



Years

**The Alaska Department of
Environmental Conservation**

1971-1991

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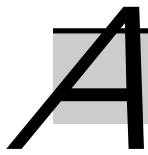
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LETTER FROM GOVERNOR HICKEL

Dear Alaskans;

As the Alaska Department of Environmental Conservation begins a third decade, let's rededicate ourselves to the goal of protecting and enhancing this unique part of the world. What is the cost of protecting the environment? The cost is to care. We must care for people, people's needs and nature. We must fight disease and provide clean air and water for our children.

At the same time, we must not take our economy for granted. A person who is cold, hungry and unemployed is in an ugly environment no matter how beautiful his surroundings. We must care for the total.

As the population expands, the earth's temperate zone will face greater demand for human habitat. The resources mankind needs will come from the oceans, outer space and the arctic.

This is not to be feared, but to be welcomed. Our challenge is also our opportunity. The world desperately searches for answers, and these answers can be discovered in Alaska.

The earth is inexhaustible, because God made our minds inexhaustible. The great legacy of freedom is that we can harness human imagination, initiative, foresight and compassion. To truly succeed, we must not just regulate, we must advocate and educate.

Our care for each other will be our cure for the planet.

Sincerely,

Walter J. Hickel
Governor

A **CKNOWLEDGEMENTS**

The department wishes to thank all its employees, past and present, for the many invaluable contributions they made in meeting the responsibilities of their jobs and serving the people of Alaska. In order not to slight the efforts of some, names have been dropped for the most part in the accounts given in this Twenty Year Report. This is despite the fact that the department has employed many heroes whose efforts have protected the environment and public health, even saved lives, over the years.

This report was edited, compiled and created largely through the efforts of Joe Ferguson and Marti Early of the Media/Publications office and Jim Powell, Deputy Director of the Environmental quality division.

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Foundations of Environmental Excellence in Alaska

Environmental Conservation before 1971

by Amos J. Alter

Many forces and events in Alaska serve as the foundation for today's endeavors to achieve and maintain environmental excellence. Early visitors to Alaska described local customs and conditions in reports of their visits. After Vitus Bering visited Alaska in 1741, Spanish, French, English and other Russian expeditions arrived here. Accounts of these expeditions contain isolated references to subjects we now recognize as matters of environmental concern.

One of the more commonly mentioned accounts is that of Captain V. F. Lisianski. According to his description a number of Aleuts perished as a result of eating poisonous mussels. Names such as Peril Straits and Poison Cove, given to the places involved in the account, record the 1799 event on the coastal charts of Southeast Alaska for all to see today. Almost 200 years later we still concern ourselves about paralytic shellfish poisoning in Alaska and try to define the environmental conditions which produce the poison.

Other accounts from the past describe disease, chemical poisoning or physical conditions and their impact upon Alaskans. Introduction and transmission of various diseases have given rise to legislation and control methods of ever-increasing complexity. Words added to our collective vocabulary to describe these efforts are many, such as sanitation, preventive medicine, environmental health, public health engineering, sanitary engineering and environmental sanitation.

The unfavorable experiences we have had as individuals and small groups from exposure to disease, poisons and physical phenomena have increased. Communities and large regions have become concerned. The territory, state, nation and the world have shown increasing concern. The arena for environmental control has also moved from one of surrounding, affecting people to people affecting their surroundings.

Chronology of Early Environmental Events in Alaska 1913-1936

The Territory of Alaska's first environmental laws, enacted by the U.S. Congress in 1913, were brief. Two paragraphs made it a misdemeanor to pollute water used for domestic purposes; a third set the consequences at a fine of between ten and fifty dollars and/or imprisonment of between five to twenty-five days.

The same year the Territorial legislature passed a law to register and regulate communicable diseases in the territory. The act named the Governor of the Territory as Commissioner of



Amos J. Alter made a career of public health in Alaska for almost 50 years. He came to Alaska in February of 1944 and was employed by the Public Health Service as a liaison officer in Juneau. He served from 1946 to 1967 as chief environmental officer for the state, and was the administrator for the Alaska Water Pollution Control Board from 1949 to 1960. In 1967, he moved to Fairbanks to administer the Office of Research and Academic Coordination at the University of Alaska. There he helped establish a graduate environmental engineering program, taught, and worked with north slope oil developers on cold weather engineering problems. In 1975 Mr. Alter returned to Juneau to serve as state coordinator for a water resources assessment until his retirement in 1977.

Environmental Foundations

The Territory of Alaska's first environmental laws, enacted by the U.S. Congress in 1913, were brief. Two paragraphs made it a misdemeanor to pollute water used for domestic purposes; a third set the consequences at a fine of between ten and fifty dollars and/or imprisonment of between five to twenty-five days.

Health, provided for assistant commissioners, local boards of health and powers which alluded to water supply, sewage and solid waste issues as they related to disease control. The governor and three assistants were responsible for all health activities in the Territory for the next three years.

The Office of the Commissioner of Health was created in 1919, with a physician taking the post part-time. With three part-time divisional representatives and a part-time stenographer, the commissioner ran all territorial health activities until 1936. Also in 1919 the legislature provided for the organization of boards of health within Alaska's school districts.

In 1914 the U.S. Public Health Service issued a report by Emil Krulish on sanitary conditions in Native villages along the Arctic Coast of Alaska. Amid descriptions of tiny, "crowded, overheated, unventilated" sod igloos with seal gut windows, diets of whale and seal meat, and other descriptions which must have amazed the report's more southern readers, there appeared a discussion of water supply and annual spring clean-up: "The water supply of these settlements is melted ice or snow. The water is of good quality... During the summer months garbage and refuse are thrown into the sea, while in winter they accumulate in the frozen state near the igloos. This is removed in the spring, when the annual village 'clean-up' occurs, under the supervision of the teacher."

In 1933 the federal laws concerning Alaska were expanded to list such public health offenses as: selling unwholesome provisions; adulterating provisions; polluting water, air or public or private premises; and throwing lumber waste in water. The penalties remained the same.

Public Health in Alaska Begins

Territorial laws were revised in 1937 to enable acceptance of federal funds through the Social Security Act to control and curb the spread of disease. The commissioner of the Territorial Department of Health was authorized to promulgate regulations for labelling and grading of milk, sanitation of dairies and protection of public water supplies. A division of public health engineering was set up. The resultant expansion of staff and services marked the real beginning of public health activities in Alaska.

Alaska's first sanitation and environmental regulations were then written, the same year as their authorizing legislation. These new rules included provisions for cannery sanitation, domestic sewage disposal, and public nuisances such as garbage, spoiled or diseased meat, and "privies not fly-proof."

Shortly after the declaration of World War II in 1941, the Territory became a front line of defense. Escalating defense activities created an ever-increasing demand for public health services while reducing the number of available providers. Public health activity was reduced to emergency measures.

The U.S. Public Health Service tried to make up for the war-time staff shortages and lack of continuity in the territorial health arena by appointing liaison officers to serve as go-betweens for the military's health concerns and territorial and local government health agencies and laws.

Post-war Environmental Efforts

In 1945 the Alaska Territorial Legislature gave legal status to the Health Department and created the first territory-wide Board of Health. The board hired the first full-time Commissioner of Health. With momentum provided by a special session of the legislature in 1946 on health issues, appropriations for health and sanitation almost tripled in 1947 during the next regular session.

Despite the increase in funds, the postwar boom exerted a tremendous drain on health and sanitation services. According to a 1949 study by the Alaska Department of Health entitled "Public Health Progress in Alaska," there was not a single complete public water treatment plant in the entire territory. "Only 10% of the sewage disposal systems in Alaska can be considered adequate. Existing sanitary facilities in many areas are outmoded, unsuited to the physical environment, or are no longer adequate to meet present needs... Most of the 174 communities located in the permafrost area urgently need improved methods of sanitation."

To ease the situation, Congress passed a special appropriation in 1948 of \$1,115,000 for "disease and sanitation investigations and control."

Territorial legislation in 1949 became much more specific about environmental quality. Amendments to the laws of Alaska called for establishment of water quality standards, examination of waters, construction of public water supply systems, and review of water supply plans. It also called for standards for the collection, treatment and disposal of sewage. A Water Pollution Control Board was established to carry out much of this work.

In 1950 the National Academy of Sciences's National Research Council sponsored its first Alaska Science Conference to define some of Alaska's problems. Cold weather engineering was at that time a major obstacle to providing and operating sanitation facilities in Alaska.

Statehood came in 1959, and with it came the combining of the departments of Health and Welfare into the Department of Health and Welfare. The Water Pollution Control Board was abolished at that time, with the duties carried out by the new department.

In 1971 The Alaska Department of Environmental Conservation came into being, formed from part of the health department's environmental health division. Responsibilities transferred to the new department involved air, land and water quality, plus solid waste and pesticides.

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R E F L E C T I O N S

Department “Historians” Assess the First Twenty Years: **Dick Stokes, Keith Kelton, Deena Henkins, Doug Lowery**

The real story of protecting the land and people of the “Last Frontier” lies beyond the rules and regulations, the permits, grants and compliance orders. People, individuals with their own training, abilities and personalities are the “life” of the statutory structure. Particularly when DEC was tiny and new, with the makeup of its programs mostly implied, individual people played an important part in keeping DEC’s mission alive.

DICK STOKES:

In the summer of 1971 raw sewage was being discharged from all southeastern communities, Ketchikan was still operating a dump which spilled into Tongass Narrows at the site of today’s shuttle ferry terminal, open burning was occurring at every dump in Southeast, garbage was being dumped off the dock in Hydaburg, Pelican, Kake and other smaller communities, teepee burners belched smoke from downtown Ketchikan and Wrangell, the pulp mills in Ward Cove and Silver Bay discharged untreated waste, and all residents in the Mendenhall and Lemon Creek Valleys in Juneau depended on on-lot water and sewage systems.

On July 1, 1971, about half of the Environmental Health Division—14 employees well-suited for their tasks—was transferred from the Alaska Department of Health, Education and Welfare to form the core of the newly-created Department of Environmental Conservation.

FIRST COMMISSIONER

Dr. Max Brewer was chosen by Governor Bill Egan to be the Department’s first commissioner. Brewer had been director of the Naval Arctic Research Laboratory in Barrow for the better part of two decades and had an international reputation as a scientist and expert in construction and transportation in the arctic. Certainly, he was chosen with an eye toward convincing a skeptic nation that Alaska could build and safely operate a pipeline from Prudhoe Bay to Valdez.

DEC might not have survived without a personality like Brewer. He delegated little and cared not a whit for chains of command. He piled table after table in his office with paperwork about which only he had a clue. He agreed to meet with various officials of other agencies, then kept them waiting in an outer office for hours. Brewer was unorthodox, but he had a presence that demanded attention. He acted as if he and DEC were at the center of influence, and he kept the fledgling department from being rolled over by better-established forces.

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James Anderegg, Director
Joe Alter, “dean” of Alaskan sanitary engineers and on special assignment to the University of Alaska in Fairbanks

Dick Britt, Deena Henkins and Gary Wells, sanitary engineers in Juneau;

Kyle Cherry, sanitary engineer in Anchorage

Jon Scribner, sanitary engineer in Fairbanks

Keith Kelton, splitting time between being regional engineer for Southeastern Alaska and setting up the state’s first solid waste management program

Tom Hanna, an air quality engineer charged with developing an air program

Jerry Koelling, a nuclear physicist in charge of radiation safety

Dick Stokes, charged with developing a pesticide control program and a Departmental lab facility.

Bev Gelston, Tana Hart, Lucy Merrell, clerical support staff, made up the balance of the recruits.

Only Stokes, Kelton and Henkins are still with the Department.

Reflections



Dick Stokes

Photo by David Job

"DEC might not have survived without a personality like Brewer... Brewer was unorthodox, but he had a presence that demanded attention. He acted as if he and DEC were at the center of influence, and he kept the fledgling Department from being rolled over by better-established forces."

Jerry Reinwand was hired from the journalism department of the University of Alaska as a scientific information officer. Jerry quickly moved up the ladder to become a special assistant, then the department's first deputy commissioner.

Brewer expanded the focus of the young DEC by creating and staffing a division of coastal zone management. He was also instrumental in developing the bureaucratic structure to regulate construction of the Alaska Pipeline. He hired Chuck Champion, the first pipeline watchdog. During the Brewer years, the first sets of regulations were developed.

After the draft pesticide control regulations that I developed went to him, it was almost a year before we discussed them. If Brewer had a plan or a schedule for review, he never revealed it. Everything simply sat on back burners until he was ready.

One morning he summoned Tom Hanna and me to his office to review the air quality and pesticide regulations. We started at about ten in the morning, took a short lunch then went non-stop till about eight at night. The entire day was devoted to the air quality regulations. Brewer picked at every word, questioning Tom about commas and demanding that his "Aunt Minnie" be able to understand the regulations. For me it was like being a prisoner watching a fellow prisoner being tortured. When Brewer and Hanna finally finished the review that night, Brewer puffed on his pipe, spoke directly to me for one of the few times that day, and said, "Should we start on your regs tonight or wait for another day?"

Brewer was a strong believer in the power of the written word. He hated bureaucratic jargon and he wrote with a flair. During part of his tenure one of his daughters did some baby-sitting of my two older children. When I brought her home one Saturday night about 3:00 a.m., Brewer came out to the car and asked if I could come in for a few minutes. He was polishing a letter and wanted a critique—or an audience. I was there for another hour, enough time to make my wife wonder if I had run away with the baby-sitter.

I remember a conversation with Brewer after he had been fired. He had been caught off-guard, thinking he would be one of the rare commissioners who would survive an administration change. Brewer told me he had accomplished only three things. He had improved the Fairbanks, Sitka and Cordova dumps. He does deserve credit for starting the process in all three. He certainly made a name for himself when he ordered the Fairbanks dump closed.

ERNST MUELLER AS COMMISSIONER

Ernie Mueller was named by Governor Jay Hammond as the next commissioner and to everyone's surprise, Jerry Reinwand, who was a heavy in the campaign to re-elect Governor Bill Egan, was allowed to remain as deputy.

Mueller was to serve as commissioner for eight years. Just as we needed Brewer at first, we needed Mueller during those years. He had strong organizational instincts and forced refinement of regulations and procedures. Under Mueller we were

introduced to adjudication and process. Less shooting from the hip cramped some styles, but made us more of a “regular” agency. Where Brewer had wanted to make most decisions, Mueller was careful to have his directors make decisions and work out differences.

DEPUTY COMMISSIONERS

Reinwand served as Deputy under Mueller for Mueller’s first four years. He eventually moved on to serve as Hammond’s executive assistant and right hand man. Reinwand was no lover of EPA, and he spent considerable effort to keep them from usurping what he considered to be DEC’s job. Demming Cowles followed Reinwand, and Glenn Akins followed Demming Cowles. Amy Kyle would eventually replace Akins. The department has always been very fortunate to have strong, capable deputies.

LATER COMMISSIONERS

In 1982 Governor William Sheffield replaced Jay Hammond and Dick Nevé soon replaced Ernie Mueller as commissioner. Chris Noah became deputy about five months later. Nevé had previously been director of the Seward station of the Marine Science Institute and was an international expert on paralytic shellfish poisoning. Nevé often ignored the chain of command during his two years with the department. Probably the biggest issue during his tenure was the Alaska Pulp permit in Sitka.

Nvé left DEC in about 1984 and Bill Ross became the new commissioner. Amy Kyle served as deputy most of the two years Ross was in the job. Ross had a fabulous memory. I remember briefing him his first week on the job before he was to meet with the contingent of Ketchikan politicians and city and borough staff. In the sessions with them he displayed a depth of knowledge which surpassed the briefings. A year later when he called back to ask if we had kept all our promises to Ketchikan, his memory was better than the sum of my memory and notes. Ross deserves credit for improving our relationship with EPA. He wanted to be a partner with them. A lot of the bickering was brought under control in his two years.

Ross was also the architect of the DEC four-day work week. Under his guidance the department agreed to take about a 15% pay cut to go to a four-day work week during a period of fiscal crisis. We avoided layoffs and bumping fiascos, and we maintained the core of DEC. We received a mix of admiration and resentment from other agencies, but we seemed to receive lots of dividends from the legislature in the coming years. I remember staff meetings for all Juneau employees that spilled out of the commissioner’s office into the waiting rooms and hallways. I suspect that survival itself during those declining budget years was a high point in DEC morale.

In 1986 Steve Cowper was elected governor, and Dennis Kelso replaced Bill Ross as commissioner. Amy Kyle remained as deputy. The years between 1986 and 1990 were to see phenomenal growth in the agency. It goes without saying that the oil spill from the T/V *Exxon / Valdez* wreck was the big event of the

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Reflections

period and that it was the largest factor in DEC's growth. But a couple of other factors are worth noting. Kelso shifted over to project-based budgeting whereby he could attach price tags to particular programs and projects. He and Amy paid enormous attention to the legislature. So some of the credit for growth should go to Kelso and Kyle. But yet another factor was important.

Somewhere in the eighties, the public mood shifted from wanting DEC to do less to wanting DEC to do more. The public phobia about all things hazardous played a part. Maybe there was a general "greening" of the middle class. But something happened. All of a sudden people came to hearings to tell us to do more, to be tougher, to expand our power. Instead of battles over permit stipulations between the department and the applicant, we were now arm wrestling with third parties to explain why we stopped short of what they wanted. This mood was upon us before the *Exxon Valdez* hit Bligh Reef, but with the spill the mood turned into a movement.

KEITH KELTON:

My first impressions of Juneau were far from favorable when I arrived on July 8, 1970 to work for the department of Health and Welfare. The rain that welcomed the state ferry Wickersham into port continued nearly unabated all summer. Housing was then more difficult to obtain than now. The office was staffed by approximately 10 people. One of those, Deena Henkins, is still with the agency. There was one engineer in Fairbanks (Jon Scribner) and one in Anchorage (Kyle Cherry).

I was the Southeast engineer and the statewide solid waste "expert." The title "expert" was earned by having taken one course in solid waste management in graduate school. The senior staff member was Richard Britt, who even in 1970 had several years of plan review experience and had served as the sole engineer in the division for several years. In addition, there were the sanitarians that earned us the title, "Environmental Health." The whole group was supervised by Jim Anderegg.

In 1971 the Department of Environmental Conservation was created, and the Environmental Health Division's staff was transferred to it. Along with the first commissioner, Max Brewer, we moved our offices to the old St. Ann's Hospital on 6th Street. This was a step up for the three employees who had shared quarters with a pregnant cat in a condemned building where the courthouse now stands. The hospital building offered us the only truly private offices (patients' rooms) that we would ever enjoy.

We stayed in St. Ann's until 1975, when most of the building was torn down and we moved to "Three Mile Island" —offices located at "3-mile Egan Drive." By this time the department had

"Along with the first commissioner, Max Brewer, we moved our offices to the old St. Ann's Hospital on 6th Street. This was a step up for the three employees who had shared quarters with a pregnant cat in a condemned building where the courthouse now stands."

grown tremendously; we not only had more employees (probably less than 50) but we also had a few regulations in place and were making slow progress to implement them.

I was assigned to develop the first set of solid waste management regulations. The commissioner insisted on direct involvement in drafting these regulations with several review sessions lasting past midnight as we pondered the significance of every word. I was admonished numerous times that the regulations would not be acceptable until the commissioner's "Aunt Minnie" could understand it all. In addition, it was extremely important that we "know our animals and have our ducks in order" as we developed the regulation package for public comments.

PROGRAM DEVELOPMENT

Early attempts to promulgate environmental regulations often resulted in threats to the health of the hearing officer. More than once it was necessary to have troopers control the responses of those who thought it was their right to continue traditional operating practices without state interference. These early regulations were simplistic when compared to the laws that currently govern the various programs. But they served to establish a base level from which our current laws and regulations evolved. In the early 1970's, it would have been impossible to envision the growth in the environmental movement and equally impossible to implement the kinds of laws we now have. The evolution of environmental safeguards has proceeded at a pace which could be accommodated by the regulated public.

The department grew slowly but steadily though the eight years when Ernie Mueller was commissioner. We acquired staff from the Departments of Natural Resources and Health and Social Services and again had an environmental health program, this time including seafood inspectors. Several organizational schemes were implemented, leading to the formation of separate "headquarters" (management division) and "field" (operations) division functions. Both health and environmental programs were split functionally into these two divisions.

My personal activities with the department changed in 1975 when I was assigned responsibility for developing the state's water and sewage construction grants program. We operated this program very successfully without regulations, guided only by a statute several paragraphs long. The state had no money, so bond issues were approved to generate the source of grant funds. In those days when the state was broke we actually had more funding than demand.

The process worked very well until the oil money started to flow, and resulting growth soon generated a demand far exceeding bond funds. The Division of Internal Audit decided our grant program needed regulations to justify their audit findings. So after three to four years of being able to run the program as we thought best, we became restricted by regulations. We now had regulations but no funding.



Keith Kelton

Photo by David Job

"Early attempts to promulgate environmental regulations often resulted in threats to the health of the hearing officer. More than once it was necessary to have troopers control the responses of those who thought it was their right to continue traditional operating practices without state interference."

Relections

"The 20th anniversary of the agency marks the beginning of a new era for DEC. We are poised to effectively deal with the state's environmental problems... We have a statewide staff of nearly 500 authorized employees and adequate budgetary support. While we may always be expected to do more than we think we can handle, we are in a good position to begin the next 20 years."

Dick Nevé gave way to Bill Ross as Commissioner in January 1985. A major environmental issue at that time was placer mining. This issue was all-consuming and raged through several administrations. It was not until EPA finally established effluent standards based on economically achievable treatment technology that the issue subsided to its current level as a recurring permit problem.

During this time period, I progressed up the "food chain" to Director of Facility Construction and Operation and then to the Division of Environmental Quality. The department continued to grow until by January 1987, we had approximately 250 employees, 150 of whom were in the EQ division. The structure contained most of the programs and problems that now exist, with the exception of the recently-legislated oil pollution, prevention and response functions. The structure and rate of growth were soon to be dramatically altered.

DEC TODAY

The Exxon Valdez oil spill in 1989 forever changed the focus and direction of the agency. As legislative attention sought to prevent future spills and increase response capabilities, the department's budget, staffing, and responsibilities virtually doubled in three years. This rapid growth occurred under the direction of Commissioner Dennis Kelso and soon resulted in an outdated management structure and the need to house Juneau staff in six different buildings.

The 20th anniversary of the agency marks the beginning of a new era for DEC. We are poised to effectively deal with the state's environmental problems. For the first time in DEC history, we will have new facilities for both our environmental laboratory, and headquarters building capable of housing all Juneau employees together. We have a statewide staff of nearly 500 authorized employees and adequate budgetary support. While we may always be expected to do more than we think we can handle, we are in a good position to begin the next 20 years. With Commissioner Sandor's direction, these resources will be directed toward providing cost-effective solutions to environmental problems.

It is often easy to lose sight of the environmental accomplishments that have occurred as we focus on the minutia of our daily routines. However, by looking back to 1971, it is absolutely astounding to see how far the agency and the environmental movement have progressed. The current levels of protection and public support could not have been anticipated. I am proud to have played a small part in the evolution of DEC from an idea to a strong functioning agency.

There have been so many well qualified and dedicated individuals in DEC's history it would be impossible to start naming them all. With their contributions, Alaska's environment has benefited greatly. For me it is a continuing privilege to work with individuals dedicated to serving Alaska's environment.

DEENA HENKINS

My impression of why a separate environmental department was formed in Alaska is because it was fashionable at the time. In those early days, many other states were creating environmental agencies at that time, and the Environmental Protection Agency itself had evolved out of the U.S. Public Health Service in 1970.

Certainly, the department wasn't formed because we had outgrown the Division of Environmental Health. Most of the staff of that division were sanitarians who remained in the renamed Department of Health and Social Services. The new Department of Environmental Conservation probably didn't have more than a couple of dozen employees with a one- or two-person regional office in Anchorage and Fairbanks, and none in Juneau.

The principal programs were water pollution control with embryonic air quality program (Tom Hanna), solid waste (Keith Kelton who also was part-time Southeast regional engineer), pesticides (Dick Stokes) and radiation protection . The wastewater program was headed by Ron Hansen, and Jim Anderegg, a U.S. Public Health Service assignee (who had been director of the environmental health section), who functioned as sort of an informal deputy commissioner to our first commissioner, Max Brewer. We had one personnel officer, one fiscal officer and one supply officer.

The department grew slowly in the 1970's, with addition of a separate region in Prince William Sound when oil pipeline construction began. Small district offices were opened in Sitka, Ketchikan, Soldotna, Wasilla and Nome. A full-time Southeast Regional Office was created, and a chemistry laboratory was started.

In reaction to the oil pipeline and Valdez marine terminal construction and imminent oil shipment, the legislature created a tanker inspection and regulation program, including a requirement for financial responsibility to deal with oil spill cleanup damages. Significantly, that portion of the law dealing with tank vessel design and operation was struck down in federal court. At that point the state adopted legislation requiring oil spill contingency planning. The public facility, seafood sanitation and meat inspection programs were transferred to the department in about 1981, and the first few staff were hired to begin to deal with hazardous waste.

By the early 1980's, most of the department's current programs existed and a strong regional/district office organization was being formed.

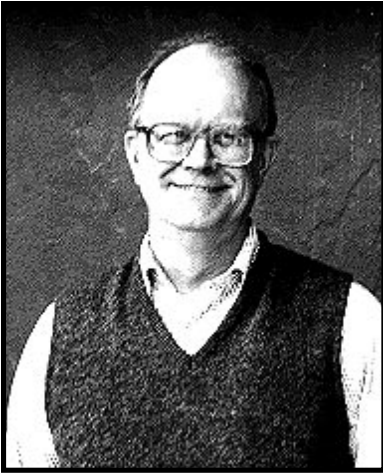


Deena Henkins

Photo by David Job

"The principal programs were water pollution control with embryonic air quality ..., solid waste ..., pesticide ...and radiation protection."

Reflections



Doug Lowery

DOUGLAS LOWERY

Six months after the creation of the new Department of Environmental Conservation, the Northern Regional Office began on the morning of January 10, 1972 when I showed up at the State Court and Office Building. I opened the Fairbanks office that day and supervised it for nearly 15 years.

The staff in Fairbanks came from the Office of Research and Academic Coordination on the University of Alaska-Fairbanks campus. It consisted of Joe Alter, his secretary, and a vacant sanitary engineering position. Jon Scribner had filled the sanitary engineering position under the former division, and when it disbanded he had been promoted and already moved to Juneau with the new department. It was his old position that I had come to Fairbanks to fill.

On that opening day, we had two employees — Jerry Hok and me. Our office space was in the Governor's Conference Room where we had no office furniture, phones, or secretary. We ordered furniture, obtained a post office box, arranged for phones and a state vehicle, and for help from Environmental Health (EH) where all the files were held. None of the files were transferred to the new office—we started more or less from scratch. Regulations were in a state of flux, as the ones we were to enforce were either being transferred from EH or were being developed.

