SRW:jar
WP: R3-6684.doc
HP: 10/3/00
TP(D): 10/3/00
RP(F): 10/25/00-ajm

Department of Environmental Resources
Water Management Program
Northeast Regional Office

Subject: Aquatic Life Protection
NPDES # PA-0029149 Pocono Manor Inn, Ireland Hotels, Inc.
PA-0060071 Aventis/Pasteur Merieux Laboratories
PA-0040444 Pocono Mountain School District

Date: 10/2/2000
File:

To :

From: Tom Stauffer/Sherrill R. Wills
Water Pollution Biologist

At your request, benthic macroinvertebrates and 7 chemical sample(s) were collected from Swiftwater Creek on 8-9-00. A location map is attached which identifies the sampling location(s).

STATION #1 (Sample #0287749) Upstream Pocono Manor discharge

The results indicate the stream is:
X excellent macrobenthic quality - diverse and pollution sensitive.
___ average macrobenthic quality - moderately diverse and sensitive.
___ marginal macrobenthic quality - low diversity and sensitivity.
___ poor macrobenthic quality - few taxa, all tolerant.
___ no macrobenthos.
COMMENTS ON MACROBENTHIC QUALITY : A total of 22 taxa identified, 18 taxa pollution intolerant.

X excellent water quality.
___ average water quality.
___ marginal water quality.
___ poor water quality.
COMMENTS ON WATER QUALITY: Very low alkalinity (10.4 ppm $CaCO_3$) typical of streams in this region

X aquatic life should be protected at this station.
___ aquatic life should not be protected at this station.

SUBSTRATE (%): Bedrock (solid) ___; Boulders (>10 in.) 20 : Rubble (2.5 to 10 in) 20 : Gravel (0.1 to 2.5 in) 35; Sand 20; Silt 5; Detritus ___.
Stream Width: 8-10ft. Stream depth: Riffle 3-6"; Pools 18";
Pool/Riffle ration ___; Gradient ___

STREAM ENRICHMENT RISK ANALYSIS:

Alkalinity: >40mg/l (5); 20-40 mg/l (3); <20 mg/l (1)	1
Shading: <50% or >25 ft wide (5); 50-75% (3); >75% (1)	1
Velocity: <0.5 fps (3); 0.5-1.49 fps (5); 1.5-2.0 fps (3); >2.0 fps (1)	1
Scouring: <2/year (5); 2 - 5/year (3); >5/year (1)	3
Substrate: sand - silt (5); gravel - rubble (3); boulder - bedrock (1)	3
SUSCEPTIBILITY RANKING	9

FIELD MEASUREMENTS: pH 6.6; temp. 16°C; D.O. 9.6; Spec Cond 70

STATION #5 (Sample #0287744) upstream Pocono Mt. SD and Aventis discharges

The results indicate the stream is:
___ excellent macrobenthic quality - diverse and pollution sensitive.
X average macrobenthic quality - moderately diverse and sensitive.
___ marginal macrobenthic quality - low diversity and sensitivity.
___ poor macrobenthic quality - few taxa, all tolerant.
___ no macrobenthos.

COMMENTS ON MACROBENTHIC QUALITY: Still has 22 total taxa, but the number of pollution intolerant taxa decrease to 12 taxa. Still has many sensitive individuals. Change in habitat (fewer trees, channel modification, no riparian buffer) could account for some of the community.

X excellent water quality.
___ average water quality.
___ marginal water quality.
___ poor water quality.

COMMENTS ON WATER QUALITY: Low alkalinity (12 ppm $CaCO_3$), hardness of 23.19.

X aquatic life should be protected at this station.
___ aquatic life should not be protected at this station.

SUBSTRATE (%): Bedrock (solid) ___; Boulders (>10 in.) 15 : Rubble (2.5 to 10 in) 40 : Gravel (0.1 to 2.5 in) 25; Sand 15; Silt 5; Detritus ___.
Stream Width: 20-25ft. Stream depth: Riffle 6" ; Pools 18-24"+;
Pool/Riffle ration _____; Gradient _____

STREAM ENRICHMENT RISK ANALYSIS:

Alkalinity:	>40mg/l (5); 20-40 mg/l (3); <20 mg/l (1)	1
Shading:	<50% or >25 ft wide (5); 50-75% (3); >75% (1)	5
Velocity:	<0.5 fps (3); 0.5-1.49 fps (5); 1.5-2.0 fps (3); >2.0 fps (1)	1
Scouring:	<2/year (5); 2 - 5/year (3); >5/year (1)	3
Substrate:	sand - silt (5); gravel - rubble (3); boulder - bedrock (1)	3
	SUSCEPTIBILITY RANKING	13

