Attachment 4

Preliminary Cost Estimates for Emergency Response, Assessment, and Recovery for the Environmental Consequences of Hurricane Katrina

Prepared for

The Louisiana Congressional Delegation

By

The Louisiana Department of Environmental Quality

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Introduction

The Louisiana Department of Environmental Quality (LDEQ) has been asked to put together preliminary estimates of costs for response, assessment, and recovery of environmental damages left in the aftermath of Hurricane Katrina. The estimates contained in this report relate only to those areas of environmental responsibility held by LDEQ. Unless otherwise specified, costs are presented for the 31 parishes identified as the impacted area by FEMA. They are:

Acadia	Jefferson Davis	St. James
Ascension	Lafayette	St. John
Assumption	Lafourche	St. Martin
Calcasieu	Livingston	St. Mary
Cameron	Orleans	St. Tammany
East Baton Rouge	Plaquemines	Tangipahoa
East Feliciana	Pointe Coupee	Terrebonne
Iberia	St. Bernard	VerMillion
Iberville	St. Charles	Washington
Jefferson	St. Helena	West Baton Rouge
		West Feliciana

At the time of preparation of this report, LDEQ is still engaged in emergency response activities, and field reconnaissance and assessments have only recently been initiated. It is emphasized that the cost estimates provided in this report are very preliminary and based primarily on Department records and examination of aerial images taken of the affected area. Numerous assumptions based on best professional judgment have been made to compute the estimated cost figures. As our information improves on actual conditions encountered by our field teams, assumptions and cost estimates can be revised.

Executive Summary

Below is a summary of the areas that LDEQ focused on in compiling this preliminary cost estimate and the associated estimated costs:

Area With Brief Description	Estimated Cost
Waste Water Treatment Infrastructure Restoration	$35 Billion
Includes cost estimates for rebuilding 50% of the existing wastewater treatment plants, rebuilding and assessment of 20% of the existing wastewater collection systems, enhancing existing systems in Baton Rouge and Lafayette to address evacuee assimilation, and regionalization of outlying systems	
Drinking Water	$1.15 Million
LDEQ does not have regulatory oversight for drinking water systems. That responsibility rests with the Department of Health and Hospitals (DHH). However, LDEQ does have a responsibility to ensure that the sources of drinking water are protected. Therefore, this estimate includes assessment costs only	
Solid Waste / Debris Removal and Disposal	$1.74 Billion
Includes cost estimates for the removal of construction and demolition waste, vegetation and debris, white goods, vehicles, tires, and boats	
Hazardous Waste Assessment and Disposition	$24.48 Billion
Includes cost estimates for the removal of hazardous wastes from known generators, commercial storage facilities, oversight of the remediation of any railcar spills, and the disposal of medical waste	
Underground Storage Tank (UST) Assessment and Disposition	$154 Million
Includes cost estimates to assess, remove, and dispose of underground storage tanks	
Securing, Storage, and Disposal of Radiation Sources	$889,000
Includes cost estimates to assess all locations of radiation sources, properly secure, and short term storage	
LDEQ Katrina Response Costs	$121 Million
Includes DEQ cost estimates for oversight, long term monitoring, laboratory support, outfitting the damaged regional office, and lost revenue	
TOTAL ESTIMATED COSTS:	$61.5 Billion

Waste Water Treatment Infrastructure Restoration

There are two basic components to Waste Water Treatment Systems (WWTS): the treatment facility and the collection system, which is composed of underground piping and lift/pumping stations. These figures are based on only the parishes listed in the Secretary's Declaration of Emergency and Administrative Order (Ascension, Assumption, East Baton Rouge, East Feliciana, Iberia, Iberville, Jefferson, Lafourche, Livingston, Orleans, Plaquemines, Pointe Coupee, St. Bernard, St. Charles, St. Helena, St. James, St. John, St. Martin, St. Mary, St. Tammany, Tangipahoa, Terrebonne, Washington, West Baton Rouge, and West Feliciana).

