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Director

Segment No. 10-23-13

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MEMORANDUM
January 2, 1987

To: Jon Neel

From: Pat Crawford P.C.

Subject: Dillenbaugh Creek Survey

ABSTRACT

A water quality survey was performed on the Dillenbaugh Creek drainage during both high- and low flows. Water quality was found to be impacted by agricultural and industrial activities. Two unpermitted industrial discharges were discovered on a small tributary located at river mile (r.m.) 2.3. One or more unidentified sources were found to be discharging into a Chehalis storm sewer causing serious pollution in the lower reaches of the Dillenbaugh drainage.

INTRODUCTION

The Southwest Regional Office (SWRO) requested a survey be conducted on specific portions of the Dillenbaugh Creek drainage during both high- and low-flow conditions. Three industries have NPDES permits for discharging non-contact cooling water into the drainage. They are: American Crossarm and Conduit, National Fruit Canning Company, and Northwest Rubber Compounders. Pittsburg Paint and Glass also has a permit application pending.

This survey request included the following objectives:

1. Locate unknown point discharges in the area of the streamwalk, quantify their impacts, and attempt to identify their sources.
2. Quantify the impact of each NPDES permitted discharge.
3. Assess land use and attempt to identify potential non-point sources of pollution.

4. Compile beneficial-use information and identify the season of use.

Site Description

Dillenbaugh Creek (stream length 8.4 miles) is a small tributary of the Chehalis River with a drainage area of approximately 17.6 square miles (Figure 1). The elevation change between the origin and its confluence with the Chehalis River is about 330 feet. The land use in the drainage is primarily rural and agricultural except for industrial development between r.m. 0.4 to 0.9 and r.m. 3.5 and 4.3.

Berwick Creek (stream length 7.6 miles) is Dillenbaugh's major tributary. The elevation change between its origin and the confluence with Dillenbaugh Creek is about 380 feet. It drains rural and residential areas and represents about a third of the total Dillenbaugh Creek drainage.

"Dillenbaugh Tributary" (DT) is a small, unnamed stream that flows through the northwest end of the industrial park adjacent to Bishop Road. Little is known about the stream length and origin.

Background

Dillenbaugh Creek has had a history of water quality problems. Only once during the seven visits made by investigators from the Water Quality Investigations Section did dissolved oxygen levels exceed 6.0 mg/L at the mouth of the creek (Johnson, 1982; Joy, 1984). Class A standards (Table 1) were never met during any of their visits. During the last three years, the creek has endured a number of manure and miscellaneous spills (SWRO, 1983-1986). Despite the poor water quality, the upper reaches of the Dillenbaugh drainage are still used for spawning by coho salmon, steelhead, and cutthroat trout (WDF, 1986).

METHODS

Between May 19 and June 24, 1986, a water quality survey was conducted on the Dillenbaugh Creek drainage. The survey included a visual evaluation of land use and drainage characteristics, streamwalks, and water quality sampling. Streamwalks were conducted on: the main stem of the Dillenbaugh from r.m. 0.2 to 1.0 and 3.5 to 4.7, the DT from r.m. 0.4 to 0.9 passing through the industrial area east of Bishop Road, and the ditches that flow into the tributary and are located adjacent to the railroad tracks between Bishop and Sturdevant Roads.

Main-channel sampling stations are designated by r.m. number; discharges (flows from springs, pipes, seeps, etc.) are identified by the r.m. number followed by a "D" and an "L" or "R", signifying a left- or right-bank location. Berwick Creek main-channel stations are designated by the r.m. preceded by a "B." Discharges into Berwick Creek are identified using the same method as for Dillenbaugh Creek. Complete station descriptions are found in Table 2.

High-flow samples were collected May 19 - 21, 1986. The low-flow portion of the survey was performed June 3, 23, and 24, 1986 (Figure 2; Table 2).

Flow measurements were made using a Marsh-McBirney magnetic flow meter at selected main-channel stations. When physical conditions allowed, small discharges were measured by recording the time required to fill a container of known volume (a 500 mL bottle or a 4-liter bucket), or estimated when actual measurement was not possible. Temperature, conductivity, and pH measurements were taken in the field. Samples for dissolved oxygen (D.O.) were fixed in the field and subsequently analyzed at the Tumwater field laboratory. Samples for chemical oxygen demand (COD), fecal coliform (F.C.), pH, conductivity, chloride, turbidity, and nutrients were stored in the dark on ice and returned to Olympia. The samples were transported to the Manchester laboratory on the day following collection.

RESULTS AND DISCUSSION

In the following discussion, both land-use observations and analytical results are evaluated simultaneously.

Dillenbaugh Creek above River Mile 4.6

Above r.m. 4.6, Dillenbaugh Creek passes through two farms of significance; one with 20 to 30 head of cattle, and one dairy farm. Homes and hobby farms with one to six animals are sparsely scattered along the creek. A large portion of the upper drainage of the creek was wooded, primarily with conifers.

Station 4.6 was chosen as an upstream reference site. Elevated FC concentrations were found during wet-weather/high-flow, probably indicating agricultural runoff. The high concentration detected during low flow (June 24) (Table 3) implies that a constant source such as barn drainings or a failing septic system may be present. Only one residence borders the creek for a considerable distance upstream.

Dillenbaugh Creek between River Mile 4.6 and 3.2

The area between the Jackson Highway (r.m. 4.6) and the industrial park (r.m. 4.3) of Dillenbaugh Creek consisted of unoccupied fenced fields (probably used for pasture).

From r.m. 4.3 to r.m. 3.5, the creek passes through the industrial area. No significant discharges were encountered on the streamwalk through this area. Flow measurements made on May 18, 1986, further confirm this. A small spring (3.6LD) was located, but its flow was negligible. Three roadside ditches were observed with a small amount of runoff. A four-inch pipe traversed the creek at r.m. 4.1. Debris coming down the creek during high flows could damage this pipe, resulting in a discharge into the creek. The pipe appeared to connect Pittsburg Paint and Glass (PPG) with the main industrial park. Whether it was in active use is unknown. Except for FC, parameters tested indicated that little degradation had occurred between upstream (r.m. 4.6) and downstream (r.m. 3.4) stations. Chemical loading between these stations increased only about 10 percent on May 19 (Table 4a). Bacteria levels were high both upstream (3,400 org/100 mL) and downstream (11,000 org/100 mL), but the sources were not found.

