

Puerto Rico's Oil Spill Relationship with Environmental Law



By

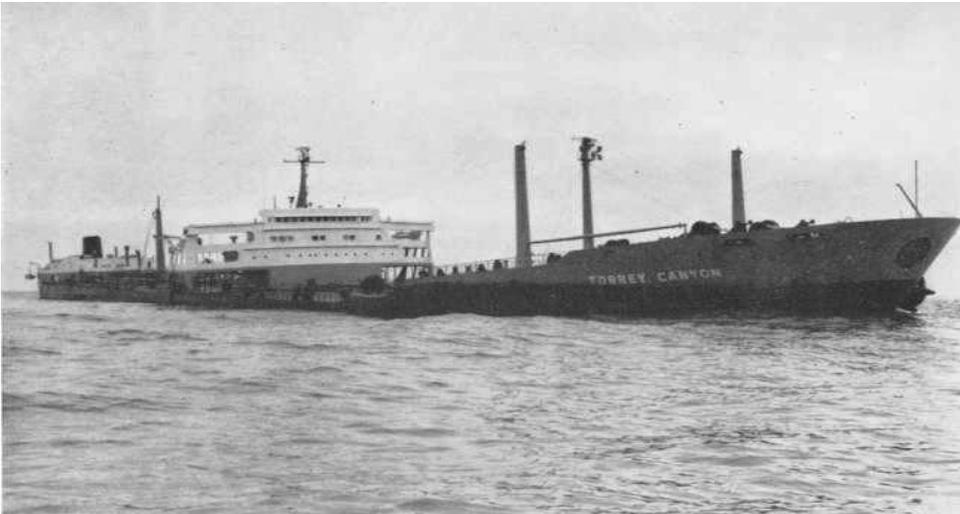
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Board of Directors

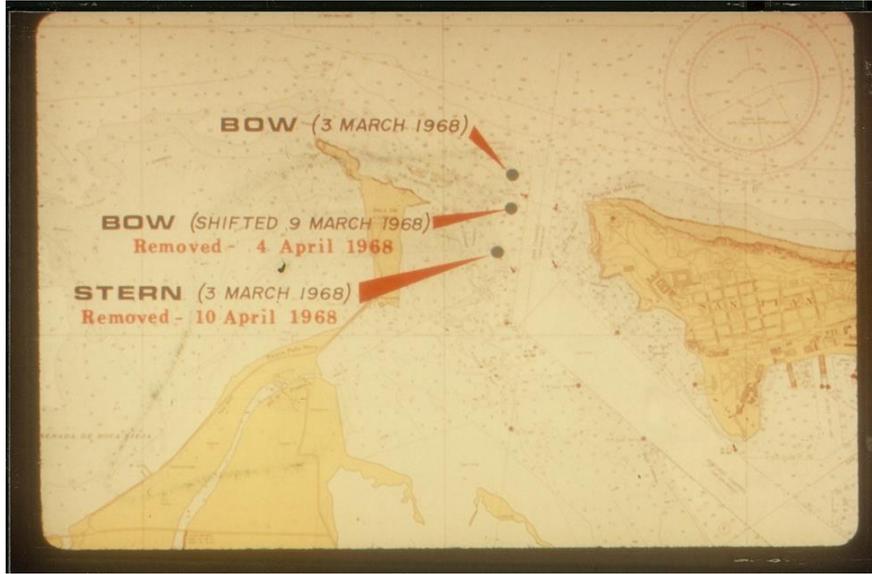
**Corporation for the Conservation of the San Juan
Bay Estuary**

INTRODUCTION:



- The development of Puerto Rico's environmental laws is closely related with two large oil spills in Puerto Rico's coasts.
- **SS Ocean Eagle Spill** at the entrance channel to San Juan harbor at 7:00 A.M. on March 3, 1968 impacted the coast of the Municipalities from Dorado to Loiza and later from Isabela to Quebradillas.
- **Torrey Canyon oil spill** on Poland Rock of Seven Stone Reef, which impacted the coasts of the English Channel between Cornwall, England and Normandie, France, was the only previous large spill to gain experience for oil spill clean-ups.
- **SS Zoe Colocotroni Spill** on an offshore reef about 3.5 miles southeast of La Parguera at 2:55 A.M. on March 18, 1973 impacted the coast of Bahía Sucia in southwestern Puerto Rico.
- Although both incidents were closely related to finally prove environmental liabilities in the U.S. Courts, their environmental impact and clean-up activities were quite different.
- While the Ocean Eagle spill impacted touristic beaches, cultural features and the San Juan port, the Zoe Colocotronis spill impacted the natural resources of the rural coast of southwest Puerto Rico.
- The experience gained from the **Ocean Eagle** was used by Puerto Rico's Environmental Quality Board (PREQB) to prove environmental liability in Zoe Colocotronis' court procedures.

