

Appendix F: NPDES Noncompliances

Table F.1. Summary of Y-12 Plant NPDES excursions, 1997

Date	Location	Excursion	Explanation	Corrective action
3/19/97	Outfall 014	Oil sheen	An oil sheen was observed flowing from Outfall 014 on the north bank of East Fork Poplar Creek (EFPC) behind Building 9720-4. The sheen resulted from a diesel fuel spill during filling of an underground tank at the Y-12 fuel station, Building 9754-3. It is estimated that less than 10 gal was spilled	The pavement upon which the diesel fuel spilled was cleaned using absorbal. Booms were installed at the Lake Reality outlets to prevent off-site release. Most of the sheen was captured in Lake Reality, and absorbent diapers were used to clean the oil sheen from EFPC and Lake Reality. Booms were also installed on EFPC at Outfall 14 and downstream of Lake Reality. A Best Management Practice plan will be implemented in future fuel station transfer operations to prevent future spills to the storm drain system.
4/22/97	Outfall 501	Permit limit exceedence	A grab sample of the Central Pollution Control Facility (CPCF) effluent indicated pH to be 9.2, which is outside the permitted pH range of 6.0 to 9.0.	CPCF personnel modified operation of the pH adjustment unit, and the effluent was brought well within permissible range. This was verified by same-day resampling of the effluent, with pH sample results at 8.3.
7/24/97	Outfall 055	Permit limit exceedence	A localized storm released nearly 6 inches of rain within 2 hours during the evening of July 22–23, 1997, flooding Building 9201-2. The East End Mercury Treatment Facility (EEMTF), which is located in this building, treats contaminated sump waters from the basement. During the flood event, a power outage rendered the sumps that feed the EEMTF inoperable. Emergency pumping was implemented per EEMTF bypass procedures, resulting in contaminated water being discharged through NPDES Outfall 55. Analysis of a grab sample taken at this location resulted in a mercury reading of 0.0047 mg/L. This is above the permitted value of 0.004 mg/L.	Operation of the treatment unit resumed after flood waters subsided

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Table F.1 (continued)

Date	Location	Excursion	Explanation	Corrective action
7/29/97	Outfall 055	Permit limit exceedence	Pumping operations in Building 9201-2 continued from the flood event of July 22–23, 1997. A grab sample of Outfall 55, from which contaminated waters bypassing the EEMTF flowed, resulted in a mercury reading of 0.010 mg/L. This is above the permitted value of 0.004 mg/L.	Operation of the treatment unit resumed after flood waters subsided.
9/4/97	Outfall 501	Permit limit exceedence	A sample taken of the CPCF effluent indicated nitrates (as nitrogen) present in the amount of 290 mg/L. This exceeds the permit limit of 100 mg/L.	Lower influent content of nitrates at CPCF.
9/24/97	Outfall 501	Permit limit exceedence	A sample taken of the CPCF effluent indicated nitrates (as nitrogen) present in the amount of 193 mg/L. This exceeds the permit limit of 100 mg/L.	Eliminate high-nitrate wastewater from system and treat at West End Treatment Facility. Lower influent content of nitrates at CPCF.
9/30/97	Station 17	Permit limit exceedence	The monthly average of the daily flow of water at Station 17 was 6.9 million gpd, which is less than the requirement of 7 million gpd. This was a result of a drier (less rainfall) than normal month and the unavailability of the north raw water feed line. The south line can supply a maximum of about 4.5 mgd.	Increase the amount of raw water released in EFPC, as necessary. Monitor and periodically remove debris and gravel to relieve submergence of the flume at the Station 17 monitoring location. Work with the USGS to identify impacts of obstructions in the creek on the accuracy of EFPC flow measurements. A funding request has been made for repair to the north line.

