

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS  
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
ADMINISTRATIVE ADJUDICATION DIVISION

IN RE: Rhode Island Solid Waste Management Corporation

DECISION AND ORDER

This matter was heard before the Department of Environmental Management Administrative Adjudication Division for Environmental Matters ("AAD") on June 8, 9, 10, 15, 16, 17, 22 and 23, 1992 pursuant to the Order of the Rhode Island Superior Court wherein this action was remanded to the Rhode Island Department of Environmental Management ("DEM") to permit the Rhode Island Solid Waste Management Corporation ("Corporation") to present, pursuant to its Petition filed with the DEM, additional evidence concerning proposed emissions limitations.

In order to expedite appropriate review, the AAD had remanded this matter on January 30, 1991 to the DEM Division of Air and Hazardous Materials ("Division") for analysis of the technical data which would be submitted and to prepare a draft decision on the Petition. Following issuance of the draft decision, this matter returned before the Hearing Officer for adjudicatory hearing on the draft decision.

Background

The parties have provided a summary of the history of this case which is attached hereto as Appendix A.

Prehearing Conference

While there were and are other counsel of record, the parties' primary attorneys are as follows:

Rhode Island Solid Waste Management Corporation	Richard A. Sherman
Division of Air and Hazardous Materials	Claude A. Cote
Town of North Kingstown	Harlan M. Doliner

Several conferences were conducted in order to simplify the procedure herein. Pursuant to order of the Hearing Officer, the parties submitted a Delineation and Limitation of Issues Before the Hearing Officer, dated April 13, 1992 (attached hereto as Appendix B), and agreed to the prefiling of direct testimony.

The Corporation presented three (3) expert witnesses: Richard C. Hittinger, Thomas C. Erikson, and Robert A. Michaels. Their prefiled direct testimony were marked as full exhibits and are listed below.

The Division called three (3) expert witnesses: Douglas McVay, Barbara Morin, and Stephen J. Majkut. Their prefiled direct testimony were marked as full exhibits and are listed below.

The Town presented one lay witness, John J. Kupa, Jr., and four (4) expert witnesses in its case in chief: Stephen G. Zemba, Laura C. Green, Dominique Brocard, and Charles B. Cooper. Their prefiled direct testimony were marked as full exhibits and are listed below.

Prior to hearing, the parties stipulated to the areas of expertise of the above-named witnesses (attached hereto as Appendix C).

The prefiled direct testimony of Paul E. Flaherty was not accepted as an exhibit as Mr. Flaherty was unavailable for cross-examination by the parties. An additional witness, John R. Martin, was called by the Town for rebuttal and was qualified as an expert in meteorology and air modeling.

The parties stipulated that all exhibits listed on the document attached hereto as Appendix D, be admitted into evidence as full exhibits. The exhibits were marked "AAD -" to distinguish them from exhibits admitted in the adjudicatory hearings which took place prior to the existence of the AAD and which were the subject of the appeals in Superior Court.

Appendix D identifies exhibits AAD - 1 through AAD - 16G. At hearing, the following documents were also submitted and marked as follows:

- |                          |   |
|--------------------------|---|
| AAD - 17<br>Full Exhibit | Prefiled Direct Testimony of Richard C. Hittinger   |
| AAD - 18<br>Full Exhibit | Prefiled Direct Testimony of Thomas C. Erikson  |
| AAD - 19<br>Full Exhibit | Prefiled Direct Testimony of Robert A. Michaels   |
| AAD - 20<br>Full Exhibit | Document entitled "Selection of Appropriate Water-to Fish Bioconcentration Factor for Mercury Based Upon Data Submitted By the Town of North Kingstown, Rhode Island" |

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AAD - 21 Full Exhibit	Table 122.2. Incremental Worst-Case Non-Cancer Risks Potentially Posed to Women Fishing Recreationally in Belleville Pond
AAD - 22 Full Exhibit	Table 123.5. Incremental Worst-Case Lifetime Cancer Risks Potentially Posed to Women Fishing Recreationally in Belleville Pond
AAD - 23 Full Exhibit	Affidavit of Douglas McVay
AAD - 24 Full Exhibit	Affidavit of Stephen J. Majkut
AAD - 25 Full Exhibit	Affidavit of Barbara Morin
AAD - 26 Full Exhibit	Letter of Thomas E. Wright, Corporation, to Thomas Getz, Division, dated August 16, 1991, with attachments
AAD - 27 Full Exhibit	Prefiled Direct Testimony of Stephen G. Zemba
AAD - 28 Full Exhibit	Affidavit of John J. Kupa, Jr.
AAD - 29 Full Exhibit	Prefiled Direct Testimony of Laura C. Green
AAD - 30 Full Exhibit	Prefiled Direct Testimony of Dominique Brocard
AAD - 31 Full Exhibit	Prefiled Direct Testimony of Charles B. Cooper
AAD - 32 Full Exhibit	Resume of John R. Martin
AAD - 33 Town for ID	ISCST Model Treatment of Tall vs. Squat Building
AAD - 34 Full Exhibit	Graphic entitled, "Conclusions: Local fish consumption was seriously underestimated for two cases in the Health Risk Assessment."

