

RULS - AD - 1980 - 430

12/17/80

Statement of Basis

Cover letter to Bedminster Twp Committee

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State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF WATER RESOURCES

P. O. BOX CN-029

TRENTON, NEW JERSEY 08625

ARNOLD SCHIFFMAN  
DIRECTOR

DEC 17 1980

RULS - AD - 1980 - 430

Mayor and Members of Bedminster Township Committee  
c/o Mr. Frank P. Robertson, Township Clerk  
Hillside Avenue  
Bedminster, New Jersey 07921

Re: Allan-Deane Project

Mayor Gavin and Committee Members:

Enclosed please find a Statement of Basis concerning the above-referenced project prepared by the Bureau of Systems Analysis and Wasteload Allocation.

The Township of Bedminster has requested a public hearing be held to consider modification of the Water Quality Based Effluent Limitations contained in the Conceptual Approval given this project. The Statement of Basis sets forth the Department's position concerning the effluent limitations. In order to obtain a modification to increase the stringency of the effluent limitations to a level matching ambient water quality, the Township, as applicant for such modification, would have to prove to the satisfaction of the Department the invalidity of the Department's presumption that:

- (1) Some degradation of high quality waters Category Two should be allowed because of necessary and justifiable economic or social development; and
- (2) Alternative effluent limitations, at least as stringent as the technically based effluent limitations required by sections 301, 306 and 307 of the Federal Clean Water Act or State law, will not interfere with or be injurious to instream uses.

As an alternative to holding a public hearing on this subject, Division of Water Resources staff members would be pleased to attend a public meeting to be held in or near Bedminster to discuss the effluent limitations and other aspects of the proposed project. The choice of whether to proceed with a hearing or to withdraw the hearing request and substitute a public meeting rests with the Township of Bedminster.

At this time the Department is proceeding with the scheduling of a hearing to be held some time in January. Thirty days notice will be provided to affected persons and, through a general circulation newspaper, to the general public. Should the hearing request be withdrawn and a public meeting scheduled during this time, the hearing will be cancelled and the draft effluent limitations will become final.

Please let this Office know, in writing within two weeks from the date of this letter, whether the hearing request is being withdrawn. Should you have any questions concerning this matter, please feel free to contact this Office at (609) 292-3746.

Very truly yours,



Barbara M. Greer, Esq.  
Monitoring & Planning Element

BMG:njf

Enclosure

cc: John Kerwin, Johns-Manville Properties  
Henry A. Hill, Jr., Esq. Brener, Wallack, Rosner and Hill  
Alfred L. Ferguson, Esq. McCarter & English ✓  
Assistant Commissioner Picco  
Candy Ashmun, ANJEC  
Bridgewater Township  
Bernards Township  
Somerset County Planning Board, Attn: Raymond Brown  
Kupper Associates  
SMC-Marin, Attn: Raymond Schiwall  
Edward Bowlby, Esq.  
Assistant Director Sadat

STATEMENT OF BASIS  
JOHNS-MANVILLE  
ALLAN-DEANE PROJECT

1. Applicants' Name and Address:

Johns-Manville Properties Corporation  
P.O. Box 72  
Far Hills, New Jersey 07931

2. Project Manager:

Mr. John Kerwin

3. Location of Discharge:

Proposed on the North Branch of the Raritan River at a point approximately 3/10 of one mile west of the intersection of Routes 206 and 287. A copy of the USGS quadrangle is attached.

4. Affected Area:

Bedminster Township  
Bridgewater Township  
Bernards Township

5. Statutory or regulatory provisions on which effluent limitations are based:

New Jersey Water Pollution Control Act, N.J.S.A. 58:10A-4,6, and 8;  
Water Quality Planning Act, N.J.S.A. 58:11A-1 et seq. and the  
Upper Raritan Areawide Water Quality Management Plan adopted March 12, 1980  
pursuant to the Act; Surface Water Quality Standards, N.J.A.C. 7:9-4.1 et seq.;  
Allocation of Waste Loads, N.J.A.C. 7:9-11.1 et seq.