FIELD MEASUREMENTS: pH 7.2; temp. 16.5°C D.O. 9.2; Spec Cond 105

Subject : Aquatic Life Protection
NPDES # PA County: Date:
File:

STATION #8 (Sample # 0287743) SR. 314 bridge

The results indicate the stream is:
X excellent macrobenthic quality - diverse and pollution sensitive.
___ average macrlbenthic quality - maderately diverse and sensitive.
___ marginal macrobenthic quality - low diversity and sensitivity.
___ poor macrbenthic quality - few taxa, all tolerant.
___ no macrobenthos.
COMMENTS ON MACROBENTHIC QUALITY:

X excellent water quality.
___ average water quality.
___ marginal water quality.
___ poor water quality.
COMMENTS ON WATER QUALITY: Alkalinity increases to 18.1 ppm $CaCO_3$, but is still < minimum state WQ criteria of 20.0 ppm $CaCO_3$. Low BOD (0.70 mg/L), low conc. of nutrients i.e. P or N. Metals all measured less than detection limit except Fe and Mn which is typical for stream with many swamps, bogs or marshes in its watershed and for the geology of the area.

X aquatic life shouldbe protected at this station.
___ aquatic life should not be protected at this station.

SUBSTRATE (%): Bedrock (solid) ___; Boulders (>10 in) 25 ; Rubble (2.5 to 10 in) 35 ; Gravel (0.1 to 2.5 in) 25 ; Sand 15 ; Silt ___; Detritus ___.

Stream width: 30-40 ft. Stream depth: Riffle 4" ; Pools 18-24"; Pool/ riffle ratio ___; Gradient ___.

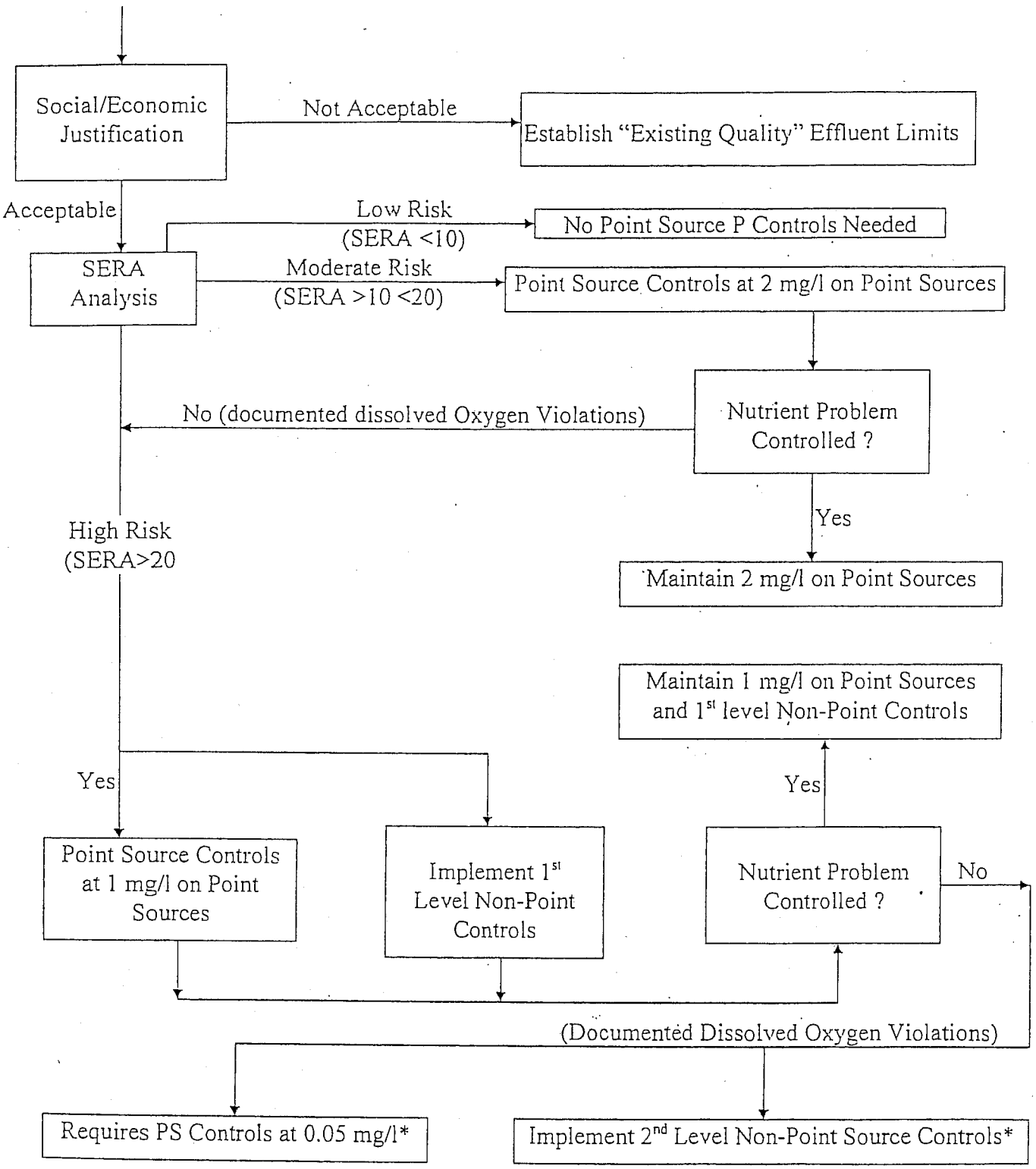
STREAM ENRICHMENT RISK ANALYSIS:

