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Sedalia Office

Reply to: Fish and Wildlife Research Center
1110 S. College Ave.
Columbia, MO 65201-2243
Telephone: 573/882-9880
FAX: 573/882-4517

August 25, 1997

Robert Hentges
Missouri Department of Natural Resources
Jefferson City Regional Office
P.O. Box 176
Jefferson City, MO 65102

Dear Bob:

Attached is a copy of the update of *Report of Pollution Investigations and Fish Kills* #96120 which covers the involvement of Missouri Department of Conservation staff since the December 13, 1996-incident of pollution of Little Muddy Creek by Tyson Foods, Inc. This report covers DNR and MDC investigation following the June 12, 1997 "bulking" problem at the facility and the results of stream temperature monitoring in the receiving tributary and Little Muddy Creek between June 10, 1997 and July 9, 1997. The data during this time period documents 123 violations of the *Missouri Water Quality Standard*, Specific Criteria for stream temperature. Included in these violations are three (3) incidents were water temperatures in the receiving stream, below the mixing zone, exceeded 90F. The remaining violations are 120 incidents where water temperatures in Little Muddy Creek were elevated more than 5F by the tributary receiving the effluent from the Tyson facility. Please share these results with your staff and John Madras of your Planning Section. Upon evaluation, please consider initiating appropriate enforcement action against the responsible party for these violations of the *Missouri Clean Water Law*.

MDC staff continues to monitor stream temperatures below the Tyson facility. A second month's-worth of data has been collected and is presently being summarized and analyzed. Those results will be forwarded upon completion. The third series is in progress.

If you have any questions, please contact me.

Sincerely,

Richard M. Duchrow
Environmental Services Biologist

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Attachment

c: John Madras, DNR, JC, Kevin Mohammadi, DNR, JC, Conservation Agent Betty Ream, Ron Dent, Reg. Supv. Don Ross

c via E-mail: Norm Stucky, Gary Novinger, Steve Weithman, and ENVIRO

**MISSOURI DEPARTMENT OF CONSERVATION**
**REPORT OF POLLUTION INVESTIGATIONS AND FISHKILLS**
Fisheries Research Center, 1110 S. College Ave, Columbia, MO. 65201
(314) 882-9880

ID: 96120 T: 46N R: 22W S: 14 NE1/4

**EVENT DATE:** 12/13/96 **COUNTY:** Pettis **WATER CODE:** 46221518
**NEAREST TOWN:** Dresden
**WATERTYPE** (1=Lake 2=Pond 3=Stream 4=Unknown): 3
**SIZE** (Acres/Order): Ord#04

**WATERBODY:** Little Muddy Creek, tributary to
PRIVATE: (UPDATED REPORT 08/25/97)
ADDRESS: CONFIDENTIAL-PREPARATN IN ANTICIPATION OF LITIGATN
PHONE:

**ORIGINAL REPORT BY:** Ron Dent
ADDRESS: 1014 Thompson Blvd Sedalia MO 65301-2243
DATE: 12/13/96 PHONE: (816)530-5500

**PERSONS NOTIFIED:**

| | NAME | ADDRESS | DATE | TIME |
|---|---|---|---|---|
| EPA: | DNR-Jerry Croy | Jeffrsn Cty Regnl Of Jeffrsn Cty | 06/13/97 | 04:05PM |
| DNR: | Tim Neal | Jefferson City Regnl Of Jeffrsn City MO | 12/13/96 | 03:22pm |
| DNR: | Dave Gullic | Jeffrsn Cty Regnl Of Jeffrsn Cty MO | 12/13/96 | 04:00pm |
| MDC: | Alan Buchanan | 1110 S College Ave Columbia MO | 12/13/96 | 03:10pm |
| MDC: | Rich Meade | 1014 Thompson Blvd Sedalia MO | 12/13/96 | 04:35pm |
| MDC: | Craig Gale | 1110 S College Ave Columbia MO | 07/30/97 | |
| WITNESS: | | | | |
| WITNESS: | DNR-Don Boos | Enforcemnt Sectn Jeff City | 07/29/97 | 09:30AM |
| OTHER: | Mark Ritsema | Tyson Foods 2210 Oaklawn Sprngdale AR 72765(501/290-2299) | | |