6. Water Quality Classification:

The North Branch of the Raritan River segment into which this project will discharge is classified FW-2 Nontrout. This classification requires that these waters be suitable for potable water supply; for the maintenance, migration and propagation of fish and natural biota; for primary contact recreation; industrial and agricultural water supply, and; any other reasonable uses.

7. Description of the proposed parameters:

- a. Rate of discharge: 0.850 MGD
- b. Frequency of discharge: Continuous

- c. Type of discharge: Sanitary wastes
- d. Draft Effluent Limitations:

<u>Parameters</u>	<u>Effluent Limitation (mg/l, 30 day average)</u>
PO <sub>4</sub> -P (May 1-Oct. 1)*	0.5
NO <sub>3</sub> -N (May 1-Oct. 1)*	2.0
NH <sub>3</sub> -N (May 1-Oct. 1)*	0.5
BOD <sub>5</sub>	10.0
DO	6.0
Suspended Solids	10.0
Total Dissolved Solids	500.0
pH	6.5-8.5
Total Residual Chlorine	0.003
Fecal Coliform	20 MPN/100 ml

\*Winter limits for PO<sub>4</sub>-P, NO<sub>3</sub>-N and NH<sub>3</sub>-N will be developed during the Stage II Treatment Works Approval process.

8. Modification Request:

The Township of Bedminster has requested the Department to modify the effluent limitations tentatively assigned to this project, questioning: (1) whether instream water uses will be adequately protected and; (2) whether some degradation of the high quality waters should be allowed to provide for necessary and justifiable economic or social development.

- a. Protection of Uses: Based on the amended wasteload allocation procedures addressed in the Upper Raritan 208 plan, available water quality data, and the report submitted by the applicant's consultant (CDM) entitled, "Evaluation of the Water Quality Impacts of the Proposed Wastewater Discharge from the Allan-Deane Development", this office, the Bureau of Systems Analysis and Wasteload Allocation, has carefully evaluated the downstream water quality impact due to the proposed discharge. From our analyses, we have concluded that the category two based effluent limitations, which we have approved for this proposed discharge, are stringent enough to protect the downstream water quality uses and biological communities. Those critical parameters which have been identified as being of greatest concern are discussed in detail in the following sections.

1. BOD-DO

The organic matter is a biodegradable substance. The stream has its natural self-purification capacity to recover the deficit DO which is taken up by the BOD through the reaeration process. In comparing the stream low flow (MA7CD10 = 6.3 cfs) with the effluent discharge (1.3 cfs), the stream provides 5 to 1 dilution ratio value during the ten (10) year low flow condition. Based on the following input data and the simplified DO mathematical model, the critical DO deficit is only about 0.4 mg/l which occurs approximately 0.6 miles downstream of discharge.

$Q_{sf}$  = 6.3 cfs (stream MA7CD10 flow)  
DO = 11.0 mg/l (ambient DO)  
BOD<sub>5</sub> = 1.8 mg/l (ambient BOD)  
Kd = 0.6 day<sup>-1</sup> (BOD decay coefficient)  
Ka = 5.0 day<sup>-1</sup> (stream reaeration coefficient)  
 $Q_{st}$  = 0.85 MGD (plant's effluent flow)  
DO = 6.0 mg/l (plant's effluent DO)  
BOD<sub>5</sub> = 10 mg/l (plant's effluent BOD)

This calculation is based on the most conservative coefficients. The result of 0.4 mg/l deficit DO means that the discharge will lower the ambient DO (11.0 mg/l) to 10.6 mg/l at the critical point 0.6 mile downstream of discharge and recover back to 11.0 mg/l as ambient water quality after 0.6 miles downstream of critical point. Theoretically this phenomenon will occur only once in ten years. Basically, this stream has a large reserve capacity of 6.0 mg/l of DO which is the difference between ambient DO (11.0 mg/l) and the stream water quality standard (5.0 mg/l). The 0.4 mg/l of deficit DO will only occupy 7% of the total reserve capacity of the stream. Under normal flow conditions, the DO deficit downstream of the discharge will be undetectable.