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AAD - 35                    Graphic entitled, "Conclusions: Local fish  
Full Exhibit                consumption was so seriously underestimated that  
                                 it doesn't even represent levels for one species  
                                 alone during a fishery closure in nearby  
                                 communities."

AAD - 36                    Graphic entitled, "Conclusions Migration is of no  
Full Exhibit                importance to the Health Risk Assessment for key  
                                 species such as clams, flounder, and lobster.  
                                 Studies in other New England bays show that these  
                                 species have pollutant residues related to those  
                                 in water and sediments in the areas in which they  
                                 are caught."

#1 DAHM                    Permit issued to Ogden Martin Systems of Bristol,  
for ID                        Inc./Bristol Resource Recovery Facility by the  
                                 State of Connecticut Department of Environmental  
                                 Protection, dated May 26, 1989.

Arguments

Corporation's Position: The Rhode Island Solid Waste Management Corporation asserts that it has satisfied or is capable of satisfying all specific regulations, standards, criteria and guidelines for the issuance of the draft revised permit by the Division and, further, that the permit should be amended in two respects: by exempting the facility from applicable emissions limitations for malfunctions whose duration is less than three hours, and by providing for quarterly stack testing for the first full year of operation with annual tests thereafter rather than the PSD Permit's requirement of quarterly stack testing over a five year period.

Division's Position: The Division of Air and Hazardous Materials states that its draft decision document is reasonable and appropriate and in accordance with applicable laws, regulations and guidelines.

Town's Position: The Town of North Kingstown asserts that the data relied upon for the Health Risk Assessment (AAD - 7; it may also be referred to herein as "HRA") was flawed and therefore the assessment itself became deficient; further, if the HRA were corrected, then the risk index maxima set by the Division would be exceeded. Among its issues, the Town questioned calculations regarding volume of Narragansett Bay, bioconcentration factors (BCFs) for mercury, lead, and chromium in fish and for mercury, cadmium, lead, and nickel in waterfowl, assumptions on fish and waterfowl consumption, the appropriateness of using the COMPDEP model for deposition modelling, and the lack of nitrogen oxide (NOx) offsets.

The Town concurred in the Division's position that the stack testing and malfunction provisions of the PSD Permit should remain unchanged.

#### HEARING SUMMARY

The prefiled testimony of the witnesses was accepted and marked as a full exhibit as each individual was presented for cross examination.

Since the Division and Corporation agree on most elements of the proposed revisions to the PSD Permit, I will first address those issues where they have reached disparate conclusions.

I. Facility Malfunctions

The thrust of the Corporation's argument and testimony is that the facility should be exempted from emissions limitations during malfunctions whose duration is less than three hours, just as unit start-up and shutdown are exempt. Mr. Thomas C. Eriksen, facility manager for Ogden Martin System of Bristol, Inc., a 650-ton per day mass-burn waste-to-energy (resource recovery) facility located in Connecticut, in his prefiled direct testimony (AAD-18), stated that such an exemption would be consistent with the requirements of the New Source Performance Standards found at 40 C.F.R. § 60.58a(a), just as the unit start-up and shutdown provisions are presently consistent. The rationale for such an exemption, as elicited in testimony, is that emissions exceedances during certain malfunctions "will be much shorter in duration than that resulting from plant shutdown and start-up." (AAD-18, p.3). The result, therefore, could be fewer exceedances and less wear and tear on the equipment. (AAD-18, p. 4).

Under cross examination by the Division and Town, Mr. Erikson stated that the Bristol facility was not subject to the New Source Performance Standards as the Connecticut permit pre-

dated issuance of the federal standards (TR June 9, p. 56); that the Connecticut permit (#1 DAHM for ID) does not exempt the facility from emissions limitations during malfunctions but allows some modifications to limits for SO<sub>2</sub> and TSP emissions (TR June 9, pp. 58, 59, 63); that he was not familiar with the Quonset Point facility control systems (TR June 9, p. 72); that the Connecticut permit allows no relief during malfunction on emissions limitations for organic substances, for acid gases other than SO<sub>2</sub>, for NO<sub>x</sub>, nor for lead, mercury, fluorides, beryllium, or carbon monoxide (TR June 9, pp. 91-93).

Douglas McVay, in charge of permits within the Division's Air Section, explained the state's policy that a source owner or operator "has an obligation to maintain his facility in compliance with stated emission levels at all times" and that individual exceedances would be evaluated on a case-by-case basis. (TR June 15, p. 18). Further, to allow such an exemption could lead to repeated short duration malfunctions indicative of a more severe problem but which would evade scrutiny and analysis by the Division. (TR June 15, p.19). Mr. McVay conceded that the lack of experience of Division personnel in operating and regulating such facilities may have been a factor in adopting a stricter policy than that set forth in the New Source Performance Standards. (TR June 15, p. 50).



Conclusion

Having considered the evidence presented, I conclude that while the rationale to avoid plant shutdown and start-up for minor incidents is a valid one, the Corporation has not met its burden to show that a blanket exemption for all malfunctions lasting less than three hours would be protective of the public health and environment and in compliance with the Division's Regulations.

II. Stack Testing Frequency

The Corporation also seeks to amend Condition F.2 of the PSD permit to allow for quarterly stack testing for the first full year of Facility operation with annual stack testing thereafter; the PSD permit issued by the Division requires quarterly stack testing for a period of not less than five (5) years and allows the Division, in its sole discretion, to modify this testing protocol as to the frequency of testing and/or the pollutants measured after the expiration of this period.

