Item No. 2 g

TOWN OF LAUDERDALE-BY-THE-SEA

ROUNDTABLE ITEM REQUEST FORM

Department Submitting Request

Mayor Nisset
Name/Title

Meeting Date / Time	Deadline w/o Backup	Deadline w/ Backup
☐ July 7, 2010 / 7:00 PM	☐ July 7, 2010 / Noon	☐ June 25, 2010 / Noon
☐ July 28, 2010 / 7:00 PM	☐ July 21, 2010 / Noon	☐ July 16, 2010 / Noon
☑ Oct 13, 2010 / 7:00 PM	☐ Oct 6, 2010 / Noon	☐ Oct 1, 2010 / Noon
☐ Oct 27, 2010 / 7:00 PM	☐ Oct 20, 2010 / Noon	☐ Oct 15, 2010 / Noon

ITEM/ITEMS*:

ACTION OR OUTCOME EXPECTED:
Create a sustainable environmental committee in L-B-T-S

SPECIAL NOTES:

***ITEMS LISTED THAT WOULD BE GOING TO REGULAR COMMISSION AGENDA REQUIRE NEW AGENDA ITEM REQUEST FORM WITH AMPLE TIME TO PRODUCE BACKUP**

CH

Revised 7/07/2010

- Public / private partnership
- "models"
- citizens committee
- Value

Unsolicited Proposal

Topic: Reduction in use of Energy for High Rise buildings in High Density Environments

Submitted to:

U.S. Department of Energy

1000 Independence Ave

Washington, DC 2000X

AQUAZUL

1600 South Ocean Blvd.

Lauderdale-by-the-Sea, Florida, 33062

The Building of High Rise Green Learning Laboratory: Zero-Net Building Energy by 2015.

Total Cost: $310,000 Request 80% = $248,000 (Aquazul 20%)

John McConaha, Building Manager

And Aquazul Board of Directors

On Behalf of The Aquazul Condominium Association, Inc Florida

July 9, 2010,

Introduction: Aquazul is a 24 story high rise building with 79 residential units located in Lauderdale-By-The-Sea, FL 33062. Construction started on Aquazul Condominium Association in 2004 on a 3.049 acre site. The Condominium Association took control of the facility in May of 2006. The building is under constant study for additional features that will increasing the energy efficiency and reduce energy consumption. Aquazul includes the following attributes:

- Smart Building Technological Features
- Residential structure wiring throughout all residences for high-speed communication, multiple telephone line capability, cable, satellite, video, audio and internet services.
- Floor to ceiling tinted windows
- Heated swimming pool
- Lighted tennis court with park local residents use
- 24 hour security system throughout the building.

The Aquazul Condominium is an ideal setting to launch a "green learning laboratory for high rise structures on the coast." The program has the initial focus of integrating green energy technology deployment with the purpose of quantifying benefits in terms of greenhouse reduced energy consumption and therefore gas emission reductions, decreases in oil dependence and potential economic building operational benefit. We will try new approaches and test innovative solutions to the toughest environmental issues that face our region and country. The Aquazul Condominium is able to move quickly from a design and planning phase into implementation because of our size, technical content experts, strategic business partnerships, strong Building, Town, State and Utility involvement, and the following information:

- 3.049 acre site
- Building completed October 2005
- Well-established, functional governing body and management team
- Flexibility and agility to enact change quickly
- Proven track record of incremental efforts to improve the building functionality past four years
- Close proximity to Ocean Front and major transportation

Benefits:

- Reduce carbon footprint of the Aquazul Condominium
- Comprehensive Plan for living building/demonstration
- Speed and ability to enact change – small size is of our initial project is an advantage
- Future integration into public/private partnership for local and statewide program
- Leverage strategic relationships and financial support to improve community

In the next three years, provisions of American Recovery and Reinvestment Act intend to promote energy efficiency, reduced energy consumption, doubling the amount of renewable energy by rapid development of innovative clean energy technologies. The implementation of this Condensing Water

and Condenser Motor Control Energy Conservation system and the future replacement LED systems will demand new types of skilled workers who will be trained for jobs in the energy conservation for manufacturing, servicing, installation, and distribution. Mass market introduction of these systems will result in green job creation throughout the U.S.

