

ILLINOIS POLLUTION CONTROL BOARD
December 3, 1981

ILLINOIS NITROGEN CORPORATION,)
)
 Petitioner,)
)
 v.) PCB 80-144
)
 ENVIRONMENTAL PROTECTION AGENCY,)
)
 Respondent.)

MR. ROBERT M. OLIAN, SIDLEY & AUSTIN, APPEARED FOR THE
PETITIONER;

MR. E. WILLIAM HUTTON AND MS. VIRGINIA YANG, ATTORNEYS
AT LAW, APPEARED FOR THE RESPONDENT.

OPINION AND ORDER OF THE BOARD (by D. Anderson):

This matter comes before the Board upon a variance petition filed August 7, 1980 by Illinois Nitrogen Corporation (Illinois Nitrogen). The petition requests a variance from Rule 406 of Chapter 3: Water Pollution with respect to discharges of ammonia nitrogen from petitioner's ammonium nitrate production facility near Marseilles, LaSalle County. On June 15, 1981, the Illinois Environmental Protection Agency (Agency) filed a recommendation that the variance be denied or, in the alternative, granted for a short period of time with conditions. Illinois Nitrogen filed a response on June 24. A public hearing was held at Marseilles on August 4. An amended recommendation was filed on September 4, 1981. The Board will grant a variance with conditions as is discussed below.

Two Board Orders addressed procedural matters (October 2 and October 30, 1980). An objection was filed by citizens on September 2, 1980; however, no citizen commented at the hearing (R-76). Petitioner indicated that, after explanation of the variance request, the objectors had indicated that they no longer objected (Response, p. 2).

Illinois Nitrogen was involved in a previous enforcement action and variance concerning permits and particulate emissions from its prilling operations (PCB 73-517, 74-169, May 9, 1974, 12 PCB 243; September 12, 1974, 13 PCB 583; June 26, 1975, 17 PCB 371; August 7, 1975, 18 PCB 288).

FACILITY DESCRIPTION

Illinois Nitrogen's ammonium nitrate plant is situated on a 173-acre tract on the northern bank of the Illinois River about one mile east of Marseilles. The plant was built in 1964 and employs about 100 people. It receives as a raw material anhydrous ammonia. A portion of this is oxidized to nitric acid, which is reacted with ammonia to form ammonium nitrate. A portion of this is "prilled" into pellet form. Ammonium nitrate is sold in both solid and solution form.

The plant draws water from the river and returns it pursuant to NPDES permit No. IL 0001708. There are three wastestreams involved: 001a and 001b are combined with once-through cooling water prior to discharge via 001.

The settling pond discharges to the cooling water stream via 001a. It receives treated sanitary waste, boiler blowdown and water treatment backwash.

Process water storage lagoon number 2 discharges to the cooling water stream via 001b. It receives wastewater, consisting of washdown and runoff from process areas, which is contaminated with ammonia. Water from the lagoons is used as makeup water for liquid fertilizer solutions, so that 001b discharges only during storms. The Agency has asked that Illinois Nitrogen demonstrate that the lagoon will contain a 25-year/24-hour storm event (Rec. 15). Illinois Nitrogen claims actual measurement would be too expensive, but has presented data correlating discharges with storm size (Response 4).

In its Response, Illinois Nitrogen indicated that a 25-year/24-hour storm involves 4.75 inches of precipitation (Response 4). 001b has discharged only four times, as follows:

<u>Date</u>	<u>Precipitation (inches)</u>	<u>Comment</u>
September 1, 1977	4.79	Following the wettest August in a century
August 20, 1979	4.88	More than 7 inches in 3 days
March 17, 1979	Snowmelt	Sudden thaw and rain
September 1, 1980	Nearly 5	Total weekend rainfall 6.50 inches

As a condition of the variance, the Board will require continued monitoring of any additional flows from 001b and prohibit discharges except those caused by a 25-year/24-hour storm event or equivalent snowmelt.

Once-through cooling water, together with some runoff from non-process areas, is combined with 001a and 001b and discharged via 001. The Agency sought to demonstrate that more ammonia is discharged from the plant than is taken in from the river. A major source is thought to be leaks in condenser pipes which would add ammonia to the cooling water.

APPLICABLE REGULATIONS

The requested variance is from the second paragraph of Rule 406, which reads as follows:

Sources discharging to...(the Illinois River)... whose untreated wasteload cannot be computed on a population equivalent basis comparable to that used for municipal waste treatment plants and whose ammonia nitrogen discharge exceeds 100 pounds per day shall not discharge an effluent of more than 3.0 mg/l of ammonia nitrogen...

