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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

1315 W. 4th Avenue • Kennewick, Washington 99336-6018 • (509) 735-7581

November 2, 2000

Mr. Steve Wisness, Director
Office of Site Services
U.S. Department of Energy
P.O. Box 550, MSIN: A5-58
Richland, Washington 99352

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EDMC

Dear Mr. Wisness:

Re: Technical Assistance Visit to 100-N Sewage Lagoon and Evaluation of Lagoon System with ST Permit 4507

A technical assistance visit was performed on September 7, 2000, by the Washington State Department of Ecology (Ecology). Please see the enclosed Facility Inspection Form. The purpose of the visit was to assess the 100-N Sewage Lagoon system; along with providing an evaluation and recommendations.

The 100-N Sewage Lagoon consists of three lagoons: the aeration lagoon, stabilization lagoon, and the infiltration lagoon. The aeration and stabilization lagoons are lined with high-density polyethylene (HDPE) liners. The infiltration lagoon is unlined, and allows for disposal of the treated wastewater to the soil column.

Ecology observed all three lagoons and the effluent discharge (effluent goes to the infiltration pond). The effluent discharge appeared clear on the day of our visit. The infiltration lagoon had the typical vegetation growth associated with a discharge and Eastern Washington.

The stabilization lagoon is the largest of the three lagoons. The water appeared somewhat clear. We did observe green algae growing along the upper part of the liner wall. The alga growth did not appear to be out of control and seemed normal for a sewage lagoon system. The lagoon contained two aerators positioned on the opposite end from the discharge outfall. The aerators appeared to be working properly and there was water movement around them. There was less water movement on the other end of the lagoon and away from the two aerators.

The aeration lagoon's water was brown in color and not clear. Floating solids and debris appeared on the surface. The two aerators positioned near one end of the lagoon were not working properly and provided little to no water movement. When Ecology asked about the operation of the two aerators, we were told that because these type aerators work from the

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bottom upwards, the equipment regularly becomes tangled with the lagoons solid debris (i.e., rags) impeding their operating capacity. We then asked why staff did not go out to the equipment and remove the debris. The U.S. Department of Energy's (USDOE's) safety issues would not allow that and a more complicated, time-consuming procedure was explained to us.

Ecology asked about screening of the truck hauling waste (removing the solids before the liquid enters the lagoon) and told there was currently no capability to screen the waste. The 100-N sewage system original design was to receive waste from the 100-N area, not truck hauling. We observed a truck arriving at the facility and discharging its contents into the aeration lagoon. This consisted of the truck backing up to a corner of the lagoon and opening the tank valve, allowing the contents to empty into the lagoon. This event created more water movement than the two aerators in the lagoon.

Recommendations for better operation and better effluent quality:

- 1) There is lack of adequate aeration. Aerators were not working properly in the aeration lagoon and, we question if two is adequate. Lagoons should produce 25 to 100 percent recycling. The water was dark and obviously not much aerobic treatment was occurring. The aeration of the stabilization lagoon looked inadequate due to its size and only two pumps are installed. The algae may be removing most of the organic material.

Take the shallow pumps from the stabilization lagoon and move them to the aeration lagoon. Add more shallow pumps to the aeration lagoon. Transfer the aerators currently in the aeration lagoon to the stabilization lagoon and add more pumps to that lagoon.

- 2) There is a lack of quick and easy access to the aerator pumps to conduct daily operating maintenance of the pumps.

Install a permanent catwalk or some other device to allow for easy and fast access so that removal of solid debris caught by the pumps can be performed and that the efficiency is maintained.

- 3) Trucks hauling waste to the 100-N Sewage Lagoon have greatly increased (approximately 75% of daily system capacity). This lagoon system is designed to accept 100-N waste.

Install screening equipment for the trucked-in waste. Calculation of the detention time, organic loading and hydraulic loading should be done on recent data since the addition of the 222-S waste to the system.

- 4) Measure the sludge depth in each cell to determine efficiency of the lagoons.

- 5) The pH is only measured at the most every two weeks and only when there is adequate flow. This data would not be sufficient or adequate for a decision or assessment of performance. Method 150.1 required in ST Permit 4507 provides the proper procedure for pH sampling and should be followed.

Measure pH in the field for a month during different times during the day. Use a calibrated field instrument.

- 6) Parameters and sampling frequencies could be reviewed and updated if appropriate.

Dissolved solids and suspended solids need to be addressed for their applicability for effluent limits.