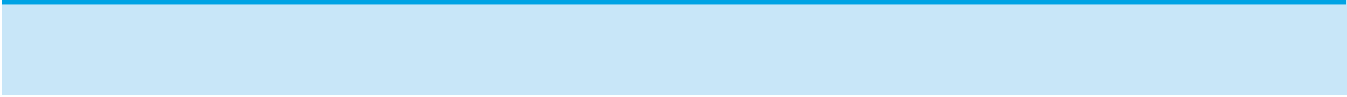
In the beginning, only one sanitary engineer carried out the duties and implemented the programs of the new department. That position, with an additional one, had the responsibility for preventing and abating water, land and air pollution of the environment within the region. Their duties included surveillance of sewage disposal systems, water supplies, and solid waste disposal practices, consultation with private and public officials relative to solution of pollution problems, plan review, public meetings, complaint follow-through and enforcement of pollution standards. Quite a workload for a staff of two! Even through the next few years, the staffing of NRO was small for the amount of environmental regulations we had to enforce.

During our second month we hired a clerical staff member and John Janssen, so our staff doubled. Our office, still in the Governor's Conference Room, became crowded quarters. Most of our work was either giving technical assistance or "putting out fires." We had very little travel money — about \$5,000 for a staff of three — even though we could travel further for less those days.

Office space on the first floor of the Alaska Court and Office building was home until the fall of 1975, when we moved into the new State of Alaska Fairbanks Regional Office Building. We remained there until the end of 1986.

For almost two years, we handled the environmental problems of the region with our staff of four. Changes came on November 16, 1973, when the President approved pipeline legislation, giving the Alyeska Consortium the go-ahead to begin

"In the beginning...their duties included surveillance of sewage disposal systems, water supplies, and solid waste disposal practices, consultation with private and public officials relative to solution of pollution problems, plan review, public meetings, complaint follow-through and enforcement of pollution standards. Quite a workload for a staff of two!"



construction of the Trans-Alaska Pipeline. Department responsibilities increased overnight, requiring pipeline review of plans for water, sewage, solid waste, pesticides, etc. But staffing stayed the same.

All of the department's responsibilities for the pipeline north of Glennallen were handled out of the NRO. At the same time the Federal/State Pipeline Coordinator's Office was addressing many of our concerns through the JFWAT (Joint State/Federal Fish and Wildlife Advisory Team), whose organization did not include DEC representation. Periods of conflict alternated with cooperation. By 1975, our staff had nearly doubled to seven and the pipeline was in full swing.

NRO's staff grew to 17 in 1977, partly attributable to the drinking water program. Two years later, NRO's staff again increased to approximately 25 with the Hazardous Waste Program and project review for the Alaska Natural Gas Transportation System.

During my tenure as supervisor, the office implemented many changes, including a filing system that remains the best in the department today, and computer use in tracking permits, field activities, budget, and workplans in order to meet various deadlines. Since 1986, my responsibilities have been with the solid waste program and later as the Regional Solid and Hazardous Waste Coordinator.

As supervisor of NRO, I saw expanded regulatory control, increased staffing, several departmental and regional office reorganizations, and numerous environmental litigations and enforcement actions. NRO has always viewed technical assistance, education, and working with the public as its primary responsibility for protecting the environment. We have always gone the extra mile to be courteous and helpful while seeking to correct a real or potential problem. NRO staffing has consistently been of outstanding, very professional quality.

"WE'RE HARD AGROUND...AND LEAKING SOME OIL"

by Joe Bridgman

At four minutes after midnight on Friday, March 24, 1989, the tanker vessel *Exxon Valdez* ran aground on Bligh Reef in Prince William Sound. The reef is a well-charted navigational hazard, more than three miles out of the charted route for tankers transiting from the Alyeska Pipeline Service Company terminal in Valdez. The accident ruptured eight of the eleven cargo compartments in the fully-loaded tanker. The resulting spill of North Slope crude oil totaled nearly 11 million gallons, and remains the nation's largest tanker spill.

In the days and weeks following the spill, more than 1,200 miles of pristine Alaska shoreline in Prince William Sound and the Gulf of Alaska were oiled, and many thousands of birds and marine mammals died. The spill was far worse than the worst-case scenario envisaged in Alyeska's oil spill contingency plan in effect at the time.

The State of Alaska launched a tremendous program to monitor, assess, map, sample, and support the attempts to contain and clean up the spilled oil. The Alaska Department of

When the Exxon Valdez spilled its cargo into Prince William Sound, Valdez resident Joe Bridgman, found himself hired by DEC's Public Information Office, to help the enormous influx of state national and international reporters and their need for information from DEC. His experience as a news reporter, training as a writer and journalist, and experience on the Spill front line has eminently qualified him to pen this account.

PHOTO -tanker with boom

Environmental Conservation was the lead agency for the state, working with other state teams from the Governor's Office, Emergency Services, and the Departments of Fish and Game, Natural Resources, and Health and Social Services to accomplish the necessary tasks.

In the years before the *Exxon Valdez* rammed Bligh Reef, DEC had gathered on its staff a circle of experienced oil spill personnel. These staff members, occupying DEC offices across Alaska, had handled hundreds of large and small contamination incidents and altogether had accrued more than a century of oil

"We're Hard Aground..."

The telephone calls began at 1:05 a.m. on March 24, one hour after the tanker accident, when the department's district supervisor in Valdez, Dan Lawn, learned of the accident... By 4 a.m. nearly all of [DEC's spill team members] were en route to Valdez or making plans to go. At daybreak, additional DEC staffers were flying in two aircraft, charting the spread of crude oil into central Prince William Sound.

spill duty with DEC.

After the *Exxon Valdez* accident, this group contributed the momentum with which the department mounted its response. Its members are part of the State Spill Response Team described in the Alaska Oil and Hazardous Substances Pollution Contingency Plan, and their actions followed this plan.

THE INITIAL RESPONSE

The telephone calls began at 1:05 a.m. on March 24, one hour after the tanker accident, when the department's district supervisor in Valdez, Dan Lawn, learned of the accident and recognized that the resulting oil spill was bound to be large. He called his supervisor, Bill Lamoreaux, at home in Anchorage and asked that the spill team's members be dispatched to Valdez. By 4 a.m. nearly all of them were en route to Valdez or making plans to go. At daybreak, additional DEC staffers were flying in two aircraft, charting the spread of crude oil into central Prince William Sound.

In Juneau, department managers gathered in Commissioner Dennis Kelso's office for an early morning strategy session, which Gov. Steve Cowper joined by speaker phone at 9:15 a.m. Just seven hours after this meeting the commissioner and governor were aboard the stricken tanker.

The commencement of DEC activities in Valdez and Prince William Sound was automatic, limited only by the supply of workers. (The personnel shortage was quickly addressed: 33 hours after the tanker accident 26 DEC personnel had arrived on the scene to assist the Valdez staff of four.)

Other DEC personnel met at an Anchorage hotel and diagrammed the state's key needs. These were: aerial spill tracking, cleanup, logistics and supply, legal documentation, scientific assessment, and liaison and coordination.

COORDINATION OF STATE AND FEDERAL AGENCIES

Personnel from DEC and the Alaska Department of Fish and Game initiated the first major science meeting in Valdez the day after the spill, at which Exxon, federal and state government agencies and other groups sought coordination on impact studies and on baseline studies that had to begin immediately.

Coordination between the many government agencies with interests in Alaska's shores and wildlife became a distinct challenge as early as the second day, when weather forecasts indicated that shoreline in Prince William Sound soon would be fouled by the floating slick. Indeed, oil began to go ashore in quantity late on the third day: some shoreline behind the tanker already had been lightly oiled by shifting tides.

By Wednesday the 29th, a committee of state and federal resource agencies, including DEC, was addressing the need for removal of the oil from the shoreline. This group became the Interagency Shoreline Clean-up Committee.

THE BATTLE OF SAWMILL BAY

The rapport between commercial fishermen and the state started on the first day, when representatives of Cordova District Fishermen United alerted DEC officials in Valdez that critical salmon grounds were threatened by the oil. DEC then invited CDFU representatives into the decision-making process.

On Sunday winds from the northeast increased as forecast, and concern concentrated on the salmon spawning areas and hatcheries in southwestern Prince William Sound. By Sunday afternoon the leading edge of the slick was nearing Naked Island, and it was clear to DEC spill trackers that the oil would continue to move in a southwesterly direction.

The Armin F. Koernig salmon hatchery (the second most prolific of Prince William Sound's five hatcheries) and the village of Chenega were next-door neighbors in Sawmill Bay and directly in the path of the spill's leading edge. In meetings on Monday spill trackers estimated the hatchery was still a day or so downwind of the slick. DEC personnel and the CDFU fisherman thought this might be enough time to lay booms in protection of those sites.

Several state-contracted seine fishing boats from Cordova had taken on DEC staff and contract personnel in Valdez on Monday and had gone to Disk Island on Tuesday. They awoke there Wednesday morning to find their anchored vessels surrounded by thick, floating oil. Later in the day the Cordova seiners arrived in Sawmill Bay, along with other vessels contracted by the department.

On Thursday DEC and U.S. Coast Guard boom was airdropped, and DEC personnel began to deploy the boom with the assistance of DEC contract personnel. The outermost of three tiers of boom, spanning more than a mile of open water, was stretched in front of both the village and the hatchery.

Heavy oil slicks arrived at Sawmill Bay on Friday, March 31. Oil penetrated the first two booms, but was stopped by the third. Some beaches near Chenega were lightly oiled, but the hatchery was saved.

DEC GETS IN THE CLEANUP BUSINESS

In the coming days the DEC-led operation expanded to include full-scale oil skimming, augmenting Exxon's efforts to pick up floating oil. Commissioner Dennis Kelso called Mark Hickey, Alaska transportation commissioner, and asked if DEC could have a ferry. The state ferry Bartlett loaded up with material and personnel in Valdez and Cordova and sailed in the middle of the night toward Sawmill Bay, where it served as a supply and housing vessel. The ferries provided much-needed support for staff from DEC, the Departments of Fish and Game and Natural Resources and other state agencies, as well as Cordova fishermen and some Exxon-affiliated people.

The DEC-led skimming operation, including the ferry, fishing boats, some Exxon contract personnel and an armada of skiffs dubbed the "Mosquito Fleet," continued to skim oil. After a few days their productivity increased with the addition of the first "supersucker" vacuum truck to be used on the Exxon Valdez

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"We're Hard Aground.."

spill.

Leaving behind a contingent to maintain the booms in front of Sawmill Bay, the ferry and armada sailed north and skimmed oil in Herring and Northwest Bays on Knight Island until Exxon took over the state's skimming operation in early May.

LOGISTICAL SUPPORT

The state's defense of the Armin F. Koernig salmon hatchery and its success in recovering oil would have been impossible without an intense organizing effort behind the front lines. Offices complete with telephones, furniture, supplies and equipment had to be set up immediately in the state courthouse in Valdez. In addition, boom, radios, aircraft, boats, sorbents, food, automobiles and other equipment had to be acquired in a short time.

By Sunday night DEC had six aircraft operating in Prince William Sound. After six weeks, an estimated 12 helicopters and eight fixed-wing aircraft were working on the spill for the State of Alaska, obtained from the Air National Guard, Civil Air Patrol and DEC contractors. The use of aircraft was vital to keeping up with the slick in the entirely roadless area it was invading.

STRENGTHENING STATE REGULATIONS

The department moved quickly to put in place stronger regulations to reduce the risk of future spills and assure a better response to any future spill. Especially worrisome was the prospect of another major tanker accident while all of the industry's resources were tied up dealing with the existing calamity.

On April 7 the DEC commissioner issued an emergency order requiring Alyeska Pipeline Services Co. to radically increase its spill preparedness. The order directed the company to develop the capacity to respond to a 10 million gallon spill in Prince William Sound by acquiring six miles of sea boom, skimmers able to recover a total of 10,000 barrels of oil per hour, barges for storage of recovered oil and the personnel necessary to respond to such a spill.

Because of this requirement the Ship Escort/Response Vessel System is now in place. Ten SERVS vessels, including three 210-foot tanker towing and oil recovery vessels, are now based in Valdez. Each outgoing tanker is escorted across Prince William Sound by two SERVS vessels.

The state legislature in the 1989 and 1990 sessions passed a number of laws to increase penalties for negligent spills of oil or other hazardous substances, improve emergency response capabilities of a number of state agencies, increase financial responsi-

Incineration of trash

bility requirements for shippers of oil, and strengthen DEC's authority to require and enforce oil discharge contingency plans.

Alyeska Pipeline Shipping Service Co. produced a new spill contingency plan to codify the new requirements. It was approved for three years as of June 1, 1991 and will be reviewed under new oil spill regulations emerging from the recent legislation.

CLEANUP MONITORING

Individuals and agencies alike were shaken on the fourth day when the Exxon Valdez slick, driven by high winds, began washing ashore in Prince William Sound. It soon became clear that much of the coastline in the Gulf of Alaska faced a similar fate. Exxon officials spoke of mounting a massive shoreline cleanup campaign.

DEC now faced a huge task: expediting Exxon's removal of oil from Alaska's shoreline, while at the same time assuring that the techniques used did not cause more harm than good to the environment.

This obligation called for a small army of DEC field people. Through an intensive hiring and training program the shoreline treatment monitoring staff grew from eight people on May 1 to 40 people six weeks later. In mid-August 1989 the staff stood at 60 people, by far the largest of the state's spill response units in terms of personnel. But the group's job was to police a legion of Exxon shoreline treatment workers 100 times as large.

The state monitors lived on DEC-contracted boats, traveled in skiffs and communicated problems in the field to their supervisors in Valdez, Seward, Homer and Kodiak, where the problems were taken to interagency committee meetings. DEC used the meetings to address differences with Exxon over shoreline treatment actions. Few citations were issued.

During the 1990 season, Exxon launched a much-reduced cleanup effort, and the numbers of DEC monitors in the field decreased to 20. In 1991, the last season of cleanup, DEC field monitors totaled eleven, with an Exxon cleanup force of about 50 workers.

WASTE MANAGEMENT

The attempt to clean up what remained of the 10.8 million gallons of oil spilled from the Exxon Valdez was bound to generate unprecedented quantities of waste, and DEC was obligated to supervise the handling and disposal of the waste material.

Over the summer the department reviewed dozens of plans for the storage, rebagging, shredding and transportation of oily solid waste; for the incineration and open burning of trash and oiled logs; for the storage and transportation of recovered crude oil; and for the washing of everything from oiled kelp to oily boats.

The department also continued to assure public sanitation, a normal role now magnified many times over by the tanker accident.

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During the summer of 1989, 65,000 barrels of recovered oil/water emulsion were transported to refineries in other states, 21 million gallons of sewage were treated in Valdez and in a floating treatment lagoon, and 30,000 tons of solid waste generated by beach cleanup were transported out of state or incinerated in Alaska.

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The successive years involved fewer cleanup personnel, and the nature of the waste changed. In 1990 Exxon-contracted cleanup workers generated 5,000 tons of oiled debris and sediment which had to be disposed of properly. In 1991 debris totalling 614 tons was picked up. This included approximately 15,000 pounds collected by DEC personnel and local response groups while inspecting areas too "clean" to send in an Exxon team but too "dirty" to sign off on. The local response groups included personnel from Homer, Kodiak, Whittier, Seward, Tatitlek, Valdez and Cordova.

SEAFOOD

Another DEC role was greatly magnified by the Exxon Valdez oil spill: assuring the wholesomeness of Alaska seafood. The tanker accident occurred only weeks before important herring, halibut and salmon fisheries were scheduled to open at locations throughout Prince William Sound and the Gulf of Alaska, and the spill threatened these and subsequent fisheries at every level.

In cooperation with other state agencies, DEC took immediate measures to protect seafood consumers and the reputation of Alaska's seafood by launching a vessel, gear and fish inspection program to prevent any contamination of seafood by oil.

Under the state's "zero tolerance" policy, ADF&G closed many scheduled fishery openings because of the risk of fouling gear and catch. Guiding these determinations were DEC inspections of test-caught fish and spill tracking.

DEC provided villages in the path of the spill with the best information available about the oil's effects on subsistence seafood harvests. Department personnel visited villages throughout the season to train residents in fish inspection techniques, and subsistence users attended oil detection workshops at the Palmer lab.

DATA MANAGEMENT AND MAPPING

Data management has proven to be a centerpiece of the state's response to the *Exxon Valdez* oil spill. With the use of powerful microcomputers and state-of-the-art shoreline mapping programs, DEC led the field in processing and mapping data from the first day of the tanker accident.

Information from airborne observers regarding the severity of shoreline damage became some of the first data to be fed into the computers. The shoreline assessment teams also provided precise measurement of the extent of oiling: how thick, how wide, how deep.

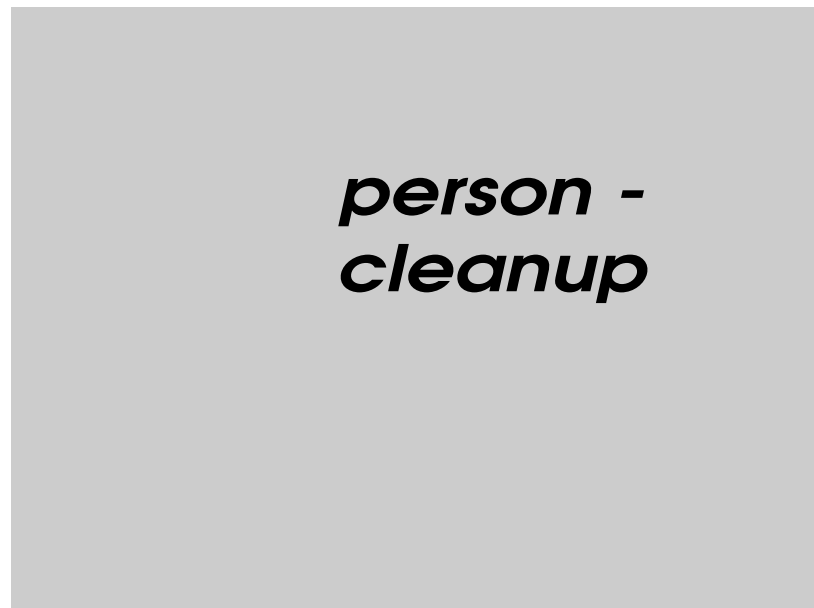
On May 11, DEC's information managers produced the first complete table showing how many actual miles of Alaska's coastline were contaminated at that time. Mapping staff contin-

ued to generate tables, maps, and charts to support state efforts and to provide information to the public.

SHORELINE SURVEYS

During the spill response, DEC, ADF&G and DNR staff were involved in five different shoreline survey programs designed to assess the extent of oiling on Alaskan shorelines. The first surveys were conducted in May of 1989, when the Shoreline Cleanup Assessment, or SCAT teams, composed of specialists from the state of Alaska, federal agencies and Exxon surveyed contaminated shoreline to make the first cleanup recommendations.

In September and October of 1989, following the cessation of shoreline treatment by Exxon, DEC conducted a so-called “walkathon,” in which teams of state employees spent weeks closely inspecting oiled coastline on foot and by skiff. In the spring and fall of 1990, and the spring of 1991, additional state,



federal and Exxon multi-agency surveys were conducted. The field data was tabulated by computer, depicted on maps, and used in planning cleanup work.

LOCAL RESPONSE PROJECTS

In September of 1989, after Exxon terminated cleanup operations, Governor Cowper called for a coordinated response to the *Exxon Valdez* oil spill by the communities and villages actually affected. DEC initiated memoranda of agreements with Chenega, Cordova, Kenai Peninsula Borough, Kodiak Island Borough, Valdez, Tatitlek and Whittier.

Response efforts conducted by citizens from the communities ranged from developing local offices to handling citizen concerns and managing local response to actual manual cleanup of the oil.

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The local programs altogether collected approximately 228 tons of oiled sediments and debris.

This local response program was the first of its kind, and certainly established the prototype for future grassroots involvement by local communities in a catastrophic situation. The Department is doing its best through support of local Emergency Planning Committees, to expand local readiness.

PUBLIC INFORMATION

From the beginning the press and the public had a voracious appetite for information about the *Exxon Valdez* oil spill and the complex response that followed. The public information function was among the first to be established on March 24.

In the nine months that followed, department personnel responded to an estimated 5,000 telephone calls, 1,000 walk-ins and 500 letters from members of the press and the public needing information about the spill. This demand for information has continued, though the volume has decreased. Into 1991, the department continued to publish reports on field activities; a monthly newsletter, the "Oil Spill Chronicle"; and to respond to requests for information from researchers, students, and the general public. Requests for information and updates continued to trickle in, and information is now regularly requested on the restoration phase of continuing work in the spill's aftermath.

TECHNOLOGY ASSESSMENT

The department knew that the difficulty of removing crude oil from Alaska shoreline would only worsen with time, and that innovative cleanup techniques would be needed more than ever. A departmental treatment technology screening group in Valdez evaluated proposals for the biological, physical and chemical removal of oil from the coastline.

The group received from the U.S. Coast Guard a list of 645 proposals, the most promising of those submitted to the federal agency since the spill. In addition, the DEC group examined 140 separate proposals received by DEC since the spill. Recommendations for treatment technologies that seemed viable were passed on to the Coast Guard and Exxon.

The Alaska Legislature in 1990 established the Hazardous Substance Spill Technology Review Council. This group, composed of federal, state, academic and citizen experts, evaluates the advancing state of the art in spill prevention and response for arctic and sub-arctic hazardous substance releases. The council makes recommendations to DEC and other state agencies to set clear ground rules for the use of new products and procedures for spill response.

SCIENCE

DEC's scientific investigations also continue in conjunction with other state and federal agencies overseeing restoration of Prince William Sound. In November and December 1989 a team of biologists, chemists and geomorphologists from the department conducted a month-long sampling study by boat. Additional

sampling studies were conducted in 1990 and 1991.

Analysis of the samples taken are producing information on the presence of hydrocarbons in the water and in the intertidal and subtidal sediments, the presence of hydrocarbon-degrading bacteria and the nutrients they use, and the health of organism populations.

CONCLUSION

There's no doubt that the Exxon Valdez oil spill has been the single biggest event in the agency's history. Staff from virtually every unit of the agency, and indeed from many other units in state government have all stepped up to do their part.

Under a new administration headed by Governor Walter J. Hickel and Commissioner John A. Sandor, DEC continues to monitor cleanup work and assess the conditions of shoreline in the spill area and to manage the restoration phase of work after the state's settlement of litigation with Exxon in 1991. As the response winds down, DEC has taken the lead by publishing a comprehensive set of regulations, policies and guidelines, developed in conjunction with sister agencies.

The agency can look forward to working with the oil industry to monitor and regulate the flow and transport of oil, implementing programs to limit the chances that a spill like the Exxon Valdez will ever happen again.

AIR QUALITY MANAGEMENT

Generally, Alaskans enjoy some of the best air quality in the nation. There are several exceptions to this, however. Cold, stagnant winter-time air, a topography dominated by mountains and ice, and the exhaust of civilization give Alaska air quality problems surprising for an area considered the “last frontier.”

Excessive **carbon monoxide** from vehicle exhaust in the air over Anchorage and Fairbanks has been a major issue since before 1971. **Dust** from vehicle traffic on unpaved roads, a nuisance in most cities, reaches concentrations which approach or exceed the health-related standards for inhalable particulate matter in some suburban areas of Juneau and Anchorage. **Wood stove smoke** from private homes also has resulted in excessive concentrations of particulate matter in the Juneau area and in very localized residential areas of several other cities.

The state also faces problems from **airborne toxins**, a variety of potentially toxic chemicals released by industrial plants and incinerators. One such trouble spot is in North Kenai, where a chemical plant releases ammonia. Other problems occur in Valdez, terminus for the trans-Alaska oil pipeline, where **volatile organic compounds** are released. **Benzene**, a component of crude oil and oil products and a potential cause of leukemia, also poses a concern.

Alaska’s air quality program works to prevent further degradation of the state’s air quality and to clean up past air pollution. It sets standards and regulations specific to Alaska’s environment and works with industry and community facilities though the permitting process to control pollutants released into the air. The program staff monitors air quality statewide and evaluates new pollution-control technology.

Why the Air Quality Program is Important

Seventy-five percent of the state’s population lives in the urbanized areas of Anchorage and Fairbanks where cold, stagnant air in winter creates problems. The gaseous emissions from private vehicles contribute 95% of the air contaminants cause winter-time violations of the health-related standard for carbon monoxide in Anchorage and Fairbanks. Carbon monoxide is a pollutant that reduces the blood’s ability to carry oxygen and can affect cardiovascular, nervous and pulmonary systems, and the fetuses of pregnant women.

The air in several parts of the state is affected by suspended inhalable dust particles. Particles smaller than 10 microns in size can irritate the eyes and throat and become lodged in the lungs to cause bronchitis and other illnesses. In Alaska the two areas with the most severe chronic particulate emission problems have been Juneau’s suburban Mendenhall Valley and the Eagle River Valley, outside of Anchorage.

History

1971:

Established by the legislature

1972:

May 26: first regulations take effect

1979:

Particulate monitoring begins in Juneau’s Mendenhall Valley

1981:

Mobile Emissions Test Facility demonstrates importance of vehicle inspection and maintenance in reducing carbon monoxide problems.

1982:

Programs begin in Juneau and Eagle River to eliminate particulate matter standards violations.

1983:

EPA delegates the prevention of significant deterioration program to Alaska

1985:

I/M programs begin in Anchorage and Fairbanks

1990:

Clean Air Act amended to require higher starting “cold start” efficiency of new cars.

Air Quality Management

Major Accomplishments

- The **Anchorage and Fairbanks vehicle I/M programs** are two of the most successful in the nation, and are attributed to cuts in CO of 15 to 20 percent.
- Innovative programs begun in 1982 in Juneau's Mendenhall Valley and the Eagle River area near Anchorage have **kept pollution from particulate matter in check** in those areas. The cooperative wood smoke monitoring/enforcement program in Juneau is regarded as the **nation's best at controlling wood smoke**.
- In **1980 DEC streamlined state permits** to establish air quality increments, cutting the number of required permits to about 100 facilities.
- Alaska's proposal to set **minimum standards for the efficient operation of cars and light trucks in cold weather** (temperatures of 20 degrees F. and colder) has been adopted by Congress as a major revision of the Clean Air Act.
- Working with industry, **most air violators in the state have agreed to clean up their air emissions**, including pulp mills in Sitka and Ketchikan, a lumber mill in Wrangell, petrochemical plants on the Kenai Peninsula, an electric power plant outside Fairbanks, seafood processors on the Aleutian chain and Alyeska's pipeline terminal.
- **Air monitoring programs** were installed in Sitka and Kenai; comprehensive monitoring programs were instituted in Anchorage, Fairbanks, Juneau and Valdez.

(continued, next page)

From the late 1970's until the early 1980's the Mendenhall Valley had wintertime air troubles from wood stove emissions during air inversions, a phenomenon caused by cold stationary air and an entrapping ring of mountains. Eagle River's problems result from its glacial past and have been caused by dust from unpaved roads.

