

ILLINOIS POLLUTION CONTROL BOARD

February 28, 1973

ALLIED CHEMICAL CORP.)
PETITIONER)
)
)
v.) PCB 73-382
)
)
ENVIRONMENTAL PROTECTION AGENCY)
RESPONDENT)
)

EDWARD G. MAAG, ATTORNEY, WALKER & WILLIAMS, in behalf of ALLIED CHEMICAL
THOMAS A. CENGEL, ASSISTANT ATTORNEY GENERAL, in behalf of the ENVIRON-
MENTAL PROTECTION AGENCY

OPINION AND ORDER OF THE BOARD (by Mr. Marder)

This action involves a request for variance filed September 5, 1973, by Allied Chemical Corporation (Petitioner). Relief is sought from Rule 408 of the Water Pollution Regulations of Illinois. The contaminants for which variance is requested are suspended solids, pH, and fluoride. Variance is also sought from Rule 921 (a) so as to allow the Agency to issue permits for proposed facilities. The Agency in its recommendation recommends a grant subject to many conditions.

Allied Chemical Corp. owns and operates in Metropolis, Illinois, a facility for the production of uranium hexafluoride (UF6), sulphur hexafluoride (SF6), fluorine, antimony pentafluoride, and iodine pentafluoride. The facility employs approximately 300 people and has total local expenditures of about \$3,600,000. Petitioner alleges that much of its process and proposed abatement facilities are of a highly proprietary nature and should be subject to non-disclosure. Upon motion of Petitioner, the Board granted non-disclosure to certain exhibits contained in the variance petition. The subject exhibits were reviewed by the Board and the contents therein were a consideration in this case.

Petitioner's plant is operating under a United States Atomic Energy Commission License (#SUB-526) (Pet. Ex. #1) in that it is dealing with radioactive materials. UF6 is manufactured by converting uranium ore concentrates (R. 12). This procedure is one link in the nuclear fuel cycle. At this point the uranium is in a state (UF6) from which it can be enriched in the 235 isotope. The facility can produce up to 14,000 tons per year of UF6.

The second major product is sulphur hexafluoride and is used as a dielectric (internal insulating medium) in electrical power equipment. The plant can produce up to 1,200 tons/year of SF6.

Before a discussion of the facts surrounding this case is entered into, one major point of contention must be determined. Petitioner contends that its major outfall (designated 002) travels from the plant

site to the Ohio River (a distance of 2500 feet) through a natural effluent channel, and that this channel should be considered an industrial ditch. In short, Petitioner alleges that said channel should fall under the restrictions of Rule 408 of Chap. 3 pertaining to effluent standards (R. 119). The Agency contends that under Section 3 (o) of the Environmental Protection Act, Petitioner is subject to the restrictions of Rule 203 of Chapter 3 pertaining to Water Quality Standards. These two rules (408 and 203) are significantly different in regard to a number of Petitioner's discharges as follows:

| | Rule 203 | Rule 408 |
|----------|-----------|----------|
| Fluoride | 1.4 | 2.5 |
| pH | 6.5 - 9.0 | 5-10 |
| S/S | - | 15.0 |
| T.D.S. | 1000 | <3500 |

The question before the Board is what is the nature of the drainage channel. The channel in question was described by a number of witnesses during hearing. Mr. A. D. Riley (plant manager Allied) stated that 002 outfall effluent runs 2500 feet from the plant to the Ohio River, and that the channel is entirely on Allied's property (R. 127), that to his knowledge no water other than Allied's effluent and natural drainage ever flows in the "natural depression." Exhibits "A" and "C" were entered, being a drawing of the plant site depicting the elevation of the plant vs. the Ohio River and an aerial photograph of the plant site, respectively. Exhibit A shows that the natural difference in elevation from the plant to the river is about 80 feet in 3000 feet or an average pitch of about 1/3" per foot slope. The aerial photograph clearly shows the discharge ditch as well as the surrounding area.