The Ocean Eagle Incident



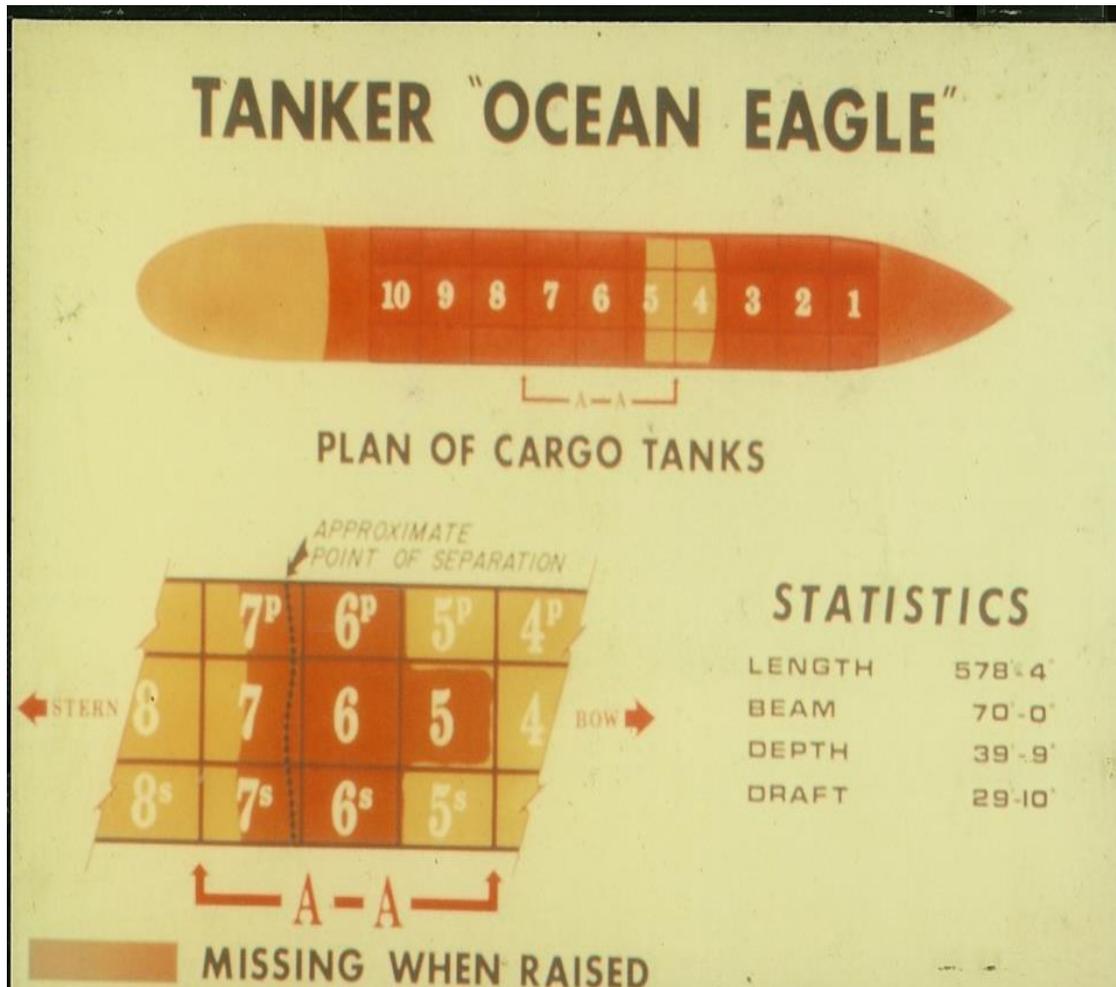
- Due to 15' to 18' high sea waves, the tanker hit the bottom in the entrance channel to the San Juan Bay, and split into two parts.
- Immediately, about 3.7 million gallons of petroleum crude were spilled to coastal waters.
- On March 9, 1968, the bow shifted towards the reefs of Cabras Island, and was removed for deep ocean disposal on April 4, 1968.
- The stern drifted in the channel to the south towards a reef near the Cañuelo Fort, and was removed for ocean disposal on April 10, 1968.

A Geologist Observing the Ocean Eagle Accident

- President, Lyndon Johnson, was returning home from a trip to South America and “*Air Force One*” had to refuel in Ramey Airforce Base, Aguadilla.
- The President decided to fly over the spill area to see the damage.
- However, his only command to the federal and local troops was:
- ***“Clean it up”.***

