

# Emerald Canal

DRAFT FINAL REPORT OF THE

EMERALD CANAL FEASIBILITY TASK FORCE

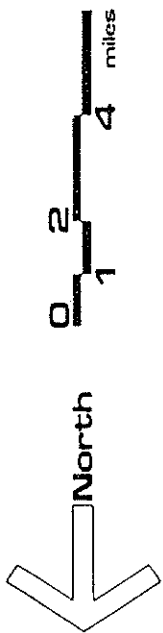
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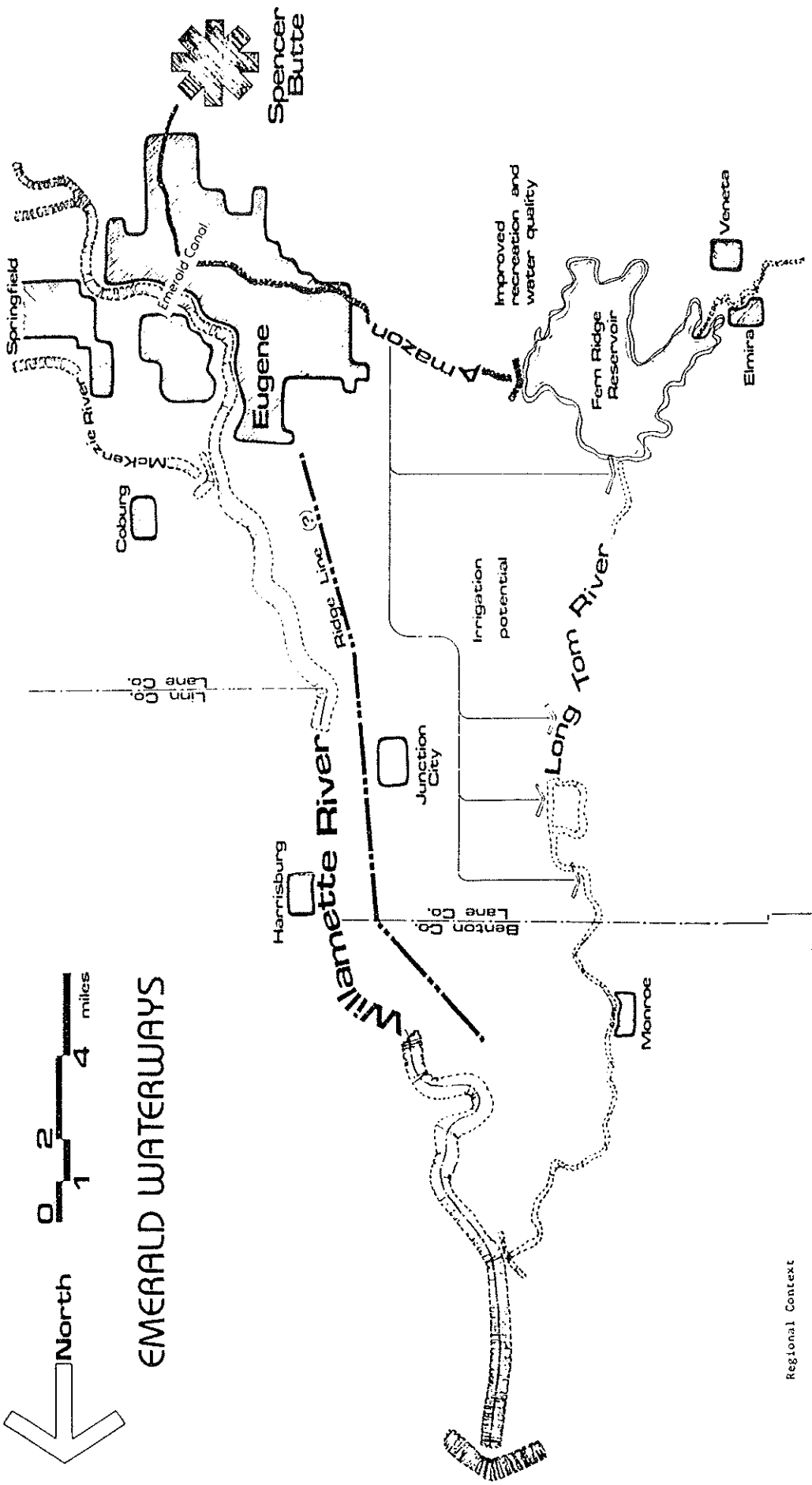
FINAL REPORT OF THE  
EMERALD CANAL FEASIBILITY TASK FORCE

October 21, 1982

The Emerald Canal Feasibility Task Force was created by joint City-County Resolution September 14, 1981, and charged with studying the benefits and problems associated with construction and operation of the proposed canal. During the past eleven months, the Task Force has reviewed previous findings, initiated research of its own, and maintained communication with the public through two quarterly reports, dated March and June, 1982, respectively, as well as a public hearing June 15. At this time, the Task Force has completed its research. This report summarizes findings of the last eleven months, as well as drawing conclusions as the Task Force was requested to do. Public comment will be solicited November 16 after which the Task Force will submit a list of recommendations to the City and County by December of this year. Reference is made here to the Task Force's earlier reports and to the more extensive working documents on which these findings are based. Copies of these are available for the public at the Eugene City Hall, the Lane County Courthouse and the Eugene Public Library.