**SOURCE OF POLLUTION:**

A. AGRICULTURAL OPERATIONS [ ]
- Poison [ ]
- Fertilizer [ ]
- Manure [ ]
- Handling [ ]

B. INDUSTRIAL OPERATIONS [X]
- Mining [ ]
- Food [X]
- Paper [ ]
- Other [ ]
- Chemical [ ]
- Petroleum [ ]
- Metals [ ]
- Lumber [ ]
- Sand [ ]

C. MUNICIPAL OPERATIONS [ ]
- Sewage [ ]
- Refuse [ ]
- Water [ ]
- Pools [ ]
- Power [ ]
- Pest Con [ ]

D. TRANSPORTATION OPERATIONS [ ]
- Rail [ ]
- Truck [ ]
- Boat [ ]
- Pipeline [ ]

E. NATURAL CAUSES [ ]

F. OTHER [ ]

G. UNKNOWN [ ]

**SPECIFIC AGENT OR CAUSE:** Poultry process water
SOURCE: Facility treatment plant
QUANTITY: Unknown

**MISSOURI WATERS CONTAMINATED** (Y/N): Y **GROUND WATER** (Y/N): N

**RESPONSIBLE PARTY** (Alleged): Tyson Foods Inc.
ADDRESS: PO Box 1658 Sedalia MO 65302
PHONE: (816)826-9991

FISHKILL (Y/N): Y

A. ESTIMATED TOTAL NUMBER/VALUE ORGANISMS: (06/12-13/97) # 6 $ 3.17

B. SEVERITY Total [ ] Heavy [ ] Moderate [ ] Light [X]

C. ESTIMATED TOTAL NUMBER/VALUE FISH: (06/12-13/97) # 6 $ 3.17

D. SPECIES OF FISH KILLED

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Bass | [ ] | Carp | [ ] | Crappie | [ ] | Sunfish | [X] |
| White Bass | [ ] | Bullheads | [X] | Shad | [ ] | Minnows | [X] |
| Catfish | [ ] | Suckers | [ ] | Darters | [ ] | Madtoms | [ ] |

List: *Distressed fish noted during 12/13/96 event*

E. ESTIMATED TOTAL NUMBER/VALUE REP/AMPH:

F. ESTIMATED TOTAL NUMBER/VALUE INVERTEBRATES:

G. ESTIMATED TOTAL NUMBER/VALUE MAMMALS/BIRDS:

**EXTENT OF DAMAGE:** (Miles/Acres): 1.7+mi (0.6 mi)

**DURATION OF EFFECT** (Days): Periodic

**WATER SAMPLE STATIONS:**

| | STATION | COUNTY | T. | R. | S. | DATE | D.O. | PH | COND | NH3 | BIOASSAY |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1: | Trib(0.6m) | Pettis | 46N | 22W | 14 | 12/13/96 | 0.8 | 7.5 | | 0.56 | Temp= 67F |
| 2: | BioChem Oxygen Demand (BOD) = 700 mg/l Non-filtrabl Resdu (NFR)= 1290 mg/l | | | | | | | | | | |
| 3: | Trib(1.7m) | Pettis | 46N | 22W | 13 | 12/13/96 | 3.8 | 8.0 | | <0.05 | Temp= 47F |
| 4: | BOD = 330 mg/l | | | | | | | | | | NFR = 390 mg/l |
| 5: | LMud(abv) | Pettis | 46N | 22W | 12 | 12/13/96 | 5.7 | 7.5 | | <0.05 | Temp= 43F |
| 6: | BOD = <2 mg/l | | | | | | | | | | NFR = <5 mg/l |
| 7: | LMud(blw) | Pettis | 46N | 22W | 13 | 12.13.96 | 4.4 | 7.5 | | <0.05 | Temp= 46F |
| 8: | BOD = 170 mg/l | | | | | | | | | | NFR = 310 mg/l |