## 2. TDS

In using a mass balance to determine the TDS limit at effluent, the background TDS concentration is the key parameter to affect the results. The background TDS concentrations vary greatly with flow conditions. The lower the stream flow, the higher is the TDS concentration. Because no TDS data was recorded during the MA7CD10 flow in this stream segment, this Office agreed that the applicant could develop the TDS concentration by statistical linear regression method based on the existing flow and water quality data. From this study it was determined that TDS could be as high as 170 mg/l during the MA7CD10 flow. Based on this number, we calculated that a 500 mg/l TDS effluent limit should be sufficient to meet the water quality standard.

As stated in the water quality impact report, mentioned above, the effluent discharge TDS concentration is expected to be between 500 ~ 700 mg/l. If the effluent TDS is greater than 500 mg/l during low flow conditions, the applicant should provide a holding tank or retention basin to store this effluent until high flow conditions prevail.

## 3. Nitrogen

The general composition of total ammonia is ( $\text{NH}_3 + \text{NH}_4^+$ ). The un-ionized fraction which is ( $\text{NH}_3$ ), in concentrations equal or greater than 0.02 mg/l is toxic to the freshwater aquatic life.

This criteria for ammonia toxicity is recommended by EPA (Quality Criteria For Water, U.S. EPA, 1976) and is therefore being used by NJDEP for this study.

The un-ionized fraction of total ammonia is a function of pH, Temperature and concentration of ammonia already present in the stream. In the analysis of ammonia toxicity we have to consider the most critical time in the year, which is the summer months. The concentration of un-ionized ammonia is directly proportional to pH, T and the concentration of ammonia-nitrogen. The higher the value of each of these parameters the higher the concentration of un-ionized ammonia and therefore the higher the probability of toxicity.

For a conservative analysis, summertime data (high temperatures, low flow) are used:

pH = 8.0	NH <sub>3</sub> -N = 0.21 mg/l
T = 25°C	Q = 6.3 cfs (MA7CD10)

Based on this data a concentration of un-ionized ammonia of 0.01 mg/l is obtained which is well below EPA's recommended criteria of 0.02 mg/l.

The effluent limitation for ammonia-nitrogen of 0.5 mg/l is acceptable for the above reasons and therefore the impact of this discharge in terms of ammonia toxicity would not be harmful to the stream water quality or the freshwater aquatic life.

#### 4. Total Phosphorus (T-P)

Before requiring that phosphorus discharge be brought under control, the limiting nutrient should be identified. At present, there is no water quality data available which can be used to identify the limiting nutrients in the affected area. The major concern stemming from a discharge of phosphorus is its impact on eutrophication in downstream impoundments. The proposed Confluence Reservoir will be the major impoundment downstream of this discharge.

Based on the non-point source loading analysis addressed in the Upper Raritan 208 Plan, the annual total phosphorus discharging into the confluence area is estimated at approximately 75,000 lbs. from this watershed (North Branch of Raritan River). Of the total phosphorus loading, point sources are responsible for 34% while nonpoint sources account for approximately 66%. In order to control the phosphorus inputs from the upland sources, the magnitude of the nonpoint source contribution must be taken into account. Based on our analysis, the permitted T-P loading for this project (about 1300 lbs/yr) is only 1.5% of the total loading, and only 5% of the total point source load.

To develop an accurate wasteload allocation for T-P for this project would involve extremely complicated procedures. Unfortunately such procedures, which take both point and nonpoint sources of T-P into account have not yet been established by either the State or EPA. The State is, however, developing programs which will attempt to reduce nonpoint source loadings of nutrients through the use of Best Management Practices (see Upper Raritan 208 Plan).

Until it is known how much reduction can be achieved through the use of nonpoint source control so that more accurate estimates of loadings of nutrients may be made, this Office, as a general policy, is requiring phosphorus removal at the level achievable through the use of the best available technology. We have roughly established the potential eutrophication for the proposed Confluence Reservoir and concluded that 0.5 mg/l of T-P effluent concentration for new upstream point sources should be sufficient to prevent significant eutrophication in the reservoir.

