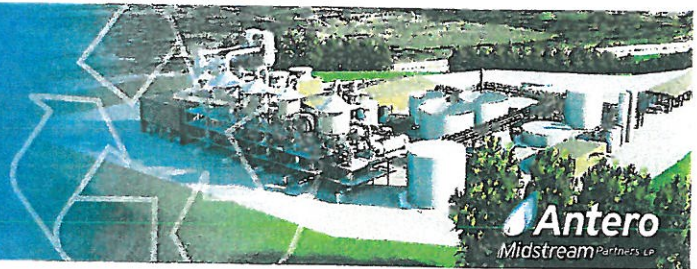


CLEARWATER SALT LANDFILL

FREQUENTLY ASKED QUESTIONS



Q: What is the purpose of the landfill?

A: Produced water is a common waste stream associated with most all oil and gas production. Like other aspects of oil and gas operations that involve water, handling this wastewater can be an invasive aspect of resource development. In dealing with this waste stream, most operators rely on a combination of options that typically require storage of wastewater in pits and wastewater disposal wells.

In constructing its water treatment and reuse facility, Antero is again leading the industry in investing significant capital into drastically reducing its impacts on the environment and the public. This treatment facility, in combination with the landfill, allows Antero to convert almost 98 percent of its wastewater into clean products: salt and freshwater. It virtually eliminates Antero's need to use storage pits and wastewater disposal wells.

The water treatment process will separate incoming water and associated solids, including salt that will comprise approximately 92 percent of all solid byproducts from the facility. Moreover, a large percentage of the salt is of such high quality that it will be commercially marketable. The remaining salt will be of landfill-quality.

Antero has filed its application with the W.Va. DEP, Division of Water and Waste Management, to operate a landfill on company-owned property to properly dispose of residual salt. The proposed permit would only authorize disposal of salt and would not authorize disposal of any other industrial, commercial or residential waste at the landfill.

Q: How will groundwater be protected?

A: The facility's enhanced design provides environmental protection at a state-of-the-art level, including the landfill's multiple liners that create redundant layers of groundwater protection. Like much of this facility's design, these added layers of environmental protection significantly exceed regulatory requirements.

In fact, Antero has chosen to add a geo-synthetic clay liner (GCL) as well as an additional 60-millimeter high density polyethylene (HDPE) to the overall design of the facility in an effort to exceed regulatory requirements.

From base soil our liner system includes:

1. 6 inch thick compacted clay soil component, demonstrating permeability values more conservative than regulatory requirements;
2. 60 millimeter HDPE secondary geomembrane liner;
3. A double-sided geo-composite leachate detection zone;
4. 12 inch compacted soil liner demonstrating permeability values more conservative than regulatory requirements;
5. GCL providing the same hydraulic protection as several feet of compacted clay;
6. 60 millimeter-HDPE primary geomembrane liner;
7. Geotextile cushion; and
8. 18 inch protective cover and leachate collection zone (clean sand or pea gravel).

Another reason the facility will not pose a risk to groundwater is because of the geologic conditions of the site. We know this because of the extensive subsurface studies that have been conducted to fully understand the geologic structure and hydrogeology of the entire site.

In addition to the conservative design approach for the liner system, the site itself is underlain with low-permeability rock and soil and will be constructed near a high ridgeline, thus further safeguarding groundwater.

As an additional measure of protection, multiple monitoring wells have been strategically installed to monitor groundwater over the life of the landfill's operation and beyond. Samples will be routinely collected and analyzed by environmental experts and submitted to the W.Va. DEP's Division of Water and Waste Management.

Q: What should the community expect in terms of activity levels?

A: The landfill has been purposely designed and located to minimize its impact to the public. For example, the site is located within two thirds of a mile from Route 50, which will contain activity to a very limited area. Moreover, the landfill will have a natural barrier from Route 50 due to site topography and existing dense vegetation.

The water treatment and reuse facility and landfill create efficiencies that further reduce operational activities including truck traffic. Specifically, all salt being disposed of in the proposed landfill – which represents approximately 92 percent of the total daily tonnage of solids from the water treatment facility – will be transported within the limits of Antero's property and will not require the use of public roads.

To further limit impacts to the community, additional best practices that often exceed regulatory requirements will be utilized. Such efforts include closely monitoring and utilizing permitted dust suppression techniques. Our planned paving of applicable access roads throughout facility will further limit dust.

Q: What is in the salt and can it be used for de-icing roads?

A: Test results using state - and nationally - recognized waste characterization methods, such as TCLP (Toxicity Characteristic Leaching Procedure), to identify any potentially hazardous characteristics have shown this salt to be benign. These findings are outlined in Antero's W.Va. DEP landfill permit.

Chemical properties of the salt display great potential for byproduct recovery and Antero does intend to market the salts for commercial applications. Current W.Va. DEP guidelines do not allow for the use of untreated shale-related brine for de-icing roads. However, much of the treated salt that will be stored in the facility's landfill is of similar or better composition than salts currently used on roadways. Given that much of the salt is of high quality, Antero continues to explore additional options for its beneficial re-use.

Q: Is this W.Va.'s first salt landfill?

A: No. In fact, there is another landfill of this type located 30 miles away in Marion County that is used for desalination of water associated with coal mining activities.

Q: Will TENORM (technologically enhanced naturally occurring radioactive material) be disposed of in this landfill?