Table F.2. Summary of ORNL NPDES excursions, 1997

Outfall	Date	Excursion	Explanation	Corrective action
081	2/10/97	Total residual oxidant	Outfall 081 discharges street and parking lot runoff, roof runoff, and dechlorinated once-through cooling water from the Radiochemical Engineering Development Center area (7920/7930) to an unnamed tributary to Melton Branch. At the time of the TRO excursion on February 10, 1997, the dechlorinated cooling water sources were not in operation. The flow rate of the effluent on that date was approximately 6 gal/minute.	ORNL personnel investigated to determine and correct the source of the chlorine-bearing water that is being released via Outfall 081. As an interim corrective measure, one of the existing dechlorination systems associated with Outfall 081 was put into operation. The source of the chlorinated water was determined to be once-through cooling for steam condensate. A recirculating cooling system has been designed and is being installed to eliminate the need for once-through cooling water at the facility.
281	2/17/97	Total residual oxidant	Outfall 281 is a Category IV cooling tower blowdown outfall that also conveys stormwater from the ORNL 7900 (High Flux Isotope Reactor, HFIR) area to an unnamed Melton Branch tributary. The main source of chlorine in Outfall 281 effluent is the chlorinated process supply water that is used as makeup water in the HFIR cooling tower.	To reduce the chlorine concentration in Outfall 281 effluent, HFIR cooling tower operators have revised the manner in which makeup water is cycled through the tower. This revision reduced the amount of makeup water that was required to operate the tower and was successfully controlling the chlorine concentration of Outfall 281 below the effective permit limit of 0.050 mg/L for several months after the February 17, 1997, excursion.
081	2/28/97	Total residual oxidant	This is a calculated, monthly average limit excursion that derived from the daily maximum concentration limit excursion on 2/10/97.	
281	2/28/97	Total residual oxidant	This is a calculated, monthly average limit excursion that derived from the daily maximum concentration limit excursion on 2/17/97.	
X01	3/24/97	Total residual chlorine	It was determined that dechlorination systems at the ORNL Steam Plant, which dechlorinate Steam Plant noncontact cooling water as well as Sewage Treatment Plant (STP) effluent, were not operating optimally at the time of the excursion.	The STP manager revised the STP operating practices to include more frequent operational checks, and adjustments whenever necessary, of the dechlorination systems that serve the ORNL Steam Plant cooling water and the STP effluent.

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Table F.2 (continued)

Outfall	Date	Excursion	Explanation	Corrective action
081	4/21/97	Total residual oxidant	Outfall 081 is a Category IV outfall that discharges street and parking lot runoff, roof runoff, and dechlorinated once-through cooling water from the Radiochemical Engineering Development Center area (7920/7930) to an unnamed Melton Branch tributary. At the time of the TRO excursion on April 21, 1997, dechlorinated water was being discharged through Outfall 081 at a flow rate of approximately 14 gal/min.	At the time of the excursion, one of the existing tablet-feeder dechlorination systems associated with Outfall 081 were in operation. Upon discovery of the excursion, the water level in the tablet feeder was adjusted to provide a greater degree of effluent dechlorination.
281	4/21/97	Total residual oxidant	Outfall 281 is a Category IV stormwater and cooling tower blowdown outfall at the ORNL 7900 (High Flux Isotope Reactor, HFIR) area that discharges to an unnamed Melton Branch tributary. The main source of chlorine in Outfall 281 effluent is the chlorinated process supply water that is used as makeup water in the HFIR cooling tower. The effluent flow rate from Outfall 281 was approximately 90 gal/min.	HFIR cooling tower operators had previously revised the manner in which makeup water is cycled through the tower to reduce the chlorine concentration in Outfall 281 effluent. This revision reduced the amount of makeup water that is required to operate the tower and had successfully controlled the chlorine concentration of Outfall 281 without additional chemical feed until the excursion. As a result of the excursion, operators installed a dechlorination system at the tower as an additional NPDES permit compliance measure.
081	4/30/97	Total residual oxidant	The excursion of the daily maximum limit on 4/21/97 caused the monthly average limit to also be exceeded based on calculations that are performed at the end of the month.	
281	4/30/97	Total residual oxidant	The excursion of the daily maximum limit on 4/21/97 caused the monthly average limit to also be exceeded based on calculations that are performed at the end of the month.	

