UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

Feb 05, 2004

In Reply Refer To: WTR-7

Randall Peterson, Envr Manager
Knauf Fiberglass
3100 Ashby Road
P.O. Box 819
Shasta Lake, California 96019-0819

Re: January 2004 Clean Water Act Inspection and Sampling

Dear Mr. Peterson:

Enclosed is the January 27, 2004 report for our inspection of Knauf Fiberglass. Please submit a short response to the findings in Sections 2 through 5 of this report, to both EPA and the City of Shasta Lake, by **March 30, 2004**.

I appreciate your helpfulness extended to me during this inspection and your willingness to allow us to provide direction to the City of Shasta Lake as they establish their sewer service requirements. As you may remember, our interest here is in the regulatory control of industrial wastewater dischargers in the small sewer districts (like the City of Shasta Lake) that are not required to operate approved pretreatment programs.

Upon reflection, I have made two conclusions in the attached inspection report that I did not state to you or the City during the many visits and telephone conversations.

First, the City, without too much difficulty, should be able to accept for treatment and thus authorize by permit the utility building discharges that are now occurring, as well as the proposed emergency discharges of cullet water and cooling tower blowdown. The only stipulations would involve discharging the cullet waters directly to the City's emergency storage pond, and curtailing any non-domestic wastewater discharges, other than softener brine or compressor condensate, to the utility building sewer. On the other hand, a permit for the emergency discharge of wash waters may prove to be difficult to obtain. The amount of BOD and ammonia in the wash water could overload the Shasta Lake wastewater treatment plant, and the phenols could impair its nitrification. Moreover, the toxicity of the wash water is unknown which means no determination can be made whether it could or could not cause the pass-through of toxicity through the treatment plant. For these reasons, the City should not accept the wash waters without first obtaining the results of a treatability study demonstrating that the treatment plant as it is currently configured and operated can successfully provide treatment and not pass-through toxicity. Possibly the best method of handling wash waters in an emergency would be a dedicated pond at Knauf large enough to impound the estimated 156,000 gallons of wash water in the system.

Second, the emergency discharge of the wash water would be subject to Federal categorical pretreatment standards. Wastewaters generated by the manufacture of a number of thermosetting resins including urea-formaldehyde and phenol-formaldehyde binders are regulated under the Federal organic chemicals, pesticides and synthetic fibers rule in 40 CFR 414. This means that an emergency discharge of the wash water must not only have no adverse impact upon the Shasta Lake wastewater treatment plant but also comply with a list of toxic organic chemicals regulated by the Federal rule.

The City has the authority in its sewer use ordinance to develop procedures to issue the proper permits for these discharges. The process could allow for a single permit that outlines specific requirements for each discharge regarding self-monitoring, reporting, and compliance. Whether the discharges are authorized under a unified permit or in separate permits is immaterial. What matters here is that these authorizations are obtained through the City's permitting process. I remain available to the City and to you to assist in any way I can.

The inspection report provides a rough determination of the technical restrictions upon the various discharges, as well as specific requirements for self-monitoring. From these, and with your input through the permit application process, the City should be able to draft a valid permit.

Once again, thank you for you cooperation during this inspection. Please do not hesitate to call (415) 972-3504 or e-mail at arthur.greg@epa.gov.

Sincerely,

Original signed by:
Greg V. Arthur

Greg V. Arthur
Clean Water Act Compliance Office

cc: Kyle Erikson, RWQCB

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION 9

CLEAN WATER ACT COMPLIANCE OFFICE

NPDES COMPLIANCE SAMPLING INSPECTION REPORT

Industrial User:	Knauf Fiberglass 3100 Ashby Road, Shasta Lake, California 96019-0819 Non-categorical Significant Industrial User 40 CFR 414 Subpart E - Zero Discharging Thermosetting Resin Mfg.
Treatment Works:	City of Shasta Lake Water Pollution Control Facility (NPDES Permit CA0079316)
Dates of Inspection:	July 1, July 22, and October 29, 2003, January 9, 2004

Inspection Participants:

US EPA:	Greg V. Arthur, CWA Compliance Office, (415) 972-3504 Meg Masquelier, CWA Compliance Office, (415) 972-3536
RWQCB:	Nolan Randall, Redding Office, (530) 224-4801
City of Shasta Lake:	Tom Chism, Wastewater Treatment Superintendent, (530) 275-7400
Knauf Fiberglass:	John Sabol, Director of Operations, (530) 275-9665 ex.101 Jim Varner, Plant Engineer, (530) 275-9665 ex.150 Randall Peterson, Envr Safety & Health, (530) 275-9665 ex.112

Report Prepared By: Greg V. Arthur, Environmental Engineer
January 27, 2004

Section 1

Introduction and Background

1.0 Scope and Purpose

On July 1, July 22, and October 29, 2003, and on January 9, 2004, EPA, the Regional Water Quality Control Board ("RWQCB") and the City of Shasta Lake conducted a compliance sampling inspection of Knauf Fiberglass ("Knauf") in Shasta Lake. The purpose was to ensure compliance with the Federal regulations covering the discharge of non-domestic wastewaters into the sewers. In particular, it was to ensure:

- Classification in the proper Federal categories;
- Application of the correct standards at the correct sampling points;
- Consistent compliance with the standards; and
- Fulfillment of Federal self-monitoring requirements.

Knauf is one of four significant industrial users ("SIUs") within the City of Shasta Lake sewer service area whose compliance was assessed as part of EPA's 2003 evaluation of the regulatory control in the City of Shasta Lake. The City and Knauf each received individual reports. The inspection participants are listed on the title page. Arthur conducted the inspection on July 1 and collected samples on July 22, October 29, and January 9.

1.1 Process Description

Knauf manufactures fiberglass wool insulation at 3100 Ashby Road in Shasta Lake. The operations began in 2002 in two buildings, the fiberglass manufacturing building, and the utilities building. The fiberglass wool is made by pouring furnace melted glass into spinning crown heads perforated with microscopic holes. The glass is flung from the crown heads through the holes and water contact quenched to form the glass wool fibers.