The overarching goal of the Aquazul Condominium's proposal is to be zero-net energy (defined as to be so efficient in energy consumption and in on-site renewable energy generation that they offset any energy use from the grid) by 2015. The Aquazul Condominium has designated July 4th as *Aquazul Energy Independence Day*. Toward this goal, each year we will increasingly reduce our energy consumption by employing practical conservation measures; improve our infrastructure and facilities with the most energy efficient technologies and systems; and generate energy using renewable and alternative technologies and efficient use of energy by each owner.

In order to meet our goal of energy independence we will employ a combination of highly collaborative endeavors drawing upon State and Utility input for future energy requirements. We are confident that our efforts will result in 6 jobs created, energy intensity reduction, and a minimum of $5000/ month dollars saved. Our actions over the next 36 months will provide a solid foundation to create a training laboratory for high rise structures.. The Aquazul Condominium respectfully requests initial funding to:

1. Jump start local high-rise investment in an advanced renewable energy portfolio of technologies;
2. Implement best practices in energy efficiency in our residential and High Rise facilities; Project
   a. Control demand of chilled water in individual units reduction of continuous water circulation
   b. Variable building frequency Control for Condenser Pump and Motor.
   c. LED conversion energy study
3. Collect and share research data to understand the feasibility of and identify the most practical measures; Estimated savings of 315 million gallons of circulated water per year.
4. Expand the application of alternative energy technologies; and
5. Educate and promote the environmental and financial value and viability of a zero-net energy Aquazul Condominium
6. Study the substitution of LED Illumination by replacement of existing florescent and incandescent lighting to additionally reduce energy consumption. This will be a phase 2 project after the proven benefit of chilled water management.

Project Description

CONVERSION OF EXISTING CONSTANT SPEED CONDENSER WATER PUMPING SYSTEM TO VARIABLE SPEED – PRELIMINARY ANALYSIS AND CALCULATIONS

The condenser water pumping system serving this building is based on centrifugal split case pumps driven by electric motors. The capacity of these is determined by obtaining the sum of the flow rate required by each water source heat pump connected to the system and calculating the pressure loss created by the piping system, its appurtenances, and equipment. Under normal service these pumps operate 24 hours/day, everyday, and are only shut-off for maintenance purposes.

According to our estimates, the operation of the (2)-100HP condenser water pumps is 100% loaded. Since there are presently no control valves in the piping circuit or servicing the heat pumps, the resistance to flow is constant at all times. Therefore, the cost of operating this pump is approximately:

(2)x100HP motor x 1.00 x 0.746 KW/HPx$0.10/kWh x 24 hr/day x 365 days/year = $130,500/year (Excluding taxes, customer charges, etc).

The constant speed-operating feature of this system does not account for fluctuations of the total cooling load occurring in the building during the course of a day, month, or year. These fluctuations are a product of the residential nature of the occupancy and the design of the building. External load factors, such as heat gain through walls and windows, are most significant in the residential component of the facility. These factors vary sufficiently to create appreciable swings in total cooling load. Internal load factors are rather small in comparison and become more noteworthy at night. Periods of full load conditions are short in comparison to periods of partial load conditions. Therefore, the constant speed pumping system works to satisfy mostly a building-wide partial load condition.

Variable speed technology applied to this condenser water system will allow for modulation of pump capacity in response to varying cooling loads. We have provided a calculation that shows relationship between cooling loads, pump capacity, and pumping power costs. These calculations are based on the following:

a. Variable behavior of external heat gain factors
b. Relatively constant internal heat gain factors
c. The minimum total load never falls below 50% of the maximum.
d. An electric rate of $0.10 per kilowatt hour
e. The maximum pumping flow rate corresponds to the requirement of the maximum block-cooling load.
f. 50-90% residential building occupancy.
g. Pump affinity laws
h. Thermostats in unoccupied apartments be set at 78 deg F or higher.

