

Rules and Regulations for Solid Waste Management Facilities and Organic Waste Management Facilities, Including Solid Waste Landfills and Construction and Demolition Debris Facilities

Benefit-Cost Analysis

Rhode Island Department of Environmental Management | June 17, 2020

Introduction: The Rhode Island Department of Environmental Management (DEM) has undertaken an update of its “Rules and Regulations for Solid Waste Management Facilities and Organic Waste Management Facilities” (250-RICR-140-05). This update is prompted by the need to clarify definitions of solid waste and construction and demolition debris facilities to make regulations and authorizing statute consistent. There are four areas where changes are proposed:

1. Update to include statutory changes to definitions of Solid Waste and Construction and Demolition Debris Separation Facilities (250-RICR-140-05-1 and 250-RICR-140-05-7).
2. Proposed changes would allow landfills to reduce air monitoring frequency under certain conditions (250-RICR-140-05-1).
3. Addition of monitoring for PFAS compounds at landfills in anticipation of new Department of Health requirements (250-RICR-140-05-2).
4. Streamlining of the approval process for solar development on the footprint of closed landfills (250-RICR-140-05-2).

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Scope: this analysis only considers proposed state regulatory amendments where DEM has discretion. Regulatory changes that were made to be consistent with statute are not considered as DEM does not have the flexibility to change those requirements.

Summary: This analysis looks at 4 separate proposed regulatory amendments and computes costs and benefits for each, wherever the costs and benefits are quantifiable. The scope of the analysis is five years from 2020 to 2025 and assumes the regulation would not take effect until the 4th quarter of 2020. The costs are then subtracted from the benefits to calculate a net present value. This analysis uses discount rates to calculate net present values for future costs and benefits. Discount rates of three percent and seven percent are used as a sensitivity analysis. The table at right summarizes the net present value of the four items. Positive numbers indicate that benefits outweigh costs and negative numbers, as represented by parentheses, indicate that costs outweigh benefits. Some costs and benefits could not be quantified.

<i>Item</i>	<i>Net Present Value (2020-2025), 3% Discount Rate</i>	<i>Net Present Value (2020-2025), 7% Discount Rate</i>
Annual Air Quality Monitoring	\$232,107	\$201,247
C&D Facility Licensing	\$0	\$0
PFAS Testing	(\$68,324) – (\$74,994)	(\$65,636) – (\$71,384)
Landfill Solar Panels	\$1,479,795 - \$1,538,416	\$1,283,054 - \$1,333,876
Total	\$1,643,578 - \$1,695,529	\$1,418,665 - \$1,463,739

Alternatives:

Following the discussion of the four items analyzed, there is a discussion of regulatory alternatives that were considered for several of the provisions.

Conclusion:

The analysis shows a net benefit over the five-year horizon analyzed. This benefit accrues from the discretionary changes in State regulations.

Determination:

This analysis was drafted pursuant to RIGL 23-18.9-8 & 14. As such, RIDEM has determined that the benefits of the proposed amendments justify the costs and that the proposed amendments will achieve the objectives of the authorizing statute in the most cost-effective manner.

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Air Quality Monitoring

Proposed Change: The proposed change is to allow certain solid waste facilities to reduce the frequency of air monitoring from quarterly to annually. The facility needs 5 years of data showing no exceedances of air standards.

The reduction in air monitoring requirement would probably only benefit the RI Resource Recovery Corporation at this time. Air monitoring costs them about \$16,500 per quarter. If monitoring were reduced from quarterly to annual, it would save them \$49,500/year

Regulatory Citation

250-RICR-140-05-1.15

Costs:

Any reduction in monitoring has to consider the risk that reduced monitoring could delay the detection of exposure to air pollutants, which could harm human health and degrade property values in the area. However, under the proposed amendment, reduce monitoring is only considered after extensive monitoring of five years (20 samples) show a consistent pattern of compliance with the standard. Also, the Department in these rules reserves the right to increase monitoring based on observations of the Department. As of this time, the only facility that would qualify for this reduction is RI Resource Recovery Corporation, so the costs and benefits are based on only this facility reducing frequency of monitoring from quarterly to annual. For RI Resource Recovery Corporation, DEM has data going back to the early 1990's showing no exceedances of applicable standards. Therefore, DEM expects this risk to be *de minimis*, and there are no projected costs associated with this proposal.

Benefits:

The expected benefit would be that RIRRC would spend \$49,500 less per year as they only have to do 1 round of sampling per year instead of 4.

	2020	2021	2022	2023	2024	2025
Monitoring Cost	\$12,375	\$49,500	\$49,500	\$49,500	\$49,500	\$49,500
Savings						

Net Present Value (2020-2025)

3% Discount Rate	\$232,107
7% Discount Rate	\$201,247

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Construction and Demolition Facility Licensing

Proposed Change: This change is being proposed to be consistent with R.I.G.L. 23-18.9-8(c)(1) regarding the need for construction and demolition debris facilities to receive a letter of compliance from the host municipality regarding zoning and other ordinances. The statute that exempted facilities receiving 50 tons/day or less from licensing was amended in 2014. Facilities receiving 50 tons/day or less are no longer exempt (see RI Gen Laws 23-18.9-7).