Total water flow to the ditch from runoff would average out to 75,000 gal/day based on an average yearly rainfall of 44"/yr., 45 acres drainage area, and 50% runoff (P. 135). The drainage ditch is from 10 feet wide to 100 feet wide during its path from the plant site to the river. On days when there is no rainfall runoff, and therefore water other than Petitioner's effluent, would be nil.

Testimony was further elicited as to the nature of the ditch before Allied occupied its present site. Mr. Yates (Allied biologist) testified that he was a lifelong resident of Metropolis and knew the area well (R. 161). He testified that he had never known the ditch to accumulate water, nor has it ever supported aquatic life (R. 166). The ditch is not used for irrigation, nor is it used for domestic animal grazing. Mr. Yates testified that there were signs of aquatic plant life and wildlife by or in the ditch (R. 183-84). It would seem, however, that the aquatic life is a result of Allied's effluent rather than life which existed before Allied started operations. The question then is should Allied be required to meet a water quality standard which would protect aquatic life even if that aquatic life would not be present if Allied were to discontinue its operations.

Section 3 (o) defines "Waters" as follows:

" 'Waters' means all accumulations of water, surface and underground, natural, and artificial, public and private, or parts thereof, which are wholly or partially within, flow through, or border upon this State."

Rule 203 General Standards provides that they will protect the State's waters for aquatic life, agricultural use, primary and secondary contact use, and most industrial use, and insure the aesthetic quality of the State's aquatic environment.

It is the opinion of the Board that in Allied's particular case the naturally occurring depression and its effluent flow shall not be considered waters of the State and Rule 408 shall apply. This determination is made on the basis of the facts in this case only and under the conditions existing at the time of this Order. It will be an explicit part of this Order that the effluent waters shall not be used for any recreational, domestic animal watering, or irrigation purposes. Furthermore, the land surrounding the ditch shall remain closed to the general public. Should Allied choose to change the use of its land, the nature of the depression will be re-evaluated. Very similar issues were raised in Alton Box Board vs. Environmental Protection Agency PCB 73-140, Environmental Protection Agency vs. Allied Chemical Co. PCB 72-109, and Environmental Protection Agency vs. Koppers Co., PCB 70-49. In Alton the ditch in question was found not to be waters of the state. In Allied the point was made that protection should be afforded to all waters, but did not specify which regulations were considered. In the Koppers case samples taken in a ditch were disregarded because no proof was offered as to the use of the ditch.

The above citations reinforce our opinion that a situation such as this must be decided on the facts of each particular case.

Having decided this issue, we now turn to the main case of whether the Petition for variance is justified.

Nature of Outflows: Petitioner discharges two flows into the Ohio River. Outfall 001 and Outfall 002 contain the following representative contaminants:

| | Outfall 001 | Outfall 002 |
|---------------|-------------|-------------|
| Flow MGD | .06 | 1.97 |
| Sus. Solids | 60 | 110 |
| mg/l | | |
| Fluoride mg/l | 45 | 425 |
| pH | 13.4-13.8 | 5.3 - 10.4 |

Petitioner alleges (R. 116-120) that the figures represented above are based on a thirty-day sampling period and that on given days the values would be higher. This is particularly important in relation to pH, in that this factor is not based on an average but must be met at all times. Petitioner states that the maximum concentrations it would expect on any given day are as follows:

| | Outfall 001 | Outfall 002 |
|--------------|-------------|-------------|
| Susp. Solids | 90 | 200 |
| Fluoride | 45 | 545 |
| pH | 6-13.8 | 1.8-10.4 |

Petitioner alleges that all of its water pollution problems are a result of its air pollution control program (R. 152). Scrubbants such as potassium hydroxide used in air scrubbing equipment are alleged to be the main contributor.

