

WASHINGTON STATE DEPARTMENT OF ECOLOGY
ENVIRONMENTAL INVESTIGATIONS AND LABORATORY SERVICES

M E M O R A N D U M

TO: Myron Saikewicz
THROUGH: Lynn Singleton *LS*
FROM: Joe Joy *JJ* and Greg Pelletier *GP*
SUBJECT: Black Diamond and Lake Sawyer- Clarification of Our Role
in the Water Quality Assessment Project and a Proposed Project
Budget

INTRODUCTION

The intent of this memorandum is to clarify our understanding of what is expected of us for the Black Diamond/ Lake Sawyer water quality assessment project. Different staff from various sections of Ecology have attended the three recent meetings discussing this project. Over the course of these meetings, the role of the Surface Water Investigations Section (SWIS) has evolved as has the purpose and scope of the project. This memorandum is to state our understanding of the negotiated scope of the project, and how and under what conditions, SWIS can accomplish the project. We also recognize that you must see the basis on which we determined the budget and schedule for the project outlined later in the memo. That has been included here as well.

GOAL AND OBJECTIVES OF THE BLACK DIAMOND/ LAKE SAWYER PROJECT

The goal of this project is to provide the information necessary for determining the best treatment option available for Black Diamond wastewater while protecting Lake Sawyer water quality. The following three objectives were defined at the meetings to meet the goal:

- 1) Determine the impact of Black Diamond wastewater on the eutrophication of Lake Sawyer compared to other sources.
- 2) If Black Diamond wastewater has a minor role in the eutrophication of Lake Sawyer, then under what permit conditions can continued discharge be allowed to Rock Creek?
- 3) What are the existing conditions of the Black Diamond marshland treatment system, and what modifications are possible to allow its continued use?

A water quality assessment very similar to a wasteload allocation study or Phase I lake restoration study is necessary to address

the project goal and objectives 1 and 2. In fact, any study accepted by Ecology should come close to meeting Phase I lake restoration study requirements. The option will then be open to Lake Sawyer residents to pursue lake restoration money after a decision on Black Diamond is made.

There are several tasks required in a large study to address each of the objectives. A detailed scope of work outlining many of these tasks was written by Joe Joy of SWIS in 1986. It was reviewed as an appropriate level of effort for this project. It is currently being revised based on comments by Ecology staff, and will be presented again pending a decision by Ecology management to support the study in-house.

SCHEDULING AND TIME CONSTRAINTS

During the meetings held to discuss the objectives of the project, it became apparent that the project was under a severe time constraint. The grant monies for the Black Diamond wastewater system modification or replacement must be awarded by September 30, 1990. Therefore, any engineering design work and the draft environmental impact statement (DEIS) must be completed and reviewed before that date. This means the Lake Sawyer and Black Diamond water quality assessment project data must be completed and available to the design engineers and DEIS staff by May 1990. This is so the DEIS can address a preferred option based on the water quality assessment weighed against the economic assessment, and so any needed engineering design for the preferred option can be written and reviewed.

A Lake Sawyer and Black Diamond water quality assessment would ideally start in October and continue through one or more water years (October to October). In that way, the nutrient loading from the watershed to the lake could be monitored, and the resultant lake effects observed. Multiple years of collection would reveal the variability in the data. Such a study would provide a strong position from which water quality management decisions could be made, and a database from which Phase I restoration requirements would be met.

However, it is not possible to wait until the next October to begin the field data collection because of the schedule constraints discussed above. Field data should be collected in winter 1988-1989 through the 1989 growing season. Fall and winter 1989-1990 data could be used to extrapolate watershed loads for the months missed in 1988-1989, but too much of this should be avoided. A one year study beginning in winter would provide data to generally evaluate major sources of nutrient loading to the lake, and describe basic lake dynamics. It too could provide a good database on which restoration options could be assessed. Whether or not the observed data describe normal conditions is dependent upon the normalcy of the water year. In any case, the earlier in the 1988-89 nutrient loading season a study begins, the better, since there is a time after which any chance of attaining

the project objectives will be lost.

The project start date depends on the availability of funds and the number of contractual steps necessary to retain someone to perform the work. Retaining Ecology staff, like SWIS, to perform the work would probably allow the earliest start date. An interagency agreement with a university would be the next quickest, if the university professor has qualified students at hand. Hiring an outside consultant would take the longest time, requiring three to four months after the decision is made to fund the project.