A: No. While current regulatory requirements and standards for oil and natural gas-related TENORM materials are still being defined, Antero's pending landfill permit is exclusively for the storage and disposal of salts removed from water treated at the reuse facility. The salt produced by the plant is below naturally occurring radiation levels and poses no exposure hazard to workers or the public.

CLEARWATER FACILITY FACTS



- 1 Water handling associated with oil and gas operations can be a very publically and environmentally invasive aspect. Antero cares deeply about reducing its footprint and has accordingly invested heavily in doing so.
- 2 Water handling refers primarily to two major operations: supplying water for completions and handling the wastewater that returns from the ground
- 3 On the first aspect, Antero led the way with a \$500 million investment in water infrastructure to source it's completions. These efforts have eliminated more than 820,000 truck trips since 2014.
- 4 The Clearwater facility, including the landfill, represents another industry-leading way to handle the produced water that returns from our operations.
- 5 With this process, 98% of the produced water is converted to freshwater and benign salt - much of which is commercially marketable.
 - Simply, we take a 100% waste and strive to reduce it to 2% waste.
 - That waste is typically trucked, stored in pits, injected into the ground, or piped around, but we convert nearly all of it into clean freshwater and salt.
 - Freshwater generated from the treatment process will reduce water sourcing needs.
 - A majority of the recovered salt is so clean we will end up selling it.
- 6 Antero anticipates the need to dispose of some of the residual salt, none of which would be classified as radioactive.
- 7 Exhaustive analysis confirms Antero's proposed landfill makes the most sense from the standpoint of reducing our environmental and community impacts.
 - Reduced truck travel;
 - Centrally located within core operations;
 - Least environmental impact; and
 - Virtually eliminates the need for wastewater disposal wells and/or storage pits.
- 8 This landfill will be permitted to receive salt only. The permit spells out the quality of that salt, but to be clear, this is not NORM-related waste.

AnteroMidstream.com/operations-2/antero-clearwater-facility-landfill

Q: Where will TENORM materials go?

A: TENORM materials associated with the water treatment and reuse process will be responsibly disposed of in appropriately permitted landfills following strict regulations and environmental safeguards, just as it is done now across the industry.

Q: How will leachate be managed?

A: In all landfill operations, minimizing leachate and maximizing compaction of placed materials are of utmost importance. In many ways, these objectives will be easier to achieve in this particular landfill. Typical municipal landfills must address fluids included in a wide array of waste types ranging from household trash to construction debris. This landfill is comprised of a single waste type that is an earthen material which readily compacts and has a limited moisture content.

This landfill is unique in that leachate will not discharge to an open water source. All leachate will be collected from the facility in double-sided geo-composite drainage material, which is a proven groundwater and environmental protection system. All leachate will be transferred back to the treatment and reuse facility for processing. Antero will leverage this safe and environmentally responsible operational enhancement across the entire landfill.

Q: How will heavy rainfall and potential runoff be managed?

A: During periods of heavy rainfall, an extensive coverage system will be used to keep the landfilled material as dry as possible. Additionally, onsite buildings are sized to allow for temporary storage of salts during inclement weather.

The perimeter of the landfill is designed with robust storm water diversion channels to limit the potential for inflow of rainwater into the site.



WATER TREATMENT & REUSE FACILITY

Antero, with its partner Veolia, is developing an industry-leading water treatment and reuse facility that provides an alternative and innovative solution to current disposal methods, creating environmental, economic and community benefits.



WATER MANAGEMENT

Antero's ongoing commitment to sustainably managing water resources is reflected in the company's industry-leading freshwater distribution system.

This initial infrastructure build-out – representing a nearly \$500 million investment – is creating important local benefits, including eliminating 480,000 water truck trips in 2014 alone.

With the new facility, Antero is building upon these long-term environmental and economic commitments.

ANTERO IN APPALACHIA

Antero has more than 2,000 employees and contract personnel working across Appalachia, including 184 direct employees in W. Va.

Antero ranks 8th in total U.S. natural gas production and is the most active Appalachian Basin operator, averaging 14 active horizontal rigs in 2015.



ENVIRONMENTAL BENEFITS

Once fully operational, the facility – which is centrally located within Antero's core acreage position to maximize efficiencies – will on average reduce water truck travel by more than 10 million miles annually.

This nearly 50 percent reduction in water-related truck travel not only further reduces roadway impacts, but will also cut greenhouse gas emissions by an average of more than 30,000 tons each year.

Approximately 95 percent of Antero's water will be treated at the facility, virtually eliminating the need for wastewater disposal wells.

The facility will provide an additional freshwater supply of 41,000 barrels/day (1.7 million gallons/day), which will positively offset withdrawals from W.Va.'s water resources.



AN ECONOMIC DRIVER

The new advanced water treatment and reuse facility represents a \$275 million investment, which will stimulate local economic activity.

Construction of the facility will support nearly 250 jobs. Once operational, Antero's facility will directly support 21 permanent employees as well as 25 supply chain service jobs.

The facility will generate significant state and local tax revenues for the region.

Since 2014 alone, Antero has invested nearly \$65 million in road maintenance and upgrades across W.Va. This work is overwhelmingly done by W.Va.-based contractors.

"Antero's planned advanced wastewater treatment complex in Doddridge County is good for the environment and good for West Virginia's economy ... I commend Antero for making a significant commitment to our state's economy and minimizing the impact of oil and gas operations on local communities." -W.Va. Gov. Earl Ray Tomblin

"We're pleased that Antero will build a \$275 million facility that will recycle flowback water for re-use at well sites." -Exponent-Telegram editorial