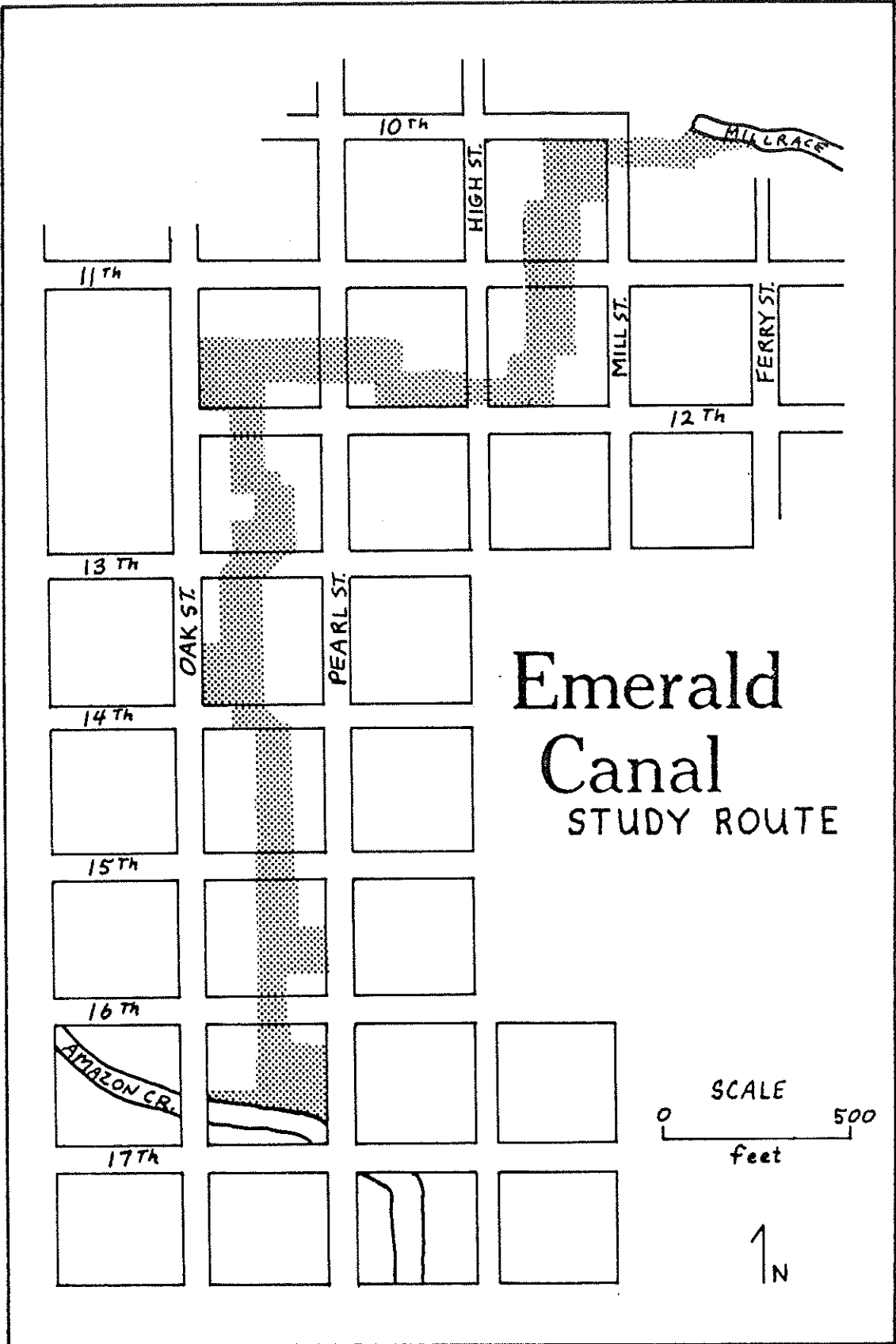
# EMERALD WATERWAYS



### Regional Context

This is a schematic diagram portraying the hydrologic and geographic relationships of the Amazon to urban areas and the Willamette and Long Tom Rivers.