Between r.m. 3.5 and its confluence with Berwick Creek (r.m. 3.2), the stream passes by three homes, under I-5 and a county road, and through about 1,000 feet of pasture.

Reach between River Mile 3.2 and 1.7

Berwick Creek enters Dillenbaugh Creek at the left bank at r.m. 3.2. Origins for both creeks are located with 1.5 miles of each other, with a common ridge between them. An unnamed tributary "Dillenbaugh Tributary" (DT) enters the main stem at r.m. 2.3.

Berwick Creek

Reach Above River Mile 2.7

One farm with approximately 20 sheep was found on Berwick Creek above r.m. 2.7, but the area was primarily rural-residential.

Water quality in the creek above station B2.7, the reference site, exhibited similar conditions as the upper Dillenbaugh. Fecal coliform bacteria were somewhat elevated at low flow (Table 3).

Reach between River Mile 2.7 and Confluence with Dillenbaugh Creek

Between r.m. 2.7 and 0.5, Berwick Creek is bordered by a series of fields (possibly pasture), an area of about 15 homes, the I-5 freeway culvert, unused fields between the freeway and LaBree Road, and dairy farm pastures. There appears to be an unidentified FC source present between B2.7 and B0.5 during high-flow conditions. Total inorganic nitrogen (TIN) and total phosphorus (TP) loads also increased between these points during high-flow conditions.

Barnyard runoff into a ditch adjacent to LaBree Road is potentially the most significant discharge found entering Berwick Creek (10 feet downstream from station B0.5). Both FC (31,000 org/100 mL) and COD (60 mg/L) concentrations indicate a severe problem. Because the dilution was high and the source volume low, the observed receiving water impacts from this source were not significant. Periodic increases in the discharge related to manure-handling practices could cause substantial impact during both high and low flows.

Dillenbaugh Tributary (DT)

The DT drainage receives NPDES permitted non-contact cooling water discharges from Northwest Rubber Compounders and National Fruit Canning Company at r.m. DT0.4. However, neither company was discharging at the time of this survey.

Headwaters to River Mile DT0.4

The upstream reference station DT1.4 has the best water quality of the stations sampled, meeting all Class A standards (Table 1).

An FC source is present between DT1.4 and DT0.9. TIN concentrations doubled. No obvious sources for these increases were observed. However, this portion of the drainage is residential and septic system failure may be responsible.

Other failed septic systems are suspected along the ditch represented by station DT0.88DL. Chloride, nutrient, and FC concentrations were elevated.

Between r.m. 0.88 and 0.4 (DT), chloride and nutrient concentrations increased by more than 50 percent. No active discharges were observed, but several potential sources were located. These include a five-inch pipe at r.m. 0.55 (left bank), a new ditch and four-inch pipe originating at an apartment complex at r.m. 0.55, a four-inch pipe in a field at r.m. 0.60 (left bank), and a ditch with red residues at r.m. 0.65 (left bank). Origins of the left-bank drains were not identified because of their remoteness from buildings.

Reach Between DT0.4 and Dillenbaugh Confluence

Discharges from two unpermitted industries, Quali-cast Corporation and Central Reddi-mix Corporation were found entering the Dillenbaugh tributary immediately below station DT0.4 from a roadside ditch on the east side of the Bishop Road culvert. Water in the ditch at the intersection of Chase and Sturdevant Roads (adjacent to Quali-cast Corporation) flows into the Dillenbaugh tributary via a series of ditches. These industrial flows constitute a significant portion of the total flow in the ditch. The ditch waters (DT0.4LD) caused the temperature in the tributary 50 feet downstream from the discharge to fail Class A temperature standards on June 3 and to nearly fail on June 23.

Quali-cast Corporation

Water in the ditch adjacent to the Quali-cast property (station QCC) was found to have an elevated temperature during both visits made to the site. Also during the June 3 visit, water was trickling from a four-inch pipe on the east sided of the Quali-cast building. An employee of National Fruit Canning Company indicated that the ditch steamed frequently during the winter months. Quali-cast is not operating under an NPDES permit. A plant inspection is necessary to identify the exact location(s) of warm water discharge(s).

Central Reddi-mix Corporation

The small discharge (station CEMCO) is located approximately 0.25 mile upstream from station DT0.4LD. Water was found percolating through a cement barrier. The source appeared to be a washwater collection pond. During one visit, the pH of the discharge was 10, but dilution and buffering capacity of water in the ditch reduced the pH to 7.4 at station DT0.4LD. The pH was found to be 7 during a follow-up visit on June 23. This industry was not operating under an NPDES permit.

Elevated nutrient and FC concentrations were also found in the ditch and may indicate septic system contribution.

Water quality at DT0.1 seemed to be impacted by an unidentified FC source. Loads from DT0.4LD are insufficient to account for the increase. Chloride concentrations nearly doubled and FC concentrations increased four-fold. Only one home is within 150 feet of the creek in this area, and about 80 percent of land bordering the creek is fenced pasture which appears to be used. Farming activities or a failed septic system could be responsible for water quality problems originating in this segment. Although sewer hookups are available in some areas of this drainage, many occupants have chosen not to be connected (Chehalis Engineering Department, 1986).

During high flow (May 21), this tributary contributes between 10 and 20 percent of the total load of most constituents in the drainage while contributing about 10 percent of the flow.

Station 1.7

D.O. levels at station 1.7 below the confluences of both Berwick Creek and "Dillenbaugh Tributary" were below Class A standards on all samplings and below the 5.0 mg/L criterion for freshwater aquatic life as determined by EPA (1976) on three of the four visits. Three of the four times this site was sampled, the FC concentrations exceeded 100 org/100 mL. Poor agricultural practices and failed septic systems were the most probable cause of these violations.

During the low-flow survey, water movement was barely discernible at station 1.7. The creek channel is deeper and wider than the upstream portions of the drainage.