The urea-formaldehyde and phenolics-formaldehyde binding agents are manufactured on-site, sprayed and heat cured to form the fibers into mats and hold them to backing paper for trimming into the final product. The binding agent manufacturing involves the mixing of urea or phenolics with formaldehyde to initiate a polymerization by condensation reaction, in which one or more new rings in polymer chains are formed as water condenses out. Knauf does not manufacture the backing paper, urea, phenolics, or formaldehyde.

Section 1 – Introduction and Background

1.2 SIC Codes

Knauf in Shasta Lake is assigned the SIC code for fiberglass insulation manufacturing (SIC 3296). It is not assigned the SIC code for the manufacturing of urea resins or phenolic resins (SIC 2821).

1.3 Waste Streams and Wastewater Handling

Knauf is configured to not discharge contact process wastewaters. The only discharges are brines from the water softening of incoming city water and air compressor condensate. All other process wastewaters are reused on-site in a series of process water systems of decreasing quality. The principal loss of water-entrained contamination is into the make-up water for the binders that are applied onto the fiberglass product. See Appendix 1.

<u>Process Cooling</u> - The process cooling water system uses the cleanest water for recirculated non-contact water-jacket cooling of glass melting furnace electrode holders and glass fiber crown heads. An ion exchange water softener preconditions city water as system make-up for evaporative losses. The make-up and tail waters from process cooling fill a hot-water equalization pit that feeds a cooling tower. Cooled waters then fill a cold-water equalization pit for delivery through the water jackets. System blowdown is drawn from the hot-water equalization pit in order to feed the wash water system and to control dissolved solids build-up. Softener brine discharges to the city sewers.

<u>Wash Water</u> - The wash water system recirculates plant washdown, fume scrubber blow-down, electrostatic precipitator wash water, and spent clean-in-place caustic pipe cleaning waters. The wash waters in the system are continually recirculated from an influent sump and equalization tank through a coagulant and flocculant-aided air flotation unit followed by a belt press to remove accumulated solids. The wash waters are drawn for reuse from the influent sump through a shaker screen. Blowdown from the process cooling water system provides the make-up for evaporation and consumption losses. The only losses from the system are the removed solids and a blowdown stream drawn from the air flotation unit as binder make-up water. Glass solids from the shaker screens and air flotation float are hauled off-site to a landfill as non-hazardous waste. The wash water quality depends on the numerous additives and contaminants into the process cooling and wash water systems. These additives and contaminants include urea-formaldehyde and phenolics-formaldehyde resins, decanol/octanol antifoaming agents, quarternary salt coagulant, descalant, polymer flocculant, and three biocides (*liquid bromine, and two methylated thiazoles*).

<u>Binder Water</u> - Wash water system blowdown is consumed as make-up water for the binders that end up in the fiberglass product.

<u>Cullet Water</u> - Contact cooling water to quench fiberglass recirculates through outdoor cullet water pits. The evaporative losses also result in mineral deposition on the quenched fiber.

Section 1 – Introduction and Background

Emergency Discharges - Knauf has the capability to discharge cullet water and wash water to the sewers in an emergency after notification of the City. The emergency shunt for the cullet water directs it through a dedicated line to the emergency retention basin at the City waste-water treatment plant. The procedure for an emergency discharge of wash water has not been determined but it can be drawn from many locations and shunted to the buildings sewer or to the dedicated line to the emergency basin.

Water Consumption - Knauf augments its city water requirements with around 100,000 gallons per day of reclaimed treated domestic sewage drawn from the reclaim reservoir of the Shasta Lake sewage treatment plant.

Section 2

Sewer Discharge Standards and Limits

Federal categorical pretreatment standards (where they exist), national prohibitions, and the local limits (where they exist) must be applied to the sewered discharges from industrial users. 40 CFR 403.5 and 403.6.

2.0 Summary

Neither the City nor the RWQCB has issued permits to the industrial users in Shasta Lake. A permit issued to Knauf as configured and operated now would need to apply the national prohibitions and local limits upon developed by the City to address the regulatory requirements for the City's wastewater treatment plant. If the permit authorizes future emergency discharges of wash waters it also would have to advance Federal organic chemicals, plastics, and synthetic fibers ("OCPSF") standards. The application of Federal categorical standards, national prohibitions and local limits was determined through visual inspection. See Appendices 2 and 3 for the discharge requirements.

Requirements

- The permit must specifically authorize the discharge of only domestic sewage, softener brine, and air compressor condensate into the city sewers, and specifi-cally prohibit all other wastewater discharges to the sewers.

- If the permit is to authorize emergency discharges, it must specify their discharge into the dedicated line to the City's emergency storage pond after notification.

- If the permit is to authorize the emergency discharge of wash waters, it must apply the Federal OCPSF standards, and the national prohibitions or local limits for formaldehyde, total dissolved solids, total phenolics, and against oxygen demand impacts from BOD and ammonia.

Recommendations

- A bench-scale test for treatment plant treatability of the emergency discharges should be performed if the permit is to authorize their discharge.

- If the permit is to authorize emergency discharges, it should define Knauf's discharge procedures and the City's procedures for the emergency storage pond.

Section 2 – Sewer Discharge Standards and Limits

2.1 Classification by Federal Point Source Category

Utility Bldg Discharges Only - Knauf, as it is configured and operated now, is a non-categorical significant industrial user, that would qualify for regulation under the Federal rule for thermosetting resins in 40 CFR 414 if there were discharges to the sewers from the manufacturing of the thermosetting resin binders. Knauf is not regulated under the Federal rule for insulation fiberglass in 40 CFR 426 because there are no pretreatment standards advanced for process wastewater discharge to sewers.

Emergency Discharges - If the City is to authorize emergency discharges from Knauf, the discharge of wash water would qualify Knauf as a manufacturer of thermosetting resin products subject to the Federal OCPSF standards in 40 CFR 414 Subpart E. The insulation fiberglass rule in 40 CFR 426 would still not apply because it does not set pretreatment requirements for new sources like Knauf. However, the insulation fiberglass rule does prohibit the discharge of process wastewaters from new sources like Knauf to any surface waterway including storm water drainage areas.