In the prefiled testimony of Mr. Hittinger (AAD-17, pp. 19-21), the Corporation's witness explained three reasons for the requested change: that five (5) quarterly tests (the initial performance stack test plus the quarterly stack testing in the first year of Facility operation) would produce a reliable database and that, besides being costly, subsequent quarterly tests will not "significantly" increase the statistical reliability of the database (at 20); that the change in testing

frequency "is consistent with and based upon the methodology used (and approved by the Division) to calculate allowable emissions for the Facility" (at 20); and that, pursuant to the draft revised PSD permit, the Facility would have a continuous monitoring system in place which would transmit emissions data to the Division and enable it "to predict compliance with emissions limitations on virtually an instantaneous basis" (at 21).

On this latter issue, Mr. Hittinger testified that the facility would have continuous monitoring for each of the following: temperature; combustion air flow; MSW feed rate; baghouse pressure drop; opacity; oxygen; spray dryer pressure drop, temperature and lime flow; and emissions of carbon monoxide, sulfur dioxide, NO<sub>x</sub>, and hydrogen chloride (when equipment becomes available). AAD-17, p. 21. But there would be no continuous monitoring of other pollutants for which stack testing is required: antimony, arsenic, beryllium, cadmium, chromium, chromium VI, cobalt, copper, lead, manganese, mercury, molybdenum, nickel, selenium, tin, vanadium, zinc, polynuclear aromatic hydrocarbons, benzo-a-pyrene, polychlorinated dibenzo-p-dioxins, polychlorinated dibenzo-p-furans, ammonia, hydrogen fluoride, formaldehyde, chlorobenzenes, chlorophenols, and polychlorinated biphenyls. (TR June 8, p. 43; AAD-15B, p. 10).

Though the witness testified that certain factors which would be continuously monitored would be an "indication" of the non-monitored pollutants, he was not familiar with any such formula; was not familiar with the activated carbon injection system which would be used by the facility; had no "quantitative idea" of the relationship between the monitored factors and the non-monitored pollutant emissions; and conceded that gaseous mercury, one of the most important pollutants evaluated in the risk assessment prepared in support of the modification of the permit, might be emitted at a rate exceeding permit limitations and not show up through the continuous monitoring system. (TR June 8, pp. 44, 46, 48). Mr. Hittinger also conceded that under the federal New Source Performance Standards, compliance and performance testing cannot be done with a continuous monitoring methodology like the one set forth in the recommended draft PSD permit. (TR June 8, p. 176).

Mr. Hittinger's other rationale for a change in testing frequency also received scrutiny under cross examination. The requirement for quarterly stack testing over a five-year period was the recommendation of Hearing Officer Malcolm Grant in May 1989 (it is unclear whether testing frequency was an issue at the Grant hearing--see TR June 8, p. 22). The witness disputed whether such a testing frequency was consistent with the methodology used by the Division to calculate emissions for the revised permit. He testified that, because the ratio of short-

term to long-term emissions was included in the back--calculations from impacts which would not cause any exceedance of applicable acceptability criteria, an additional safety factor in the establishment of the emissions limitations would result and, therefore, annual testing, rather than quarterly, would be consistent with the allowable emissions (AAD-17, p. 20; TR June 8, pp. 28-31).

It appears from the testimony of this witness, as well as in the cross examination of Douglas McVay, that the requirements and conditions for the initial PSD permit issued in October 1989 have undergone some revision: the Division's recommendation for an amended permit contains, with the exception of lead, only one set of emissions limitations for metals and all other pollutants evaluated in the health risk assessment, rather than the two sets of emissions rates (for annual averaging and for the not-to-exceed or short-term limits) set forth in the initial PSD permit; further, the initial permit did not have the benefit of the multi-pathway health risk assessment which was so crucial to arriving at the current draft permit. (TR June 15, pp. 27-28).

A review of exhibits AAD-16B, AAD-16D and AAD-16G, which are memoranda from Mr. McVay and from Stephen J. Majkut, the licensed Professional Engineer in charge of the Division's Air Section, to Thomas D. Getz, Chief of the Division of Air and Hazardous Materials, indicates that they felt bound by Hearing Officer Grant's determination that quarterly stack testing

should continue over a five-year period. In the March 5, 1992 memorandum to Getz (AAD-16B), McVay quoted Malcolm Grant's Decision and Order on the original application: "Quarterly testing of stack emissions provides a reasonable method of monitoring compliance with annual emissions averages. However, quarterly testing for one year is not sufficient to measure compliance on an on-going basis . . ." (at 2). He concluded that the petition did not include any documentation to support a change in the Hearing Officer's finding and therefore could not recommend any alteration in testing frequency. (See also AAD-16G, p. 2).

The final basis for the change in testing frequency was the cost-effectiveness issue. In his cross examination by Town's counsel, Mr. Hittinger stated "Certainly the money issue is the cost side. I've looked at the effect of the additional tests." (TR June 8, pp. 40-41). His analysis of the effect, as set forth in his prefiled testimony, was that the incremental improvement in reliability with each additional quarterly testing would become smaller and smaller as the number of stack tests increased. (AAD-17, p. 19). Mr. Hittinger further stated in his prefiled direct that "statistically speaking, 5 is an appropriate number of stack tests in order to produce a reliable database, subsequent quarterly tests will not significantly increase this reliability." (At 19, 20).