The calculations made in this document are made using several broad assumptions. One is that we know all the WWTS in the emergency area. Recent work in St. Tammany and Tangipahoa Parishes indicate LDEQ's Permit coverage of WWTS may be approximately 33% of the known universe. Of the remaining 67%, we assumed 90% have flows of less than 25,000 gallons per day (gpd). The facilities used in the calculations are all over 25,000 gpd. Many more systems exist that are less than 25,000 gpd and are addressed in the specific section, "Regionalization Of Facilities In Rural Areas".

Other assumptions include impacts to municipalities surrounding the affected area due to evacuee assimilation (additional 100,000 persons in the Baton Rouge area and 30,000 in the Lafayette area). This entails an additional 2 WWTPs in Baton Rouge and 1 in Lafayette with supporting collection lines.

Treatment Facilities

An example cost of facility construction, the recent construction of the City of Kenner Waste Water Treatment Plant (WWTP) represents a Major WWTP treating to secondary limits. The 5MGD facility was constructed at a cost of $12.5 Million. 25 major facilities discharge to the Mississippi River and have these effluent limit requirements. An additional 32 Major WWTPs discharge to waters where advanced treatment is required. These have a higher estimated cost of construction of $4-5/gallon treated. Smaller WWTPs (Minors), to which LDEQ has issued 470 permits, make up the remainder of known WWTPs in the effected area that exceed 25,000 gpd design capacity.

Replacement of treatment facilities is more likely in the following subset of parishes listed in the Secretary's Declaration of Emergency and Administrative Order: Washington, St. Tammany, St. Bernard, Jefferson, Orleans, Plaquemines, St. Charles and St. John the Baptist Parishes. As such the department's estimates are based on 50% replacement.

Major WWTP reconstruction for all facilities represents maximum cost:

WWTPs designed to treat to secondary limits
$12.5 MILLION x 25 = $312.5 Million

WWTPs designed to meet water quality based effluent limits
5MGD x $5/gal x 32 = $800 Million

Total for this category $1.125 Billion

Assuming 50% require reconstruction = $562.5 Million

Minor WWTP reconstruction

470 x 5$/gal x 0.4 MGD = $940 Million Total

Assuming 50% require reconstruction = $470 Million

SUBTOTAL: $1.03 Billion

Collection Systems (WWCS)

These estimates vary greatly due to topography and areal extent of collection system coverage. The City of Shreveport stated an estimated replacement value of their (major) collection system at $267 Million. This system feeds two Major WWTPs. This value can be compared to a collection system **repair** cost estimate for the City of New Orleans in which $800 Million would be spent over 10 years to refurbish the City collection system (one Major WWTP). Therefore we can estimate the cost of collection system replacement for Major WWTPs to range from $134 MILLION to $1.2 Billion. For the calculations below, LDEQ assumed the higher of the two estimates and that only 20% would require replacement.

Minor facilities can be pro-rated downward based on relative design flows, with an average Minor WWTS design flow of 100,000 gpd. The estimated range for minor systems is $10 Million to $120 Million. Again, the department assumed the higher of the two estimates and that only 20% would require replacement for calculations

Major WWCS replacements

57 Treatment Facilities x $1.2 Billion = $68.4 Billion

Assuming 20% require replacement = $13.7 Billion

Minor WWCS replacement

470 Treatment Facilities x $120 Million = $56.4 Billion

Assuming20% require replacement = $11.28 Billion

SUBTOTAL $25.1 Billion

Cost to Assess

Surveys of collection systems to determine the need of replacement and prioritization, using flow meters and remote television equipment is estimated at 10% of construction costs:

SUBTOTAL: $2.5 Billion

Evacuee Assimilation

In addition, two additional WWTPs may be needed to accommodate the increase in Baton Rouge and Lafayette population due to the displacement of affected area residents and one for Lafayette.