The construction of a proposed link between the Millrace and the Amazon would provide (1) improved recreation potential in the Amazon and Fern Ridge Reservoir, (2) improved water quality throughout the water system, and (3) increased agricultural productivity through irrigation of lands between the Willamette and Long Tom Rivers.



# Emerald Canal

## STUDY ROUTE

SCALE  
0 500  
feet

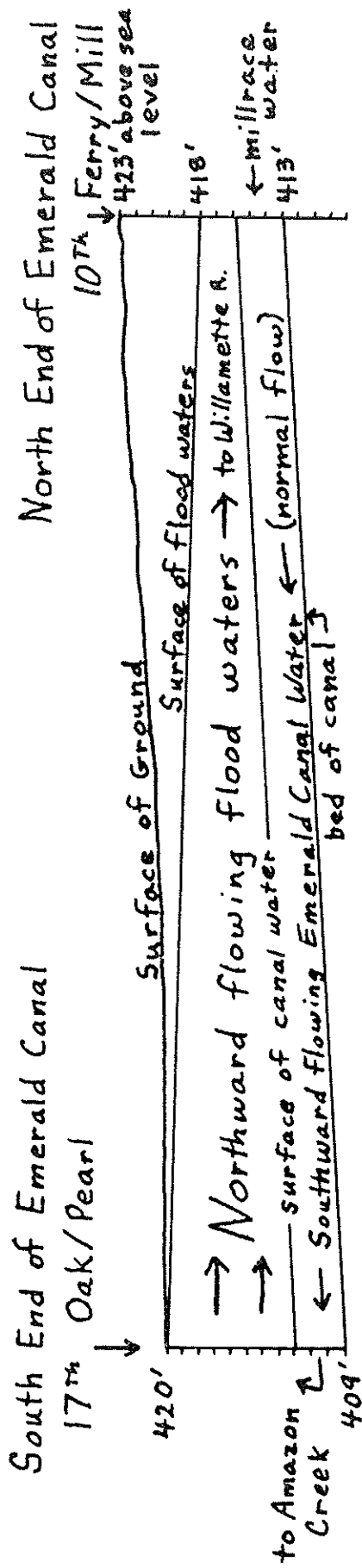


## CONTENTS

The report is organized by topic; both benefits and problems associated with the subject are discussed together. Conclusions and recommendations of the Task Force are stated at the end.

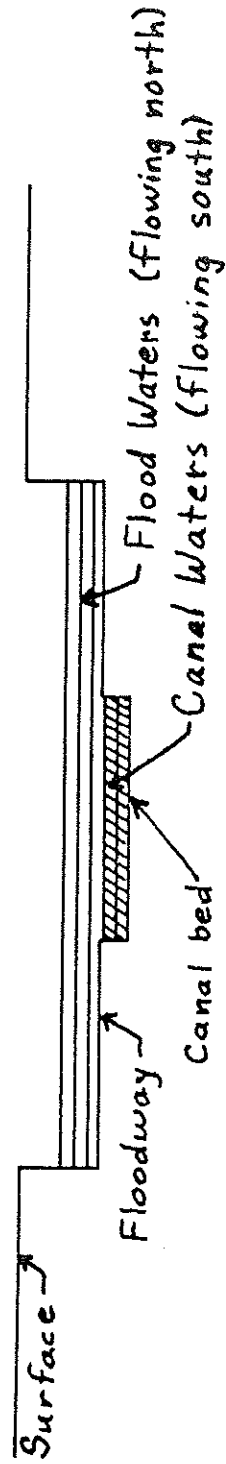
- I. A. Flood Control
- B. Hydroelectric Power Generation
- C. Recreation
- D. Irrigation
- E. Economic Development
  - 1. Housing
  - 2. Commercial property
  - 3. Tourism
  - 4. Transportation
- F. Public Perceptions
- G. Liability and Safety
- H. Funding and the Current Economy
- II. Conclusions and Recommendations

# SCHEMATIC LONGITUDINAL PROFILE OF THE EMERALD CANAL



Reversal of flow requires the opening and closing of flood control gates.

# SCHEMATIC CROSS-SECTION OF THE Emerald Canal at 11<sup>th</sup> between High and Mill Sts.



#### A. FLOOD CONTROL

The Canal's ability to resolve major flooding problems in the Amazon Basin has been documented by the U.S. Army Corps of Engineers. Up to \$2.5 million would be available to the community for flood control aspects of the Canal under the Corps' Small Projects Program. The Corps would cooperate with a local canal authority to assure that a multi-purpose waterway would solve the area's flooding problems. Oregon congressional delegation support for the flood control project remains strong, and \$30,000 of the Corps' original \$50,000 study allocation has been carried over to fiscal 1983 to assist with technical aspects of design development.