Alkalinity:	> 40 mg/l (5); 20-40 mg/l (3); < 20 mg/l (1)	1
Shading:	< 50% or > 25 ft wide (5); 50-75% (3); > 75% (1)	1
Velocity:	< 0.5 fps (3); 0.5-1.49 fps (5); 1.5-2.0 fps (3); > 2.0 fps (1)	1
Scouring:	< 2/year (5); 2-5/year (3); > 5/year (1)	1
Substrate:	sand-silt (5); gravel-rubble (3); boulder-bedrock (1)	3
	SUSCEPTIBILITY RANKING:	7

FIELD MEASUREMENT: pH 7.1 ; temp 17.0°C; D.O. 9.0 ; Spec cond 145.0

ADDITIONAL COMMENTS: Total P conc of 0.02 mg/L.

FIGURE 2: DETERMINATION OF P CONTROLS FOR HIGH QUALITY WATERSHEDS



*If nutrient problems persist after implementation, the BWC and BSWC will jointly determine what further actions will be necessary

Name of Stream: Swiftwater Creek
County: Monroe
Date: August 9, 2000

Water Chemistry Data

Parameter (mg/l unless noted)	Sta. 1	Sta. 2	Sta. 3	Sta. 4	Sta. 5	Sta. 6	Sta. 7	
Temperature (°C)	16.0	22.0	19.0	16.0	16.5*	30.0	18.0	
pH (Field)	6.6	6.4	6.8	6.6	7.2*	8.0	7.6	
Dissolved Oxygen	9.6	6.0	8.0	9.6	9.2*	7.2	8.8	
Spec. Cond.(Field)	70		190	70	105*	1600	150	
Cl Total (Field)		0.60				0.30		
Cl Free (Field)								
Flow (cfs)	5.279	0.774	3.2		6.82*	0.312	7.1	
pH (Lab)	6.3	6.3	6.7	6.3	6.3	7.9	6.4	
Spec.Cond. (Lab)								
Alkalinity (ppm $CaCO_3$)	10.4	26.0	19.6	10.4	12.0	170.0	17.0	
pH_s (Hot)								
Turbidity(NTU)								
T.O.C.								
5-Day BOD	0.60	8.4	2.4	0.60	0.60	1.5	0.60	
COD	<10.0	38.0	20.0	<10.0	<10.0	<10.0	<10.0	
P (Total)	0.01	2.44	1.73	0.02	0.02	0.17	0.02	
P (Dissolved)								
Total Solids	26.0	218.0		54.0	68.0			
Suspended Solids	<2.0	10.0	2.0	8.0	<2.0	<2.0		
Settleable Solids								
Total Dissolved Solids	26.0	208.0	196.0	46.0	68.0	776.0		
NH_3N	<0.02	1.89	0.02	<0.02	<0.02	0.07		
NO_2-N	<0.01	0.04	<0.01	<0.01	<0.01	0.02		
NO_3-N	0.24	6.19	4.43	0.28	0.36	8.20		
Total N	0.33	9.97	5.43	0.41	0.49	9.61		
Hardness (ppm$CaCO_3$)	14.8			14.4	23.19	143.32	28.75	
Ca (Total)	3.94			3.83	6.26	39.2	7.86	
Mg (Total)	1.2			1.17	1.83	11.0	2.21	
SO_4								
Cl	17.0	50.0		16.0	23.0	258.0	36.0	
F								
MBAs								
Fecal Coliforms (per 100ml)	<10	20	80	<20	20	140	<20	
Fecal Strep (per 100 ml)	120			<20	110		40	
Al_{TOT} (µg/l)	<200.0			<200.0	<200.0	617.0	<200.0	
Cu_{TOT} (µg/l)	<10.0			<10.0	14.0	<10.0	<10.0	
Fe_{TOT} (µg/l)	55.0			49.0	34.0	41.0	31.0	
Ni_{TOT} (µg/l)	<50.0			<50.0	<50.0	<50.0	<50.0	
Pb_{TOT} (µg/l)	<1.0			<1.0	<1.0	<1.0	<1.0	
Zn_{TOT} (µg/l)	<10.0			<10.0		157.0	<10.0	
Mn_{TOT} (µg/l)	17.0			17.0	10.0	26.0	10.0	
Ag_{TOT} (µg/l)								
Cd_{TOT} (µg/l)	<10.0			<10.0	<10.0	<10.0	<10.0	
$Cr + 6_{TOT}$(µg/l)	<50.0			<50.0	<50.0	<50.0	<50.0	
Hg_{TOT} (µg/l)	<1.0			<1.0	<1.0	<1.0	<1.0	

