



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
STATE HOUSE STATION 17 AUGUSTA, MAINE 04333

DEPARTMENT ORDER

IN THE MATTER OF

TOWN OF FALMOUTH)
Falmouth, Maine) SOLID WASTE ORDER
CLOSING PLAN)
#S-005138-7C-A-N) FINDINGS OF FACT AND ORDER

Pursuant to the provisions of Title 38, M.R.S.A., Section 1301 et. seg., and Department of Environmental Protection has considered the closing plan dated December 1988 of the TOWN OF FALMOUTH with its supportive data and other related materials on file and finds the following facts:

1. The project involves the closing of the Town of Falmouth municipal solid waste landfill located off Woods Road. Sited on approximately 60 acres of property, the solid waste boundary encloses approximately 10 acres.
2. In September of 1988, the Town stopped accepting household and commercial solid waste for disposal at the landfill. At that time, curbside solid waste collection began, serving most Falmouth residences. Curbside collection contractors and commercial haulers dispose at the Regional Waste Systems, Inc. (RWS) incinerator in Portland. At the landfill site, the Town maintains transfer containers for use by residents not served by curbside collection, and a recycling center open to all residents.
3. The Town continues to accept demolition debris and wood waste for disposal at the landfill. The Town accepts white goods and tires for storage at the landfill and recycling.
4. The Town proposes to continue disposing of wood wastes and demolition debris at the landfill until a regional facility opens. The Greater Portland Council of Governments (GPCOG) and RWS, each of which include Falmouth as a member, are actively seeking a suitable site for this regional facility. GPCOG and RWS estimate that the regional facility will begin accepting waste in 1990. As of April, 1989, however, the Department had not received an application for this facility.
5. The landfill is located directly on or within a few vertical feet of a fractured bedrock formation. Leachate and/or ground water is mounded within the landfill. Leachate-contaminated ground water seeps and surface water ponds occur at numerous locations within and outside of the solid waste boundary. The landfill is located within 300 feet of tributaries to Scitterygusset Brook and Mill Creek. Contamination of ground and surface water has been documented.

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6. The Town proposes to close the landfill in two phases. The Phase 1 closure area contains the sanitary landfill area in which solid waste disposal ceased in September 1988, and the existing wood waste and demolition debris disposal area. Phase 2 will close a proposed short-term wood waste and demolition debris disposal area as soon as the RWS regional facility is available. The Town will employ a construction superintendent to oversee closure construction and a Maine Registered Professional Engineer to assure the landfill is closed out according to the contract documents and a Department-approved plan.
7. The Town states that they previously covered approximately 3 acres of the landfill with "dense gray clay". Logs of test pits show that this layer ranges from 2 to 6 feet in thickness. The results of a sieve analysis show that this material contains greater than 35% fines. The Town proposes to use 1.5 acres of this area as the base for the Phase 2 demolition debris and wood waste disposal area. The remaining 1.5 acres are vegetated and will remain as final cover.
8. Phase 1 will cover about 10 acres. A composite synthetic membrane/soil system will be used on about 6.5 acres of relatively flat surfaces. Eighteen inches of clay will be used on about 3.5 acres of sideslopes. Prior to final construction of cover systems, the Town will clean the Phase 1 site of stockpiled white goods and tires and exposed solid wastes, and grade as necessary to achieve design contours. Final grades will be greater than 5 percent and less than 33 percent at all points. After initial grading, intake piping and risers for a gas venting system will be installed.
9. Preparation of a base for the 6.5 acre composite cover will entail hand-auger sampling and sieve analysis of existing soil cover to ensure that a minimum of 12 inches of minimum 35% fines soils overly solid waste at all points. Over the 12 inch minimum, an additional 6 inches of minimum 35% fines soils will be compacted in accordance with Department regulations. A 30-mil polyvinyl chloride (PVC) geomembrane will be installed over the compacted 6-inch layer. The Town proposes to overlap the sideslope clay with a 2 foot strip of the membrane edge. Prior to placement of soil layers over the installed PVC, the Town will require that a manufacturer's representative certify that the membrane is properly installed on a prepared base. Membrane seams will undergo destructive and vacuum testing. The membrane will be covered with 12 inches of drainage sand, a filter fabric, 9 inches of common borrow, and 3 inches of loam, in ascending order. The Town proposes an optional substitution of 6 inches of "synthetic topsoil", a mixture of papermill sludge from S.D. Warren Co., Westbrook, and inert soil, for the loam. Finally, the loam or synthetic topsoil will be seeded and mulched.