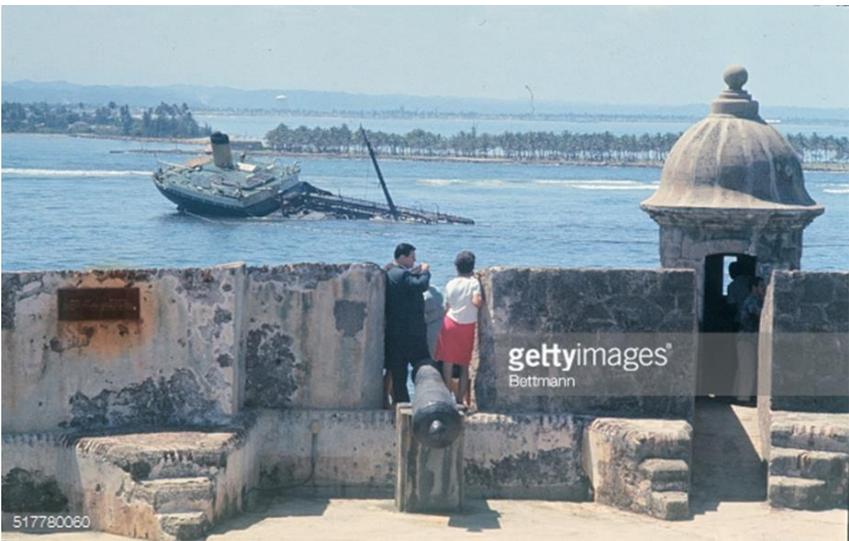


Ocean Eagle Cargo Tanks



- High waves did not allow the rescue boats to reach the ship, and barges could not unload the crude petroleum from the 30 storage tanks.
- The ship could only be reached by helicopters during the first week of the spill.
- Tanks 7^p, 6^p, 7, 6, 5, 7^s, and 6^s completely lost their cargo, since it was missing when ship was raised.
- Tanks 8^p, 7^p, 6^p, 5^p, 4^p, 8, 7, 6, 5, 4, 8^s, 7^s, 7^s, 6^s, and 5^s partially lost their cargo.
- The spilled crude quickly drifted to the Cataño coast, the old walls of the Morro and Cañuelo Forts, and the tourist beaches of the Escambrón, Caribe Hilton, Condado, Ocean Park and Isla Verde.

OIL SPILL EMERGENCY PLAN



Since there was no adequate contingency plan in place, the federal and local officials determined:

- Bow was under the jurisdiction of the USCG, because it was located outside San Juan Bay. The USCG was in-charge of reclaiming petroleum left in the bow tanks and disposing both parts of the vessel.
- The stern was under jurisdiction of the USACE, because it was located within the San Juan Bay. The USACE was in charge of reclaiming petroleum remaining in the stern.
- Both agencies were assisted by the U.S. Navy, as needed.
- Puerto Rico's Department of Public Works (PRDPW) was in charge of the beach and coastal water clean-up, because local government had the personnel and equipment for the clean-up work.
- The strategy developed was to maintain most of the petroleum confined within San Juan Bay, and prevent contamination of the coastal mangrove forests by blocking the water inlets to the lagoons.
- PRDPW clean-up included: waters in San Juan Bay, river channels, coastal lagoons (Condado, Los Colosos, San José, Torrecillas & Piñones Lagoons), beaches, beach rocks, eolianites (cemented sand dunes), and coastal historic structures.

OIL SPILL EMERGENCY PLAN



- Since Governor **Roberto Sánchez Vilella** was on a trip away from Puerto Rico, Acting Governor, **Guillermo Irizarry**, delegated the coastal clean-up to the Secretary of Public Works, **Francisco Lizardi**.
- **Francisco Lizardi** created a *Petroleum Emergency Office* and appointed **Hamilton Ramírez**, as its Director.
- **Ramírez** selected an emergency team consisting of: **Eng. Rafael Cruz Pérez, Dr. Máximo Cerame Vivas, Lawyer Nicolás Jiménez, Eng. David Peré** and **myself**, a geologist, as his technical advisors.
- **David Peré**, Director of the DPW Testing Materials Laboratory, was in charge of the testing the materials to be used in the clean-up.
- **Dr. Máximo Cerame Vivas**, UPR's Director of Marine Sciences Department, created a small laboratory to analyze the toxicity of the clean-up materials, and evaluate the impact on marine life with his professors and students.
- **Jiménez & Fuste Law Firm** was in charge of the legal aspects related to the oil spill clean-up costs, damages, liabilities and/or compensations.
- **Cruz Pérez** and myself were in charge of field testing the clean-up materials and procedures.
- After 3 months, **Ramírez** was replaced by **Cruz Pérez**, as Director, and I became the Deputy Director of the *Petroleum Emergency Office*.

Petroleum Effects on Marine Life

Most of the marine organisms were adversely affected along Puerto Rico's Atlantic coast waters.

Although pelicans were captured and cleaned, they kept flying and diving into the thick petroleum slick of the San Juan Bay until the complete pelican colony had died.



Petroleum Recovery From Ship's Tanks

Pumps were installed in the decks of bow and stern to transfer petroleum remaining in the ship's tanks to barges for its recovery.



Petroleum remaining in ship's tanks was pumped to barges and transported to Caribbean Petroleum Co. (CAPECO) refinery for its recovery.



Clean-up Materials and Field Procedures



- Due to their toxicity, most of the liquid, solid and gaseous clean-up materials were rejected, but some dispersants were originally used by USCG.
- “*Ecopearl*”, an adsorbant consisting of perlite treated to repel water and adsorb oil with no adverse effect on marine life, was selected for the clean-up work.
- **Shelley & Goodman Laboratories** developed a similar adsorbent named “**Puramar**”, which also adsorbed oil and repel water, and was later used to treat the oil spills.
- Using PREPA’s helicopter and flying about 10 to 15 ft. over the ocean, **50 sacks of adsorbent** were dumped on the oil slicks. Slicks disappeared in less than a minute, due to the steering winds of the helicopter’s propeller.
- Oil impregnated adsorbent particles drifted to shore, where they were hand raked, and lifted into trucks by front-end-loaders for recovery as asphalt aggregate in Betterroads Co. or disposed at the San Juan Sanitary Landfill.