As demonstrated by the calculations (see next page), variable speed pumping can save a considerable amount over the cost of constant speed pumping. These calculations are based on limited data. A more detailed analysis and calculation is possible by analyzing the building mechanical plans and performing hourly calculations of system demand and required performance.

Conversion of Condenser Water Pumping System to Variable Speed

Existing System Data			
No. of Pumps =	2	No. of Pumps in Operation =	2
Rated Flow ea =	1600 gpm	Resulting System Flow (gpm) =	3200
Rated Pressure =	190 fwg	Total Connected Load (tons) =	1067
Pump Speed =	1775 rpm	Diversity Factor Applied =	70%
Rated Motor HP (ea) =	100	Approx Thermal Block Load (tons) =	747
Motor Load =	100%	Electric Rate ($/kWh) =	0.10

Design Intent =	3200 gpm,	190 fwg,	1775 rpm,	200.0 HP	
k Block Load Conditions =	2240 gpm,	93 fwg,	1243 rpm,	83.8 HP	and 140 valves in operation
Operating Conditions =	3200 gpm,	190 fwg,	1775 rpm,	200.0 HP	

Month of Year	% of Block Load	Max Capacity (tons)	Req'd Flow (gpm)	Pump Speed (rpm)	Discharge Pressure (fwg)	Req'd Shaft Power (HP)	V/S Pumping Cost	C/S Pumping Cost
January	50%	373	1,120	621	93	41.9	$ 2,320.02	$ 11,085.60
February	55%	411	1,232	683	93	46.0	$ 2,552.03	$ 10,012.80
March	65%	485	1,456	808	93	54.4	$ 3,016.03	$ 11,085.60
April	75%	560	1,680	932	93	62.8	$ 3,480.04	$ 10,728.00
May	80%	597	1,792	994	93	67.0	$ 3,712.04	$ 11,085.60
June	85%	635	1,904	1056	93	71.2	$ 3,944.04	$ 10,728.00
July	95%	709	2,128	1180	93	79.5	$ 4,408.05	$ 11,085.60
August	90%	672	2,016	1118	93	75.3	$ 4,176.04	$ 11,085.60
September	80%	597	1,792	994	93	67.0	$ 3,712.04	$ 10,728.00
October	70%	523	1,568	870	93	58.6	$ 3,248.03	$ 11,085.60
November	60%	448	1,344	746	93	50.2	$ 2,784.03	$ 10,728.00
December	55%	411	1,232	683	93	46.0	$ 2,552.03	$ 11,085.60

Yearly CS pumping cost =		$ 130,524.00
Yearly VS pumping cost =	$ 39,904.42	
Yearly Savings =	$ 90,619.58	
Avg Monthly Savings =	$ 7,551.63	
Approximate System Cost =	$ 200,000.00	
Payback Period =	2.2 years	

See Attachments 1-4 for System Overview

Scope of Work

1. Furnish and Install (3) 100 hp VFD's with Ethernet connectivity and elapsed kWh function to existing electrical disconnect
2. Furnish (1) 100 hp VFD as a spare -
3. Furnish and Install (140) 3/4" automated 2-way valves to existing heat pump units (24V operation)
4. Furnish and Install a new configurable controller with sufficient inputs and outputs to control the (3) pump VFD's. Controller will be visible via a static IP address and web accessible from anywhere at anytime given the proper passcode.
5. Furnish and Install (1) Flow Meter (Flowstat) with a 4-20mA output for the closed loop control sequence on ground floor unit.
6. Furnish and Install all necessary low-voltage control wiring from flowstat sensor on ground floor unit to the pump room controller located at the roof level
7. Provide the necessary programming of controller to achieve the proper pumping sequence
8. Provide necessary permitting and engineered drawings as needed
9. Provide necessary training for building personnel on system and web access to system

General:

1. All work will be performed during normal working hours; Monday - Friday: 8:00 a.m. to 4:00 p.m. not including holidays
2. Access to all apartments and affected areas must be coordinated prior to commencement of work and cooperation from building personnel is required
3. This scope is contingent upon existing apartment shut-off valves holding (valves will be tested prior to unit shut-down, no problems foreseen)