Reach between River Mile 1.7 and the Confluence with the Chehalis River

A ditch draining a cattle feedlot (1.7LD) is located ten feet downstream from station 1.7 (Table 2). During our visit the flow was small compared to the creek. However, the FC, COD, and ammonia (NH_3-N) concentrations were the highest observed in the drainage. This problem deserves immediate attention.

At r.m. 0.55, a 30-inch Chehalis storm sewer enters the creek. The pipe, the John Street storm sewer, (0.55RD) is under water during high flows. On June 5 the pipe was visible, but not flowing. Residues of oil and grease were observed in the soil in close proximity to the end of the pipe. When the site was sampled on June 23, a flow of about 0.4 cfs was measured. No measurable rainfall had been recorded for three days (National Weather Service, 1986) (Table 5), and other storm drains were dry. Flow from this drain appeared to be intermittent. A fairly continuous layer of oil and clumps of lubricating grease were observed floating out of the storm drain. FC concentrations had to be calculated from downstream data because the undiluted value was so high. FC were estimated to be 20,000 org/100 mL at the discharge. A sample was collected for polynuclear aromatics and halogenated hydrocarbon analysis. Results indicated relatively low concentrations of combustion-type byproducts (Appendix A). This discharge was reported to SWRO and subsequent investigations and samples by Gary Bailey revealed that American Crossarm and Conduit (NPDES permit for non-contact cooling water), Consolidated Dairy Products, Houston Auto Parts, Auto Motive, Inc., and a broken city of Chehalis sanitary sewer line were discharging water and wastewater into the storm sewer. The most noteworthy contributor, American Crossarm and Conduit, was the source of pentachlorophenol. A later sample (August 14, 1986) of material trapped within a boom placed at the end of the storm sewer was analyzed at 0.17 percent (1,700 mg/L) pentachlorophenol (Bailey, SWRO, personal communication, 1986). Measures have been taken by SWRO to eliminate all contributing discharges.

Station 0.51 is a main-channel station located just downstream from the John Street storm sewer outlet. FC levels increased by a factor of 65, and the D.O. concentration dropped by a factor of 3.5 when compared to upstream values. COD and total phosphorus, ammonia, and chloride loading was up 70, 300, and 26 percent, respectively (Table 4B).

At r.m. 0.32, Dillenbaugh Creek splits during high flows. On May 20, water quality in the alternative channel was poor, similar to the main channel. It carried 12 percent of Dillenbaugh's total flow to the Chehalis River. It should be noted that on the previous day (May 19), this channel was dry. The maximum rainfall that could have fallen between visits as recorded in Centralia was 0.99 inch (National Weather Service, 1986) (Table 6).

Water quality at the mouth of the creek (station 0.1) violated one or more Class A standards during the five visits. D.O. concentrations never exceeded the minimum 5 mg/L criterion recommended by EPA (1976). FC exceeded Class A levels on three of the five visits. More than 10 acres of woodwaste fill material are located adjacent to the creek between r.m. 0.4 and 0.7. Leachate from this acreage probably compounds the poor water quality in this reach (Schermer, 1976).

CONCLUSIONS

In general, illegal discharges, failing septic systems, and animal management practices appear to be major problems throughout the drainage. Animals usually have access to the stream. The organic and nutrient loading from farming activities were found to be lowering

D.O. levels in the lower, slower-moving portion of the drainage where gradient change in the creek does not promote adequate reaeration. Because of reduced velocity, deposition of suspended organic material also occurs, further reducing D.O. concentrations.

Two industries were found to be discharging small quantities of water into the Dillenbaugh drainage. Water with elevated temperatures appeared to be emanating from the Quali-cast Corporation property. This caused water quality downstream from station DT0.4LD to fail Class A temperature standards. Failing septic systems in the "Dillenbaugh Tributary" and the Berwick Creek sub-drainage appear to be the most likely reason for the bacteria contamination.

The dairy feedlot operation near r.m. 1.7 was the most significant agricultural source observed.

The primary source of pollution in the lower portion of the drainage was originating from the John Street storm sewer. This drain has been shown to be impacted by several businesses. Follow-up monitoring is recommended to determine if actions taken by the SWRO have corrected the problems.

RECOMMENDATIONS

- Inform local health authorities regarding suspected septic system failures.
- Conduct a follow-up investigation on the John Street storm sewer.
- Pursue animal waste problems on Berwick and Dillenbaugh Creeks.
- Address illegal discharges in the drainage.
- Identify the contents of the four-inch pipe traversing the creek at the Pittsburg Paint and Glass facility.

PC:cp

Attachments

cc: Norm Glenn
Lynn Singleton

REFERENCES

Environmental Protection Agency, 1976. "Quality Criteria for Water," Washington, DC. EPA-440/9-76-0231. 501 pp.

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Heid, B., 1986. Chehalis Engineering Department, personal communication, October 1986.

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Joy, J., 1984. "Evaluation of the conditions contributing to the dissolved oxygen problem in the Chehalis River between Chehalis and Centralia," memorandum to J. Neel, Southwest Regional Office, Ecology, October 29, 1984. Wash. St. Dept. Ecol., 51 pp.

National Weather Service, 1986. Daily precipitation records.

Schermer, E.D. and J.B. Phipps, 1976. A Study of Woodwaste Leachate. Grays Harbor College, Aberdeen, WA. 63 pp.

Southwest Regional Office, 19880-1986. Lewis County complaint file.

Table 1. Class A (excellent) water quality standards (WAC 173-201-045) and characteristic uses.