Clean-up Materials and Field Procedures (continue)



- To protect the coastal lagoons, plywood curtains were installed at **Dos Hermanos Bridge** in Condado Lagoon and **Torrecillas Inlet Bridge** at Boca Cangrejos.
- For use in open high seas, **oil booms** constructed with plywood boards attached to empty steel-barrels on both sides of the boards were used to float the booms.
- For shallow coastal waters, **oil booms** were made with rectangular shaped rubber mats (24" by 15 ft.), floated between 2 fiberglass cylinders (24" long), to collect the oil and pump it to tank trucks for recovery.
- Once the oil was in the steel tanks, the light petroleum accumulated at the liquid's surface, and the heavier water sank to the tank bottom, where they were separated, the water was disposed, and the petroleum was retrieved for recovery.
- Recovered petroleum was transported to the Caribbean Petroleum Refinery (CAPECO) for recovery.

Ocean Eagle's Bow Disposal at Sea



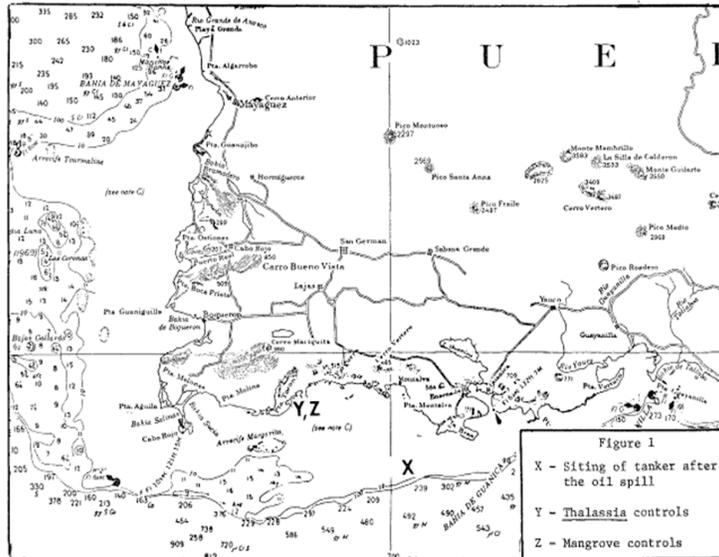
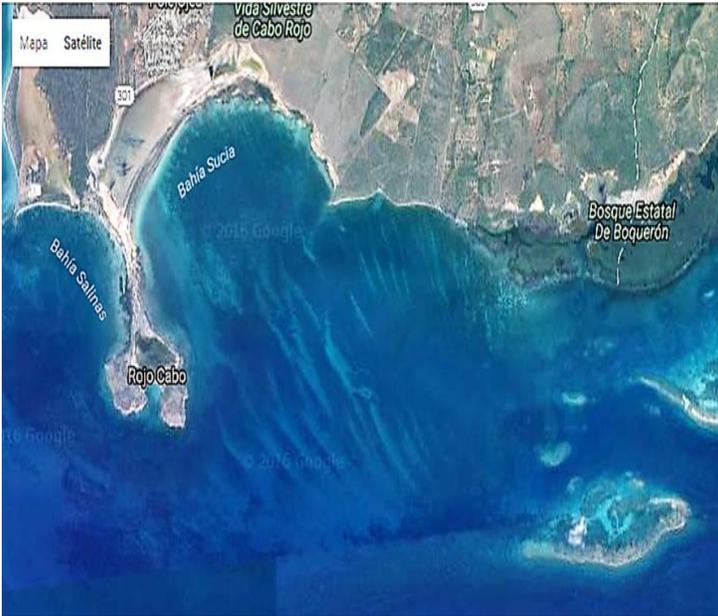
- **USCG** planned to sink the bow in the Puerto Rico Trench by exploiting the tank section 10 miles from shore.
- **Pilot Freddie Cortez** and I followed bow in PREPA's helicopter.
- As the bow was towed for about **8 miles** from shore, it began to sink.
- **USCG Emergency Strike Team** was on board, and the team captain ordered to abandon ship.
- He stayed alone on board, as I yelled "**jump, jump, jump**" (like an old calypso song) until he finally jumped into the black sea to safety.
- Remaining oil in the sunken tanks escaped, and drifted west reaching Puerto Rico's northwestern shores.
- PRDPW began cleaning the impacted coast from Quedradillas to Isabela for 2 additional months.

OCEAN EAGLE CASE IN FEDERAL COURTS



- On March 27, 1968, **federal and commonwealth governments** sued the owners and insurers of the Ocean Eagle requesting payments for clean-up activity and environmental damage liabilities.
- At that time, the penalty for an oil spill was only **\$100 per ton** of ship displacement to a maximum of penalty of **\$140,000** for each incident until the **Clean Water Act** increased such penalties in 1972.
- **Law Office of Jiménez & Fusté** represented the Commonwealth of Puerto Rico, and Nicolás Jiménez used as witnesses: **Dr. Máximo Cerame Vivas, Rafael Cruz Pérez and myself** to prove the case.
- It was stipulated that the ship's crew came from different nations and could not adequately communicate between themselves.
- Although Nicolás Jiménez was able to obtain **\$600,000** for clean-up costs, he could not prove environmental damages.
- The defense argued that no comparative evidence had been presented of the environmental conditions before the spill occurred.
- Although frustrated for not being able to justify environmental liability, we learned the manner on how to prove such damages in court.