Name of Stream: Swiftwater Creek
County: Monroe
Date: August 9, 2000

Water Chemistry Data

Parameter (mg/l unless noted)	Sta. 8	Sta. 9
Temperature (°C)	17.0	19.0
pH (Field)	7.1	7.4
Dissolved Oxygen	9.0	8.6
Spec. Cond.(Field)	145.0	145
Cl Total (Field)		
Cl Free (Field)		
Flow (cfs)	8.638	15.593
pH (Lab)	6.5	6.4
Spec.Cond. (Lab)		
Alkalinity (ppm $CaCO_3$)	18.6	18.8
pH_s (Hot)		
Turbidity(NTU)		
T.O.C.		
5-Day BOD	0.70	1.5
COD	<10.0	<10.0
P (Total)	0.02	0.01
P (Dissolved)		
Total Solids	74.0	92.0
Suspended Solids	4.0	<2.0
Settleable Solids		
Total Dissolved Solids	70.0	92.0
NH_3N	<0.02	<0.02
NO_2-N	<0.01	<0.01
NO_3-N	.050	0.24
Total N	0.64	0.46
Hardness (ppm$CaCO_3$)	30.74	28.86
Ca (Total)	8.39	7.92
Mg (Total)	2.37	2.2
SO_4		
Cl	34.0	
F		
MBAs		
Fecal Coliforms (per 100ml)	<10	20
Fecal Strep (per 100 ml)	130	<10
Al_{TOT} (µg/l)	<200.0	<200.0
Cu_{TOT} (µg/l)	<10.0	<10.0
Fe_{TOT} (µg/l)	<20.0	169.0
Ni_{TOT} (µg/l)	<50.0	<50.0
Pb_{TOT} (µg/l)	<1.0	<1.0
Zn_{TOT} (µg/l)	<10.0	<10.0
Mn_{TOT} (µg/l)	<10.0	48.0
Ag_{TOT} (µg/l)		
Cd_{TOT} (µg/l)	<10.0	<10.0
$Cr + 6_{TOT}$(µg/l)	<50.0	<50.0
Hg_{TOT} (µg/l)	<1.0	<1.0

STREAM: Swiftwater Creek

DATE: August 9, 2000

ENUMERATION

TAXA	HSCO	FFG	Sta. 1	Sta. 4	Sta. 5	Sta. 5A	Sta. 7	Sta. 8	Sta. 9
TURBELLARIA	7	P						1	4
HYDRACARINA	7	P		1	6	2		1	
OLIGOCHAETA	10	CG			1	1	3	1	5
SPHAERIIDAE	8	FC							38
PHYSA	8	SC			1	1	7	2	
ANCYLIDAE	7	SC			1				
HIRUDINEA	8	P			1				
TALLAPERLA	0	SH	9						
LEUCTRA	0	SH	8	8	2			6	1
ALLOPERLA	0	CG	2	1			1	1	
CULTUS	2	P						1	
SWELTSA	0	P			7	4			
AGNETINA	2	P			1			2	
ISOPERLA	2	P	2						
MALIREKUS	2	P	3						
YUGUS	2	P					1		
PTERONARCYS	0	SH	2	2				2	
EURYLOPHELLA	4	SC					1	1	1
DRUNELLA	1	SC						1	
SERRATELLA	2	CG		1		1			
ISONYCHIA	3	CG						1	1
ARTHROPLEA	3	FC				1			
EPEORUS	0	SC							1
STENONEMA	3	SC	2	2	1			6	3
ACERPENNA	6	CG			11	1			
BAETIS	6	CG	4	15	14	8	16	12	7
PARALEPTOPHLEBIA	1	CG	2	1	1		1	4	
TRICORYTHODES	4	CG				1		1	
RHYACOPHILA	1	P	3	5			7		1
LEPIDOSTOMA	1	SH	2					1	
HYDROPSYCHE	5	FC			1	3	5	10	27
CERATOPSYCHE	5	FC			2	1			
CHEUMATOPSYCHE	6	FC	3	3	6	5	34	1	10
BRACHYCENTRUS	1	FC	7	11	5	1	11	2	
DOLOPHILODES	0	FC	6	2	11	8	38	25	
LEUCOTRICHIA	6	SC							1
GLOSSOSOMA	0	SC		1	3				
OLYCENTROPUS	6	FC	3						
YRNELLUS	8	FC		7					
YCNOPSYCHE	4	SH		1					
ARAPOYNX	5	SH		1					
IGRONIA	2	P					1	3	1
ANTHUS	5	P	1			1			
PTIOSERVUS	4	SC	1						
ROMORESIA	2	SC	1						
TENELMIS	5	SC	1						
LEPHARICERA	0	SC					1		
NTOCHA	3	CG	1		7	9	1		1
EXATOMA	2	P			1	3		1	
EDICIA	6	P		1					
PULA	4	SH	1						
EZZIA	6	P		1					
ELIFERA	6	P					1		
MULIUM	6	FC		3	1	2	22	2	1
IRONOMIDAE	6	CG	100	59	153	99	114	38	51