Characteristic Uses:	Water supply, wildlife habitat; livestock watering; general recreation and aesthetic enjoyment; commerce and navigation; fish reproduction, migration, rearing, and harvesting.
<u>Water Quality Criteria</u>	
Fecal coliform:	Geometric mean not to exceed 100 organisms/100 mLs with not more than 10 percent of samples exceeding 200 organisms/100 mLs.
Dissolved oxygen:	Shall exceed 8 mg/L.
Total dissolved gas:	Shall not exceed 110 percent saturation.
Temperature:	Shall not exceed 18°C due to human activity. Increases shall not, at any time, exceed $t = 28/(T+7)$; or where temperature exceeds 18°C naturally, no increase greater than 0.3°C. t = allowable temperature increase across dilution zone, and T = highest temperature outside the dilution zone. Increases from non-point sources shall not exceed 2.8°C.
pH:	Shall be within the range of 6.5 to 8.5, with man-caused variation within a range of less than 0.5 unit.
Toxic, radioactive, or deleterious materials:	Shall be below concentrations of public health significance, or which may cause acute or chronic toxic conditions to the aquatic biota, or which may adversely affect any water use.
Aesthetic values:	Shall not be impaired by the presence of materials or their effects, excluding those of natural origin, which offend the senses of sight, smell, touch, or taste.

Table 2. Station descriptions for the May and June survey of the Dillenbaugh Creek drainage.

Station	River Mile	Station Description
4.6	4.6	Dillenbaugh Creek - Downstream side of Jackson Highway bridge
3.6LD	3.6	Spring on left bank of Dillenbaugh Creek
3.48LD	3.48	Ditch 50 feet southeast of Dillenbaugh Creek northeast of Bishop Road
3.5LD	3.5	Field runoff into Dillenbaugh Creek on the left bank
3.4	3.4	Dillenbaugh Creek - Either at culvert under Hamilton Road just northwest of the LaBree Road bridge over Interstate 5 (3.4) or 500 feet downstream from this culvert (3.3)
B2.7	--	Berwick Creek - 50 feet upstream from the Jackson Highway culvert
B0.5	--	Berwick Creek - Downstream side of LaBree Road culvert
B0.5LD	--	Ditch on the left bank of Berwick Creek five feet downstream from station B0.5
DT1.4	--	Tributary to Dillenbaugh Creek with same name - Upstream side of Jackson Highway culvert
DT0.9	--	Tributary to Dillenbaugh Creek with same name - Downstream side of Ribelin Street culvert approximately 0.9 mile from its confluence with the main channel located across from house at 142 Ribelin Road
DT0.89LD	--	Small stram entering the Dillenbaugh Tributary at Ribelin Road - Sampled at Ribelin Road culvert 150 feet south of station DT0.9
DT0.4	--	Tributary to Dillenbaugh Creek with same name - 25 feet from the upstream side of the culvert under Bishop Road 0.4 r.m. from confluence with the main stem of Dillenbaugh Creek
DT0.4LD	--	Ditch entering the left bank of the Dillenbaugh Tributary (DT) just below the sampling site for station DT0.4
QCC	--	Ditch on Chase Road adjacent to Quali-cast Corporation
CEMCO	--	Seepage from pond on Central Reddi-mix Cement Company's property about 200 yards east of Bishop Road on the south side of the railroad tracks

Table 2 - continued.

Station Symbol	River Mile	Station Description
DT0.1	--	Tributary (DT) to Dillenbaugh Creek with same name - Upstream side of the culvert under Kelly Road about 0.7 mile southeast of the exit 76 Interstate 5 interchange. NOTE: The confluence with Dillenbaugh is at r.m. 2.3
2.1RD	2.1	Ditch 0.15 mile southeast on Interstate Avenue from the exit 76 Interstate 5 interchange
1.7LD	1.7	Ditch 10 feet downstream from station 1.7
1.7	1.7	Dillenbaugh Creek - 25 feet downstream from remnants of old county road bridge 150 feet west of exit 76
0.95	0.95	Dillenbaugh Creek - Main channel under the GN-NP railroad trestle
0.55RD	0.55	30-inch John Street storm sewer
0.51	0.51	Dillenbaugh Creek - Just downstream from the discharge from the John Street storm sewer
0.5RD	0.5	Small discharge originating in grasses adjacent ot the woodwaste fill located about mid-way between the GP, NP, UP railroad tracks and the CMSP&P railroad tracks
0.3R&L	0.3	Dillenbaugh Creek - Area of upwelling (from submerged pipe?) between the Interstate 5 bridge for the north-bound lanes and the north-bound exit 77 bridge
0.2A	0.2	Overflow channel for Dillenbaugh Creek - 50 feet downstream from the Frontage Road bridge ("A" designates alternate channel)
0.1	0.1	Dillenbaugh Creek - 50 feet downstream from the state highway 6 bridge

Table 3. Field data and laboratory results for samples taken from the Dillenbaugh drainage - May and June, 1986.

Field Data										Laboratory Data											
Station Number	River Mile	Date	Time	Flow (cfs)	Temperature (°C)	pH (S.U.)	Conductivity (umhos/cm)	D.O. (mg/L)	% Saturation	pH (S.U.)	Conductivity (umhos/cm)	Turbidity (NTU's)	Fecal Coliform (#/100 mL)	COD (mg/L)	Cl (mg/L)	NO_3-N (mg/L)	NO_2-N (mg/L)	NH_3-N (mg/L)	O-PO_4-P (mg/L)	T-P (mg/L)	TOC (mg/L)
4.6	4.6	5/19	1215	4.3	13.0	6.4	56	10.2	96	7.3	56	4	100	13	2.5	0.19	0.01	0.03	0.03	0.05	--
		5/20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/21	1540	--	11.0	--	48	10.6	96	6.8	45	10	1400	26	3.0	0.45	0.01	0.04	0.04	0.07	--
		6/23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		6/24	1120	--	16.0	7.3	78	9.0	90	7.1	78	4	2400	23	2.9	0.15	<0.01	0.02	0.06	0.09	--
3.6LD	3.6	5/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/21	1250	--	10.7	5.8	60	4.7	42	6.0	60	43	300	16	3.0	0.13	<0.01	0.06	0.01	0.05	--
3.5LD	3.5	5/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/21	1450	--	16.7	--	106	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3.48LD	3.48	5/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/21	1510	--	19.7	--	122	10.1	110	8.1	149	180	490	26	3.1	0.07	0.01	0.03	0.02	0.18	--
3.4	3.4	5/19	1100	4.66	12.6	6.3	60	10.2	95	7.3	59	4	140	13	2.7	0.19	0.01	0.02	0.03	0.05	--
		5/20	1720	27.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/21	1020	27.3	9.4	6.1	43	10.4	91	6.8	42	10	380	23	2.4	0.50	0.01	0.03	0.02	0.06	--
		6/23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		6/24	0950	1.29	15.5	7.3	99	8.9	89	7.1	70	6	11,000	27	3.9	0.35	0.02	0.16	0.08	0.15	--
B2.7	--	5/19	1300	2.2	13.6	6.4	48	10.1	97	7.3	46	4	71	13	2.3	0.18	<0.01	0.01	0.02	0.03	--
		5/20	1730	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		6/23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		6/24	1135	--	15.5	7.3	67	9.5	95	7.0	70	4	300	23	3.1	0.17	<0.01	0.02	0.04	0.07	--
B0.5	--	5/19	1140	3.1	13.5	--	55	10.0	95	7.0	52	5	510	16	2.9	0.22	0.01	0.03	0.03	0.05	--
		5/20	1730	14.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/21	1050	12.4	10.2	6.2	47	10.3	91	7.2	52	13	1000	23	2.7	0.45	0.01	0.04	0.03	0.08	--
		6/23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		6/24	1245	--	16.8	7.3	75	8.2	84	6.7	78	7	350	23	4.1	0.34	0.01	0.05	0.07	0.11	--
B0.5LD	--	5/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/21	1600	0.001	21.0	--	152	12.6	140	7.2	185	28	31,000	66	8.7	0.84	0.08	0.47	0.19	0.67	--
DT1.4	--	5/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		6/03	1520	--	14.5	7.7	47	9.5	93	7.4	47	4	3	16	2.5	0.11	<0.01	0.01	0.01	0.05	--
		6/23	1225	0.067	14.8	7.4	50	9.2	90	7.2	49	4	14	12	2.5	0.08	<0.01	0.01	0.02	0.04	--
		6/24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 3 continued.

