KLAMT

Workplan For

Water Quality Management Planning Program [Section 205(j)]

on

TOXIC SUBSTANCES DETECTION AND EARLY WARNING FOR THE RUSSIAN RIVER

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CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

A. STATEMENT OF OBJECTIVE

This project will investigate the findings of occasional low levels of formaldehyde, DDT, pentachlorophenol, and other chemicals in the Russian River through a water quality assessment program and will evaluate and recommend an early warning network for use by Russian River water purveyors serving approximately 500,000 people. The ultimate goal of this program is the development of an implementable early warning program for alerting Russian River water users of the presence of toxic substances in the Russian River. Specific objectives are:

1. the implementation of macro-reticular resin sampling methodology developed by a previous 205(j) project,

2. testing and assessment of an early warning system to detect toxic substances in the Russian River,

3. recommendations for the implementation of a toxic substances early warning network for the Russian River.

Additionally, the data gathered in this project will be used for spill response by the Regional Board and other agencies, and regulatory activities arising from illegal discharges and/or spills of toxic substances into the Russian River.

B. EXECUTIVE SUMMARY

The Russian River serves as a domestic water supply for about 500,000 people in Mendocino, Sonoma, and Marin counties. Hazardous material transport, storage, and use within the Russian River basin pose the threat of toxic substances entering the Russian River. Recent, though limited, sampling of the river has indicated the sporadic presence of formaldehyde, DDT, and pentachlorophenol in river waters. These chemicals potentially affect the beneficial uses of the Russian River, primarily as a drinking water supply.

This program will provide intensive sampling with resin columns and test a prototype early warning system. The ultimate goal is the development of an implementable early warning program for alerting water users of the presence of toxic substances in the river.

C. AGENCY ORGANIZATION

The North Coast Regional Water Quality Control Board (Regional Board) is a regulatory agency responsible for protecting the beneficial uses of groundwater and surface water within the Russian River basin and other hydrologic basins of the North Coast area. The Regional Board consists of nine members appointed by the Governor, and is served by a staff headed by an Executive Officer.

This Russian River planning project is one of several planning programs being conducted by the Regional Board. The overall project will be directed by the Regional Board Assistant Executive Officer, Benjamin D. Kor. The project manager will be Robert Klamt, with additional staff required for the effort supplied through contract student interns from a local university. Matching funds are being provided as in-kind services by the Regional Board, Sonoma County Water Agency (SCWA), and Anatec Laboratories, Inc. (Anatec). Project liaisons from the SCWA and Anatec are Robert Morrison and Edmund Smith, respectively.

D. BACKGROUND

The proposed project is within the Russian River basin, the most populated section of the North Coast region. This basin supports the largest industrial development within the region, and the quality of the Russian River and its tributaries is directly influenced by man's cultural activities.

The Russian River originates in the coastal range of Mendocino and Lake Counties and flows southwesterly through Sonoma County to the Pacific Ocean. The major surface streams include the Russian River and its East and West forks, Big Sulfur Creek, Dry Creek, Mark West Creek, Santa Rosa Creek, Laguna de Santa Rosa, and Austin Creek (Figure 1).

Precipitation in the Russian River basin occurs primarily as rainfall, with snow being deposited at the upper elevations. Valley areas receive an annual average of about 30 to 40 inches of precipitation. Average annual precipitation at higher elevations in the basin is up to 80 inches.

The high amounts of precipitation result in periodic winter flooding, with the Russian River flowing at over 40,000 cubic feet per second (cfs) during flood conditions. Many communities and associated industries are located within the floodplain of the river and its tributaries. Two major impoundments, Lake Mendocino and Lake Sonoma, reduce winter season flood severity and provide for summer flow releases at a minimum of 125 cfs at Guerneville to serve surface and near-river diversions.

The valley floor areas of the Russian River basin are alluvial deposits, with shallow groundwaters yielding high quality water for domestic uses. The shallow groundwaters are closely connected with the surface flow regime. Over much of its mainstem reach, the Russian River is alternately recharging to or receiving discharge from the shallow groundwaters of the basin.

The Russian River basin supports several important beneficial uses, the highest being its use as a drinking water supply for nearly 500,000 people. The municipal water systems provide limited, if any, off-stream storage and only minimal water treatment by chlorination. Many of these municipal diversions are Ranney collectors placed in or adjacent to the river, drawing upon the river underflow through collection systems in the alluvial gravels. There is direct hydraulic continuity with river surface flows and gfese subsurface collectors.

The river supports an anadromous fishery, and is a popular sport fishing area. Recreational uses such as swimming and boating make tourism along the river an important local industry. The river is used to irrigate and provide frost protection to thousands of acres of sensitive crops such as wine grapes, and is used as a water supply for wineries, breweries, and other industries.

The threat of uncontrolled or unknown toxic substance discharges and/or spills into the Russian River is of immense concern to the Regional Board, water purveyors, and residents of Mendocino, Sonoma, and north Marin Counties. This concern prompted the development of a workplan under the first phase of 205(j) grant funding for a program to identify potential discharge sources within the basin (NCRWQCB 1983). That program is near completion, and findings indicate that management practices on the storage, use,

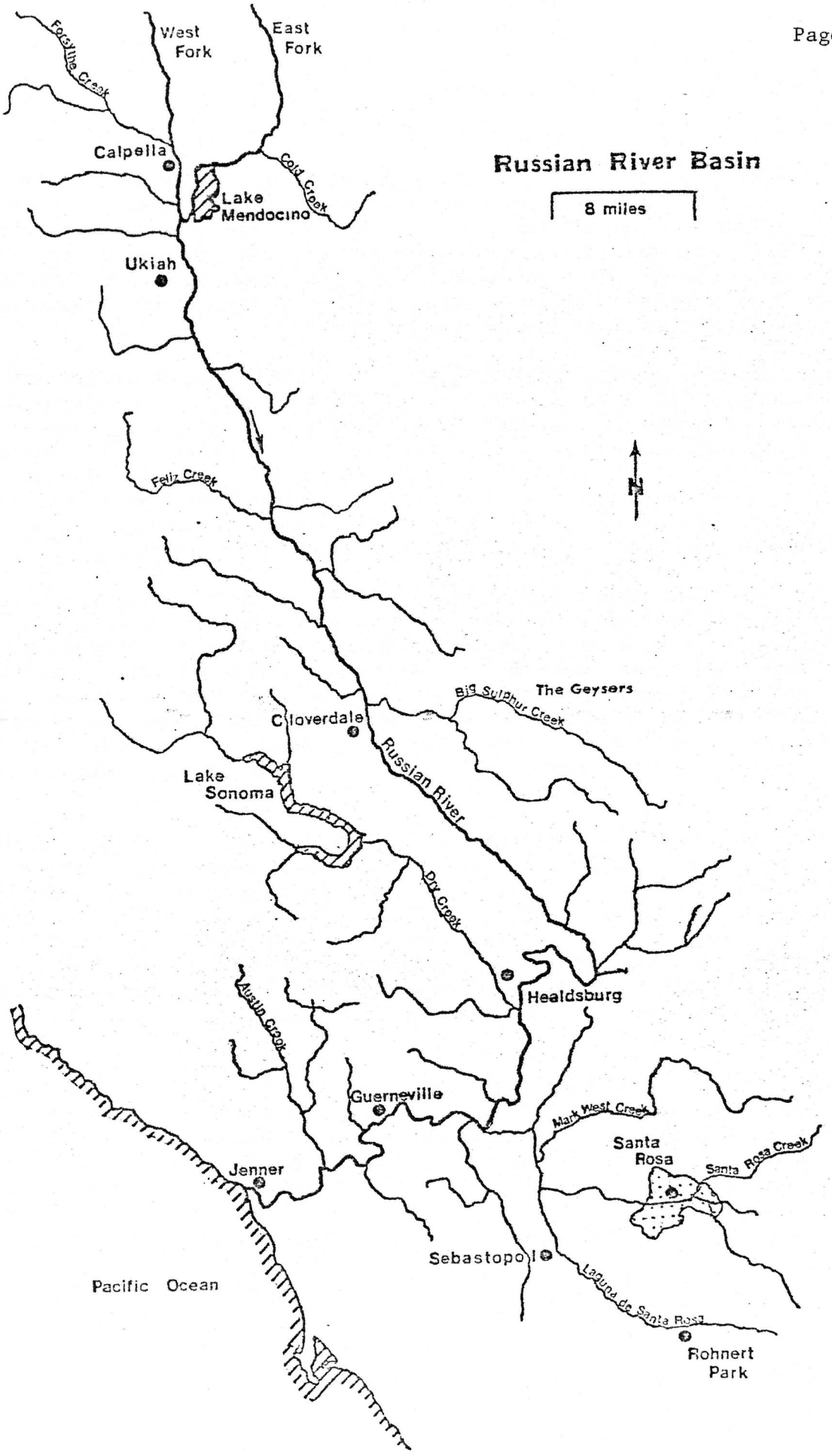

Figure 1. Russian River hydrographic basin

transport, and disposal of hazardous substances vary widely within the basin. Inspections conducted under the program have shown that many businesses utilize excellent practices and positive controls designed to prevent discharge to groundwaters or surface waters, while others have virtually no preventive measures. Some businesses inspected during the program were found to have illegal, direct discharges to surface waters or groundwater, and required regulatory action. The current 205(j) program is still underway, and is expected to conclude by November, 1985.

One element in the current 205(j) program provided for testing of sophisticated water sampling techniques at three locations along the Russian River. The objective of that effort was to determine the quality of the Russian River water using time-integrated sampling procedures, rather than the traditional grab sampling method. The University of California at Davis (UCD) and at Santa Cruz (UCSC) were contracted to develop the new monitoring equipment consisting of a concentrating medium (resin) packed into a teflon column. River water was pumped through the packed columns for various lengths of time varying from a few hours to five days, and the extracts from the resin analyzed.

Results from the UCSC resin column sampling of the Russian River showed generally very low levels of metals in the river water, with one exception (Landing and Bruland 1984). The exception was the detection of mercury in May of 1984 at 0.3 to 1.3 parts per billion (ppb). These levels were above the EPA recommended criteria for protection of fishery resources and human health (EPA 1980), but are below the State Department of Health Services (DOHS) maximum contaminant level of 2 ppb (DOHS 1977). Copper was detected near 1 ppb, but all other metals or metalloids were found at levels less than 1 ppb. Selenium, for example, ranged from 27 to 87 parts per trillion (ppt) (Landing and Bruland 1984).