Nitrogen oxides are emitted by the state's industrial plants. While average levels of the oxides are far below the national ambient air quality standards, the situation requires monitoring to ensure the substances are not released in excessive amounts. Nitrogen oxides are a contributor to smog, can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections.

Program Development

Alaska's air quality control program was established by the legislature in 1971, and the first regulations took effect on May 26, 1972. The regulations:

- established ambient air quality standards for six air contaminants;
- classified Anchorage and Fairbanks as non-attainment areas for carbon monoxide;
- set emission standards for sulfur dioxide and particulate matter from several classes of industrial/commercial facilities;
- limited visible emissions from motor vehicles, marine vessels and sources of ice fog; and
- established a permit to operate for larger emission sources.

The air quality program's efforts over the years have involved the following major issues.

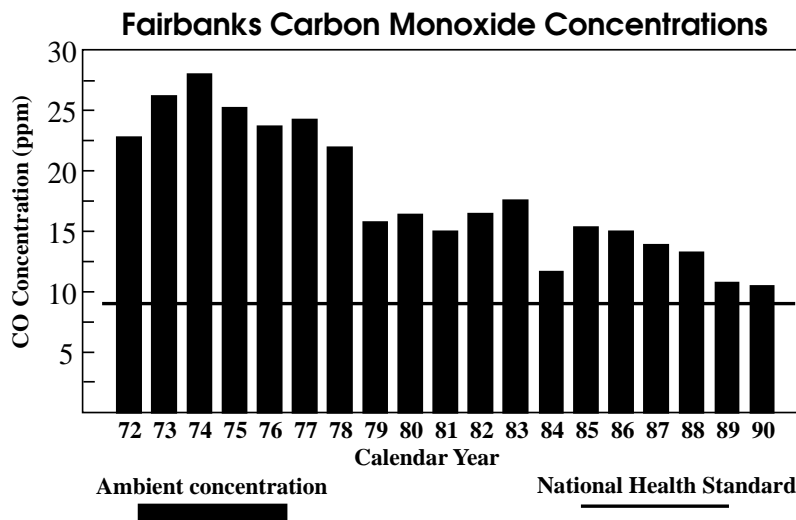
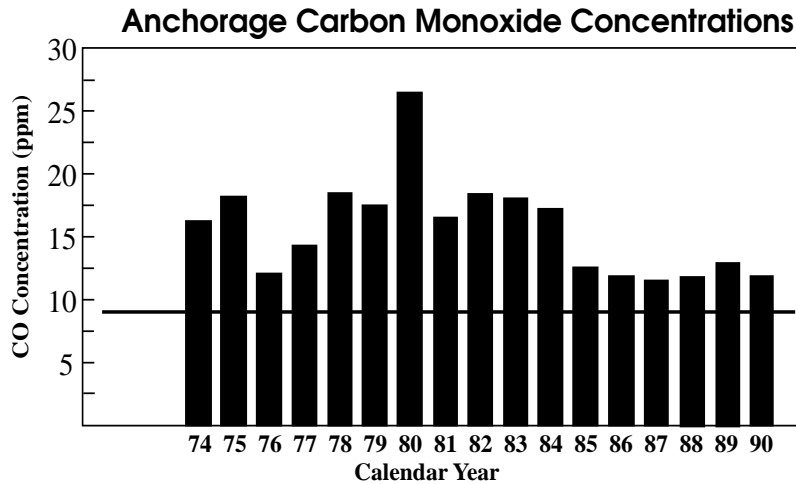
Carbon monoxide: While air quality in Anchorage and Fairbanks continues to exceed the national ambient standards for carbon monoxide (CO), emissions from autos have been greatly reduced. The genesis of the carbon monoxide problems is in the prolonged warm-up phase after a motor vehicle is started in cold weather. Auto makers traditionally design cars to vaporize more fuel in cold weather, which aids starting but results in incomplete burning of fuel.

In 1981 Alaska was successful in obtaining a Mobile Emissions test facility, dubbed METFac, from the U.S. Environmental Protection Agency (EPA). This facility cost EPA approximately \$1 million to build, and was a part of \$4 million spent on the investigation of cold climate inspection and maintenance (I/M) strategies, alternative fuels, Texas Instruments' heated carburetor grid, and other state-of-the-art devices. Tests conducted over the winters of 82-84 showed that I/M did work and was the most cost-effective strategy. Consequently, both the Anchorage and

Fairbanks carbon monoxide reduction programs included I/M as major components of their strategies. I/M has been very successful in reducing CO in both cities. After the tests, METFac was given by EPA to the Alaska Vocational Technical Center where the equipment was used to train mechanics from Anchorage and Fairbanks. Even with these improvements, Anchorage needs to update its air quality plan to address the remaining gap between

Major Accomplishments

- The first **statewide air quality report** was published in 1978 following public meetings to discuss air issues. Further reports were published in 1988 and 1990.
- **Testing of oxygenated fuels at cold temperatures** was completed—no adverse effects were noted on test vehicles. Wintertime use of these fuels will be required in Anchorage and Fairbanks during the winter, beginning 1992.
- In the summers of 1984 and 1987 the department used a **sophisticated wind sensing instrument to predict atmospheric dispersion of smoke** from the burning of slash from clearing at the Pt. Mackenzie agricultural project near Anchorage. The instrument was used to



actual air quality and the standards.

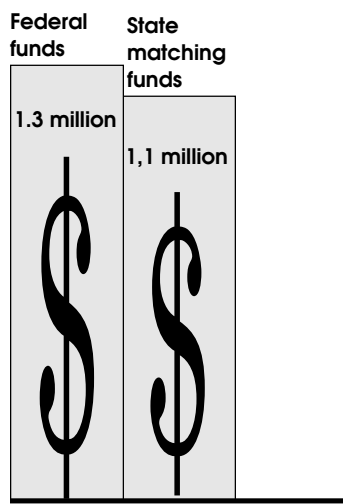
For more than a decade Alaska has been working on “cold start legislation” as a revision to the federal Clean Air Act. The idea is to have automobile makers design cars to produce low carbon monoxide emissions at 20 degrees Fahrenheit. EPA would then certify vehicles at that temperature. Prior to the passage of the Clean Air Act, Amended 1990, the EPA tested vehicles only between 68-86 degrees Fahrenheit. The new “20-degree F.” vehicles are scheduled for manufacture in 1994.

Particulate matter: In 1979 DEC began a particulate monitoring program in Juneau’s Mendenhall Valley which showed that rapid increase in use of wood stoves would result in

Air Quality Management

Program Costs

Total cost of the air quality program to the state, not counting other local grants, in FY 92:



TOTAL: \$2,400,000

particulate concentrations exceeding health standards. In 1982 an innovative program was begun, run cooperatively with the City and Borough of Juneau. It involved wood stove certification and a public information and education program on proper wood storage and wood stove use. Now whenever the level of particles in the Mendenhall Valley's air reaches a level just below the air quality standard, a ban is imposed preventing use of any but the most efficient wood stoves. This has prevented violations of the standards, thus avoiding the need to impose more severe restrictions.

In Eagle River Valley near Anchorage a program to pave valley roads also has worked to stop air violations. DEC also monitors for particulate violations in Fairbanks and Delta Junction, where agricultural dust and land clearing (burning) can pose problems; in Sitka (the site of a pulp mill); and in Nikiski, (site of a large chemical plant).

Stationary pollution sources: Alaska has fewer industrial operations than any other state and consequently fewer problems with air pollution from manufacturing. A 1988 survey found only 118 major industrial facilities in the state: 53 in or near Fairbanks and on the state's North Slope near the Prudhoe Bay oil field; 52 in Southcentral Alaska, including Anchorage and the Kenai Peninsula, and just 13 in Southeast Alaska. Air emissions from those facilities are regulated so that the plants are prevented from causing significant deterioration of local air quality.

Air quality staff worked successfully with the U.S. Senate during development of the 1977 Clean Air Act amendments to ensure that the state would have primary responsibility for implementing the new Prevention of Significant Deterioration (PSD) permit system. As a result of these amendments, the state revised its permitting program in 1982 to establish the air quality PSD program. Requirements were deleted for many smaller facilities and ones which posed no threat to health-related standards. This cut the number of permitted facilities to about 100.

A very detailed permit application system for new major facilities was put in place. Approximately 45 permits have been reviewed under this new program.

Congress recently passed a major revision of the Clean Air Act in which a new, broader federal permitting system is established. The air program is working with EPA to ensure that the new program will have minimal impact on the state's existing program. One major requirement which will affect many commercial and industrial facilities in Alaska is the assessment of permit fees by the state. The permit fees could range between \$500 and \$200,000 based on the size and type of facility and the quantity and degree of hazard of its emissions. The fee program would not be set in place until undergoing public review. Another requirement is that as many as 600 existing facilities not currently required to obtain permits will be required to do so.

After years of effort the state is on the threshold of working out compliance orders or consent decrees that should cause all the industrial plants to install, operate and maintain air control devices so their air emissions are within air standards.

PUBLIC DRINKING WATER

The Drinking Water Program of DEC seeks to improve the public health and reduce the incidence of water borne diseases of all Alaskans, whether living in urban areas or the “Bush.” The program administers the state’s drinking water regulations, which set standards for safe levels of contaminants and for operation of public water systems. The program also responds to water contamination emergencies, takes samples to identify and resolve contamination problems, provides technical assistance to water system operators and performs sanitary surveys of public water systems to identify possible health problems.

Challenges facing the drinking water program include diseases caused by microorganisms or viruses in drinking water such as salmonellosis, cholera, gastroenteritis, dysentery, hepatitis A, and typhoid fever. The organism *Giardia lamblia* from beavers or muskrats may contaminate the water, making it unsafe to drink without treatment.

Chemical contamination is also a growing problem. Chemical and fuel handling procedures in the state have contaminated some groundwater sources of drinking water. High natural concentrations of minerals such as arsenic have contaminated some wells in Alaska. The naturally-occurring minerals leach from the bedrock into a drinking water source.

Why the Drinking Water Program is Important

Giardia lamblia is a disease caused by microscopic parasites capable of causing abdominal bloating, cramps and diarrhea in humans. The parasites appear in the water in the form of cysts which are difficult to kill by customary water system disinfection.

Since 1974, ingestion of many chemicals which contaminate water have been linked to cancer, genetic mutations, and birth defects. Others cause ailments like liver disease, nausea, and kidney problems, while still others are known carcinogens.

Alaska has some 2,500 public water systems: about 500 are community water systems that serve 25 or more residents; some 1,100 are non-community systems that serve 25 or more people in facilities like schools, lodges, restaurants, and factories; and another 900 are systems that serve fewer than 25 people per month. The 1,600 community and non-community systems must test their water monthly to ensure that it is safe.

In Alaska, and nationwide, large utilities usually do their testing regularly and without problems. It is the smaller water systems that are prone to miss their samples. Whether from logistical difficulties in getting samples to a lab or water supplier inattention, missed samples mean no information on the safety of the water supplied to consumers. Systems that do not test

History

1972:

The Clean Water Act, a major amendment to the Federal Water Pollution Control Act, contains comprehensive provisions for restoring and maintaining all bodies of surface water in the U.S.

1974:

The Safe Drinking Water Act is amended to extend authorization for technical assistance, information, training, and grants to the states.

DEC is granted primary enforcement authority for the federal drinking water program

1977

The Safe Drinking Water Act is amended to authorize technical assistance, information, training and grants to the states.

1986:

The Safe Drinking Water Act is further amended to set mandatory deadlines for the regulation of key contaminants; to require monitoring of unregulated contaminants; to establish benchmarks for treatment technologies; to bolster enforcement powers; and to provide major new authorities which promote protection of ground water resources.

Public Drinking Water

Major Accomplishments

- In 1990 the Drinking Water Program revised its regulations to include Volatile Organic Chemicals (VOCs) and enhanced public notification procedures.
- The program implemented in 1989 a ban on lead pipe and solder in repairs and new construction of drinking water systems that connect to public water supplies.
- Currently inspects over 185 major public water systems yearly. Also reviews the results of public water supply tests and specifies corrective measures in 500 cases each year where contamination is indicated.

regularly are often the same ones that suffer from poor operation and maintenance, and are therefore most susceptible to contamination.

Even the incomplete information showed some 493 cases of bacterial contamination of public water supplies in Alaska in FY 1988. The state has averaged more than 300 cases per year for the past five years. To meet this challenge DEC is developing new cooperative working arrangements with the U.S. Public Health Service and other state and federal agencies to cost-effectively address drinking water issues.

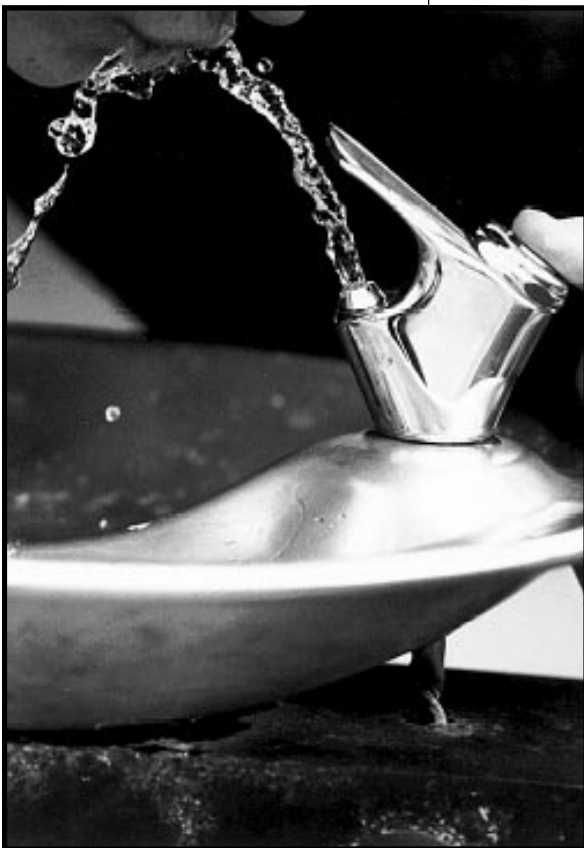
Program Development

Prior to creation of the Department of Environmental Conservation, the Department of Health and Welfare had public water supply regulations which were implemented primarily by a field staff of sanitarians. When the Department was created, the sanitarians remained in the newly renamed Department of Health and Social Services. Without field staff there was some question whether the new Department of Environmental Conservation could enforce the old Health and Welfare drinking water regulations. In fact, there was almost no regulation of public water systems until the department finally adopted a new set of public water supply regulations in 1979.

In the meantime, the federal Safe Drinking Water Act of 1974 required the Environmental Protection Agency (EPA) to set minimum standards for water contaminants and for state drinking water programs. The state was granted primary enforcement authority, or "primacy," for the federal drinking water program in 1978 and has retained it ever since. With primacy the state qualified for federal drinking water grant funding which, by FY 92, had grown to approximately \$1.3 million. The department believed then, and continues to believe that the state has a responsibility to ensure that public water supplies are safe, and that the state can do a better job of that in Alaska than EPA.

Along with the regulations in 1979, the program developed a data system on the state main frame computer system to track the analyses required of public water systems. This system, informally known as "IGOR," never worked well and finally was replaced in the mid-1980's with a custom-designed program usable on personal computers. This system was a great improvement, but it was not designed to track enforcement actions which EPA asked us to emphasize beginning in the mid-1980's. The system also was not designed for automatic transfer of data to the Federal Reporting and Data System at EPA.

In 1986 Congress passed amendments to the Safe



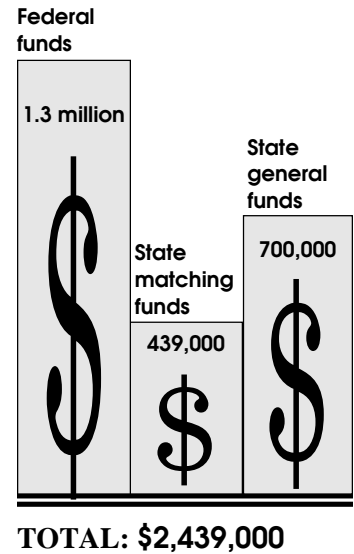
Drinking Water Act which require EPA and the states wishing to retain primacy to regulate at least 85 more contaminants, protect consumers from lead in plumbing fixtures, filter surface waters and provide more protection from pathogens by increased coliform monitoring. Final federal regulations for eight volatile organic chemicals (VOC's), public notification, surface water treatment and coliform monitoring are in effect. The department has adopted changes to its regulations which include VOC standards and public notification.

Current staff levels allow for inspection of over 185 major public water systems. The drinking water program also reviews the results of public water supply tests and specifies corrective measures in 500 cases each year where contamination is indicated.

A chart showing the compliance of public water supply systems in Alaska with the drinking water regulations appears on the next page.

Program Costs

Total cost of the drinking water program in FY 92:



Public Drinking Water

DRINKING WATER COMPLIANCE TARGETS FOR Fiscal Year 92

"Monitoring Compliance" = # systems in compliance/# total number of systems	REGION	SFY 90 TARGET	SFY 91 TARGET
BACTERIOLOGICAL			
# of systems in region			
563	SCRO	86%	86%
All Class A	72 SERO	90%	90%
	191 NRO	90%	90%
Class B Food Service, Schools, Day Care, Camps	SCRO	75%	75%
	SERO	75%	85%
	NRO	80%	85%
All other Class B Systems	SCRO	60%	75%
	SERO	70%	85%
	NRO	75%	85%
TURBIDITY			
All Class A Surface Water Systems	SCRO	75%	75%
	SERO	75%	75%
	NRO	75%	75%
INORGANIC CONTAMINANTS			
Ensure all Class A systems have at least one test result for inorganic series on file.	SCRO	100%	100%**
	SERO	100%	100%**
	NRO	100%	100%**
True Compliance	SCRO		50%**
	SERO		50%**
	NRO		50%**
RADIOLOGICAL CONTAMINANTS			
Ensure all Class A systems have at least one test result for gross alpha on file.	SCRO	100%	100%**
	SERO	100%	100%**
	NRO	100%	100%**
True Compliance	SCRO		50%**
	SERO		50%**
	NRO		50%**
PESTICIDE CONTAMINANTS			
Ensure all Class A systems have at least one test result of pesticide series on file.	SCRO	100%	100%**
	SERO	100%	100%**
	NRO	100%	100%**
True Compliance	SCRO		50%**
	SERO		50%**
	NRO		50%**
VOLATILE ORGANIC COMPOUNDS			
All Class A > 10,000		100%	100%
All Class A > 3,300 and < 10,000		100%	100%
All Class A < 3,300		25%	100%

Total # of systems = 3730

** Dependent on receipt of EPA special initiative data.

*** Class B compliance will be reported as a single percentage for FY 92

WASTEWATER CONTROL

The domestic and industrial wastewater control program seeks to ensure that both household and industrial wastewater is treated and disposed of in a manner that protects public health and the environment. A major issue facing the program is simply how to guarantee necessary treatment of the wastewater produced by all municipal sewage treatment plants, industrial complexes, subdivisions and single-family homes.

Alaskans using state funds and federal grants have spent hundreds of millions of dollars on improving local sewage treatment systems during the past three decades. Unfortunately, millions more are required to handle wastewater and the resulting sludge from sewage treatment plants, and to install other facilities needed to provide sanitary water and sewage systems.

Why the Program is Important

Human waste, or sewage is an obvious public health hazard. Many diseases are easily transmitted through contact with wastes. In addition to biological contamination, chemical substances released into Alaska's waters can negatively affect plant and animal life, the overall health of the environment, and drinking water.

Program Development

When the Department of Environmental Conservation was formed in July 1971, the state already had domestic and industrial wastewater statutes and regulations. Plan reviews of domestic and industrial wastewater treatment systems and waste disposal permits were required. Waste disposal permits were already in place for significant industrial dischargers such as the Collier Carbon Ammonia/Urea plant at Nikiski, the Ketchikan Pulp Company and Alaska Lumber and Pulp Company (now Alaska Pulp Corporation) in Sitka. Before the Clean Water Act was amended in 1972 to create the National Pollutant Discharge Elimination System (NPDES), the Department of Environmental Conservation and its predecessor, the Department of Health and Welfare, had required both pulp mills to install primary clarifiers to remove pulp fibers and other solids from their effluent before discharge.

After the creation of the NPDES permitting system, most of the department's wastewater permitting time was devoted to certification of federal NPDES permits, rather than on issuance of



Juneau's new sewage sludge incinerator.

History

1972:

The federal Clean Water Act is amended to create the National Pollutant Discharge Elimination System.

1973:

DEC adopts new wastewater disposal regulations, instituting subdivision plan review

1981:

Regional office staff begin review of NPDES permits

1990:

Major revisions made to the regulations on subdivision and sewer system plan review, to spell out submittal and approval criteria to make the reviews more consistent and predictable.

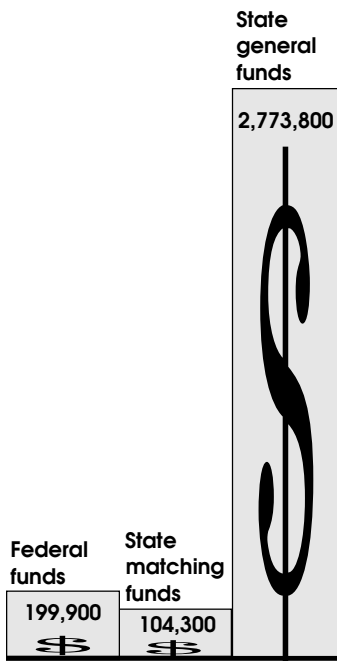
Wastewater Control

Major Accomplishments

- For industrial wastewater treatment and disposal, the program **annually inspects 300 systems**, and responds to up to 400 complaints.
- The program annually **certifies 20 federal permits** for major industrial wastewater discharges.
- Plans for up to **800 domestic wastewater disposal systems** and up to **200 new subdivisions** are annually reviewed for adequacy.
- **400 wastewater disposal systems** are inspected and response is given to up to 800 complaints of inadequate sewage systems.
- Program staff annually **certify about 2,500 single-family septic tank systems** (in cooperation with lenders) so people can secure home financing.

Program Costs

Total cost of the wastewater control program in FY 92:



TOTAL: \$3,078,000

state waste disposal permits. Certification of NPDES permits, and later Army Corps of Engineers permits for fills, was a central office function until 1981 when it was delegated, along with most other permitting, to DEC's regional offices in Anchorage, Fairbanks and Juneau. In the late 1970's the Environmental Protection Agency began issuing NPDES permits only to major dischargers as staff time allowed.

In 1973, the department adopted an entirely new set of wastewater disposal regulations, which implemented DEC's statutory authority to review public and private property subdivisions, as well as other aspects of mainly domestic wastewater collection, treatment and disposal. The regulations were revised periodically since then, including a revision of the subdivision and sewer system plan review section in 1990. Most domestic and industrial wastewater work, including response to complaints, technical assistance, plan reviews, permitting, inspections and enforcement, is done in regional and district offices.

Except for a growing amount of wastewater work due to increasing population, the only new wastewater program besides subdivision review since the department was formed was the bank loan certification program, one not required by state statute and regulation. In the mid-1980's the Alaska Housing Finance Corporation became the dominant mortgage lender in the state. AHFC required government health agency approval of on-lot water and sewer systems before a mortgage was approved. Except for the Municipality of Anchorage, only DEC had regulations governing on-lot sewer systems — even this department does not regulate private water systems. With the pressure of the housing boom at that time the department evolved a system in which registered engineers furnished information to the DEC, which then signed off on the loan if the systems met regulations.

AHFC eventually funded about half of the cost of the program, which in fiscal year 1990 was estimated at \$530,000, with 9 positions out of a total domestic wastewater budget of \$1.4 million and a staff of 24. The next fiscal year \$800,000 was cut from the domestic wastewater budget, an amount equivalent to 18 positions. With reduced program staff, the department has proposed to drop the bank loan certification program, since DEC is not required to conduct it. Instead, the department is offering workshops to inform them regarding how to conduct these reviews according to preferred environmental and public health criteria.

WATER QUALITY MANAGEMENT

Alaska, in its 586,000 square miles, has an estimated three million lakes, 365,000 miles of rivers, and 36,000 miles of coastal shoreline. Well over 99% of the state's waters, plus a similar percentage of its wetlands, are unaffected by human activities and thus remain in their natural state. More than 60% of the state's land mass qualifies as wetlands, a designation used to characterize land useful for water storage, aquifer recharge and for protection of bird and marine life. Most of Alaska's wetlands remain undisturbed.

While the quality of most of Alaska's rivers and streams is quite high, it can be impacted by industrial or developmental pressures in urban areas and by some natural resource extraction industries in rural areas. The state and its municipalities monitor more than 500 waterbodies, in both rural and urban areas, for pollution.



A host of issues relating to protection of state water quality is handled by the water quality management program. These include setting water quality standards, conducting monitoring programs, and issuing grants for water quality improvements. The program promotes responsible land use planning and permitting, particularly in the state's coastal areas and wetlands. The program also ensures water quality in Alaska in activities in oil and gas exploration and development.

The program leads the department functions in forest practices and other nonpoint source pollution controls and coordinates statewide efforts towards improved groundwater protection.

History

1972:

DEC's water programs put under the division of marine and coastal management. U.S. Congress passes the Coastal Zone Management Act.

1974:

DEC monitors construction of the Trans-Alaska Pipeline; oversight of the coastal zone management program is moved to the Governor's Office.

1977:

Trans-Alaska Pipeline is completed, duties to review environmental impacts of oil and gas development is shifted to DEC's water quality management section.

1978:

Alaska Coastal Management Program laws and regulations are established.

1979:

Alaska's Coastal Management regulations are issued. Thirty-three coastal resource districts are created, responsible for developing local coastal management programs.

First major amendments made to water quality standards since 1960's.

DEC begins certifying federal dredge and fill and NPDES permits under the Clean Water Act, which requires state review of projects that take place in wetlands.

(continued, next page)

Water Quality Management

History

1986:

Alaska's first water quality assessment is released.

1987:

Clean Water Act amended to include nonpoint source pollution control requirements and toxic controls. DEC applies for federal grant to develop nonpoint source assessment.

1990:

Water quality program receives federal grants for implementing nonpoint source program. Volunteer water watch program is established to enlist citizen involvement in water quality monitoring.

Why Water Quality is Important

According to the program's 1990 water quality assessment, more than 70 of the state's waterbodies are "impaired" by various types of pollution. Nearly 200 others of the 500 monitored are suspected of being affected by a range of pollutants including heavy metals, chemicals, sewage, sediment, and contaminants from urban runoff. Three waterbodies are impaired by toxic materials, with an additional 15 more suspected of having toxic contamination. Over 40 groundwater aquifers are contaminated.

Impairment means that the waterbody has been affected within the past five years by pollution incidents serious enough to violate state water quality standards. Contamination of the waterways varies in scope and degree, but specific uses most often compromised by the pollution include human consumption, recreation, and growth and propagation of fish, shellfish and wildlife.