Also related to the variance request is Rule 203(f) which sets a water quality standard of 1.5 mg/l ammonia nitrogen. Rule 402 prohibits effluent discharges which would violate this standard. Federal effluent limitations for certain process discharges are 191 kg/day on a daily average and 366 kg/day on a daily maximum (421 and 806 pounds respectively) (40 CFR Part 418) (Pet. 13).

PERMIT CONDITIONS

The variance is requested in order to set an effluent limitation in the renewed NPDES permit. The old permit contained conditions which: limited 001a to 1.5 mg/l if the water in the River exceeded the water quality standard; and, limited 001 to 3.0 mg/l only when 001a exceeded 100 pounds per day (Rec. 6). This condition applied the 100 pounds rule and the water quality standards only to the settling pond (001a); it appears there was an Agency finding that the cooling stream and process lagoon did not contribute nitrogen. There was no express mention of background concentrations.

Illinois Nitrogen has requested that the Board choose one of three optional effluent limitations and order it incorporated into the permit. Option 1 is somewhat different from the old permit in that it would apply the water quality standard downstream at the point of final discharge, unlike the old permit which applied it at 001a. Option 1 is similar to the old permit in that it applies the 100 pounds rule only to 001a.

Although it is ambiguously worded, Option 2 is probably intended to require 001 to meet 3.0 mg/l only if the sum of 001a and 001b exceeds 100 lbs./day. There is no express mention of water quality standards or background concentrations.

Option 3 would limit 001 to 3.0 mg/l over background, which is to be determined "on the basis of samples taken during a particular calendar month." There is no mention of water quality standards (Pet. 3).

The Agency's proposed permit contains no limitations or monitoring of ammonia nitrogen from 001a. The process effluent (001b) is limited to 191 and 366 kg/day on a monthly and daily basis respectively. The combined discharge (001) is limited to 3.0 mg/l when it amounts to more than 100 pounds per day. There is an exception if the contamination results entirely from influent contamination or addition of traces not utilized or produced in the process. The water quality standards are applied in the river at the edge of the mixing zone (Rec. Ex. A).

Illinois Nitrogen's problem is basically background ammonia in the river. When background levels rise it must curtail operations, assuming it is unable or unwilling to treat. Under the old permit it had to shut down only its settling pond (001a) if either the river went over 1.5 mg/l or 001a went over 100 pounds per day. This latter possibility is unlikely considering the small size of 001a.

Option 1 would again require a shutdown of the settling pond if it went over 100 pounds per day. It would require a plant shutdown if the river went over 1.5 mg/l.

Option 2 is similar but would require a shutdown of 001a or 001b if the sum went over 100 pounds. There appears to be little environmental reason for so restricting 001b which only discharges at high water.

Option 3 allows addition of 3 mg/l to background at 001. 001a could never do this. It could result from either a large leak in the cooling system or an overflow condition at 001b.

The Agency's proposed permit authorizes unlimited discharges of ammonia from the tributaries 001a and 001b. However, treatment to 3.0 mg/l is required at 001. The permit is ambiguous as to application of the background rule at this point and as to what happens in water quality limited situations.

None of the five alternatives--the old permit, three options and proposed permit--is acceptable because they do not properly reflect applicable Board regulations. Although the Board could order them incorporated in the variance context, there are simpler alternatives.

BACKGROUND LEVELS

Rule 401(b) provides as follows:

Because the effluent standards in this Part are based upon concentrations achievable with conventional treatment technology that is largely unaffected by ordinary levels of contaminants in intake water, they are absolute standards that must be met without subtracting background concentrations. However, it is not the intent of these regulations to require users to clean up contamination caused essentially by upstream sources or to require treatment when only traces of contaminants are added to the background. Compliance with the numerical effluent standards is therefore not required when effluent concentrations in excess of the standards result entirely from influent contamination, evaporation, and/or the incidental addition of traces of materials not utilized or produced in the activity that is the source of the waste.

There appears to be confusion as to whether the 100 pounds limit of Rule 406 applies to discharge of ammonia in the river water taken in (Response 14). This is not the intent of Rule 406. The rule applies only if the source contributes to background more than 100 pounds per day. Indeed, the simplest interpretation of the interrelation between Rule 401(b) and 406 is that the 100 pounds rule defines what is meant by "traces" of ammonia in Rule 401(b).

MASS DISCHARGED

The old permit and options 1 and 2 apply the 100 pounds rule to part of the facility, usually 001a. It is not clear whether these permit conditions arose because the facility was treated as several sources or because it was determined that 001a was the only source of nitrogen. It seems evident that "source" as used in Rule 406 means the entire plant; otherwise the standard would be easily evaded by arbitrary creation of several discharge points. Application of the 100 pound rule to 001a alone should be done only after a determination that the other sources are not significant.