Description of the Zoe Colocotroni Incident



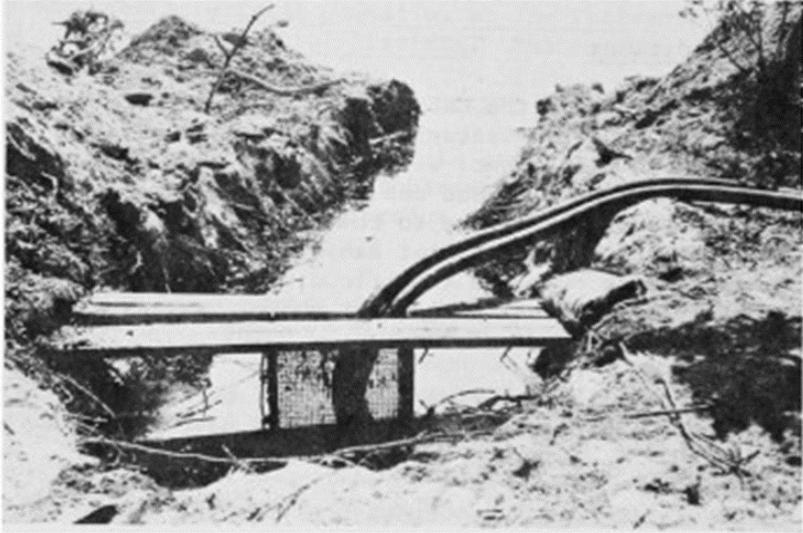
- Greek oil tanker, **SS Zoe Colocotroni**, was sailing from La Salinas, Venezuela to Commonwealth Oil Refinery Co. (CORCO) at Peñuelas, Puerto Rico under contract with Mobil Oil Co. of Venezuela, carrying a cargo of **180,000 million of barrels** of Tía Juana petroleum crude.
- Ship's captain, **M. Michalotoulis**, decided to use celestial navigation, because the ship compass, radar and sonar were not functional.
- The vessel ran off course by 3° in Puerto Rico's southern coastal waters.
- On **March 18, 1973 at 2:55 AM**, the tanker went aground on **Margarita Reef** about 3.5 miles southeast of La Parguera, Puerto Rico (latitude 17° 54° N & longitude 66° 59'W) .
- **USCG** reported an intentional spill, estimated at **1.5 million gallons** of petroleum crude, as the captain ordered to discharge **5,170 tons** of crude into the Caribbean Sea to reduce the ship's weight.
- After dumping **37,579 barrels** of petroleum, the tanker was free from the reef, and continued its course to CORCO, where the remaining petroleum in the tanks was delivered to the refinery.
- The reasons for the spill were: (1) the **crew was lost**, (2) **nautical charts** had inadequate scales, (3) the ship drifted **3 degrees** from its course, (4) **navigation equipment** was damaged, (5) **no observation officer** on guard, and (6) the **incompetent crew**.
- **Mobil Oil Co.** accepted to pay clean-up costs, but refused to pay any environmental liabilities.

Clean-up Operation for Zoe Colocotroni Oil Spill



- The oil slicks drifted from Margarita Reef to **Bahía Sucia in Cabo Rojo**, and impacted the eastern part of the cove from **67 ° 11.6' West and 17° and 57.6° North to 67° 11.0' West and 57.6 ° North** on the western part of the cove.
- By this time, there were: (1) Oil Pollution Control Act (1924), (2) Federal Pollution Control Act (1972), (3) creation of USEPA (1970), (4) creation of PREQB (1970), (5) creation of PRDNR (1973) and (6) PR Oil Spill Contingency Plan, and (7) National Strike Team in USCG.
- On **March 19, 1973**, Natural Resources Secretary, **Cruz A. Matos, Rafael Cruz Pérez and myself** flew over the damage area in a helicopter to develop a clean-up plan.
- Since **Zoe Colocotronis'** oil spill was out at sea, the oil slicks impacted isolated areas of difficult access by land and sea.
- With the positive experience gained during the **Ocean Eagle**, adsorbents were used to manually and/or mechanically pick up the oil impregnated adsorbents along the coast.
- **Personnel, equipment and materials** were transported from nearby cities and ports due to the isolation of the impacted area.
- **Diverse ecological areas** consisting of marine grasses, mangroves, sandy beaches, and rocky coasts had difficult access for clean-up.
- Petroleum crude **infiltrated into soils** with devastating effects on flora and fauna.
- **A different restoration plan** was required, since mangrove areas had to be destroyed to gain access to the impacted areas.
- **Restoration plan** suffered severe criticism from Boston circuit judges classifying it as a **“draconian plan”**.