Yet, Mr. McVay's testimony indicated that he had reviewed stack testing results from a number of Ogden Martin facilities and found test results for certain pollutants at the same facility "which can differ several orders of magnitude, ten, one hundred times as opposed to the two times that Mr. Hittinger had suggested in his testimony." (TR June 15, p. 58). Both witnesses agreed that the more tests conducted, the better the quality of the data (Hittinger, TR June 8, p. 40; McVay, TR June 15, p. 59).

Conclusion

The quarterly stack testing required in Condition F.2 of the PSD Permit essentially serves two purposes: to obtain a reliable database of the facility's emissions and to monitor the facility's compliance with emission standards and requirements. Hearing Officer Grant's Decision and Order appears to focus on the latter issue: "quarterly testing for one year is not sufficient to measure compliance on an on-going basis." And the memoranda of the Division's witnesses McVay and Majkut is clear: they did not consider whether circumstances had changed since the Grant determination, specifically that the short-term emissions limits had been dropped and the emissions rates formula had been revised. Absent these changes and the fact that the Division apparently felt it could not take them into account and investigate whether a change in testing frequency was reasonable, the prior Decision would, of course, stand.

In light of Mr. McVay's testimony about the variations in the Ogden Martin facility test results, however, I cannot find that the Corporation has met its burden to show that one year of quarterly stack testing would provide a sufficient database. Clearly, without that statistical reliability, compliance might be difficult to monitor, especially in the early operation of the facility.

While I cannot recommend that the Director adopt the Corporation's proposed amendment to the PSD permit, under the changed circumstances of the revised "Permit Conditions and Emission Limitations Quonset Point Resource Recovery Facility RI-PSD-2" as recommended by the Division, the requirement of quarterly stack testing for a five-year period may be, as the Corporation suggests, "regulatory overkill." (Final Argument of Rhode Island Solid Waste Management Corporation on Proposed Revised PSD Permit For Quonset Point Resource Recovery Facility, p. 11). Only as the data becomes available, however, can this determination be made, as can be seen in Mr. McVay's analysis of other Ogden Martin facilities.

The present language of Condition F.2 of the PSD Permit vests in the Division "sole discretion" to modify the testing protocol after five years. I recommend that the Division maintain this discretion but that such authority vest at the conclusion of the facility having operated two full years.

III. Health Risk Assessment

In order to obtain modification of its PSD permit, the Corporation, pursuant to Air Pollution Control ("APC") No. 7, "Emission of Air Contaminants Detrimental to Person or Property" and APC Regulation No. 9, "Approval to Construct, Install, Modify or Operate", submitted, among other documents, a multi-pathway human health risk assessment ("HRA"). The Division required that the HRA follow the methodologies and assumptions set forth in the 1990 EPA document entitled Methodology for Assessing Health Risks Associated with Indirect Exposure to Combustor Emissions (AAD-5) for the purpose of calculating exposures, except in instances where it could be documented that another methodology was more appropriate; Exhibit AAD-5, therefore, became the guiding document for the HRA.

Several drafts of the HRA were submitted to the Division for review and comment. The final evaluation was completed on February 24, 1992 by Barbara Morin, Principal Engineer for the Division. (AAD-12, AAD-12A).

Following review of the amended petition and its supporting documents, the Division determined that the proposed facility complied with the regulatory requirements and standards identified in APC Regulations No. 7 and No. 9 (AAD-1; AAD-2), the Guidelines for Assessing Health Risks from Proposed Air Pollution Sources (AAD-3), and the Guidelines for Assessing the Welfare Impacts of Proposed Air Pollution Sources (AAD-4).



Thereafter the Division issued a revised "Permit Conditions and Emission Limitations Quonset Point Resource Recovery Facility RI-PSD-2" (AAD-15; AAD-15A), which represented its recommendation for an amended Permit. The Division has confirmed that, following the testimony and evidence presented at the June 1992 hearing, it remains committed to its position as outlined in the draft revised permit. (Post Hearing Memorandum--Proposed Findings of Fact and Conclusions of Law Submitted by the Division of Air and Hazardous Materials, p. 2.)

In contrast, the Town aggressively attacked many aspects of the HRA: its assumptions and calculations, erroneous information and typographical errors, and the standards applied.

a. Standards and Criteria

The standards and criteria employed by the Division in its review of the HRA were whether it was adequately conservative to protect human health based on the use of the hypothetical maximum exposed individual ("MEI") having assumed exposures to predicted maximum Facility emissions through a number of different routes and pathways and whether the calculated results of such exposures were less than the various acceptable levels of risks set forth in the DEM Guidelines and as set by the Division. (See AAD-3; AAD-12A.) In interpreting its own regulations and guidelines, the Division determined the degree of conservativeness which it believed was adequate, and under

Gryguc v. Bendick, 510 A.2d 937, 939 (R.I. 1986), such interpretation by an administrative agency must be given great weight.