Hardship and Value of Facility to Community: Petitioner alleges that an arbitrary and unreasonable hardship will be suffered if the variance is not granted. Petitioner alleges that one alternate to a variance is a complete shutdown of its facilities. The Board restates its opinion that denial of a variance is not equivalent to a shutdown order, but rather a variance is a shield from prosecution. It is true that denial of a variance would leave Petitioner open to enforcement action by the Agency and to the full penalty provision as provided for in the Environmental Protection Act. However, it is true that in many past enforcement cases the Board has issued a cease and desist order as part of its final order, and the possibility of a shutdown is a realistic one (Environmental Protection Agency vs. Incinerator PCB 73-314). The Board must therefore consider the potential results of such a shutdown order.

Petitioner alleges the following losses to itself and the community if it were forced to close.

1. UF6 is a vital part of the nuclear energy chain. Allied is the major producer of UF6 in the United States, and if forced to close, the other producer, Kerr Magee, does not have sufficient capacity to fill the gap.

2. Allied has a payroll and other local expenditures of over 3.5 million dollars. In the event of a shutdown this income would be lost. Massac County has an unemployment rate of 9.6% (1970 census), and Petitioner's work force of 350 accounts for 30% of the industrially employed work force in the Metropolis area (Pet. Pg. 29).

3. If the Metropolis works were shut down, it is alleged that future growth of this type of facility in the area would be seriously jeopardized.

4. Allied would lose sales of \$30,000,000 from this date until the completion of its abatement facilities.

The above alleged hardships in the event of a possible shutdown lead the Board to the conclusion that a diligently pursued compliance plan will justify the issuance of a variance. The other factor which must be explored is that of environmental impact.

Environmental Impact: Petitioner alleges in its Petition that the effects of its present discharges are negligible on the Ohio River.

The following is a summary of projected effects on the Ohio River (Pet. for Variance Pg. 33-36):

Effect of Discharge on Environment

| Component | Plant Discharge | Conc. of River | Conc. of River After Mixing | Conc. in Mixing Zone | Standard Rule 203 |
|-----------|-----------------|----------------|-----------------------------|----------------------|-------------------|
| Fluoride | 410 mg/l | 0.2 mg/l | 0.22 mg/l | 0.40 mg/l | 1.4 mg/l |
| S/S | 108 mg/l | 109 mg/l | Not detectable | Not detect. | - |
| pH | 5 - 10.5 | 7.8 | Insignificant | Insignif. | 6.5 - 9.0 |

Petitioner entered Exhibit #6, which is a bioassay conducted on the plant effluent. Tests were conducted using both outfalls and the combined outfalls diluted with Ohio River water. Mr. Yates (Allied employee) testified as to how the samples were obtained and that the test was run according to standard methods. Counsel for the Agency objected to the testimony regarding how the test was run as speculation, based on the fact that the person who actually ran the bioassay was not available for cross-examination. (R. 178.) The Board finds, however, that the reputation of the consulting laboratory would cause us to enter this testimony and accept the bioassay as valid (R. 72). The following results were obtained from the above test:

| Effluent | 96 hr. TLM |
|----------------|--------------|
| 001 | 69,000 mg/l |
| 002 | 430,000 mg/l |
| 003 (Combined) | 292,000 mg/l |

This test would indicate that stream 001 is much more toxic than 002. It must, however, be noted that outfall 001 is of a much smaller volume than 002 (.06 mgd vs. 1.97 mgd). According to Petitioner's calculations the concentration at the edge of a 600' mixing zone would be 484 mg/l which is much lower than the TLM (Pet. Pg. 36).

Nature of Compliance Plans: Allied has submitted a compliance plan which calls for full compliance for all parameters except fluoride by 12/1/75. The reasons for this rather lengthy period of time are detailed in the record. The main points are A) that Petitioner produces products which are unique and that standard abatement methods are not readily available; and B) that due to the cost of raw materials and other considerations Petitioner is working towards recycle/reuse rather than end of the pipe technology.