**INVESTIGATIVE COSTS** (MDC Personnel):

| NAME | ADDRESS | HOURS SPENT | DATE |
|---|---|---|---|
| PROTECTION PERSONNEL | | | |
| 1: | | | |
| 2: Biometrics-Craig Gale | 1110 S College Ave Columbia | 8 | 08/04-17/97 |
| FISHERIES MANAGEMENT PERSONNEL | | | |
| 1: Ron Dent | 1014 Thompson Blvd Sedalia MO 65301 | 3.5 | 12/13/96 |
| 2: Rich Meade/Dale Cornelius | 1014 Thompson Sedalia | 10.5/3.5 | 12/13/96-6/16/97 |
| 3: Shannon Zezula | 1014 Thompson Blvd Sedalia MO 65301 | 4 | 06/12-13/96 |
| ENVIRONMENTAL SERVICE PERSONNEL | | | |
| 1: AC Buchanan/RM Duchrow | 1110 College Ave Columbia MO | 4/17 | 12/13/96-8/25/97 |

**DATE OF REPORT:** 08/25/97 **INVESTIGATOR:** Ron Dent, Rich Meade, Dale Corneliu
**TITLE:** Sedalia Fisheries Mgmt. District
**REPORT COMPILED BY:** Alan C. Buchanan/RM Duchrow
**TITLE:** Environmental Services Biologists

COMMENTS:
SECOND MAJOR INCIDENT INVESTIGATION

On 12/13/96, Fisheries District Supervisor Ron Dent received an anonymous report of a problem at the Tyson processing plant near Dresden, Missouri (Pettis County). A smelly yellowish liquid was being released from the process water treatment plant into a tributary of Little Muddy Creek. Fisheries Management Biologist Rich Meade and Fisheries Management Specialist Dale Cornelius investigated the incident. They observed dead fish in the tributary at the outfall from the Tyson facility and fish piping at a road crossing the tributary 0.6 miles downstream. Following is information reported by Ron Dent:

According to the waste water treatment manager, the plan having extensive blue-green and red algae problems around Thanksgiving. The real problem started on 12/12/96 as the COD went from 23 on 12/10/96 to 78 on 12/11/96 and 377 on 12/12/96. Suspended solids reached high levels, causing high BODs in the effluent discharged to the tributary to Little Muddy Creek. Dissolved oxygen in the effluent was 6.4 ppm at 12:30 pm on 12/13/96. Effluent temperature was 23.2C.

Rich Meade and Dale Cornelius observed fish piping at the first road crossing below the plant (T46N,R22W,S14, SW 1/4 of the NE 1/4) at 3:39 pm on the 13th.

I contacted the plant at about 4:30 pm on 12/13/96, told them of the problem, and asked them to turn off the effluent. I reached the plant a little after 5:00 pm and the effluent had been turned off. Some bluegill and channel catfish were stranded in the ditch about a block or two above the location where Rich Meade and Dale Cornelius observed distressed fish.

I believe the suspended solids caused the high COD and BOD in the small tributary that eventually enters Little Muddy Creek. No dead fish were observe [in Little Muddy Creek]. However, there will be dead fish in the tributary since they were stranded without water. It was my call to turn the water off because I did not want to further pollute Little Muddy Creek. Therefore we will not make a fish count..."

Signed Ron Dent, Fisheries District Supervisor, Sedalia

Tyson personnel were very cooperative during this event.

Custody of water samples collected by MDC field personnel was transferred to Dave Gullic, DNR Jefferson City Regional Office, at 6:45 pm on 12/13/96. The analysis summary for these samples, shown in the WATER SAMPLING STATIONS section of this report, document significant elevation of BioChemical Oxygen Demand and Non-Filterable Residue concentrations and a significant reduction of dissolved oxygen levels in nearly two (2) miles of the receiving tributary and Little Muddy Creek below the Tyson Foods facility discharge on 12/13/97. Levels of BOD and NFR in the tributary, 0.6 miles downstream from Outfall #001, significantly exceeded limits of 15 mg/l and 30 mg/l (weekly average) for that outfall listed in NPDES permit MO-0115061. These high levels of pollutants from that outfall were still significantly elevated in Little Muddy Creek, more than 1.7 miles downstream.