Trace organic analyses were conducted by UCD (Seiber, et al. 1985). One 12-hour composite sample taken at Cook's Beach in the lower river area in October, 1983, contained 2.25 ppb DDT, 0.21 ppb DDE, and 0.013 ppb DDD, confirmed by gas chromatograph/mass spectrometry (GC/MS). Those levels were above the EPA recommended criteria for protection of fishery resources and human health (EPA 1981). Pentachlorophenol was measured at 0.06 ppb in one sample near the Wohler Bridge Ranney collectors in November, 1983, also confirmed by GC/MS. Two other samples from the same sampling period also may have contained pentachlorophenol, but that could not be confirmed (Seiber, et al. 1985).

These results indicated that discharges and/or spills had occurred, and further emphasize the need for early warning to Russian River water users in the event of river water contamination. Water supplies along the Russian River have been forced to close in the last few years due to known chemical spills, raising a greater concern among water users regarding an unknown and undetected spill. The concern is that domestic supplies may need to be closed, but the need will not be discovered until much later, when after-the-fact monitoring and reporting indicate that a contaminant was present. This possibility was illustrated by the detection of DDT and its breakdown products in October, 1983: the analysis results did not become available until nearly nine months after the sample was taken.

Monitoring systems which rely on cumbersome chemical analyses are limited by the time it takes to conduct analyses, the high cost of the continuous or repeated analyses, and the need to specify individual or classes of compounds for analysis, and as such are not

suitable for "early warning". An early warning system that uses a quick indicator, such as that proposed for development in this 205(j) project and described in Appendix A, must be designed to give an immediate indication or warning of toxic substances in the Russian River.

This project contains two concepts which meet the high priority needs of both state and local agencies concerned with the protection of domestic water uses of the river: 1) monitoring techniques that assess the quality of the river waters over extended periods of time, and 2) testing of an early warning system to alert regulatory agencies, water purveyors and users of a potential "toxics" problem in the river. Consequently, this project has received considerable support from local agencies. The attached letters of support indicate the committment by local agencies to pursue this program once it is established (Appendix B). The Board of Directors of the SCWA indicate in their Resolution DR84-1674 that it is the director's intent "...to assume responsibility for the continuing operation and maintenance of an early-warning system beyond the two-year life of the program, provided the program results in the development of a viable system which would allow for a timely warning of a toxic substance in the Russian River". In addition, the Regional Board will utilize the data obtained during the project and from any ongoing programs for appropriate regulatory activities. Techniques and methodologies will also be transferred to monitoring needs elsewhere in the Region.

E. PROJECT MANAGEMENT AND CONTROL

The Project Manager will assess expenditures and accomplishments on a monthly basis, and provide written progress reports to the Regional Board and the State Board Project Director on a quarterly basis. Those reports will also outline plans for the ensuing quarter.

The members of the North Coast Regional Water Quality Control Board (Table 1) will comprise a dual policy advisory and technical advisory committee. Quarterly reports to the Board will cover critical milestones and accomplishments for evaluation. The Board may provide any needed redirection on this project as it progresses. The makeup of the Regional Board follows Porter-Cologne Act requirements:

> 13201. (a) There is a regional board for each of the regions described in section 13200. Each board shall consist of the following nine members appointed by the Governor, each of whom shall represent and act on behalf of all the people and shall reside or have a principal place of business within the region:
>
> (1) One person associated with water supply, conservation, and production.
> (2) One person associated with irrigated agriculture.
> (3) One person associated with industrial water use.
> (4) One person associated with municipal government.
> (5) One person associated with county government.
> (6) One person from a responsible, non-governmental organization associated with recreation, fish, or wildlife.
> (7) Three persons not specifically associated with any of the forgoing categories, two of whom shall have special competence in areas related to water quality problems.
>
> 13201. (b) All persons appointed to a regional board shall be subject to Senate confirmation, but shall not be required to appear before any committee of the Senate for purposes of confirmation unless specifically requested to appear by the Senate Committee on Rules.
>
> 13201. (c) Insofar as practicable, appointments shall be made in such a manner as to result in representation on the Board from all parts of the region.
>
> 13201. (d) Notwithstanding subdivision (a), if appointments cannot be made of persons associated with county government because of the requirements of Section 13388, those appointments may be made of persons not specifically associated with any category.

An active public participation program is anticipated and is discussed in a later section of this workplan. Particular attention will be given to Regional Board workshops and consultation with concerned agencies. Program participants will regularly confer with the State Board Project Director in the review of the project's progress and obtain State Board approval for program redirection or changes. Quarterly project updates and public. participation summaries will be provided to the State Baord Program Director.

Table 1. Members of the North Coast Regional Water Quality Control Board.

Board Member	City of Residence	Appointment Expires	Representing Category
Eugene Senestraro (C)	Eureka	9/30/85	Irrig. Agriculture
Joyce Crockett (VC)	Smith River	9/18/86	Public Member
Albert Beltrami	Ukiah	9/30/88	Municipal Government
Duane Butler	Santa Rosa	9/30/85	Water Quality
Melvin C. Edlund	Eureka	9/30/87	Water Supply
James Steinhaus	Yreka	9/30/87	County Government
Zelma Long	Healdsburg	9/18/86	Indus. Water Use
Anna Sparks	Eureka	9/30/88	Rec., Fish & Wildlife
Vacancy		9/30/88	Water Quality

F. WORK DESCRIPTION

This two-year project will result in an ongoing program for surface water quality assessment in the Russian River and early warning of possible contamination of the river by toxic chemicals. The early warning system will be of value to water purveyors along the river, and to Regional Board staff and other spill response agencies who must respond to the sudden presence of toxic chemicals in the river in a rapid and appropriate fashion. The project will include close coordination with local health agencies, emergency service agencies, water purveyors, and the public in order to develop an effective and useful tool for all of the appropriate regulatory and public service agencies in the basin.

Eight main tasks have been identified for this project. These tasks will not be performed consecutively, but will overlap or parallel other tasks (see time-lines in Table 5). The entire project is diagrammed in Figure 2, and detailed effort and cost allocations are provided in Table 2.

TASK 1. IDENTIFY EARLY WARNING STATIONS

Objective: The objective of this task is to determine key river sites that could serve as early warning stations for major drinking water diversions along the entire Russian River.

Work Description: This task requires location and mapping of the known river diversions. Individual diversions will not be mapped due to the expected difficulty in locating and identifying such diversions, but the major areas where individual supplies are located will be described and mapped.

Early warning stations must be located upstream of diversions to allow for true "early warning", as it often takes several hours or days for water supplies to shut down and avoid intake of contamination into the cone of depression (Morrison, 1985). Estimates would be made on the time of travel of river water under low-flow and high-flow conditions from upstream sites to several downstream sites including the identified diversion points. In addition, these stations must be located downstream of the most likely sources of contamination. In the Russian River basin, this may involve stations in major tributaries, as well as the main-stem of the river.

Subtask 1.1 Locate regulated drinking water supply diversions.

County and State Health Department records will be reviewed by contract student interns, as well as the results from the current Russian River 205(j) project. A map will be prepared locating each major diversion.

Subtask 1.2 Describe zones of individual supply development.

The available records for individual water right diversions will be reviewed and the information used to map areas where water supply developments exist. Locations of those areas will be field verified. All staff time will be provided through student intern contracts.

Subtask 1.3 Determine estimates of river travel times.

Estimates of travel times to diversion zones from key upstream points will be based on Russian River flow records, evaluations of releases from Coyote Dam which occurred to augment river flows and aid in flushing of residual contamination from spills (e.g., the recent Santa Rosa municipal wastewater spill), and special monitoring events, such as the 1982 formaldehyde spill. The Sonoma County Water Agency will provide matching in-kind services in the form of staff time and computer analysis of flow data to assist in the development of this information.

Subtask 1.4 Locate sites for potential construction of early warning stations.

Stations must be located upstream of diversions to allow for true "early" warning, but also downstream of the most likely sources of contamination. The sites will likely require power and telecommunication lines, and construction of permanent stations similar to the U.S.G.S. gaging stations. Contract student interns will perform this task in cooperation with SCWA, County and State Health Departments, and ineterested water purveyors.

Subtask 1.5 Prepare interim report

An interim report detailing the findings of this task and recommending potential sites for the installation of early warning stations will be presented to the Regional Board and State Board Project Director. Report preparation will the responsibility of Regional Board staff with assistance from contract student interns, and in close consultation with the County and State Health Departments, the SCWA, and other interested water purveyors.

TASK 2. SELECT PROTOTYPE STUDY SITE

Objective: The objective of this task is to select and develop the most readily useable site for the purposes of conducting the resin column sampling and testing the prototype early warning system.

Work Description: The selected site must accommodate resin column sampling equipment and the prototype early warning system. Power and telecommunication lines already exist near the Wohler Bridge Ranney collector site, and will be provided by the Sonoma County Water Agency as in-kind match for this grant. A small structure to house the resin column samplers and the prototype early warning system will be built at the site. The exact placement of the water line intake to serve the prototype EW system and the resin column apparatus is yet to be determined. The sample intake line must be engineered and installed in the river to allow for all-season sampling, and to ensure that a representative flow of the river is being sampled.

Subtask 2.1 Select study site.

Subtask 2.2 Modify site to accommodate resin column and early warning systems.

Subtask 2.3 Construct river intake line.

This task will be performed by contract student interns and matching services from the SCWA in close consultation with Anatec and Regional Board staff. The SCWA will provide the location for the site, access to and security of the site, construction of the structure to house the system and all intake lines and structures, power, and telecommunication lines.

TASK 3. RESIN COLUMN PROCEDURES AND SAMPLING

Objective: The objective of this task is to transfer the resin column prototype from University of California development to Regional Board implementation.

Work Description: The necessary laboratory design and supplies will be obtained, and protocols developed to allow for resin preparation, column packing, and resin extraction by Regional Board staff. A "clean room" will be constructed in a laboratory to accommodate the ultra-clean procedures dictated by resin-column work.

Subtask 3.1 Construct "clean-room" in SCWA laboratory.

The laboratory space and "clean room" construction will be provided by the Sonoma County Water Agency as matching in-kind services.

Subtask 3.2 Prepare resins and columns.

The resin materials, reagents, and teflon supplies will be obtained through contract assistance from the UCSC. Quality assurance procedures and checks also will be provided by UCSC. Actual resin column preparation will be done by contract student interns and SCWA matching personnel time.

Subtask 3.3 Resin column sampling.

Contract student interns will perform the resin column sampling. The SCWA will provide matching services in the form of personnel for resin extraction, with the help of contract student interns in concert with Task 4.3. Laboratory services for analysis of extracts and discrete samples will be provided through contract assistance with a local private laboratory.

Subtask 3.4 Prepare interim report

An interim report detailing the resin column methodology and quality assurance procedures for monitoring selected metals and organic chemicals will be prepared by UCSC. Sampling results will be analyzed and reported by the Regional Board staff assisted by contract student interns.