The standard "adequately conservative" was addressed by Barbara Morin, the Division's expert in the evaluation of health risk assessments, who indicated that the Division made or approved conservative assumptions which were generally protective. (TR June 15, p. 70). In the Corporation's cross examination, she cautioned against being overly conservative:

However, there is a phenomenon where if each assumption you make is very conservative, they become in many cases additive or even multiplicative, so you might end up with some -- the net total of that to be an extremely conservative assumption and that it is something that we sought to avoid where possible, that there may be some cases where someone is very far -- to the far end of a distribution of where most of the population lay and that we didn't necessarily aim for that or we didn't necessarily aim for any assumption that we knew would absolutely protect 100 percent of the population because in many cases that might be several orders of magnitude higher than what 95 percent of the population would be expected to be exposed to, that we -- we felt that because of the multiple pathways that were being considered and the number of assumptions and number of routes that had to be evaluated that we had to pick assumptions that were conservative but were not assumptions that necessarily we were sure would characterize exposure of 100 percent of the population. (At 70-71).

b. Fish and Waterfowl Consumption

The Town presented several witnesses, particularly Messrs. Kupa and Cooper, who challenged certain assumptions in the HRA regarding local fishing and hunting for consumption. Both witnesses relied largely on their own recreational fishing

experience to demonstrate that fish and waterfowl consumption exceeded assumptions, and questioned whether such assumptions were therefore "adequately conservative."

Dr. Michaels, the President of RAM TRAC Corporation, a company which provides toxicology and health risk assessment consulting services, and who prepared the HRA for the Corporation, testified that he made "extremely conservative" assumptions of other aspects of fish consumption: all fish consumed were from Narragansett Bay and that 10.8 percent of the fish were continuously residing at the point of maximum impact and neither migrated nor moved during their entire life cycle; and none of the pollutants would be lost in food preparation and cooking. (TR June 10, p. 85, 93-94). The witness also testified that the concentration of pollutants in the Bay had been overestimated due to errors regarding bay volume and the flushing rate of the bay; the effect being that the concentration of pollutants assumed in the risk assessment should be reduced by 43 percent because of the volume differential and reduced an additional "factor of ten" due to the miscalculation of flushing rate. (TR June 10, pp. 86-87).

In a related matter, Barbara Morin, testifying for the Division, indicated that she had recalculated the Belleville Pond scenario since the HRA had used the wrong fish ingestion rate. She used an even more conservative exposure number than

that provided by the Town and concluded that there still was not a problem for the hypothetical recreational fisherwoman in Belleville Pond. (TR June 15, pp. 95-96).

Dr. Michaels was also questioned about his assumptions regarding hunting in the area. In his cross examination by Town's counsel, Dr. Michaels explained his conclusion that there "would not be very much hunting going on" due to the industrial park and suburban nature of the area. (TR June 9, p. 147). Whatever consumption of local game or waterfowl was accounted for in the study's assumption that the local diet included consumption of farm animals which were assumed to be 100 percent of the year present at the farm of maximum impact. (TR June 9, pp. 147-149).

In light of the testimony of Dr. Michaels and considering that the Town's witnesses presented only individual case studies and no indication of how the consumption would apply to the population at large, I find that the HRA assumptions were adequately conservative. Additionally, while there may be individuals whose exposure exceeds that evaluated in the HRA for a particular pathway, given the hypothetical MEI and conservative assumptions for all pathways, it is extremely unlikely for an actual person to be exposed to the maximum exposure calculated for each pathway evaluated in the HRA.

c. Mercury Bioconcentration Factor ("BCF")

Of particular concern to Mr. Cooper, a senior consultant and manager of the Applied Waste Technology Unit at Arthur D. Little, Inc., who testified on behalf of the Town regarding his critical review of the various scientific and socioeconomic methods and data required to characterize exposure conditions in the HRA, was the calculation used by the Corporation of the bioconcentration factor (BCF) for mercury in fish.

Dr. Michaels had used a 5,500 value obtained from the U.S. EPA Ambient Water Quality Document which number was subsequently approved by the Division. (TR June 10, p.34; AAD-7 Table 17, following p. 116; AAD-12A, p. 22). The Town sought the BCF of 16,332. (AAD-31, App. B (5)).

Data elicited from Dr. Michaels and separately provided by the Town to the Division indicates that different kinds of fish and shellfish have different mercury BCFs. Dr. Michaels, through a series of calculations apportioning the consumer's diet with high mercury BCF fish with lower mercury BCF fish concluded that the 5,500 value was still valid (TR June 10, pp. 120-122). After reviewing the Town's information, however, Barbara Morin disagreed and recalculated the hazard of pollutant emissions to the MEI using approximately the same BCF as recommended by the Town. In this sensitivity analysis, the Division found that no acceptability criteria were exceeded even when using the elevated BCF value. (AAD-12A, pp. 22, 30-35).

d. NO<sub>x</sub> Offsets

The Town contends that the NO<sub>x</sub> offset provisions of the Clean Air Act Amendments of 1990, 42 U.S.C. §§ 7401 et. seq. (the "1990 Amendments") apply in the instant case. As presented in the Town of North Kingstown's Closing Memorandum and as elicited in the Town's cross examination of Mr. McVay, the 1990 Amendments require emission offsets for NO<sub>x</sub> emissions of major stationary sources in severe non-attainment areas for ozone. While Mr. McVay agreed that the Quonset Point Resource Recovery Facility would be a major stationary source of NO<sub>x</sub> and that Rhode Island is considered a severe non-attainment area for ozone, no emission offsets for the NO<sub>x</sub> emissions were required because the facility presently has a valid permit which was obtained prior to the enactment of the offset requirement. (TR June 15, pp. 46-49, 59-60).