3 Treatment Facilities x $12.5 Million = $37.5 Million

For the WWCSs needed for the additional WWTPs needed for evacuee assimilation, LDEQ estimated 100 miles of collection lines for Baton Rouge and 50 for Lafayette

$247,000/mile (includes lift stations, pumps tie-ins) X 150 Miles
= $37 Million

SUBTOTAL: $75 Million

REGIONALIZATION OF FACILITIES IN RURAL AREAS

Recent surveys have indicated that the LDEQ is aware of and has issued permits to only about one-third of all WWTS in the State. Many of these are small plants (<25,000 gallons per day). Regionalization of the waste water treatment in the effected area would greatly benefit the small surface waters that receive these effluents. Establishing regionalization would require extensive collection system construction. An example of collection system construction costs come from Shreveport, where the ~1000 miles of collection lines is estimated to have a $247 Million replacement cost covers a geographic area of ~ 110 square miles.

Applying the $2.24 Million per square mile cost for collection line construction to the parishes north of Lake Ponchartrain, where regionalization is most likely to be considered, would entail the expenditure of $6.27 Billion.

SUBTOTAL: $6.3 Billion

TOTAL COST FOR WASTE WATER TREATMENT INFRASTRUCTURE RESTOTATION:

$35 Billion

Drinking Water

SPECIAL NOTE: LDEQ does not have regulatory oversight for drinking water systems. That responsibility rests with the Department of Health and Hospitals (DHH). However, LDEQ does have a responsibility to ensure that the sources of drinking water are protected. The estimate below reflects our small part in the oversight of drinking water

Surface Water Intakes

The LDEQ sampling program currently in place for the Mississippi River drinking water quality is called EWOCDS (Early Warning Organic Compound Detection System). EWOCDS is a cooperative agreement between LDEQ, a public entity (New Orleans Sewage and Water Board) and five industries along the Mississippi River. The type of compounds tested for are volatile organic compounds (VOCs). EPA has set a maximum contaminant level (MCL) for those compounds. The main objective of the cooperative agreement is to provide early warnings of possible contamination of drinking water supplies to water systems drawing water from the river. This allows downstream water systems to close intakes thus preventing contaminated water from entering their system.

LDEQ anticipates using the existing EWOCDS system. However, some of the sites are currently offline. In the interim LDEQ's responsibility to do additional sampling and the analysis until the sites are up and running again. The cost associated with this effort is approximately $50,000

Additionally, to ensure proper coverage of the impacted area, it will be necessary to add 4 additional EWOCDS sites at a cost of $100,000.

SUBTOTAL: $150,000

Aquifer Assessments

LDEQ's approach would be to assess aquifers in roughly the southern half of the central and western Florida parishes by sampling a grid of domestic wells in an area of approximately 5,000 square miles. Based on LDOTD water well registry database, there are about 16,000 registered domestic wells in that area.

The number of water wells selected to be sampled is based on a well spacing grid that is 10 times more dense than the ambient ground water monitoring program currently in place in the state, which is one well for every 400 square miles. A well spacing grid 10 times more dense would result in one well for every 40 square miles, or 125 wells.

A per well laboratory cost a analysis for the following parameters: Conventionals, VOCs, SVOCs, Pesticides, PCBs, and bacteriological, would be about $5,000.00. Add to that manpower, transportation, necessary equipment, and supplies cost of $2,500.00 per well results in a total per well estimated cost of $7,500.00

Based on the recommended 125 wells to be sampled times the per well cost of $7,500.00 gives an estimated INITIAL assessment cost of $937,500.00, or rounding up, about One Million dollars.

SUBTOTAL: $1 Million

TOTAL COST FOR DRINKING WATER ASSESSMENT:

$1.15 MILLION

Solid Waste / Debris Removal and Disposal

Debris and Vegetation Disposal

The estimated quantities and cost provided are associated with information gathered for thirty-one (31) parishes in Louisiana. It provides quantities and cost related to the generation and disposal of vegetative and construction and demolition debris resulting from Hurricane Katrina. The estimated cost is based on tipping fee, demolition and transport per ton. Tipping fee is an average of construction and demolition (C&D) and municipal facility fees. Transportation is based on a 20 mile radius.