#### B. HYDROELECTRIC POWER GENERATION

Three potentially productive hydroelectric generation sites have been identified in connection with the Canal. They are at the diversion dam on the Willamette River near the I-5 bridge, at the outlet of the Mill Race west of the University steam plant, and at Fern Ridge Dam.

It is difficult to assess the ultimate economic feasibility of these sites because of three factors. First, each project must be rigorously evaluated from an engineering standpoint. Only then can the size of the generating device be determined.

Second, cost of financing is uncertain. Because of the "capital intensive" nature of hydroelectric projects, the cost of borrowing money becomes a critical factor in determining economic feasibility.

Third, the value of the power produced has not been determined.

Even with these qualifications, our investigation has shown that the possibility for power generation in connection with the Emerald Canal is quite good.

The Emerald People's Utility District's consulting engineer is currently as-

POTENTIAL HYDROELECTRIC SITE  
ASSOCIATED WITH PROPOSED EMERALD CANAL

LEGEND

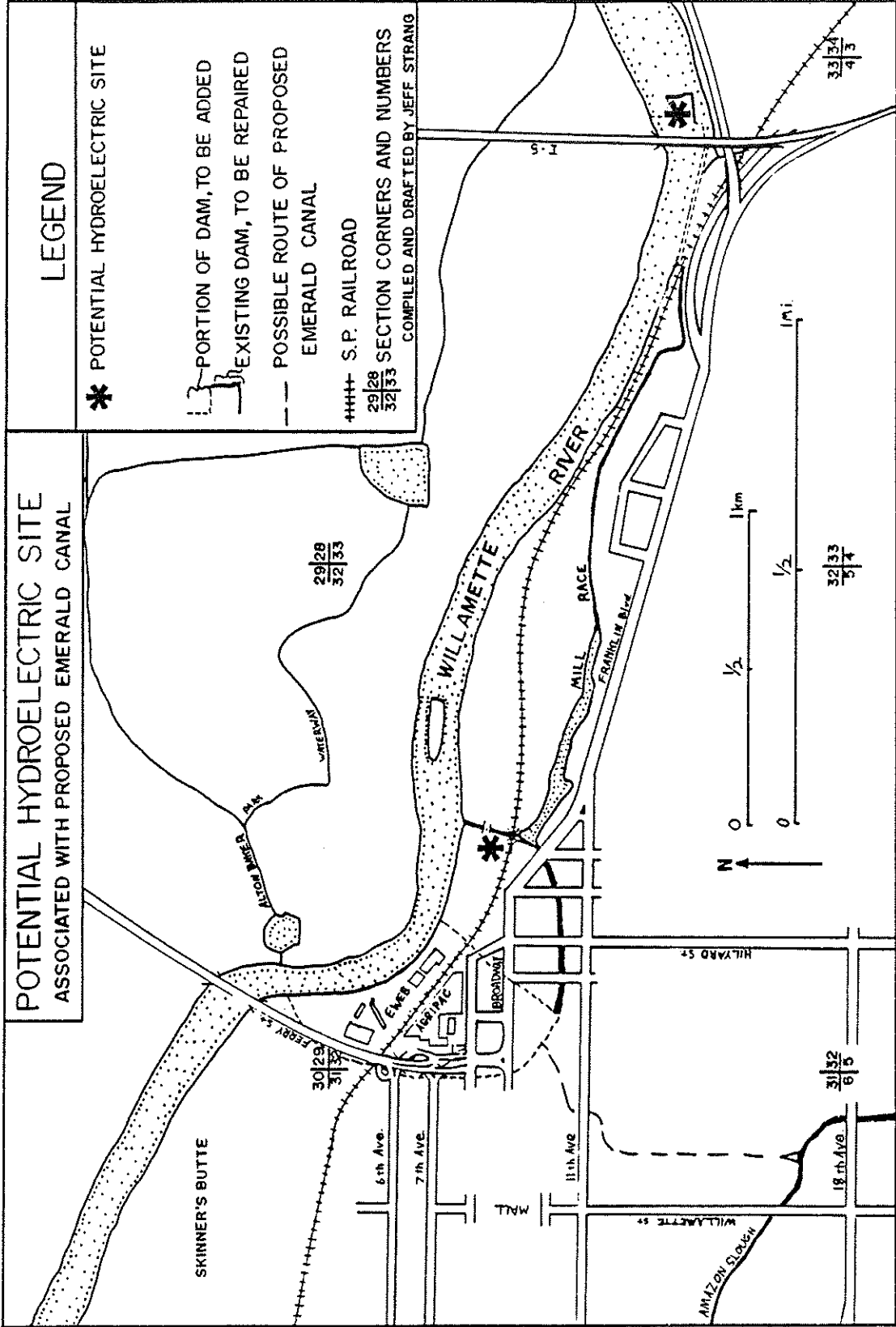
\* POTENTIAL HYDROELECTRIC SITE

--- PORTION OF DAM, TO BE ADDED  
--- EXISTING DAM, TO BE REPAIRED

--- POSSIBLE ROUTE OF PROPOSED  
EMERALD CANAL

++++ S.P. RAILROAD

29|28  
32|33 SECTION CORNERS AND NUMBERS  
COMPILED AND DRAFTED BY JEFF STRANG





sessing the cost of rebuilding the diversion dam and placing a generating device in the structure. If this project is undertaken, the diversion dam repairs would not be a direct canal construction cost.

A hydropower generation unit could be built between the Mill Race and the Willamette River just west of the University steam plant. A rough estimate of the cost of construction is one million dollars, not counting interest. If the power could be sold at seven cents per KWH (a reasonable projection in the 1990's), it appears that the installation would pay for itself in twenty years and would quite possibly yield enough profit after that time to provide for the annual operation of the Canal.

The Emerald Canal would augment the flow of water via the Amazon Channel to Fern Ridge Reservoir. The Springfield Utility Board, which holds the generation permit to the Fern Ridge site, estimates an annual generation rate of 800,000 KWH per year worth \$350,000 over a ten-year period from the additional canal water, this figures at the current repurchase rate of 4.3 cents per KWH.

Finally, it has been suggested that Lane County could amend its request for 200 CFS to 500 CFS. If this were granted, the feasibility of two of these sites would be enhanced considerably. The additional 300 CFS would be directed back into the Willamette at the outlet of the Mill Race.

#### C. RECREATION

Increasing water flow through the Mill Race should revitalize that body of water, which once played a more significant recreational role in the City. The additional water flow would also make possible an Amazon recreational corridor stretching westward to Fern Ridge. Connecting the Amazon north through the West University Neighborhood to downtown, the Mill Race and the Willamette River would provide an integration of existing park and open space systems. Comprehensive