(Alan C. Buchanan 01/20/97)
(Richard M. Duchrow 05/15/97)

UPDATE 05/15/97

Ron Dent received a request for MDC's investigation report of the 12/13/96 incident on 05/11/97. In order to provide an updated account of activities on that incident, David Gullic, DNR-Jefferson City Regional Office, was contacted on 05/12/97. Mr. Gullic indicated that Jim Houlihan of his office had conducted an inspection of the Tyson Foods facility on 04/02/97. The inspection report cited non-compliance of NPDES permit limits, sludge deposits in the receiving tributary, unacceptable hydraulic and organic loading, excessive foam in the aeration basin, and insufficient freeboard in

m grease cap to berm as problems identified
astewater Treatment facility. Excessive quantities of filamentous algae were also identified in the portion of the treatment process containing the activated sludge. According to Mr. Houlihan's report, "... the sludge settles very slowly in the final clarifier, and frequently carries over into the effluent and receiving stream ...". The problem of excessive algae in the effluent was first documented by MDC field personnel in February 1996 (Report of Pollution Investigation and Fish Kills #96139) and has apparently not been resolved by the company since initial notification more than one year ago. A Notice of Violation (#0879JC) was issued to the Tyson Foods facility by DNR-Jefferson City Regional Office staff on 04/30/97 for non-compliance with NPDES permit limits.

***The violations of permit limits have occurred eight times between 05/06/96 and 12/13/96.***

Correspondence from Robert Hentges, Regional Director, DNR-JCRO, on 04/30/97 notified Tyson Foods management of these violations and requested a meeting "... to discuss operational adjustments you need to make to prevent future violations from occurring ...".

Copies of Reports of Pollution Investigations and Fish Kills #96120 and #96139 were provided to Mr. Mark Ritsema, Tyson Foods, on 05/16/97. Monitoring of both DNR activities to resolve present problems and water quality conditions of the receiving stream(s) will continue by MDC Fisheries Management personnel.

(Richard M. Duchrow 05/15/97)

THIRD MAJOR INCIDENT INVESTIGATION

Ron Dent, MDC-Fisheries District Supervisor, Sedalia, reported pollution of the tributary to Little Muddy Creek by the discharge from the Tyson Foods, Inc. facility near Sedalia on 06/12/97. The following is information from his initial report:

"The Tyson plant is "bulking" meaning Total Suspended Solids are very high and the effluent ditch from Tyson and Little Muddy Creek below the outfall are milky green with algae and suspended solids. Shannon Zezula saw the problem Sunday [06/08/97] and DNR was on site yesterday [06/11/97] ... So far we have seen no dead fish..."

Signed Ron Dent, MDC-Fisheries Management Supervisor, Sedalia

Water chemistry information collected from the tributary below the Tyson Foods facility discharge by MDC field staff is presented below:

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DATE: June 8, 1997 Location: Snow Road crossing; 0.6 miles downstream

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Discharge = 1.87 cubic feet per second  Alkalinity = 503 mg/l $CaCO_3$

Turbidity = 40 Nephelometric Turbidity Units  pH = 7.9 @ 24.0C

Conductivity = 3,000 uSiemens/cm  Chloride = 105 mg/l Cl

Dissolved Oxygen = 9.3 mg/l @ 24.0C  Nitrate = 2.6 mg/l N-$NO_3$

Nitrite = 0.027 mg/l $NO_2$  Ammonia = 2.44 mg/l $NH_3$-N

Total Phosphorus = 55.0 mg/l $PO_4$

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MDC field staff checked the tributary to Little Muddy Creek on 06/12/97. The following are their observations:

"... Shannon Zezula and I checked the tributary to Little Muddy Creek for dead fish and saw only two at the bridge at Snow Road ... We did not check the tributary downstream of there. We went to the confluence of Little Muddy and did not find any dead fish. The creek was flowing over the ford (it was up) due to last night's rain and was very muddy. We checked Little Muddy Creek downstream, just below the confluence with the tributary and also at H Highway and only saw evidence of live fish...