Based upon predictions from the Army Corps of Engineers, approximately 55 Million cubic yards (22 Million tons) of debris would be generated and require disposal. The cost for management, transportation and disposal of the debris at $47.53/ton would be $1, 045,660,000.

Also to be included is a 25 percent additional cost of $261,415,000 for the demolition of the homes and commercial property. This would bring the total estimated cost to $1,307,075,000.

SUBTOTAL: $1.3 Billion

Sediment And Sludge Removal

It is estimated that we are dealing with an area of approximately 20 miles by 10 miles covered with 1 foot of sediment or sludge. It is assumed that approximately 25% of that area would have to have sludge and sediment removed. This would equate to 50 Million cubic yards of material.

Category	Unit Price	Total
Transportation	$3.00/cubic yard	$150 Million
Disposal	$3.00/cubic yard	$150 Million
SUBTOTAL		**$300 Million**

White Goods

For disposal of white goods, LDEQ assumed that 100% of the households in Orleans, St. Bernard, and Plaquemines Parish would need to dispose of all white goods, 50% of the households in Jefferson Parish would need to dispose of all, 15% of the households in Washington Parish and 10% of the households in St. Tammany, Tangipahoa, Lafourche and Terrebonne would need to dispose of all white goods.

Parish	Estimated Affected Households	# of White Goods (4 per Household)	Cost of Disposal (16 White Goods per ton @ $100 per Ton)
Orleans	188,251	753,004	$4,706,275
St. Bernard	25,123	100,492	$628,075
Plaquemines	9021	36,084	$225,525
Jefferson	88,117	352,468	$2,202,925
Washington	2,470	9,880	$61,751
St. Tammany	6,925	27,701	$173,133
Tangipahoa	3,656	14,623	$91,395
Lafourche	3,206	12,823	$80,143
Terrebonne	3,600	14,399	$89,993
SUBTOTAL			**$8,259,000**

Vehicles

The estimates below are based on 30% of the registered vehicles in the parish requiring disposal.

The cost estimate for the disposition of vehicles includes a cost of:

- $150 for towing, staging, and the removal of tanks and switches
- $85 to scrap

Parish	Number of Vehicles to be Scrapped	Cost of Towing, Staging, Removal of tanks and switches	Cost of Scrapping
Orleans	112,976	$16,946,460	$9,602,994
St. Bernard	23,090	$3,463,425	$1,962,608
Plaquemines	10,361	$1,554,165	$880,694
Jefferson	187,282	$28,092,240	$15,918,936
Washington	14,786	$2,217,960	$1,256,844
St. Tammany	91,200	$13,680,045	$7,752,026
Tangipahoa	37,309	$5,596,380	$3,171,282
Lafourche	32,286	$4,842,855	$2,744,285
Terrebonne	43,644	$6,546,645	$3,709,766
	SUBTOTALS	$82,940,000	$46,999,000
FINAL SUBTOTAL			**$129,939,000**

Waste Tires

Based upon 552,000 vehicles that require scrapping, approximately 2,760,000 waste tires will need to be processed. Assuming $1.50 per tire, the cost will be $4.14 Million

SUBTOTAL: $4.14 Million

Boats

The numbers below are based on the number of registered boats from Wildlife and Fisheries. LDEQ assumed that 10% of the boats in the hardest hit parishes would need to be disposed, 7.5% of the boats in Plaquemines Parish, 5% in Jefferson, 1.5% in Washington, and 1% in St. Tammany, Tangipahoa, Lafourche and Terrebonne.

The cost estimated for the disposition of boats includes a cost of $1000 per boat scrap charge.

Parish	Number of Boats to be Scrapped	Cost of Scrapping
Orleans	714	$714,000
St. Bernard	540	$540,000
Plaquemines	307	$307,000
Jefferson	1105	$1,105,000
Washington	47	$47,000
St. Tammany	181	$181,000
Tangipahoa	67	$67,000
Lafourche	117	$117,000
Terrebonne	143	$143,000
SUBTOTAL		**$3,200,000**

TOTAL COST FOR SOLID WASTE / DERIS REMOVAL AND DISPOSAL:

$ 1.74 Billion

Hazardous Waste Assessment and Disposition

For this estimate, LDEQ focused in on three areas: waste created by known generators, commercial storage of hazardous materials, and household hazardous wastes. Also included are estimates for waste from railcars and medical waste.