Clean-up Operation for the Zoe Colocotroni Oil Spill (continued)



- **USCG** coordinated the oil clean-up operation with Department of Natural Resources (DNR), Environmental Quality Board (EQB), Department of Public Works (DPW) and Servicios Ambientales de Puerto Rico, Inc. (SAPRI) under contract by DNR.
- The clean-up activities used oil booms, skimmers, direct pumping of oil from holes dug on the beach to truck tanks, applications of adsorbents, and manual and mechanical collection of polluted materials.
- By March 29, 1973, **755,000 gallons** of petroleum crude were collected from Bahía Sucia, and **4,500 cu. yds.** of polluted sands were removed and disposed in Cabo Rojo's sanitary landfill.
- After a field inspection on **September 24, 1973**, the clean-up operations were suspended; but oil was still sporadically appearing on the beaches from Guánica to Boquerón Bay.
- On **March 24, 1973**, an EPA team of experts from the Edison, New Jersey performed an evaluation of the spill environmental impact.
- **UPR Department of Marine Sciences** studied a similar non-impacted area to be used as **comparison** with the impacted area.

Legal Case in Federal District Court of Puerto Rico



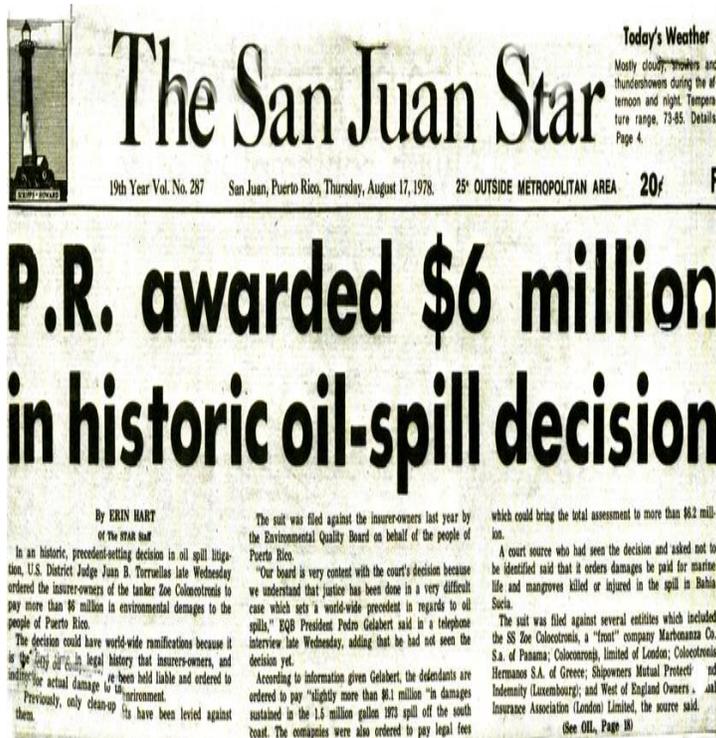
- PREQB contracted **Jiménez & Fusté Law Offices** due to their experience gained during the Ocean Eagle court case.
- On **Mach 23, 1973**, the vessel; its captain, **M. Michalotouslis**; and ship crew were arrested by Nicolás Jiménez, and all the navigation documents were sieged.
- EQB sue “*parens patrias*” the oil tanker registered in England and Greece; its owners **Marbonanza Compañía Naviera S.A., Colocotroni Ltd. and /or Colocotroni Brothers S.A.**; and its insurance agents **West of England Ship Owners Mutual Protection & Indemnity Association** from West of England-Luxemburg, and **West of England Ship Owners Mutual Insurance Association** from West of England -London (Reference: Civil Case 985-73).
- EQB’s main intention was to prove **environmental liability damages** caused by an oil spill in the federal court system.

Legal Case in Federal District Court (continued)



- Experts from the State of California advised Nicolás Jiménez on how to set a **price per dead organism** by taking its price from a sales catalog, and reducing the sailing, capture and handling cost to determine an estimated price of the organism in the wild.
- This novel procedure was **applied to all affected organisms** by the oil spill based on the damage report prepared by EPA's scientists.
- The estimated price range from a minimum of **\$0.10** for an insect to a maximum of **\$4.50** for a lobster.
- **Marvin Durning**, EPA's Ex-Assistant Administrator for Enforcement, represented several USA environmental groups, as friend of the court.
- The 6-week trial began in the **San Juan District Court on November 7, 1977**. The ship's owners presented a motion of exoneration which was denied by the judge, **Juan R. Torruellas**, ordering the parties to negotiate.
- After 3 days of negotiations, the owners and insurers offered only **\$600,000** for the clean-up costs without any environmental liabilities.
- Commonwealth of Puerto Rico presented **Plan A** for environmental damage inflicted per organism, and left pending **Plan B** for restoration costs of the affected areas.

Legal Case in Federal Circuit Court of Boston



The San Juan Star

Today's Weather
Mostly cloudy; showers and
thundershowers during the af-
ternoon and night. Tempera-
ture range, 73-95. Details,
Page 4.

19th Year Vol. No. 287 San Juan, Puerto Rico, Thursday, August 17, 1978. 25¢ OUTSIDE METROPOLITAN AREA 20¢

P.R. awarded \$6 million in historic oil-spill decision

By ERIN HART
OF THE STAR Staff

In an historic, precedent-setting decision in oil spill litigation, U.S. District Judge Juan B. Torruellas late Wednesday ordered the insurers-owners of the tanker Zoe Colocotronis to pay more than \$6 million in environmental damages to the people of Puerto Rico.

The decision could have world-wide ramifications because it is the first time in legal history that insurers-owners, and not just the actual damage to the environment.