Petitioner is one of only two manufacturers of UF6 in the United States. Kerr-Magee is the other producer, and according to Petitioner (Pet. Pg. 7, R. 17), the Allied process is unique. Petition for variance (Pg. 8, 9) clearly shows the difference between the steps used in the two procedures.

The effluents discharged by Allied are shown on Pg. 10 of the vari-

ance petition and are as follows:

1. Spent ammonium sulfate solution
2. Sulfide liquors
3. Hydrofluoric acid solution
4. Spent potassium hydroxide solution
5. Uranium recovery leach liquors

Petitioner testified (R. 82) that because of the unique nature of the plant's effluent, even standard control equipment will have to be modified to suit. It was further testified that conventional treatment (black box approach) could bring about earlier compliance, however, Petitioner argues and the Agency agrees (Reco Pg. &) that recycle/reuse are superior methods of treating wastes.

The following table (Exhibit #11) was submitted as a proposed project completion schedule.

Proposed Completion Schedule

| | Final Plans | Approval | Contracts | Start Constr. | Comp. Constr. | Start Up |
|--------------------------------------|-------------|----------|-----------|---------------|---------------|----------|
| KOH Regeneration | 4/1/74 | 12/31/73 | 7/1/74 | 7/15/74 | 9/1/75 | 12/1/75 |
| HF Neutralization | 4/1/74 | 12/31/73 | 7/1/74 | 7/15/74 | 9/1/75 | 12/75 |
| "U" Recovery cycle | Re-3/31/74 | 2/28/74 | 4/30/74 | 5/15/74 | 11/1/74 | 12/74 |
| Spent H ₂ SO ₄ | 3/31/74 | 2/28/74 | 3/31/74 | 4/15/74 | 7/15/74 | 8/74 |
| Sulfide Wastes | 9/1/74 | 10/1/74 | 12/1/74 | 12/15/74 | 1/1/76 | 4/76 |

Another major point is that the proposed plan calls for reduction of the fluoride level to only 7.0 mg/l (standard 2.5 mg/l). Petitioner alleges there is no reasonable method of achieving the 2.5 mg/l level (R. 30), but that it will continue to investigate methods for abatement and if any breakthrough occurs, will apply for permits to proceed. Perhaps the greatest problem facing Petitioner in regards to fluoride is that the well water used in the process is about 2.5 ppm (R. 111) (Exhibit G Pg. 2 shows Fl analysis as 3 ppm). This influent contamination puts Petitioner in the position of having to achieve 100% fluoride abatement.

Petitioner alleges that it has diligently been working on the problem of water pollution since 1971. Mr. Sobel's (Allied witness) testimony (R. 51-93) outlines the chronology of reporting to and contacts with the Illinois Environmental Protection Agency regarding progress in this area. These contacts included submission of progress reports and exploration of deep well disposal. The chronology as testified to has led to the abovementioned project completion schedule. Progress has led to the submission of construction permits for three abatement plans (KOH, HF, U recovery systems). This indicates to the Board that a viable plan is underway.

Petitioner alleges (R. 42) that the total compliance plan will cost about \$4,200,000 as follows:

| | |
|----------------------|-------------|
| A) KOH Regeneration | \$1,100,000 |
| B) HF Neutralization | 1,100,000 |
| C) U Recovery | 100,000 |
| D) Sulfide Liquor | 1,300,000 |
| E) Acid Disposal | 50,000 |
| F) Sewer Work | 100,000 |
| G) Monitoring | 50,000 |
| H) Other | 400,000 |
| | <hr/> |
| | \$4,200,000 |

The Board notes that full compliance (exception fluoride at 7.0 mg/l) cannot come about before 1976, however, certain partial abatement can be accomplished sooner. It will be an express part of this Order that interim steps will be completed as soon as possible. Furthermore, Petitioner alleges (R. 50) that the final completion dates could be shortened up. It will be an express part of this Order that Petitioner prove in any future proceedings exactly what steps were taken to expedite this program.