Estimated Cost of Waste Handling, Transportation and Treatment/Disposal of Hazardous Waste from Large Quantity Generators

This estimate is based on the 2004 annual RCRA hazardous waste reports submitted by the large quantity generators (LQGs) in the 14 southeastern parishes (Ascension, Assumption, Jefferson, Lafourche, Orleans, Plaquemines, St. Bernard, St. Charles, St. James, St. John the Baptist, St. Tammany, Tangipahoa, Terrebonne, Washington) most impacted. Wastes were grouped by the treatment/disposal categories listed on the reports.

Quantities of Hazardous Waste: It was assumed that each facility was not required to have a RCRA permit and could only store for a maximum of 90 days; therefore, one-fourth of the annually reported quantities were used.

Treatment/Disposal Technologies: It was assumed that the treatment/disposal technologies indicated in the annual reports would also be used to treat/dispose of any wastes. Costs were derived from current cost-estimating software (CostPro and Racer) developed by EPA for RCRA closures and also literature searches. Those facilities that reported “unknown” technology or “storage/bulking” were lumped with “incineration”. Conservatively, those facilities with a reported “stabilization” technology were lumped with “landfill”. Minor waste amounts (those technologies utilized by less than one ton) were omitted.

Note that disposal and treatment processes that may be required for the flood and hurricane clean up are not included in this estimate. The treatment/disposal technology costs included herein are costs normally associated with treatment in a controlled setting. Additional treatment and disposal costs may occur during actual clean-up of release hazardous waste.

Waste Handling: Costs were derived from current cost-estimating software developed by EPA for RCRA closures. Due to the variability in the waste, personnel protection equipment (PPE) was not fully considered.

Clean-up of any released waste can be assumed to be more problematic due to the nature of the event. However, because of a lack of information, data specific clean-up problems can not be addressed at this time. It was assumed that waste characterization (sampling and analysis) would not be a significant cost. However, this assumption may change during assessment of the damage. Also, contractor costs are not considered in this estimation.

Transportation: Based on literature, it is assumed a typical rate of $3.75 per loaded mile, 200 mile average haul distance, and 40 cubic yards per load at 26 pounds per cubic foot for hazardous waste, the rate is approximately $55 per ton. This cost will vary based on the actual density and transport distance.

Treatment/Disposal Method	Amount Generated (Tons)	Treatment/ Disposal Cost Per Ton	TOTAL TREATMENT/ DISPOSAL COST
Adsorption	29.105	$3,400	$98,957
Biological treatment	919579.99	$314	$288,748,117
Deepwell or underground injection	1000113.305	$376	$376,042,603
Energy recovery (includes blending)	18259.1075	$270	$4,929,959
Incineration	6371.205	$1,958	$12,474,819
Land treatment or application	155.365	$29	$4,506
Landfill	3287.6475	$322	$1,058,622
Metals recovery	6577.0475	$500	$3,288,524
Neutralization	75119.2	$267	$20,056,826
Other recovery or reclamation	3330.6025	$2,600	$8,659,567
Other treatment	13.7025	$500	$6,851
Sludge treatment and/or dewatering	2757.0375	$99	$272,257
Solvents recovery	530.555	$4,000	$2,122,220
Treatment/Disposal Totals	2036123.87		$717,763,828

Waste Handling Total	$150	$305,418,581
Transportation Total	$55	$111,986,813
SUBTOTAL		**$1,135,169,222**

Estimated Cost of Waste Handling, Transportation and Treatment/Disposal of Commercial Products Hazardous Waste from Generators

This estimate is based on the 2002 Tier 2 reporting information submitted by commercial facilities in the 5 southeastern parishes (Jefferson, Lafourche, Orleans, Plaquemines, St. Bernard) impacted by the most severe flooding.