STREAM: Swiftwater Creek
COUNTY: Monroe
DATE: August 9, 2000

METRICS

Metric	Sta. 1	Sta. 4	Sta. 5	Sta. 5A	Sta. 7	Sta. 8	Sta. 9
Subsample size	164	125	237	152	265	126	154
No. of grids	2	8	2	6	2	4	4
Total Taxa	22	19	22	19	18	25	17
HBI*	4.35	4.70	5.21	5.20	4.77	3.66	6.28
*EPT	12	10	10	8	8	15	7
*%EPT	29.3	27.2	14.3	13.2	24.5	50.8	22.7
%Dominant	61.0	47.2	64.6	65.1	43.0	30.2	33.1
ShannonDiversity	1.76	1.98	1.58	1.53	1.90	2.39	1.91
Intolerant taxa(<6)	18	11	12	11	11	17	9
*%Mayflies	2.4	2.4	0.8	2.0	0.8	11.1	3.9

SCORING (25 Pa Code Ch.93,5/19/99)

	Reference Sta. 1	Sta. 4	Sta. 5	Sta. 5A	Sta. 7	Sta. 8	Sta. 9
Total Taxa[a]	100.00	86.4%	100.0%	86.4%	81.8%	113.6%	77.3%
*HBI Index[d]	0.00	0.35	0.86	0.85	0.42	-0.69	1.93
*EPT Index[a]	100.00	83.3%	83.3%	66.7%	66.7%	125.0%	58.3%
%Dominant[d]	0.00	-13.80	3.60	4.10	-18.00	-30.80	-27.90
%Modified mayfly[b]	0	0.0	1.6	0.4	1.6	-8.7	-1.5
Total Taxa[a]	6	6	6	6	6	6	4
*HBI Index[d]	6	6	4	4	6	6	0
*EPT Index[a]	6	6	6	4	4	6	2
%Dominant[d]	6	6	6	6	6	6	6
%Modified mayfly[b]	6	6	6	6	6	6	6
TOTAL	30	30	28	26	28	30	18
% Reference	100%	100%	93%	87%	93%	100%	60%
	NON	NON	NON	NON	NON	NON	SL

IN COMPARISON TO REFERENCE SCORE: (From EPA/440/4-89/001, pg. 6-27)

Non=Nonimpaired	>83%
SI=Slightly impaired	54-79%
Mod=Moderately impaired	21-50%
Impaired=Severely impaired	<17%

[a]=candidate/referenceX100.

[b]=reference-candidate site value

[d] candidate-reference site value

COMMONWEALTH OF PENNSYLVANIA
Department of Environmental Resources
Water Quality Management Program
Northeast Regional Office

DATE: August 3, 1992

SUBJECT: Aquatic Chemical and Biological Investigation
Swiftwater Creek
Connaught Laboratory - 6/16/92

TO: George M. Fetchko
Water Quality Management
Monitoring & Compliance Manager

THRU: Robert Bisignani
Water Quality Specialist

SL

FROM: Edward P. Kupsky 8-5-92
Water Pollution Biologist

On June 16, 1992, an aquatic chemical and biological investigation of Swiftwater Creek, Monroe County, was conducted to determine the effect of the Connaught Laboratory IW/sewage treatment plant on the stream. Assisting in the field collection of data and samples were Sherrill R. Wills, Water Pollution Biologist and Robert Bisignani, Water Quality Specialist for Monroe County. On September 15, 1991, a problem with an old chlorination system resulted in a fishkill in the stream downstream of Connaught. This system has since been abandoned and ozone is now used for effluent disinfection.