Further, if the revised PSD permit was determined to be a "modification" under the 1990 Amendments, thus subject to offset requirements, then no regulations or guidelines exist, whether by the R.I. Department of Environmental Management or the EPA, to govern the process. As Mr. McVay (as a regulator) and Corporation's counsel explained, Rhode Island had not promulgated rules to carry out the 1990 Amendments by incorporating offsets into its permitting requirements and had until November 15, 1992 to do so. Following receipt by the EPA of Rhode Island's State Implementation Plan ("SIP") containing

provision for offsets in the State's permitting requirements, the EPA has a year to review and determine its approval. Only after the completion of this process will the state have put into place a mechanism to administer the offset provisions of the 1990 Amendments. As of the hearing, the EPA had also not yet adopted NO<sub>x</sub> guidelines. (TR June 15, p. 60; Final Argument of Rhode Island Solid Waste Management Corporation on Proposed Revised PSD Permit for Quonset Point Resource Recovery Facility, pp. 35-38).

e. Deposition Modelling - COMPDEP

In determining which model should be utilized to gauge deposition of pollutants, the Division preferred a model which would predict dry deposition with sehmel curves and still use the Slinn approach to wet deposition, according to the Corporation's witness Hittinger. Mr. Hittinger testified that the only model available which could meet these requirements was the COMPDEP model. (TR June 8, pp. 183-184).

The Town has questioned the use of the COMPDEP model and, in its rebuttal case, presented John R. Martin as its expert in meteorology and air modelling. While he was qualified as an expert in both categories, it was clear in voir dire that his experience with deposition modelling was limited.

Despite testimony about the inadequacies of COMPDEP and with particular regard to the Sunshine Day Care Center, Mr. Martin conceded that wet deposition would likely not be affected

by use of a different model and that dry deposition, which amounted to only 1.4 percent of total deposition at the Center, even if increased by 80 percent would still not be significant in relation to total deposition. (TR June 23, pp. 54, 59, 60).

f. Conclusion

In conducting the risk assessment review, the Division had required the Corporation to focus on the impact to the theoretical maximum, or most, exposed individual--the MEI. The assessment assumed that this individual would receive all of his/her exposure to air, soil and dust for seventy years at the point of maximum residential impact (AAD-12A, p. 2). Further, the study assumed that the facility would operate 24 hours per day, 365 days per year for 30 years, though it was anticipated that the operating hours would actually be less. (at 3).

The thoroughness of the Division's review was evident in the cross examination of Barbara Morin by the Corporation and Town. She testified that she had checked "virtually every calculation" in the HRA and in Appendix A and repeated it all independently. The only error raised in testimony which she had not previously discovered dealt with bay concentration of pollutants. This was an error on the side of the Corporation being more conservative than they had to be. (TR June 15, pp. 124, 127). Her conclusion was that the HRA in its final iteration was adequately conservative and acceptable for the purposes of revising the PSD permit.



The Town raised many legitimate questions regarding assumptions made in the study. At hearing it was clear that there were instances where the HRA could have been more conservative, but there were also assumptions which were overly conservative. If the HRA had been a single pathway, rather than a sixteen pathway assessment, the Town may have uncovered a "fatal flaw" which would have shown that the study was not adequately conservative, not protective of human health and the environment, and not in compliance with the pertinent statutes and regulations. But such is not the case.

The HRA made numerous levels of assumptions--from how much fish a New Englander would normally consume, to where the fish lived, to the level of pollutants in the water, to how much water was in Narragansett Bay. Along the way the study on occasion may not have made assumptions that quite met the standard "adequately conservative." But on balance, and considering the bundles of assumptions, some of which were overly conservative, and the multiple pathways, I find that the HRA is consistent with the appropriate standards and guidelines.

In summary, the Corporation has shown that the proposed permit is protective of human health and the environment and has met its burden of proof with respect to its Petition, has rebutted the case presented by the Town and is entitled to receive the recommended revised PSD permit with the sole amendment being to Condition F.2 as previously discussed.

After considering the testimony and documentary evidence of record, I make the following:

**FINDINGS OF FACT**

1. On October 4, 1990 the Superior Court remanded to the Department of Environmental Management ("DEM") the consolidated action of Rhode Island Solid Waste Management Corporation v. Department of Environmental Management, et al., C.A. No. 89-3253, and The Town of North Kingstown v. The Rhode Island Department of Environmental Management, et al., C.A. No. 88-5208.

2. The remand, pursuant to R.I.G.L. § 42-35-15(e), was ordered to allow Rhode Island Solid Waste Management Corporation ("Corporation") to submit to DEM additional evidence concerning proposed emissions limitations for the proposed Quonset Point Resource Recovery Facility ("Facility") in North Kingstown, Rhode Island.

3. On February 27, 1992, the Corporation filed with the DEM Division of Air and Hazardous Materials ("Division") its Third Amended Petition to Modify Certain Permit Conditions of a License to Construct and Operate a Major Source of Air Pollution in an Attainment Area.