				Field Data						Laboratory Data											
Station Number	River Mile	Date	Time	Flow (cfs)	Temperature (°C)	pH (S.U.)	Conductivity (umhos/cm)	D.O. (mg/L)	% Saturation	pH (S.U.)	Conductivity (umhos/cm)	Turbidity (NTU's)	Fecal Coliform (#/100 mL)	COD (mg/L)	Cl (mg/L)	NO_3-N (mg/L)	NO_2-N (mg/L)	NH_3-N (mg/L)	O-PO_4-P (mg/L)	T-P (mg/L)	TOC (mg/L)
DT0.9	--	5/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		6/03	1730	--	15.9	7.6	50	8.7	87	7.4	48	8	700	22	2.9	0.22	0.01	0.04	0.02	0.06	--
		6/23	1155	--	14.8	6.4	57	8.8	86	7.1	53	10	870	27	2.9	0.19	0.02	0.04	0.05	0.08	--
		6/24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DT0.89LD	--	5/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/21	1640	--	15.0	--	78	7.8	77	6.8	92	38	3700	36	4.2	0.14	0.01	0.08	0.04	0.16	--
		6/03	1540	--	17.9	7.3	260	1.3	14	7.2	259	10	1900	31	40	0.06	0.04	0.54	0.20	0.36	--
DT0.4	--	5/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		6/03	1135	--	14.5	7.3	110	8.1	79	7.5	110	10	700	22	6.2	0.34	0.02	0.06	0.07	0.14	--
		6/23	0950	--	14.6	6.2	125	8.0	79	7.2	122	17	370	23	7.2	0.35	0.03	0.04	0.12	0.13	--
		6/24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
QCC	--	5/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		6/03	1800	--	24.6	8.2	108	8.6	102	8.4	42,900	--	150	16	7.9	0.63	<0.01	0.01	<0.01	<0.01	--
		6/23	1120	0.015	28.8	7.1	84	8.7	111	8.4	94	3	--	19	6.2	0.43	<0.01	0.02	<0.01	0.01	--
		6/24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CEMCO	--	5/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		6/03	1310	0.006	19.2	10.0	226	9.8	105	10.1	189	--	--	170	4.2	0.22	0.02	0.09	0.01	0.33	--
		6/23	1100	0.003	17.2	7.2	146	11.7	120	6.8	145	10	--	145	4.7	0.01	0.01	0.03	0.01	0.04	--
		6/24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DT0.4LD	--	5/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		6/03	1200	0.037	19.0	7.4	142	9.3	99	7.5	143	6	1000	16	8.1	0.39	0.01	0.05	0.01	0.08	--
		6/23	1000	--	17.2	6.7	132	7.6	78	7.2	124	11	220	31	6.5	0.40	0.01	0.09	0.02	0.14	--
		6/24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 3 continued.