TASK 4. ASSESS EARLY WARNING SYSTEM

Objective: The objective of this task is to test the prototype early warning (EW) system under laboratory and field conditions and evaluate its performance with regard to the water quality of the river as determined by resin column and traditional sampling methods.

Work Description: The EW system is a prototype that will require intensive laboratory and field observations on the performance of the system. Part of the evaluation will entail comparisons of river quality (assessed with resin column sampling and discrete samples) and the "warning" or behavioral changes detected by the EW system. Resin column sampling will occur simultaneously with the field testing of the prototype EW system (Task 3.3). Any significant detection in the prototype EW system will trigger immediate laboratory analysis of the resins. Additional resin column monitoring will occur on a routine basis as well.

Subtask 4.1 Laboratory testing of the prototype EW system

This task will involve the establishment of prediction parameters for the detection of changes in environmental conditions in both Santa Rosa tap water and Russian River water. That necessarily includes the introduction of known quantities of selected metals and organic chemicals, and monitoring of the responses. Anatec will provide as matching services the system for testing, the laboratory facilities, and staff time for monitoring and analyzing results. Contract student interns also will be used in monitoring and analysis of results.

Subtask 4.2 Install prototype EW system.

The prototype system will be installed at the site selected and prepared in Task 2 by Anatec and the SCWA with assistance from contract student interns.

Subtask 4.3 Field test prototype EW system.

Field testing of the EW system will involve observations of the system at the remote site by Anatec personnel and contract student interns. Necessary water quality sampling and analysis will be done as part of Task 3.

Subtask 4.4 Prepare interim report

An interim report will be prepared detailing the findings on laboratory and field testing of the system by Anatec and contract student interns.

Although the majority of the effort and equipment for this task will be provided as matching services by Anatec with contract student intern help, the final testing and evaluation will be performed at the SCWA site: SCWA will be providing the site, security, power, and telecommunications.

TASK 5. DEVELOP ALARM CRITERIA

Objective: The objective of this task is to determine the criteria for issuing an alarm based on detection by the EW system.

Work Description: Regional Board staff will confer with the State Department of Health Services, County Health Departments, Sonoma County Water Agency, Anatec Laboratories, and others to develop the criteria and process for issuing any alarm. This is a key factor in the performance of an EW system. The prototype EW system may not immediately identify the toxicant triggering its warning, but will indicate that

a toxic substance is altering the behavior of the indicator organisms. Because the identity of the toxic substance may be unknown at the beginning of the warning, the closure of domestic water intakes could be a subjective judgement. During the final testing phase of the EW prototype, closures might be premature or unnecessary. This task will consider the effectiveness of the prototype EW system as one factor in the criteria, as well as the turn-around time for identification of unknown substances triggering the EW system.

Subtask 5.1 Evaluate the effectiveness of the prototype EW system in identifying classes of compounds.

The results of Task 4 will be used to evaluate the effectiveness of the EW system in detection of classes of "toxic substances," and provide guidance for "fine-tuning." Anatec will provide computer analysis of the data assisted by contract student interns, and in close communication with the SCWA, the Regional Board, County and State Health Departments, and other affected water purveyors and users.

Subtask 5.2 Develop criteria for issuing alarm.

Close coordination with the involved agencies and water users mentioned above in the consideration of the sensitivity of the EW system will result in the development of criteria for issuing an "alarm." Anatec will provide matching in-kind services with assistance from the Regional Board and SCWA. Such criteria will necessarily require revision and "fine-tuning" as further information becomes available - Task 6.

TASK 6. FORM EW IMPLEMENTATION TASK FORCE

Objective: The objective is to form a task force to develop and recommend an early warning system for toxic substances at key locations in the Russian River basin.

Work Description: The formation of a task force to implement an early warning system for the Russian River will involve coordination with the SCWA (which has indicated a committment to continue with a useful EW program), County and State Health Departments, and other affected water purveyors and users. The Regional Board staff will be a primary and major participant in the task force.

TASK 7. FINAL REPORT

Objective: The final report will identify specific implementing agencies, necessary administrative actions and coordination, implementation costs, and likely funding sources for EW implementation.

Work Description: The final report will provide recommendations on EW system alternatives, coordination among agencies and water users, and implementation of an EW system for use by the task force formed in Task 6. Major responsibility will be with the Regional Board. Contract student interns and cooperative input from SCWA, Anatec, and County and State Health Departments will provide the additional staffing and guidance needed.

TASK 8. PUBLIC PARTICIPATION

Objective: The objective of this task is to obtain timely input and suggestions from public agencies, affected entities, and interested persons.

Work Description: This program must involve cooperation with the County and State Health Departments, county emergency response officials, users of the Russian River, and other interested parties. Coordination with those entities and the State Board Project Director will occur at least quarterly throughout the life of this project. Public involvment in the decision making process will be ensured through full public disclosure of staff activities on a quarterly basis at regularly scheduled Regional Board meetings. Staff will solicit comments from the public at these meetings, and workshops and mailouts will precede any major decision process. Information obtained through public participation will guide key decisions. A summary report will be prepared following the workshops, indicating the concerns raised by the public and staff's response and incorporation of the public's concerns into the plan. Both quarterly and summary reports will be provided to the State Board Project Director.

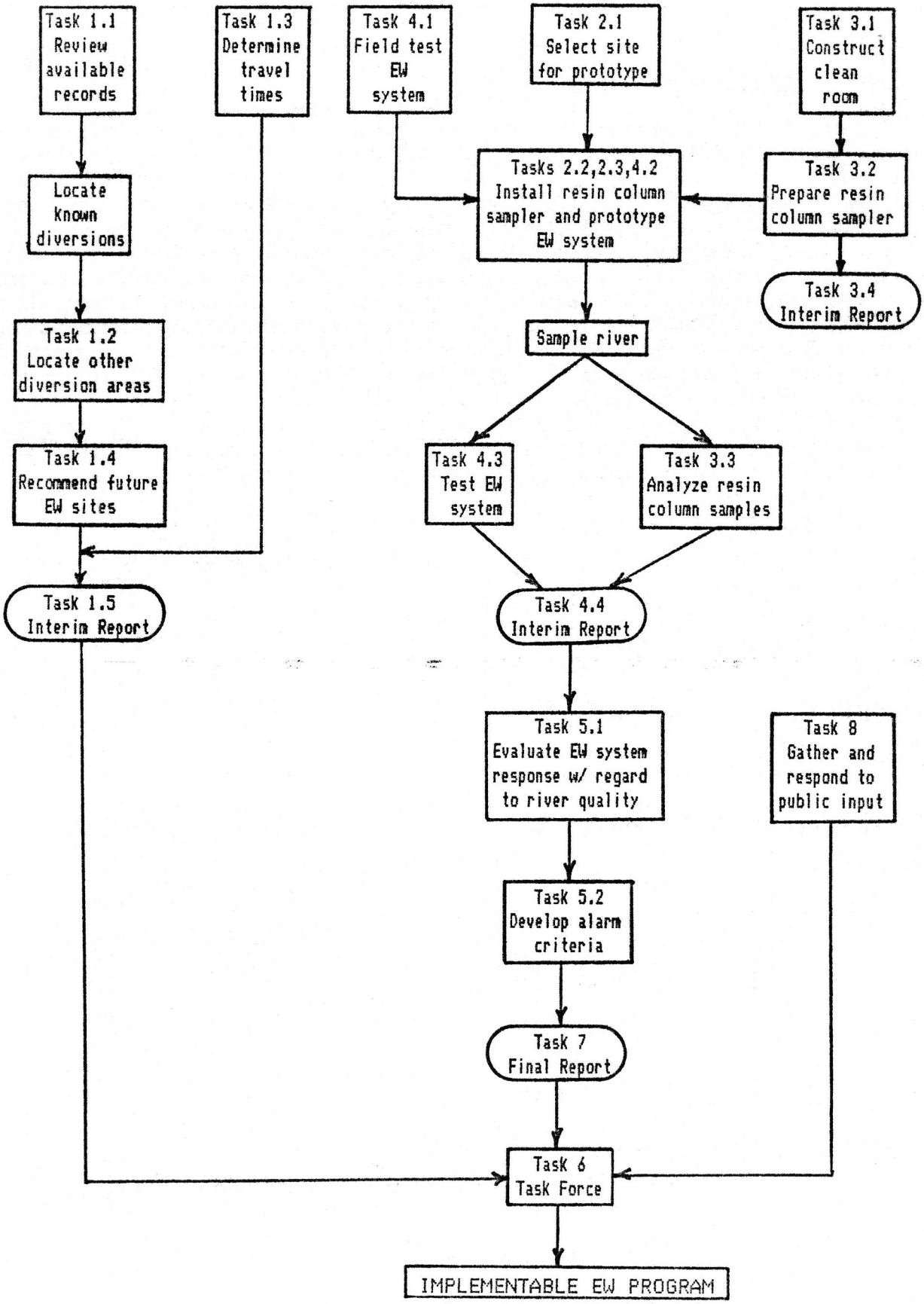

Figure 2. Flow diagram for Russian River early warning project.

Table 2. Budget allocations and task products

Task 1: IDENTIFY EARLY WARNING STATIONS

Task Description	Staff Years	Funding Sources 205(j)	Funding Sources Match	Completion Date
IDENTIFY STATIONS 1.1 locate diversions 1.2 locate zones 1.3 determine travel times 1.4 locate potential sites 1.5 interim report	*	$ 5,000	$ 640[a]	12/1/86

Task Outputs or Products: interim report detailing locations of diversions, travel times, and potential locations for future EW sites.

Task 2: SELECT PROTOTYPE STUDY SITE

Task Description	Staff Years	Funding Sources 205(j)	Funding Sources Match	Completion Date
SELECT STUDY SITE 2.1 select study site 2.2 modify site 2.3 construct intake	*	$ 3,000	$ 5,600[a] 1,000[b]	11/15/85

Task Outputs or Products: prepared study site for installation of prototype EW system and resin column monitoring.

Task 3: PREPARE RESIN COLUMN PROCEDURES

Task Description	Staff Years	Funding Sources 205(j)	Funding Sources Match	Completion Date
PREPARE RESINS 3.1 construct clean-room 3.2 prepare resin columns 3.3 extract & analyze resin samples 3.4 interim report	*	$77,000	$ 6,920[a]	7/1/87

Task Outputs or Products: interim report detailing resin column methodology and quality assurance procedures.

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* Staffing will be provided by student intern contracts.
a Funding match provided by in-kind services from the SCWA.
b Funding match provided by in-kind services from Anatec.

Table 2. Continued.