4. The Corporation submitted the Health Risk Assessment for the Planned Quonset Point Resource Recovery Facility, the Pollution Dispersion, Deposition and Environmental Transport Results, the Determination of Tract Metal Impacts on Plants,

Soils and Animals and the Visibility Analysis for the Planned Quonset Point Resource Recovery Facility to the Division in support of its requested permit modifications.

5. On March 30, 1992, the Division issued its recommended revised PSD permit in response to the Corporation's Petition.

6. Adjudicatory hearings were conducted on June 8, 9, 10, 15, 16, 17, 22 and 23 of 1992.

7. The Division's use of the Methodology for Assessing Health Risk Associated with Indirect Exposure to Combustor Emissions, Interim Final (AAD-5) is persuasive as a methodology for determining exposure from proposed new and modified resource recovery facilities.

8. Exhibit AAD-5 (EPA 1990) is not directive. Professional judgment must be used in applying AAD-5 to any particular health risk assessment.

9. The Division's standard for conservatism in the assumptions to the health risk assessment, that the assumptions be adequately conservative, is reasonable and appropriate to determine compliance with Air Pollution Control Regulation No. 7.

10. The application of the adequately conservative standard may not necessarily assess the worst case for any given pathway, but, for multi-pathway risk assessments the standard used by the Division is protective of the overall health of all individuals.

11. In accordance with DEM guidelines, the HRA was designed to focus on predicted impacts to the theoretical most exposed individual (MEI).

12. The HRA was prepared by the Corporation in accordance with a protocol approved by the Division and in accordance with the DEM and EPA guidelines on preparation of multi-pathway human health risk assessments.

13. The assumptions in the HRA concerning levels of fish consumption are adequately conservative and appropriate for use in a multi-pathway health risk assessment.

14. The Belleville Pond fisherperson sensitivity analysis conducted by the Division in AAD-12A, using a bioconcentration factor for mercury of 16,322 and a local fish ingestion rate of 40 grams per day was appropriate for examining that pathway. The result of the sensitivity analysis was within the acceptability criteria.

15. No credible evidence was presented that a limited survey of local fishermen would better determine local fish consumption rates than using the published data from studies in New Jersey and Connecticut.

16. Calculations of pollutant concentrations in Narragansett Bay were correct, except that an incorrect, but more conservative number for the volume of Narragansett Bay was used.

17. The Division conducted a sensitivity analysis assuming that pollutant concentrations in Narragansett Bay were increased six times to account for localized impacts due to a reduction in the flushing volume and a higher deposition rate at receptors near the facility. No acceptability criteria were significantly exceeded.

18. The Division used a mercury bioconcentration factor of 16,322, a value three times that used in the health risk assessment in its evaluation of the health risk assessment. (AAD-12A). The use of this bioconcentration factor did not result in the exceedance of any acceptability criteria.

19. The bioconcentration factors for chromium and lead used in the health risk assessment and approved by the Division were appropriate.

20. The waterfowl consumption pathway was properly excluded from quantitative analysis in the scoping process for the risk assessment in view of the assumption that any contribution that hunted game animals might make to exposure would be accounted for in considering their potential exposure via local farm animals.

21. The COMPDEP model, as used by the Corporation and approved by the Division, is an appropriate model to predict deposition impacts from Facility emissions.

22. The predictions of the COMPDEP model are acceptable for evaluating deposition in the vicinity of the facility.

23. The health risk assessment conducted by the Corporation and the evaluation conducted by the Division indicate the operation of the facility at the suggested emission levels will not exceed any of the acceptability criteria set forth in the DEM Guidelines or as set by the Division.

24. The recommended revised PSD permit does not authorize any increase in NO<sub>x</sub> emissions from the Facility over that authorized in the original PSD permit.

25. At the time of hearing, the Division did not have in place any emissions offset rules contemplated by the federal Clean Air Act Amendments of 1990, and the Division had until November 15, 1992 to submit to EPA revisions to its State Implementation Plan concerning such rules.

26. The increases in emissions of pollutants allowed in the recommended revised PSD permit do not constitute a "major modification" for any regulated pollutant under Air Pollution Control Regulation No. 9.

27. The emission limitations in the recommended revised PSD permit will not result in any impact greater than the applicable acceptability criteria set forth in the DEM Guidelines and/or established by the Division.

28. There are reasonable and valid bases for allowing Facility emissions during certain malfunctions of three hours or less in duration not to be subject to emissions limitations.

29. There are reasonable and valid bases for not allowing a blanket exemption from emission limitations for facility malfunctions with a duration of three hours or less.

30. The policy of the Division is and has been to require compliance with emission limitations even during periods of malfunctions.

31. An automatic exemption from emission limitations during a malfunction would inhibit the Division's ability to minimize emissions and enforce permit conditions and might not provide protection of short term air quality standards.

32. The Hearing Officer in hearing the original PSD application found in his 5/18/89 Decision and Order that:

" . . . Quarterly testing of stack emissions provides a reasonable method of monitoring compliance with annual emissions averages. However, quarterly testing for one year is not sufficient to measure compliance on an on-going basis . . ."

Therefore, quarterly testing is appropriate.