Quantities of Hazardous Waste: The Tier 2 report contains maximum capacities to be stored at a facility at any given time. It was assumed that 90% of the reported materials are a hazardous waste. It was also assumed that 80% of the materials would be require disposal as a hazardous waste.

Cost Per Ton: Costs were derived $150/Ton for Handling, $55/Ton for Transportation, and $120/Ton For Disposal for a total of $325/Ton.

PARISH	REPORTED TONS	80% FLOODED	90% HAZARDOUS	COST / TON	TOTAL COST
Jefferson	23,123,703	18,498,963	16,649,066	$325	$5,410,946,563
Lafourche	4,602,774	3,682,219	3,313,998	$325	$1,077,049,192
Orleans	1,769,372	1,415,497	1,273,948	$325	$414,032,971
Plaquemines	27,600,666	22,080,533	19,872,480	$325	$6,458,555,862
St. Bernard	42,527,222	34,021,777	30,619,600	$325	$9,951,369,892
SUBTOTAL	**99,623,737**	**79,698,990**	**71,729,091**		**$23,311,954,481**

Estimated Cost of Waste Handling, Transportation and Treatment/ Disposal of Household Hazardous Wastes

For disposal of household hazardous wastes, we assumed that 100% of the households in Orleans, St. Bernard, and Plaquemines Parishes would need to dispose of all household hazardous waste, 50% of the households in Jefferson Parish would need to dispose of all, 15% of the households in Washington Parish and 10% of the households in St. Tammany, Tangipahoa, Lafourche and Terrebonne would need to dispose of all household hazardous waste.

Parish	Estimated Affected Households	Gallons (5 per Household)	Cost of Disposal ($18.50 per Gallon)
Orleans	188,251	941,255	$17,413,218
St. Bernard	25,123	125,615	$2,323,878
Plaquemines	9021	45,105	$834,433
Jefferson	88,117	440,585	$8,150,823
Washington	2,470	12,350	$228,480
St. Tammany	6,925	34,627	$640,590
Tangipahoa	3,656	18,279	$338,162
Lafourche	3,206	16,029	$296,527
Terrebonne	3,600	17,999	$332,972
SUBTOTAL			**$30,559,000**

Railcars

The department has estimated 250 tank cars in the affected area that were holding some sort of hazardous material. LDEQ has assumed a 10% damage rate (25) that would result in a release of materials. And, assuming that the disposal/scrapping of the tank car would be the responsibility of the railroad, the department would bear only remediation oversight costs of $1 Million per damaged car.

SUBTOTAL: $25 Million

Estimated Cost of Handling, Transportation and Treatment /Disposal of Medical Waste

This estimate is based on the hospitals generating waste were in affected parishes of Lafourche, Orleans, St. Bernard, Plaquemines and Jefferson) impacted by the most severe flooding.

Quantities of Medical Waste: Medical Waste generated in hospitals statewide totaled approximately 1.5 Million lbs/month. The medical waste generated in the affected areas with approximately three months of material on hand at the time of the hurricane disaster, the estimated amount of medical waste to be generated is 346,992 pounds of material.

Medical Waste Disposal Cost: Assuming thirty-three percent and the three month factor into account, the estimated cost for disposal of medical waste generated as a result of the hurricane disaster for the hospitals in the flooded areas is approximately $86,751.

TOTAL COST: $86,751

TOTAL COST FOR HAZARDOUS WASTE ASSESSMENT AND DISPOSITION:

$24.48 Billion

Underground Storage Tanks (UST) Assessment and Disposition

Based on LDEQ records there are 2000 UST's sites in the affected area of Orleans, Jefferson, Plaquemine, Lafourche, and St. Bernard parishes that will have to be addressed. The department estimated another 200 tanks that may have to be addressed in the parishes of St. Tammany, Washington, and Tangipahoa. It was assumed that each location would have an average of three tanks.