Task 4: ASSESS EARLY WARNING SYSTEM

Task Description	Staff Years	Funding Sources 205(j)	Funding Sources Match	Completion Date
ASSESS SYSTEM	*	$40,000	$ 320[a] 20,340[b]	1/1/87
4.1 lab test prototype 4.2 install prototype 4.3 field test prototype 4.4 interim report				

Task Outputs or Products: installation of prototype EW system; interim report of of EW system operation and results of resin column monitoring.

Task 5: DEVELOP ALARM CRITERIA

Task Description	Staff Years	Funding Sources 205(j)	Funding Sources Match	Completion Date
DEVELOP ALARM CRITERIA 5.1 evaluate prototype 5.2 develop criteria	*	$ 3,000	$3,600[b]	4/1/87

Task Outputs or Products: criteria for EW alarm issuance.

Task 6: FORM EW IMPLEMENTATION TASK FORCE

Task Description	Staff Years	Funding Sources 205(j)	Funding Sources Match	Completion Date
Form task force	+	$ 0	$ 0	ongoing from 11/1/86

Task outputs or Products: task force for agency coordination and to implement recommendations as described in final report.

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* Staffing will be provided by student intern contracts.
a Funding match provided by in-kind services from the SCWA.
b Funding match provided by in-kind services from Anatec.
\+ Regional Board staff will perform as part of routine functions.

Table 2. Continued.

Task 7: FINAL REPORT

Task Description	Staff Years	Funding Sources 205(j)	Funding Sources Match	Completion Date
Final report	*	$ 5,000	$ 2,552[c]	10/1/87

Task Outputs or Products: final report detailing results of study and recommending a future EW system for the Russian River.

Task 8: PUBLIC PARTICIPATION

Task Description	Staff Years	Funding Sources 205(j)	Funding Sources Match	Completion Date
Public participation	*	$ 5,000	$ 5,104[c]	10/1/87

Task Outputs or Products: quarterly reports detailing progress and response to public input.

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* staffing will be provided by student intern contracts.
c funding match provided by Water Quality Control Planning in Regional Board Budget.

G. SCHEDULE

The project will be completed over a two-year period, with the sequence and duration of major activities as estimated in Table 3. Table 4 is a tabular inventory of all expected products or outputs, with the anticipated completion dates.

Table 3. Estimated time-lines for completion of tasks.

SCOPE	FY 85-86 O N D J F M A M J J A S	FY 86-87 O N D J F M A M J J A S	FY 87-88 O N D J F M A M J J A S
Task 1: IDENTIFY STATIONS	**********		
subtask 1.1	*****		
subtask 1.2	*****		
subtask 1.3	**		
subtask 1.4	***		
subtask 1.5	***[r]***[R]		
Task 2: SELECT PROTOTYPE SITE	***		
subtask 2.1	*		
subtask 2.2	***		
subtask 2.3	*		
Task 3: PREPARE RESINS	**********	**********	
subtask 3.1	****		
subtask 3.2	**********	**********	
subtask 3.3	**********	**********	
subtask 3.4			**[r]*[R]
Task 4: ASSESS SYSTEM	**********	**********	
subtask 4.1	**********		
subtask 4.2	*		
subtask 4.3	**	**********	
subtask 4.4		**[r]*[R]	
Task 5: DEVELOP CRITERIA	**********	**********	
subtask 5.1		**********	
subtask 5.2		******[r]*[R]	
Task 6: FORM TASK FORCE		**********	**********
Task 7: FINAL REPORT			******[r]*****[R]
Task 8: PUBLIC PARTICIPATION	**********	**********	**********
QUARTERLY PROGRESS REPORTS	[R] [R] [R]	[R] [R] [R]	[R] [R]

Note: [r] = draft report, [R] = final report

Table 4. Inventory of all products/outputs with expected completion dates.

Quarterly progress reports	every quarter as indicated in Figure 3
Task 1 - interim report	draft: Oct 1, 1986 final: Dec 1, 1986
Task 2 - site setup	November 15, 1985
Task 3 - clean room interim report	December 1, 1985 draft: May 1, 1987 final: July 1, 1987
Task 4 - interim report	draft: Nov 1, 1986 final: Jan 1, 1987
Task 5 - alarm criteria	draft: February 1, 1987 final: April 1, 1987
Task 6 - task force	November 30 ,1986
Task 7 - final report	draft: June 1, 1987 final: Oct 1, 1987
Task 8 - public participation	ongoing as indicated in Figure 3.

H. BUDGET

The budget is summarized in Table 5, and assumes an October 1, 1985 start-up date. Matching is provided by SCWA and Anatec as in-kind services described following Table 5, and by the Regional Board as Water Quality Control Planning (Task 150-01) staff time.

Table 5. Russian River project budget summary.

Item	FISCAL YEAR: 1985-86	1986-87	1987-88	Total
a. Staff-years	$ 0	$ 0	$ 0	$ 0
b. Equipment	0	0	0	0
c. Supplies	0	0	0	0
d. Contracts				
C.S.U. Sonoma	17,850	29,000	0	46,850
U.C. Santa Cruz (resin columns)	36,000	6,500	0	42,500
Resin Analysis	26,650	22,000	0	48,650
e. Total direct	80,500	57,500	0	138,000
f. 25 percent match				
SCWA staff time	5,920	2,560	0	8,480
SCWA materials	5,000	0	0	5,000
Anatec staff time	13,320	10,620	0	23,940
Anatec materials	1,000	0	0	1,000
Reg. Bd. (Task No. 150-01) staff time	2,552	3,276	1,828	7,656
Total match	27,792	16,456	1,828	46,076
g. Grand Totals	$108,292	$73,956	$1,828	$184,076

Estimates of matching funds were calculated based on the following information:

SCWA - staff time at $160 per day, including overhead.
Anatec - staff time at $186 per day, excluding overhead.
Regional Board - Water Quality Control Planning (Task No. 150-01) staff time at $240 per day, including overhead.

Incidental materials included the following:

SCWA - construction materials: clean room and structure for prototype site.
piping and pumps: prototype intake line and plumbing.

Anatec - materials: probes for general physico-chemical monitoring of EW system.

H. BUDGET (revised 7/23/85)

The budget is summarized in Table 5, and assumes an October 1, 1985 start-up date. Matching is provided by SCWA and Anatec as in-kind services described following Table 5, and by the Regional Board as Water Quality Control Planning staff time.

Table 5. Russian River project budget summary.

Item	FISCAL YEAR: 1985-86	1986-87	1987-88	Total
a. Staff-years	$ 0	$ 0	$ 0	$ 0
b. Equipment	12,000	4,000	0	16,000
c. Supplies	0	0	0	0
d. Contracts				
C.S.U. Sonoma	18,130	28,665	5,488	52,283
Resin Analysis	29,500	40,000	0	69,500
e. Total direct	59,630	72,665	5,488	137,783
f. 25 percent match				
SCWA staff time	5,920	2,560	0	8,480
SCWA materials	5,000	0	0	5,000
Anatec staff time	13,320	10,620	0	23,940
Anatec materials	1,000	0	0	1,000
Reg. Bd. staff time	2,552	3,276	1,828	7,656
Total match	27,792	16,456	1,828	46,076
1. Grand Totals	$108,292	$73,956	$1,828	$184,076

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piping and pumps: prototype intake line and plumbing.

Anatec - materials: probes for general physico-chemical monitoring of EW system.

I. REFERENCES

1. Anatec Laboratories. 1983. Russian River Monitoring Study. First progress report.

2. California Department of Health Services. 1977. Title 22. California Administrative Code.

3. Environmental Protection Agency. 1980. Ambient water quality criteria for mercury.

4. Landing, W. M., and K. W. Bruland. 1984. The design and use of a flow-through, time-integrating, concentrating/sampling system for the determination of trace element concentrations and speciation in fresh waters. Draft Report. Univ. Calif., Santa Cruz. In fulfillment of Contract No. 2-121-420-0.

5. Morrison, R. 1985. Sonoma County Water Agency. Personal communication.

6. North Coast Regional Water Quality Control Board. 1983. Development of a toxic and hazardous substances control program for the Russian River basin. Section 205(j) water quality management planning program. Workplan: 33 pp.

7. Seiber, J.N., T. L. Shibamoto, M. Majewski, C. Reece, and J. E. Woodrow. 1985. Development and testing of resin column method for accumlative sampling of trace organics in river water. Final Report (Draft). Univ. Calif., Davis. In fulfillment of Contract No. 2-123-428-0.

ADDENDUM TO
SECTION 205(j) WORKPLAN ON

TOXIC SUBSTANCES DETECTION AND EARLY WARNING
FOR THE RUSSIAN RIVER

1. Quality Assurance Project Plan

A quality assurance project plan which adequately addresses the requirements of Section 30.503(f) of 40 CFR Part 30 (Federal Register: September 30, 1983) will be prepared by the Project Manager and approved by the State Water Resources Control Board prior to implementation of any sampling or monitoring activities.

2. Data Management

To the extent feasible, all water quality related data generated by this project will be submitted to the State Water Resources Control Board in a timely manner and in a format compatible with the federal STORET data management system.

3. Project Modification

The Project Manager will promptly notify the State Board's Project Officer of events or proposed changes which could affect the scope, budget or schedule of work performed under this workplan.

4. Acknowledgement of Funding Source

The following sentence shall appear in all informational documents provided by the Contractor or Project Manager to news media and the public:

> "Primary funding for this study has been provided by the California State Water Resources Control Board using Section 205(j) grant funds made available by the U.S. Environmental Protection Agency."

The following paragraph shall appear on the title page of all reports resulting from this agreement or workplan:

> "Primary funding for this study has been provided by the California State Water Resources Control Board using Section 205(j) grant funds made available by the U.S. Environmental Protection Agency. This does not signify that the contents necessarily reflect the views and policies of the U.S. Environmental Protection Agency or the California State Water Resources Control Board, nor does mention of trade names or commerical products constitute endorsement or recommendation for use."