Items Excluded:

1. Replacement of any defective shut-off valves or stainless steel braided hoses. (Items can be quoted separately or performed on a time and material basis)
2. Computer Front end system (Controller data can be accessible via the internet given that Aquazul can provide an Ethernet cable into the pump room)

Warranty:

1. *Three Year Parts and Labor Warranty on Turnkey Installation*

Investment:

The investment for the above mentioned scope of work shall be ..... **$ 220,000.00**

Savings Guarantee: City Wide Mechanical will guarantee that at least 50% of the projected kWh avoidance will be realized. In order to validate the energy savings, City Wide will install kWh sub-meters on the pumps and record data for a period of 60 days to establish a baseline. The guarantee will be based on achieving a reduction in consumption of $ 5,000.00 per month. An independent Engineer will be engaged to establish the base line and quantify the savings and

Aquazul Strategic Energy Management Policy, Program Design, and Implementation Plan

In conjunction with input and direction from the Building Board of Directors, technical experts, and Building Staff, Aquazul will develop a master energy management plan for the building to meet its ambitious goal of zero-net energy by 2050. One of the first tasks for this initiative will be to develop a policy for sustainability across the building's facilities, and strategies to meet the objectives of the policy. The establishment of a sustainability policy is critical to the success of a long-term, sustainable initiative for several reasons. It will demonstrate the building's commitment to employees, residents, businesses, stakeholders, and vendors and service providers; serve as the foundation for goals, objectives, and supporting tactics; and allow for smooth and more cost-effective implementation of sustainability efforts. The policy will include building objectives in creating a sustainability program, as well as the strategies that will be carried out to achieve those objectives.

Some of the objectives that the policy will address include:

- Recommend low-cost and no-cost measures to improve building energy efficiency, reduce water consumption, and decrease the production of solid waste thereby reducing our overall energy loads
- Integrate green energy technology and quantifying benefits
- Evaluate technology, monitor results, and share data broadly with the explicit purpose of aiding the local building energy goal to select future technologies to invest in that will help us achieve our zero-net energy goal
- Create new, sustainable, living wage green collar jobs
- Develop a sustainable business model with the building of Fort Lauderdale Building Energy Alliance to replicate and disseminate to other municipalities

Once the building policy is developed and approved and goals are established Aquazul will implement the plan that addresses goals, timeframes, and metrics, and assigns accountability for implementing the sustainability initiatives. The implementation plan will define the path Aquazul will take to achieve sustainability goals – both short-term and long-term. The creation of the implementation plan will be guided by the sustainability policy. It will include definitive tasks that will contribute to a successful sustainability initiative.

Budget

- Design, draft and adopt a strategic sustainability policy, plan and implementation plan for the program – $5,000

Budget

- Condensing Water and Condenser Motor Control Energy Conservation Project - $220,000
- Project 3 year maintenance, $12,000/yr = $36,000
- Management reporting $8,000/year, $24,000 over 3 years.
- LED lighting replacement study for high rise buildings $25,000
- Total cost of entire project: $305,000.
- Cost to DOE (80%) = $244,000
- Cost to Aquazul Residents = $61,000
- Cost for Policy development = $5000

Total Cost: $310,000
DOE Contribution 80% = $248,000
Aquazul Cost Share 20% = $62,000

Performance Period

It is intended that the program will be monitored over a 3 year period.

Accountability

This section will outline the reporting mechanism and frequency to DOE. It will stress transparency and a reduced burden of reporting – only as much as necessary without driving up the overall program administration costs.