					Field Data					Laboratory Data											
Station Number	River Mile	Date	Time	Flow (cfs)	Temperature (°C)	pH (S.U.)	Conductivity (umhos/cm)	D.O. (mg/L)	% Saturation	pH (S.U.)	Conductivity (umhos/cm)	Turbidity (NTU's)	Fecal Coliform (#/100 mL)	COD (mg/L)	Cl (mg/L)	NO_3-N (mg/L)	NO_2-N (mg/L)	NH_3-N (mg/L)	O-PO_4-P (mg/L)	T-P (mg/L)	TOC (mg/L)
DT0.1	--	5/19	1420	0.69	16.7	6.3	104	10.2	104	7.1	107	8	1100	16	5.1	0.28	0.02	0.08	0.05	0.07	--
		5/20	1740	2.45	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/21	1620	--	12.4	--	87	9.2	86	7.2	106	32	2400	36	7.2	0.21	0.04	0.13	0.09	0.13	--
		6/03	1100	0.27	15.1	6.2	130	8.6	85	7.5	130	10	3000	25	7.1	0.20	0.02	0.03	0.05	0.12	--
		6/23	0910	0.052	15.5	6.4	128	5.7	57	7.1	131	9	870	31	7.0	0.18	0.02	0.36	0.07	0.11	--
		6/24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2.1RD	2.1	5/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/20	1750	1.27	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1.7	--	5/19	1010	--	13.9	6.4	74	4.3	41	6.7	69	5	160	23	3.9	0.19	0.01	0.05	0.04	0.08	--
		5/20	1625	--	12.9	6.0	64	7.1	67	6.7	62	12	5200	23	3.4	0.48	0.02	0.06	0.06	0.12	--
		5/21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		6/05	1220	--	19.1	6.7	106	1.9	20	6.8	97	6	34	31	5.0	0.02	<0.01	0.03	0.04	0.17	--
		6/23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		6/24	1015	--	19.0	6.6	100	1.2	13	6.3	102	6	500	31	5.2	0.01	<0.01	0.04	0.05	0.15	--
1.7LD	1.7	5/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/20	1640	--	19.0	6.7	780	7.7	82	7.4	794	40	213,000	220	140	0.24	0.07	2.7	0.23	2.0	--
		5/21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
0.95	0.95	6/23	1650	--	22.4	5.4	114	5.4	62	6.7	100	6	69	19	5.5	0.22	0.01	0.07	0.05	0.11	--
		6/24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
0.55RD	0.55	6/23	1430	0.5	19.5	4.9	201	3.2	34	6.9	201	13	>6000	54	11.0	0.38	0.10	1.7	0.79	1.5	16
		6/24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
0.51	0.51	6/23	1510	--	20.8	5.3	125	1.6	18	6.7	114	5	4500	27	5.7	0.14	0.01	0.17	0.07	0.15	7
		6/24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
0.5RD	0.5	5/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/20	1320	0.03	13.9	5.7	138	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
0.3R	0.3	5/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/20	1600	--	13.8	--	76	4.6	44	--	--	--	--	--	--	--	--	--	--	--	--
		5/21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		6/05	1140	--	17.4	6.8	105	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 3 continued.

					Field Data									Laboratory Data							
Station Number	River Mile	Date	Time	Flow (cfs)	Temperature (°C)	pH (S.U.)	Conductivity (umhos/cm)	D.O. (mg/L)	% Saturation	pH (S.U.)	Conductivity (umhos/cm)	Turbidity (NTU's)	Fecal Coliform (#/100 mL)	COD (mg/L)	Cl (mg/L)	NO_3-N (mg/L)	NO_2-N (mg/L)	NH_3-N (mg/L)	O-PO_4-P (mg/L)	T-P (mg/L)	TOC (mg/L)
0.3L	0.3	5/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/20	1540	--	13.7	5.9	58	4.6	44	--	--	--	--	--	--	--	--	--	--	--	--
		5/21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		6/05	1200	--	17.4	--	104	--	--	--	--	--	--	--	--	--	--	--	--	--	--
0.2A	0.2	5/19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		5/20	1450	2.9	13.7	6.1	98	5.5	53	6.7	93	9	1130	30	4.7	0.34	0.02	0.09	0.06	0.12	--
		5/21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
0.1	0.1	5/19	0915	11.8	13.2	6.4	87	4.2	40	6.7	84	5	88	20	4.0	0.14	0.01	0.03	0.05	0.07	--
		5/20	1030	22.0	10.4	6.0	88	4.4	39	6.7	81	8	2500	23	4.2	0.21	0.01	0.03	0.07	0.11	--
		5/21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		6/05	0850	3.3	17.9	6.3	97	3.2	33	7.0	166	4	14	4	4.6	0.13	<0.01	0.07	0.06	0.10	--
		6/23	0815	2.3	21.2	6.7	128	2.6	28	6.7	123	5	480	35	6.0	0.03	0.01	0.18	0.12	0.17	--
		6/24	0820	1.9	19.0	6.5	114	1.7	18	6.6	123	5	500	27	6.0	0.03	<0.01	0.24	0.11	0.16	--

Table 4A. Dillenbaugh Creek constituent loads in pounds/day (5/19/86) (during stable high-flow conditions).

Station Number	Flow	NO_3-N	NO_2-N	NH_3-N	TIN	T-P	Cl.	COD	FC[1/]
4.6	4.3	4.4	0.2	0.7	5.3	1.2	58	300	1.1
3.3	4.7	4.8	0.2	0.8	5.8	1.3	68	330	1.6
B2.7	2.2	2.1	---	0.1	2.2	0.4	27	150	0.4
B0.5	3.1	3.7	0.2	0.5	4.3	0.8	48	270	3.9
DT0.1	0.69	1.0	0.1	0.3	1.4	0.3	19	60	1.9
0.1	11.8	8.9	0.6	1.9	11.0	4.5	250	1300	2.6

Table 4B. Dillenbaugh Creek constituent loads in pounds/day (during dry-weather/low-flow conditions).

Station Number	Date	Flow	NO_3-N	NO_2-N	NH_3-N	TIN	T-P	Cl.	COD	FC[1/]
3.4	6/24	1.3	2.4	0.1	1.1	3.6	1.0	27	160	35
B0.5	6/24	1.0[2/]	1.8	<0.1	0.3	2.1	0.6	22	150	0.8
0.95	6/23	1.9[3/]	2.3	0.1	0.7	3.1	1.1	56	190	0.4
0.55DR	6/23	0.4	0.8	0.2	3.7	4.7	3.2	24	120	26
0.51	6/23	2.3[4/]	1.7	0.1	2.1	3.9	1.9	71	330	27
0.1	6/23	2.3	0.4	0.1	2.2	2.7	2.1	74	430	2.4
	6/24	1.9	0.3	<0.1	2.4	2.7	1.6	61	280	2.3

[1]Fecal colonies per day times 10^{10}

[2]Flow estimated from previous day (plus or minus 20 percent)

[3]Flow estimated from flows at stations 0.55DR and 0.51

[4]Flow from station 0.1 was used for calculations

Table 5. Daily precipitation at Centralia Weather Station (inches) - 1986.

Day of Month	May	June
1	0.01	*
2	0.44	*
3	0.03	*
4	0.09	*
5	0.35	*
6	0.19	0.12
7	0.08	*
8	T	*
9	0.12	*
10	0.35	*
11	0.09	*
12	0.22	*
13	0.57	*
14	T	0.23
15	*	T
16	T	0.02
17	*	0.41
18	0.12	0.32
19	0.35	0.02
20	0.64	0.69
21	0.08	*
22	*	*
23	*	*
24	0.03	*
25	*	*
26	T	*
27	*	*
28	*	T
29	*	0.05
30	*	*
31	*	

T = trace
* = none measured

NOTE: Measurements are taken at 1800 hours.