May 28, 1985

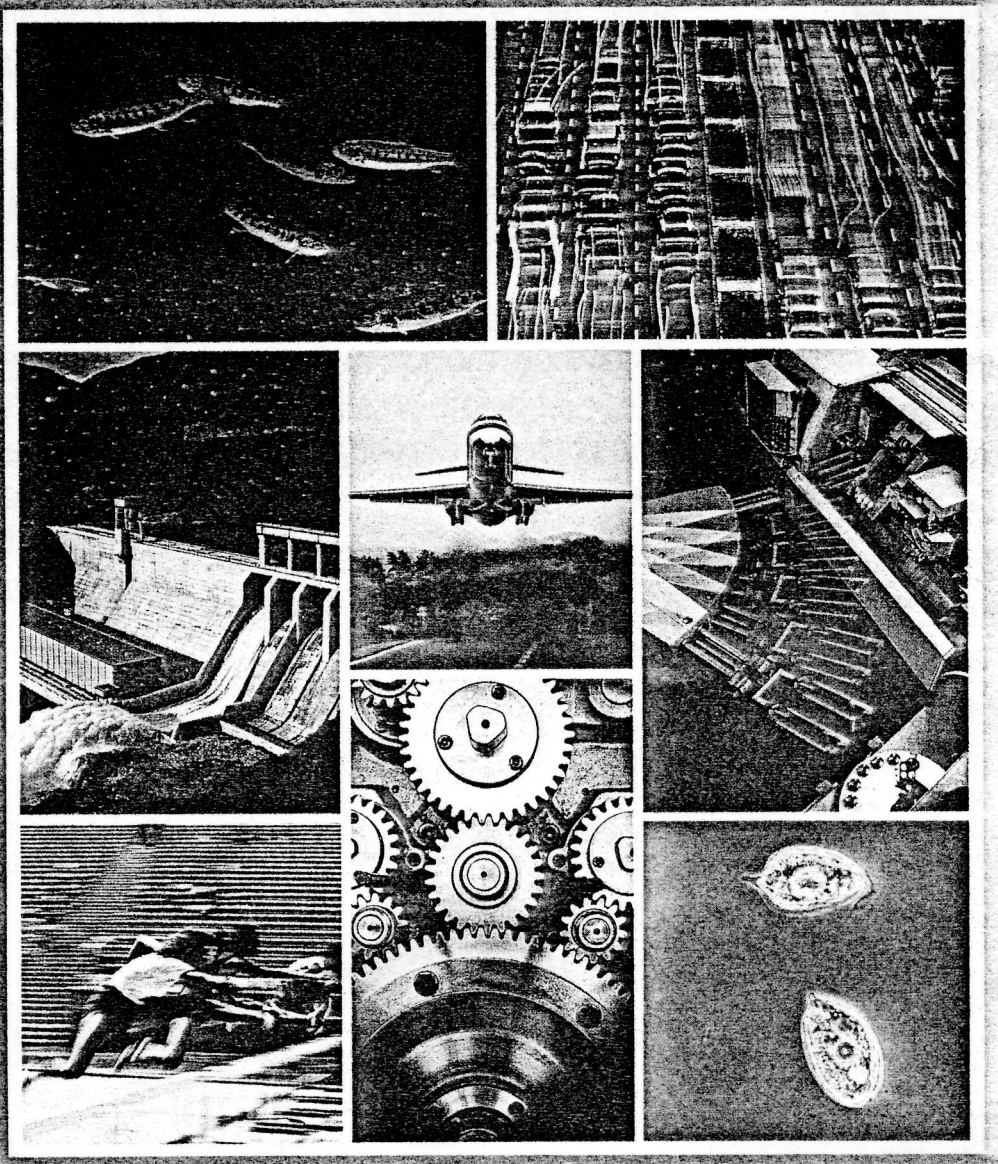
APPENDIX A

Prototype early warning system description

An automated motion analysis system (see accompanying brochure) to detect changes in movement patterns of aquatic organisms will be adapted to form the basis of the early warning system. Anatec Laboratories, Inc. has been testing such a system from Motion Analysis Corporation (MAC) for some months. Basically, a video camera linked to a computer and attendant software monitors and analyzes the movements of a group of living aquatic organisms in an flow-through chamber (or chambers). Anatec has done preliminary testing on Daphnia spp. and selected fishes. A data base of knowledge on movements derived from previous observations will be used as a baseline for "expected movements". Changes from expected movement patterns will be compared to environmental conditions, including typical physico-chemical conditions and a variety of toxic substances at sublethal concentrations (Tasks 4.1 and 4.3). Those substances will be injected into the observation chambers, and include selected heavy metals and organic compounds as determined through consultation with water purveyors and users, County and State Health Departments, the Regional Board, and County Agricultural Commissioners. Criteria will be developed from the baseline knowledge and tests with toxic substances for the generation of a warning message when the organisms' observed movements do not correspond to the prediction parameters (Tasks 5.1 and 5.2).

ExpertVision

Automated Motion Analysis System



A Tool to Capture and Analyze A World in Motion

MotionAnalysis Corporation

Now get all the data you need about moving objects—quickly, accurately and affordably.

Now there's a better way to analyze motion—an efficient alternative to cumbersome, often imprecise, frame-by-frame or intrusive methods. ExpertVision.™

ExpertVision is a complete, integrated system for analyzing all types of movement . . . on all kinds of subjects . . . in most every situation.

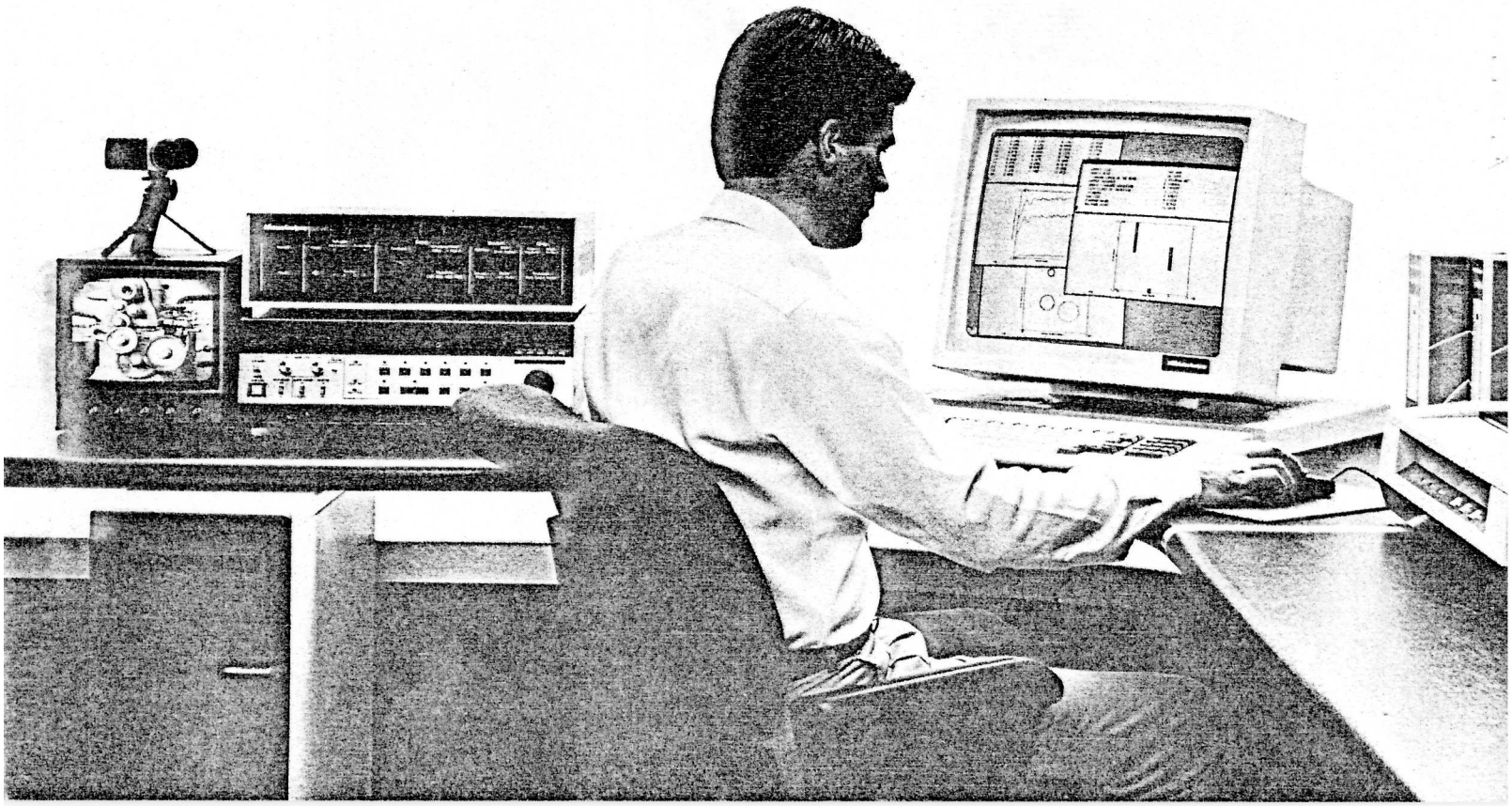
ExpertVision automates every step of your motion studies—from data capture to digitizing, from analysis to reporting. So you have answers in minutes, not weeks or months.

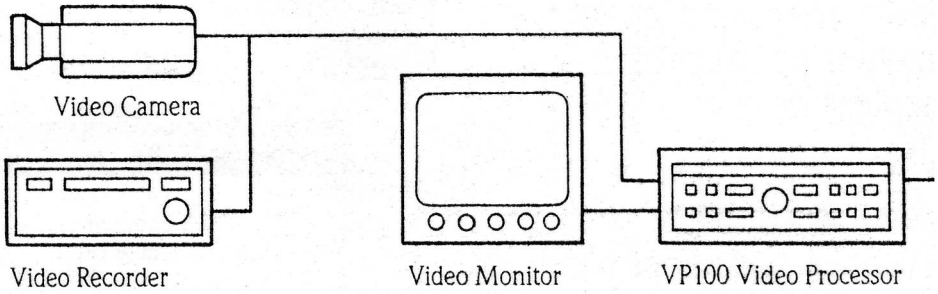
You get more information about more motion variables than ever before possible. And with more speed, precision and ease.

A unique package of advanced capabilities.

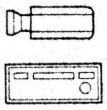
The combined capabilities, versatility and power of ExpertVision are totally unique. No other system does so much to enhance your investigations of movement.

▶ A complete, fully integrated system of hardware and software, it takes you from data capture through printed output without interruption.





1. Image Capture



Video equipment is used for simplified recording of a wide choice of subjects.

ExpertVision requires only standard video tape equipment and procedures to record moving objects. Images can enter the system from either a video-recorder or directly (live) from the video camera.

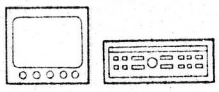
The use of video technology adds speed and economy to the process.

▶ A wide variety of subjects from micro to macro in size can be analyzed in a wide variety of locations.

▶ Numerous camera options are available to support diverse lenses, color and illumination conditions and frame rates, including high speed.

▶ Original data can be preserved on videocassette for convenient storage, editing and redisplay.

2. Image Processing



The VP100 eliminates irrelevant information from the video image and extracts only the relevant data necessary to analyze the motion.

Real-time Image Enhancement: Unlike other systems, only the digitized outlines of the objects under study enter the ExpertVision system (rather than pixel-by-pixel copies of an entire subject or scene.)