Chemical data are based on three (3) 500 ml non-composite grab samples: one left unfixed for regular chemical analysis; one fixed with 5 mls of HCL for metals analysis; and, one fixed with 5 mls H_2SO_4 for cyanide analysis. Temperatures, dissolved oxygen and pH were measured in the field.

Benthic macroinvertebrates were collected by kicking a 1 meter square area in both slow and fast riffle areas. An attempt was made to follow EPAs rapid bioassessment protocol by collecting approximately 100 organisms. However, instead of depositing the kicked material into a pan for random picking, the organisms were randomly picked from the screen itself. There was no need to randomize the areas of the screen picked since the entire collection was needed from numerous kicks to reach the 100 organism goal.

Fish were collected by electric fishing a representative section of stream approximately 50 meters in length overlapping the area at which the chemical and macrobenthic samples were collected.

Table I is a summary of the chemical data. Table II is a summary of the macrobenthic data. Table III is a summary of the fish data.

Station 1 Swiftwater Creek at Connaught Laboratories upstream of treatment plant discharge point, downstream of Pocono Mountain High School STP discharge point.

All of the measures of water quality, physiochemical, coliform, macrobenthic and fish indicated excellent quality existed at this station. The chemical data reflect typical naturally occurring conditions with low hardness and alkalinity and all of the measured heavy metals present at less than the detection level with the exceptions of aluminum and iron which are the predominant naturally occurring metals in the soils of the area. No measured parameters exceeded optimal criteria for macrobenthos or fish.

Twenty-three macrobenthic taxa were collected over one-half of which (13 taxa) were mayfly/stonefly/caddisfly species. These taxa are generally considered the most pollution sensitive.

Although only 2 taxa of fish were collected, they were the taxa representative of headwater unpolluted conditions: brown trout and mottled sculpins. The size range of the brown trout indicated that they were reproducing in the stream and the condition of the larger fish indicated that if not native to this stream, they had been present for a long period of time and had not been recently stocked.

Effluent from Connaught Laboratory Treatment Plant

The effluent was well within the permit requirements. The only measured parameters which were above aquatic life protection limits were zinc at 139.0 ug/l and copper at 52.0 ug/l. These values were in the effluent itself prior to stream dilution

Station 2 Swiftwater Creek approximately 50 meters downstream of Connaught Laboratories Treatment Plant discharge point.

This station was located at the point on the stream where the effluent from the treatment plant mixed completely with the stream water as determined by dye testing the effluent.

The chemical quality mirrored the upstream quality as dilution had dissipated any input from the treatment plant. As with the chemical quality, the macrobenthic and fish community were almost exactly similar to the ones found upstream. They were well within the degree of similarity expected in sampling biological communities.

In summary, there was no loss in the chemical and biological integrity of the stream when comparing upstream from and downstream from the discharge of the treatment plant.

Station 3 Swiftwater Creek at Route 314 Bridge.

Chemically and macrobenthically this station was similar to both upstream stations. In the fish collection, mottled sculpins were absent and a white sucker was collected. Also, most of the larger trout were stocked recently enough to allow for differention between them and native or hold over individuals. The shift to a lower stream gradient with many slow pools together with heavy stocking of trout may account for the absence of sculpins. The September 15, 1991 fishkill may also have contributed as scuplins may not yet have recolonized this far downstream from the resident upstream population.

Conclusions: Swiftwater Creek exhibited excellent chemical, coliform, macrobenthic and fish quality at the locations investigated. There was no measured depreciation of the water quality attributable to the discharge from the Connaught Laboratory Treatment Plant.

Recommendations: None.

EPK:kab

cc: R. Bisignani
Connaught Laboratory
Friends of Forest Hills Run

Table I: Physio-chemical data, Swiftwater Creek and Canaught Laboratories, Monroe Coun
6-16-92.

Parameter	Station 1	Canaught 2b	2	3
Temp (field)	11.5		12.3	14.1
Diss Oxygen (field)	11.6		10.2	9.7
pH (field)	7.49		7.04	7.71
Spec Cond	79	894	93	89
BOD 5	<0.4	1.0	<0.4	<0.4
pH (lab)	6.8	7.7	6.9	6.9
T Alk CaCO3	11	64	12	14
Tot Diss Sol	11	503	18	21
Susp Sol	11	13	14	9
Sett Sol	<0.4	<0.4	<0.4	<0.4
NH3-N	<0.02	0.04	<0.02	0.05
NO2-N	<0.004	<0.004	<0.004	<0.004
NO3-N	0.4	12.3	0.48	0.40
KJELD-N	<0.2	1.39	<0.2	<0.2
P tot	0.02	2.88	0.05	0.05
TOC	<1.0	3.2	<1.0	<1.0
CN, Free HBG. ~~mg~~/l	<1.0	18.0	<1.0	
CN, Tot	<0.001	0.019	<0.001	
Tot hardness CACO3	14	87	16	17
Cl	13	198	15	14
Cd ug/l	<0.2	0.3	<0.2	<0.2
Cr ug/l	<4.0	<4.0	<4.0	<4.0
Cu ug/l	<10.0	52.0	<10.0	<10.0
Fe ug/l	56.0	116	31	23
Pb ug/l	<4.0	<4.0	<4.0	<4.0
Mn ug/l	<10.0	<10.0	<10.0	<10.0
Ni ug/l	<25.0	<25.0	<25.0	<25.0
Zn ug/l	<10.0	139	<10.0	<10.0
Al ug/l	192.0	213	200	<135
MBAS	<0.5	<0.5	<0.5	<0.5
Mercury ug/l	<1.0	<1.0	<1.0	<1.0
Fecal Coliforms (MPN/100ml)	20	<20	20	<20
Fecal Strep (MPN/100ml)	40	<20	<20	40