2.2 Federal Categorical Pretreatment Standards
Organic Chemical, Plastics and Synthetic Fibers - 40 CFR 414 Subpart E

Applicability - Under 40 CFR 414.11 the OCPSF standards apply to discharges (1) from the manufacturing of the products and product groups listed in the rule (2) at facilities that are included under the listed SIC codes. Regarding the first condition, the products and product groups listed in the rule were manufactured through the reaction chemistries referenced in the development document for the rule (such as polymerization, condensation, alkylation, etc.). Regarding the second condition, the reference to the SIC codes is meant to delineate between facilities that perform the same reaction chemistries and manufacture the same products or product groups but are either specifically covered under other Federal rules or specifically exempted. For example, the facilities that manufacture and mold listed plastics on-site under SIC code 3079 are covered by 40 CFR 463 for plastics molding. The integrated oil refineries that manufacture listed chemicals under SIC code 2911 are covered by 40 CFR 419 for oil refining. Others delineated for exclusion from the OCPSF rule include SIC 2843 surfactants, SIC 2834 pharmaceuticals, SIC 2841 detergents, SIC 2891 adhesives, SIC 2861 gum and wood products, and SIC 2899 specialty industrial chemicals.

As a result, an emergency discharge of wash water to the sewers qualifies Knauf under the first condition because Subpart E of the rule for thermosetting resins specifically applies to the discharges from the manufacturing of phenolic resins and urea formaldehyde resins via the polymerization by condensation reaction chemistry. Knauf also qualifies by default under the second condition because it is not assigned to any of the listed SIC codes either for inclusion into or exclusion from the rule.

Section 2 – Sewer Discharge Standards and Limits

Standards - The discharge standards in 40 CFR 414.111 apply to Knauf since it is an indirect discharging point source. New source OCPSF facilities are required to comply upon discharge. See Appendix 3.

Adjustments – The Federal standards do not have to be adjusted to account for dilution or multiple Federal categories, using the combined waste stream formula in 40 CFR 403.6(e). Also under 40 CFR 414.11(g,h), the OCPSF standards, by default, do not have to be adjusted to apply to only the metals-bearing or cyanide-bearing waste streams because there are none. If there were any of the metals-bearing and cyanide-bearing waste streams listed in Appendix A of the OCPSF rule or as determined through sampling, then the standards would have to be adjusted to account for the dilution of non-metals-bearing or non-cyanide-bearing flows.

Basis of the Standards - The OCPSF standards for indirect dischargers were based on a model "best-available-technology" treatment system that comprises steam stripping to remove volatile and semivolatile organics, hydroxide precipitation for metals, alkaline chlorination for cyanide, and in-plant biological treatment for phenols, phthalate esters, and polynuclear aromatics. The best-available-technology standards were set where facilities with model treatment operated at a long-term average and variability that achieved a compliance rate of 99% (1 in 100 chance of violation).

2.3 Local Limits and National Prohibitions

Local limits and the national prohibitions are meant to express the limitations on non-domestic discharges necessary to protect the sewers, treatment plants and their receiving waters from adverse impacts. In particular, they prohibit discharges that can cause the pass-through of pollutants into the receiving waters, the operational interference of the treatment works, the contamination of the sewage sludge, sewer worker health and safety risks, fire or explosive risks, and corrosive damage to the sewers. The national prohibitions apply nationwide to all non-domestic sewer discharges. The Shasta City local limits apply to non-domestic discharges in its service area, however they are provide only narrative prohibitions for toxic pollutants. The City will likely have to develop new local limits to reflect new WWTP discharge requirements for toxics and nitrates expected in 2006.

2.4 Permit Conditions for Emergency Discharges

A permit for emergency discharges must apply the applicable Federal standards and ensure against the pass-through of toxics or the operational interference of the City's wastewater treatment plant. Specifically this means the following:

- Cullet water discharges may not result in temperatures entering the treatment plant above 104°F. Knauf staff said that cullet water discharges may be as high as 180°F.

Section 2 – Sewer Discharge Standards and Limits

- The emergency discharges may not result in a failure of the acute toxicity test at the Shasta Lake wastewater treatment plant. The pass-through of formaldehyde, total phenolics, and un-ionized ammonia all would impart toxicity. The cullet and wash waters contain low concentrations of other toxics such as molybdenum and chromium.

- Process wash water discharges may not in any way interfere with the operations of the Shasta Lake wastewater treatment plant. The BOD, ammonia, total phenolics, and formaldeyde concentrations in the wash water are 1200, 200, 46, and 2.3 mg/l. See Appendix 4 for example calculations. Defaults based on literature searches are as follows:

  discharge flow rate - 71,000 gpd (BOD and BNOD oxygen demand requirements)

  formaldehyde - 9 mg/l in the sewers (worker health and safety from fumes)

  phenolics - 4 mg/l at the WWTP (nitrification inhibition)

Because of the potential to cause an operational interference at the Shasta Lake wastewater treatment plant or result in the pass-through of toxicity to the receiving waters, the cullet and process wash waters should be bench scale tested for treatability, before a permit is drafted. Moreover, the acceptance of emergency discharges and the protection of the Shasta Lake wastewater treatment plant necessarily involves the operation of its emergency storage pond. For the purposes of drafting a permit, the emergency storage pond should be considered full, which as a worst-case, would also result in a flow restriction upon the emergency discharges from Knauf.

2.5 Point(s) of Compliance

Local limits and the national prohibitions apply end-of-pipe to all non-domestic flows from Knauf. The sample point designated in this report as IWD-1 is a suitable end-of-pipe sample point representative the day-to-day non-domestic wastewater discharges from the utility building. The sample points designated in this report as IWD-2 and IWD-3 are representative of the water quality of the cullet water and process wash water. In the event of an emergency discharge authorized by the permit, these sample points would be sited on the dedicated line to from Knauf to the City’s emergency storage basin.

2.6 Compliance Sampling

Local limits and the national prohibitions are instantaneous-maximums and are comparable to samples of any length including single grab samples. Federal categorical pretreatment standards are daily-maximums comparable to 24-hour composite samples and monthly-averages which are arithmetic averages of all 24-hour composite samples collected in a

Section 2 – Sewer Discharge Standards and Limits

calendar month. The 24-hour composite samples can be supplanted with single grabs or manually-composited grabs that are representative of the sampling day's discharge.