The largest number of impacts are from urban development, followed by timber harvesting and oil and gas development.

Wetlands are habitat for a variety of fish and wildlife and are tied to the productivity of two-thirds of the nation's major commercial fisheries. They are important for improving and maintaining water quality since they filter harmful chemicals, store water to help prevent flooding and provide habitat for waterfowl. Nationwide, they are also the basis for a \$20 to \$40 billion-a year recreation industry.

On the North Slope, an estimated 9,160 acres of wetlands have been affected by oil development, while another 20,156 acres were affected by construction of the trans-Alaska oil pipeline haul road, now known as the Dalton Highway. Smaller acreages have been affected by **urban development**. For example, Anchorage has filled about 2,300 of the city's 8,800 acres since 1978, while Juneau by 1984 had filled 1,162 of its 9,208 acres of wetlands.

Alaska has forests covering 119 million acres, with 28 million classified as sufficient quality for commercial **timber harvest**. The greatest Alaska commercial forest is the nation's largest national forest, the 1.8 million acre Tongass National Forest in Southeast Alaska. The Chugach National Forest is located in Southcentral Alaska. Besides federal forest land, logging also occurs on 400,000 acres of Native-owned lands in Southeast, and potentially on some state-owned land in Alaska's interior.

Logging and road construction can affect water quality by increasing sedimentation in streams, sometimes directly, and at other times by facilitating landslides. Logging also can affect the vegetative debris that falls into streams, stream temperatures (and thus oxygen content), and the biological content of water through accumulation of bark on the bottom of waterways. The latter most often occurs at log transfer facilities. "Best management practices" for timber harvest and roading include routine monitoring for effectiveness in meeting state water quality

standards.

Mining in Alaska, especially hard rock mining, is currently on the rise. At present, there are two hard rock mines open in the state: the Greens Creek multi-metal mine on Admiralty Island in Southeast, which opened in 1989, and the Red Dog zinc mine outside of Kotzebue. The Usibelli coal mine at Healy has been in operation. Exploration efforts are also underway on a host of additional projects in Southeast and Southcentral.

Placer mining, in which gold is recovered from stream gravels, is more widespread. As of mid-summer 1989, more than 450 active placer mines were on record with the Alaska Department of Natural Resources. Placer mining operations vary in size from single-person operations to ones capable of moving more than 2,000 cubic yards of gravel per day.

Mining operations can affect water quality by increasing stream sediment erosion and turbidity (the amount of suspended particles in water) or by discharging heavy metals or minerals into the water. Under new federal regulations, placer miners must now recycle 100 % of their processing water to reduce turbidity. The effect on water quality from hard rock mines is regulated in state-certified federal water quality discharge permits. Reclamation of mining sites is evaluated for long-term water quality impacts.

Oil production in Alaska currently exceeds 600 million barrels yearly, or between 1.8 and 1.5 million barrels a day, comprising about one-sixth of the United States' production and one-tenth of its consumption. **Oil and gas** development can affect nearby waterbodies by increased impoundments and surface runoff, fuel spills, changed water routes and increased sedimentation and erosion through construction of causeways and use of drilling mud reserve pits. Groundwater is affected by oil leaks and spills, the most serious effects being observed on the Kenai Peninsula and at a number of military installations.

Prevention of groundwater pollution is the goal of the water quality program, through proper planning to predict the effects of oil and gas development on the environment and development of stipulations to safeguard and lessen adverse impacts.

While agriculture has been an industry in Alaska for nearly 200 years, it was traditionally a subsistence enterprise until major cooperative farming ventures were encouraged by the state in the Delta area and at Point MacKenzie, north and west of Anchorage, in the late 1970's and early 1980's. In recent years, however, the rate of agricultural development has declined.

Agriculture can affect water quality through increased erosion, sedimentation, pesticide and fertilizer runoff and the addition of animal wastes to water. So far, however, pollution from agriculture is local in scale and has had little statewide effect on waterbodies.

Major Accomplishments

- Every three years the program reviews the **state's water quality standards**, with the latest review in 1987. Mixing zone and zone of deposit amendments were completed. The next review will be completed in early 1992.
- Received federal approval of the statewide nonpoint source pollution control strategy and groundwater quality protection strategy in August 1990.
- Completed 3 biennial **reports assessing the quality of Alaska's waters**, including those affected by toxic pollutants, since 1986.
- Participates on the **interagency forest practices regulation team** to complete regulatory changes required under the revised Forest Practices Act, to improve water quality protection on state and private lands.
- In fiscal year 91, completed review of 45 **shellfish mariculture applications** in Southeast Alaska and began review of 33 shellfish applications in Southcentral Alaska for potential water quality impacts and compliance with public drinking water, solid waste and other regulations.
- In fiscal year 1991 **awarded five grants totalling \$85,000 to Alaskan communities** for local water quality monitoring activities.
- Incorporated **groundwater protection standards** into the department's underground storage tank, wastewater and drinking water regulations.

Water Quality Management

Program Development

In 1972, the department's water programs were organized under the division of marine and coastal zone management. Responsibilities were statewide coordination for the CZM program, marine monitoring, U.S. Army Corps of Engineers permit reviews, and water quality planning. The U.S. Congress in that year passed the federal Coastal Zone Management Act that required states to set up programs to plan for and control development in coastal areas.

In 1974, with election of Governor Hammond and as Alaska began to draft its coastal zone program, statewide oversight of the CZM program was moved permanently to the Office of the Governor. The remaining water programs now also included technical assistance on large water permits, industrial and municipal discharges, drinking water, water quality standards and regional water quality planning ("Section 208" of the federal Clean Water Act). A new division of program coordination coordinated the department's purview of CZM programs and broad planning initiatives.

In 1979, DEC reorganized, setting up two divisions: Operations and Management. Many functions were given over to the regional offices. Water quality responsibilities now included oil and gas issues and wetlands. Water pollution control retained its normal functions.

Responsibilities grew over the years, and by 1986, programs included the "404/401" (sections of the federal Clean Water Act) program governing wetlands. Other were fills, water quality standards, nonpoint source pollution, drinking water, underground storage tanks, oil pollution control, industrial and municipal waste regulations and discharges, CZM, oil and gas, local planning grants, placer mining, and water quality monitoring assistance.

DEC began conducting biennial assessments in 1986 of statewide water quality to determine which waterbodies are impaired or suspected of impairment by pollutants. Assessments are made from the results of monitoring conducted by DEC and several municipalities and agencies.

The groundwater program began in 1987, and in 1988, water quality management's responsibilities broadened to include a formal nonpoint source pollution control program.

The water quality standards program maintains and updates the state's water quality standards regulations, first promulgated in 1960 and the foundation of all the water quality management program's activities.

Water quality monitoring procedures were developed over the years for various types of industries, including timber harvesting and placer mining. Some procedures are conditions of permits to operate while others take the form of technical assistance provided to operators.

DEC serves on the statewide Coastal Policy Council, which

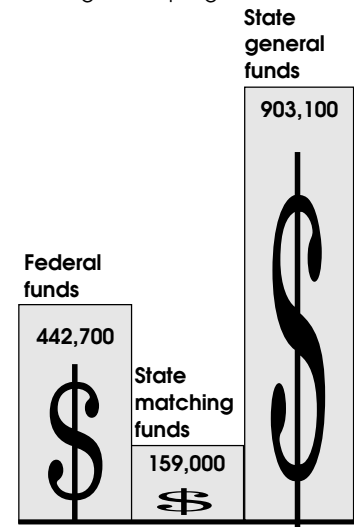
approves local coastal district management plans. Water quality program staff review coastal project proposals for consistency with the state coastal management program. Typical projects include oil and gas, mining, mariculture and other major industrial projects.

Congress recently passed the Coastal Zone Management Act Reauthorization of 1990. This act establishes eight coastal zone management objectives to be achieved through an enhancement grants program for which coastal states will compete. Some of the objectives which affect DEC are related to wetlands, cumulative impacts of coastal growth, and protection of coastal waters through establishment of a coastal nonpoint source pollution control program.

The oil and gas development program is currently participating for leasing parts of the Alaska outer continental shelf for oil development, in planning for continued development of the Prudhoe Bay oil field and possible development in the Arctic National Wildlife Refuge east of Prudhoe Bay.

Program Costs

Total cost of the water quality management program in FY 92:



Plus interagency receipts of \$199,800

TOTAL: \$1,704,600

Vertical line

SOLID AND HAZARDOUS WASTE

Alaska's trash problems by volume are smaller than in other states, largely because of the state's relatively small population, currently estimated at about 537,800. Still, the state's solid waste problems are daunting because of the large number of small communities, with populations and economic bases too small to benefit from the economies of scale needed to economically operate well-engineered, environmentally sound landfills. The high cost of surface transportation in Alaska also adds to the problem. And increasing land use pressures over the last 20 years have made it harder to find sites for solid waste disposal even in remote areas of the state.

The solid and hazardous waste management program seeks to protect Alaska's people and environment from the harmful effects of improper solid waste disposal, improper hazardous waste handling, storage, transport and disposal. The program develops and advises residents about methods for managing household, commercial and industrial solid wastes. To accomplish this, the program:

- ❑ issues permits for landfills that meet required standards;
- ❑ provides technical help to businesses and local communities for design of environmentally sound solid waste management facilities;
- ❑ assists port facilities and coastal communities to comply with 1989 U.S. Coast Guard regulations under the International Convention for the Prevention of Pollution from Ships;
- ❑ does regional planning for waste reduction and future recycling efforts; and
- ❑ sets standards through regulations for hazardous waste management, handling, storage, transport and disposal.

Why is Solid and Hazardous Waste Management Important?

Poorly run landfills can contaminate ground water supplies through leaching. They can also foster blowing litter or attract animals, like bears. Given the lack of approved sewage treatment facilities in many rural villages, dumps sometimes handle sewage, or "honey-bucket" wastes. Dump fires cause air pollution and can spread to adjacent timber. Contamination of the aquifer under a landfill can make land ownership a liability rather than an asset. Waste disposal usually limits the future uses of a disposal site by making the land unstable for building foundations.

Early Alaskan solid waste disposal practices were especially careless, and many of the same attitudes about garbage still exist

History

1973:

The state's first solid waste management regulations are established.

1976:

The federal Resource Conservation and Recovery Act (RCRA) is passed, banning open dumps and establishing criteria for the siting of landfills.

Ban on open dumping takes effect.

1981:

Alaska's hazardous waste law is passed, establishing a hazardous waste program in DEC.

1982:

A proposed five-year solid waste management plan is drafted.

1983:

Anchorage begins design of its model landfill.

Solid waste regulations are updated.

DEC begins annual hazardous waste collection service.

1984:

Congress strengthens RCRA and Alaska adds new hazardous waste authority to the state program.

1987:

Hazardous waste regulations adopted in July, solid waste regulations updated in September.

(continued, next page)

Solid and Hazardous Waste

History

1989:

U.S. Coast Guard issues regulations stating that trash from the state's large maritime industry can no longer be dumped at sea. Maritime trash must be accepted by coastal communities for on-shore disposal—the result of the "MARPOL" annex to a 1989 international high-seas marine litter treaty.

1989:

DEC adopts regulations on the siting of hazardous waste facilities in Alaska.

1990:

The community hazardous waste collection program collects about 88 tons in eight communities.

today. Waste generation rates are also increasing. Alaskans generate more than 5 pounds of garbage per day for every resident of the state, meaning that Alaska generates between 500 million and 1.01 billion pounds of trash per year. (The average U.S. citizen produces ___ per year.) The development of new areas and increasing population in the villages also means growth in the number and size of the dump problems.

About one-half of the state's trash is produced in Anchorage. Fortunately, the municipality has an environmentally sound, state-of-the-art landfill, begun in 1983. With state assistance, the municipality also set up a model community hazardous waste collection and transfer facility at the landfill to encourage recycling and collection of non-industrial hazardous material for shipment to approved disposal facilities in the Lower 48 states.

The remaining one-half of the state's waste finds its way into about 400 municipal landfills of varying design and quality. The state's 20 largest municipal disposal facilities serve more than 90 percent of the state's population, and these facilities receive the highest priority in DEC's monitoring program.

Federal regulations for solid waste disposal facilities are becoming more stringent in response to well-publicized pollution problems in eastern states. Meeting the national standards for landfills may help Alaskans avoid the pollution and garbage crisis that has developed down south, but changing long-held attitudes about needing cheap and easy garbage disposal poses a significant challenge to the DEC solid waste program.

According to DEC studies, in 1989 Alaskans generated an estimated 8,870 tons of **hazardous wastes**: 6,860 produced by households, and just over 2,000 tons generated by industry, businesses and government. The military was the second largest producer of hazardous waste in Alaska, accounting for 15 percent of the state's large-volume production. At present, while household hazardous waste is being properly managed in Anchorage, in most parts of the state it simply finds its way into landfills. Industry generally stores its more dangerous wastes in a handful of facilities until it can be shipped outside for disposal. By current estimate, about 3,600 tons of hazardous wastes were shipped from the state in 1989.

Program Development

The state of Alaska has been advising landfill operators on ways to curb trash problems since 1973, when the state's first **solid waste management** regulations were established. DEC's regulatory efforts increased with drafting of a proposed five-year solid waste management plan in 1982. That plan grew out of passage of the federal Resource Conservation and Recovery Act (RCRA) in 1976 which banned open dumps and established criteria for the siting of landfills.

The ban on open dumping went into effect in 1979 under Subtitle D of the act, which mandated minimum federal stan-



dards for state and local (usually municipal) landfills. It also established an overall regulatory framework for non-hazardous solid waste management, and authorized the U.S. Environmental Protection Agency to provide technical assistance to states. State and local governments were then made responsible for the planning and implementation of Subtitle D solid waste programs. Minimum criteria for states implementing the statutory ban and setting landfill standards were proposed by EPA in August, 1988.

The solid waste program has concentrated its efforts in recent last few years on bringing into compliance the 20 largest community waste disposal facilities, which collectively handle 90 percent of the state's solid waste. It has also focused efforts on getting government agencies and commercial-industrial waste producers to bring their landfills up to state standards.

Prior to July 1981, **hazardous waste** management activities were part of the department's solid waste program, created in 1971. The hazardous waste management program began in July 1981, following the enactment of Alaska's hazardous waste law. This law directed DEC to establish a hazardous waste program and develop regulations similar to the federal Resource Conservation and Recovery Act (RCRA) regulations.

In 1984, Congress strengthened the RCRA laws, and the Alaska Legislature revised hazardous waste statutes in the same year. New provisions were added to state laws, including a mandate to seek EPA authorization to administer a state hazardous waste program in accordance with RCRA. The amendments also directed the department to provide for temporary annual collection of hazardous waste from "small quantity" and household generators and to evaluate, regulate, and report on the siting of hazardous waste management facilities in the state.

The hazardous waste management program developed and adopted regulations which took effect in July 1987. The program continued technical assistance and public education efforts on hazardous waste management requirements, including statewide

Major Accomplishments

SOLID WASTE

- In response to DEC'S efforts, local governments and private waste hauling firms around the state have made notable improvements. The **landfill in Anchorage is designed and operated to the most up-to-date standards.** Powerful waste balers in a number of communities have extended the life of existing landfills.
- **"Rail belt" borough governments have consolidated waste disposal sites,** choosing to operate a few large landfills rather than many small dumps. This is a cost-effective way to serve large areas.

HAZARDOUS WASTE

- For the past seven years, **conducted spring-time community collections of hazardous waste** from local small-quantity producers.
- Completed **preliminary report "Hazardous Waste Management Facilities in Alaska,"** recommending to the governor and the legislature state actions that are necessary to manage hazardous waste in the state.
- Completed a **study that identifies the sources of hazardous waste** in Alaska (the Capacity Assurance Plan, December 1989), and produced regulations for control of wastes.
- In cooperation with Washington, Oregon, and Idaho, conducted a **workshop on waste management for dry cleaners,** and is planning a similar one for auto shop owners.
- Contracted with the Alaska Health Project to develop a strategy on how to deal with used oil wastes.

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Solid Waste and Hazardous Waste

Major Accomplishments

- Continues work with the Pacific Northwest Hazardous Waste Advisory Council to develop regional approaches to safe waste disposal.
- Conducted state-wide workshops on proper management of hazardous waste to assist small quantity generators, and offered technical assistance inspections.

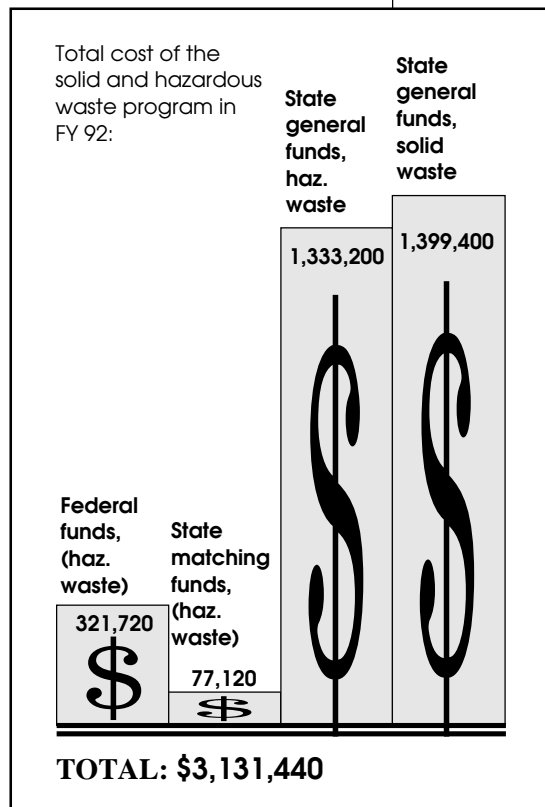
workshops to help specific industries reduce their generation of waste and to understand hazardous waste management requirements. Public education, technical assistance and community outreach continue to be essential components of the hazardous waste program.

The program adopted regulations, effective in March 1989, on the siting of hazardous waste management facilities. That October the program released and held public meetings on a preliminary report discussing hazardous waste management facilities in Alaska and the potential of siting such facilities in the state.

Since the department has not yet obtained authorization from EPA to operate the RCRA program in the state, the hazardous waste management program currently operates under a cooperative agreement with EPA to provide RCRA-related services. Activities include monitoring hazardous waste management facilities for compliance, investigating citizen complaints, developing facility permits (issued jointly by DEC and EPA), preparing enforcement actions, managing information such as annual reports from hazardous waste generators and handlers, and on-going program development to replace the EPA program currently in place in Alaska. The program also provides hazardous waste transporter reporting/tracking of shipments; planning for the capacity to handle hazardous waste in the state, including encouraging development of in-state facilities; and promoting waste reduction and pollution prevention strategies for hazardous waste.

The program's annual hazardous waste collection service is coordinated with municipal governments around the state. In 1983, the program collected approximately 15 tons of hazardous waste in two communities, and in 1990 collected approximately 88 tons in eight communities. The program will collect wastes in nine communities in 1992.

PROGRAM COSTS



COMMUNITY SANITATION FACILITIES

Without adequate water, sewer, and solid waste facilities the vitality of Alaska's communities is hampered, public health threatened, and opportunities for economic development severely restricted. As Alaska grew, many communities expanded beyond their public water, sewer and solid waste services. In many cases, facilities were needed in communities not previously served by a system. Building new facilities and replacing/expanding old facilities can be expensive and complex. Poorly-trained operators can pose dangers to public health through running facilities improperly, and poor maintenance can result in expensive repairs or re-construction.

Since the department's inception in 1971 it has worked with communities to prevent disease associated with contaminated drinking water and improperly disposed wastes, and to provide the sanitation facilities vital to community health. The four major programs to meet this goal are in the division of facility of construction and operation, and are summarized below.

Through the **Alaska Clean Water Fund**, communities may receive low interest loans for up to 100% of the costs of planning, designing, and constructing wastewater treatment and collection projects. The fund operates as a revolving loan fund, with repayments used to fund additional projects in the future.

The **municipal 50% matching grant program** was established to assist communities by matching the monies they pledge to water, sewer, and solid waste projects on a dollar-for-dollar basis. The program thus stretches state monies and at the same time assists communities in reducing potential health hazards and improving environmental conditions.

Since 1972, the **village safe water program** has served Alaska's smaller communities (second class and unincorporated cities with populations of 25-600) by providing funding and engineering assistance for safe drinking water and adequate sewage and solid waste disposal. Program staff provide communities with hands-on technical support, while each community maintains project control and responsibility. Grants are awarded for up to 100 percent of eligible project costs.



Community Sanitation Facilities

History

1970:

The Alaska legislature creates the 50 percent municipal matching grant program for water and sewer project design and construction.

1972:

Passage of the federal Clean Water Act creates wastewater improvement funding through EPA.

The village safe water program begins funding of rural sanitation facilities.

1974:

The operator assistance program begins for operators of waste, sewer and solid waste facilities.

1976:

Operator training and certification begins for operators of water and wastewater treatment facilities.

1981:

Alaska's remote maintenance worker program begins.

1987:

Amended Clean Water Act phases out federal construction grants and replaces them with revolving state loan programs.

1988:

Congress passes a bill specifying that Alaska Native villages could qualify for the grant program addressing wastewater needs of Indian tribes.

1989:

The Alaska Clean Water Fund begins operation.

The **operator assistance program** allows for a comprehensive state-wide approach to ensure the ongoing success of water, sewer, and solid waste systems throughout the state. Operator training and certification, the remote maintenance worker program, and over-the-shoulder training are the three components of operator assistance.

Why Sanitation Facilities are Important

Municipal wastewater treatment has improved significantly during the past two decades. In 1970 there were no secondary sewage treatment plants in the state. Wastewater disposal was generally handled by septic tank systems or by discharging raw waste into local waters. These practices presented severe health hazards and in several cases resulted in widespread outbreaks of disease. In contrast, today nearly all larger communities in the state operate primary or secondary treatment plants and not a single Alaska community appears on the national municipal policy list of non-complying publicly-owned treatment works.

The availability of quality public water for residents of Alaska's larger communities has also improved significantly. For the past two decades, the matching grants program has assisted communities in planning and constructing facilities to meet growing needs for high quality drinking water. Over the last few years, however, federal drinking water regulatory requirements have become increasingly more stringent. As a result, many Alaskan communities will need to construct improvements to their water treatment facilities. Municipal matching grants will likely assist communities in making these improvements.

Perhaps one of the most pervasive problems resulting from population growth is solid waste disposal. Substandard landfills throughout the state have resulted in contaminated surface and ground water, animal foraging, and windblown litter over the surrounding landscape. In the past five to ten years communities have begun constructing higher standard landfills using matching grant program funds. During the last five years many larger communities have also used the funds to develop more comprehensive solid waste management programs.

The large public capital investment in water, sewer and solid waste facilities throughout the state dictates a similar major effort to ensure the proper operation and maintenance of these facilities. The loss of a single facility can result in replacement costs to the State in excess of \$1 million. Protecting facilities from freezing during winter is of vital importance. Not only is the facility endangered, but residents may be without safe drinking water, fire protection or sewage disposal until the system can be thawed and repaired. The cost of these emergency repairs is extremely high. Prevention—through training—is a much more cost effective alternative.

Program Development

When the Department of Environmental Conservation (DEC) was created in 1971, funding for water and sewer capital improvements was handled by the state Department of Health and Welfare, with most funding for projects in rural areas provided by the U.S. Public Health Service. Another funding source was available through voter-approved bond issues to fund capital improvements.

The U.S. Environmental Protection Agency became a new major source of wastewater improvement funding through the federal Clean Water Act of 1972. Since then, communities with larger, more complex wastewater projects have come to depend upon the federal government for grants to partially finance their projects. During its nineteen years of operation, the construction grants program (presently administered by the division of facility construction and operation) provided a total of over \$195 million in federal grant monies to twenty-six Alaska communities for needed wastewater treatment and collection projects.

In 1987, however, Congress amended the Clean Water Act to phase-out the 15-year-old construction grants program and phase-in state revolving loan programs. The **Alaska Clean Water Fund** is Alaska's response to this change in national direction. The fund began operation in 1989, and during the last three years has been awarded over \$28 million in federal capitalization dollars. The legislature has also appropriated \$8.5 million to the program, making a total of over \$36.5 million available for community assistance. By 1994, the program has the opportunity of securing another \$25 million in federal monies.

The Alaska Clean Water Fund consists entirely of state appropriations. Low interest loans are offered to communities in lieu of direct grants, or to augment 50% matching grants, made for up to 100% of the costs of planning, designing, and constructing wastewater treatment and collection projects. Returning monies are then used to finance additional projects. This year communities requested over \$96 million from the fund. By 1994, the program is projected to be self-sustaining.

The other non-grant financial option open to communities is bonds. However, a community receiving an Alaska Clean Water Fund loan, with a 4.5% interest rate, will save approximately 50 percent over issuing bonds to finance their project.

Grants from the Municipal Matching Grant program may be combined with Clean Water Fund loans so communities need only deal with DEC staff for complete financing of water pollution control projects.

In the future, the Clean Water Fund may be expanded to offer low-interest loans to communities for water, sewer, and solid waste projects ineligible for the federal wastewater loans. Last year alone, DEC received community requests for these types of loans totalling over \$100 million. Enabling legislation was passed to create the new loan program and regulations

Major Accomplishments

CONSTRUCTION GRANTS PROGRAM:

- Provided a total of **over \$195 million in federal grant monies** to twenty six Alaska communities for needed wastewater treatment and collection projects.
- Brought **over \$220 million in federal monies** into the state's economy.
- **Assisted over 200 of Alaska's communities** during the last two decades, identifying needed projects and working with all levels of government agencies and the private sector to secure funding for and to ensure the success of all phases of sanitation projects.
- **Reduced the incidence of water-borne disease** in many parts of Alaska and helped ensure compliance with wastewater discharge standards.

THE ALASKA CLEAN WATER FUND:

- Made available **\$36 million for community assistance**, with over \$28 million from federal capitalization dollars.

MUNICIPAL MATCHING GRANT PROGRAM

- Since 1970, **assisted over 61 communities and provided over \$223 million in matching grants.** The program has been responsible for sharply upgrading wastewater treatment, solid waste disposal and drinking water quality in the state's urban areas.

VILLAGE SAFE WATER PROGRAM:

- **Helped over 150 remote Alaskan communities** plan, design, and build sanitation facilities with over \$224 million.

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Community Sanitation Facilities

Major Accomplishments

- Placed **Alaska as the foremost participant in the national grant program** to address the wastewater needs of Indian tribes.

OPERATOR CERTIFICATION PROGRAM

- **Over 700 individuals in Alaska were certified as operators** of water, sewer and solid waste facilities.
- **Established the Remote Maintenance Worker Program** which now covers 107 of the 220 remote Alaska villages.

adopted. A state appropriation needs to be made, however, before the program can begin addressing the community loan requests.