Special Note: LDEQ has the "Motor Fuel Trust Fund" that is used to pay for the removal and disposal of underground storage tanks at eligible sites. All the sites in area might be considered eligible and as such the fund would bear the brunt of the cost.

Description	Cost Per Site	Total
Removal/Disposal	$70,000	$154 Million
TOTAL		**$154 Million**

Securing, Storage, and Disposal of Radiation Source

The following estimate is based on if all of the Licensed Radioactive Material in the Parishes impacted by Hurricane Katrina had to be secured, stored and disposed of by the the department. Estimates are based on 126 facilities/sites in Orleans, Jefferson, St. Bernard, Tangipahoa, St. Tammany, Plaquemines and Washington Parishes

Description	Cost Per Site	Total
2 LDEQ employees (13 hrs, paperwork, site visit and travel)	$1553.38	$195,725
Cost for contract Decontamination and Disposal (1 facility, 8hr day, Assessment, secure or retrieve, and transportation for storage or Disposal	$4358.00	$549,108
Disposal transportation to Utah	NA	$10,000
Interim storage for sources retrieved ($10/day,3 months, for 150 sources)	NA	$135,000.00
TOTAL		**$889,833.88**

This action be conducted in two phases. The first phase would consist of 26 high priority licensees. The second phase would include the remaining 100.

LDEQ Katrina Response Costs

LDEQ Response, Assessment, and Recovery Oversight

Based on the issues listed above, LDEQ will have a large oversight presence throughout this process. Cost estimates are as follows and are based on LDEQ's annual personnel services costs of $65 Million

YEAR	% of Personnel	Cost
1	35	$22.75 Million
2	30	$19.5 Million
3	20	$13 Million
4	15	$9.75 Million
5	15	$9.75 Million
SUBTOTAL		**$74.75 Million**

LDEQ Long Term Water Monitoring

Based on the amount of water drained from New Orleans into the Lake Ponchartrain, long term monitoring of the lake and associated waterbodies is necessary. Estimates for this effort include

Category	Cost
20 Continuous Monitors	$5 Million
5 year Personnel Costs (10 FTE with average salary and benefits of $50,000)	$2.5 Million
SUBTOTAL	**$7.5 Million**

Short Term Air Monitoring and Replacement of Monitoring System

Temporary air monitoring could be used to address potential air emissions as a result of controlled burning of debris. The purpose of the monitoring would be to assess the impact on air quality or human health and the environment. For each burn site, temporary upwind and downwind monitoring would be necessary. Monitoring would be conducted for particulate matter and also for any chemicals that would be released as a result of the incomplete combustion of the materials.

Once FEMA and other agencies have made determinations relative to the disposition of the debris generated by the storm, we will be better able to assess the monitoring needs. LDEQ would need particulate monitors and temporary power to supply them.

LDEQ anticipates that contractors would be brought in to accomplish this work to include: determining the estimated emissions from the burning activities, securing the appropriate types and numbers of monitors, and collecting and analyzing the samples. LDEQ has been in the process of establishing a special purpose monitoring network that would have included similar equipment. Cost estimates for that project were between $750,000 and $1Million for the equipment and then another $250,000 for 9 months of operational expenses. Operational expenses for a monitoring project based around cleanup efforts in New Orleans would be higher, depending on the duration of the effort and availability of utilities.

SUBTOTAL COST: $1.25 Million

Ambient Monitoring System Restoration Activities

Re-establishment of the ambient air monitoring network in the Greater New Orleans area is an important piece of the restoration effort.

The department estimates that the following permanent air monitoring sites have been totally lost and will need to be re-established: Kenner, City Park, Tulane, Arabi, Meraux, and Chalmette. The estimated cost of re-establishing the monitoring sites, including security fencing, buildings, and instrumentation is estimated to be $750,000.

The department has reason to believe that six additional sites have sustained a certain level of damage that is less than total destruction. Once cleared to travel into these areas, the department will be able to make a better determination. These six sites are: Garyville, Hahnville,

Thibodaux, Houma, Luling, and Marrero. If these 6 sites would be totally lost, then the estimated cost of replacement would be around $750,000.