2.7 Pollutants of Concern

Utility Building Discharge - The permit should advance local limits and self-monitoring requirements for pH, total dissolved solids, ammonia, chromium, formaldehyde, molybdenum, oil & grease, and total phenolics.

Emergency Discharge of Cullet Waters - If the permit is to authorize this discharge, it should advance local limits and self-monitoring requirements for pH, discharge flow rate, temperature, total dissolved solids, ammonia, formaldehyde, oil & grease, and total phenolics.

Emergency Discharge of Wash Waters - If the permit is to authorize this discharge, it should advance the Federal standards for regulated pollutants in 40 CFR 414.111, and the local limits and self-monitoring requirements for pH, discharge flow rate, total dissolved solids, ammonia, chromium, formaldehyde, molybdenum, oil & grease, and total phenolics.

Section 3

Compliance with Federal Standards

Industrial users must comply with the Federal categorical pretreatment standards that apply to their process wastewater discharges. 40 CFR 403.6(b).

Categorical industrial users must comply with the prohibition against dilution of the Federally-regulated waste streams as a substitute for treatment. 40 CFR 403.6(d).

Industrial users must comply with the provision restricting the bypass of treatment necessary to comply with any pretreatment standard or requirement. 40 CFR 403.17(d).

3.0 Summary

Knauf currently complies with the Federal OCPSF standards by not discharging to the sewers the process wastewaters associated with thermosetting resin manufacturing. If the permit is to authorize the emergency discharge of these wastewaters, then Knauf will have to first demonstrate an expectation of consistent compliance with the Federal standards. Samples collected during this inspection are inconclusive because the results did not cover all of the Federally-regulated pollutants.

Requirements

- A baseline monitoring report regarding the emergency discharge of process wash waters and its compliance with the applicable Federal standards must be submitted to EPA and the City at least ninety days before the start of discharge.

Recommendations

- None.

3.1 Baseline Monitoring Report

A baseline monitoring report ("BMR") must be submitted at least ninety days prior to the commencement of a discharge of Federally-regulated wastewaters from a new source. The Federal pretreatment rules outline the requirements for a baseline monitoring report in 40 CFR 403.12(b). In particular, the BMR must contain at least four samples representative the sampling day's operations analyzed for all of the Federally-regulated pollutants. In this case, these pollutants are those listed in 40 CFR 414.111 for indirect discharges from industries regulated under the OCPSF rule. See Appendix 3.

Section 3 – Compliance with Federal Standards

3.2 Best-Available-Technology Treatment

The proposal for the emergency discharge of process wash waters does not involve pretreatment of any sort. It cannot be determined whether pretreatment, equivalent or not to the best-available-technology (“BAT”) model treatment used in setting the standards, would be necessary to meet the Federal standards since no complete sample set has been collected as of yet. See Appendix 5 for sampling results.

Section 4

Compliance with Local Limits and National Prohibitions

All non-domestic wastewater discharges to the sewers must comply with local limits and the national prohibitions. 40 CFR 403.5(a,b,d).

Industrial users must comply with the provision restricting the bypass of treatment necessary to comply with any pretreatment standard or requirement. 40 CFR 403.17(d).

4.0 Summary

No conclusion regarding overall compliance can be made until the City revises its local limits to cover the pollutants of concern and drafts a permit enacting the provisions. However, its is likely that the daily discharges from the utility building do not pose a threat to the local sewer system or treatment plant. On the other hand, the proposed emergency discharges pose an as-of-yet unquanitifed risk to the treatment works of pass-through, sludge contamination, and operational interference.

Requirements

- The emergency discharge of wash waters may not cause an overloading the City's wastewater treatment plant.
- If a permit is to authorize the emergency discharge of process wash water, bench-scale treatability testing should be performed first to ensure that the City's wastewater treatment plant can accept the wastewater and to determine the acceptable loading rate.

Recommendations

- The source of ammonia in the utility building discharge should be identified and prevented if it is from uncontrolled releases such as spills.

4.1 National Objectives

The general pretreatment regulations were promulgated in order to fulfill the national objectives to prevent the introduction of pollutants that:

(1) cause operational interference with sewage treatment or sludge disposal,
(2) pass-through sewage treatment into the receiving waters or sludge,
(3) are in any way incompatible with the sewerage works, or
(4) do not improve the opportunities to recycle municipal wastewaters and sludge.

Section 4 – Compliance with Local Limits and National Prohibitions

This evaluation did not include an evaluation of whether achievement of the national objectives in 40 CFR 403.2 have been demonstrated by consistent compliance with the sludge and discharge limits at the City of Shasta Lake wastewater treatment plant. That analysis is available as part of the EPA evaluation report for Shasta Lake. Moreoever, of more interest are the proposed emergency discharges of cullet water and process wash waters that as of yet have not discharged into the Shasta Lake treatment works. If the objectives are not found to have been achieved in Shasta Lake or if they are unlikely to be achieved with the advent of emergency discharges, then Knauf would have to comply with new Shasta Lake local limits that are protective of the sewerage works.

4.2 Oxygen Demanding Pollutants

Utility Building Discharge - Water softener brine and air compressor condensate would be expected to entrain almost no oxygen demanding pollutants. However, the sample results obtained by the City indicate unexpected concentrations of BOD (*136 mg/l*) and ammonia (*143 mg/l*). It is uncertain whether the City's sample included domestic sewage. But even so, domestic sewage cannot produce the ammonia levels. The sources of the oxygen demanding pollutants in the utility building discharge must be identified and curtailed, in particular, if their source is the uncontrolled release of wash waters or related solids.

Emergency Discharge of Cooling Tower Blowdown - The cooling water blowdown discharged alone would not be expected to impart a significant oxygen demand upon the Shasta Lake wastewater treatment plant. This inspection did not involve sampling of the cooling water blowdown by itself.

Emergency Discharge of Cullet Waters - Cullet waters would not be expected to impart a significant oxygen demand upon the wastewater treatment plant. The sample results obtained as part of this inspection confirm the expected low concentrations of BOD and ammonia.