It was suggested at the most recent meeting that by late summer of 1989, enough data would have been collected to address the first objective so that the DEIS and engineering focusing could begin. Rethinking this, a statement on the first objective that early could prove to be erroneous. The full impact of internal lake cycling, and seasonal changes in loading sources would not have been evaluated, and any fall 1989 watershed input data will not have been evaluated. Furthermore, an early, but wrong, assessment of Black Diamond's role in Lake Sawyer eutrophication would be unfortunate, endangering the study's credibility and wasting time on a false start. Therefore, data for the refinement of the DEIS and engineering design should not be expected until late April or early May when the draft project report would be out.

REQUIREMENTS AND BUDGET

It appears that performing this project within Ecology would be the preferred option at this time. SWIS would be the most likely group within Ecology take the technical lead on the project. Also, SWIS could perform most of the field work and write-up. We would arrange and oversee the help needed to perform the groundwater and sanitary surveys around the lake, and the laboratory analyses contract. The sample analyses must be contracted out because the load is beyond the capabilities of the Manchester Lab. As mentioned earlier, our current scope of work for the project with the suggested revisions addresses only the first two objectives. An engineering firm would have to be retained to address the third objective. As was suggested at the last meeting, perhaps your section would oversee that portion of the work, if, and when that is determined a viable option.

A rough budget was calculated to assess the cost for SWIS to undertake the first two objectives of the project over the 1.5 years required for its completion (Table 1). Items included are: the estimated laboratory, groundwater, and sanitary survey contract costs, equipment costs, the cost of additional personnel for SWIS, and SWIS lead staff costs.

The first four items in the budget are self-explanatory. They are costs for analytical services and equipment. The fifth item is the cost for a project support staff to prepare for sampling events, assist in the field, clean-up after sampling events, track

sample progress, receive and compile data, and assist the lead investigator with all aspects of the project. Besides the money, one FTE for a year and a half will need to be acquired. Item six is the lead investigator's time. It includes 0.3 FTE for managing all aspects of the project: scope refinement, negotiating and managing outside contracts, supervising and directing the support staff, evaluating data, and writing the report. An additional 0.1 FTE is included to reflect the time necessary for public involvement and interaction with the project committee and other sections of Ecology. The seventh item may have two options: the hydrogeological work can be contracted out, or we can find the expertise within Ecology from a 0.3 FTE Hydrogeologist III for one and a half years. The latter would have some monetary and time benefits, but still needs to be worked-out. Well installation, item eight, would be contracted out in either case. The sanitary survey of lakeshore homes would be contracted to the King County Health Department. They have the authority to conduct these surveys, and there was an indication they were interested in a survey anyway. At this time we don't know if they require our incentive money.

If SWIS were to obtain the money and FTEs in early January to conduct the project, the May, 1990 report completion date appears to be reasonable. Delays of this major decision past January will make the objectives less attainable, and will require a re-evaluation of what can be reasonably obtained. If the early January decision is reached, SWIS could begin setting-up contracts for the sample analyses, hydrogeological work, and health dept. services; purchasing equipment and hiring personnel. A revised scope of work would be presented to the committee of Ecology staff and others for comment and discussion. SWIS staff would be available to explain the study during presentations to the Black Diamond and Lake Sawyer communities at the start of the project and after the report is final. The SWIS lead investigator would be able to make progress presentations to the committee of Ecology, USEPA, METRO, Black Diamond, and Lake Sawyer representatives. Formal interim reports would be impractical given the accelerated and compressed schedule of the project. A formal presentation of the draft report is planned before the committee. The committee could then comment extensively on the draft, and revised draft before the final report.

In closing, we hope this gives you the information you need to get the project started. Whether SWIS performs the work or some other arrangements are made, is not our most important concern. If you choose to go with a university or a private consultant we will be glad to serve on the advisory water quality committee. Our concern is that any study conducted has clear objectives and will help to solve the short and long term problems at Black Diamond and Lake Sawyer, and that it can proceed with the support from Ecology management as soon as possible.

cc: Kim McKee, Lake Restoration Grants
Richard Koch, Northwest Regional Office

Table 1. Budget estimate for the Lake Sawyer/ Black Diamond water quality assessment study tentatively planned for February 1988 to May 1990.