One time presentation on various strategies to implement policy and lighting replacements with LED energy efficient lighting

Quarterly:

- Summary of energy saved
- Summary of money saved
- Maintenance on equipment summary

Annually:

- Summary of energy saved
- Summary of money saved
- Maintenance on equipment summary
- Commentary on equipment and recommendations on potential improvements for other buildings

Reporting by Email Quarterly

Summary and Energy Security

In the next three years, provisions of American Recovery and Reinvestment Act intend to promote energy efficiency, reduced energy consumption, doubling the amount of renewable energy by rapid development of innovative clean energy technologies. The dramatic increase in energy efficiency and reduced energy consumption depends on new systems and technologies being applied to existing structures and existing systems in those structures along with readily being integrated into the Smart Grid. A key element of the Smart Grid is central and distributed energy management systems such as the proposed Condensing Water and Condenser Motor Control Energy Conservation Project and the future LED lighting replacement project. Such energy control and management systems will have to be highly reliable, "green", energy efficient, inexpensive cost, and have a rapid impact on energy use and therefore reduction of green house gases and importation of foreign oil.

The potentially low cost and ease of installation of the Condensing Water and Condenser Motor Control Energy Conservation Project and the future LED lighting replacement will provide realistic demonstrable savings that will cause other buildings to implement similar systems. This will cause the sparking and development of existing and small business and generate 100's of jobs in our local community. With prospects for operating cost reduction and increased grid reliability due to reduced load, increase employment and this proposed project will stimulate local and regional economies. This project is expected to play a role in decreasing our dependence on foreign oil, decreasing our use of greenhouse gas emitting hydrocarbon fuels, reducing electrical operating costs and supporting reduced energy use and a national smart grid.

Economic Recovery

The implementation of this Condensing Water and Condenser Motor Control Energy Conservation system and the future replacement LED systems will demand new types of skilled workers who will be trained for jobs in the energy conservation for manufacturing, servicing, installation, and distribution. Mass market introduction of these systems will result in green job creation throughout the U.S.

As an example how Condensing Water and Condenser Motor Control Energy Conservation can contribute to the USA's economic recovery, one should consider the approximately 124 million residential consumers of electricity and approximately 17 million commercial customers who can add efficiency systems. Given this huge number of users, even a small market demand should result in substantial sales. Additionally, expansion of Condensing Water and Condenser Motor Control Energy Conservation system will also increase employment in the material and component supply chain. Establishment of manufacturing plants for these products in the US will allow our country to regain leadership in the advanced energy conservation technology field.