The legislature created the **50 percent municipal matching grant program** for municipal water and sewer project design and construction in 1970. In urban areas, this grant program provides part of the money for improvements. The program emphasizes local funding participation to strongly encourage community interest and better project management, with lower total project cost than one fully funded by the state. Shared funding provides local governments incentives to implement local water and sewer master plans, to develop long range financial plans, and to raise local revenue. The program encourages local governments to resolve their own sanitation problems.

The municipal grants engineering staff assists communities in developing project facility plans and reviews engineering plans, contracts, and change orders. Staff members also provide on-site technical inspections to ensure that projects meet statewide standards suited to local conditions, and operate as expected.

Municipal matching grants are supplemented by direct capital grants appropriated by the legislature for specific projects and by the Alaska Clean Water Fund loans. In unincorporated communities, sewer and solid waste projects are funded by the Village Safe Water Program.

Since 1970 the municipal matching grant program has assisted over 61 communities and provided over \$233 million in matching grants.

In the late 1960's, U.S. Senators Ted Kennedy and Ted Stevens toured rural Alaska and were appalled at the lack of sanitation services in remote villages. Their reaction was the promotion of the **village safe water program**. During its first six years of operation, VSW constructed one or two projects a year. Then, in 1978, voters approved bonding for eleven communities to receive VSW facilities. In 1980, voters approved bonding for similar projects in twenty additional communities. After 1980, legislative appropriations became the funding source for VSW projects.

Today, engineering staff may work in up to fifty villages during any given year. The program has helped over 150 remote Alaska communities plan, design, and build sanitation facilities with monies in excess of \$224 million. In fiscal year 1992, the state legislature funded over \$28 million in projects through the village safe water program.

Program goals have expanded from simply planning and constructing projects to working with communities to ensure a project's continued success well after construction completion. VSW is a "dirty

boots" outfit. Engineering staff, experienced in cold climate utility development, work primarily in remote villages, helping



out when the community does not have the management expertise needed for a major capital project. VSW also helps communities review alternatives for solving their sanitation problems, the capital costs of these alternatives and operation and maintenance expenses after project completion.

Force account construction practices are usually employed during a VSW project. In this way, the local work force and local economy benefit directly. VSW provides assistance in expediting materials, construction supervision, and project inspection.

In 1987, Congress re-authorized the Clean Water Act and provided a grant program to address the wastewater needs of Indian tribes. Alaska Native villages were not considered eligible participants. VSW worked successfully with EPA and Alaska's Congressional Delegation to reverse this and, in 1988 Congress passed a bill specifying that Alaska Native villages could participate in the program.

Since that time, VSW has captured over one-third of all grant funds made available nationally through the program and has worked closely with EPA to ensure that overburdening or inapplicable federal regulations and requirements are not placed on projects constructed in Alaska.

The **operator assistance program** was started in 1974 for operators of water, sewer and solid waste facilities. The program began with a single position, a shoestring budget, and a lending library with empty shelves. Training and certification of operators began in 1976, with state certification mandatory for operators in communities over 500 population. Today over 700 operators in Alaska are certified. Certification exams are given twice a year in over 35 sites across the state, and classroom training opportunities and seminars are provided on request. During the past few years DEC has worked with the U.S. Public Health Service in cooperative training ventures in rural areas. Most village operators have been to at least one of these sessions.

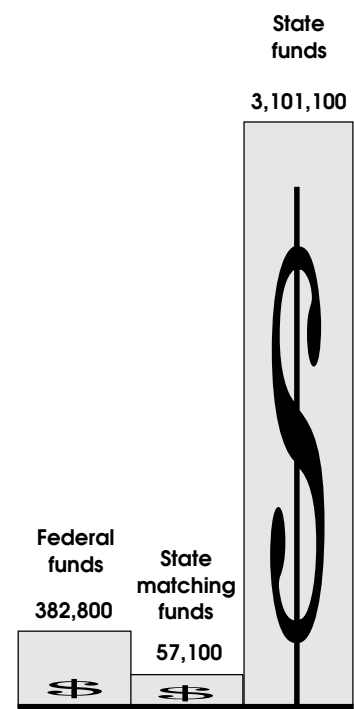
Educational services include developing training aides and materials specific to Alaska's unique culture and climatic conditions, and the program's lending library maintains many resources. The program also publishes a newsletter.

Future plans are to offer more individual training, develop new cold weather system curriculum, and use the new curriculum in existing training opportunities. DEC is also looking at ways the private sector and industry can help provide training on a volunteer basis to help stretch declining training funds.

A remote maintenance worker program was started by the legislature in 1981 in the Yukon-Kuskokwim and Norton Sound regions. It was set up to provide skilled preventive maintenance assistance to community water and sewer systems, on-the-job training for local operators and help in emergencies. The remote maintenance workers save millions of dollars in capital investments annually. Through this innovative program, the state provides grants to health corporations to place the workers in their regions. Each worker is responsible for aiding and advising village facility operators and assisting in emergency repairs. Of 220 remote Alaska villages, 107 are now covered by the remote

Program Costs

Total cost of the wastewater control program in FY 92:



TOTAL: \$3,541,000

Community Sanitation Facilities

maintenance worker program. In these villages, response time for repairs has been improved and “hands on” assistance is now available on a regular basis.

Through over-the-shoulder training, staff members provide on-site training in areas where sewage systems were constructed with federal funds. Facilities are evaluated to determine whether operation, maintenance, or effluent quality can be improved through training. To date, 25 systems have been evaluated and training has been provided in 22 communities. Training results in improved system maintenance, reduced the need for emergency repairs, and improved facility performance.

Future plans for the program include expansion to develop an inventory of publicly-owned water and wastewater utilities statewide to where operating problems can be corrected through training programs. A comprehensive assistance plan will be developed that blends formal classroom education, video presentations, correspondence courses, lending library resources, over-the-shoulder training, remote maintenance worker assistance, and rural business utility assistance.

OIL AND HAZARDOUS SUBSTANCES

Oily beaches and dead sea birds along the Cook Inlet were sometimes a problem even before the creation of the Department of Environmental Conservation in 1971. Tankers in-bound for the inlet's refineries would dump their oily ballast water, before arrival, to save time or because of inadequate capacity at the terminal. Impounding of the T/V *Rebecca* in 1968 by the federal Water Pollution Control Administration was the catalyst for a voluntary ban by the Western Oil and Gas Association on ballast discharges.

One or more untraceable discharges oiled the shores of Kodiak area Islands in 1970, possibly from legal discharges outside the 50-mile limit. The WPCA again brought about a voluntary ban, this time on discharges along the whole Pacific coast. These two events helped provide public support for creating DEC.

Two major events have shaped Alaska's spill prevention and response program more than anything else: the trans-Alaska oil



pipeline and the wreck of the super tanker *Exxon Valdez* in 1989. While most spills are smaller than 10,000 gallons, it is the threat or experience of catastrophe which has led to major changes in law, policy and budget.

The 800-mile trans-Alaska pipeline was conceived in 1969, about the same time as the nation's Environmental Policy Act. Construction in the mid-70's, and the pipelines start-up on June 22, 1977, galvanized the state's spill prevention and response program for the first two decades of the Department of Environmental Conservation's existence.

The nation's largest single petroleum discharge happened in Alaska on March 24, 1989, when the *Exxon Valdez* ran aground

History

1976:

Alaska enacts the "Tanker Safety Law," and DEC's oil pollution control program is formed.

1977:

June 22, operation of the trans-Alaska pipeline begins.

1978:

Federal courts strike down the Coastal Protection Fund and tanker standards in the 1976 tanker safety law.

1980:

DEC's oil pollution control program budget is reduced by 75%.

1982:

Under the Resource Conservation and Recovery Act (RCRA), Congress directs the state to identify and clean up sites on all lands contaminated by chemical leaks and spills.

1983:

About 1,000 drums leaking hazardous waste are discovered at North Slope Salvage at Prudhoe Bay.

DEC receives first insurance policy covering a barge operator's liability for pollution under Alaska law.

1984:

First report on hazardous waste sites in Alaska is published, based on a formal assessment of the 45 most suspect of the 100 known sites in the state.

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Oil and Hazardous Substances

Timeline

1985:

DEC staff finds illegally high levels of trichlorethane in 100 barrels abandoned near the Kenai Spur Highway at Nikiski. Following cleanup, DEC staff finds no measurable traces of the chemical in the groundwater.

1986:

House Bill 470 establishes the Oil and Hazardous Substance Release Response Fund, making funds available for cleaning up contaminated sites.

1987:

EPA funding establishes a permanent CERCLA program under the DEC's air and solid waste section.

1988:

The oil and hazardous substance spill response section within DEC is formed.

1989:

March 24: Grounding of the *Exxon-Valdez*.

Legislation creates the Alaska Oil Spill Commission and a new spill response office. Additional laws levy a 5-cent-per-barrel surcharge on Alaska oil to continually finance the state Response Fund and call for a state master spill plan for oil and hazardous substances spills.

1990:

Legislation creates the State Emergency Response Commission, a Hazardous Substance Spill Technology Review Council, and a Citizen's Oversight Committee for oil and Hazardous substances.

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on Bligh Reef in Prince William Sound, discharging nearly 11 million gallons of crude oil into the pristine marine environment 70 miles south of the Valdez oil terminal. It was the only major tanker accident in 10,000 tanker sailings from Valdez since the pipeline began operation.

DEC officials were the first to respond, arriving on the scene within three hours of the spill. The agency coordinated all state response and undertook independent cleanup operations in partnership with local communities. Working with the Coast Guard and Exxon, DEC set appropriate standards for cleanup, oversaw field operations, and ensured that the response dealt with critical community and agency interests.

The spill pointed to some major "holes" in state law in need of repair and an oil pollution control program in need of funding. Twelve bills concerning oil and hazardous substances passed the legislature that year in the wake of the spill.

Other large but less catastrophic spills have occurred throughout DEC's history, but smaller spills are a far more common occurrence. Each year DEC and the U.S. Coast Guard log about 3,000 spills state-wide. While many are from groundings of fishing boats, the majority are the result of small spills on shore. For example, in 1985-86 DEC recorded 953 spills totalling 193,319 gallons just at Prudhoe Bay. Only 66 of the spills were greater than 500 gallons.

In the last decade, spills and contamination by hazardous chemicals other than petroleum have become a large area of concern. Alaska has approximately 850 sites on federal, state and private land where the soil or water has become so contaminated by chemicals that it poses a health hazard to people living and working nearby. In nearly all cases, the affects of contamination accumulated over many years.

In addition to response personnel, the cornerstones of spill prevention and response are industry spill prevention and response plans and the requirement for proof of financial responsibility to compensate for damages. The growing number and types of spills have required a greater capacity with greater sophistication to respond to these emergencies.

The *Exxon Valdez* disaster in Prince William Sound dramatically demonstrated a need for the state to have an independent spill containment and cleanup capability in the event of future discharges of oil or hazardous substances. The spill also made clear the need for regional and local systems "greased and ready" to respond to emergencies, with the many levels of government able to cooperate instantly.

In July of 1991, the department created a new division of spill prevention and response to manage all of its oil and hazardous substance spill and cleanup programs. The division's spill prevention, planning and management section provides staff support for regulations development, review of industry plans and approval of proof of financial responsibility. The contaminated sites cleanup program and Alaska's spill response office are also located in this new division.

Local emergency planning committees are now forming to

complete plans and preparedness activities for response to hazardous substance incidents. These local plans will be part of a statewide planning network for all hazards. The State Master Oil and Hazardous Substance Discharge Prevention and Contingency Plan will be an annex to the State Emergency Plan and provide for integration of all state agencies' response activities for catastrophic incidents. The state now has a dedicated, highly-trained, professional response team capable of responding to hazardous substance incidents anywhere in the state. This team continually trains with local emergency responders and serves as the core of regional response teams.

Throughout the state, local citizens are considerably involved in prevention and preparedness activities through citizen advisory councils and oversight associations. Volunteers will also be part of the integrated network of spill responders.

Why Spill Prevention and Response is Important

Aside from the spill of the *Exxon Valdez*, there were some 4.2 million gallons of oil and hazardous substances spilled in Alaska in 1989, according to draft data compiled by DEC's spill prevention, planning and management section.

The EPA regulates more than 65,000 chemicals and substances that, under certain circumstances, can present hazards to human health and the environment. Depending on the chemical, hazards can include organ or nervous system disorders, birth defects in unborn fetuses, a variety of cancers or others. While necessary to business and industry, chemicals stored, used, or disposed of around communities become everyone's business.

The state is far from pristine, although Alaska ranks third from the bottom of the list of states with seriously-contaminated waste dumping sites needing cleanup. According to EPA, Alaska has two priority sites that warrant cleanup under the Superfund program for dangerous sites: Eilson Air Force Base and Alaska Battery Enterprises, both in the Fairbanks area. Four additional suspected sites are awaiting designation: Standard Steel, Elmendorf Air Force Base, and Arctic Surplus—all in Anchorage—and Fort Wainwright near Fairbanks.

There are about 850 known contaminated sites in the state; experts predict that number will reach 1,000 by the end of 1991. Nearly all of the contaminated sites in the state are located in or near populated areas. Some are polluting or threatening community water supplies.

History

1991:

July: DEC creates a new division to manage all of its oil hazardous substance spill and cleanup programs: spill prevention, planning and management, contaminated sites cleanup and the spill response office.

Major Accomplishments

SPILL PREVENTION AND PLANNING

- Reviewed 163 facility and vessel contingency plans for adequate response planning in fiscal year 1991.
- Provided annual review of proof of financial responsibility applications for 369 major oil operations.
- Through spill drills, tested the response performance of 71 facilities or vessels with approved contingency plans.
- Worked with representatives of industry and local government to establish industry response organizations in the Cook Inlet and Southeast regions.
- Completed a draft State Oil and Hazardous Substance Discharge Prevention and Contingency plan.
- Completed a study of 46 small non-crude terminal facilities in the state.
- Established 10 regions for development of regional spill prevention and contingency plans and completed the first regional plan.

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Oil and Hazardous Substances

Major Accomplishments

- Completed a **study of non-crude oil transportation** in the state.
- Initiated a **dramatic improvement in oil pollution prevention and response capability in Prince William Sound**, including escort vessels for tankships and catastrophic spill response capability.

SPILL RESPONSE OFFICE

- Responded to **six declared or potential emergencies since September of 1990** and assisted the department's response personnel in responding to numerous additional events during that time.
- Since May 1, 1991 participated in and evaluated industry-sponsored **(12) spill drills**.
- Formalized the **incident command system**, which spells out the lines of responsibility and authority among governmental and other entities during an emergency spill response.
- **Developed oil pollution prevention measures** for vessels and facilities holding state-approved contingency plans.
- Trained 118 persons through an annual **course in hazardous waste operations and emergency response**.
- Saved the state over \$37,500 by offering an annual emergency response course and conducting respirator fit testing.
- Established **guidelines for medical monitoring of spill responders and hazardous material personnel** and identified medical facilities available to provide the monitoring.

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Program Development

OIL POLLUTION CONTROL

In 1976, oil pollution control became important for the state as the Trans-Alaska Pipeline System neared completion and supertankers began operation in Alaskan waters. In an effort to set safeguards against oil spills, the 1976 legislature enacted the "Tanker Safety Law." This law required large oil terminals and tank vessels operating in the state to provide DEC with adequate spill contingency plans and proof of financial responsibility to compensate for damages in the event of a spill. The law also established the Coastal Protection Fund, an oil spill cleanup fund to be paid for by both tankers and terminal facilities.

The department's oil pollution control program was formed in late 1976 as a result of this legislation. The oil industry immediately challenged the new laws, and in June 1978, the federal courts struck down the Coastal Protection Fund and the tanker standards contained in the Act. Due to this decision and legislative budget cuts, the program's fiscal year 1980 budget was reduced by 75%. The state's ability to adequately respond to oil spills had been seriously jeopardized.

By 1980 the legislature had corrected the defects of the 1976 law and thus maintained the legal integrity of the state's program. In the new law, offshore exploration and production facilities as well as oil barges were added to the list of operations required to write contingency plans.

Industry continued in 1983 to expand operations into offshore areas of the Beaufort Sea and to extend drilling activities into seasons previously considered too hazardous. Also during this year DEC received its first insurance policy covering a barge operator's liability for oil pollution under Alaska law. This was considered a major breakthrough, after nearly six years of effort by DEC and the marine insurance industry.

Over the next five years, however, the oil pollution program continued to be grossly understaffed to carry out its mission. The department conducted few inspections of facilities, responded only to the larger reported spills, and provided only limited technical assistance to industry. There was no data base for tracking contingency plan approvals or vessel operations, and staff was available only to conduct limited contingency plan reviews. By 1987, cutbacks had reached the point where employees were placed on four-day work weeks.

On March 24, 1989, the grounding of the *Exxon Valdez* revealed many of the serious inadequacies of the state's oil pollution program. The Alaska Oil Spill Commission was created to investigate the causes of the incident. The commission's recommendations provided the basis for a multitude of changes and reforms.

That same year the Alaska legislature created the spill response office to provide a core group of experts, specially trained and equipped to respond to any catastrophic or emergency spill in the state. The legislation also called for establishment of

depots of response equipment and formation of a volunteer corps to respond to catastrophic spills. Alaska now has greater independent spill containment and cleanup capability in case a spiller does not begin cleaning up quickly or adequately.

Training of other state response personnel in oil and hazardous substance spill response is also conducted by the spill response office. The legislation also called for preparation of a state master plan, including regional plans, for oil and hazardous substance spills.

The next year, in 1991, new legislation established the State Emergency Response Commission, a Hazardous Substance Spill Technology Review Council, and a Citizen's Oversight Council for Oil and Hazardous Substances. This legislation included a new focus on preventing spills, increased financial responsibility requirements and new response planning standards for vessel and facility operators. It also required a survey of small non-crude facilities and a study of non-crude transportation.

The *Exxon Valdez* incident also demonstrated the need for adequate staffing and resources to implement an effective prevention control and response program. These resources were made available in the 1991 fiscal year.

It is only now that DEC has sufficient resources to carry out its mandated "core level" responsibilities. The department is in the process of fully implementing the state's new oil spill legislation and upgrading the oil pollution program.

The department is also coordinating efforts with several other organizations, such as regional citizen advisory councils, oil spill cooperatives, the Alaska Regional Response Team, the Coast Guard, EPA, and the States/British Columbia Task Oil Spill Task Force. Companion legislation at the federal level, the Oil Pollution Act of 1990, is also being implemented.

Oil and Hazardous Substances

Major Accomplishments

CONTAMINATED SITES PROGRAM

- Completed 45 (48%) of the 95 site investigations slated for the Kenai Peninsula.
- Established a **cooperative agreement with the Department of Defense** to clean up three military sites in Alaska that are on EPA's priority list of the nation's most hazardous contaminated sites.
- Set up a **computerized inventory of over 230 sites** in the state contaminated by leaking underground storage tanks, with information on ownership and liability as well as cleanup status for each site.
- **Recovered \$600,000 in state cleanup costs** spent to restore Peters Creek following a chronic underground storage tank leak.
- **Recovered state cleanup costs from Texaco Inc.** for restoring an Anchor Point site following an underground storage tank spill.
- **Published industry guidelines** for:
 1. treatment and disposal of petroleum-contaminated soils,
 2. hazardous substance cleanup levels in soil and water,
 3. contractors that assess and clean up contaminated sites in Alaska.
- **Developed a model for ranking contaminated sites** based on the relative threat posed to public health and the environment.
- **Established a Board of Storage Tank Assistance** consisting of representatives from the oil industry, tank owner associations, the insurance industry, government and community interest groups.
- Handled **20 Response Fund cleanups and oversight of approximately 100 owner/operator cleanups** annually.

CONTAMINATED SITES

Cleanup of land contaminated by historic chemical leaks and spills received national attention in 1982 through a Congressional appropriation to the 50 states to implement provisions of the Resource Conservation and Recovery Act (RCRA). Congress had noted many delays nationwide in discovery, inspection and evaluation of hazardous waste sites. To help states complete the site survey and inspection process mandated by section 3012 of RCRA, Congress made a one-time \$10 million appropriation from the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) trust fund.

Alaska's share of this appropriation was \$60,000, and staff from the air and solid waste section administered the grant. The first report on hazardous waste sites in Alaska was prepared in 1984, based on preliminary assessments of the 45 most suspect sites of the 100 known sites in the state. Additional grant funds allowed further investigation of sites identified in the report as high priority.

The state's contaminated sites program essentially began in 1986 when House Bill 470 established the Oil and Hazardous Substance Release Response Fund, broadening the use of the previously existing response fund to include hazardous substances. Legislation in 1989 increased the fund's base by imposing a 5-cent-per-barrel surcharge on Alaska oil.

In 1987, EPA gave funding that allowed Alaska to establish a permanent CERCLA program under the DEC's air and solid waste section. Using a standard method to evaluate contaminated sites, the staff has thus far identified 224 sites in Alaska, six of which have been included on the national priority list.

In the next year the oil and hazardous substance spill response section was formed in DEC, with responsibility for administering the federal grants program and state involvement in the

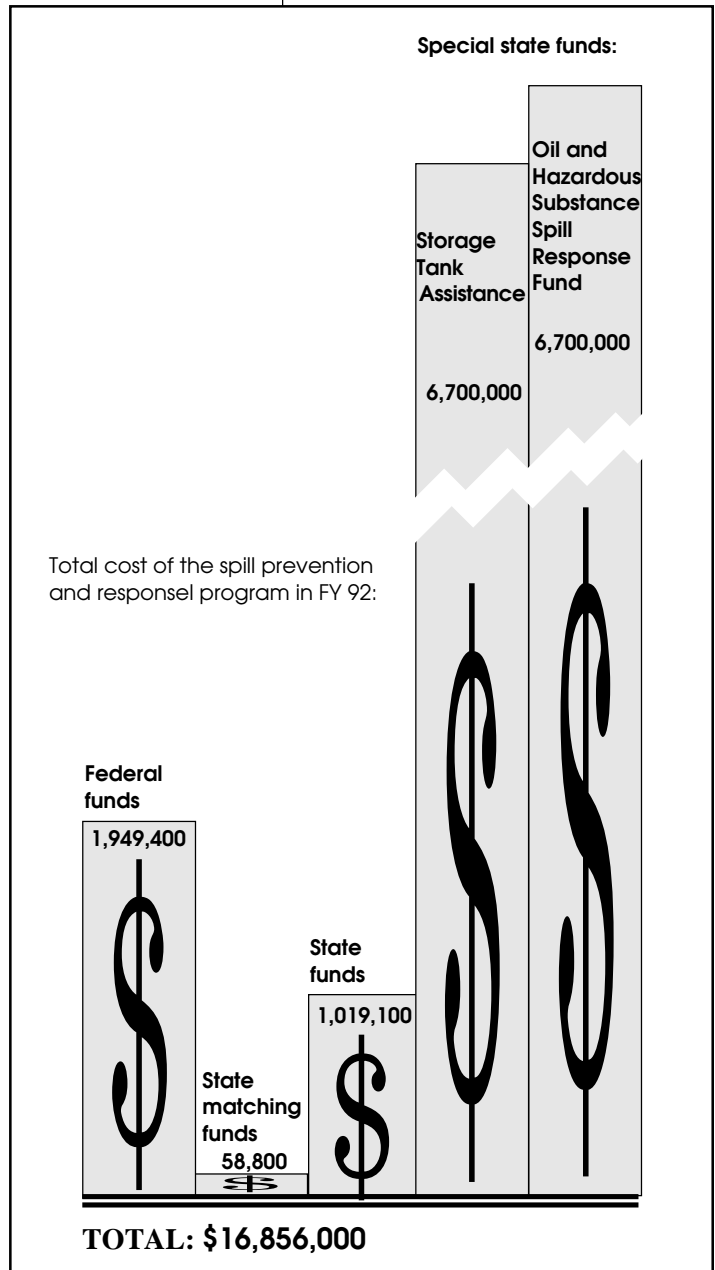


CERCLA program. Duties grew with the addition of the federal leaking underground storage tank program, new programs that help finance cleanup sites contaminated by Leaking Underground Storage Tanks and Underground Storage Tank programs, and the Defense Environmental Restoration Program.

The state contaminated sites program now oversees an inventory of about 850 sites, a list which is expected to expand to over 1,000 within the next year. A database tracking system includes all reported sites with known or potential contamination, and ranks them according to risks to human health and/or the environment. DEC staff selects sites on an annual basis for assessment or cleanup work, considering the priority and such factors as lack of owner/operator cooperation, and making use of the Response Fund when necessary.

In the fall of 1991 the new state Underground Storage Tank Assistance program was put in place. The program primarily providing assistance to owners/operators of USTs, and also includes extensive regulations covering tank leak prevention and remediation. To date about 3,400 UST owners have registered with the state as required. Approximately 30% of the contaminated sites currently on the statewide inventory are represented by leaking USTs, and the number is expected to grow rapidly as UST sites are evaluated under the assistance program.

The contaminated sites section is currently part of the division of spill prevention and response.



POLLUTION PREVENTION

Preventing pollution is good business. It offers environmental quality with economic benefits. Businesses can enjoy cost savings by reductions in raw materials, more efficient waste handling and disposal, improved worker safety, and reduced litigation and legal fees. Residents and visitors alike benefit from a cleaner, safer environment.

The pollution prevention office of DEC seeks to protect public health and the environment by eliminating or reducing pollutants at their source rather than controlling pollution later on.

The office serves as a focal point for coordinating and integrating pollution prevention efforts across all the department's programs. The office also encourages pollution prevention in communities and industries and works to facilitate partnerships between government agencies and the private sector.

The primary means of preventing pollution are proper purchasing of goods and materials to eliminate waste, reducing waste at its source, reusing and recycling waste material, and exchanging or selling waste as raw materials to another business.



Darwin Wright at Photolab in Anchorage uses an electrolytic silver recovery system.

The amount of waste produced in Alaska each year is great: up to 1 billion pounds of trash, over 1000 tons of hazardous waste and thousands of tons of toxic air emissions. Local communities often have problems dealing with old batteries, waste antifreeze, and used paints and solvents. Innovative strategies are needed to manage these wastes—approaches that maximize use of source reduction and recycling techniques. Effective use of these tech-

History

1989:

House Bill 106 passes, establishing the office of hazardous waste reduction and recycling and authorizing matching grants for community efforts.

The department receives a source reduction recycling technical assistance grant from the U.S. Environmental Protection Agency.

1990:

The legislature passes the Waste Recycling, Reduction, and Planning Act (WRRAP Act), including a bill to establish the solid and hazardous waste reduction program within the department.

1991:

Additional legislation creates a program to recognize schools, businesses and the general public for their pollution prevention efforts.

The pollution prevention office is established within the director's office of the division of environmental quality.

The office receives additional federal money to provide training to local government and implement industry specific initiatives.