Although there was some misunderstanding of the applicable rule regarding suspended solids (e.g., 404 or 408), both parties now agree that the more stringent Rule 408 applies (R. 116, 126). Allied shall be required to meet the 15 mg/l suspended solid criteria in its compliance plan.

In regards to fluoride, as mentioned above a special problem exists. Allied shall be allowed to meet the 7 mg/l projection of its compliance plan so long as a viable research and development program is ongoing. This is in keeping with previous Board orders that in the absence of known technology a continuing program of research and development will be an acceptable compliance program (Union Oil Co. v. Environmental Protection Agency PCB 72-447).

Discussion of Good Faith Efforts: Petitioner has alleged throughout the record that it has diligently attempted to work toward compliance (R. 20, 53, Pet. Pg. 15, 16). As discussed above, Petitioner's process and discharges are unique, and therefore require unique solutions. However, a detailed study of the nature of effluents and plans for compliance as outlined in Exhibit #2 (non-disclosure) cast doubt on Petitioner's good faith efforts. Methodology planned for certain abatements does not seem very exotic. For example, methods for spent sulphuric acid and KOH regeneration do not employ unique unit processes, but rather are of a seemingly routine nature. The Board is not in a position to evaluate the type of technology used, and indeed would rather leave this aspect to Petitioner; we can only judge by what is presented to us in the record. This record caused the Board to question Petitioner's good faith efforts. Petitioner alludes (Exhibit #2 Pg. 24) to its completed abatement projects. A review of same reveals these projects to be merely tokens in relation to the total problem, and not indicative of a true good faith effort to get to the root of the problem.

In its interim Order dated January 17, 1974, the Board requested additional information as to what role dilution plays in Petitioner's overall treatment scheme. Dilution is specifically ruled out as a method of treat-

ment in Rule 401 of the Water Pollution Rules and Regulations. Petitioner proposed mixing the treated effluent streams with once through cooling water, thus lowering its final effluent concentrations. In its answer to the Board's interim Order, Petitioner states: "It is beyond dispute that the issue of dilution is inherent in the Petition for variance." Petitioner further contends that the compliance plan it proposes will yield the best degree of treatment consistent with technological feasibility, economic reasonableness, and sound engineering judgment. From material balances submitted the following effluent concentrations are anticipated:

| | Flow | Diss. Solids | Susp. Solids | Fluoride |
|-----------------|-------------------|--------------|--------------|----------|
| With cool water | 16,700,000 P.P.D. | 1274 ppm | 15 ppm | 7 ppm |
| W/O cool water | 3,500,000 P.P.D. | 5243 ppm | 56 ppm | 25 ppm |

It is obvious that cooling water gives a dilution factor of about 4.8, and that a relatively small increase in the use of cooling water (order of 10%) could greatly affect the final effluent quality. It will be a part of this Order to specifically disallow adjustments in cooling water volume to "fine tune" effluent concentrations.

By Order of the Board on February 14, 1974, the Agency was granted leave to amend its recommendation to read: "After detailed review of Exhibit #2 of the Petition for variance, and the construction and operating permits submitted to the Agency, it is the Agency's opinion that when Petitioner's control program is complete, each of the separate waste streams will be given the best degree of treatment consistent with technological feasibility, economic reasonableness, and sound engineering judgment."

The Board realizes fully its responsibility to interpret its rules to strike a reasonable balance between environmental control and economic reasonableness. The Board must also rely on the Agency's expertise in evaluating special circumstances, and on the basis of the above will allow Petitioner's method of compliance in this unique case.

Taking all factors into consideration the Board will grant a variance subject to many conditions. Petitioner has made an adequate case regarding hardship and environmental impact, but on the other hand has failed to display to the Board a good faith willingness to comply. The Board emphatically states that any future variance requests will be subject to the closest scrutiny. Petitioner's progress during the term of this variance will be a major consideration in any future grants.