The VP100, used in combination with the TV monitor, assures that the moving images will be clear and free of ambiguities.

Both before and during recording sessions, you can observe your moving subjects in outline form.

You can quickly identify and correct problems in lighting and background clutter before processing.

Filtering, threshold and image mode control functions also help improve the image along with built-in hardware edge detection and enhancement.

For complete repeatability of measurements, filter settings and other adjustments may be recorded and easily reset into the system. User-selected software parameters are automatically stored as a disk file.

Image Conversion and Storage: The digitized video records are quickly entered on disks at the workstation keyboard.

Because only the essential X- and Y- coordinates outlining the objects under study go into processing, the system requires far less storage than conventional video-to-digital convertors.

Other experimental data (such as temperature, lighting changes, etc.) may be embedded in the video data at this time. Four independent Event Markers automatically record this input with each digitized video page.

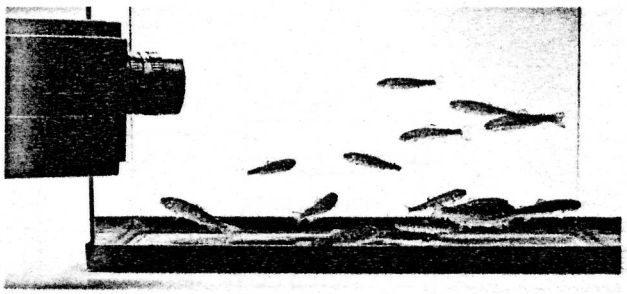
...tal dware and software system for motion analysis.

▶ A versatile system, it easily accommodates multiple subjects, in regular or chaotic motion, for micro or macro applications.

▶ A flexible system, it performs simple or extensive statistical operations with ease. Plus it gives you programmability and as much or as little interaction as you need.

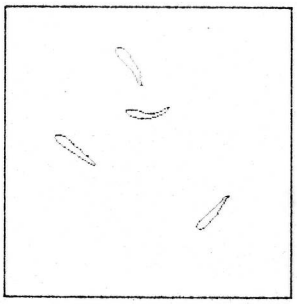
▶ A fast system, it works many times quicker than manual or semi-manual techniques, with far more precision and repeatability.

▶ A practical system, it suits a wide range of tasks including prototype testing, experimental design, product development and long-term monitoring.

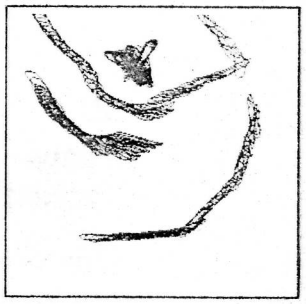


Videotaping Rainbow Trout

Image Capture:
Video equipment records the moving images. Multiple subjects, random movement and long sequences can be easily managed by the system.

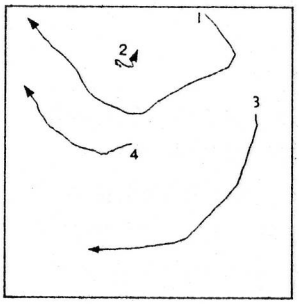


Digital Outlines of Rainbow Trout

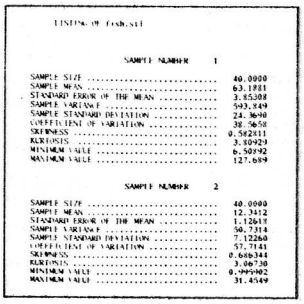


Digital Outlines Over Time and Space

Image Processing:
Real-time image enhancement lets you view the images in outline form, just as the computer will receive them. Outlines of the objects on sequential frames are plotted over time and space.

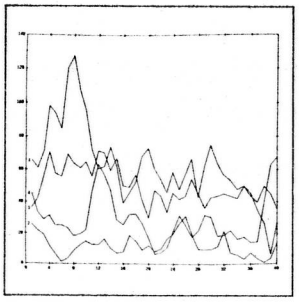


Paths Calculated from Centroids

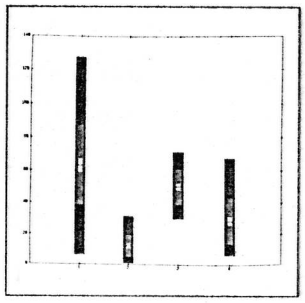


Summary Statistics

Statistical Analysis of Motion:
Paths are generated and sophisticated calculations are performed quickly with powerful, but easy-to-use motion analysis software. Data can be compiled into cumulative data bases for further study.

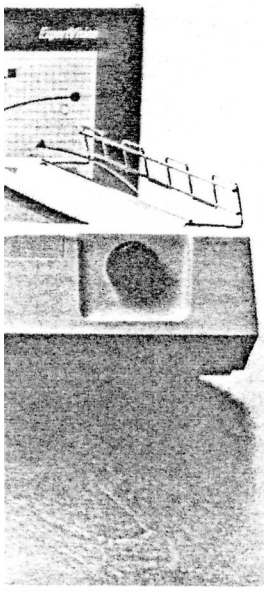


Linear Velocity vs. Time



Statistical Display of Linear Velocities

Graphic and Tabulated Results:
Results are displayed in a wide choice of formats at the graphics workstation. A mouse/menu editor simplifies interaction with the data.

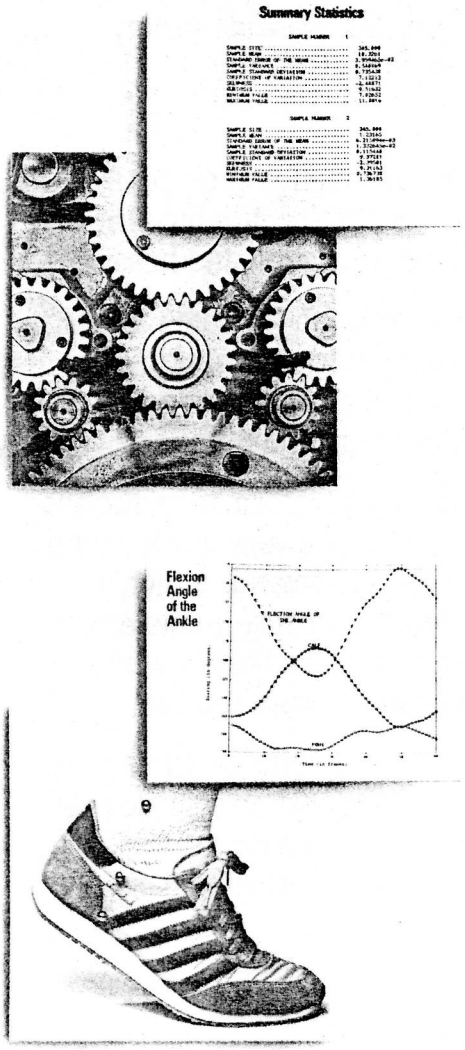


A remarkably fast and efficient system.

ExpertVision allows you to perform complete and accurate motion studies many times faster than with manual systems.

▶ Hardware and software are interactive and completely dedicated to motion analysis.

▶ Non-intrusive data capture eliminates the need for time-consuming physical attachments (and won't affect the motion being studied).

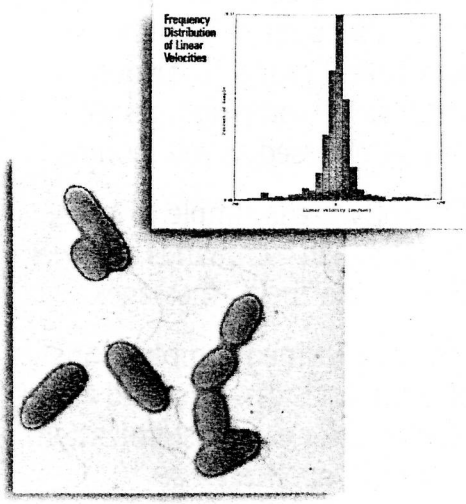


▶ Automatic conversion of video-taped images into computer-usable data eliminates tedious frame-by-frame manipulation or manual digitizing.

Suited to a wide choice of subjects.

Unlike other systems, ExpertVision is useful in most situations where motion is a factor.

▶ All sizes of objects and organisms can be studied from large mechanical devices to microscopic particles (as small as one pixel). Extensive camera options accommodate specialized applications.

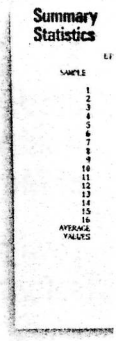


Movements of high speed machinery, long-distance runners, and microscopic organisms can be studied with equal ease. Results as varied as linear velocities, flexion angles and frequency distributions are easily computed.

▶ Large numbers of randomly moving objects can be tracked simultaneously over long periods of time.

▶ Images can be captured both on-site and in remote locations using the portable video camera, VCR and video processor.

Highly versatile in its operation.



ExpertVision also provides extensive options in analysis and output.

▶ A wide variety of motion variables can be easily computed, charted and studied.

▶ Data can be compared, revised, added to the results of other studies and retrieved for future processing.

▶ For routine tasks, the system can be programmed to work automatically.

▶ For exploratory work or complex studies, you can interact with the system to adjust the parameters of the experiment.

▶ The workstation supports a wide variety of visual formats, including annotated graphics.

▶ The system combines the flexibility of command orientation with the ease of mouse/menu interactions.

MotionAnalysis™

John Greaves, PhD
Director
Engineering

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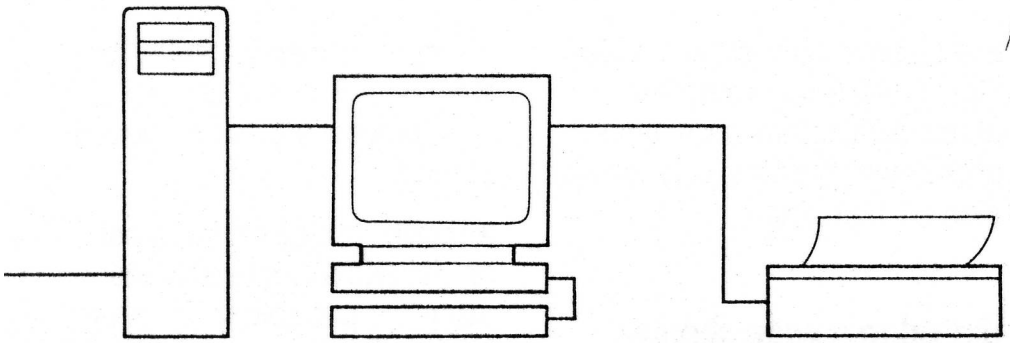
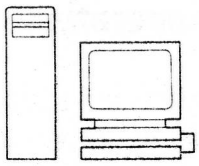


CPU, Disk and Tape Graphics Workstation Printer/Plotter

3. Statistical Analysis of Motion



Powerful but easy-to-use software permits extensive manipulation of raw data, plus creation of cumulative data bases.