Pollution Prevention

Major Accomplishments

- Provided funding and assistance to **15 waste reduction and recycling workshops** for various communities in Alaska, and conducted **18 on-site pollution prevention technical assistance assessments** for selected Alaska businesses.
- Conducted **six waste reduction and recycling workshops** for photofinishing, printing, and vehicle maintenance industries, and sponsored numerous other pollution workshops, seminars and video conferences.
- Conducted a joint **EPA-DEC-Coast Guard waste reduction opportunity assessment** for Coast Guard Base—Ketchikan.
- Published the 46-page **Pollution Prevention Resource Guide**.
- Established the **Municipal Pollution Prevention Roundtable**.
- Established the **hazardous waste reduction matching grant program**.
- Established the **school waste reduction and recycling awards program**.
- Currently assisting the Anchorage Chamber of Commerce develop and deliver the **Green Star Program**, a model city program.
- Provided funding and assistance in developing a **3-credit undergraduate pollution prevention course** and a **3-credit graduate level engineering course** on waste reduction, in cooperation with the University of Alaska School of Health Sciences (Anchorage).

niques can help businesses and communities through reduced spills and fewer costly cleanups, and improved business efficiency and competitiveness. Pollution prevention can translate into properly managed solid waste disposal facilities and a healthy, safe business and community.

Program Development

The department's pollution prevention activities were first initiated in 1989 with the passage of House Bill 106. This bill established the office of hazardous waste reduction and recycling and authorized matching grants for community efforts. In the same year, the department received a source reduction recycling technical assistance grant from the U.S. Environmental Protection Agency. These funds are currently helping provide technical assistance to businesses and communities, funding for the pollution prevention office and a pollution prevention strategy for the department.

In 1990, the legislature passed the Waste Recycling, Reduction, and Planning Act (WRRAP Act), which provided additional direction for the department. The WRRAP Act included a bill which established the solid and hazardous waste reduction program within the department. The bill directs the department to promote the following waste management practices in this order of priority:

- 1) waste source reduction;
- 2) recycling of waste;
- 3) waste treatment;
- 4) waste disposal

In 1991 additional legislation created a program to recognize schools, businesses and the general public for their pollution prevention efforts.

Under a department-wide reorganization in 1991, the non-regulatory pollution prevention office was established within the director's office of the division of environmental quality. This change was necessary to emphasize pollution prevention within the department and to enable the office to function more easily across program and division lines.

The office publishes a quarterly *Pollution Prevention Bulletin*, the *Pollution Prevention Resource Guide* and several informative fact sheets. Office staff make on-site visits to help business identify pollution prevention opportunities and develop pollution prevention plans. These assessments also allow transfer of relevant information to other similar business types.

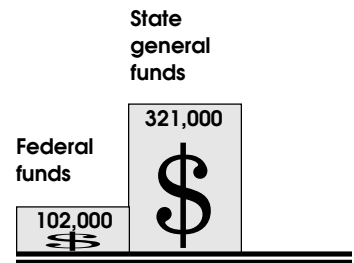
DEC is under a cooperative agreement with the Alaska Health Project's Waste Reduction Assistance Program to implement portions of the EPA grant. In 1991, the office received additional federal money to provide training to local government and implement industry specific initiatives.

The office keeps abreast of current events through active

participation on the Northwest Regional Pollution Prevention Roundtable and the National Roundtable for State Pollution Prevention Programs.

Program Costs

Total cost of the pollution prevention program in FY 92:



TOTAL: \$423,000

ENVIRONMENTAL HEALTH

Environmental Sanitation Pesticides

In 1980, Executive Order 51 transferred environmental sanitation functions from the Department of Health and Social Services' division of public health, and the seafood, meat and dairy and Palmer Laboratory functions from the Department of Natural Resources' division of agriculture to DEC. The consolidation was made to eliminate duplicated services and to reduce the burden placed on public facilities and processors inspection visits by multiple agencies. These goals have been achieved through inter-divisional coordination within the department. In addition, the division's programs maintain cooperative working relationships with other state and federal agencies through participation in interagency committees, task forces and written interagency agreements. In December, 1984, the department's environmental health functions were consolidated into the division of environmental health.



ENVIRONMENTAL SANITATION

There are more than 6,000 public places including institutions in the state that provide food and other services, including big-city restaurants to isolated lodges, facilities for infants and the elderly, and to pools and spas. To control and eliminate unsanitary conditions in public facilities, the environmental sanitation program sets basic standards for facility cleanliness and employee hygiene, educates facility workers and enforces state regulations by conducting inspections and providing operator training.

In 1984 significant revisions were made to the Smoking in

Seafood Inspection Animal Health

History

1975:

A pesticide-related fatality occurs in Alaska and is investigated by the Navy.

1976:

Congress passes the Toxic Substances Control Act, to regulate the manufacture, processing, distribution and use of all new chemicals.

1981:

Executive Order 51 transfers the majority of environmental health functions from the Departments of Natural Resources and Health and Social Services to DEC.

Division of Seafood and Animal Industries is formed within DEC, and develops dairy cattle regulations to prevent introduction of livestock diseases.

The agricultural revolution in Alaska begins. Eight dairy farms with approximately 500 head, three Delta dairy farms with 100 head, and Delta I and II Projects are initiated to grow livestock feed. Eleven new dairy farms in Point McKenzie follow, adding 1500 head of cattle.

1982:

A Belgian man dies of botulism contracted from eating a can of salmon processed in Alaska.

USDA declares Alaska cattle and swine "Brucellosis-free."

1984:

The division of environmental health is created, transferring DEC's environmental health functions into one division.

Alaska's Smoking in Public Places Law is enacted.

1989:

Seafood processing regulations are revised.

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Environmental Health

History

1989:

Following the March 24th oil spill, seafood and sanitation inspectors prevent harvest of oil-contaminated fish and inspect potentially contaminated boats.

1990:

New state pesticide regulations take effect.

State food service regulations are revised to include guidelines for bottled water and vacuum-packaged food producers.

The program initiates a state-wide pool and spa operator training program using a nationally-recognized program.

Alaska lawmakers fund a state reindeer inspection program.

1991:

The sanitation program's 19 staff members collectively perform 5,000 public facility inspections, investigate 500 public complaints, issue more than 1,200 permits and certificates, give 90 training sessions and conduct four statewide contaminated product recalls. Reported incidents of foodborne illness is down 23% from 1987 figures.

Major Accomplishments

- Increased public facility inspection by 30%; decreased enforcement actions by 18% and **decreased food borne illness by 23% over the past five years.**
- **Standardized food service and school inspections** to ensure uniformity between inspections.

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Public Places law, increasing the program's responsibilities in this area. A grant from the U.S. Environmental Protection Agency was awarded to the section in 1990, to conduct a comprehensive survey of radon gas in schools and preschools throughout the state. To augment permitting, inspection and enforcement activities, the program staff also publishes guides, presents instructional workshops and gives technical assistance.

Foodborne illness incidents, which result from unsafe or unsanitary preparation or storage practices, are directly related to the frequency of inspections conducted. In the past 10 years, the environmental sanitation program has increased inspection frequency across the state, yielding a reduced number of enforcement actions and disease outbreaks associated with restaurants, pools and day care facilities. This includes the absence of foodborne illness in Valdez food service operations during the *Exxon Valdez* oil spill cleanup.

While program staff levels have remained the same in the past decade, public facilities in Alaska have grown by 150%. In response program staff have developed a highly efficient inspection method that bases inspection frequency on public health risk. They have also used education, training and self-inspection to reinforce efforts by program staff.

Why Environmental Sanitation is Important

Most Alaskans take for granted that food sold in public establishments and grocery stores meets basic sanitary standards. When foodborne illness strikes, it can affect many people at once and, in a few isolated cases, can prove fatal. For example, in recent years, eight people contracted Hepatitis A from a child-care center, 29 people developed severe gastrointestinal illness during a retreat, and 32 Alaskans became sick from eating pesticide-contaminated watermelon.

Over the past 30 years, Alaska has experienced relatively few disease outbreaks that resulted from unsanitary practices in public places. Occasional incidents have resulted in facility closures and statewide food product recalls to stem potential outbreaks. With its program of frequent inspections and an established network of operators, the state epidemiologist and national experts, the department prevents hundreds of disease outbreaks every year and, when one occurs, responds quickly to contain the incident to a few individual cases.

Program Development

When DEC was created in 1971 out of the environmental health division of the Alaska Department of Health, Education and Welfare, the environmental sanitarians from that division

remained in the re-named Department of Health and Social Services. In 1981, Governor Hammond transferred the environmental health programs into the Department of Environmental Conservation. The environmental sanitation program remained in the division of environmental quality operations until 1984 when the division of environmental health was created, reuniting all the environmental health programs.

Added responsibility came in 1984 with the enactment of Alaska's Smoking in Public Places Law, which authorized DEC to regulate the impact on the public from second-hand tobacco smoke. The new legislation was far more comprehensive than previous laws and regulations.

Revisions were made in 1990 to include updated technologies now available in the industry to pool and spa regulations. The state food service regulations were revised the same year to include guidelines for use of sulfites, bottled water and vacuum-packaged food producers.

The program developed pool and spa operator training using a nationally recognized program. Operational guidelines and courses were developed in food service, daycare and school safety and sanitation, pool operation and bed and breakfast operations. Further efficiency came with utilization of staff between division programs. Staff members routinely evaluate public facilities' private water, wastewater and solid waste supplies, and seafood and meat sources. Staff also conducts marketplace pesticide inspections and often investigates complaints regarding potential misuse of pesticides.

The section has recently completed three special projects addressing special environmental health concerns. Information gained from these— playground safety, radon in schools and safe drinking water curriculum studies — will be used to develop further evaluation criteria and public information.

SEAFOOD INSPECTION

Alaska seafood processing is a multi-million dollar industry that provides more than 35,000 jobs. Over half of the nation's seafood production—more than one billion pounds each year—comes from the state. Alaska seafood products are sold fresh, frozen, canned, smoked, cured, salted, sealed in retortable pouches and as sirimi. Despite this high production level, there has not been a single incident of foodborne illness associated with Alaskan commercial seafood in nine years. Today, the state's seafood inspection program, which focuses on product safety and wholesomeness through consistent inspection and enforcement of state laws, is widely regarded as the best in the United States.

The program issues permits, conducts regular, thorough inspections of the state's more than 600 shore-based and floating

- **Revised environmental sanitation and food service regulations** to include playground safety, bottled water labeling, sulfiting and vacuum-packed food production.
- Conducted **statewide recalls** of produce and food service machinery contaminated with chemicals or diseases.
- Developed a state policy on monitoring sales of domestic turtles.
- Initiated an **annual training session for state fair workers and state ferry workers**.
- Developed a special **information package for temporary food service operators**.
- Developed a **pool/spa regulatory program** with operator training and certification, enforcement guidelines and guidance on specific chemical use.
- Developed **emergency sanitary measures for schools and day cares** in the event of a sewer or water system failure.
- Conducted **statewide surveys of campground facilities and playground equipment hazards**.
- Developed and monitored the use of **elementary and secondary drinking water curriculum** designed to develop understanding of and sense of pride and ownership in rural drinking water systems.
- **Developed cooperative agreements** with local, state and federal entities to coordinate inspections and investigations and maximize use of resources.
- Participated in several task forces to **identify deficiencies in drinking water and wastewater systems serving RV parks and campgrounds**.

Environmental Health

Program Costs

Total cost of the environmental sanitation program in FY 92:

State general funds

1,400,000



TOTAL: \$1,400,000

processors, and enforces state seafood processing regulations. Permits are issued to facilities meeting minimum construction and equipment requirements. Inspections are conducted to guarantee that fish remain free of any chemical or bacterial contamination.



Major Accomplishments

- Extended microbiological testing of seafood products.
- Established an **inspection method** to concentrate staff efforts on facilities which present potentially higher health risks or scored poorly on previous inspection.
- **Standardized the inspection process**, with written directives, policies, and guidelines for processors.
- **During 1989 detained more than 490,000 pounds of decomposed salmon, another nearly 300,000 pounds of adulterated salmon** potentially contaminated by the results of the oil spill, plus **thousands of pounds of halibut, herring, oysters and crab.**

Why the Seafood Inspection Program is Important

The state's challenge is to maintain its reputation for quality while supporting processor diversity, given the rapid rise in the number of seafood processing facilities and the variety of conditions under which seafood is processed in the state. These range from high-tech ocean-going processors to remote land-based operations with limited access to water, sewer and electricity.

In 1982 and again in 1989, Alaska's fishing industry narrowly escaped disaster. Efforts by the state's seafood inspection staff needed to be quick and thorough. A canned salmon scare in 1982 involved a botulism-tainted can of Alaska salmon which was reported to have caused the death of a Belgian man. During the 1989 *Exxon-Valdez* oil spill in Prince William Sound, the state launched special inspection programs to prevent any additional contaminated fish from reaching the market.

Since 1982 there have been no incidents in which contaminated fish reached market and no cases of botulism reported from Alaska seafood. The program has guaranteed the wholesomeness and safety of seafood stocks, helped increase the market for Alaska seafood, helped Alaska fish stocks compete against foreign, pen-reared salmon, and helped to promote satisfactory prices for the catch.

Program Development

While the state has had a seafood inspection program since the 1970's, it was expanded in the spring of 1982 after the botulism death in Belgium. Since then the program has been upgraded, standardized and expanded. It now employs 11 inspectors to monitor about 600 floating and shore-based seafood processing plants.

Over the last 10 years the program has become more focused, concentrating inspection on facilities with higher health risks or those with lower previous inspection scores. Handling procedures have been upgraded. For example, fish are required to be iced before processing and kept free of petroleum-based contamination.

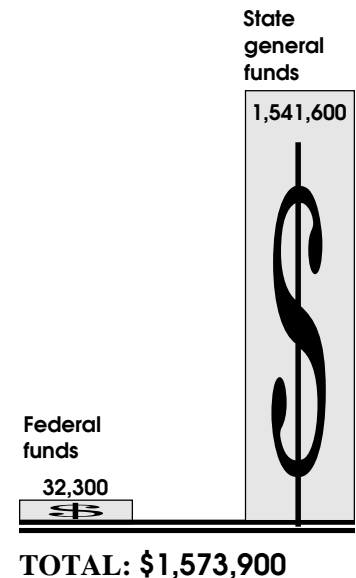
In 1989, seafood processing regulations were revised, consolidating requirements and establishing a special section for direct market fishing vessels and smoked fish.

The program also created an advisory committee made up of the U.S. Food and Drug Administration, the National Fish Processing Association and others to oversee creation of new regulations and procedures.

Following the March 24, 1989 Prince William Sound oil spill, a special program was developed to inspect processing plants several times daily to prevent the harvest of any oil-contaminated fish. Potentially contaminated boats were also inspected. The efforts protected the consumer and ensured the reputation of Alaska's seafood.

Program Costs

Total cost of the seafood inspection program in FY 92:



PESTICIDES PROGRAM

Pesticides, insecticides, fungicides, rodenticides, disinfectants and wood preservatives are all chemicals which can be a source of environmental contamination. Except for oilfield biocides, used by the thousands of pounds, quantities of pesticides in Alaska are very small compared to amounts applied in any major agricultural state. Yet the **variety** of pesticides available in Alaska is comparable to most other states partly because many of the pesticides used here are ordered through mail order firms in other states.

The most common pesticides in Alaska are biocides used to control microorganisms in the food processing industry and to control bacteria in "produced water" from oil wells. The major household compounds are insecticides and herbicides, used for control of common home and garden weeds and insects. With the

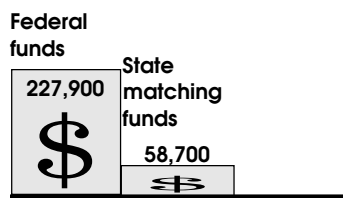
Environmental Health

Major Accomplishments

- **Prevented medical injuries** from improper application or use of pesticides during past four years.
- **Certifies roughly 1,825 pesticide applicators a year** in proper use of the chemicals.
- In fiscal year 1991, offered **39 training courses for chemical users**; 341 persons were involved.
- Issues about **12 new permits each year** and last year investigated **66 cases of alleged misuse** of pesticides.
- Conducts about **two dozen marketplace inspections yearly** and several dealer inspections.
- Created **guidelines to protect farm workers** from pesticide contamination.

Program Costs

Total cost of the pesticides program in FY 92:



TOTAL: \$286,600

decline of Alaska's farm industry since 1980, the use of agricultural formulations has declined, through home and garden compound sales have increased both in quantity and variety.

Federal legislation passed in 1976 was designed to regulate the risks posed by more than 65,000 existing chemicals and the thousands of new chemicals created yearly. The major issue for the department has been to set up programs to train commercial applicators on the proper methods of pesticide and herbicide use.

The department has carried out Environmental Protection Agency (EPA) regulations on pesticides since the mid-1970's. The program certifies applicators, trains chemical users, investigates misuse of pesticides, and inspects food processing business, restaurants, service establishments and seafood processing plants for proper use of chemicals ranging from pesticides to sanitizers.

Why the Pesticides Program is Important

Nationally, Americans use about 3 billion pounds of pesticides each year. Improper use can cause the chemicals to pollute soil, kill vegetation and animals, and contaminate the nation's and state's groundwater supplies.

Prior to 1970, Alaska farmers and military establishments were the largest users of pesticides in the state. With the great increase in state population that occurred between 1975 and 1985, the use of public health formulations as well as compounds used for houses and gardens has outweighed the concurrent decline in agricultural pesticide use. At the same time there has been much public resistance to large-scale use of pesticides in city- and state-sponsored programs to control mosquitoes and brush. This outcry has been recognized in the implementation of DEC's permit program, and the 1990 requirement that commercial applicators must be certified to use **any** pesticide.

There has been only one pesticide-related fatality in Alaska, which occurred in 1975 on Adak and investigated by the Navy. Since then there have been few incidents of a serious nature.

Program Development

The department's pesticide program began with the creation of the department, with one person assigned the task of developing a pesticide control program. The first set of state regulations for use of the chemicals took effect in 1973. Congress in 1976 passed the Toxic Substances Control Act, which set up a pre-manufacturing review process that also regulates the manufacture, processing, distribution and use of all new chemicals.

Under a letter of agreement, the Extension Service trains and tests private applicators (applicators not for hire) and com-

mercial applicators who need to use wood preservatives.

In 1990 the department revised its regulations to prevent pesticide contamination of drinking water supplies.

The program also works in concert with the University of Alaska's Cooperative Extension Service and DEC's hazardous waste project, on proper disposal methods for unused pesticides and empty containers. The program also participates with other departmental units to develop a groundwater management plan.

ANIMAL HEALTH PROGRAM



Guaranteeing the wholesomeness of meat and dairy products produced within Alaska is essential to protection of public health and the success of Alaska's agricultural industries. The state's dairy products are produced from farms located primarily in the Matanuska-Susitna Valley and Delta area. Domestic reindeer herds located on the Seward Peninsula of Northwest Alaska serve as the source for reindeer meat used in inspected meat products such as reindeer sausage.

The department's animal health program, in the Division of Environmental Health, protects human health by ensuring that:

- importation and exportation of domestic animals is monitored and animal-to-animal and animal-to-human diseases are controlled;
- diseased livestock are quarantined and controlled;

Major Accomplishments

- Since 1981, **state declared free of three major livestock diseases**, classified as low incidence for Blue Tongue state and within one step of being declared Swine Pseudorabies Free state.
- Consistently received **high rating from FDA and USDA for meat and dairy inspection programs**.
- In FY 91 inspected over 100 dairy farms, milk transporters and processors, inspected 2,144 animals prior to slaughter and examined and tested 4500 domestic animals for brucellosis and tuberculosis.
- Issued over 20,000 health certificates for animals and 100 animal import permits
- Investigated some 50 dairy and 25 animal disease complaints, completed 8,000 meat and poultry inspections and collected over 1,000 meat samples for analysis.

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Environmental Health

Major Accomplishments

- Continues toward **implementation of a reindeer inspection program** to ensure that products meet federal requirements for mixing reindeer with other inspected meat products
- **Maintains a state "Equal to Federal Inspection" program** to enable state-inspected meat products to enter commerce
- Continues to provide **technical assistance and field support** to animal industries in Alaska.

□ producers and processors of milk and frozen desserts operate in a sanitary manner and produce products which are wholesome; and

□ slaughter houses and processors of meat and poultry products meet federal sanitation standards and produce wholesome products.

The section is responsible for managing the reindeer inspection program which allows the use of reindeer meat in other meat products. The use of all animal vaccines are controlled through the issuance of permits.

Why Animal Health is Important

The control of diseases within domestic animals in Alaska is critical to ensuring protection of human health from such diseases as brucellosis or tuberculosis, as well as supporting the development and economic viability of the agricultural industry in Alaska. Alaska's dairy program is audited by the federal Food and Drug Administration and has continued to maintain high standings. Monitoring and control of livestock is important to maintaining the "disease free" status granted by the U. S. Department of Agriculture.

Control of disease transmission and wholesomeness of meat and poultry products is essential to protection of Alaska consumers. Wholesomeness of meat and poultry products is ensured through an "equal to" federal inspection program with state control which allows greater flexibility in meeting standards.

Program Development

Before statehood, the U.S. Department of Agriculture was responsible for programs to monitor the health of Alaska's livestock and farms and to inspect the dairy processing industry. These programs were originally the responsibility of the Department of Natural Resources' agriculture division until they were transferred by Executive Order 51 to DEC. In DEC, these programs were first managed in the seafood and animal industries division and then transferred in 1984 to the newly-created environmental health division.

In 1981 the Matanuska-Susitna Valley had eight operational dairy farms milking approximately 500 herd of dairy cattle. Delta had three dairy farms milking approximately 100 head. Then the agricultural revolution began: Delta Projects I and II initiated the new era. The farms were developed to provide barley, oats, grass seed and hay for livestock feed. Point McKenzie followed, with 11 new dairy farms milking an additional 1500 herd of cattle.

Prior to the importation of these dairy cattle, new regulations

were implemented to prevent the introduction of livestock diseases. Additional serological testing prior to shipping and post-shipment quarantine and testing were required to prevent the introduction of brucellosis, tuberculosis, anaplasmosis and blue tongue disease. As a result, the USDA declared Alaska cattle "brucellosis free" in May 1982, "swine-brucellosis free" in November, 1982, and "bovine tuberculosis free" in March 1986. Due to these efforts, the USDA and Canada has declared the state a "low incidence blue tongue state" and a "stage IV" (last stage before "free" status) state in pseudorabies eradication. When regulations are enacted providing control, quarantine and destruction of pseudorabies infected swine, the state could be the first in the nation to be declared "pseudorabies free."

With the growth of the dairy, beef and swine industry, the state vet was asked to examine and provide technical assistance for farmers with cattle and swine herds experiencing decreased fertility, premature and weak births, growth abnormalities and herd health problems. Tests revealed a selenium deficiency causing enzootic muscular dystrophy (white muscle disease), attributed to selenium-deficient soils resulting in selenium deficiency feeds. A bulletin was then developed to advise ranchers and farmers of the problem and recommend feeding selenium through mineral blocks. When used properly, the selenium blocks eliminated the disease.

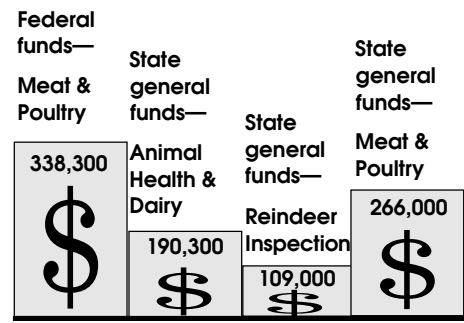
As the years progressed, grain prices rose but milk prices steadily declined, resulting in cash flow problems and insolvency among many dairy farmers. Today only seven MatSu Valley and three Delta dairy herds remain, milking a total of 850 cows. Currently the numbers in the dairy, beef and swine industry have stabilized, but a new agricultural industry is emerging. For years, reindeer owners have supplied horn to the Far East market, uninspected red meat to the villages of northwestern Alaska and inspected meat to sausage plants in Anchorage.

American consumers' interest in low-fat organic red meat has created a demand for reindeer products. Over 400 live reindeer were flown from Nome to Palmer to allow slaughter under the state meat inspection program, with owners receiving over seven dollars per pound for processed products. In the spring of 1991, the slaughter facility on Nunivak Island constructed by the people of Mekoryuk began operation, slaughtering and boning over 400 animals.

The long-range goal of the program is to relocate reindeer on farms established in the Delta area and MatSu Valley, where reindeer can be bred and feedlotted. When operational, these farms could provide reindeer year-round to state meat plants. New regulations will be needed to prevent the movement of reindeer infected with Brucellosis to uninfected areas.

Program Costs

Total cost of the animal health and dairy industry inspection program in FY 92:



TOTAL: \$903,600

L **ABORATORY SUPPORT**

- **Environmental Quality Monitoring and Laboratory Operations**
- **Environmental Health Laboratory Support**

Before the Department of Environmental Conservation was created in 1971, most scientific work was handled by a laboratory in Palmer run by the U.S. Department of Agriculture. The lab continued to support DEC programs for the department's first 10 years. In 1981, however, the state assumed full control of the laboratories, with the Palmer facility specializing in microbiological tests, such as meat, seafood and dairy analyses, and the Douglas laboratory concentrating on chemical analysis.

Since then, the Douglas lab also has set up a quality assurance project to check the performance of private contract labs in the state and assist field data collection activities of department staff and contractors. It has also established a monitoring program to devise proper sampling strategies for specific environmental issues.



ENVIRONMENTAL QUALITY MONITORING AND LABORATORY OPERATIONS

Monitoring and lab services in Juneau support a wide range of programs for most of the department. The lab provides high-quality analysis on samples, manages the state's drinking water certification program for chemical labs, monitors water quality, and ensures that all environmental data generated for the department is scientifically valid, defensible and of known quality.

Why Monitoring and Lab Services are Important

The Douglas monitoring and lab services test for heavy metals, volatile and semi-volatile organic compounds, pesticides, and petroleum in soil, water, and sludge. The lab also can perform radiological tests and tests for nitrates and fluorides. It conducts customized, technically complex analyses for department programs.

The lab tests drinking water samples and also tests the seven private labs in the state which do the bulk of drinking water analysis for municipal and private water systems.

Samples required for enforcement of hazardous waste regulations and water quality permits are tested. The soil and

Major Accomplishments

- The Environmental Quality Lab analyzed oil tanker ballast water, performed oil spill "fingerprinting" to identify the source, analyzed drinking water samples for alpha particle radiation and helped track pollution plumes in groundwater by analyzing groundwater samples.
- In fiscal year 1991, conducted about 3,400 tests on 1,200 samples.
- Reviewed and administered over 60 quality assurance plans.
- Equipped sampling rooms in regional offices to assist field crews.
- Provided sampling and quality assurance assistance on the *Exxon Valdez* spill response. *(continued next page)*

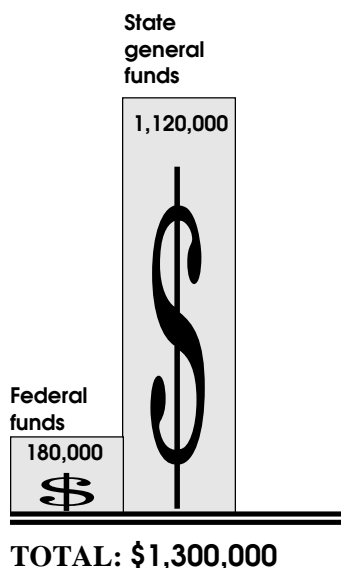
Laboratory Support

Major Accomplishments

- Completed reports on problems in Fish Lake near Tanana, Bettles, Wasilla, Harding Lake and Lutak Inlet.
- Provided quality assurance and testing methods in connection with the Kenai Peninsula hazardous waste cleanup efforts.
- Provided sampling and technical support for the Skagway lead cleanup during fiscal year 1990.
- Monitored water quality in the Kaslof River, in Clearwater Creek at Delta, near Thane in Juneau, and on a toxics investigation at Ship Creek in Anchorage.