Reduction of Green House Gases

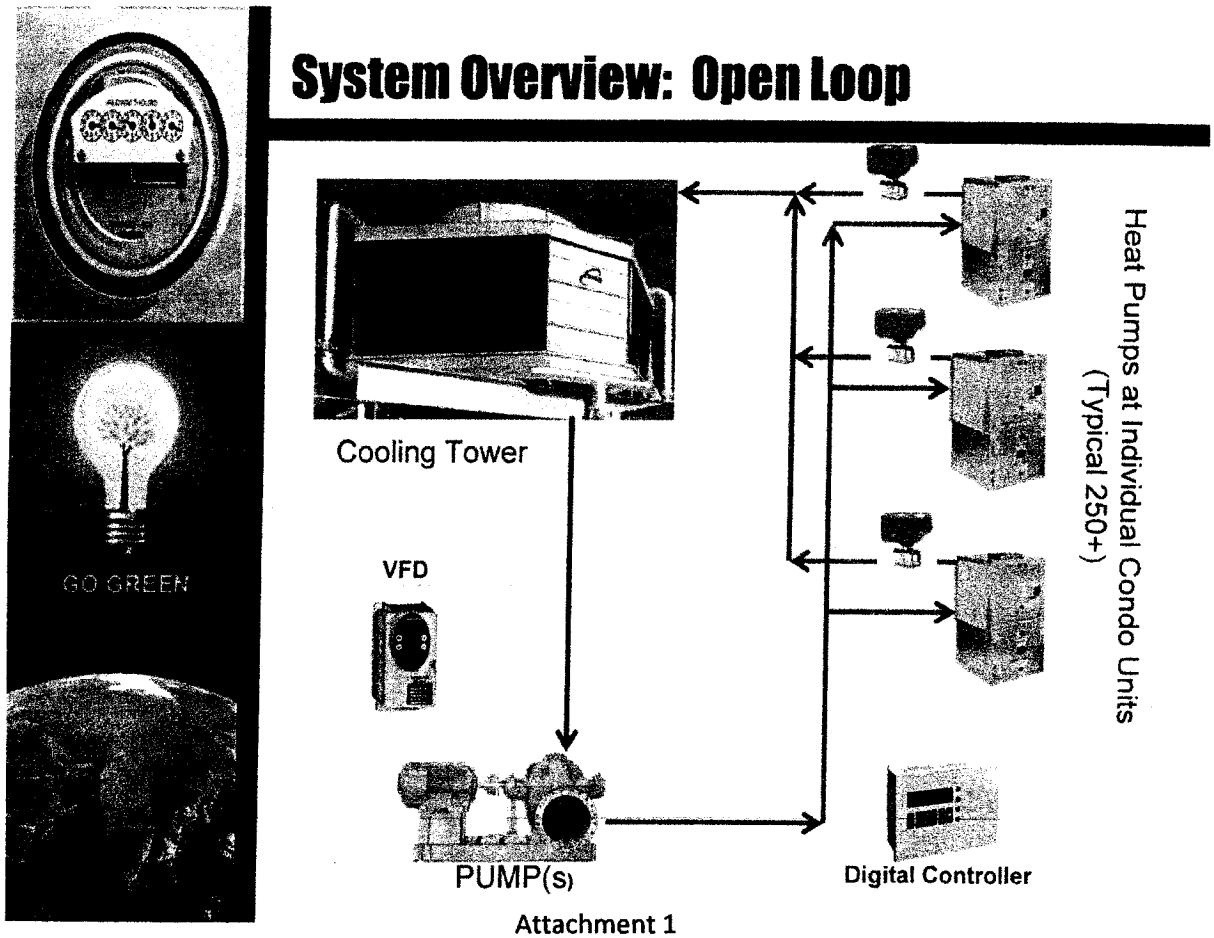
Based on 2009 U.S. Greenhouse Gas Inventory Report1 fossil fuels supply 85 % of the primary energy consumed in the United States and are responsible for 98 % of emissions of carbon dioxide. Electricity generation consumes 40% of U.S. primary energy and is responsible for 40 % of carbon dioxide emissions. In the electric power sector, coal accounts for 83 % of the emissions. Due to extensive use of

[1] http://epa.gov/climatechange/emissions/usinventoryreport.html

coal, power from the US electric grid is carbon intense. Therefore, even small improvements in grid efficiency and reduced energy consumption can generate significant reductions in carbon emissions. For example, it is estimated that even a 5% increase in grid efficiency would result in GHG emissions reductions equivalent to eliminating 53 million cars from the road. 2 Reduced energy use will directly reduce Green House Gases.

U.S. Technological Leadership

The US needs to focus on concept, product, system and implementation to maintain its technological leadership. This Condensing Water and Condenser Motor Control Energy Conservation system implementation will further impetus to advance technology and implementation and therefore expansion of Jobs.



Attachment 1

[2] "The Smart Grid: An Introduction," Prepared for the US DOE by Litos Strategic Communication under Contract No. DE-AC26-04NT41817.

Solution

CONTROL DEMAND

A 2-way **control valve (CV)** is a device used for regulating the flow of water into a unit. It opens to allow water flow when the A/C is running and closes when the unit is not in operation. The reduction of the amount of water needed for pumping allows for considerable savings.

A typical property with 200 3-ton A/C units will experience a

REDUCTION IN PUMPING OF OVER

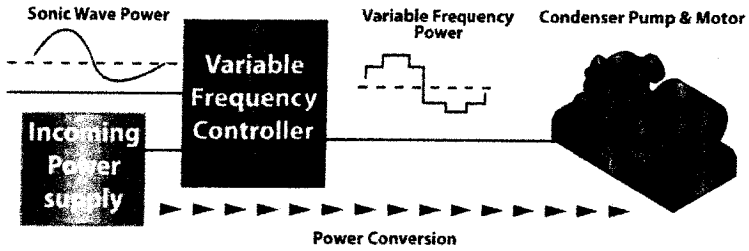
315 MILLION GALLONS PER YEAR

Attachment 2

Solution

CONTROL THE OUTPUT AND HORSEPOWER OF THE PUMP

A **variable frequency drive (VFD)** is a device used for controlling the speed of an electric motor by modulating the frequency of the electric power supplied.