recreational corridors east-west and north-south would become possible. The two streams could be transformed from waterway liabilities into community assets.

Surveys of boat owners at Fern Ridge indicate strong interest in year-round use which the Canal would make possible. Half of the respondents suggested that the Canal would bring a desired improvement in water quality in late summer. Increased business at local stores due to a lengthened boating season is estimated to be at least \$50,000 per year or \$500,000 over a ten year period. Additional facilities including restaurants and an overnight camping park are mentioned as probabilities of an expanded recreational season.

Water quality along the entire system is expected to improve to the point of bringing major public health benefits; that is, fewer mosquitoes and other vectors. (See Second Quarterly Report.) The Canal would also benefit wildlife in several ways. An additional 200 CFS of water would have a cleansing effect along the entire route. This "flushing" of the Mill Race, the Amazon and the Lower Long Tom River would benefit fish and wildlife considerably. The augmented flow through the Amazon Channel would afford flexibility to the Corps of Engineers in timing water release in the spring; in turn, this, properly managed, could create a more water-related wildlife habitat, and would enable the Oregon Department of Fish and Wildlife to seed grasses on the thousands of acres it manages in the Fern Ridge area.

#### D. IRRIGATION

Water brought through the Emerald Canal can be conducted north and west of Eugene into the agricultural lands of the Lower Amazon and Flat Creek drainages. An estimated 3,000 acres could benefit from the availability of irrigation water. At the moment, a lack of markets for irrigated crops and personal capital scarcity are limitations to this potential. A 1980 study by the Soil Conservation

Service estimates an average additional yield per acre of \$62.72 due to irrigation on these 3,000 acres. More land would be put into pasture, beans, corn and mint than is now the case. Net benefits are estimated at \$148,160 per year, or \$1,481,600 over a ten-year period.

## E. ECONOMIC DEVELOPMENT

### 1. Housing

The proposed route of the Canal project would have minimal direct effect on existing housing in the West University Neighborhood. It is possible that development of the Canal will lead to increased high density housing at the edge of downtown. Thus, the Canal could aid City policy of encouraging housing downtown. The Social and Economic Impact Study of the West University Neighborhood concludes that the Canal would help focus higher density housing changes in the neighborhood and thereby contribute to the preservation of valued, lower-density "neighborly" areas. Concern exists among renters, especially of lower income, that the Canal would ultimately raise rents in the neighborhood.