Program Costs

Total cost of the lab and all related programs in FY 92:



water quality around waste sites and industrial facilities and the sites of leaking underground storage tanks are tested at the lab.

The quality assurance project reviews plans to insure that data meets the project's measurement objectives, and it validates the data on all tests to assure its usefulness.

Program Development

In 1975, Commissioner Mueller consolidated three small, independent laboratory activities with separate facilities — air quality, pesticide residue, and marine and coastal zone management — into a single environmental quality laboratory unit named “technical services.” This created a central point for scientific and technical knowledge to support all department programs. The technical services laboratory, with a staff of five, was set up in the spring of 1976 in Douglas, Alaska, near Juneau.

In 1980, a departmental reorganization consolidated the technical service and environmental analysis sections into the “environmental quality monitoring and laboratory operations” section, which conducted water quality monitoring, water quality planning and report writing.

Between 1980 and 1985, a gas chromatograph/mass spectrometer system was added to analyze volatile organic compounds (VOCs) as well as “semi-volatile priority pollutants.” An inductively coupled plasma spectrometer was purchased to perform multi-element metals analyses as well as an atomic absorption spectrophotometer to analyze metals one element at a time.

An EPA audit in 1986, which severely criticized the department's quality assurance procedures, sparked greater emphasis on developing and writing quality assurance project plans for field and lab data collection activities within the department.

In 1989-1991 new laboratory instrumentation was purchased and existing instruments were interfaced to personal computers for automated data acquisition and computations. The lab now has state-of-the-art instrumentation for inorganic and organic determinations. The latest acquisition, an inductively coupled plasma with a mass spectrometer detector, can determine up to 81 periodic table elements with a detection limit 100 to 1000 times lower than required for drinking water standards.

Portable laboratory capability is being purchased to provide on-site analytical service for spills and emergencies. The individual instrument systems and supporting equipment will be sufficiently compact to be crated for shipment in aircraft as small as a DeHavilland Beaver for remote area response.

The section currently has three units — quality assurance, laboratory services, and monitoring — with a staff of 21. Quality assurance staff are located in Anchorage and Fairbanks regional offices. A monitoring staff member is also located in the Fairbanks Office.

ENVIRONMENTAL HEALTH LABORATORY SUPPORT

The Palmer lab supports the field inspection staff in their mission of public health and safety. It performs chemical and/or microbiological tests on inspection-controlled meat in the state, on state dairy products, and all state fish and shellfish stocks sold to the public. The laboratory also supports veterinary medicine by testing pet animals at the request of veterinarians. It performs a host of chemical checks on questionable samples, searches for the cause of illness outbreaks, monitors the quality of water testing labs and deals with consumer complaints and diverse health issues from human illness to brucellosis in cattle.

Why Laboratory Support is Important

The Palmer lab conducts basic seafood-related examinations, ranging from decomposition evaluations to testing for the toxin that causes Paralytic Shellfish Poisoning, as well as for parasites and other contaminants of seafood. Tests are also performed for brucellosis in cattle and dogs, equine infectious anemia in horses, mastitis in dairy cows and goats, and other animal diseases.

The lab examines milk produced in the state's two milk sheds both for quality and meeting basic standards of the Interstate Milk Shippers program administered by the US Food and Drug Administration. It also certifies the performance of 25 private laboratories which examine water for microbiological quality. The laboratory tests water samples for pesticides and products such as animal feeds, fertilizers and toxic materials intentionally fed to animals. It also supports other state programs with laboratory needs, including testing water from state parks and examining a variety of tissue samples for the presence of trichinosis.

Program Development

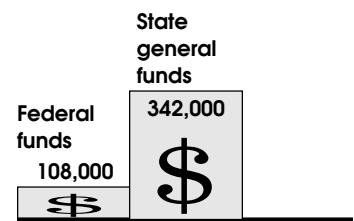
The laboratory was established in 1966 as a cooperative facility between the Division of Agriculture, the Alaska Department of Natural Resource and the U.S. Department of Agriculture to support animal disease programs. Work in the early years was a combination of field sample collection and laboratory testing, with less than 500 samples handled each year. There was a constant growth in the number of samples processed until 1981 when the organization was re-aligned by Executive Order 51. The seafood program development and the occurrence of botulism in canned salmon were major events that refocused the direction of the lab and resulted in major expansion.

Major Accomplishments

- In fiscal year 1990 conducted multiple tests on 15,000 samples, including some 5,000 seafood samples, 3,700 of which involved potential contamination from the Exxon Valdez oil spill.
- In fiscal year 1989 tested 126 animals bound for export from the country, conducted 1744 samples for PSP, completed 1619 water sample analyses and handled 173 consumer complaints that resulted in sample submission.
- Developed a sampling and testing program for listeria, a bacteria found in seafood products in other states that may be of significance in Alaska.
- In the final process of establishing a Vibrio testing program for shellfish produced in-state and imported.

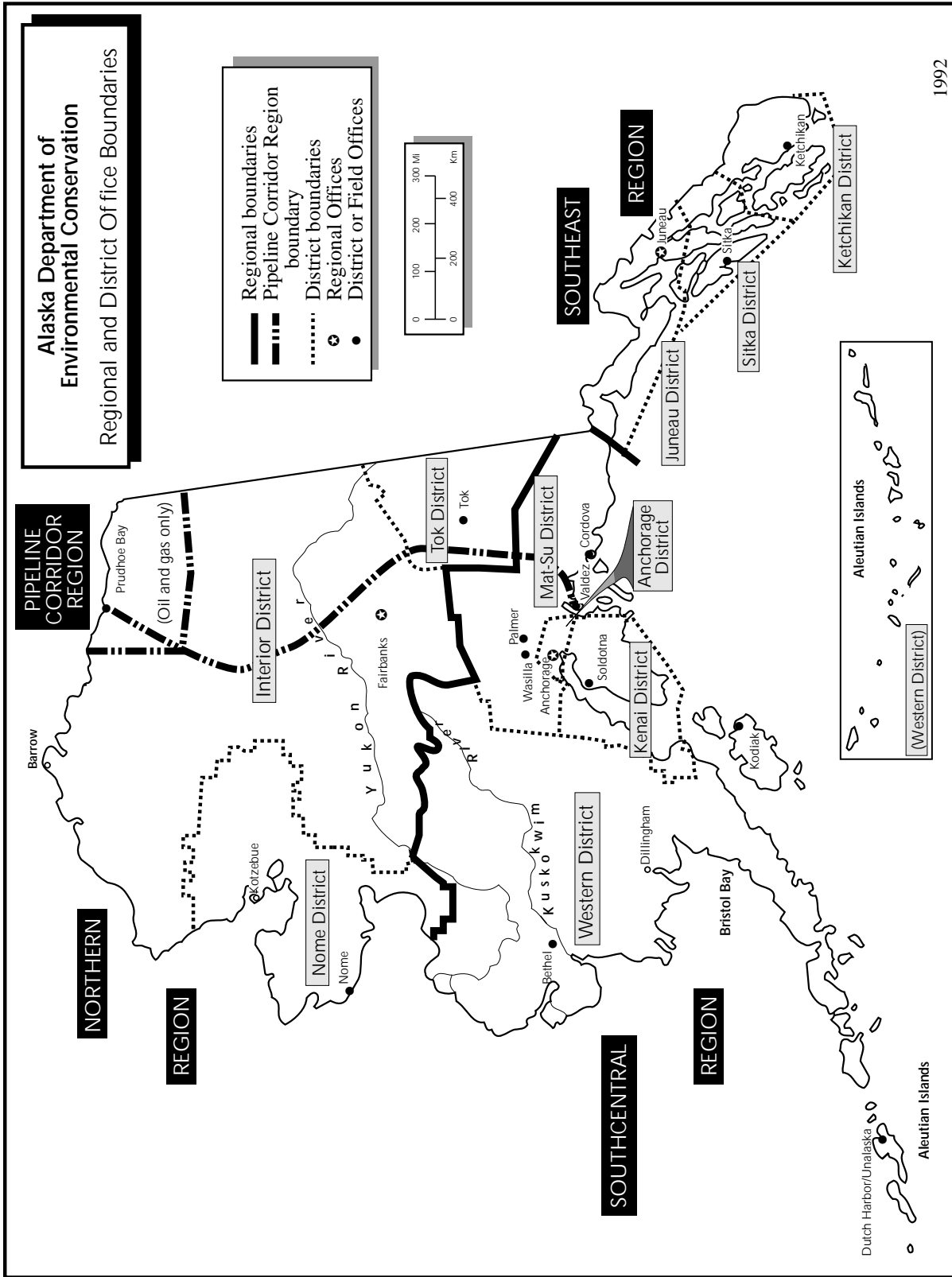
Program Costs

Total cost of the environmental health laboratory support program in FY 92:



TOTAL: \$450,000

DEC's Regional Offices



E *nvironmental Protection in Action: DEC's Regional Offices*

The department's regional offices are where the "rubber meets the road." All the planning, regulations, standards and background work that take place in the central offices in Juneau are put to work by regional office personnel and the affiliated district and field offices. Regional staff seek to maintain a balanced program of regulatory standards, education, technical assistance and enforcement.

Enforcement

When enforcement is necessary, several mechanisms exist to bring about compliance. The initial response is to work with people. A notice of violation is often the first step toward enforcement. An NOV basically states the problem to the responsible party and what they need to do to prevent enforcement action.

The first level of actual enforcement is administrative, and consists of Compliance Orders, Compliance Orders by Consent and Emergency Orders. The first two are issued by a regional administrator and begin with a Notice of Intent, which states the problem and allows 15 days for written response and rights to a judicatory hearing. The Compliance Order by Consent shortens the process considerably and works through reaching agreement with the responsible party on corrective measures. Emergency orders are issued by the Commissioner and are used in instances of greater public or environmental threat.

Civil or criminal legal action is less common, needed only when necessary, and usually involves larger-scale events. Civil action is taken through the State Attorney General's office, and considers damages, costs to the state and economic savings. Criminal action is taken by the District Attorney's office; burden of proof is greater, and a jail sentence as well as fines are potential outcomes.

Since 1990 the department has had an Environmental Enforcement Unit in each regional office, with an investigator for criminal and civil cases who works with a district attorney to handle environmental cases.

DEC's Regional Offices

One way in which the regional offices are tackling the complexity of today's environmental issues is through cooperative agreements with communities. The agreements spell out which problems have the highest priority for each community and therefore will receive the greatest attention and resources.

History

When DEC was first formed in 1971, the tiny staff included one full-time engineer in Anchorage and Fairbanks and half of an engineer's time for regional issues in Juneau.

The department grew slowly in the 1970's, including establishment of a separate region in Prince William Sound when oil pipeline construction began. Small district offices were opened in Sitka, Ketchikan, Soldotna, Wasilla and Nome. A full-time Southeast Regional Office was created, and the chemistry laboratory was formed.

As the environmental health division was transferred in 1980 from the Department of Health and Social Services, sanitarians became a part of the staff in all the regions. The scope of regulations to be met grew to include food service, environmental sanitation, smoking in public places, and various meat and animal inspections.

Staff from all regions trained in spill response have helped with larger oil and hazardous waste spills, regardless of the region of occurrence. The March 24, 1989 crude oil spill from the *Exxon Valdez* spill in Prince William Sound and its lengthy cleanup required involvement of personnel from every region. Expertise is likewise shared for other major spills and hazards in any given region. Regional staff respond to about 2,000 smaller oil and hazardous substance spills each year.

A procession of issues and events have shaped the history of environmental protection in Alaska. Some took the efforts of only a few regional staff to solve, while others were major events involving not only DEC staff from many levels, locations and programs, but also the cooperation of other state, federal, and individual citizens.

Southeast Regional Office

Inadequate sewage collection and treatment problems drew the most attention in the early 1970's. Plants were being built in most communities. Other early efforts involved review of subdivision plans for adequate water and sewage treatment systems. A fledgling public drinking water program was started, with its first computer, a little beast dubbed "Ego."

Wastewater discharge at the Ketchikan Pulp Mill and Sitka's Alaska Pulp Corporation were major issues even before DEC's creation. Both mills were in operation before statehood, and the Alaska Department of Health and Welfare imposed the first restrictions on the mills effluents by requiring use of primary clarifiers. Federal wastewater permits, or National Pollutant Discharge Elimination System permits, became a requirement in 1972 for both plants. State certification was needed for these permits, which were significant issues every time a permit was amended to meet the U.S. Environmental Protection Agency's increasingly stringent effluent limits on wastewater discharges.

Over the years, the mills have sought innovative and cost-effective ways to meet the new standards, including an anaerobic waste treatment plant at the Sitka mill.

Air quality at the Ketchikan and Sitka pulp mills was another concern in the 1970's. It centered on the terms of each mill's permits and the first level of enforcement action taken against the two mills for non-compliance.

Permit reviews for the U.S. Borax molybdenum mine south of Ketchikan involved staff time for over ten years. Closing of teepee burners in Wrangell, Ketchikan and Haines was effected through the central office staff during the 1970's.

A legal battle began between Skagway and EPA over "301 h" waivers in the late 1970's. This federal program allowed waiver of the requirement for secondary sewage treatment in instances of ocean discharge where no water quality problems exist.

The *T/V Lee Wang Zin* oil spill north of Dixon Entrance—the biggest of the Southeast oil spills—occurred during a storm on Christmas Eve 1979 when the ship hit a rock. The heavy load of iron ore shifted, capsizing the vessel, and the entire crew of 26 perished at sea. The vessel eventually drifted ashore on Prince of Wales Island. This was a mini-*Exxon Valdez* exercise for the department, with staff on call seven days a week for three months. At least 700,000 gallons of "bunker C" fuel despoiled 200 miles of beaches.

Woodsmoke in Juneau's Mendenhall Valley became a problem as more and more of the city's expanding population built homes there. DEC called the first woodstove emergency, requiring woodstove fires to be quenched. An innovative program of education, monitoring and enforcement, operated cooperatively with the City and Borough of Juneau put the problem under control.

A litter control and resource recovery program launched statewide in 1980 included shoestring grants distributed to communities to seed litter pickups and aluminum recycling. The \$1,500 that went to Tenakee Springs bought a crusher, still in operation, and Tenakee has consistently shipped out aluminum cans since their initial funding.

During the late 70's and early 80's the timber industry was shifting away from the "beaverslide" method of transferring timber to marine waters for rafting and toward less violent entry methods, like double A-frames, cranes and low-angle slides. Studies had shown that bark deposition in marine waters decreased with the "violence" of entry.

Project reviews became important in the early eighties. Big projects included the municipal coastal zone management plans, a plan to reprocess old mine tailings at Thane, the Auke Bay floating breakwater, and a number of controversial log transfer facilities.

Incineration of solid waste in Southeast was also a big issue at that time. Incinerators were eventually built in Juneau and Sitka.

In the early 1980's, DEC's decision to issue a state certification of the federal 401 wastewater permit for a log transfer

Woodsmoke in Juneau's Mendenhall Valley became a problem as more of the city's expanding population built homes there. DEC called the first woodstove emergency, requiring woodstove fires to be quenched. An innovative program of education, monitoring and enforcement, run cooperatively with the City and Borough of Juneau put the problem under control.

DEC's Regional Offices

Solid waste problems received increasing attention in the 1980's... During this time, real progress toward proper disposal was made by Ketchikan, Wrangell, Petersburg, Haines, Hoonah and Skagway. Sitka and Juneau landfills met most standards.

facility in Cube Cove was challenged by the Sierra Club Legal Defense Fund and the City of Angoon. After eight days of testimony the hearing officer allowed an amended certification to stand. This was only the first of several challenges to Shee Atika's proposal. Eventually, a facility was built.

SERO was represented on the Interdisciplinary Team which analyzed environmental impact from the proposed mine on Admiralty Island, which later became the Green's Creek Mine. A number of DEC staff were involved.

A series of fuel spills from barges plagued Southeast waters, with at least one spill occurring per year between 1981 to 1985. The barges, carrying fuel and sometimes freight, were negotiating narrow passageways while servicing small communities.

In the fall of 1988 very high levels of lead and zinc were found in soils in Skagway. DEC chaired a multi-agency task force to evaluate risks and cause necessary remediation. Two years of analysis by the Department of Health and Social Services of lead levels in the blood of Skagway citizens indicated a low risk to human health in spite of the contamination. By the spring of 1990, upland soils were successfully remediated. One of the sources of the original contamination, an ore conveyor to ocean-going freighters, was rebuilt with state-of-the-art controls.

DEC and the Ketchikan Gateway Borough forged closer ties toward the end of the 1980's in dealing with chronic sewage disposal problems in un-sewered areas of Ketchikan.

Electrostatic precipitators were installed on sawmills in Wrangell and Haines to solve long-standing problems.

Solid waste problems received increasing attention in the 1980's. The Southeast Conference of Mayors, DEC and EPA sponsored a study in 1981. An analysis of solutions for Prince of Wales Island was completed in 1990, and the Southeast Conference of Mayors, supported by a DEC solid waste planning grant, completed an analysis of recycling opportunities in 1991. During this time, real progress toward proper disposal was made by Ketchikan, Wrangell, Petersburg, Haines, Hoonah and Skagway. Sitka and Juneau landfills met most standards.

A toxic chlorine-acid gas release occurred in Ketchikan in 1990 when the waste was off-loaded from a tour ship into a garbage truck. The reactions from 1300 pounds of seven chemicals produced a toxic gas as the truck drove through town. The load was isolated at Ketchikan's landfill, and DEC responded to neutralize it, with assistance from contractors and other local, state and federal entities.

The Southcentral Regional Office has negotiated and signed community agreements with three communities, as of mid-January, 1992. Agreements with sixteen more are in various draft stages at this time.

Southcentral Regional Office

In the early 70's the biggest single factor determining the work of the fledgling regional office was the "civilian side" impact of the pipeline. While the pipeline corridor extends from Barrow to Valdez, going nowhere near Anchorage, the state's largest city necessarily served as the hub of much of direct and indirect pipeline activity. Population in the Southcentral area grew very rapidly, and trailer parks, subdivisions, and new businesses sprang up rapidly, engendering more water, sewer and solid waste problems than the tiny staff could keep up with. This period was when many of the subdivisions in the Matanuska-Susitna Valley and the Kenai area were created.

During the first decade of DEC's existence, attention was much more focused on the pipeline than the growth of the petroleum industry on the Kenai Peninsula, and many of the problems there today stem from that era of inadequate attention.

The Prince William Sound Office of DEC, currently a district office of SCRO, operated as a Regional Office during many years of the pipeline and was on hand for the commencement of operations at the Alyeska Marine Terminal.

In the early 80's, SCRO became concerned that lending institutions were using misleading information concerning sewer and water systems to make decisions on loans. The Alaska Housing Finance Corporation, in turn, became concerned about loans for properties without a better information on possible sewer and water non-compliance. SCRO led the way to develop the Bank Loan Program, in which private engineers and installers were used to develop the data bank lenders needed to approve loans. DEC provided oversight of the private sector, and AHFC provided funding to DEC for this service—approximately \$200,000 per year initially. This was a unique solution to a serious problem, since the banks and lenders utilized the private sector to a major degree and identified and solved many health problems. The program operated without a hitch for many years and yet was never specifically spelled out in regulation.

An eight-year effort to investigate and reissue a wastewater permit for the Alyeska facility began in 1982. Serious violations to the state water quality standards were discovered and handled in the process. An ongoing investigation of air violations at the Alyeska Valdez terminal began in 1985. This investigation was expanded to the entire pipeline from Prudhoe Bay on down.

In the mid-80's, SCRO staff, working with the Attorney General's office, refined the Compliance Order by Consent process to start including dollar amount settlements. This resolved many environmental problems without court actions while still recovering cost to the state. The process was used extensively to conclude many investigations, spills, and projects.

Also at that time the DEC MatSu District office safely regulated the open burning of 13,000 acres of farm land at the Point MacKenzie Agricultural Project.

Also in the 80's, a Homer surveyor challenged DEC's regula-

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DEC's Regional Offices

In 1987, the Southcentral Regional Office negotiated a tri-agency cleanup agreement with ARCO (Formerly Chevron USA) for the cleanup of PCB-contaminated soils in the Swanson River Wildlife Refuge...Until the Exxon Valdez, this was the largest single clean-up project in Alaska.

tions requiring review of subdivision wastewater plans. After a series of court actions, the regulations were upheld. Resistance by some subdividers in Kenai left many lands converted into residential lots that cannot support sewer disposal. Many of these inadequate systems remain today, causing health problems that the Kenai District Office deals with.

A railroad tank car began leaking its cargo of hazardous material near Moose Pass, on the way to Seward, in the spring of 1985. Many people were evacuated from their homes, some up to a year, due to the contamination. This event was perhaps the first pollution event causing major community impact and had long-lasting impacts on the department, its response capabilities, and industry practices. DEC staff led the response efforts, and experience made clear regulatory inadequacies concerning response to hazardous substance emergencies.

In 1986 came the discovery of the first groundwater supply severely polluted by benzene from a service station leak in Peters Creek, near Eagle River. This resulted in much concern on the part of residents of several subdivisions affected by the contamination. DEC was again called upon to lead the response and conduct an investigation. Both the Moose Pass and Peter's Creek events attracted extensive media coverage.

During 1987, the MatSu District office investigated complaints about illegal oil disposal, solid waste disposal, illegal burning, unreported oil spills and other problems at Cambior Company's Valdez Creek gold mine near Cantwell. An ensuing investigation resulted in legal action and a \$300,000 settlement for environmental restoration. The district office also established an oil spill cleanup and pollution prevention program at the mine.

In 1987, the Southcentral Regional Office negotiated a tri-agency cleanup agreement with ARCO (Formerly Chevron USA) for the cleanup of PCB-contaminated soils in the Swanson River Wildlife Refuge. The roads and parking lots in the range became polluted when oils containing PCBs were used for dust control. Negotiations included the U.S. Bureau of Land Management and the U.S. Fish and Wildlife Service. Until the *Exxon Valdez*, this was the largest single clean-up project in Alaska, costing around \$40,000,000.

SCRO staff have responded to many major spills, including the *T/V Glacier Bay* oil spill in Cook Inlet in 1987, the *T/V Thompson Pass* spill in Port Valdez in 1989 and six large spills in the Aleutian Islands and Gulf of Alaska. DEC has led Alaska's efforts to clean up the largest tanker spill in North American history, the *Exxon Valdez*. Southcentral Regional staff were the first to respond, landing on the stricken tanker within three hours of the spill. The department coordinated all state response staff from all the regions as well as the central office and was heavily involved in cleanup operations and work with Alyeska and local communities.

In both the *Exxon Valdez* and *Glacier Bay* spills, the department launched emergency seafood inspection programs that ensured the high quality of Alaska seafood products, which support the largest job-producing industry in the state.

In the same winter as the *Exxon Valdez*, three ships and one or more barges were lost in the Aleutians, with a cumulative loss of about 5 million gallons of fuel. One vessel would have been allowed to remain on the beach at Dutch Harbor, but an emergency order by DEC required the immediate removal of crab to prevent health and safety problems. After the effort to remove the product, which the insurance company had written off, the order allowed the oil to be removed. With that done, the ship was discovered to be salvageable.

In 1990, a barge loaded with fuel broke loose from a tug and threatened to wash ashore at Hinchbrook Entrance in Prince William Sound. DEC urged the Coast Guard to prepare to burn the barge and contents if control could not be accomplished before it drifted too close to land. This may have provided the incentive for the tug operator to make a last-ditch, successful attempt to hook up and save the barge.

When the Redoubt volcano on the west side of Cook Inlet began to erupt in the winter and spring of 1989-90, the area's principal oil storage facility, at Drift River, was threatened by potential floods. Regional staff worked with the facility's operators to modify operations and build new protection works that minimized the risk from the volcano. The response allowed the field to continue producing with minor shutdowns, protecting the oil field's productivity and the thousands of jobs associated with Cook Inlet oil and gas production.

Kenai Area Waste Disposal Issues

After 30 years of oil production and industrial activity on the Kenai Peninsula, lingering waste disposal problems, primarily caused by outdated practices, have begun to emerge in the form of groundwater contamination and other hazardous waste issues. In the mid 70's the Kenai District Office took legal action against the Tesoro company for its sludge pits behind its Kenai oil refinery. Eventually, however, the U.S. Environmental Protection Agency blessed the disposal practices, cutting short DEC's efforts.

In 1982-83 DEC took action against United Oil of California for having illegal mud disposal pits in the Kenai area. This was the first action taken by the department to put all mud pits under solid waste permitting requirements, including the multitude of pits on the North Slope. UNOCAL challenged DEC's denial of permits and eventually lost the legal battles in the mid- and late 80's. Beginning in 1983, all oil company drilling mud pits were handled through permits under the solid waste regulations. The solid waste regulations were soon amended to include much more specific language concerning drilling muds disposal.

Criminal charges were brought against the Atlantic Richfield Company in the mid-80's for illegal disposal of liquid drilling waste into the subsurface without the appropriate waste water permit. They paid \$75,000. DEC staff later discovered that ARCO regularly injected similar wastewater downhole in Prudhoe Bay without permits and without DEC taking action. That practice stopped quickly.

Beginning in 1983, all oil company drilling mud pits were handled through permits under the solid waste regulations. The solid waste regulations were soon amended to include much more specific language concerning drilling muds disposal.

DEC's Regional Offices

During the summer of 1985, DEC investigators confirmed that pollution existed in the Poppy Lane gravel pit near Soldotna. Petroleum hydrocarbons of many types had contaminated the soil and the groundwater around the pit, which had been used as a disposal site for many kinds of oil field wastes. Political pressures brought by local citizens helped obtain a special legislative appropriation for problem analysis. The 23-acre area is still being cleaned up.

During 1988 and 1989, the precursor to DEC's Environmental Enforcement Unit identified the cause of pollution problems at the Tesoro Alaska Refinery, initiating a project-wide, owner-financed cleanup. Corrosion of the underground oil transfer lines at the refinery, built in 1969, caused multiple leaks, with a layer of fuel up to 5 feet deep accumulating in the groundwater. Fuel recovered from the groundwater totalled about 300,000 gallons. The out-of-court settlement involved a total fine of \$500,000, with \$100,000 of this funding a study of groundwater in the Kenai area. The cleanup costs totalled in excess of \$1 million.