Emergency Discharge of Wash Waters - The process wash waters would impart a significant oxygen demand upon the wastewater treatment plant. The sample results obtained as part of this inspection indicate concentrations of BOD (*1,200 mg/l*) and ammonia (*200 mg/l*) that are many times higher than typical concentrations found in domestic sewage. Sewage treatment plant capacities to provide oxygen are typically based on design parameters for BOD and ammonia of 200 mg/l and 40 mg/l, respectively. As a result, any discharge of the wash waters would cause the City to use some of its remaining treatment capacity. Dry-weather flows at the WWTP currently are approximately 400,000 gpd less than the design capacity of the WWTP. This available capacity allows the City to increase its services as the City grows. A maximum discharge of 71,000 gpd directly from Knauf would consume the entire available capacity. Moreover, as the City grows, the available treatment capacity to provide oxygen and the maximum discharge flow rate acceptable from Knauf would shrink.

This means any emergency discharge of wash waters from Knauf should be done in a way that results in the lowest possible oxygen demand upon the City's wastewater treatment

Section 4 – Compliance with Local Limits and National Prohibitions

plant. Two discharge methods have been identified that would either prevent the emergency discharge of oxygen demanding pollutants or reduce the oxygen demand.

- the discharge of the cooling tower blowdown prior to mixing with the wash waters
- the discharge of wash waters to the City's emergency pond

Knauf might also consider the construction of its own dedicated 156,000 gallon emergency storage basin to hold all process wash waters. This would provide access to an always empty pond and thus allow the impoundment of any emergency discharges without restriction. The permit would then define the conditions for the metered discharge of impounded wastewaters to the Shasta Lake wastewater treatment plant. This would also allow the reclaim of the emergency wastewaters back into Knauf. See Appendix 4 for rough example calculations.

4.3 Toxicity

The process wash waters contain formaldehyde, phenolics, ammonia, and metals, as well as cooling water biocides. EPA did not sample for volatile organics. These pollutants acting singly or symbiotically together can all impart toxicity which could impact the ability of the City's wastewater treatment plant to operate as designed. In particular, slug loads of oxygen demanding pollutants, and phenols, can impair treatment plant performance. These and other pollutants can also impart toxicity that pass-through the City's wastewater treatment plant. The pass-through of phenolics, un-ionized ammonia, and formaldehyde all could cause the City to fail the acute toxicity requirement in its NPDES discharge permit for the wastewater treatment plant. High levels of molybdenum impair the disposal of treatment plant sludge. As a result, Knauf should demonstrate through bench-scale testing the treatability of the wash waters by the City wastewater treatment plant, before applying to the City for an emergency discharge permit.

4.4 Flammability

Flammability is not a risk because of an expected lack of organic solvents in the waste streams.

4.5 Temperature

The emergency discharge of cullet waters could produce temperatures at the headworks of the City's wastewater treatment plant over 104°F. The emergency discharge of the cullet waters to the dedicated line leading to the City's emergency pond should prevent high temperatures at the headworks.

Section 5

Compliance with Federal Monitoring Requirements

Significant industrial users must self-monitor for all regulated parameters at least twice per year unless the sewerage agency monitors in place of self-monitoring. 40 CFR 403.12(e) & 403.12(g).

Each sample must be representative of the sampling day's operations. Sampling must be representative of the conditions occurring during the reporting period. 40 CFR 403.12(g) & 403.12(h).

5.0 Summary

The utility building discharges at IWD-1 have not been self-monitored by Knauf nor sampled by the City for of all of the pollutants of concern, in particular, since the lone sample had unexpected levels of ammonia and BOD. The emergency discharges if they are to be authorized must be self-monitored nearly continually for a range of pollutants because of the potential adverse impacts to the City's treatment works.

Requirements

- The utility building discharges must be self-monitored twice per year for pH, total dissolved solids, ammonia, chromium, formaldehyde, molybdenum, oil & grease, and total phenolics.

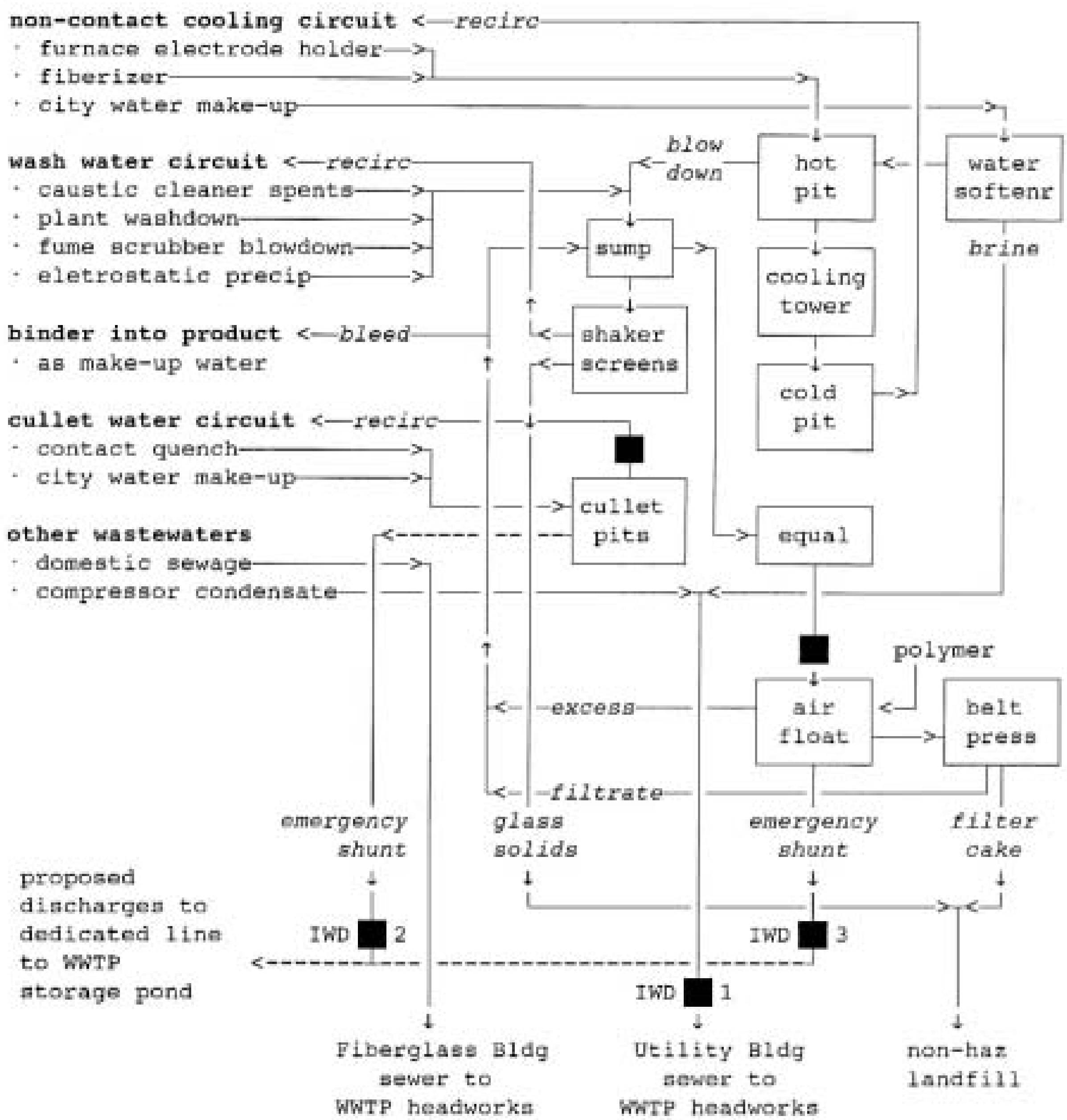
- Each emergency discharge of wash waters must be self-monitored each day for pH, discharge flow rate, total dissolved solids, ammonia, chromium, formaldehyde, molybdenum, oil & grease, and total phenolics, and at least once for the Federally-regulated pollutants listed in 40 CFR 414.111.