On January 28, 1999, a meeting was held between Ecology, USDOE, Fluor Hanford (FH), and DynCorp Tri-Cities Inc. to discuss methods to improve the quality of the 100-N Sewage Lagoon effluent. This discussion was initiated to pursue options of evaluating and ensuring compliance with groundwater quality standards due to the results of the 100-N Sewage Lagoon variability study submitted to Ecology on November 6, 1998. Ecology identified two concerns from the results of the variability study, high nitrogen levels and high fecal coliform counts. On February 17, 1999, Ecology formally requested the development of a 100-N Sewage Lagoon Improvement Plan. Ecology also added monitoring requirements for nitrate, ammonia, and fecal coliform to the State Waste Discharge Permit ST 4507.

The goal of the Lagoon Improvement Plan was to identify methods to improve the effluent quality with respect to nitrogen and fecal coliforms. On March 23, 1999, a plan and schedule for the implementation of lagoon improvements was submitted, received, and approved by Ecology. Ecology stated that it was their intent to "support a stepped approach of trying simpler upgrades, then monitor the results before trying more complex and expensive upgrades."

Ecology believes that, although the requests for the Lagoon Improvement Plan and the operational improvements were provided, it has had limited success. This concerns Ecology because the current permit has allowed for monitoring (no enforcement limits) of the nitrate and fecal coliform parameters. This was to allow the facility to monitor its operation and make upgrades to the system. A renewal permit will impose enforcement limits for nitrate and fecal coliform. Reviewing the current monitoring data collected on these two parameters, Ecology does not believe the 100-N Sewage Lagoon can meet the state required enforcement limits.

Recommendations for long term operation of the 100-N sewage Lagoon:

- 1) The infiltration lagoon is unlined. After loading calculations and past records are looked at for the effluent flows, determine if evaporation will handle the final flow. This should be

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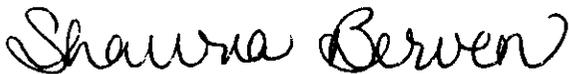
evaluated for the entire year, taking into account the temperature, humidity, sunlight, etc. If evaporation can handle the flow, evaluate a no-discharge system by lining the infiltration lagoon. Consideration of continued operation/maintenance and Ecology's requirement (or no requirement) of groundwater monitoring well would be important.

- 2) The system is not designed for truck hauling. Energy Northwest has a sewage treatment facility with a 170,000-gallon per day capacity. It has the capability and equipment to accept truck-hauling waste. Ecology has asked Energy Northwest about the 100-N Sewage Lagoon waste and they are interested. Evaluate closing down the sewage lagoon and sending the waste off-site.
- 3) Make considerable changes and upgrades to the current system to improve effluent quality, operation and maintenance, and meet current and future permit limits maintaining compliance. Increase monitoring of the system by increased collection and analysis of effluent samples. Evaluate the cost effectiveness taking into consideration equipment, manpower, reporting documentation, and laboratory expenses.

As noted in the Facility Inspection Form and the site visit, the 100-N Sewage Lagoon is currently operating at a marginal to unsatisfactory level. Improvement is strongly recommended.

If you have any questions or concerns regarding this letter, please feel free to contact me at (509) 736-3045.

Sincerely,



for
Kathy Conaway, Water Quality Coordinator
Nuclear Waste Program

KAC:sb
Enclosure

cc w/encl.: D.J. Ortiz, USDOE
Alex Temouri, USDOE
Jeff Thornock, DynCorp
Mary Lou Blazek, OOE
Administrative Record: ST Permit 4507



WASHINGTON STATE DEPARTMENT OF ECOLOGY

FACILITY INSPECTION FORM

FACILITY NAME 100 N-Sewage Lagoon

FACILITY NUMBER ST Permit 4507

SECTION 1: INSPECTION INFORMATION

START DATE 9-7-2000

PRIMARY INSPECTOR K. Conway

PERMIT# ST 4507

COMPLAINT# NA

LAB PROJECT # NA

ENFORCEMENT DOCKET # NA

INSPECTION TYPE (CHECK ONE)

COMPLIANCE INSPECTION W/O SAMPLING

COMPLIANCE INSPECTION W/ SAMPLING

COVERAGE INSPECTION

COMPLIANCE FOLLOW-UP INSPECTION

TECHNICAL ASSISTANCE VISIT

OPERATION & MAINTENANCE INSPECTION

Y/N

SCHEDULED

ANNOUNCED

PART OF GROUP

REASON FOR INSPECTION

(CHECK ONE)