### 2. Commercial Property

The proposed canal would have a significant impact on all commercial property in close proximity to it. The impact would vary in degree according to proximity to the Canal. The Canal would create a lineal park extending from the eastern edge of the central business district approximately 3/4 of a mile south and west to the southern edge of the commercial district. This corridor would create a focal point for the area, affording a "locational identity" for the surrounding property. This locational identity is a site amenity which enhances the value of commercial property. It is anticipated that the Canal project would increase vehicle and pedestrian traffic in the immediate area. This increased traffic flow would further enhance commercial property values in the surrounding

area.

In addition to the Canal route proper, the proposed project will increase the flow in the Mill Race and Amazon Canal. This increased flow could be expected to precipitate a revitalization of the Mill Race with corresponding enhancement of surrounding property. It is not believed that increasing the flow of the Amazon Channel will have a great impact on the commercial property located on that waterway. This is due to the physical nature of the channel as it passes through the central business district. However, it has the potential to enhance the Lane County fairgrounds through which it passes. The significant impact which increasing flow in the Amazon would have will be felt at Fern Ridge. This would be in the form of a prolonged recreation season, benefiting the existing businesses there and creating additional opportunities for new business, as stated in Section C.

The impact on the canal route proper will be manifested in increased property values and rental rates. These factors would encourage upgrading of existing property and development of new projects. It is recognized that a side effect of this process would be some economic displacement of existing tenants and owners. It is not possible to predict with certainty the gains in property value which would occur, only the likelihood that the Canal would have a net positive effect on commercial real property in the area.

### 3. Tourism

It is possible that construction of an Emerald Canal could lead to a substantial increase in tourism. The Task Force has sought information from two other cities with somewhat comparable waterways -- Flint, Michigan, and San Antonio, Texas. No dollar figure was available from Flint, although officials report construction of a new Hyatt Hotel on the Canal there. San Antonio officials estimate annual tourist expenditures at \$650 million. Preference for the

city as a convention site is attributed to the highly developed waterway with its restaurants, shops and hotels.

The creation of an urban waterway system similar to that of San Antonio and complementary to the new Eugene Center may result in extra convention site selections in Eugene's favor. The added income to the local economy of one major convention each month would be approximately \$50,000, or more than half a million dollars a year. Additional tourist dollars could be expected to accrue to the county's economy through increased recreational use of Fern Ridge.

#### 4. Transportation

Transportation studies by the Task Force have been limited. The project appears compatible with West University Neighborhood's emphasis on creating special pedestrian environments. A study of the major Canal crossing on 11th Avenue shows the bridge building, utility relocation and urban redevelopment to be feasible. The Canal would make possible east-west bicycle traffic across the city. There would be temporary traffic disruption during construction. Some existing parking would be displaced.

#### F. PUBLIC PERCEPTIONS

The first public forums on the problems and potentials of the Amazon Corridor were held by Jerry Diethelm, Landscape Architecture professor at the University of Oregon, in the fall of 1977. The Emerald Canal project may be said to be beginning its sixth year. Public testimony at the first Task Force hearing this summer made it clear that conveying the concept of the Canal and larger waterway system to the public is not yet fully accomplished. The multi-purpose complexity of the system, which enhances its feasibility, also appears to contribute to confusion about the nature and scope of the project. Proponents of the project at the public hearing include among its desirable features the revi-

talization of the Mill Race which they recall as a focal point for recreation and festivities years ago.

#### G. SAFETY AND LIABILITY

Concern has been expressed about the project's potential as a safety hazard. Comparisons with circumstances in other cities seem to indicate that urban waterways can be designed with regard for public safety. The waterway surface of the Canal, always on a level below that of the normal city floor, should exist within a public zone that is consciously entered, with appropriate signing throughout. Ongoing education should stress careful supervision of children within the lower Canal area. In our own region, the existing Mill Race, the Willamette River and Fern Ridge Reservoir are examples of waterways of public access analogous to the proposed Canal. The City and County will need to review their risk management programs with regard to liability.

#### H. THE CURRENT ECONOMY AND CANAL FUNDING

The Task Force estimates the proposed Emerald Canal would cost \$22,103,000 (summarized below). Various sources of financing have been identified, and include state, federal and private sources. (These are listed below; reference should be made also to the Task Force's earlier reports.) Direct and indirect economic benefits are likely to accrue to diverse entities, public and private, as well as to the taxpayers of the County and City. The ratio of local, public cost to overall project cost is estimated at 1:3, which coincides with the ratio normally assumed for funding major public works projects. This means that there would be an influx of \$2 into the local economy for every \$1 of local investment. Construction of the Canal would likely produce a major economic stimulus to the local economy in the short run, in the manner of WPA projects during the Great

Depression. Much of the project funding would come from outside the community, i.e. from federal and state programs. The Task Force believes the Canal project would tap funding sources not otherwise available to the community. That is, the Canal would not be competing for outside monies with other community projects currently envisioned.