Previously, only clean-up costs have been levied against them.

The suit was filed against the insurers-owners last year by the Environmental Quality Board on behalf of the people of Puerto Rico.

"Our board is very content with the court's decision because we understand that justice has been done in a very difficult case which sets a world-wide precedent in regards to oil spills," EQB President Pedro Gelabert said in a telephone interview late Wednesday, adding that he had not seen the decision yet.

According to information given Gelabert, the defendants are ordered to pay "slightly more than \$6.1 million" in damages sustained in the 1.5 million gallon 1973 spill off the south coast. The companies were also ordered to pay legal fees which could bring the total assessment to more than \$6.2 million.

A court source who had seen the decision and asked not to be identified said that it orders damages be paid for marine life and mangroves killed or injured in the spill in Bahía Sucia.

The suit was filed against several entities which included the SS Zoe Colocotronis, a "front" company Marbonanza Co. S.A. of Panama; Colocotronis, limited of London; Colocotronis Hermanns S.A. of Greece; Shipowners Mutual Protection and Indemnity (Luxembourg); and West of England Owners and Insurance Association (London) Limited, the source said.

(See OIL, Page 18)

- **Dr. Roger Zimmerman**, marine biologist of UPR Department of Marine Sciences testified on studies conducted in 1976 and 1977 to compare the organism living in Bahía Sucia before and after the oil spill.
- **Dr. Ariel Lugo Garcés**, a DNR wetland expert, testified on the dying mangroves due to the petroleum contained in the soils, and summarized previous studies performed by other scientist on Bahía Sucia.
- **Rafael Cruz Pérez** presented a **plan to remove and replace** the polluted sediments on **40 acres**, consisting of **25 acres** at the East Mangrove Forest and **15 acres** at the West Mangrove Forest; however, the plan had to also remove **23.5 acres** of live mangroves to access the affected areas.
- **Dr. Sorenson** assigned an average replacement value of **\$0.06** per organism for **92,108,702** organisms for a subtotal of **\$5,526,582.20**, plus a 10-year monitoring program, replanting vegetation, and clean-up costs for a total of **\$14,733,755.60**.
- **Dr. Howard Teas**, a biologist, testifying for the defense proposed restoration of **15 acres** of mangroves and **10 years monitoring program** at a cost of **\$1,200,000.00**.
- **Judge Torruellas** decided for the **theory of value per organism** at **\$6,164,193.42** with **10 year monitoring** and **6% interest** from Nov, 12, 1974 to April 8, 1978 for a total of **\$7,762,000**, thus establishing a world-wide precedent in environmental liability for oil spills.

Legal Case in Federal Circuit Court of Boston



- The defense appeal questioned **EQB's "standing"**, using commercial value as a standard, and the procedure and data used by the District Court to determine **environmental damage and liabilities**. Although the Circuit Court understood that the District Court decision was correct, the Court questioned the procedure to establish environmental damage, and determined that **\$7 million cost** was impracticable, expensive, unjustly, and dangerous for the living flora and fauna within the area.
- The **Circuit Court returned the case** to the **District Court** with instructions to reopen the case record and reconsider additional evidence for environmental damage, in accordance with other previous recovery cases:
 - (1) *"The First Circuit Court of Appeals remands a district court ruling awarding damages to Puerto Rico for injuries to its natural resources sustained as a result of an oil spill from appellants' ship. Considering first several procedural issues, the court rules that the district court did not abuse its discretion in striking appellants' pleading on the question of liability."*
 - (2) *"Appellants' persistent noncooperation with the court and opposing counsel during discovery proceedings justified such a sanction under FED. R. CIV. P. 37(b). Though it was therefore unnecessary for the district court to make findings on the question of liability, the making of such findings did not prevent it from fairly determining an appropriate damages award."*
 - (3) *"In addition, the court finds that in light of Puerto Rico's expansive long-arm statute, the district court had personal jurisdiction over appellants."*
 - (4) *"Moving to substantive issues, the court rules that Puerto Rico and its Environmental Quality Board have a valid cause of action to recover damages for injuries to natural resources."*
 - (5) *"Declining to decide whether a state's inherent regulatory power authorizes it to bring suit for injuries to such resources, the court finds that Puerto Rico statute calculated the amount of the damages in an improper manner. It was error to multiply the total number of organism killed by the spill times the cost of their replacement by biological supply houses."*
 - (6) *"Recent federal legislation dealing with the issue suggests that sovereign to recover or rehabilitate the environment in the affected area to its pre-existing condition, or as close thereto as is feasible without grossly disproportionate expenditures. The case is remanded for re-estimation of damages on this basis."*
- (Citation: 10 ELR 20882 No. Nos. 78-1543, 79-1468, 628 F,2d 652/15 ERC 1675/1st Cir. 08/12/1980, before Coffin, Campbell and Wyzanki, *JJ)."