ExpertVision motion analysis software allows the raw data to be manipulated into meaningful numeric information.

Generally, the first step done by the system is to reduce the video data outlines to position-related centroids, then connect these into time-space paths.

The path trajectory provides a basis for calculating motion variables such as velocities, acceleration, orientation, displacement, range and bearing, and rate of change of direction.

Statistical software. The software is a powerful tool for high level data reduction. Simple or extensive data can be extracted.

In addition to the analysis of parameters of motion, the statistical package includes an extensive set of mathematical operations.

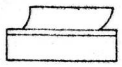
Interactive editing functions such as joining and merging help you fine-tune the data. Raw, processed or summary data can be compiled into a cumulative data base. Results of various tests can be compared, revised and reprocessed as you require.

The software is simple to learn, with English commands and over 100 on-line "help" messages.

User-determined combinations of commands can be stored as programs for easy customization of specific applications.

Precise program functions assure repeatability and accuracy of analysis.

4. Graphic and Tabulated Results



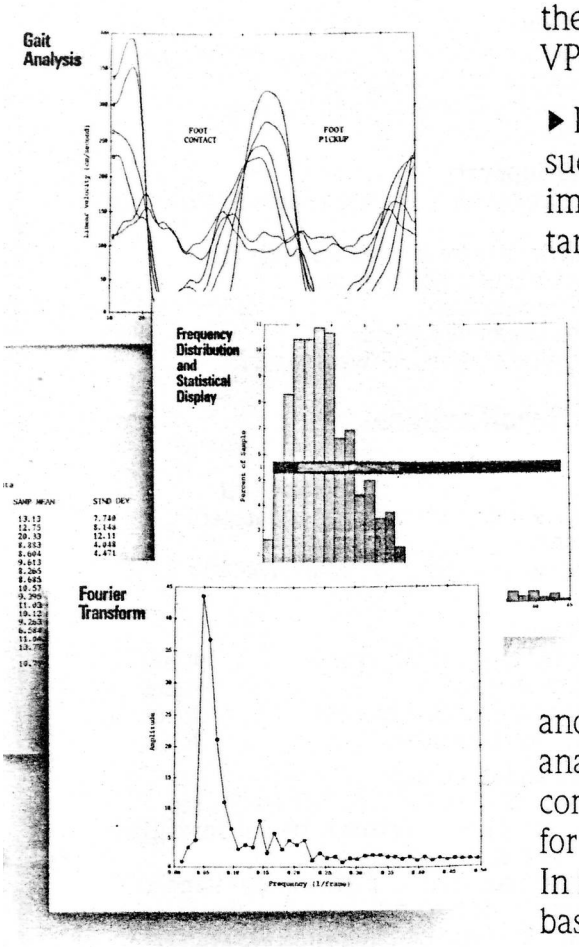
Results can be quickly displayed, manipulated and printed in a wide variety of formats.

The workstation provides fast, high-resolution graphic summaries of motion and behavior.

In addition to tabulated results, formats range from simple line and dot displays to complex graphic representations.

Simple and informative displays are generated very quickly with a single command. A highly interactive mouse/menu editor lets you interact easily with the raw or processed data.

You can combine multiple plots, charts and text on a single page. Anything seen on the CRT display can be reproduced exactly in hard copy.



At the graphics workstation, motion analysis software transforms results into a wide variety of visual formats.

Engineered to manage large amounts of information accurately.

ExpertVision allows greater amounts of data to be captured and analyzed than ever before possible—with a higher degree of precision.

This means you can now create data bases of sufficient size to establish meaningful, useful standards.

▶ Extensive and complex data can be manipulated with minimum computer storage due to the unique operation of the VP100 video processor.

▶ Difficult movement studies such as chaotic motion, multiple images (up to 200 or more simultaneously) and long sequences can be accomodated easily.

▶ High resolution image capture (even of fast-moving objects) provides stable, precise data and repeatable results.

Designed for simplicity.

The system is easy to use and follows familiar steps for analyzing motion. Only minimal computer background is required for even complex operations. In fact, new users can master basic procedures in a day.

▶ Real-time image enhancement eliminates needless repetition of testing by assuring that only high quality data goes into processing.

▶ Frequently-used command sequences can be stored as programs—a quick way to customize the system for routine applications.

▶ The mouse streamlines scaling and setting up graphic displays.

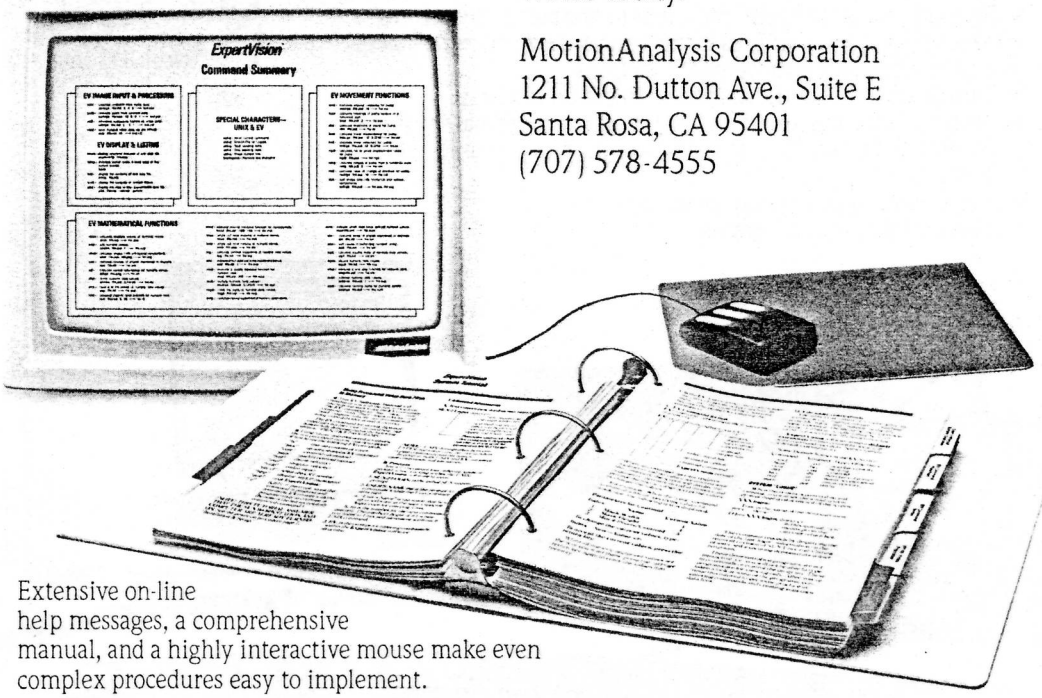
▶ Diagnostic and self-checking hardware and software simplify maintenance.

▶ Extensive user training and support programs maximize your productivity.

Let ExpertVision help improve your motion studies.

For more information and a personal demonstration of how ExpertVision can meet your specific needs, please call or write today.

MotionAnalysis Corporation
1211 No. Dutton Ave., Suite E
Santa Rosa, CA 95401
(707) 578-4555



Extensive on-line help messages, a comprehensive manual, and a highly interactive mouse make even complex procedures easy to implement.

ExpertVision Motion Analysis System Specifications

System Components

Monochrome Video Camera:
- Calibrated for ExpertVision system
- Standard RS-170/330 interface

Laboratory Video Recorder/Playback:
- Standard ½" VHS videocassette
- Forward/backward/still-frame features

Monochrome Video Monitor:
- Standard 525-line, RS-170 interface

Motion Analysis VP-100 Video Processor:
- Wide range of frame rate selections from 60 frames/sec.to 0.01 frames/sec. in convenient steps
- Accommodates video input from optional high-speed video capture-playback systems
- Single to quad-edge real-time edge detector
- Filtering of non-uniform or noisy images
- Operator can view original or processed video outlines
- Built-in event markers for synchronizing external events with video sequences

Sun-2/120™ Graphics Workstation:
- UNIX™ bsd 4.2 operating system
- 42 megabyte disk
- 1 megabyte physical memory, 16 megabyte virtual memory
- Streaming tape cartridge for data storage
- High-resolution, high-performance graphics
- Optical mouse

Dot Matrix Printer/Plotter:
- Used for listings, reports and screen-dump graphics
- Heavy-duty, laboratory quality

ExpertVision System Software:
Complete tool-kit: full functionality for a broad range of applications in motion capture and analysis
- Combines image processing front-end with signal processing back-end
- Extensive list of input, editing, maintenance, image processing, kinetic movement, math, statistical, histogram and display commands
- Translational and angular movement variables and statistics
- Generalized data structures to track and analyze multiple objects
- Absolute or relative movement functions
- Fourier and inverse transforms with digital filtering
- Simple calibration for scaling to real-world coordinate systems
- Generalized interactive path editor with mouse/menu commands
- Command sequences may be stored and executed as user programs

Software Environment:
- High-speed UNIX device driver for VP-100 Video Processor
- Runs as an application program under UNIX
- Written in Fortran-77 and C programming languages
- Open systems software architecture

Documentation and Support:
- User's Manual with complete instructions, tutorials and examples
- Reference Manual with a more detailed presentation of the ExpertVision commmands and their uses
- Quick-Reference Command Card
- System programmers' Reference Manual
- Customer training, hardware and software support