The proposed Canal is a long-range project, entailing planning, design development, financing, land acquisition and construction. The Task Force believes that a clear understanding of the project and a commitment to it on the part of public officials would be necessary to enlist the support of local citizens and to insure state and federal financing.

**Federal:**

Flood control through U.S. Army Corps of Engineers (12.016), up to \$2.5 million that would not otherwise be available to the community.

In addition, a number of federal programs related to waterways and usage appear pertinent to the proposed Canal:

15.503 Small Claims Projects -- for fully reimbursable federal loans and possible grants to public organizations for construction of water resource projects in the 17 western states. Projects can be single purpose or multipurpose and include the objectives of the Emerald Canal.

10.419 Watershed protection and flood prevention loans -- to provide loan assistance to sponsoring local organizations in authorized watershed areas for share of costs of improvement. These are guaranteed insured loans not to exceed \$10,000,000.

10.914 Watershed protection and flood prevention -- to provide technical assistance in planning and carrying out works of improvement to protect, develop and utilize land and water resources in small watersheds. Types of assistance: project grants, advisory services and counseling.

**State:**

ORS 541.830/542.075 appears to be the most logical source of state funds. This legislation provides for partial funding of multipurpose water projects. The list of benefits to be obtained is congruent with those expected from the proposed Canal.

**Other:**

EPUD (or other entity) usage of the hydropower site at the I-5 intake would mean assumption of the diversion construction cost, or a reduction in direct Canal cost of \$1 million.

Hydropower generation at the other site on the Mill Race could produce revenues after a twenty-year payback on cost of installation.

The third hydropower site permit, Fern Ridge Dam, is held by SUB. It is assumed that additional revenues made possible by increased water flow via the Emerald Canal would be shared, or that Canal construction costs would be shared in proportion to benefits received.

The potential for increased tourism and recreational usage would appear to justify commitment of some room tax funds (and funds from similar sources), as well as park and bike path monies.



EMERALD CANAL COST ESTIMATE

PLANNING

Conceptual Design	\$ 10,000	
Flood Control Model	50,000	
Economic Analysis	25,000	
Social Analysis	25,000	
Refinement Plans	50,000	
Public Information	<u>10,000</u>	\$ 170,000

DESIGN

Engineering	\$100,000	
Transportation Study	50,000	
Street & Highway	50,000	
Park Design	<u>200,000</u>	\$ 400,000

PHYSICAL CONSTRUCTION

Canal & Roads	\$2,050,000	
Bridges	1,000,000	
Diversion	1,000,000	
Outflow	1,500,000	
Control Structures	500,000	
Amazon Canal	700,000	
Utilities		
EWEB Steam	\$ 240,000	
EWEB Water	240,000	
EWEB Electric	1,200,000	
Phone Co.	1,500,000	
Sewers	500,000	
Gas	<u>300,000</u>	
	3,980,000	
Fish Screens	300,000	
Parks and Ponds	500,000	
Bike Ways	100,000	
Planting	300,000	
Water Way Structures	250,000	
Amazon Park	300,000	
Signs and Misc.	<u>200,000</u>	\$12,680,000

PROPERTY ACQUISITION

Purchase	\$7,353,000	
Admin. - legal, appraisal relocation, etc.	<u>1,000,000</u>	\$ 8,353,000

MISC. SECONDARY COSTS

Includes such items as:  
Public Meetings, User Studies,  
Ordinance Drafting, Water Quality

Studies, Plan Monitoring, etc.	<u>\$ 500,000</u>
TOTAL - - - - -	<u>\$22,103,000</u>

ONGOING YEARLY COSTS

Cleaning	\$10,000
Park Maint.	70,000
Structures Maint.	50,000
Fish Screen Maint.	50,000
General Repair	50,000
Law Enforcement	50,000
Misc.	<u>25,000</u>
TOTAL	\$305,000/year

## CONCLUSIONS AND RECOMMENDATIONS

### Is it feasible?

Determining project feasibility was the central charge of the Task Force and it is our conclusion after a year of study that the proposal is feasible.

### What we mean by feasible.

By feasible we mean, as set out last November, 1981, in our Work Plan, that the idea of an Emerald Canal and Emerald Waterways System is technically and economically possible and is, on balance, after weighing urban and rural potential benefits against all known potential problems, a desirable and community enhancing proposal assuming the community is willing to provide its share of project costs. By feasible, however, we do not mean to suggest that all matters related to the proposal are resolved and that the canal could be dug tomorrow. The problems which this group has pronounced resolvable may yet require some years for actual resolution.