Since 1987, SCRO staff have surveyed all 68 potential oil production waste disposal sites in the Kenai area. The department has cleaned up or closed out 14 of them, is working on 12 more, and has identified 37 others that require further investigation. A groundwater protection strategy begun in 1989 includes a Kenai Groundwater Task Force.

The Southcentral Regional Office currently has negotiated three community agreements, and has 16 under review in draft forms.

At the end of September, 1972, Commissioner Brewer, at the request of Fairbanks Mayor Julian Rice, ordered the Fairbanks City Dump closed. The closure lasted four days until an agreement was made, with the Fairbanks North Star Borough taking over operation of the landfill.

Northern Regional Office

The Northern Regional Office (NRO) has an area of responsibility covering some 300,000 square miles. In 1971, there were approximately 70,000 persons located in some 100 Alaska communities in the region, although about 40,000 resided in or near Fairbanks. Over the past twenty years the population served in NRO has increased, as has the staff size and responsibilities.

Most of the initial work, due to limited staff, consisted of technical assistance and "crisis management."

At the end of September, 1972, Commissioner Brewer, at the request of Fairbanks Mayor Julian Rice, ordered the Fairbanks City Dump closed. The closure lasted four days until an agreement was made, with the Fairbanks North Star Borough taking over operation of the landfill.

During the first several years much time was spent monitoring air quality in the Fairbanks core area. EPA was threatening to control traffic in downtown Fairbanks if the carbon monoxide levels were not reduced. An air bag monitoring system utilizing garbage cans was set up throughout the area. Eventually the operation was turned over to the Fairbanks North Star Borough.

Oil and Gas Development

On November 16, 1973, the President gave approval to the Alyeska Consortium to begin construction of the Trans-Alaska Pipeline. Department responsibilities increased overnight, requiring pipeline review of plans for water, wastewater, solid waste, pesticides, air emissions and hazardous substance disposal. All of the department's responsibilities for the pipeline north of Glennallen were handled out of the NRO.

NRO was also responsible for monitoring the massive development of the North Slope oil field, including an aggressive exploration program both onshore and offshore, along with megascale development of the Prudhoe reservoir. The ancillary fields of Kuparuk, Milne Point, Lisbane, and Endicott also fell under NRO's permitting, inspection and review authority.

Attention was drawn in the late 70's to problems in the North Slope area with the region's first major hazardous waste incident. Under the North Slope Salvage Company's operations fifteen thousand drums of hazardous materials had been dumped on the gravel pad. Enforcement action ensued, requiring cleanup.

Federal funds, through the Resource Conservation and Recovery Act, were made available in 1979 to inventory and cleanup sites with hazardous waste problems in the state.

The unrealized prospect of an Alaska natural gas pipeline, to transport natural gas from Prudhoe Bay to the Canadian border, involved NRO staff time for three years, beginning in 1984 as NorthWest {{firm's name?}} conducted the project's preliminary design phase. Pipeline alignment, selection of camp sites, and permitting for the various elements all required DEC approval and comment. The project was shelved in 1987.

The pipeline office closed mid-way through the 1980's, and NRO expanded its presence on the North Slope. This led to establishment of the North Slope District Office. The combined attempt to have a state representative on location throughout the week, either from NRO or the Alaska Departments of Fish and Game or Natural Resources, provided increased surveillance of associated industrial activities on the North Slope.

The new surveillance teams were able to devote much more attention to the area's many problems, including contaminated pads and campsites, unreported spills, and over 400 disposal pits for drilling muds plus a full spectrum of solid waste from drilling operations and camps.

An overhaul of North Slope solid waste practices took place over the next few years, including re-writing DEC's solid waste regulations to include new practices for drilling mud disposal as well as encouragement of industry to segregate and salvage or backhaul the enormous quantities of scrap metal, tires, batteries, insulation and drums. Several unpermitted and poorly-situated dumps were closed, replaced by a new landfill and incinerator operated by the North Slope Borough.

Air pollution problems also were discovered in the Prudhoe Bay area, caused by flaring of the excess natural gas from flow tests conducted on oil wells and flow stations. DEC addressed

An overhaul of North Slope solid waste practices took place over the next few years... Several unpermitted and poorly situated dumps were closed, replaced by a new landfill and incinerator operated by the North Slope Borough.

DEC's Regional Offices

Water quality related to placer mining has been a real success story at NRO... A key element of the program was technical assistance, reflected in steady improvement each year in the water quality of streams impacted by mining.

the problems through changes to permits and enforcement action, requiring smokeless flaring and monitoring for nitrogen oxide emissions.

New emphasis on drinking water began in 1977 with the department's first set of drinking water regulations. The authority to carry out the federal program brought new money and new staff in all the regions.

New environmental health responsibilities were added with transfer of staff from the Department of Health and Social Services in 1980. The expanded scope of transferred regulations included food service, environmental sanitation, smoking in public places, and various meat and animal inspections.

During the history of oil and gas development NRO handled many spills, large and small, as well as monitoring and investigating the associated cleanups. Within one month of pipeline start-up in 1977, two major pipeline spills occurred: the explosion and fire at Pump Station 8, just as the first oil was passing through the station; and shortly thereafter the Check Valve 7 spill near Prudhoe Bay, caused by an equipment operator.

Other memorable spills and litigation covering the pipeline include the Steele Creek pipeline bombing (sabotage), resulting in an oil spill and cleanup, and the Atigun Pass oil spill in 1986 and its associated cleanup and eventual litigation.

In 1990, an Alaska Railroad derailment near Fairbanks spilled 170,000 gallons of fuel, requiring an extensive response by NRO.

Water quality related to placer mining has been a real success story at NRO. During the 80's, the office was heavily involved with both mining application reviews by the three resource agencies, and field inspections. A key element of the program was technical assistance, reflected in steady improvement each year in the water quality of streams impacted by mining. In 1989, EPA permits required total recycling of wastewater effluent, and those conditions were met for the whole mining season that year.

Six agreements between communities in the northern region's area and DEC have been signed. This represents approximately 50% of the region's land area. Two more agreements are in draft form.

Pipeline Corridor Region

DEC established a fourth region in July 1991 to provide a centralized structure to deal with issues related to the oil and gas industry. This region begins geographically at Prudhoe Bay, covers the oil and gas industrial activities of the north slope, the 850 miles of pipeline (and the rights-of-way), the Valdez Terminal, tanker traffic in Prince William Sound and the Alyeska ballast water treatment facility in Valdez. The staff of this region, with a budget of nearly \$2 million, is responsible for implementing the regulations for oil and gas exploration, produc-

tion and transportation facilities on the North Slope, the pipeline right-of-way, and Prince William Sound. In the past, DEC's oil and gas industry contacts has gone through two regional offices, two district offices and the central office in Juneau. The department expects the single pipeline corridor office to result in a more consistent application of the regulations and in increased accountability by industry. This streamlined structure comes at the beginning of a new decade, which looks to be an active one for the oil and gas industry, and could include the opening of the Arctic National Wildlife Refuge for oil exploration.

The central office for this region is located in the State Pipeline Coordinator's office in Anchorage. This office was set up to administer state regulations as they apply to the oil and gas industry, and also houses the federal agency office charged with similar responsibilities. Working along side DEC are staff members from the departments of Natural Resources and Fish and Game, and federal staff from the Bureau of Land Management and the Fish and Wildlife Service.

This means that there exists a unified point of governmental contact for the oil and gas industry. Similar pipeline offices have existed twice in the last 20 years, created when the need has arisen.

Field offices to support the Anchorage office are in Valdez and Fairbanks, as well as another office in Prudhoe Bay, which is located with staff from the Department of Natural Resources. Sharing offices provides the state with a considerable cost savings and increases the direct service provided to the citizens of Alaska.

DEC's Regional Offices

COOPERATIVE ENVIRONMENTAL COMMUNITY AGREEMENTS

In 1991 the department began to develop formal cooperative agreements throughout the state to strengthen its working relationship with communities and other organizations. These agreements enlist the cooperation of communities or organizations in developing a common agenda with DEC, providing a structure for practical, cost-effective solutions to environmental problems.

The agreements identify significant environmental issues that the community and DEC will jointly address and actions to be taken. Departmental representatives work with communities to help identify the issues and maintain communication.

By developing cooperative agreements, a community and DEC can better focus their combined resources on issues the community identifies as most important.

Most agreements are being developed with cities and boroughs. For communities outside of organized cities or boroughs, agreements may be developed individually or with organizations representing a group or cluster of communities.

Contents of Agreements

The agreements commit the parties to address specific issues and to make general long-term environmental improvements. They develop a common agenda between DEC and the community or organization through identifying and ranking environmental problems and provide an opportunity to work cooperatively on the community's prioritized list. Agreements are voluntary and not used as an enforcement document. They contain:

- A contact person in both DEC and the community to identify environmental issues and maintain a communication link.
- Provisions for amendment at any time — agreements are effective for one year.
- No commitment of additional DEC funds for solving the problems.
- A section specifying pollution prevention actions.
- A list of the contaminated sites in the community.
- A list of environmental problems, as well as strategies and goals for addressing the problems.
- A list of the other programs that DEC administers.

Agreements signed with:

Northern Region

Fairbanks North Star Borough
City of Fairbanks
City of North Pole
Tanana Chiefs conference
City of Kotzebue
North Slope Borough
City of White Mountain
City of Nenana

Southcentral Region

City of Unalaska
City of Sanit Paul
City of Sand Point
Kenai Peninsula Borough
Chenega Bay
Tatitlek
City Of Cordova

Southeast Region

Ketchikan Gateway Borough
Haines Borough
City of Angoon
Southeast Conference
Regional Partnership
City of Ketchikan
City of Petersburg
City of Haines

as of 9/92

Community Agreements

Development of Agreements

Community agreements will be developed with every Alaskan community interested in the program. As of September 1992, the department had signed twenty agreements. DEC is in the process of developing 35 more.

MAJOR ISSUES OF THE 90'S

Just a glance at Anchorage's new state-of-the-art solid waste disposal facility or the new "scrubbers" on smokestacks around the state, makes it clear there has been a vast improvement in care taken of Alaska's environment over the last 20 years. But as the Alaska Department of Environmental Conservation starts its third decade, it is equally clear that the problems affecting the 49th state's environment appear more complex and interconnected than they might have seemed 20 years ago.

Today there is increasing evidence that Alaska, even with its unique position on the northwestern tip of the continent, can't ignore the environmental concerns of the rest of the globe, be it fears over global warming or concerns about what to do with the state's growing mounds of trash.

While there is no crystal ball that clearly points out what the leading environmental concerns will be in Alaska in another decade, a listing of probable concerns include the following.

Air Issues

Now that the state is getting a handle on the most widespread air pollutants, with carbon monoxide in its two cities remaining a lingering concern, emerging areas of interest are the release of chemicals into the air, so-called **air toxics**, and in the release of volatile organic compounds (VOCs). The U.S. Environmental Protection Agency estimates that more than 60,000 chemicals are used in the United States and that release of 15,000 of them should be considered for control.

Alaska has a much smaller problem with air toxics than other states. Motor vehicles can release formaldehyde, benzene, toluene and xylene emissions. Wood stoves can release phenols, cresols, acetaldehyde and dioxins. Oil terminals and refineries can release benzene and other hydrocarbons, while chemical plants release ammonia and other contaminants. Large diesel engines can release trace amounts of heavy metals, such as cadmium and chromium.

The state has just promulgated new air standards for controlling ammonia releases — a problem largely caused by the Union Oil of California ammonia/urea plant at Nikiski, north of Kenai. Other regulations may well follow on benzene, a known cancer-causing chemical, with further regulations likely on dioxin emissions — dioxin, a by-product of burning anything in the presence of chlorine, also a possible cancer-causing agent.

Arctic haze is a special pollution problem unique to the

Major Issues of the 90'S

Radon Testing results in Alaska's Interior.

- 3 % of the homes had radon levels higher than 20 picocuries (pCi) per liter of air —

a lung cancer risk equivalent to smoking about a pack and a half per day, or likely cause the death of 60 to 210 people per 1,000 population.

- 17.6 % of the homes had radon levels higher than four pCi per liter —

a lung cancer risk about four times higher than non-smokers face. Statistically, about 13 to 50 people per 1,000 would be expected to die from lung cancer if they lived for 70 years in such radon afflicted homes.

Northern Hemisphere. Arctic haze, which has been observed for only the past 40 years, causes a brownish layer in the atmosphere that affects a large area of the state's northern Arctic coast. Since tracer studies have been done which prove most of the haze stems from industrial air pollution from eastern Europe and the Soviet Union, transported to the state in winter over the North Pole, it is unclear if emissions from oil development at Prudhoe Bay contribute and to what extent.

Another area of developing haze is in Anchorage, where during the past 15 years parts of the town, ringed on two sides by the Chugach Mountains, have begun to experience a brownish ground fog-haze. DEC is monitoring the haze problems in both locations to get a better handle on possible solutions.

Ice fog is another problem caused chiefly by the state's cold climate. It is a problem in winter on the North Slope, in Fairbanks, and in a few other communities when temperatures drop below minus 30 degrees Fahrenheit. Then water vapor in the air from vehicle emissions forms ice crystals around any particulate matter, cutting visibility markedly. The state's efforts to cut carbon monoxide emissions from autos — a leading source of the particulate matter needed for the crystals to form — have helped reduce ice fog formation. The state also has worked with local governments to reduce all air pollution to the lower the chances of ice fog. Incidents have actually decreased in recent years, but that may be the result of less severe winter temperatures during the past decade.

A third area of concern involves **radon**. For the past six years, EPA has warned of the substantial long-term health risks of breathing elevated levels of radon gas, formed by the natural decay of radioactive radium-226 in rock. It can seep from the surrounding rock and come through cracks into homes. The state geological division of the Department of Natural Resources, EPA and a research contractor conducted radon sampling in 1988 and the winter of 1989 from more than 1,300 homes statewide to test for radon.

According to the survey results, Interior Alaska has the highest proportion of homes with elevated radon concentrations, as well as the highest number of homes with the highest concentrations of radon. There was a serious problem in at least 3% of the homes tested (see chart at side).

In the Fairbanks area, homes built in the hills adjacent to the valley floor with concrete slabs or basements directly on the rock yielded the highest radon levels. Some 30 to 35 percent of the homes in the hills around Fairbanks recorded elevated radon concentrations. Throughout Interior Alaska, homes built on bedrock have higher radon risks than homes on pilings. In Southcentral there are a number of communities with elevated radon concentrations, but with levels far lower than in Fairbanks. Tests of homes in Southeast, Northern and Western Alaska show little signs of trouble, however, homes immediately adjacent to one another can test high and low respectively.

EPA is encouraging homeowners to test for the gas and then take steps to vent homes with higher concentrations of radon

inside them. DEC has been working on tests of schools, but the results generally show that radon is not a problem in Alaskan schools.

The debate over **global warming** and whether it is underway is more relevant in Alaska than in most other states. The theory of global warming, or the so-called Greenhouse Effect, proposes that the average temperature of the planet is warming because of the increase in carbon dioxide during the past century — carbon dioxide being a byproduct of the burning of fossil fuels. By the theory, the build-up in gases are trapping heat close to the earth's surface, much like the glass roof of a greenhouse traps the sun's rays.

According to some computer models, the equivalent of a doubling of the current level of carbon dioxide in the earth's atmosphere would result in average world temperatures rising by 3 to 9 degrees, and at current rates, such levels could double by the year 2030. But in northern Alaska, average temperatures would more likely rise two to three times that amount, possibly hitting 15 degrees warmer in winter. That could generate a host of effects, from thawing parts of the state's permanently frozen (permafrost) soils with resulting engineering problems, to increasing coastal flooding, a potential problem for the Yukon Flats bird-nesting area. The extra energy could also cause marked changes in Interior weather patterns and worsen the force of coastal storms.

At present the entire issue is controversial. It is, however, under study by the University of Alaska's Geophysical Institute at Fairbanks.

University scientists, in consultation with DEC personnel and in conjunction with the National Oceanographic and Atmospheric Administration, are also studying a related concern, the possible formation of an **ozone hole** over the North Pole.

Research has been conducted over the past two winters at the university's Poker Flats Research Station and at Barrow to determine whether a thinning of the protective ozone layer over the North Pole is occurring. Several years ago scientists discovered a thin area of ozone in winter at the South Pole over Antarctica. In 1988-89, tests in Norway indicated the possibility that the ozone layer over the North Pole also was thinning, although the extent appeared far less than noted in the Southern Hemisphere. Tests in recent years have detected a small hole for short periods.

The decrease is potentially important, however, since ozone blocks the sun's harmful ultraviolet light, and a decrease in ozone could increase skin cancer generation and potentially decrease the productivity of plants. While DEC is not directly involved in research on ozone and effects of chlorofluorocarbons (CFCs) at present, it is certainly an area on the horizon that could affect the department during the coming decade.

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Major Issues of the 90'S

Land Issues

New minimum standards for solid waste landfills were published by the federal government in October of 1991. The regulations will become effective in phases over the next 30 months, ending in the spring of 1994. The first rules to impact Alaska's landfills require detailed construction plans for the remaining life of each facility and a financial plan to cover the cost of closing each landfill.

What Alaskans will be doing with their garbage, generated on both land and sea and their **hazardous wastes** clearly will be among the top environmental issues of the 90s. Landfilling and **solid waste disposal** in general have been major issues nationwide in the previous decade. Hazardous waste has been a prominent national issue since the mid-1970s.

The department sets standards for solid waste landfills and all handling of hazardous waste. Public perception of solid and hazardous waste disposal practices often involves a high degree of suspicion. Due to past failures in the waste management system, any plan to build new landfills or hazardous waste facilities of any kind meets heavy opposition. DEC is working to raise the level of professionalism in waste handling so that communities will come to accept the need for, and safety of, places that take care of their unavoidably generated waste.

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Past practices of unsafe disposal of hazardous wastes have shown themselves by the number of **contaminated sites** discovered, for example, on the Kenai Peninsula. Estimates are that there may be up to 2,000 contaminated sites in the state. As of this fall about 975, containing a wide range of hazardous substances, have been identified and evaluated as part of the department's newly developed computerized ranking and tracking system for such sites.

Cleanup of contaminated sites in Alaska, from those on federal military facilities, to sites on state land, to those caused by the private sector, will be a major issue during the coming decade. The department is currently devising a plan to rid the state of contaminated sites within 10 years.

A subset of this issue is the problem of **leaking underground fuel storage tanks** (LUSTs). Nationally, there are about five to six million fuel storage tanks underground, the vast majority being home heating oil storage tanks. Of the nation's commercial storage tanks, EPA estimates that 49 percent of them, or 767,000 tanks, are at retail filling stations; 47 percent, or about 651,000 are operated to store petroleum produced by firms; while 4 percent, or 54,000 tanks, are used for chemical storage.

In Alaska, DEC statistics show that some 1,850 individuals and firms have about 5,000 such tanks registered. The scope of the leaking tank problem is shown by field inspections which find signs that 30 to 40 percent of tanks have leaked or are leaking at the time of routine replacement. Eighty-five percent of the state's public drinking water systems depend on groundwater supplies,

the water source most often contaminated by leaking tanks.

Gasoline, for example, contains several contaminants, the most serious being benzene, a known cancer-causing substance. As of this summer the department had issued more than \$2.8 million in grants set aside more than \$5 million to test tanks for leaks, install leak detection systems, install new tanks, and conduct further cleanup. And that is just the tip of the iceberg! The state is aware of more than 200 known or suspected sites of leaking underground tanks, most in the Railbelt area of the state. While there are no firm cost estimates, preliminary reviews indicate it may cost around \$100 million to clean up all the leaking tanks in the state and to install leak detection and leak prevention systems on existing tanks — making the cleanup and future prevention of leaking storage tanks a leading issue for the 1990's.

Water Issues

Drinking water quality in Alaska represents an interesting paradox. While the state enjoys a reputation for vast areas of pristine environment, it ranks at the bottom of the nation in public water system protection for public health.

In 1988 alone, the 1,600 community and non-community water systems failed to submit 4,000 water samples, the worst testing rate in the nation. And the state in recent years has averaged more than 300 incidents of poor-quality water coming from municipal systems — water containing everything from fecal coliform to leeches.

In the 1990's, the department will be faced with expanding its **drinking water program** to retain control of enforcement of drinking water provisions — to keep them from lapsing back into federal hands.

Beside testing, a major issue will be new EPA rules requiring filtration for most water systems that use surface waters for drinking (to guard against Giardia and other water-borne ailments).

In addition to making the state's existing public water systems work better, the state will be facing major expenditures for capital improvements to municipal **water and sewer systems** statewide, especially those serving the state's rural villages.

According to a study by the department's Facility Construction and Operation Division of the state's rural communities, 37% have piped sewage service. In the rest, sewage is handled in a number of ways. In 49%, people use outhouses, or haul their sewage in "honey buckets" or plastic bags to be dumped into pits, bunkers, ponds or lagoons where the waste is frozen for about half of the year. In approximately 14%, the community operates a honeybucket haul service.

According to two reports, one by the department and a second by the U.S. Public Health Service, the state needs be-

In Alaska, DEC statistics show that some 1,850 individuals and firms have about 5,000 underground fuel storage tanks registered. The scope of the leaking tank problem is shown by field inspections which find signs that 30 to 40 percent of tanks have leaked or are leaking at the time of routine replacement...85 percent of the state's public drinking water systems depend on groundwater supplies, the water source most often contaminated by leaking tanks.

Major Issues of the 90'S

Water Issues of the 90's

- **Public Water Supply Systems—**
Alaska ranks at the bottom of the nation in public water system protection for public health.
- **Construction of Community Water and Sewer Systems—**
Where will the money come from?
- **Groundwater protection—**
Agreements between local state and federal agencies will help share the responsibility.
- **Non-Point Sources of Pollution—**
Diffuse sources of pollution such as runoff from roads and parking lots can cause violations of the state's water quality standards.

tween \$1.1 billion and \$1.2 billion to fund rural water and sewage system needs.

Even in urban areas, the state needs to spend money on sewage improvements. While Alaska has 60 sewage treatment plants in operation in urban areas, a study by the Alaska Associated General Contractors, indicates Alaska will need to build another 39 new plants during the next five years at a cost of more than \$83.6 million to keep municipalities in compliance with the federal Clean Water Act.

During the 1990's, Alaska will be tackling a series of **other water quality concerns**, including pollution from diffuse sources ("nonpoint source" pollution), groundwater protection, and water-borne toxics and carcinogens. Recent amendments to the federal Clean Water Act will require DEC to set new water quality standards for toxics, call for remediation plans in coastal areas and strengthen its monitoring program. The department will also seek greater oversight of wetlands management at both the state and local levels.

Formal agreements and partnerships with communities and governmental land management agencies will help share the responsibility for groundwater protection and nonpoint source pollution control through land use controls. A new program called "Alaska Water Watch" encourages volunteers to monitor, clean up and restore polluted urban waterways.

Alaska, in its 586,000 square miles, has an estimated three million lakes, 365,000 miles of rivers and 36,000 miles of coastal shoreline. Over 99 percent of the state's waters, plus a similar percentage of its wetlands, are unaffected by human activities and thus are still in their natural state. The state and its municipalities, however, do monitor more than 500 waterbodies in urban areas, or areas affected by urban activities, for pollution.

According to DEC's 1990 water quality assessment, 66 of these waterbodies, or about 13 percent of those monitored, have been "impaired" by differing types of pollution, while 186 other waterbodies, about 37 percent of the state's monitored waterbodies, are listed as "suspected" of being affected. Three of the waterbodies have been impaired by toxic materials, with an additional 15 suspected of having suffered toxic contamination. Impairment means that the waterbody within the past five years has been affected by pollution incidents serious enough for the water to violate state water quality standards. The violations might include: excessive sediment, turbidity, the introduction of residues or debris, contamination by petroleum or by toxic substances.

According to the report:

* Some 29 rivers and streams have been impaired, with another 124 suspected of contamination. Most of the rivers were affected by urban runoff problems with timber harvest waste or placer mining also problems.

* Some 20 lakes have been impaired, generally by fuel or chemical leaks and spills, septic system pollution, soil erosion, pesticides and fertilizers or animals wastes; another 35 are suspected of being impaired.

* Fifteen coastal waterbodies and estuaries have been impaired, with 15 more suspected of being impaired. During 1989, the nearly 11-million-gallon oil spill caused by the wreck of the tanker *Exxon Valdez* was the key cause of coastal and estuary impairment, while a number of smaller fuel spills occurred statewide.

* And over 50 groundwater sites are listed as impaired, with many more suspected of being impaired, largely due to leaking underground fuel storage tanks.

Over the next decade the department will address water quality concerns primarily through four strategies: groundwater protection, non-point source pollution, the Alaska Water Watch program, and the state's water quality standards. The strategies set priority tasks and participants for the coming years.

For the next decade, combatting pollution of the state's water resources, caused most notably by urban development, timber harvest, hard rock and placer mining, oil and gas development and to a lesser extent agriculture, will be key issues for the department.

Spill Prevention and Response

The department will continue to coordinate oil and hazardous substance spill prevention and response preparedness with local communities, other state agencies, the federal government, and potential responsible parties.

Through lessons learned with the T/V Exxon Valdez spill, the state of Alaska will never again be caught off-guard in spill response. And several past hazardous substance releases have resulted in increased efforts to prevent and respond to such incidents.

During the 1990s, local emergency planning committees will complete plans and preparedness activities for response to hazardous substance incidents. These local plans will be part of a statewide planning network for all hazards. The State Master Oil and Hazardous Substance Discharge Prevention and Contingency Plan will be an annex to the State Emergency Plan and provide for integration of all state agencies' response activities for catastrophic incidents. The state will have a dedicated, highly-trained, professional response team with the capability to respond to hazardous substance incidents anywhere in the state. This team will train with local emergency responders continually and be the core of regional response teams.

Throughout the state local citizens will be considerably involved in prevention and preparedness activities through citizen advisory councils and oversight associations. Volunteers will be part of the integrated network of spill responders throughout the state.

By the year 2000 the state likely will be changed by new events barely perceived as environmental problems at the start of the decade. As the 1980's proved, volcanic eruptions, giant oil

Facing the prospect of future spills

- During the 1990s, local emergency planning committees will complete plans and preparedness activities for response to hazardous substance incidents.
- Local plans will be part of a statewide planning network for all hazards.
- The state master spill plan will integrate all state agencies' response activities for catastrophic incidents.
- The state has a dedicated, highly-trained, professional response team with the capability to respond to hazardous substance incidents anywhere in the state.
- Local citizens will be considerably involved in prevention and preparedness activities through citizen advisory councils and oversight associations.
- Volunteers will be part of the network of spill responders throughout the state.

Major Issues of the 90'S

spills, global atmospheric changes or heavy metal contamination incidents aren't possible to predict precisely, but are quite possible to occur, no matter how hard the department's staff works to prevent them from happening.