The following is a summary of the waste streams*:

		<u>MGD</u>	<u>Ml/day</u>
001a	Settling Pond	0.062	0.23
001b	Storage Lagoon	Intermittent	
001	Combined Discharge	15.5	58.7

001a discharges about 10 lbs./day (4.5 kg/day) (Ex. 6). 001b, when discharging, may contribute large amounts of ammonia. During March, 1980, 001b discharged .172 MGD (.651 Ml/day) at 2,333 mg/l. This amounts to about 1,500 kg/day of ammonia as nitrogen (R.53, Ex. 6). The Agency's computations indicate a discharge of about 7,000 kg (15,000 lbs.) over five days in March, 1980. By way of comparison, 100 lbs./day is 36,500 pounds per year.

There is a dispute as to unknown sources of nitrogen, such as leaks to the cooling water. The Board will require monitoring to establish the difference between intake and output levels. For purposes of this variance the Board will assume the plant discharges more than 100 pounds per day and will grant a variance from the 3.0 mg/l standard.

At the hearing the Agency sought to establish through mass balance that unknown sources were contributing ammonia to the discharge (R.54, Petitioner's Ex. 2). An Agency employee testified that the reported 001 levels minus the contribution from 001a were significantly greater than those reported in the intake. On cross-examination Illinois Nitrogen questioned the statistical significance of the difference (R.57). The plant manager testified concerning difficulties in reliably measuring this difference.

*Combined discharge is assumed equal to intake of river water which is estimated from pumping rates (R.36). MGD is million gallons per day; Ml/day is megaliters per day.

It is difficult to detect leaks by testing inflow and output: a difference of 0.1 mg/l would amount to loss of 6 kg/day at this flow. The instruments in use are accurate to about this level (R. 38).

There appear to be technical difficulties involved in sampling the intake and main outfall. The Board will not attempt to include in the Order details concerning the sampling to be undertaken. Illinois Nitrogen will be ordered to take samples sufficient to demonstrate the amount added to the cooling water apart from 001a and 001b. The Agency will be authorized to write conditions into the permit.

WATER QUALITY CONDITION

The old condition required that, if the river water exceeded the water quality standard, 001a must meet the 1.5 mg/l standard prior to discharge to the flume tributary to 001. This appears to apply the water quality standards prior to the point of final discharge at 001. It is well settled that the water quality standards are not applicable within treatment works, or indeed within a mixing zone after the discharge. [Rule 104, definition of "waters," Rules 201(a), 203 and 401(a)]. A more appropriate condition might contain either a general prohibition against violation of water quality standards or a mass load limitation which decreases with deterioration of water quality. [Rules 402, 910(b) and 910(c)]. The Board will require the latter in the permit during the term of this variance.

SEGREGATION OF WASTESTREAMS

The old permit segregated wastestreams and applied the effluent standards before the point of final discharge. This is allowed under Rule 401(a) which proscribes dilution of effluents. The Agency's proposed permit would move the point of measurement downstream to 001. Illinois Nitrogen opposes this.

The plant has three wastestreams: it gives treatment to sanitary and other wastes; it recycles its process water; and, it passes cooling water through. This seems a logical and environmentally beneficial segregation which is completely in accord with Rule 401(a). Placement of the measuring point downstream would appear to allow and encourage Illinois Nitrogen to abandon its sanitary plant and mix the sanitary stream with boiler blowdown, process water and cooling water prior to treatment in a large plant. This would result in a lower level of contaminant removal and undue dilution in violation of Rule 401(a). The Board will require continued separate measurement of concentrations at 001a, 001b and 001.

VARIANCE CONDITIONS

Rather than attempt to write permit conditions which track the complexities of Part IV as applied to ammonia nitrogen discharges from this facility, the Board will grant a broad variance with effluent limitations tailored to the facility. 001a will be limited to 4.5 kg/day on a monthly basis and 11 kg/day on a daily basis. This reflects its past performance. 001 will be limited to 191 and 366 kg/day on a monthly and daily basis respectively. These are USEPA's limits (40 CFR Part 418). They are probably higher than what Illinois Nitrogen needs, so the Board will impose a condition requiring minimization of leaks to the cooling system. Petitioner will be required to decrease its discharges in the event of deteriorating water quality.

001b will be limited to discharges only after a 25-year/24-hour storm event. There is no indication of why 25 years was chosen rather than 10 years or some other frequency. The Board has required 25 years upon Petitioner's assurances that the system can meet this requirement.

