATIVES

Alternative 1 - No Action

The No Action alternative is required by the National Contingency Plan to be carried through the screening process, as it serves as a baseline for comparison of the other remedial action alternatives.

The no action alternative does not include any on-site or legal controls or actions for soil or groundwater at the site. There is no cost associated with implementing this alternative.

Alternative 2 – Soil Vapor Extraction (SVE)

Soil vapor extraction (SVE) is soil remediation technology in which a vacuum is applied to the soil to induce the controlled flow of air and remove volatile and some semi-volatile contaminants from soil.

This Alternative was further developed for detailed analysis from the installation and field pilot testing of new SVE wells near the source area. The pilot study concluded that the vadose zone within the study area appears to have a highly transmissive layer that connects the observation wells and the pilot test well.

The estimated present value capital cost to implement SVE moving forward is $280,400. These costs represent installation, maintenance, monthly inspections, and effluent sampling as part of discharge permit requirements for site-related constituents found in groundwater. Electric usage and repair work have also been included. Operation and maintenance (O&M) and monitoring will continue for four years.

Alternative 3 – Excavation

This alternative consists of excavation of contaminated material and transport to a permitted off-site treatment and/or disposal facility.

The costs are roughly estimated to be $3,070,600 to implement. This remedy would require an extended shut-down of the plant due to the extended infrastructure located in the area. Excavation activities will take approximately 12 months to complete.

Alternative 4 - *In Situ* Chemical Oxidation/Blending (ISCO)

This remedial alternative will include *in situ* blending and/or injections of chemicals into the source area. Oxidation chemically converts hazardous contaminants to non-hazardous or less toxic compounds that are more stable, less mobile, and/or inert.

The estimated capital cost to implement ISCO moving forward is $2,578,400. This cost includes setting up injection points and purchase/mixing of chemical oxidants as well as estimates for shoring, utilities relocation, and the disruption to facility operations. Remedial objects with ISCO will be achieved in approximately 12 months.

Alternative 5- Continued Pump and Treat (CP&T)

This alternative represents the current operations at the Site. It consists of implementing no action to specifically target the source material except for treating the source by containing contaminants that are in groundwater. This alternative provides for continued plume containment at the site interior and boundary utilizing the current remediation infrastructure. Currently, groundwater is extracted using submersible pumps and treated via an air stripper prior to being collected into a central sump and then discharged to Broad Mouth Creek under a National Pollutant Discharge Elimination System (NPDES) permit.

CP&T would require no additional capital costs. Typical pump and treat system will operate for 30 or more years and current annual costs are between $125,000 and $200,000 per year.

Alternative 6- Optimized Pump and Treat (OP&T)

This alternative improves the existing groundwater capture and extraction rate in the source area with added extraction wells in the source area and improved pump and treat remedial infrastructure. This alternative utilizes submersible pumps and existing treatment via an air stripper prior to being discharged to a central sump and then to Broad Mouth Creek via an NPDES permit.

The cost to implement the OP&T is approximately $50,000 to connect the pilot study test well (PTW-1) to the existing groundwater treatment system. OP&T costs would then be consistent with CP&T and would be expected to operate for 30 or more years with the current annual costs up to $200,000 per year.

Alternative 7- Vacuum Enhanced Extraction (VEP&T)

This option provides the addition of vacuum enhancement to the Optimized Pump and Treat (VEP&T) alternative. A vacuum is placed on the source-area pumping well(s) to increase the radius of capture for the pumping well.

The cost to implement the VEP&T is approximately $156,600 to install the required vacuum equipment to the existing groundwater treatment system plus an estimated $850 per month for power. VEP&T costs would then be consistent with CP&T with additional power costs and would be expected to operate for 30 or more years with annual costs up to $210,200 per year.

EVALUATION OF ALTERNATIVES

The National Contingency Plan requires the Department use specific criteria to evaluate and compare the different remediation alternatives individually and against each other in order to select a remedy. This section of the Proposed Plan profiles the relative performance of each alternative against the criteria, noting how it compares to the other options under consideration. The criteria are:

1. Overall protection of human health and the environment;
2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs);
3. Long-term effectiveness and permanence;
4. Reduction of toxicity, mobility, or volume through treatment
5. Short-term effectiveness;
6. Implementability;
7. Cost; and
8. Community acceptance

The main objectives for the preferred remedial action are to be protective of human health and the environment and to comply with State and Federal regulations. These two objectives are considered *threshold criteria*. Threshold criteria are requirements each alternative must meet in order to be eligible for selection.