Final Resolution of the Legal Case



- The principal environmental problem confronted in **Bahía Sucia** was that the crude petroleum had **vertically infiltrated into the soil profile** affecting the mangrove trees roots, and eventually their death.
- **Hurricanes David** (Aug. 30, 1979) and **Frederick** (Sept. 4, 1979) passed over southwestern Puerto Rico generating **high waves in Bahía Sucía**.
- **Groundwater level rose** as the petroleum **floated at the land surface**, where **wave action battered and removed** the oil from the land, and dissolved the oil particles in the Mona Channel.
- The EQB accepted a penalty of **\$1.2 million** as compensation in the case.
- When asked by the press: why EQB accepted just **\$1.2 million**, I answered: ***“Remember, it’s not the money; it’s the principle”***, since we had proven environmental liability in USA courts.
- Environmental liability was granted again in the **Morris Berman Oil Spill** in San Juan, Puerto Rico, and the legal precedent was accepted world-wide.

CONCLUSION



Major oil spills, like that from the tanker Ocean Eagle off Puerto Rico in 1968, have focused international attention on the serious problem of oil pollution of the seas.



- The environmental impact of Zoe Colocotroni spill was very different from the Ocean Eagle spill.
- The Ocean Eagle accidentally split in two parts, as vessel hit bottom due to high waves. Oil immediately escaped into coastal waters. Oil slicks were concentrated in the San Juan Bay and nearby coasts between Loiza and Dorado, and when the vessel was sunk at sea from Isabela to Quebradillas.
- Although surprised, confused, and disorganized due to the lack of clean-up procedures for oil spills, the Ocean Eagle proximity to San Juan Bay and a petroleum refinery adjacent to the bay facilitated the clean-up in order to restore the affected areas in a period of 6 months.
- Mayor problems encountered in the Federal District Court of Puerto Rico were due inadequate legislation for appropriate demonstration between environmental conditions before and after the incident and lack of experience on oil spills; thus, failing to prove environmental liability,
- Although the petroleum remaining in the Zoe Colocotroni tanks was taken directly to the refinery for recovery, the remaining petroleum on the Ocean Eagle's tanks had to be pumped out and barged to the refinery.
- The petroleum spilled from the Ocean Eagle was concentrated in the coast of Cataño, where it was directly pumped into truck tanks, while the Zoe Colocotroni oil concentrated in the remote Bahía Sucia, where it had to be pumped from man-made traps into trucks.
- No mangroves were exposed along the coast in the Ocean Eagle spill, since Piñones mangrove forest and sporadic lagoon mangroves were protected by blocking bridges between land strips.
- By blocking the access of the polluted waters in Dos Hermanos and Cangrejos bridges, the mangrove ecosystem was protected from contamination.
- Oil pollution impact on the birds in the San Juan Bay was devastating, as the total pelican colony was lost.
- Although the oil-impregnated birds were captured, and washed in captivity, the birds flew again and dived successively in the contaminated waters until they died due to the need for food.
- Pelicans sequestered should have been maintained and fed to keep them from flying and diving into the oily waters, but this fact was an unforeseen neglect due to the limited rescue experience.

Conclusion (continued)



- The Zoe Colocotroni incident was caused by the grounding on a coastal reef, and the spill was intentionally caused by the ship captain order to discharge the petroleum to the sea in order to reduce the vessel's weight, and float the ship off the reef.
- Although the ship's oil cargo left in the tanks reached its final destination at CORCO refinery, the discharged oil impacted various isolated areas of difficult access in Bahía Sucia, which required the transfer of specialized personnel, equipment and materials from nearby towns, and even San Juan.
- Holes were excavated in the beach adjacent to the sea in order to trap oil and pump it into tank trucks for their transportation to the refinery.
- In the Ocean Eagle incident, some of the oil was recovered from the ship's tanks, while oil concentrations in the beaches were pumped to tank trucks and recovered at the refinery.
- In the Zoe Colocotroni, the discharged oil impacted the beaches, wetlands, and mangroves, where it infiltrated into the subsoil difficulting its recovery, and causing a devastating impact on the mangroves as the generation of new trees was blocked.
- It was not until after two hurricanes passed over southwestern Puerto Rico, and wave action on the wetlands raised the groundwater level to the surface, where the oil was removed from the ground.

Conclusion (Continued)

Zoe Colocotroni case proved environmental liability in federal court.

The court decision brought on the commonwealth, federal and international regulations on oil spills with the elimination of obsolete tankers sailing the oceans and new design of double hulls to increase tank safety.

Legal outcome let me to represent the USA in UNEP international treaties on oil spills, presiding 3 meetings of experts of the **Wider Caribbean Region**, which resulted in the development of a **Caribbean Contingency Plan** for oil spills.

In 1981, Environmental Quality Board approved an **Emergency Plan for Oil Spills** in Puerto Rico's waters.

In March 24, 1983, UNEP adopted a **Protocol on Cooperation to Combat Oil Spills for the Wider Caribbean Region**.

I can't finish my presentation without mentioning thousands of **anonymous people**, who worked from dawn to sunset like a huge Olympic team combating these oils spills.

The People of the **Wider Caribbean Region** have an immense debt of gratitude with all these people, who conducted these difficult tasks to restore our natural resources, ecosystems and quality of life to assure our welfare in the Caribbean.

The lessons learned in these two incidents were applied January 7, 1994 to collect environmental liabilities, when the tank barge **Morris Berman** grounded on a reef near Punta Escambrón, San Juan spilling about 750,000 gals. of number 6 fuel.