General System Specifications

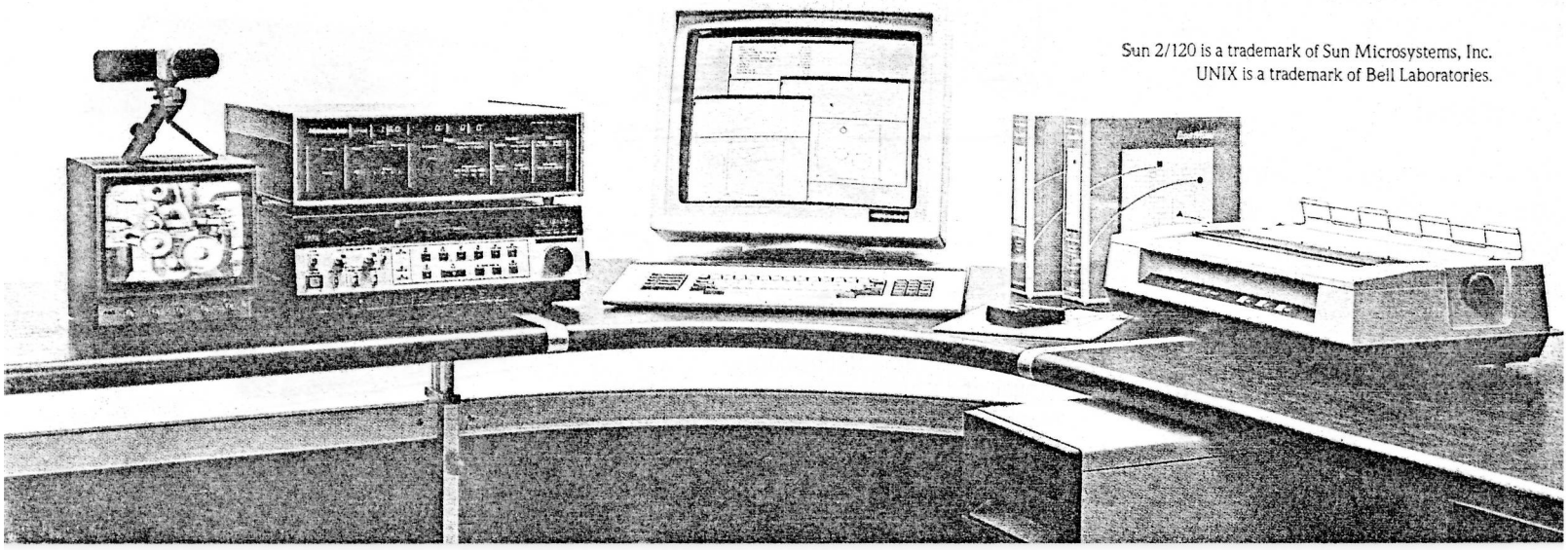
System Capacity:
- 10 megabytes of user file storage space implies about 20,000 frames of outline video data or 6 min. of data recorded at 60 frames per second
- Maximum data file size = 2 megabytes or about 6000 typical records or frames

Typical Analysis Times:
- Object recognition and centroid calculations . . . . . 140 sec.
- Path trajectory calculcations . . . . . 90 sec.
- Calculations of kinetic variables from paths . . . . . 10 sec.
- Calculations of statistical parameters . . . . . 10 sec.

Resolution, Stability and Accuracy:
- Raw video resolution: 256 H X 240 V, 60 field-frames/sec.
- Stability of non-moving objects: 0.1 pixels = standard deviation of centroid position of a non-moving object
- Stability of speed measurements: 0.1 pixel/frame = standard deviation of a constant speed object moving in two-dimensions
- Accuracy of angular movement measurements: 0.3 degrees/frame = Standard deviation of constant angular speed object moving in two-dimensions
- Accuracy of speed measurements: 0.1 pixels/frame = standard deviation of centroid position of object moving in two-dimensions

Environmental:
- Temperature: 5-40 degrees Celsius
- Humidity: 5%-80%, non-condensing
- Electrical: 117 VAC, 15-20 amp service

MotionAnalysis™
1211 North Dutton Avenue, Suite E
Santa Rosa, California 95401
(707) 578-4555



APPENDIX B

Letters of support for and committment to the proposed Russian River project.

MotionAnalysis

02 MAY 85

Dr. David Joseph
Executive Director
California Water Quality Control Board,
North Coast Region
1000 Coddingtown Center
Santa Rosa, CA 95401

Dear Dr. Joseph:

This joint letter from Motion Analysis Corporation and ANATEC Laboratories stipulates our joint commitment to the Early Warning System development project.

Motion Analysis Corporation has contracted with ANATEC Laboratories to conduct research and development work on the Early Warning System for the Russian River. Both firms are very interested in the project and will be supplying state-of-the-art computer hardware and software to the project. The level of effort and cost estimates that accompany this letter are an indication of the two firms' commitment.

If you have any questions on our participation in the project, please do not hesitate to call us.

Sincerely yours,

for Motion Analysis Corporation

for ANATEC Laboratories, Inc.

/hs
Enc.

ANATEC LABOR COSTS ESTIMATED FOR THE PROJECT (Per Month)

Personnel Category	Est. Hrs.	Rate/Hr.	Est. Cost
Project Manager	64	$ 25	$ 1,600
Senior Biologist	80	16	1,280
Biologist	112	11	1,232
			$ 4,112
Overhead		$ 4112 x 1.57	6,332
		TOTAL PER MONTH	$10,444

The total figure does not include equipment costs nor staff time committed to the project from Motion Analysis Corporation.

SONOMA COUNTY WATER AGENCY

DATE: August 17, 1984

FILE: 43-4&5-1

California Regional Water Quality Control Board
North Coast Region
1000 Coddingtown Center
Santa Rosa, CA 95401

Attention: Dr. David Joseph
Executive Officer

Dear Dr. Joseph:

In 1981 the Sonoma County Water Agency commissioned a study by CH2M-HILL to investigate the state of existing technology for continuously monitoring the water quality of the Russian River. At that time the scientists at CH2M-HILL did not locate a single system in existence or previous use which had the necessary capabilities although they indicated the technology existed to fabricate a remote automatic polyfunctional chemical and physical monitoring station. Unfortunately cost and reliability considerations made it impractical to develop and install such a unit on the Russian River at that time.

The Agency's concern about the quality of the Russian River was not diminished. On January 23, 1983, the Agency commissioned a one-year study of the water quality of the Russian River. The purpose of this study was to determine the prevalence and concentration of the chemical substances used by agriculture and industry in the Russian River Basin. While the study indicated a general absence of persistent, detectable concentrations of many of the potential organic and metallic contaminants considered, industrial chemicals were on occasion detected. The primary weakness of this study was the use of grab samples rather than continuous sampling.

There is continuing and probably escalating development and industrialization in the Russian River Basin. There is also an increasing demand on the Russian River for consumptive uses. These factors bid ill for the future quality of the Russian River unless critical monitoring and control of water quality is exercised.

P.O. BOX 11505 • SANTA ROSA, CA 95406-1505 • 2425 CLEVELAND AVENUE • SANTA ROSA, CA 95401-2991 • 1(707) 526-5370

As outlined above the Agency has demonstrated with substantial expenditures of funds its concerns regarding the quality of the waters of the Russian River. The Agency strongly supports the proposed workplan of the North Coast Regional Water Quality Control Board for a water quality management planning program on toxic subtances detection and early warning for the Russian River. The Agency will vigorously support an allocation of Section 205(j) funds for the workplan before the State Water Resources Control Board.

We sincerely appreciate your past and continuing efforts in response to our continuing concerns regarding the water quality of the Russian River.

Sincerely yours,

Robert F. Beach

Robert F. Beach
General Manager

WATER ADVISORY COMMITTEE-
TO THE
SONOMA COUNTY WATER AGENCY
P. O. Box 146
Novato, California 94948

August 17, 1984

Dr. David C. Joseph, Executive Director
California Regional Water Quality Control Board
North Coast Region
1000 Coddingtown Center
Santa Rosa, California 95401

Dear Dr. Joseph:

I have recently learned of your proposal to obtain funding for a Toxic Substance Detection and Early Warning Program for the Russian River.

The Russian River is the potable source water for over 300,000 people. Experience has shown the river is vulnerable to sporadic contamination by various toxic chemicals. An early warning system that would provide the critical response time necessary to protect public health has long been advocated by the water utilities dependent on the Russian River.

On behalf of the public agencies which contract with the Sonoma County Water Agency for water supply, may I express my complete support for your efforts to implement an early warning detection program.

Sincerely yours,

John Olaf Nelson
General Manager

JON:nm

Water Advisory Committee Members:
John Scharer, City Manager, City of Petaluma
Ron Brust, City Engineer, City of Rohnert Park
Broydon J. Riha, Director of Public Works, City of Santa Rosa
Richard L. Rowland, Director of Public Works, City of Sonoma
Paul Schabracq, City Planner, City of Cotati
Edward Pressey, General Manager, Forestville County Water District
Jerry J. Olrich, General Manager, Valley of the Moon Water District
John Olaf Nelson, General Manager, North Marin County Water District

SONOMA COUNTY WATER AGENCY

WATER QUALITY
CONTROL BOARD
REGION

SEP 6 '84

September 4, 1984

File: 43-4&5-1 RRWQ Study

California Regional Water Quality
Control Board
North Coast Region
1000 Coddingtown Center
Santa Rosa, CA 95401

Attention: Susan Warner

Enclosed is a copy of the resolution adopted by the Board of Directors of the Sonoma County Water Agency on August 28, 1984 supporting the proposal of the Regional Water Quality Control Board for Section 205(j) of the Clean Water Act funding for a Russian River Water Quality Management Planning Program.

Patricia Hanly
Executive Secretary

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THE WITHIN INSTRUMENT IS A CORRECT COPY OF THE ORIGINAL ON FILE IN THIS OFFICE.

ATTEST. AUG 28 1984

EEVE T. LEWIS, County Clerk & ex-officio Clerk of the Board of Directors of the SONOMA COUNTY WATER AGENCY

By: D. Mellon
Deputy Clerk

RESOLUTION NO. DR84-1674

County Administration Bldg.
Santa Rosa, CA

DATE August 28, 1984

WATER QUALITY CONTROL BOARD REGION 1

SEP 6 '84

☐ DJ ____ ☐ ____
☐ BK ____ ☐ ____
☐ CJ ____ ☐ ____
☐ BB ____ ☐ ____

RESOLUTION OF THE BOARD OF DIRECTORS OF THE SONOMA COUNTY WATER AGENCY SUPPORTING PROPOSAL OF REGIONAL WATER QUALITY CONTROL BOARD FOR SECTION 205(j) OF THE CLEAN WATER ACT FUNDING FOR RUSSIAN RIVER WATER QUALITY MANAGEMENT PLANNING PROGRAM

WHEREAS, The North Coast Regional Water Quality Control Board has developed a workplan proposal for a water quality management program for the Russian River to be funded under Section 205(j) of the Clean Water Act; and

WHEREAS, said water quality management program would result in an on-going program for surface water quality assessment in the Russian River and early warning of possible contamination of the river by toxic chemicals; and

WHEREAS, the maintenance of the quality of the Russian River is of the greatest importance to the three counties and several hundred thousand citizens who are dependent thereon for their water supply.

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of the Sonoma County Water Agency hereby declares its unreserved support for the workplan proposal for a water quality management program for the Russian River and urge the State Water Resources Control Board to allocate Section 205(j) of the Clean Water Act funds to finance the proposed program;

BE IT FURTHER RESOLVED that the Board of Directors hereby declares its intention to assume responsibility for the continuing operation and maintenance of an early-warning system beyond the two-year life of the program, provided the program results in the development of a viable system which will allow for a timely warning of a toxic substance in the Russian River.

DIRECTORS
RUDEE Aye ESPOSTI Aye CARPENTER Aye ADAMS Aye Dsit 2 Vacant
AYES 4 NOES 0 ABSENT 0 ABSTAIN 0

SO ORDERED.