SUBTOTAL COST: $750,000

LaTAGA

A mobile monitoring vehicle will be outfitted with equipment suitable for the measurement of air pollutants suspected in the majority of air quality complaints and concerns. The monitoring capability will address not only air toxics but also criteria pollutants.

To address air toxics concerns the initial plans call for the installation of a near real time gas chromatograph which can be configured for both ozone precursors and specific toxics species. The vehicle will also be equipped with sampling equipment to permit time integrated or instantaneous collection of samples in summa canisters which can be sent to the laboratory for more extensive analysis. The vehicle will also be equipped with a continuous hydrogen sulfide and a mercury analyzer, ozone, and oxides of nitrogen monitors.

SUBTOTAL: $300,000

FINAL SUBTOTAL: $2.3 Million

Laboratory Support

Below is an itemized list of projected increases necessary for Laboratory Services Division to increase its analytical capability with regards to the emergency situation created by the aftermath of hurricane Katrina:

Description	Cost
Travel (in & out of state) regarding accreditations for necessary laboratories to analyze samples under state regulations	$15,000
Increase in mail & delivery systems for sample distributions	$9,000
Increase in data processing software	$50,000
Operating and maintenance of autos	$15,000
Operating supplies (analytical gases for equipment)	$300,000

Repair & maintenance supplies for equipment	$100,000
Increase in office supplies	$50,000
Increase in clothing and uniforms (disposal & laundry services)	$100,000
Initial setup and operating costs for fecal coliform	$250,000
Outside contracts for most conventional analyses	$150,000
Outside contract for fecal coliform	$50,000
Outside contract for clean metals	$220,000
Outside contract for asbestos (based on 12 samples)	$2,000
SUBTOTAL	**$1,311,000**

Additional equipment would consist of:

Description	Cost
6 GCMS systems	$860,000
6 GC systems with various detectors	$900,000
1 HPL system	$80,000
3 Extraction Units and glassware	$70,000
1 Solid extraction unit	$50,000
3 Purge & trap systems	$114,000
3 Air concentrator systems	$165,000
2 Extraction concentrator system	$50,000
2 GPC systems	$150,000
300 air canisters	$135,000
1 ICPMS system	$180,000
2 Mercury systems	$75,000
5 Digesting Units	$100,000
1 IC system	$80,000
1 FIA system	$60,000
5 Miscellaneous meters (ion-selective, BOD,	$30,000

conductivity)	
1 Autotritrator system	$75,000
1 TOC system	$75,000
5 Ovens	$40,000
1 Autoclave	$250,000
2 Temporary buildings	$20,000
45 computers & 20 laptops & 20 printers	$215,000
2 Copiers	$150,000
3 Scanners (high speed)	$45,000
SUBTOTAL	**$3,969,000**

This projected increase does not cover additional positions that would be necessary to handle an increase in sample load. It is estimated that 15 new positions are required to handle the additional work load. Ten (10) analysts, 1 QA officer, and 4 support personnel would be required. The cost would be $915,000.

FINAL SUBTOTAL: $6,195,000

Replacement of the Southeast Regional Office

LDEQ has a regional office in Harahan, which is in Jefferson Parish. The office sustained considerable wind and water damage. LDEQ will have to replace computer equipment, office equipment, communication equipment, furniture, and supplies.

SUBTOTAL: $250,000

Lost Revenue

LDEQ realizes a large amount of its operating revenue from self-generated fees. These fees are assessed for several activities across all media. Large concentrations of the regulated community on which these fees are assessed are located in the affected area. Preliminary estimates show a loss of revenue of $10 Million dollars for the current fiscal year. Assuming a 20% per year rehabilitation rate, the total loss of revenues is as follows:

Year	Lost Revenue
1	$10 Million
2	$8 Million
3	$6 Million
4	$4 Million
5	$2 Million
SUBTOTAL	**$30 Million**

TOTAL COST FOR LDEQ KATRINA RESPONSE:

$121 Million