



Foundry Sand Reuse in New Hampshire

Best Practices & Regulatory Compliance

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3. Key Concepts and Definitions

What is Foundry Sand?

Foundry sand is high-quality silica sand used in the metal casting process to create precise molds for New Hampshire's specialized manufacturing sectors, including aerospace, defense, and firearms. Once the sand can no longer be used internally—due to thermal fatigue or binder saturation—it is removed as **spent foundry sand (SFS)**. In New Hampshire, this material is considered a solid waste unless it is formally authorized for **Beneficial Use**.

What is Beneficial Reuse?

In New Hampshire, beneficial reuse is the utilization of a solid waste as an effective substitute for a commercial product or raw material in a manner that protects public health and the environment. This process is governed by the New Hampshire Department of Environmental Services (NHDES) to ensure that industrial byproducts are diverted from limited landfill space.

What is the TCLP Test?

The **Toxicity Characteristic Leaching Procedure (TCLP)** (EPA Method 1311) is the standard test required by NHDES to verify that a waste is not hazardous. Only non-hazardous SFS is eligible for the Beneficial Use permitting process in New Hampshire.

4. Regulatory Guidelines

New Hampshire Dept. of Environmental Services (NHDES)

NHDES regulates the reuse of industrial byproducts through its Waste Management Division, specifically under the Solid Waste Rules.

Specific Legal Citations:

- **Env-Sw 1500:** "Beneficial Use of Solid Waste." This is the primary regulatory framework for New Hampshire foundries. It outlines the requirements for obtaining a formal Beneficial Use Determination (BUD).
- **Env-Sw 1503:** Outlines the specific application requirements for a BUD, including physical and chemical characterization.
- **RSA 149-M:** The state's primary solid waste management statute, which provides the authority for NHDES to issue surcharges and permits.

Statewide Disposal Surcharge

Beginning **January 1, 2026**, New Hampshire has implemented a mandatory **\$3.50 per ton** solid waste disposal surcharge on all waste sent to landfills or waste-to-energy facilities. Material diverted for beneficial reuse is generally exempt from this state-mandated cost.

5. Reuse Applications and New Hampshire Examples

Application	Description	New Hampshire Context
Road Sub-base	Foundation layer for road construction.	High potential in NHDOT infrastructure and municipal road beds.
Landfill Daily Cover	Alternative Daily Cover (ADC).	Critically needed at Four Hills (Nashua) and Mt. Carberry landfills.
Asphalt Manufacturing	Fine aggregate in hot-mix asphalt.	A preferred reuse pathway; used by major regional paving firms.
Structural Fill	Bedding for building pads or embankments.	Subject to site-specific NHDES risk assessment (Env-Sw 1500).
Flowable Fill	Low-strength concrete for utility trenching.	Demand in Manchester and Nashua urban utility projects.

6. Environmental and Technical Considerations

Groundwater and Watershed Protection

New Hampshire places high priority on protecting its surface and groundwater. For unbound structural fill, NHDES requires that SFS meet the state's most conservative soil-remediation standards (S-1) to ensure zero risk of metals or binders leaching into the state's vital watersheds.

Physical Stability

SFS from New Hampshire's investment casting foundries often has an extremely uniform grain size, making it a high-performance fine aggregate for specialized concrete and asphalt mixes that must withstand the state's severe freeze-thaw cycles.

7. Funding, Grants, and Incentives

NHDES Waste Management Grants

The NHDES occasionally offers grants for "Waste Reduction and Recycling" through the Solid Waste Management Bureau. Foundries investing in internal sand reclamation or high-value reuse hubs can apply for these funds to offset capital costs.

Business Finance Authority (BFA)

The **New Hampshire BFA** provides loans and guarantees for industrial manufacturers. Projects that improve environmental efficiency or reduce the state's reliance on out-of-state waste disposal may qualify for favorable financing terms.

8. Active Participants in New Hampshire

Major Foundries:

- **Hitchiner Manufacturing Co., Inc.** (Milford) - World leader in investment casting for automotive and aerospace.

