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Faxed RDG 4-28-86
BJR

To: R. D. Gamblin - Houston

From: R. A. Conrad
Date: April 28, 1986

VISTA

Interoffice
Communication

Subject: Acid Neutralization Tanks Replacement -
Impact of Zinc in Limestone

Reference your questions concerning a possible zinc problem in the VCM Plant waste water associated with the limestone neutralization process, George Hopkins and Mike Hayes prepared the attached memos which explain some of the potential impacts of zinc on our NPDES permit limitations.

While the memos point out some potential problems in a worst case situation, each points out that the current plans represent the best option compared to the caustic neutralization alternative.

If you have any other questions, please advise.



R. A. Conrad
Plant Manager
LCVCM

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cc: RTF-GEH-MGH

CWM 000006007

To: R. A. Conrad ✓

From: G. E. Hopkins
Date: April 25, 1986

Interoffice
Communication

Subject: Effect of Zinc in Limestone on Proposed NPDES
Permit Compliance
(Re: Acid Neutralization Tanks Replacement
Project)

VISTA

Studies and calculations to date indicate that with our present secondary treatment system, the zinc in the limestone from limestone neutralization should not prevent compliance with the proposed NPDES permit limitations for zinc (3 lbs/day average and 6 lbs/day maximum).

These studies are based on the following:

1. Laboratory analyses conducted at the VCM Plant for zinc in four different limestones.
2. One set of analyses of wastewater entering and leaving the LCVCM Plant secondary treatment system indicating a zinc removal efficiency by the secondary of 84.6%.
3. Maximum and normal limestone usage rates from design conditions used by PED for the Acid Neutralization Tanks design.
4. Assumption that all zinc in the limestone will be dissolved.

The calculated results indicate a maximum of 7.3 lbs/day zinc will enter the LCVCM Plant secondary of which only 1.1 lbs/day should be discharged in the effluent. This maximum case, however, should be very infrequent as it includes the methyl chloride water and incinerator water which normally will be neutralized in the other tank and be transferred to the LCCP secondary (Note the LCCP permit allows much higher zinc values - 13.75 lbs/day average and 30.19 lbs/day maximum). During normal operation mainly the neutralized steam stripper water will go to the VCM Plant secondary resulting in only 0.2-0.3 lbs/day entering the secondary and 0.02 to 0.04 lbs/day being discharged.

CWH 000006008

Two potential difficulties with the above conclusions include:

1. The zinc removal efficiency in the secondary is based on only one set of analyses.

With reference to this item, future studies are planned to further define zinc removal efficiency. This will be done as part of the NPDES source survey in early May. However, we do not anticipate substantial reduction from the 84.6% efficiency as it is reasonably consistent with available technical literature (OCPSF guidelines indicate typical zinc removal efficiency of 76% from POTW).

2. Revisions to the VCM Plant to comply with the proposed NPDES Permit and future OCPSF guidelines will result in very little organic material in the wastewater to the secondary. This may result in the secondary no longer being needed or in a reduced bug population and subsequent loss or reduction of zinc removal by the secondary. However, this would only be a problem during the infrequent occurrences when one neutralization tank is out of service such that methyl chloride water and incinerator water are diverted to the VCM Plant secondary.

The attached letter from Mike Hayes discusses several options to correct this difficulty. One option mentioned in his letter was to precipitate zinc from the limestone tanks using caustic. Based on very preliminary analysis, PED indicated expenditure of the very approximate estimate of \$400M for the zinc precipitation facilities (in addition to the \$1,500M for the new limestone neutralization tanks) is more economical than installing a caustic neutralization system (instead of limestone). Further, it is doubtful at this time that zinc precipitation is expected to be required as many of the other less costly items in Mike Hayes letter appear quite viable.

G. E. Hopkins

G. E. Hopkins
Chief Process Engineer

CWH 000006009

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cc: PEM, WPS, PLF, MLA, SCR, MCM, MWC, VMF, MGH,
T. Heller, P. Fetizanan (Houston)

To: G. E. Hopkins

From: M. G. Hayes
Date: April 24, 1986

Interoffice
Communication

Subject: Acid Neutralization Tanks/Zinc Limitations

VISTA

The question of zinc in the limestone rock causing NPDES permit problems, based on the draft permit, versus the proposed neutralization scheme has been raised. The following points should address your concerns:

1. The existing neutralization scheme is still considered appropriate, even though zinc is added from the limestone neutralization media. The zinc generated can be controlled in three manners. One is to limit the quantity of zinc by imposing a specification on limestone rock purchased. The second, and most expensive, is to do zinc precipitation in the caustic trim pits. More on this option later. The third is the removal of zinc in the secondary treatment system.
2. The organic pollutant reductions required may cause the secondary to have insufficient organic feed to sustain biological activity, causing the zinc to break through. An alternate feed stream from LCCP would maintain the biological activity.

Please keep in mind that through reductions in organic loading, reduction in hydraulic loading through stormwater segregation and direct discharge of the cooling tower blowdown, we may reach a point where the LCVCM wastewater flow could be combined with the flow to the LCCP secondary system. This bears further investigation following completion of the projects required for NPDES compliance; however, the proposed neutralization scheme is consistent with this possible alternative.

3. The LCVCM system may not be required due to not needing additional treatment for organics following completion of the projects to ensure compliance. In this event, precipitation of zinc through caustic trim and subsequent settling and acid modification would be necessary if zinc specifications did not yield the needed improvement. From a cost standpoint, this option would be less expensive from an operating cost standpoint than total caustic neutralization of the entire plant stream, and likely less susceptible to pH excursions. Also, if capital costs weighed heavily in favor of total caustic neutralization, the planned tanks are designed so that conversion later is possible.

CWH 000006010

G. E. Hoplins
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Directionally, the pressures and alternatives still point to proceeding with the project as it is currently planned.

M. G. Hayes

M. G. Hayes

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cc: RTF RAC

CWH 000006011