Table II: Benthic macroinvertebrate enumeration, Swiftwater Creek, Monroe Co. 6-16-92

Taxa	Station Number / ≈100 organisms 1	2	3
Oligochaeta		1	1
Ephemeroptera			
Epeorus	9	12	8
Stenonema vicarium	1		
S. rubrum		1	2
S. rubromaculatum	1		
Ephemerella sp 1	32	46	14
E. sp 2	10	1	1
E. sp 3	1	6	21
E. sp 4	2	1	6
E. sp 5		1	
Baetis sp 1	8	2	5
B. sp 2	1		
B. sp 3		1	
Isonychia			1
Paraleptophlebia	10	12	
Tricoptera			
Dolophiloides	9	9	22
Hydropsyche sp 1	5	9	5
H. sp 2		1	
Rhyacophila fuscula	2	2	

Taxa	Station 1	2	3
Psilotreta		1	
Odontoceridae sp	2		
Glossosoma			3
Neophylax	1	1	2
Pycnopsyche			2
Lepidostoma	1		
Diptera			
Hexatoma			
Tipulidae sp		1	1
Blephariceta		3	
Orthocladiinae sp	1	1	
Tanypodinae sp	1		1
Thienemanniyia	1		
Paratendipes	1		1
Chironomis		1	
Odonata			
Cordulegaster		2	
Lanthus		1	
Gomphidae sp			1
Megaloptera			
Nigronia			1
Plecoptera			
Pteronarcys	3		1
Leuctra			1
Isoperla holochlora		6	9

Taxa	Station 1	2	3
Phasganophora capitata	2	1	
Mollusca			
Gastropoda			
Physa	1		2
Pelecepoda			
Sphaerium		1	
Total taxa	23	26	23
Total individuals	105	124	111
EPT	13	15	12

ble III: Fish enumeration, Swiftwater Creek, 6-16-92

Taxa / size class		Station 1	Station 2	Station 3
own trout	0-3"	1	4	11
	3-6"	6	6	
	6-9"	8	4	4
	9-12"	4	4	2
	12+"			
ottled sculpin	0-3"	10	2	
rook trout	0-3"			
	3-6"			
	6-9"		1	
	9-12"		2	
	12+"			
hite Sucker	12+"			1
Total taxa		2	3	2

INDIAN RUN UPSTREAM OF FAIRVIEW AVENUE

DATE	TIME	AIR TEMP	WATER TEMP	pH	WATER LEVEL	WATER DEPTH	LAST RAIN	WEATHER	WATER COLOR/PARTICL	ODOR	TURB-IDITY	NITRATE -N	ORTHO -P
IEW AVEN	(INDIRU01)		HARRY JOHNSTON 839-7223										
8/23/03	2:00 PM	22.2	10	5.7	ML	0.92	16-Aug	CLR	CLR	NO			0.1
9/10/03	5:15 PM	16.7	10	5.5	M	0.9	3-Sep	CLR	CLR	NO		0.8	0.1
10/9/03	5:30 PM	16.7	10	5.6	M	0.96	4-Oct	CLR	CLR	NO		0.7	0.04
11/5/03	8:45 AM	12	10	5.7	M	1.02	5-Nov	LT RN	CLR	NO		0.4	)
12/31/03	3:30 PM	4	6	5.7	MH	1.2	24-Dec	CLR	CLR	NO		0.72	)
5/10/04	7:00 PM	26	11.5	5.6	M	0.9	8-May	CLR	CLR	NONE		0.48	0.24
6/23/04	3:40 PM	22	10	5.5	ML	0.34	22-Jun	CLR	CLR	NONE		0.24	0.03
8/18/04	4:20 PM	22	12	5.8	M	0.92	18-Aug	CLR	CLR	NONE		0.7	0.03
12/5/04	1:00 PM	11	8	6.1	M	0.9	12/1/2004	CLR	clr	None		0.06	
7/26/05	6:00 PM	25	10	5.9	L	0.68	7/25/2005	CLR	CLR	NONE		0.34	0.03
9/9/05	6:10 PM	20	10	5.6	L	0.68	9/1/2005	clt	clr	none		0.38	0.3
10/7/05	5:40 PM	19	10	5.6	L	0.65	9/30/2005	clr	clr	none		0.72	0.14
11/24/05	11:30 AM	10	8	5.7	M		11/22/2005	clr	clr	NONE		0.19	0.22