ROUTINE

COMPLAINT

DRIVE-BY

ENFORCEMENT

QA

BIOMONITORING

OTHER SPECIFY

PARTICIPANTS

Jerry Yokel
Steve Liick
Alex Terhouni
Dust. Ortis
TOM Lazarski
Jeff Thornock

AGENCY

ECU
ECU
RLD
RL
FH
DynCorp

FAC REP

(Y/N)

N
N
Y
Y
Y
Y

PHONE

(509) 736-3009
(509) 736-3047

SECTION 2: FACILITY INFORMATION

FACILITY NAME & ADDRESS 100-N-Sewage Lagoon
Hanford

	DATE	TIME
ENTRY 1	_____	_____
EXIT 1	_____	_____
ENTRY 2	_____	_____
EXIT 2	_____	_____
ENTRY 3	_____	_____
EXIT 3	_____	_____

ENTRY TYPE (CHECK ONE)

DENY

DELAY

WARRANT

REGULAR

SECTION 3: AREAS EVALUATED DURING INSPECTION

N=NOT EVALUATED, S=SATISFACTORY, M=MARGINAL, U=UNSATISFACTORY

INSPECT BENCH SHEETS N

INSPECT PERMIT N

RECORDS/REPORTS N

FLOW MEASUREMENT S

LABORATORY N

EFFLUENT/RECEIVING WATER S

PRETREATMENT N

COMPLIANCE SCHEDULES N

SELF MONITORING PROGRAM M

OPERATION & MAINTENANCE M *ELLKAC*

SLUDGE DISPOSAL N

FACILITY SITE REVIEW M

LAB ACCREDITATION N

OTHER _____

(SPECIFY)

SECTION 4: SUMMARY OF FINDINGS/COMMENTS (ATTACH ADDITIONAL PAGES IF NEEDED)

See Attached letter

SECTION 5: FOLLOW-UPS (CHECK ALL THAT APPLY)

TYPE	DETAIL	RESP PERSON	SCHED	DONE
<input type="checkbox"/> CONDUCT CLASS II	_____	_____	_____	_____
<input type="checkbox"/> LAB ACCRED MANUAL	_____	_____	_____	_____
<input type="checkbox"/> REINSPECT	_____	_____	_____	_____
<input type="checkbox"/> REOPEN PERMIT	_____	_____	_____	_____
<input type="checkbox"/> SEND APPLICATION	_____	_____	_____	_____
<input checked="" type="checkbox"/> TECH ASSIST-REGULAR	_____	_____	_____	_____
<input checked="" type="checkbox"/> TECH ASSIST-OUTREACH	_____	_____	_____	_____
<input checked="" type="checkbox"/> MOD PERMIT AT RENEWAL	_____	_____	_____	_____
<input checked="" type="checkbox"/> FACILITY ACTION	_____	_____	_____	_____
<input type="checkbox"/> ENFORCEMENT (WARN LET)	_____	_____	_____	_____
<input type="checkbox"/> NOV, ORDER, PENALTY)	_____	_____	_____	_____
<input type="checkbox"/> OTHER (SPECIFY)	_____	_____	_____	_____

SECTION 6: ACTIVITIES (CHECK ALL THAT APPLY)

DESCRIPTION	DATE COMPLETED	TRACKING NUMBER
<input type="checkbox"/> DATA RECEIVED FROM LAB	_____	_____
<input type="checkbox"/> DRAFT INSPECTION REPORT COMPLETED	_____	_____
<input type="checkbox"/> FINAL INSPECTION REPORT COMPLETED	_____	_____
<input type="checkbox"/> FINAL INSPECTION RPT RCD FROM EILS	_____	_____
<input type="checkbox"/> FORM 3506 SENT TO EPA	_____	_____
<input type="checkbox"/> INSPECTION REPORT REVIEWED	_____	_____
<input type="checkbox"/> SAMPLES TO LAB	_____	_____
<input type="checkbox"/> OTHER _____	_____	_____

SECTION 7: SIGNATURES

	NAME (PRINT)	SIGNATURE	DATE	AGENCY/PHONE
INSPECTOR 1	<i>Kathy Conway</i>	<i>Kathy Conway</i>	<i>9-11-00</i>	<i>ECU 736-3045</i>
INSPECTOR 2	_____	_____	_____	_____
REVIEWER	_____	_____	_____	_____