- **Thompson Investment Casting** (Rochester) - Precision casting for defense and commercial sectors.
- **Patriot Foundry & Castings** (Regional service) - Specialized non-ferrous sand casting.
- **Numerous Precision Hubs:** Concentrated in the Merrimack Valley and Seacoast regions.

Potential End-Users:

- **NHDOT (New Hampshire Dept. of Transportation)** - Major aggregate consumer for highway maintenance.
- **Pike Industries, Inc.** (Regional) - Major asphalt, concrete, and paving contractor.
- **Brox Industries** (Dracut/Regional) - Large-scale paving and civil contractor.
- **WIN Waste Innovations / Mt. Carberry** - Significant users of Alternative Daily Cover (ADC).

9. Success Story Highlights

Milford-Nashua Paving Loop: Leading investment casting facilities in the Milford area, such as **Hitchiner Manufacturing Co., Inc.**, have successfully established long-term diversion programs for their spent mold sand. By securing a certification under Env-Sw 1500 for waste-derived products, these facilities transition their spent sand into certified asphalt aggregate for use in the regional transportation sector. This strategy avoids the high disposal fees at regional transfer stations (which can exceed **\$135.00 per ton**) and bypasses the state's **\$3.50 per ton** solid waste disposal surcharge. These initiatives provide regional paving companies with a high-purity silica source that meets strict highway-grade specifications while directly supporting New Hampshire's waste reduction goals and the state's solid waste hierarchy (RSA 149-M).

10. Clear Business Case Summary

1. **Avoidance of Gate Fees:** Directly saving up to **\$135.00 per ton** (Manchester Commercial rate).
2. **Exemption from State Surcharges:** Bypassing the **\$3.50/ton** state solid waste disposal surcharge.
3. **Logistics Optimization:** Utilizing sand in local Hillsborough or Rockingham County construction rather than hauling to remote MSW landfills.

11. Risk Management Overview

- **Stockpile Compliance:** Foundries must ensure that SFS is stored in a manner that prevents wind-blown dispersal and prevents contact with precipitation to satisfy NHDES performance standards.
- **BUD Reporting:** Failure to maintain accurate diversion logs and report annually to NHDES can result in the revocation of the BUD and retroactive classification of the material as solid waste.

12. Step-by-Step Workflow for Foundries

1. **Analytical Profiling:** Conduct a full 32-parameter chemical profile, including TCLP and totals.
2. **BUD Application:** Prepare and submit the formal application per **Env-Sw 1500**.
3. **Pre-Application Meeting:** Consult with the NHDES Solid Waste Bureau to review the project scope.
4. **End-User Match:** Secure an intake agreement with a local NHDOT project or asphalt plant.
5. **Implementation:** Maintain daily tonnage records and annual characterization updates for state audits.

13. Real Cost Savings Example

Scenario: A Hillsborough County foundry generating 2,500 tons of sand annually.

- **Disposal Cost (at \$138.50/ton incl. state surcharge):** \$346,250
- **Reuse Program (BUD Filing + Testing + Local Logistics):** \$75,000
- **Annual Savings:** \$271,250

15. General FAQ & Landfill-Specific FAQ

Q: Does NHDES have "pre-approved" beneficial uses?

A: While asphalt is common, NHDES generally requires a site-specific or material-specific BUD to ensure the unique chemical profile of the sand is safe for the intended application.

Q: Are C&D fees higher than MSW in New Hampshire?

A: Yes, Nashua recently set C&D rates at **\$300/ton**, highlighting the extreme economic benefit of re-classifying specialized sand streams as aggregate.

16. References

1. **New Hampshire Administrative Rules Env-Sw 1500:** Certification of Waste-Derived Products.
2. **New Hampshire Revised Statutes RSA 149-M:** Solid Waste Management Act.
3. **NHDES:** [Solid Waste Disposal Surcharge Guidance (Effective 2026)] (<https://www.des.nh.gov/waste/solid-waste/disposal-surcharge>).
4. **City of Manchester:** 2025-2026 Transfer Station Rate Schedule.
5. **City of Nashua:** Four Hills Landfill Fee Schedule (Effective 2026).
6. **EPA SMM Technical Guidance:** Foundry Sand in Transportation Applications.