V

SITE 225 - INDIAN RUN ABOVE SWIFTWATER CONFLUENCE

DATE	TIME	AIR TEMP	WATER TEMP	pH	WATER LEVEL	WATER DEPTH	LAST RAIN	WEATHER	WATER COLOR/PARTICLES	ODOR	TURB-IDITY	NITRATE -N	ORTHO -P
1/16/00		4	4.0	6.50	M		1/13/00	CLEAR	CLEAR	NONE	<1	<.02	0.3
4/16/00		17	9.0	6.80	M		4/15/00	P/CLDY	CLEAR	NONE	<1	0.1	0.1
7/9/00		20	12.0	7	M		7/2/00	CLEAR	CLEAR	NONE	<1	0.1	<.02
8/10/00		18	16.0	6.6	M		8/7/00	P/CLDY	CLEAR	NONE	<1	<.02	0.1
9/17/00		18	10.0	6.8	M		9/15/00	CLDY	CLEAR	NONE	<1	<.02	<.02
10/15/00		9	8.0	6.8	L		DROUGHT	CLDY	CLEAR	NONE		<.02	0.28
12/5/00		40	4.0	7	M	11"	11/28 SNOW	P/CLDY	CLEAR	NONE	<1	<.02	<.02
1/8/01		32	4.0	6.8	M	12"	1/05 SNOW	CLDY	CLEAR	NONE	<1	<.02	<.02
6/28/01		22	13.0	6.5	L	12"	6/21/01	CLR	CLEAR	NONE		0.2	<.02
8/29/01		28	15.0	6.9	L	5"	8/28/01	CLR	CLEAR	NONE		0.1	0.4
11/15/01		14	8.0	6.9	L	8"		CLDY	CLEAR	NONE		0.02	<.02
12/19/01		6	6.0	6.9	M		12/17/01	CLR	CLR	NONE		0.02	0.9
03/29/02		9	5.0	6.9	MH		3/20	CLR	CLR	NONE		<.02	<.02
5/23/02	9:40 AM	20	10.0	6.8	H		5/20/02	CLR	CLR	NONE		<0.02	<0.02
7/28/02	9:30 AM	24	16.0	6.7	m		7-Jul	CLR	CLR	NONE		<.02	<.02
9/25/02	8:15 AM	10	10.0	6.7	L		9/22/02	CLR	CLR	NONE		0.04	0.02
11/20/02	9:10 AM	5	7.0	6.4	H		11/18/02	CLR	CLR	NONE		0	0
12/27/02	9:40 AM	0	4.0	6.7	h		12/25/02	snow	CLR	NONE		<.02	<.02
1/9/03	7:15 AM	3	2.0	6.8	M		1.8 4" SNOW	snow	CLR			<.02	<.02
2/17/03	3:30 PM						2/17 SNOWING	SNOW					
6/11/03	5:30 PM	20.5	12.0	5.7	H		6/10/03	P/CLDY	CLR	NONE		0.02	<.02
7/24/03	12:45 PM	31	16.0	7	M		7/23/03	P/CLDY	CLR			0.01	<.02
11/3/03	9:15 AM	22	10.0	6.8	M		11/2/03	CLR	CLR	NONE		0.5	0.02
6/4/04	11:05 AM	25	11.0	6.8	M		6/2/04	CLR	CLR	NONE		0.04	0.04
8/18/04	10:50 AM	25	13.0	6.8	M		8/16/04	P CLDY	CLR	NONE		0.01	0.08
11/23/04	2:30 PM	14	7.0	6.9	M			CLDY	CLR	NONE		0.04	0.14
6/17/05	11:45 AM	21	13.0	7.2	L		6/15/05	PCLDY	CLR	NONE		0.02	0.04
7/21/05	8:30 AM	22	15.0	6.8	L		7/19/05	CLR	CLR	NONE		0.02	0.08
9/7/05	5:30 PM	23	14.0	7	VL		9/1/05	CLR	CLR	NONE		0.02	0
11/21/05	11:45 AM	14	6.0	6.8	M		11/16/05	CLDY	CLR	NONE		0.02	0.04