Table F.2 (continued)

Outfall	Date	Excursion	Explanation	Corrective action
X01	7/10/97	Total residual chlorine	It was determined that an STP dechlorination system pump had experienced a loss of suction, which prevented an adequate feed rate of the dechlorination chemical, sodium metabisulfite.	The system was adjusted, and subsequent chlorine measurements that were made at 1:17 p.m. and at 3:45 p.m. on July 10, 1997, confirmed that the system was working properly. The STP manager had revised STP operating practices to include more frequent operational checks, and adjustments whenever necessary, of the STP dechlorination system. The revised practices include frequent routine checks of dechlorination systems and keeping a log record of various dechlorinator operating parameters to ensure proper operation of the systems and an adequate dechlorination chemical feed rate. No additional chlorine excursions have been measured at the STP since July 10, 1997.
267	7/22/97	Unpermitted discharge	On July 22, 1997, an underground potable water supply pipeline was accidentally breached during utility work on underground pipe fittings, allowing the release of approximately 4000 gal of potable (chlorinated) water to Fifth Creek via Outfall 267. The release occurred within a utility excavation; therefore, considerable turbidity was also conveyed to Fifth Creek.	The damaged pipe was valved off for repair within 15 minutes, stopping the release, and erosion control measures were taken at the site. A stream survey that was conducted shortly after the release indicated no impact on fish in Fifth Creek.
X16	9/8/97	Total residual oxidant	The TRO was attributed to water effluent from Outfall 241, a storm drain outfall that originates near Building 1503. No impacts on aquatic life in First Creek were noted at the time of the exceedence, or thereafter.	Investigation of the water effluent from Outfall 241 indicated the source to be a nearby leaking underground potable water supply pipe. The location of the leak was determined, and the pipe was excavated and repaired. No additional chlorine excursions have been measured at X16 since September 8, 1997.

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Table F.2 (continued)

Outfall	Date	Excursion	Explanation	Corrective action
X16	9/30/97	Total residual oxidant	The single exceedence of the daily maximum limit on 9/8/97 also caused a calculated exceedence of the monthly average limit of 0.011 mg/L, even though no other measurements during September actually indicated the presence of TRO at monitoring point X16.	
X01	10/9/97	Carbonaceous biochemical oxygen demand	Aqueous sodium metabisulfite is used at the Sewage Treatment Plant, which discharges through Outfall X01, to dechlorinate the effluent and has the secondary effect of an additional oxygen demand if overfed into the effluent stream. The additional oxygen demand placed by the sodium metabisulfite was interfering with the CBOD5 measurement required for the STP effluent.	The chemical discharge tube from the dechlorination evaluation system has been relocated to a point below where the CBOD5 composite sample intake is located, yet where adequate dechlorination will occur. The chlorine disinfection and dechlorination evaluation system will be supplemented with an ozone disinfection system. The Tennessee Department of Environment and Conservation has approved plans for this ozone system, and equipment is currently being procured for installation. This is an excursion of the daily maximum concentration limit.
X01	10/9/97	Carbonaceous biochemical oxygen demand	This is a daily maximum amount excursion that was calculated using the daily maximum concentration from and the average daily flow for October 9, 1997.	
281	10/20/97	Total residual oxidant	Diagnosis of this event indicated this excursion occurred when the aqueous sodium metabisulfite dechlorination chemical crystallized in the delivery line during a period when the cooling tower was not operating.	Immediate corrective measures included air purging the chemical delivery line to remove the blockage. An additional TRO measurement later that day verified that delivery of the chemical had been restored. Other planned corrective measures included installation of an in-line flow meter and an air purge system.