This Office also realizes that the downstream segment of the North Branch Raritan does not have the capacity to accommodate additional discharges of T-P. Based on the MA7CD10 flow, background T-P concentration (0.1 mg/l), and the permitted T-P load (3.6 lbs/day), the downstream concentration of T-P will increase to 0.15 mg/l. As mentioned before, much of the T-P concentration in the background is contributed from nonpoint source pollution. In order to maintain water quality at a level similar to background, 100% phosphorus removal would have to be employed. Such removal is technically and economically infeasible.

The conclusions from our analysis are that the permitted effluent T-P concentration is sufficient to protect the water quality in the reservoir. However, until the limiting nutrient is identified, in order to assure this effluent will protect downstream uses, we will require the applicant to provide the Department with an instream water quality monitoring program to ensure that this discharge will not cause any additional problems downstream during low flow conditions.

5. pH, SS, TRC and Fecal Coliform

All of these effluent limits are stringent enough to protect the downstream water quality objectives and water uses.

b. High Quality Waters Category Two Classification:

The surface waters classified in Category Two for the purpose of developing water quality based effluent limitations are those waters having biological, chemical or physical characteristics better than water quality standards and are not designated Nondegradation Waters or High Quality Waters Category One. The categorization is based upon the sensitivity of the



uses for which the waters are intended. Nondegradation waters are those waters which are determined to be Outstanding National Resource Waters. Category One waters are: FW-2 trout production waters; FW-2 trout maintenance or nontrout waters which are upstream of trout production waters; approved shellfish waters; or other high quality waters which flow through State and National Parks, Forests, and Wildlife Lands.

The North Branch of the Raritan River at the point of the proposed discharge is classified FW-2 Nontrout and is of high quality. It does not support any of those exceptional uses, which are so highly sensitive to any change in the chemical or physical characteristics of the water, that a policy of maintaining ambient water quality is presumed to be necessary.

Based upon the need to provide for economic and social development in the State, the Department has made the initial determination that Category Two waters, which support less sensitive uses than Category One waters, may be slightly degraded. The draft effluent limitations for Category Two waters are not required to be assigned so as to maintain ambient water quality for all parameters. However, limitations are established so that existing uses are protected and water quality standards are not violated. These policy decisions, concerned with the implementation of the Antidegradation Policy (N.J.A.C. 7:9-4.4 (a) 7.) have evolved through the Water Quality Management Planning process which included extensive public participation.

Based upon these policies, the draft effluent limitations for the Allan-Deane project were developed so as to protect the designated uses of the waters while providing for necessary and justifiable economic and social development. In the opinion of the Department, its initial determination to place the waters in question in Category Two, for the purpose of assigning effluent limitations, is amply supported by the facts related to this particular project.

The proposed wastewater treatment facility will serve at least 3,257 dwelling units, some of which will provide least cost and subsidized housing for low and moderate income families. As noted in the decision in Allan-Dean v. Bedminister, this development will fulfill a demonstrated need for housing in a developing area which has recently experienced commercial and industrial growth. While the judgment obtained in the absence of the Department as a party to that suit is not binding upon the Department and cannot unilaterally overturn Departmental water resource policy objectives, the Department does recognize the decision, arrived at after extensive litigation (including 42 trial days) as good and persuasive evidence of the need for economic and social development in the area. The judicial decision, therefore, reinforces the Department's initial presumption of the need to provide for economic and social development and is fully consonant with Department policies which place this segment of the North Branch of the Raritan River in Category Two for the purpose of assigning water quality based effluent limitations.

9. Conclusion:

The Department is of the opinion that a modification of the draft water quality based effluent limitations is not warranted and that some degradation of the high quality waters Category Two should be allowed because of necessary and justifiable economic and social development; and that the draft effluent limitations which are at least as stringent as the technically based effluent limitations required by the Clean Water Act or State law will not interfere with or be injurious to instream water uses.

10. Person to Contact for Additional Information:

Barbara M. Greer  
Department of Environmental Protection  
Division of Water Resources  
(609) 292-3746