DEM proposes updating 250-RICR-140-05-1, §1.5(A)(49) to align with statutory definitions of solid waste and Construction and Demolition Debris Separation Facilities. Construction and Demolition Debris Separation Facility is defined in statute (RI Gen. Laws 23-18.9-7(6)) DEM's current practice is to apply the same licensing standards to C&D debris separation facilities as to C&D debris processing facilities. Therefore, this change in definition merely clarifies existing practice and does not result in a change to the status quo. The current definitions allow a loophole where one could circumvent the permitting/licensing process by arguing that one is only "separating" waste. However, RI Gen. Laws 23-18.9-7(6) defines Construction and Demolition Debris Separation Facilities as a type of solid waste management facility. There are currently no licensed facilities operating that claim this exemption. Although the Department has never recognized these claims, this definition update will clarify and state outright DEM regulatory and licensing requirements for all C&D facilities. Therefore, we expect no fiscal impact from this change in definition.

Regulatory Citation

250-RICR-140-05-7 and 250-RICR-140-05-1

Net Present Value (2020-2025)

3% Discount Rate	\$0
7% Discount Rate	\$0

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PFAS Testing

Proposed Change: The proposed changes would require owners of closed landfills to perform 2 rounds of groundwater monitoring for PFAS (Per- and polyfluoroalkyl substances), specifically those PFAS included in the target analyte list for EPA Method 537.1. This analysis includes all currently regulated compounds (PFOA and PFOS) in both groundwater and drinking water, and also includes those compounds currently proposed by RIDOH for a Maximum Contaminant Level (MCL) at no additional cost. Due to the advances in scientific knowledge of PFAS, a comprehensive analysis will ensure the usefulness of this data in future risk management decisions. The goal here is to establish a baseline to see if PFAS at landfills are at levels that threaten human health and the environment. At this time, the cost of testing is relatively high due to lack of standardization and therefore we are attempting to keep the costs reasonable by only requiring 2 rounds, with more rounds required only in cases of identified problems.

The proposed amendment would also require owners of closed landfills, where exceedances are detected in a well, to update their monitoring plans. If a well is in the category deemed suitable for drinking water use, it will likely require routine testing. Although we do not know at this time how many wells in this category are likely to test with exceedances, we obtained data from similar testing conducted in Vermont in 2019. We recognize the uncertainty in applying this Vermont data to a Rhode Island estimate, but we believe it is the best data available and allows us to estimate a reasonable range of Rhode Island landfills that are rated as GA (suitable for drinking), which might have PFAS exceedances and therefore require further testing. We believe that range to be between one and six wells. Therefore, in the estimates below, we estimate the one-time costs of the initial two rounds of PFAS testing for all wells, and then estimate a range for annual costs over the next five years, assuming one round of testing annually for those one to six wells that have exceedances. These costs are estimated at \$300 per year for each well with exceedance (\$300 to \$1,800 per year total).

Regulatory Citation

250-RICR-140-05-2

Costs:

It is estimated that the cost of PFAS sampling in groundwater at solid waste landfills will be \$300/sample. This would require two rounds of sampling and it is estimated the average landfill has 4 wells. Right now, 20 landfills are undergoing monitoring. This estimate is on the high end as some facilities may be able to justify the sampling of a smaller number of wells. This is particularly true with the RIRRC landfill in Johnston that has 39 wells.

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Ownership	Landfills undergoing monitoring	Estimated number of wells	Estimated number of wells	cost/sample	Number of rounds of sampling	Estimated total cost
Municipal		14	4	\$300	2	\$33,600
Private		5	4	\$300	2	\$12,000
RIRRC (state) owned		1	39	\$300	2	\$23,400
Total cost						\$69,000

	2020	2021	2022	2023	2024	2025
PFAS Testing Costs	\$69,000	\$300 - \$1,800	\$300 - \$1,800	\$300 - \$1,800	\$300 - \$1,800	\$300 - \$1,800

Benefits:

PFAS has emerged as a significant concern in drinking water only over the last several years. The Rhode Island Department of Health is currently in the process of promulgating drinking water standards for these compounds. Without PFAS baseline sampling data, it is not possible to ascertain if any current or former landfills are threatening public water supplies. The goal of this proposal is to acquire that baseline dataset.

Having a baseline dataset would allow the state to focus resources more effectively at sampling drinking water wells in areas that have been affected by PFAS contamination in landfills.

Net Present Value

3% Discount Rate	(\$68,324 - \$74,994)
7% Discount Rate	(\$65,636 - \$71,384)

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Solar Panels on Capped Landfills

Proposed Change: The Department proposes to allow solar panel systems to be placed on landfill caps as part of a final cover system approved by the DEM Office of Land Revitalization and Sustainable Materials Management without requiring separate wetlands and stormwater permit applications. Applications to DEM for solar panel installations on landfills will be considered if they include a feasibility study, have the required monitoring/alarm systems and meet the requirements of the Solid Waste Program or Landfill Closure Program.