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10. The Department has received an application from Resource Conservation Services, Inc., for program approval to use "synthetic topsoil" as the surface layer of landfill covers independent of a specific site.
11. On the Phase 1 sideslopes, 18 inches of clay will be installed in compacted 6 inch lifts. Compaction equipment will be capable of bonding lifts by penetrating deeper than individual lift thickness, or alternative method of bonding. Clay will be source tested for sieve analysis, and source and in-place tested for moisture, density and permeability. An independent party will perform at least 2 field density tests and 2 moisture content tests per acre per lift, and 3 permeability tests per acre for the total thickness. Average in-place permeability will not exceed 1×10^{-7} centimeters per second. Overall permeability will not exceed 5×10^{-7} centimeters per second. In-place test results and a plan showing the in-place test locations will be submitted to the Department within 30 days of completion. The clay will be covered with 6 inches of common borrow, followed by 3 inches of loam or 6 inches of synthetic topsoil. The top surface will be seeded and mulched.
12. In preparation for Phase 1 construction, the Town will relocate demolition debris and wood waste disposal operations to the designated Phase 2 area. Waste will be deposited against the closed Phase 1 sideslope, beginning at the southeast corner of the Phase 2 area and progressing to the north and west. Upon availability of the RWS regional facility, the Town will cease accepting these wastes, grade the Phase 2 site to design contours, and install a final clay cover as described in Finding of Fact number 11 of this Order.
13. Landfill gas will be controlled by means of 11 passive vents installed in the synthetic/composite cover area. Each vent will consist of 4 to 10 foot lengths of perforated pipe, connected to each other at right angles, buried in a crushed-stone-lined trench in the intermediate cover, and connected to a vertical riser. A boot seal will be furnished at each riser membrane interface. Each riser will end in an inverted U above the final topsoil layer. No gas vents were proposed for the previously covered area or for Phase 2, due to the low potential for gas generation or concentrations within the predominantly inert material buried in these areas. Gas buildup in on-site buildings is unlikely due to a reinforced concrete foundation and good ventilation. Off-site gas migration is unlikely due to the high water table in the area. There are no off-site buildings within 1000 feet of the site.

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14. The proposed cover systems are designed to stop infiltration from recharging the ground water mound within the solid waste. Precipitation which infiltrates the vegetated cover topsoil over the synthetic cover area will flow within the sand layer above the membrane, collect in the perforated pipe underdrains, and combine with surface runoff in riprap channels which will channel drainage away from the disposal area and any nearby recharge zones.
15. Grade design and vegetation of the cover minimize the potential for erosion. Surface contours will direct drainage from the west corner of the site southeasterly via a clay-lined ditch along Woods Road and from the highest landfill elevation southerly via a vegetated channel. These channels will drain into the Scitterygusset Brook tributary stream and pond area adjacent to the south corner of a site. Drainage ways are designed to manage flows from the 25 year stormevent.
16. Silt fencing and hay bales will be installed at designated locations to prevent transport of sediment below sideslopes and within drainage channels. These erosion checks will be placed prior to construction or as early as possible during construction and will remain in place until the areas above the erosion checks are stabilized and permanent vegetation established. Cleaning, repairs and/or replacement of the fences will occur as necessary to maintain filtering capability.
17. Following addition of lime and fertilizer, the topsoil will be seeded at a prescribed rate with a mixture of 58 percent flat pea, 38 percent creeping red fescue and 4 percent red top. Flat pea requires little maintenance, inhibits the growth of woody plants, and improves bank stability. Drainage and temporary locations will be seeded with a lower-cost, more moisture-tolerant mix of fescues, bluegrass, and clover.
18. Leachate contamination of the ground water stems from mounded groundwater in contact with landfilled solid waste. Ground water from the landfill seems to flow through an abandoned cable trench to surface water, where contamination has been detected. The success of the completed closure in deflating the mound will be evaluated with respect to changes in ground water table and surface water quality. If the ground water remains mounded within the landfill, or if surface water quality does not improve, further study will be required to identify appropriate remedial measures.
19. The Town submitted chemical analysis result from one set of groundwater monitoring well and surface water samples collected in November 1987. Analytes included Ca, Cl, Fe, Mg, hardness, specific conductivity, chemical oxygen demand, and pH. Surface water samples and most of the monitoring wells showed contamination significantly above ambient levels. The Town proposed a quarterly ground and surface water monitoring program for the same parameters listed above. The Department technical review indicated that a more extensive monitoring program will be necessary at the proposed sampling points.