- Each emergency discharge of cullet waters must be self-monitored each day for temperature, and discharge flow rate, and at least once for pH, total dissolved solids, ammonia, formaldehyde, oil & grease, and total phenolics.

See parts 2.5 and 2.6 for specific self-monitoring protocols.

Appendix 1

Knauf Fiberglass, City of Shasta Lake
Schematic of the Wastewater Collection and Treatment



Sewer Discharges (gpd est.)	Federal	Non-Fed + Dilution	Total
IWD-1 Utility Building	0	˜2000	˜2000
IWD-2 Emergency Cullet Water	0	<40000	<40000
IWD-3 Emergency Wash Water	<156000	0	<156000

Appendix 2

Clean Water Act Requirements for IWD-1 and IWD-2

Knauf Fiberglass, Shasta Lake, California
IWD-1 - Utility Building Non-Domestic Wastewaters
IWD-2 - Emergency Discharge of Cullet Waters

Pollutants of Concern Specific Numeric Limits (mg/l)	@ IWD-1 **Local Limits** inst-max	@ IWD-2 **Local Limits** inst-max	@ IWD-1 and 2 **Nat'l Prohib** inst-max
ammonia	a/	b/	-
chromium	c/	-	-
formaldehyde	a/	b/	-
molybdenum	c/	-	-
oil+grease-total	300	300	-
total phenolics	a/	b/	-
total dissolved solids	d/	d/	-
pH-minumum (s.u.)	5.0 su	5.0 su	5.0 su
pH-maximum (s.u.)	11.0 su	11.0 su	-
flow rate (gpd)	-	b/	-
temperature (°F)	-	b/	-

Narrative Limits - National Prohibitions against pass-through, interference, sludge contamination, obstruction, toxic gases or fumes, fire or explosion hazard, causing heat >104°F @ WWTP, closed cup flashpoint <140°F

Narrative Limits - Local Limit Prohibitions against objectional color, noxious odors, trucked or hauled wastes, unpolluted wastewater such as non-contact cooling water, causing foaming @ WWTP, radioactive wastes, pretreatment solids, medical wastes

a/ Pollutants of concern as indicators of process wash waters which would not be authorized to discharge to the sewers through IWD-1 or IWD-2.
b/ Pollutants of concern based on WWTP influent conditions. See example calculations in Appendix 4.
c/ Pollutants of concern if the permit authorizes the emergency discharge of cooling tower blowdown to the sewers through IWD-1. Local limits are expected to be mass-loads based on WWTP sludge quality.
d/ Potential pollutants of concern because present in significant concentrations and could become locally limited in the future.

Appendx 3

Clean Water Act Requirements of IWD-3

Knauf Fiberglass, Shasta Lake, California
IWD-3 - Emergency Discharge of Process Wash Waters

Pollutants of Concern Specific Numeric Limits (mg/l)	@ IWD-3 **Federal Stds a/** d-max	mo-avg	@ IWD-3 **Local Limits** inst-max	@ IWD-3 **Nat'l Prohib** inst-max
acenaphthene	0.047	0.019	-	-
anthracene	0.047	0.019	-	-
benzene	0.134	0.057	-	-
bis(2-ethylhexyl)phthalate	0.258	0.095	-	-
carbon tetrachloride	0.380	0.142	-	-
chlorobenzene	0.380	0.142	-	-
chloroethane	0.295	0.110	-	-
chloroform	0.325	0.111	-	-
di-n-butyl phthalate	0.043	0.020	-	-
1,2-dichlorobenzene	0.794	0.196	-	-
1,3-dichlorobenzene	0.380	0.142	-	-
1,4-dichlorobenzene	0.380	0.142	-	-
1,1-dichloroethane	0.059	0.022	-	-
1,2-dichloroethane	0.574	0.180	-	-
1,1-dichloroethylene	0.060	0.022	-	-
1,2-trans-dichloroethylene	0.066	0.025	-	-
1,2-dichloropropane	0.794	0.196	-	-
1,3-dichloropropylene	0.794	0.196	-	-
diethyl phthalate	0.113	0.046	-	-
dimethyly phthalate	0.047	0.019	-	-
4,6-dinitro-o-cresol	0.277	0.078	-	-
ethylbenzene	0.380	0.142	-	-
fluoranthene	0.054	0.022	-	-
fluorene	0.047	0.019	-	-
hexachlorobenzene	0.794	0.196	-	-
hexachlorobutadiene	0.380	0.142	-	-
hexachloroethane	0.794	0.196	-	-
methyl chloride	0.295	0.110	-	-
methylene chloride	0.170	0.036	-	-
naphthalene	0.047	0.019	-	-
nitrobenzene	6.402	2.237	-	-
2-nitrophenol	0.231	0.065	-	-
4-nitrophenol	0.576	0.162	-	-
phenanthrene	0.047	0.019	-	-
pyrene	0.048	0.020	-	-
tetrachloroethylene	0.164	0.052	-	-
toluene	0.074	0.028	-	-