The following measures are considered *balancing criteria*: long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; and cost. These criteria are used to weigh the technical feasibility, strengths and weaknesses, and cost advantages and disadvantages of each alternative.

Community acceptance of the cleanup alternative and the other considered alternatives is a *modifying criterion* that will be carefully considered by the Department prior to final remedy selection.

COMPARATIVE ANALYSIS OF ALTERNATIVES

A comparative analysis of each alternative was performed. The alternatives were evaluated in relation to one another for each of the evaluation criteria. The purpose of the analysis is to identify the relative advantages and disadvantages of each alternative.

Alternatives 1-4 are compared against each other for soil cleanup and Alternatives 5-7 are compared against each other for groundwater cleanup. The final remedy will be a combination of remedies to address both medias. The tables below rank the alternatives from 0-4 based off their effectiveness for each category. The remedy with the highest total score is considered the best alternative for each media.

Comparative analysis of Alternatives Table for Soil:

Remedial Options Soil	Alternative 1 No Action	Alternative 2 Soil Vapor Extraction	Alternative 3 Removal	Alternative 4 In-Situ Chemical Oxidation
Protection Human Health and the Environment	0	3	4	4
Compliance with ARARs	0	2	4	3
Short-Term Effectiveness	0	3	2	3
Long-Term Effectiveness	0	3	2	2
Reduction of toxicity, mobility, & volume through Treatment	0	3	4	3
Implementability	4	4	0	0
Costs	4	4	1	1
Total Score	8	22	17	16

Comparative analysis of Alternatives Table for Groundwater:

Remedial Options Groundwater	Alternative 5 Groundwater Pump and Treat	Alternative 6 Optimized Groundwater Pump and Treat	Alternative 7 Vacuum Enhanced Extraction with Pump and Treat
Protection Human Health and the Environment	3	3	3
Compliance with ARARs	3	3	3
Short-Term Effectiveness	3	3	3
Long-Term Effectiveness	2	3	3
Reduction of toxicity, mobility, & volume through Treatment	3	3	3
Implementability	4	4	3
Costs	4	4	1
Total Score	22	23	19

Overall Protection of Human Health and the Environment

When evaluating alternatives in terms of overall protection of human health and the environment, consideration is given to the manner in which Site-related risks are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

The No Action does not provide for overall protection of human health and the environment on site as there will be no decrease in contaminants in the source areas. The potential for off-site impacts to protect human health and the environment are uncontrolled.

Alternative 2 - SVE is protective of human health and the environment because it reduces the concentrations of contaminants of concern in soil and thus groundwater source areas and eliminates potential vapor exposure pathways.

Alternative 3- Excavation is protective of human health and the environment because it removes the contaminants of concern in soil and thus groundwater and eliminates exposure pathways.

Alternative 4 -In-situ Chemical Oxidation is protective of human health and the environment because it removes the contaminants of concern in soil and thus groundwater and eliminates exposure pathways.

Alternative 5 -Continued Pump and Treat provides for overall protection of human health and the environment as there is containment of the groundwater plume. The continued operation of the pump and treat system limits the potential for off-site exposure.

Alternative 6-Optimized Pump and Treat-(OP&T) provides protection of human health by improving site groundwater that poses unacceptable risk. OP&T will prevent human contact with, or consumption of, contaminated groundwater and restore groundwater quality to meet state and federal standards.

Alternative 7- Vacuum-Enhanced Extraction (VEP&T) provides protection of human health by improving site groundwater quality. VEP&T will prevent human contact with, or consumption of, contaminated groundwater and restore groundwater quality to meet state and federal standards.

Compliance with ARARs (Applicable or Relevant and Appropriate Requirements)

This evaluation criterion evaluates whether an alternative meets federal and state environmental statutes and regulations that pertain to the Site. Each alternative is evaluated with respect to its ability to comply with such requirements.

The No Action alternative does not meet applicable South Carolina regulations.

Alternative 2 would potentially bring source soil into compliance with ARARs. Alternatives 3 and 4 are effective in meeting ARARs provided site constraints allow access to impacted soil.