More planning and design work needs to be done. The proposal will require skillful coordination with city and county planning processes and with many affected agencies and groups. Financing for the project will need to be pinned down. What has been identified as potential will need to be actually secured. Many topical grants will need to be applied for and economic studies refined.

All of these tasks are properly the work of a joint County-City authority or coordinating body such as a Waterways Commission. The Task Force believes that the proposed Emerald Canal and Waterways System should be jointly pursued by local government and is recommending that the County and City cooperate in taking these next important steps.

### General economic conclusions

The Task Force was asked to pay particular attention to economic aspects of the proposal and has refined earlier estimates of project cost, calculated the

dollar value of tangible benefits wherever possible and identified potential funding sources.

Our updated estimate of total project cost is 22,103,000. This includes the most recent utility relocation figures from E.W.E.B. and P.N.W. Bell Co. and a downward revision of our second quarter estimate of yearly operating expenses based on better information. Many of our figures are too preliminary to allow for a conclusive cost-benefit comparison. No attempt has been made to discount anticipated future benefits. It is our best guess that if anticipated benefits over a 10-20 year period are balanced against the estimated cost to the local community (approximately 1/3 of the total costs) the net benefit to the community will exceed the cost.

The outside funding would appear to be non-competitive with other local projects. These dollars for flood control, irrigation, water quality, hydro-electric generation and water-related recreation are local tax dollars which would otherwise go to other communities. Newport, Oregon, for example, received over \$4,000,000 in federal funds for their Marina project in 1975-76 through the Upper Willamette Resource Conservation and Development Projects (a federal coordinating body for the Department of Agriculture).

#### Tangible benefits

Tourism: If our canal and waterways system is only a fraction as successful as San Antonio's Paseo del rio it will be more than worthwhile from a purely economic point of view. San Antonio's Chamber of Commerce attributes some \$650,000,000 a year to its tourist industry, the principal attraction of which is its waterway. This Task Force believes that the canal proposal would enhance and support the already substantial community investment in hotel and convention-related facilities.

Flood Control: The proposal would solve area flooding problems and capture

approximately \$2.5 million federal dollars for a locally controlled project.

**Hydroelectric Power Generation:** Some hydroelectric power could be generated at both the Millrace end of the system and at Fern Ridge Dam.

**Irrigation:** The canal and waterways system could bring water to 3,000 acres of irrigable farm land.

**Water Quality:** Water quality in the area's inland waterways would be considerably improved in the Mill Race, Amazon Slough and the lower Long Tom River.

**Economic Development:** The Task Force believes the waterways system would stimulate economic development in three general areas: the downtown "Canal Zone", the Amazon Corridor, including Willow Creek Basin, and at Fern Ridge Lake. This scale of public works effort could help put many of our building tradespeople back to work.

#### Intangible Benefits

While always harder to evaluate than the above mentioned benefits, the Task Force is enthusiastic about the many potential contributions the waterways system could make to the quality of life in our metropolitan area.

The proposal would support and enhance our park, recreation and open space plans and already substantial achievements. It would improve our present hiking and biking system and help establish a needed north-south recreational corridor through town. It would enhance urban wildlife habitat, especially at Fern Ridge Lake and reinforce our connection with nature in the city. It would rehabilitate the Mill Race and Amazon Creek.

The canal portion of the system could help to create the quality of downtown environment needed to support a larger downtown resident population.

The waterways system would help reinforce our overall sense of place by clarifying urban structure and sharpening our sense of orientation and identity.

As in San Antonio and earlier with our own Millrace, special community

occasions could develop, such as festivals, pageants or fetes which focus on the waterways.

There are no doubt many deeply felt qualities associated with this proposal which appeal to our senses and our hopes for the environment our children will inherit together with our many other neighbors in time.

#### Specific Recommendations

The Task Force makes the following specific recommendations:

1. That the County and City cooperate in pursuing the project.
2. That the County and City establish an authority or coordinating body to manage the further development of the proposed Emerald Canal and Waterways System.
3. That the County and City instruct their coordinating body, authority or commission to:
  - a. apply to identified funding sources such as the Upper Willamette Resource, Conservation and Development Project for Department of Agriculture funds; the State of Oregon for water bonds and the Corps of Engineers for flood control funds.
  - b. develop the planning and design of the project and coordinate the work with our congressional supporters, the Corps of Engineers, City and County Capital Improvement Programs, our Downtown Development Commission and upcoming Downtown Refinement Plan, the West University Neighborhood Refinement Plan, the Joint Housing Committee, the Parks and Open Space Master Plan, LCOG's water quality program, the State Water Resources Department, our local utilities, the University of Oregon, Emerald Waterways Citizen's Committee, Inc. and all other affected agencies and groups.

- c. help our community better understand this multi-faceted complex proposal.

TASK FORCE MEMBERS

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