DISSOLVED OXYGEN

The Agency also presented testimony concerning the effect of ammonia in depressing oxygen levels in water. The Agency estimated that 1,000 pounds of ammonia would lower oxygen levels 0.3 mg/l in the river (R-66). However temperature and turbulence in the cooling system may have a greater immediate impact on oxygen levels near the outfall. It is doubtful whether any ammonia-induced depression in oxygen levels would be seen close to the plant (R-72). The evidence is that dissolved oxygen is not a serious problem in this stretch of the Illinois River.

HARDSHIP

In the verified Petition, Illinois Nitrogen stated that compliance with Rule 406 would necessarily result in curtailment or reduction in operations (Pet. 16). The Agency did not dispute this in the recommendation. Petitioner presented no testimony on hardship at the hearing. However, in its post-hearing amended recommendation, the Agency for the first time argued that Petitioner had failed to prove arbitrary or unreasonable hardship. Another hearing would serve no useful purpose. The Board holds that testimony is not necessary where a sufficient allegation is supported by affidavit and there is no indication of opposition in the recommendation or other pleadings filed prior to the hearing.

The Board finds that immediate application of Rule 406 to Illinois Nitrogen would impose an arbitrary or unreasonable hardship within the meaning of §36(b) of the Act. The variance will be granted with conditions similar to those recommended by the Agency.

The Agency recommended an 18-month variance. The Board will grant the variance for 30 months in order to allow Illinois Nitrogen two full years to collect data. This may be necessary in order to get enough overflow situations to yield meaningful data.

This Opinion constitutes the Board's findings of fact and conclusions of law in this matter.

ORDER

Petitioner, Illinois Nitrogen Corporation, is granted a variance from Rule 406 of Chapter 3, subject to the following conditions:

1. This variance will expire 30 months from the date of this Order.

2. This variance shall apply only to outfall 001 and tributary outfalls 001a and 001b at Petitioner's Marseilles plant.

3. Petitioner shall not cause or allow discharge of ammonia as nitrogen from outfall 001a in excess of the following levels:

	<u>Monthly Average</u>	<u>Daily Composite</u>
001a	4.5 kg/day	11 kg/day

4. Petitioner shall not cause or allow discharge from outfall 001b unless it is necessary to prevent overflow and results from rainfall, or equivalent snowmelt, in excess of a 25-year/24-hour precipitation event.

5. Petitioner shall not cause or allow discharge of ammonia as nitrogen from outfall 001 in excess of the following amounts above intake background levels:

	<u>Monthly Average</u>	<u>Daily Composite</u>
001	191 kg/day	366 kg/day

6. Paragraph 5 notwithstanding, Petitioner shall not cause or allow the discharge from outfall 001 of ammonia nitrogen in excess of background by more than the amounts listed in the table below. Water quality levels shall be based on the average of representative samples taken on the three days immediately preceding the day on which the effluent levels apply. Samples shall be taken near the intake pursuant to Paragraph 8.

<u>Ammonia Nitrogen Water Quality (mg/l)</u>	<u>Ammonia Nitrogen Daily Composite (kg/day)</u>
Less than 1.5	366
1.5 or more but less than 2.0	330
2.0 or more but less than 2.5	259
2.5 or more but less than 3.0	188
3.0 or more but less than 3.5	117
3.5 or more but less than 4.0	46
4.0 or more	11

7. Petitioner shall maintain its heat exchangers so as to minimize leakage.

8. Petitioner shall sample, monitor and report ammonia nitrogen levels and flows at 001a, 001b, 001 and its intake as required by NPDES permit condition and shall collect such additional data as may be necessary to reliably estimate the total addition of ammonia to background.

9. The Agency, pursuant to Rule 914 of Chapter 3: Water Pollution, shall modify the NPDES permit consistent with the conditions set forth in this Order.

10. Within forty-five days of the date of this Order, Petitioner shall execute and forward to the Illinois Environmental Protection Agency, Variance Section, 2200 Churchill Road, Springfield, Illinois 62706, a Certificate of Acceptance and Agreement to be bound to all terms and conditions of this variance. This forty-five day period shall be held in abeyance for any period this matter is being appealed. The form of the Certificate shall be as follows:

CERTIFICATION

I, (We,) _____, having read and fully understanding the Order in PCB 80-144, hereby accept


that Order and agree to be bound by all of its terms and conditions.

SIGNED _____
TITLE _____
DATE _____

IT IS SO ORDERED.

Mr. Jacob D. Dumelle concurred.

I, Christan L. Moffett, Clerk of the Illinois Pollution Control Board, hereby certify that the above Opinion and Order were adopted on the 3rd day of December, 1981 by a vote of 5-0.



Christan L. Moffett, Clerk
Illinois Pollution Control Board