Alternatives 5 and 6 are focused on TMV reduction and complies with potential ARARs as contaminants are leached from soil and contained by the pump and treat systems. Alternative 7 is not likely to realize significant improvement in ARAR compliance when compared to Alternative 6.

Long-Term Effectiveness and Permanence

Long Term Effectiveness measures the magnitude of residual risk remaining from untreated impacted media or treatment residuals and the adequacy and reliability of containment systems and institutional controls are evaluated under this criterion. It also factors the time to reach remedial goals.

The No Action alternative includes no controls for exposure and no long-term management measures. All current and potential future risks would remain under this alternative.

Alternative 1 does not provide long-term effectiveness or permanent remedy for the soil contamination or provide long-term protection to prevent human exposure.

Alternative 2 will achieve long-term effectiveness by treating soil contaminants with no waste products or residuals and continually remove source area mass.

Alternatives 3 and 4 are effective as long as all impacted media is removed via excavation or treated via in-situ soil blending. If impacted soil is not treated, then potentially clean backfill or treated soil can be impacted by the surrounding soil outside of the excavation or soil blending limits.

Alternative 5 does not provide long-term effectiveness or permanent remedy for the groundwater contamination under the assumption that source material half-life concentrations could be on the order of decades. Alternatives 6 and 7 both significantly improve long-term effectiveness by more directly removing groundwater contaminants at the presumed source area and accelerates TMV reduction.

Reduction of Toxicity, Mobility, or Volume through Treatment (TMV)

This evaluation criteria measures the degree to which an alternative employs treatment to reduce the harmful effects of contaminants, their ability to move in the environment, and the amount of contamination present is evaluated by this criterion.

Alternative 1 does not reduce TMV of contaminated soil at the site. Alternative 2 accelerates contaminant removal and irreversibly reduces the toxicity and volume of contaminated soil by destroying the contaminant via treatment (i.e., volatilization).

Alternatives 3 and 4 are very effective at reducing TMV of contaminated soil via excavation and off-site removal or soil blending. The contaminants of concern are removed or oxidized in place. These two technologies are effective provided site constraints allow access to impacted soil.

Alternative 5 only reduces TMV of contaminated groundwater by intercepting contaminants outside the source area. Alternatives 6 and 7 are expected to accelerate contaminant removal and reduce the toxicity and volume of contaminated groundwater by treatment (i.e., air stripping)

Short-Term Effectiveness

The short-term effectiveness evaluation takes into consideration any risk the alternative poses to on-Site workers, the surrounding community, or the environment during implementation, as well as the length of time needed to implement the alternative.

Alternative 1 does not provide short-term effectiveness as the source area soil will continue to contribute to groundwater contamination and provides no protection for potential human exposure. Alternative 2 will immediately reduce the contaminant TMV, thereby reducing the impacts to groundwater. Additional considerations for Alternative 2 include the reduction or elimination of vapor intrusion concerns.

Alternatives 3 and 4 are very effective in the short term provided the site constraints allow access to the impacted soil media.

While Alternative 5 does provide control of plume migration through TMV reduction, this alternative does not provide short-term effectiveness as the source area aquifer matrix contributes to groundwater contamination. Both Alternatives 6 and 7 will accelerate the reduction of the contaminant TMV by direct extraction, thereby reducing impacts to groundwater.

Implementability

The analysis of implementability considers the technical and administrative feasibility of remedy implementation, as well as the availability of required materials and services.

No technical or administrative feasibility concerns are associated with implementing Alternative 1 because no actions are being taken.

Implementation of Alternative 2 is considered technically feasible and could be accomplished through conventional construction methods.

The implementation of alternatives 3 and 4 are considered technically feasible, however, due to site constraints it would be difficult to implement and would impact facility operations.

No technical or administrative feasibility concerns are associated with implementing Alternatives 5 or 6 since both are either existing or straightforward enhancement of the current system, and both will be based primarily on existing infrastructure.

Alternative 7 is a significant expansion and may include installation of additional extraction wells with a mechanical vacuum system.

Cost

The cost criterion includes estimated initial capital costs and annual O&M costs, as well as a present worth cost evaluation. 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 -30% to +50%.

The cost to implement Alternative 1 is negligible as there will be no active remediation.