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20. Thirty days prior to the start of closure construction, the Town will contract with a professional pest control company for rodent extermination, weekly until construction is completed and as necessary thereafter.
21. The site will be inspected and maintained continuously during construction, quarterly during the first year following completion, and annually thereafter. Inspection targets include, but are not limited to, erosion, siltation, clogged drainages, vegetation decline, slope failures, leachate breakouts, and unapproved waste disposal. Prompt and efficient repairs and measures to eliminate causes will follow reported problems. Newly seeded areas will be inspected and maintained weekly until vigorous coverage exceeds 85 percent of the area.
22. The Town will contract with scrap processors or haulers for removal and ultimate disposal or recycling of the white goods pile, and removal or on-site chipping and burial of the tire pile, to allow the use of the current tire and white good stockpile area for ongoing demolition and wood waste disposal.
23. Upon completion of the closing, the Town will submit a deed amendment to the Cumberland County Registry documenting the type and extent of wastes, the extent of cover, and the date of closure. This amendment will serve as a permanent record of the existence of a closed-out landfill on the property.
24. Thirty days in advance of closing the landfill for demolition and wood waste disposal, the Town will post a notification at the landfill and publish an advertisement in a local newspaper. The location and hours of the RWS regional facility, and a rodent extermination schedule and warning will be posted at the Falmouth site. The Town proposes to construct Phase 1 closure during 1989. Construction of Phase 2 during 1990 depends on the schedule for opening the regional facility.

BASED on the above findings, the Department concludes that the Town of Falmouth has complied with the requirements of the Department of Environmental Protection Regulations, in effect as of December 1988, Chapter 401, Section 5 for the closing of the Falmouth landfill and THEREFORE, the Department APPROVES the Closing Plan for the TOWN OF FALMOUTH, Maine subject to the following conditions:

1. The Standard Conditions of Approval, a copy attached.
2. Prior to the start of Phase 1 construction, the Town shall arrange for removal of the white goods pile and removal or chipping and burial of the tire pile.
3. Prior to starting installation of the final 6 inches of cover soil immediately underlying the synthetic membrane, the applicant shall survey the existing graded cover and add additional material as necessary to ensure a minimum 12 inch thickness of satisfactory (greater than 35 percent fines) material, and submit survey results to the Department for approval prior to installation of the final six inches.

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4. At least 30 days prior to starting installation of the flexible membrane cover material, the Town shall submit a seam testing plan to the Department, including types, locations, frequency, and performance criteria to tests, for approval.
5. The sources of cover material and topsoil, results of sieve analysis, and mining plans for these materials, as may be required by Department regulations, shall be submitted to the Department for approval at least 30 days prior to the placement of cover soils.
6. Proposed mixing locations for "synthetic topsoil" and a procedure for stockpile management shall be submitted to the Department for at least thirty days prior to placing any of this material. Information on "synthetic topsoil" makeup and material characteristics shall comply with the general program for utilization of this material, or, if the Department has not granted program approval, shall be included in the abovementioned submittal.
7. All proposed water quality monitoring points, i.e. groundwater wells and surface water locations, shall be sampled at least quarterly and analyzed for the Detection set of monitoring parameters listed in the Department Rules, Chapter 401. For two of the four episodes, corresponding to yearly high and low water, samples shall be analyzed for the additional Baseline parameters. Analysis results shall be submitted to the Department within 10 days of their receipt by the applicant. Semiannual Baseline parameter analysis shall continue for those analytes present in concentrations greater than Minimum Containment Levels (MCL's) to be furnished by the Department. Analytes with concentrations less than MCL's may be omitted from the semiannual program, with Department approval.
8. Within 30 days of the Public Notice date for Phase 2 closure, the applicant shall provide evidence that a deed amendment constituting a permanent record of the site has been filed with the Cumberland County Registry.
9. The applicant shall submit copies of the following to the Department within 10 days of their receipt by the applicant: results of all source and in-place cover soil tests, and flexible membrane cover seam tests; construction and post-construction maintenance inspection reports; and certification of proper synthetic membrane installation.
10. An interim report prepared by a Maine Registered Professional Engineer certifying that the Phase 1 closure was conducted according to the Department-approved closing plan shall be submitted to the Department within 30 days after completion of Phase 1 construction.

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11. A final report prepared by a Maine Registered Professional Engineer certifying that the overall closure was conducted according to the Department-approved closing plan shall be submitted to the Department within 30 days after completion of Phase 2 construction.

DONE AND DATED AT AUGUSTA, MAINE THIS 5th DAY OF June, 1989

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY:

Dean C. Marriott
Dean C. Marriott, Commissioner

PLEASE NOTE ATTACHED SHEET FOR APPEAL PROCEDURES....

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