33. Permit condition F.2. requires stack testing for a series of pollutants on a quarterly basis for a period of not less than five (5) years in length beginning with the commencement of commercial operations. At the end of five years of quarterly stack testing, the Division in its sole discretion may modify this testing protocol as to the frequency of testing and/or the pollutants measured.

34. The Corporation has demonstrated that the changes in the emissions limitations formula and the risk assessment methodology support a decrease in the required quarterly stack testing over a five-year period.

35. The Division has demonstrated that quarterly stack testing for the first full year of facility operation and annual stack testing thereafter is insufficient to ensure statistical reliability and compliance with emissions limitations.

36. The permit modifications proposed by the Division (AAD-15B) are appropriate for the Quonset Point Resource Recovery Facility.

37. No evidence was presented to support a finding that the Division's proposed permit modifications are not appropriate or protective of human health and the environment.

Based on the foregoing facts and the documentary and testimonial evidence of record, I make the following:

**CONCLUSIONS OF LAW**

1. The adjudicatory hearings in this matter, open to the public, were conducted as proceedings derivative from the October 4, 1990 order of the Superior Court.

2. The recommended revised PSD Permit does not constitute a "major modification" as defined in Rhode Island Air Pollution Control Regulation No. 9, and no public comment, hearing or notice thereof was required.



3. The recommended revised Permit does not need to be revised at this time to account for NO<sub>x</sub> emissions offsets, which may be required at some future time.

4. The Corporation bears the burden of proving by a preponderance of the evidence that (i) the HRA and other documents submitted in support of its Petition are in accordance with applicable laws, rules, regulations and guidelines and (ii) the Facility, if operated in accordance with the provisions of the revised PSD Permit, will comply or is capable of complying with all applicable laws, regulations, guidelines, standards and criteria.

5. The Division of Air and Hazardous Materials' Guidelines for Assessing Health Risks From Proposed Air Pollution Sources and the Methodology for Assessing Health Risk Associated with Indirect Exposure to Combustor Emissions, Interim Final are persuasive and controlling.

6. The Division's standard of using assumptions which are adequately conservative in performing health risk assessments is reasonable and appropriate as a matter of law.

7. The Corporation has proved by a preponderance of the evidence that (i) the HRA and other documents submitted in support of its Petition are in accordance with all applicable laws, rules, regulations and guidelines, and (ii) the Facility, if operated in accordance with the provisions of the revised PSD

Permit, will comply or is capable of complying with all applicable laws, regulations, guidelines, standards and criteria.

8. The Corporation failed to submit sufficient or adequate evidence to meet its burden of proof with respect to the issues of stack testing and emissions limits during malfunctions in the form requested in their amended petition.

9. The Corporation has proved by a preponderance of the evidence that future performance may demonstrate statistical reliability sufficient to warrant the Division reducing the mandated number of quarterly stack test events set forth in Permit Condition F.2.

10. Subject to the limitations of the draft permit proposed by the Division, the facility as proposed will comply with the applicable Rhode Island General Laws and the Air Pollution Control Regulations.

Wherefore, it is hereby

**ORDERED**

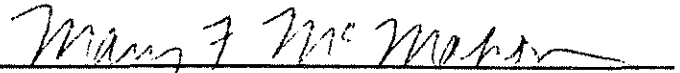
1. The revised PSD Permit recommended by the Division (AAD-15B) is approved with the following amendment to Permit Condition F.2. on Stack Testing:

Substitute the word and numeral "two (2)" for the words and numeral "five (5)" and "five" as they appear. The remainder of Condition F.2. shall remain unchanged.

2. The Permit shall issue in the form attached hereto as Appendix E with the above amendment to Condition F.2, and shall constitute the final PSD permit for the Quonset Point Resource Recovery Facility.

3. This decision constitutes the evaluation of the petition ordered by the Superior Court and is therefore returned to the Superior Court.

Entered as an Administrative Order this 15<sup>th</sup> day of January, 1993.



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Mary F. McMahon  
Hearing Officer  
Department of Environmental Management  
Administrative Adjudication Division  
One Capitol Hill, Third Floor  
Providence, RI 02908

Entered as a Final Agency Order this \_\_\_\_\_ day of January, 1993.

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Frederick J. Vincent  
Associate Director/Planning  
Department of Environmental Management  
83 Park Street  
Providence, RI 02908

CERTIFICATION

I hereby certify that I caused a true copy of the within Decision and Order to be forwarded via regular mail, postage prepaid to Harlan M. Doliner, Esq., Jonathan L. Moll, Esq., Goldstein & Manello, P.C., 265 Franklin Street, Boston, MA 02110; Donald D. Page, Esq., Lynch & Greenfield, 321 South Main Street, Providence, RI 02903; Richard M. Sherman, Esq., Tillinghast Collins & Graham, One Old Stone Square, Providence, RI 02903; J. William W. Harsch, Esq., Suite 800, 170 Westminster Street, Providence, RI 02903; Flanders & Medeiros, 700 Turks Head Building, Providence, RI 02903 and via interoffice mail to Frederick J. Vincent, Associate Director, DEM/Planning, 83 Park Street, Providence, RI 02908 and Claude A. Cote, Esq., Office of Legal Services, 9 Hayes Street, Providence, RI 02908 on this \_\_\_\_\_ day of January, 1993.

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