BUDGET ITEMS	COST	COMMENT
1 Laboratory analysis	\$126,000	Surface & ground water samples detailed in Table 2
2 Phytoplankton and zooplankton identification	\$2,000	Samples contracted out to increase efficiency
3 Sediment Core- Pb 210 dating and phosphorus analyses	\$2,500	-----
4 Equipment & expendable goods & services	\$21,000	Equipment not currently available with SWIS detailed Table 3
5 Surface water field staff- 1 FTE for 1.5 yrs. (1.5 FTE*)	\$61,000	Environmentalist II, mid-range at 3 %, 1989 rate times 1.67 overhead
6 Lead Environmentalist III 0.4 FTE for 1.5 yrs. (0.6 FTE*)	\$28,500	0.3 FTE with SWIS to manage & conduct project & 0.1 FTE for public involvement
7 a Groundwater hydrology evaluation and sample collection	\$40,000	Contracted well log evaluation prior to well installation & well sampling
b Hydrogeologist III, 0.3 FTE for 1.5 yrs. (0.45 FTE*)	\$24,500	Perform groundwater evaluation, oversee well installation, conduct well sampling
8 Well installation	\$30,000	Approximately 20 wells constructed to meet new Ecology regulations
9 Shoreline sanitary survey	\$15,000	Seattle-King Co. Health Dept. contract possible
Travel and per diem	\$4,000	

	\$330,000	\$314,500

* Denotes total FTEs needed over the entire project period (1.5 yrs.).

Table 2. Individual parameter or survey task analytical costs for the Lake Sawyer/ Black Diamond water quality assessment.

Parameter	Unit Cost*	LAKE SURVEY	WATERSHED SURVEY	BLK. DIA SURVEY	GRNDWATER SURVEY	PRECIPAT. SAMPLES	SEDIMENT TRAPS		
pH	\$5							0	0
Chloride	\$18	240	66	70	80	12		468	8424
Turbidity	\$6							0	0
Hardness	\$9	9	18					27	243
Alkalinity	\$9	180	18					198	1782
Solids (4)	\$28	0	0	30				30	840
TSS	\$8	60	66	50				176	1408
BOD-5	\$25	60	18	70				148	3700
BOD-20	\$90		0	5				5	450
COD	\$20	60	18	70	80			228	4560
TOC	\$35	60	66	70			60	256	8960
NO2+NO3 & NH3	\$24	240	66	70	80			456	10944
Orthophosphate	\$12	240	66	70	80			528	6336
Total Phosphorus	\$12	240	66	70	80	12	60	468	5616
Total Nitrogen	\$20	240	66	70	20	12	60	468	9360
Fecal Coliform	\$18	60	66	70	80			276	4968
Enterococcus	\$22	10						10	220
Fecal Strep	\$22	60	66	70				196	4312
Oil and Grease	\$30			21				21	630
Chlorophyll	\$30	180	0					180	5400
Silica	\$15	60	18					78	1170
Iron	\$15	60	18	20				98	1470
PP Metals - Wat.	\$156							0	0
Lead 210								0	0
Volatile Organics	\$200			7				7	1400
- Sed.	\$250							0	0
Org.P Pest. - Wat.	\$200							0	0
- Sed.	\$250							0	0
Carb. Pest. - Wat.	\$200							0	0
- Sed.	\$250							0	0
Herbicides - Wat.	\$200							0	0
- Sed.	\$250							0	0
PCP/Bromacil	\$50							0	0
Grain Size	\$65							0	0
% Solids	\$8							0	0
% Lipids	\$35							0	0
								0	0
								0	0
Estimated Cost by task		\$47461	\$15906	\$21270	\$7760	\$456	\$4020	96873	0
GA/QC		\$14,238	\$4,772	\$6,381	\$2,328	\$137	\$1,206	\$29,062	0
								\$0	0
TOTAL by task		\$61,699	\$20,678	\$27,651	\$10,088	\$593	\$5,226	\$125,935	0
GRAND TOTAL	\$125,935								

* Based on 4/14/87 Lab Price List and Pers. Comm. with M. McCall on 6/30/87

Table 3. Itemized equipment list to purchase for the Lake Sawyer/ Black Diamond water quality assessment project.

ITEM	NUMBER	COST
Medium duty sediment corer	1	\$600
Inidata data loggers with pressure transducers	6	\$6000
Hydrolab submersible water quality data recording units	2	\$12000
Bottles, filters and other expendible items	--	\$2000

		\$20600

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