Appendix A.

ANDREA BEATTY RINIKER
Director

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

MEMORANDUM

July 30, 1986

TO: Pat Crawford

FROM: Dick Huntamer, Chemist

SUBJECT: Organic Analysis of Dillenbaugh Creek Water Sample, Lewis County

One water sample, collected on June 24, 1986, was received at the Manchester Environmental Laboratory on June 24, 1986, extracted July 1, 1986 and analyzed July 17, 1986. Detection limits are higher than normal due to the small sample size. No pentachlorophenol or 2 or 4 methylphenols (cresols) were detected. Results for the hydrocarbon identification will be sent when completed.

The results of the analyses are attached.

Lab Number

267544 .55RSS

Attachment
DH/cm

Laboratory Name: MANCHESTER LAB
Case No: DOE-412

Sample Number
E267544

ORGANICS ANALYSIS DATA SHEET
(Page 2)

SEMIVOLATILE COMPOUNDS

Concentration: LOW
Date Extracted/Prepared: 07/01/86
Date Analyzed: 07/17/86
Dil Factor: 12.500
Percent Moisture: (Decanted) ______

GPC Cleanup ___ Yes _X_ No
Separatory Funnel Extraction ___ Yes
Continuous Liquid-Liquid Extraction ___ Yes

CAS Number		UG/L	CAS Number		UG/L
108-95-2	Phenol	130. U	83-32-9	Acenaphthene	27. J
111-44-4	bis(2-Chloroethyl)Ether .	130. U	51-28-5	2,4-Dinitrophenol	630. U
95-57-8	2-Chlorophenol	130. U	100-02-7	4-Nitrophenol	630. U
541-73-1	1,3-Dichlorobenzene . . .	130. U	132-64-9	Dibenzofuran	130. U
106-46-7	1,4-Dichlorobenzene . . .	130. U	121-14-2	2,4-Dinitrotoluene	130. U
100-51-6	Benzyl Alcohol	130. U	606-20-2	2,6-Dinitrotoluene	130. U
95-50-1	1,2-Dichlorobenzene . . .	130. U	84-66-2	Diethylphthalate	130. U
95-48-7	2-Methylphenol	130. U	7005-72-3	4-Chlorophenyl-phenylether	130. U
39638-32-9	bis(2-Chloroisopropyl)Ether	130. U	86-73-7	Fluorene	130. U
106-44-5	4-Methylphenol	130. U	100-01-6	4-Nitroaniline	630. U
621-64-7	N-Nitroso-Di-n-Propylamine	130. U	534-52-1	4,6-Dinitro-2-Methylphenol	630. U
67-72-1	Hexachloroethane	130. U	86-30-6	N-Nitrosodiphenylamine (1)	130. U
98-95-3	Nitrobenzene	130. U	101-55-3	4-Bromophenyl-phenylether	130. U
78-59-1	Isophorone	130. U	118-74-1	Hexachlorobenzene	130. U
88-75-5	2-Nitrophenol	130. U	87-86-5	Pentachlorophenol	630. U
105-67-9	2,4-Dimethylphenol	130. U	85-01-8	Phenanthrene	140.
65-85-0	Benzoic Acid	630. U	120-12-7	Anthracene	130. U
111-91-1	bis(2-Chloroethoxy)Methane	130. U	84-74-2	Di-n-Butylphthalate . . .	130. BU
120-83-2	2,4-Dichlorophenol	130. U	206-44-0	Fluoranthene	70. J
120-82-1	1,2,4-Trichlorobenzene . .	130. U	129-00-0	Pyrene	100. J
91-20-3	Naphthalene	130. U	85-68-7	Butylbenzylphthalate . . .	130. U
106-47-8	4-Chloroaniline	130. U	91-94-1	3,3'-Dichlorobenzidine . .	250. U
87-68-3	Hexachlorobutadiene . . .	130. U	56-55-3	Benzo(a)Anthracene	130. U
59-50-7	4-Chloro-3-Methylphenol .	130. U	117-81-7	bis(2-Ethylhexyl)Phthalate	310. B
91-57-6	2-Methylnaphthalene . . .	130. U	218-01-9	Chrysene	130. U
77-47-4	Hexachlorocyclopentadiene	130. U	117-84-0	Di-n-Octyl Phthalate . . .	130. U
88-06-2	2,4,6-Trichlorophenol . .	130. U	205-99-2	Benzo(b)Fluoranthene . . .	130. U
95-95-4	2,4,5-Trichlorophenol . .	630. U	207-08-9	Benzo(k)Fluoranthene . . .	130. U
91-58-7	2-Chloronaphthalene . . .	130. U	50-32-8	Benzo(a)Pyrene	130. U
88-74-4	2-Nitroaniline	630. U	193-39-5	Indeno(1,2,3-cd)Pyrene . .	130. U
131-11-3	Dimethyl Phthalate	130. U	53-70-3	Dibenz(a,h)Anthracene . .	130. U
208-96-8	Acenaphthylene	130. U	191-24-2	Benzo(g,h,i)Perylene . . .	130. U
99-09-2	3-Nitroaniline	630. U		2-FLUOROPHENOL (SURR.STD.)	97%
				D5-PHENOL (SURR.STD.) . .	76%
				D5-NITROBENZENE (SURR.STD.)	75%
				2-FLUOROBIPHENYL (SURR. STD	84%
				D10-PYRENE (SURR. STD.) .	104%
				D14-TERPHENYL (SURR. STD.)	75%

(1) - Cannot be separated from diphenylamine

Form I

Laboratory Name: MANCHESTER LAB
Case No: DOE-412

Sample Number
EBN6181W

ORGANICS ANALYSIS DATA SHEET
(Page 2)

SEMIVOLATILE COMPOUNDS

Concentration: LOW
Date Extracted/Prepared: 07/01/86
Date Analyzed: 07/17/86
Conc Factor: 4.000000
Percent Moisture: (Decanted) ____