The estimated present value capital cost to implement Alternative 2-SVE moving forward is $280,400. These costs represent installation, maintenance, monthly inspections, and effluent sampling as part of discharge permit requirements for site-related constituents found in groundwater. Electric usage and repair work have also been included. O&M and monitoring will continue for four years.

The cost for off gas treatment has not been included since it is assumed that the system will not remove more than 1,000 pounds a month.

The estimated cost to complete Alternative 3 moving forward is $3,070,600. The costs are exceptionally high when including facility down time, relocation of utilities, shoring to protect existing infrastructure, off-site disposal fees, and impacts to local community due to truck traffic. Treatment of soil would extend as deep as 25 ft bls in the vicinity of the facility building and power substation. This cost also assumes that the impacted soil requiring treatment is not under existing infrastructure that cannot be moved such as the power substation or building.

The estimated cost to complete Alternative 4 moving forward is $2,578,400. The costs are exceptionally high when including facility down time, relocation of utilities, and shoring to protect existing infrastructure. Treatment of soil would extend as deep as 25 ft bls in the vicinity of the facility building and power substation. This cost also assumes that the impacted soil requiring treatment is not under existing infrastructure that cannot be moved such as the power substation or building.

The costs to implement Alternative 5 are the current annual costs to operate, maintain, and monitor the ongoing activities, with no incremental cost incurred. The cost of this Alternative is assumed to be $125,000 to $200,000 per year projected over the next 30 years in present-value dollars. These costs represent monthly inspections, maintenance, and effluent sampling as part of discharge permit requirements and annual sampling and analysis of groundwater for site-related constituents found in groundwater. Electric usage and repair work have also been included. O&M and monitoring will continue for the duration of the project.

The cost to implement Alternative 6 is essentially the same as 5 but adds a one-time $50K cost to install and plumb new wells.

The cost to implement Alternative 7 is approximately $156,600 to install the required vacuum equipment to the existing groundwater treatment system plus an estimated $850 per month for power. Alternative 7 costs would then be consistent with CP&T with additional power costs and would be expected to operate for 30 or more years with annual costs of between $135,200 and $210,200 per year.

Community Acceptance

Community acceptance of the preferred remedy will be evaluated after the public comment period. Public comments will be summarized and responses provided in the Responsiveness Summary Section of the Record of Decision document that will present the Department's final alternative selection. The Department may choose to modify the preferred alternative or select another remedy based on public comments or new information.

SUMMARY OF THE DEPARTMENT'S PREFERRED ALTERNATIVE

The Department has identified a preferred alternative to address the contamination in both the soil and groundwater at the Site. The preferred remedial alternatives, are a combination of Alternative 2, Soil Vapor Extraction within the soil source area and Alternative 6 optimization pump and treat system for the groundwater plume.

Alternative 2, Soil vapor extraction (SVE) is soil remediation technology in which a vacuum is applied to the soil to induce the controlled flow of air and remove volatile and some semi-volatile contaminants from soil.

This Alternative was further developed for detailed analysis from the installation and field pilot testing of new SVE wells near the source area. The pilot study concluded that the vadose zone within the study area appears to have a highly transmissive layer that connects the observation wells and the pilot test well. The system will be operated for approximately 4 years or until the soil contamination has been adequately treated.

Alternative 6, Optimized Pump and Treat improves the existing groundwater capture and extraction rate in the source area with added extraction wells in the source area and improved pump and treatment remedial infrastructure. This alternative utilizes submersible pumps and existing treatment via an air stripper prior to being discharged to a central sump and then to Broad Mouth Creek via an NPDES permit.

The total estimated net present worth of this alternative combination is approximately $6M. It is the Department's judgment that the Preferred Alternative identified in this Proposed Plan is necessary to protect public health and the environment.

USE THIS SPACE TO WRITE YOUR COMMENTS

Your input on the Proposed Plan for the Ingersoll Rand Honea Path Facility Site is important. Comments provided by the public are valuable in helping DHEC select a final cleanup remedy.

You may use the space below to write your comments, then fold and mail. Comments must be postmarked by November 20, 2020. If you have any questions, please contact Jan Trent at 803-898-0723. You may also submit your questions and/or comments electronically to: trentjc@dhec.sc.gov

Name _____ Telephone _____

Address _____ Email _____

City _____

State _____ Zip _____