a/ 40 CFR 414.111 for indirect discharge point sources

Appendix 3 (continued)

Clean Water Act Requirements of IWD-3

Knauf Fiberglass, Shasta Lake, California
IWD-3 - Emergency Discharge of Process Wash Waters

Specific Numeric Limits (mg/l)	@ IWD-3 **Federal Stds** a/ d-max	mo-avg	@ IWD-3 **Local Limits** inst-max	@ IWD-3 **Nat'l Prohib** inst-max
total cyande *	1.200	0.420	-	-
total lead *	0.690	0.320	-	-
total zinc *	2.610	1.050	-	-
1,2,4-trichlorobenzene	0.794	0.196	-	-
1,1,1-trichloroethane	0.059	0.022	-	-
1,1,2-trichloroethane	0.127	0.032	-	-
trichloroethylene	0.069	0.026	-	-
vinyl chloride	0.172	0.097	-	-
ammonia	-		b/	-
chromium	-		b/	-
formaldehyde	-		b/	-
molybdenum	-		b/	-
oil+grease-total	-		300	-
total phenolics	-		b/	-
total dissolved solids	-		c/	-
pH-minumum (s.u.)	-		5.0 su	5.0 su
pH-maximum (s.u.)	-		11.0 su	-
flow rate (gpd)	-		b/	-

Narrative Limits - National Prohibitions against pass-through, interference, sludge contamination, obstruction, toxic gases or fumes, fire or explosion hazard, causing heat >104°F @ WWTP, closed cup flashpoint <140°F

Narrative Limits - Local Limit Prohibitions against objectional color, noxious odors, trucked or hauled wastes, unpolluted wastewater such as non-contact cooling water, causing foaming @ WWTP, radioactive wastes, pretreatment solids, medical wastes

a/ 40 CFR 414.111 for indirect discharge point sources
* default values based on the finding of no metals or cyanide bearing waste streams

b/ Pollutants of concern if the permit authorizes the emergency discharge of process wash waters to the sewers through IWD-1. Local limits are expected to be mass-loads based on WWTP influent conditions. See example calculations in Appendix 4.

c/ Potential pollutants of concern because present in significant concentrations and could become locally limited in the future.

Appendix 4

Example Rough Calculations
Maximum Discharge Flow Rate Based on Oxygen Demand

Step 1 - Available WWTP Treatment Capacity

$$\text{available treatment capacity} = \left[\text{design dry-weather capacity} - \text{current dry-weather flows}\right] = 1.3 - 0.9 \text{ mgd}$$

Average dry-weather values used in order to maintain the peak treatment capacities for wet-weather conditions.

Step 2 - Available Oxygen at WWTP

$$O_2 \text{ lbs/d available} = \text{available capacity} \times \text{design BOD removed} \times \text{oxygen demand for BOD conversion factor}$$

$$+ \text{available capacity} \times \text{design } NH_4 \text{ removed} \times \text{oxygen demand for } NH_4 \text{ conversion factor}$$

$$- \text{Qknauf flowrate} \times \text{knauf BOD emergency} \times \text{oxygen demand for BOD conversion factor}$$

$$- \text{Qknauf flowrate} \times \text{knauf NH4 emergency} \times \text{oxygen demand for } NH_4 \text{ conversion factor}$$

$$= \left[\frac{0.4(10^6)\text{ gal}}{\text{day}}\right]\left[\frac{200\text{ mg}}{1}\right]\left[\frac{1.5\text{ lbs-}O_2}{\text{lbs-BOD}}\right] \times \left[\frac{8.327\text{ lbs}\cdot 1}{(10^6)\text{ mg}\cdot\text{gal}}\right]$$

$$+ \left[\frac{0.4(10^6)\text{ gal}}{\text{day}}\right]\left[\frac{40\text{ mg}}{1}\right]\left[\frac{4.6\text{ lbs-}O_2}{\text{lbs-}NH_4}\right] \times \left[\frac{8.327\text{ lbs}\cdot 1}{(10^6)\text{ mg}\cdot\text{gal}}\right]$$

$$- \left[\frac{Qknauf(10^6)\text{gal}}{\text{day}}\right]\left[\frac{1200\text{ mg}}{1}\right]\left[\frac{1.5\text{ lbs-}O_2}{\text{lbs-BOD}}\right] \times \left[\frac{8.327\text{ lbs}\cdot 1}{(10^6)\text{ mg}\cdot\text{gal}}\right]$$

$$- \left[\frac{Qknauf(10^6)\text{gal}}{\text{day}}\right]\left[\frac{200\text{ mg}}{1}\right]\left[\frac{4.6\text{ lbs-}O_2}{\text{lbs-BOD}}\right] \times \left[\frac{8.327\text{ lbs}\cdot 1}{(10^6)\text{ mg}\cdot\text{gal}}\right]$$

$$= 999 + 613 - 15 - 8 = 1589 \quad (Qknauf = 0.001 \text{ mgd})$$

$$= 999 + 613 - 468 - 239 = 905 \quad (Qknauf = 0.031 \text{ mgd})$$

Step 3 - Maximum Discharge Flow Rate

$$= 999 + 613 - 1069 - 545 = 0 \quad (Qknauf = 0.071 \text{ mgd})$$

Appendix 4

Example Rough Calculations
Maximum Discharge Flow Rate Based on Phenol Inhibition

Step 1 - Available WWTP Treatment Capacity

$$\text{available treatment capacity} = \left[\text{design dry-weather capacity} - \text{current dry-weather flows}\right] = 1.3 - 0.9 \text{ mgd}$$

Average dry-weather values used in order to maintain the peak treatment capacities for wet-weather conditions.