GPC Cleanup ___ Yes _X_ No
Separatory Funnel Extraction ___ Yes
Continuous Liquid-Liquid Extraction ___ Yes

CAS Number		UG/L	CAS Number		UG/L
108-95-2	Phenol	2.5U	83-32-9	Acenaphthene	2.5U
111-44-4	bis(2-Chloroethyl)Ether .	2.5U	51-28-5	2,4-Dinitrophenol	13. U
95-57-8	2-Chlorophenol	2.5U	100-02-7	4-Nitrophenol	13. U
541-73-1	1,3-Dichlorobenzene . . .	2.5U	132-64-9	Dibenzofuran	2.5U
106-46-7	1,4-Dichlorobenzene . . .	2.5U	121-14-2	2,4-Dinitrotoluene	2.5U
100-51-6	Benzyl Alcohol	2.5U	606-20-2	2,6-Dinitrotoluene	2.5U
95-50-1	1,2-Dichlorobenzene . . .	2.5U	84-66-2	Diethylphthalate	2.5U
95-48-7	2-Methylphenol	2.5U	7005-72-3	4-Chlorophenyl-phenylether	2.5U
39638-32-9	bis(2-Chloroisopropyl)Ether	2.5U	86-73-7	Fluorene	2.5U
106-44-5	4-Methylphenol	2.5U	100-01-6	4-Nitroaniline	13. U
621-64-7	N-Nitroso-Di-n-Propylamine	2.5U	534-52-1	4,6-Dinitro-2-Methylphenol	13. U
67-72-1	Hexachloroethane	2.5U	86-30-6	N-Nitrosodiphenylamine (1)	0.72BJ
98-95-3	Nitrobenzene	2.5U	101-55-3	4-Bromophenyl-phenylether	2.5U
78-59-1	Isophorone	2.5U	118-74-1	Hexachlorobenzene	2.5U
88-75-5	2-Nitrophenol	2.5U	87-86-5	Pentachlorophenol	13. U
105-67-9	2,4-Dimethylphenol	2.5U	85-01-8	Phenanthrene	2.5U
65-85-0	Benzoic Acid	13. U	120-12-7	Anthracene	2.5U
111-91-1	bis(2-Chloroethoxy)Methane	2.5U	84-74-2	Di-n-Butylphthalate . . .	0.33BJ
120-83-2	2,4-Dichlorophenol	2.5U	206-44-0	Fluoranthene	2.5U
120-82-1	1,2,4-Trichlorobenzene . .	2.5U	129-00-0	Pyrene	2.5U
91-20-3	Naphthalene	2.5U	85-68-7	Butylbenzylphthalate . . .	2.5U
106-47-8	4-Chloroaniline	2.5U	91-94-1	3,3'-Dichlorobenzidine . .	5.0U
87-68-3	Hexachlorobutadiene . . .	2.5U	56-55-3	Benzo(a)Anthracene	2.5U
59-50-7	4-Chloro-3-Methylphenol .	2.5U	117-81-7	bis(2-Ethylhexyl)Phthalate	1.8BJ
91-57-6	2-Methylnaphthalene . . .	2.5U	218-01-9	Chrysene	2.5U
77-47-4	Hexachlorocyclopentadiene	2.5U	117-84-0	Di-n-Octyl Phthalate . . .	2.5U
88-06-2	2,4,6-Trichlorophenol . .	2.5U	205-99-2	Benzo(b)Fluoranthene . . .	2.5U
95-95-4	2,4,5-Trichlorophenol . .	13. U	207-08-9	Benzo(k)Fluoranthene . . .	2.5U
91-58-7	2-Chloronaphthalene . . .	2.5U	50-32-8	Benzo(a)Pyrene	2.5U
88-74-4	2-Nitroaniline	13. U	193-39-5	Indeno(1,2,3-cd)Pyrene . .	2.5U
131-11-3	Dimethyl Phthalate	2.5U	53-70-3	Dibenz(a,h)Anthracene . .	2.5U
208-96-8	Acenaphthylene	2.5U	191-24-2	Benzo(g,h,i)Perylene . . .	2.5U
99-09-2	3-Nitroaniline	13. U		2-FLUOROPHENOL (SURR.STD.)	103%
				D5-PHENOL (SURR.STD.) . .	76%
				D5-NITROBENZENE (SURR.STD.)	92%
				2-FLUOROBIPHENYL (SURR. STD	110%
				D10-PYRENE (SURR. STD.) .	100%
				D14-TERPHENYL (SURR. STD.)	103%

(1) - Cannot be separated from diphenylamine

Form I

TENTATIVELY IDENTIFIED COMPOUNDS

PROJECT: Dillenbaugh Creek COMPILED BY: JM Blazevich DATE: 7-28-86

LABORATORY: Manchester REVIEWED BY: ________ DATE: ________

NBA FRACTION: SAMPLE # :	267544								
CAS # NAME	1/7								
1. 575-37-1 1,7-dimethyl-naphthalene	300 J µg/L								
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									

ACID/BASE/NEUTRAL COMPOUNDS

PROJECT Pasco Land Park COMPILED BY: JM Blazevich DATE: 3-23-86

LABORATORY Manchester REVIEWED BY: [illegible] DATE: 3-24-86

	SAMPLE # :	378094	378095	378076						
	UNITS :	ug/Kg	→	→						
60.	Di-n-octyl phthalate	1400u	1400u	1600u						
61.	Benzo(b)fluoranthene	↓	↓	↓						
62.	Benso(k)fluoranthene	↓	↓	↓						
63.	Benzo(a)pyrene	↓	↓	↓						
64.	Indeno(1,2,3-cd)pyrene	↓	↓	↓						
65.	Dibenz(a,h)anthracene	↓	↓	↓						
66.	Benzo(g,h,i)perylene	↓	↓	↓						

Value — If the result is a value greater than or equal to the detection limit, report the value.

U — Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U (e.g.10U) based on necessary concentration dilution actions (This is not necessarily the instrument detection limit). The footnotes should read U: Compound was analyzed for for but not detected. The number is the minimum attainable detection limit for the sample.

J — Indicates an estimated value. The flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. (e.g. 10J)

B — This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.