The flow from Tyson was shut off and up to 8-15 inches of sludge had settled onto the bottom of the tributary at Snow Road [T46N R22W Sec 14 SW1/4]"

Signed Rich Meade, MDC-Fisheries Management Biologist, Sedalia

Ron Testerman, DNR-Jefferson City Regional Office, conducted an inspection of the Tyson Foods facility on 06/11/97. Time was spent by DNR staff, working with Tyson staff, in an attempt to correct the problems causing the "bulking" problem in the wastewater treatment plant. During the inspection, water samples were collected from the discharge and receiving stream. These results are as follows:

| Location | pH | Temperature | Ammonia (mg/l) | BioChemical Oxygen Demand (mg/l) | Non-filterable Residues (mg/l) |
|---|---|---|---|---|---|
| Discharge | | | | 373 | 840 |
| Tributary @ Snow Road | 7.2 | 29C | 3.05 | <12 | 7 |
| Tributary @ L Muddy Creek | | | | 17 | 18 |

Don Boos, DNR-Enforcement Section, Jefferson City, was contacted on 07/29/97. Mr. Boos indicated that DNR-Jefferson City Regional Office staff contacted his office on 06/19/97 and requested an evaluation of all evidence collected during complaint investigations involving Tyson Foods, Inc. since early 1996. A request for the initiation of enforcement action for Missouri Clean Water Law violations was also included.

WATER QUALITY STANDARD VIOLATIONS RELATING TO AMBIENT STREAM TEMPERATURES

The Missouri Clean Water Law 10CSR 20-7.031 Water Quality Standards section (4)(D) Temperature (1996) states:

" 1. For general and limited warm-water fisheries beyond the mixing zone, water contaminant sources and physical alteration of the water course shall not raise or lower the temperature of a stream more than five degrees Fahrenheit (5F). Water contaminant sources shall not cause or contribute to stream temperature in excess of ninety degrees Fahrenheit (90F)..."

Fisheries Management staff initiated monitoring of stream temperatures below the Tyson facility discharge in the receiving tributary and Little Muddy Creek during March 1996. Equipment problems negated the collection of meaningful data on the impacts of the effluent on the stream temperature in the receiving stream.

This effort was initiated again at four site below the discharge on 06/10/97 and continues to this date. Temperature monitoring units at the sites were set to take individual readings at thirty (30) minute intervals and were synchronized within 1/100th of a second of each other.

The location of the stream temperature monitors is given below:

Site 1. Tributary 0.6 miles below Tyson discharge (@ Snow Road crossing)
T46N R22W Sec 14

Site 2. Tributary 1.7 miles below Tyson discharge (just above confluence)
T46N R22W Sec 13

Site 3. Little Muddy Creek just above tributary confluence
T46N R22W Sec 12

Site 4. Little Muddy Creek just below tributary confluence
T46N R22W Sec 13

Data analysis of this monitoring for the time period 06/10/97 to 07/09/97 is presented below:

MAXIMUM STREAM TEMPERATURE (June 10, 1997 to July 9, 1997)

Temperature readings in the tributary 0.6 miles below the Tyson facility discharge (Site 1) exceeded 85F on eighteen (18) of the thirty (30) days in the monitoring period. A total of 167 readings in excess of 85F were recorded. A temperature of 90F was reached on one day (06/18/97) and covered a period of 1.5 hours (n=3).

Stream temperatures at Sites 2, 3, and 4 remained below 85F during the period.

WATER QUALITY STANDARD VIOLATIONS ( >5F increase [06/10-07/09/97])

Site 1 (0.6 miles below Tyson Foods discharge)

This site lies on the tributary to Little Muddy Creek, downgrade from the Tyson Foods discharge. Corresponding synchronized temperatures are not available for that discharge, so detection of Water Quality Standard temperature elevation violations in the tributary was not possible. For the 30-day sample period, the mean water temperature at Site 1 was 79.76F. The range of temperatures fell between 67.03F and 93.54F. There were eighteen (18) days where water temperatures exceeded 85F (n=167) and twenty-three (23) days with readings above 80F (n=729).

e 2 (1.7 miles below Tyson Foods dischar

This site is 1.1 miles below Site 1. The mean water temperature at Site 2 was 77.14F with a range of temperatures between 67.14F and 84.47F. No days showed temperatures in excess of 85F and ten (10) days exceeded 80F (n=144).