This Opinion constitutes the findings of fact and conclusions of law of the Board.

ORDER

IT IS THE ORDER of the Pollution Control Board that:

1. The natural drainage channel running from Petitioner's plant to the Ohio River is an industrial ditch and the effluent

therein be subject to Rule 408 of Chapter 3. Said classification to be effective so long as the following is true:

- A) Petitioner's discharge and natural runoff are the only flow in said channel.
- B) Effluent in said channel is not used for purposes of:
 - i. Public drinking water supply.
 - ii. Domestic animal feeding.
 - iii. Irrigation of crops.
 - iv. Recreational use.
- C) Said ditch is solely on Petitioner's property and said property is closed to the general public.

Should any of the conditions in subparagraphs A,B, or C change, said channel shall be subject to re-evaluation by the Environmental Protection Agency and the Board.

- 2. Variance is granted from Rule 408 regarding fluorides for one year from the date of this Order, subject to the following conditions:
 - A) That the 001 discharge shall not exceed 45 mg/l fluoride as a daily average;
 - B) That the 002 discharge shall not exceed 425 mg/l fluoride as a monthly average, nor shall it exceed 545 mg/l on any daily average;
 - C) That Petitioner shall continue to pursue diligently a program to reduce the fluoride content of its effluent to 2.5 mg/l.
- 3. Variance is granted from Rule 408 regarding suspended solids for one year from the date of this Order, subject to the following conditions:
 - A) That the 001 discharge shall not exceed 60 mg/l on a monthly average, nor shall it exceed 90 mg/l on any daily average;
 - B) That the 002 discharge shall not exceed 110 mg/l on a monthly average nor shall it exceed 200 mg/l on any daily average.
- 4. Variance is granted from Rule 408 regarding pH for one year from the date of this Order, subject to the following conditions:
 - A) That the pH of the 001 effluent will not exceed 13.8 nor be lower than 5.0;
 - B) That the pH of the 002 effluent will not exceed 10.4 nor be lower than 1.8.
- 5. By August 1, 1974, Petitioner shall cease and desist from discharging 95% sulphuric acid into the drainage channel.
- 6. Petitioner shall diligently pursue all aspects of its compliance plan as contained in Exhibit #11 of its Petition

(spent sulphuric acid plan shall be subject to Order #5). The ultimate goal of said compliance plan shall be:

- i. Reduction of suspended solids to 15 mg/l.
- ii. Reduction of fluoride to 7.0 mg/l.
- iii. Maintenance of pH between 5 and 10.

Petitioner shall make every effort to expedite the completion date of said compliance plan.

7. Petitioner's program for "U" recovery recycle shall be completed by 12/1/74.
8. Variance shall be granted from Rule 921 (a) of Chap. 3 for the limited purpose of allowing the Agency to issue permits for Petitioner's proposed facilities.
9. All effluent concentrations shall be based on cooling water flow rates submitted on Feb. 11, 1974 (Petitioner's Response to Interim Order of the Board). Any subsequent increases in cooling water flow shall not be used as a basis for calculating final effluent concentrations.
10. Petitioner shall send reports monthly to the Environmental Protection Agency containing at the minimum:
 - A) pH, fluoride, and suspended solids levels of each of its two outfalls. Such values shall contain the monthly and daily averages of each component. In the case of pH maximum and minimum readings shall be supplied.
 - B) A complete summary of progress in regard to Orders 2 (C), 5, and 6.
 - C) Any changes in the use of the drainage channel.
 - D) What efforts and results Petitioner has made or obtained in efforts to expedite Order #6.

I, Christan L. Moffett, Clerk of the Illinois Pollution Control Board, certify that the above Opinion and Order was adopted by the Board on the 28th day of February, 1974, by a vote of 5 to 0.