Table F.2 (continued)

Outfall	Date	Excursion	Explanation	Corrective action
281	10/23/97	Total residual oxidant	Additional monitoring was initiated on October 23, 1997, to further verify the corrective measure; however, an additional TRO excursion was measured. Further investigations by HFIR personnel revealed that the dechlorination chemical was not being delivered to the blowdown water and that the inconsistent dechlorination chemical delivery was related to air binding in the feed line.	Planned corrective measures included reconfiguration of the piping to eliminate air traps, installation of a high-point vent, installation of a flow meter for routine system performance checks, installation of a poly-tank (to provide inherent level indication for tank inventory), and incorporation of daily operational checks. To implement all of the corrective measures discussed above, a backup dechlorination system, which used sodium metabisulfite tablets, was activated and the aqueous sodium metabisulfite system was deactivated.
281	10/27/97	Total residual oxidant	Additional monitoring on October 27, 1997, resulted in an additional TRO excursion being measured. This excursion is attributed to the poor performance of the sodium metabisulfite tablets in the backup dechlorination system. It was observed that the tablets had incompletely dissolved and did not allow fresh tablets to drop into the flow of water.	The tablets were immediately adjusted to restore maximum water contact with fresh tablets. The liquid feed system was returned to service during the evening of October 27, 1997, after the corrective measures discussed above were completed. Additional monitoring results during the week showed the corrective measures to be effective in reducing the TRO levels below the detection limit.
281	10/31/97	Total residual oxidant	This excursion, which was calculated on the final day of the reporting period, is the average of all daily maximum TRO concentrations for October at Outfall 281.	Additional daily monitoring after the October 27, 1997, excursion indicated that the corrective measures had been successfully implemented and that the dechlorination capabilities of the system were being maintained. No subsequent excursions occurred in 1997.

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Table F.2 (continued)

Outfall	Date	Excursion	Explanation	Corrective action
302	11/10/97	pH	pH was measured at Outfall 302 during an investigation of a newly discovered source of water near the lower reach of the storm drain network that feeds Outfall 302. A measurement of the newly discovered water source also had a high pH.	ORNL personnel investigated the newly discovered source of water. Monitoring upstream in the 302 storm drain network revealed pH values within the expected range of 6.0–9.0 SU. Potential nearby sources of water leakage were isolated and cut off. No specific source, has been identified, but actions to find a source, including installation of an inflatable plug, have decreased the flow and pH of the water source and several subsequent pH measurement at Outfall 302 were within the allowable range.

Table F.3. Summary of ETPP NPDES excursions, 1997

Date	Location	Excursion	Explanation	Corrective action
3/17/97	Outfall 014 (CNF)	Total petroleum hydrocarbon	TPH measurement of 1.64 mg/L exceeded maximum permitted level of 0.1 mg/L.	Reviewed all operating records, lab procedures, and TPH levels in influent streams.
9/24/97	Storm Drain Outfall SD-124	Total residual chlorine	TRC measurement of 0.18 mg/L exceeded maximum permitted level of 0.14 mg/L.	SD-124 drainage area walked down, smoke testing conducted at catch basins, maps and video tape survey reviewed, daily surveillance of flow patterns conducted, dechlorination tablets placed in catch basin.
10/1/97	Storm Drain Outfall SD-100	Unpermitted discharge	Liquid solution of absorbent material used by private industrial firm leasing building at ETPP entered storm drain system.	BMPs to prevent occurrences were recommended to private industrial firm.
10/2/97	Storm Drain Outfall SD-500	Failure to obtain required sample	Category I Storm drain outfall was not sampled for flow and pH during 6 month reporting period of 3/1/97 through 9/30/97 as required by permit.	Existing tracking system for storm drain sampling reviewed and determined to be satisfactory. Sampling personnel were counseled to emphasize attention to detail.