Step 2 - Phenol Inhibition

$$\text{maximum phenols at WWTP} = \frac{\left[\text{current dry-weather flows} \times \text{typical phenols at WWTP}\right] + \left[Qknauf \times \text{knauf phenols}\right]}{\left[\text{current dry-weather flow} + Qknauf\right]} = 4 \text{ mg/l}$$

$$= \frac{\left[\frac{0.9(10^6)\text{gal}}{\text{day}}\right]\left[\frac{0.0 \text{ mg}}{1}\right] + \left[\frac{Qknauf(10^6)\text{gal}}{\text{day}}\right]\left[\frac{46 \text{ mg}}{1}\right]}{\left[\frac{0.9(10^6)\text{gal}}{\text{day}} + \frac{Qknauf(10^6)\text{gal}}{\text{day}}\right]}$$

$$= \frac{\left[\frac{Qknauf(10^6)\text{gal}}{\text{day}}\right]\left[\frac{46 \text{ mg}}{1}\right]}{\left[\frac{0.9(10^6)\text{gal}}{\text{day}} + \frac{Qknauf(10^6)\text{gal}}{\text{day}}\right]} = 4 \text{ mg/l}$$

Step 3 - Maximum Discharge Flow Rate

$$Qknauf = \frac{\left[\frac{0.9(10^6)\text{gal}}{\text{day}}\right]\left[\frac{4 \text{ mg}}{1}\right]}{\left[\frac{46 \text{ mg}}{1}\right] - \left[\frac{4 \text{ mg}}{1}\right]} = 0.086 \text{ mgd}$$

Appendix 5

Wastewater Sampling Results
Knauf Fiberglass - City of Shasta Lake

Sample Number Date Type	SC011 07/22/03 grab b/	SC016 01/09/04 grab d/	SC012 07/22/03 grab b/	0305465 05/12/03 grab a/	SC006 07/22/03 24-hr b/
Sample Results (mg/l)	AirFloat Influent	AirFloat Influent	Cullet WaterPit	Utility Bldg	WWTP Influent
BOD	1200		8	136c	
formaldehyde		2.30			
phenol	<0.220	46		0.12	
ammonia as N	190	206	<0.30	143	24.7
nitrates as N	38	3.6	7.6		<0.23
aluminum	0.230		0.920		1.2
arsenic	0.046		0.0027		0.0011
cadmium	<0.0040		<0.0040	<0.001c	<0.0010
chromium	1.30		0.042	0.003c	<0.0050
copper	0.052		0.012	0.582c	0.049
lead	0.080		0.0051	<0.005c	<0.0050
mercury	<0.00003		<0.00003	0.017c	<0.00020
molybdenum	3.60		0.056		
nickel	0.017		0.0098		0.015
selenium	0.019		<0.0040		<0.0010
silver	0.0027		<0.0020		<0.0010
zinc	0.200		0.033	<0.020c	0.091
iron	0.78		0.74		0.45
manganese	0.21		0.06		<0.08
o-phosphate as P	<2.0		1.3	2.94c	
phosphate as P		<0.95		8.47c	2.28
hardness	230	230	94		71
sulfate	89	90	28	16.6	16
potassium	200		16	29	
sodium	540		110	35	48
chloride	190	180	84	71	42
boron	220		11.0		
calcium	58		26	14	
magnesium	21.		7.1	4.0	
oil+grease				40	
TDS	4500	6000	520	272	290
EC (µmohs/cm)	4900	4000	730	1240	550
pH (s.u.)				8.13	

a/ Sampled by the City of Shasta Lake (24-hr marked by c, grab otherwise). All other samples collected, kept in custody, and delivered to the lab by Greg V. Arthur. Sampling documentation including chain of custody and quality control results are part of a January 2004 pretreatment program evaluation report for Shasta Lake.
b/ Samples analyzed by EPA Richmond Laboratory
d/ Samples analyzed by Sequoia Analytical

Appendix 5 (continued)

Wastewater Sampling Results
Knauf Fiberglass - City of Shasta Lake

Sample Number Date Type	SC011 07/22/03 grab b/	Sample Number Date Type	SC011 07/22/03 grab b/
Sample Results (mg/l)	AirFloat Influent	Sample Results (mg/l)	AirFloat Influent
acenaphthene	<0.010	nitrobenzene	<0.010
anthracene	<0.010	2-nitrophenol	<0.010
benzene		4-nitrophenol	<0.025
bis(2-ethylhexyl)phthalate	<0.010	phenanthrene	<0.010
carbon tetrachloride		pyrene	<0.010
chlorobenzene		tetrachloroethylene	
chloroethane		toluene	
chloroform		total cyande	
di-n-butyl phthalate		total lead	0.080
1,2-dichlorobenzene	<0.010	total zinc	0.200
1,3-dichlorobenzene	<0.010	1,2,4-trichlorobenzene	<0.010
1,4-dichlorobenzene	<0.010	1,1,1-trichloroethane	
1,1-dichloroethane		1,1,2-trichloroethane	
1,2-dichloroethane		trichloroethylene	
1,1-dichloroethylene		vinyl chloride	
1,2-trans-dichloroethylene			
1,2-dichloropropane			
1,3-dichloropropylene			
diethyl phthalate	<0.010		
dimethyl phthalate	<0.010		
4,6-dinitro-o-cresol			
ethylbenzene			
fluoranthene	<0.010		
fluorene	<0.010		
hexachlorobenzene	<0.010		
hexachlorobutadiene	<0.010		
hexachloroethane	<0.010		
methyl chloride			
methylene chloride			
naphthalene	<0.010		

b/ Samples analyzed by EPA Richmond Laboratory
All samples were not detected at the detection limits listed. However the surrogate spike recoveries for this sample were outside control limits, which increased the reported detection limits to <0.220 mg/l.