Site 3 (Little Muddy Creek, just above tributary confluence)

Mean stream temperature in Little Muddy Creek, above the confluence of the tributary (Site 3), was 72.90F with a range between 64.95F and 80.83F. No days exceeded 85F and 80F was exceeded on only one (1) day (n=12).

Site 4 (Little Muddy Creek, just below tributary confluence)

Mean stream temperature in Little Muddy Creek, below the confluence of the tributary (Site 4), was 75.14F (66.23F -83.75). No days exceeded 85F and readings during ten (10) days exceeded 80F (n=183).

The impact of elevated water temperature in tributary on Little Muddy Creek below the confluence with the tributary was measured by comparing the temperature difference between Site 3 (Little Muddy above) and Site 4 (Little Muddy below). Water temperatures were significantly higher at Site 4 when compared to Site 3 ($p < 0.0001$). Water temperatures at Site 4 were elevated by more than 5F on 120 occasions during 10 of the 30 days in the time period. The maximum increase at Site 4 was 10.2F which occurred on 07/06/97 (n=4). The cause of this increase was significantly warmer water entering from the tributary receiving the Tyson effluent ($p < 0.0001$). A summary of the violations are presented below:

| Date | Maximum Temperature difference (degrees F) | Date | Maximum Temperature difference (degrees F) |
|---|---|---|---|
| 06/10/97 | 5.2 (n=3) | 06/11/97 | 5.5 (n= 7) |
| 06/22/97 | 5.2 (n=3) | 06/23/97 | 7.1 (n=17) |
| 06/26/97 | 5.7 (n=13) | 06/27/97 | 5.7 (n=13) |
| 06/28/97 | 7.6 (n=11) | 07/05/97 | 9.4 (n=20) |
| 07/06/97 | 10.2 (n=25) | 07/08/97 | 6.3 (n= 8) |

Stream temperature monitoring data continues to be collected from the four sites.

All evidence from these investigation and monitoring activities have been transmitted to Kevin Mohammadi, DNR-Enforcement Section, Jefferson City, to be included in any litigation for Missouri Clean Water Law violations by Tyson Foods, Inc.

(Richard M. Duchrow 08/25/97)

RECTIVE ACTION:

Continue to monitor algae levels in effluent.

Provide an unchlorinated freshwater source immediately below effluent outfall for flushing (dilution) purposes should similar problems occur in the future.

(Alan C. Buchanan 01/20/97)

Work with Tyson Foods to possibly develope a pre-treatment of the effluent in an attempt to decrease nutrient loading of the tributary, Little Muddy and Muddy creeks.

(Richard M. Duchrow 05/15/97)

Evaluate information and evidence collected on violations and take appropriate enforcement action to insure correction of problems in Little Muddy Creek below the Tyson outfall.

(Richard M. Duchrow 08/25/97)

STATUS:

Case open as of 08/25/97 pending enforcement by DNR-Jefferson City. Updated report sent on 08/25/97.

(Richard M. Duchrow 08/25/97)

SUBSTANTIATING DOCUMENTS:

All field notes, water chemistry (field and laboratory) results, correspondence and investigation reports are filed with the original report in the Pettis County pollution file.

(Richard M. Duchrow 08/25/97)

REPORT COPY CHECKLIST

Weithman
Tillitt, Streams WQ Coordinator

Mr Ritsema Tyson Springdale AR
(upon request only [05/15/97])

Regional Supervisor
Ross
Conservation Agents
Ream

Fish Dist. Supervisor Dent
Drenon, Info Services, J.C.
Teeter, DNR Emergency Response J.C.
Kevin Mohammadi, DNR Enforcement J.C.
DNR Reg Off. Hentges JC Regnl Of Jeffrsn Cty
John Madras DNR-Planning JefCty