Given that landfill caps are engineered to minimize infiltration, and the landfill itself has very limited ecological value, it would be in the interest of the environmental preservation to encourage solar development at these sites as opposed to destruction of forests, openspace and farmland. Also, landfill lands offer thousands of acres of open space in areas where solar installations may be less likely to involve community concerns over aesthetic impacts. In addition, many landfills have environmental conditions that are not well suited for commercial or residential zoning or otherwise have low demand for real estate development. Furthermore, providing a source of income by solar power generation may encourage more cities and towns to close old landfills that have never been capped that potentially pose a threat to human health and the environment.

Governor Gina M. Raimondo's renewable energy policy specifically encourages development of solar energy in a way that does not create environmental degradation caused by cutting down forests or taking away agricultural land. In March 2017, the Governor announced a strategic goal to increase the state's clean energy ten-fold by the end of 2020 to achieve a total of 1,000 MW of clean energy projects. By increasing the available land on landfills, this would allow an average of 2.02 MW of additional solar capacity per landfill (see attached calculations), and will help accelerate the achievement of Rhode Island's energy policy goals.

Regulatory Citation: 250-RICR-140-05-2

Costs:

There is no cost for this proposal.

Benefits:

Benefits are calculated based on the attached document. The assumption is by not requiring wetlands permitting, more surface area is available for solar development because the buffer zone would no longer prevent development on the landfill footprint. This is based on the presumption that there are wetlands near the toe of the slope of the landfill. Historically, dumps were often created by filling in wetlands, so there often are wetlands at the toe of the slope. The increased surface area made available for solar panels by this policy change varies based on the slope of the ground inside of the 200' wetland buffer zone. A steeper slope adds more surface area than a gentler slope, within the same 200 horizontal feet of wetland buffer. DEM estimates the range of slopes to be between 3% and 33%. Therefore, we calculate the

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financial benefits of the increased solar capacity as a range. This range is estimated below, using a 3% slope to calculate the lower bound of the range and a 33% slope to calculate the upper bound. These calculations assume that the rule is only in effect for the final quarter of 2020. Therefore, the 2020 benefit is reduced by 75%. The electrical production and financial value calculations are shown in the accompanying document, "Calculations for percent increase of solar panels footprint considering wetlands buffer, landfill slope and mean landfill area." Assuming 3% and 33% slopes, and wetlands located on one side of the landfill, the benefit would be as shown below. Other less tangible benefits, such as preservation of green space, is not calculated here but discussed in the narrative.

	2020	2021	2022	2023	2024	2025
Solar Financial Benefit: 3% Slope	\$78,894	\$315,575	\$315,575	\$315,575	\$315,575	\$315,575
Solar Financial Benefit: 33% Slope	\$82,022	\$328,088	\$328,088	\$328,088	\$328,088	\$328,088

Net Present Value (2020-2025)

3% Discount Rate	\$1,479,795 - \$1,538,416
7% Discount Rate	\$1,283,054 - \$1,333,876

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Alternatives

The following regulatory alternatives were considered when drafting this regulation.

Air Quality Monitoring

Alternative 1: No change to current regulation. The RI Resource Recovery has been doing air monitoring quarterly since 1990. The below action level testing results have been fairly consistent, therefore, the Department recommends reducing the frequency of required monitoring to optimize economic and human resources.

Alternative 2: Originally we considered monitoring every 2 years, however this interval was judged to be excessive since landfill operations can change significantly in that period of time. By allowing us to reduce monitoring to no less than once per year, we still have the option of reducing from quarterly to semi-annual based on the data and situation.

Determination: The proposal is a good use of resources while being protective.

C&D Facility Licensing

Alternative: The Department considered having a separate licensing process for C&D separation facilities but our experience with these facilities shows that the risks, nature of contamination and overall operations are so similar that a separate process would be of limited use.

PFAS Testing

Alternative 1: With the growing information about PFAS being a health concern, the DEM has determined it unreasonable not to monitor landfills for this constituent.

Alternative 2: We could add PFAS to the list of contaminants required to be monitoring on a quarterly basis. However, monitoring for PFAS is significantly more expensive than any other constituent on the list.

Determination: Quarterly monitoring at this time might be unreasonably burdensome on municipalities. With time, this cost may come down significantly as standardized methods evolve, and we can revisit the issue at that time.

Solar Panel Permissions for Capped Landfills

Alternative: We could leave the current rules in place. In our experience, this results in less electrical generation due to the time and cost of the existing wetlands and stormwater application process. It might impede some municipalities from voluntarily closing their landfills

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due to cost. It also results in either more greenspace being destroyed to make room for solar or less alternative energy and therefore more greenhouse gas emissions to fulfill our energy needs.

Determination: This is the right time to consider streamlining the application process for solar energy installation on landfills given the State of RI's immediate green energy goals.