This in turn speeds up or slows down the motor to match the "actual" system demand; thus significantly reducing energy consumption.

Attachment 3

Solution

Operate the HVAC System Based on Demand

Current Operation	Demand Based Operation
• (2) 100 Hp Pump Motor running 24 hours a day, 7 days a week, 365 days a year regardless of building load.	• (2) 40 Hp Pump Motor slowed down and de-rated to operate only as needed to satisfy the load at any given time.
• Approximate Annual Cost of Operation: $ 130,500.00/year	• Approximate Annual Cost of Operation: $ 39,900.00/year

POTENTIAL ANNUAL SAVINGS: $ 90,600.00

Attachment 4

Deepwater Horizon BP Oil Spill: Modeling the Potential Long Term Movement of Oil

Objective

The National Oceanic and Atmospheric Administration (NOAA) has used computer models to estimate the potential threats to U.S. coastlines that might result if oil spilling from the Deepwater Horizon site continues until a relief well successfully stops the flow. Although it is impossible to predict precisely where surface oil will go in the coming months, it is possible to analyze where surface oil is most likely to go by (a) using historical wind and ocean current records; and (b) accounting for both natural processes of "weathering" and human intervention to recover and remove the oil. This report will be updated as more information becomes available.

Major Findings and Implications

The details of the study are outlined in the following pages, but the major findings are represented in the figures on the next page and include:

- The coastlines with the highest probability (81% – 100%) for impact -- from the Mississippi River Delta to the panhandle of Florida– are already receiving oil.
- Along U.S. Gulf of Mexico shorelines, the oil is more likely to move east than west, with the south coast of Texas showing a relatively low probability (less than 1%) for impact.
- Much of the west coast of Florida has a low probability (1% – 20%) for impact, but the Florida Keys, Miami and Fort Lauderdale areas have a greater probability (61% – 80%) due to the potential influence of the Loop Current.
- A projected threat to the shoreline does not necessarily mean that oil will come ashore. It means that oil or streamers or tar balls are likely to be in the general vicinity (within 20 miles of the coast). Winds and currents will have to move the oil or tar balls onto the shore. Booms and other countermeasures would be used to mitigate the potential coastal contact once oil is in the area.
- The longer it takes oil to travel, the more it will degrade, disperse, lose toxicity, and break into streamers and tar balls. For example, any oil that enters the Loop Current will take at least 8 to 12 days to reach the Florida Straits, but could take much longer. Over that time, the oil will degrade and disperse, and any shoreline impacts to Keys, southeast Florida or beyond would be in the form of scattered tar balls, not a large surface slick of oil.
- As the Gulf Stream moves northeast and angles away from the continental US, there is an increasingly lower probability of shoreline impacts from eastern central Florida up the eastern seaboard. If oil does reach these areas, it will be in the form of tar balls or highly weathered streamers after traveling a thousand miles or more through the ocean.
- Implications. The findings cover potential impacts based on a scenario that assumes a significant continuing spill. Some of these impacts may be weeks or months away or may not

materialize. In light of these uncertainties and extended timeframes, NOAA will continue to work with the U.S. Coast Guard and other members of the response team to track the movement of oil, including monitoring the Loop Current, producing 72-hour projections of oil movement and updating these longer-term models, to inform states, communities, businesses, consumers, and others. Updated information can be found at: http://response.restoration.noaa.gov/deepwaterhorizon/longterm_outlook

The two graphics below depict the composite results of 500 individual scenarios or runs of the model. The model assumes that oil is released at an average rate of 33,000 barrels per day for 90 days. The model predicts the location of oil after 120 days from the start. Figure 1 shows the probability of shoreline threats that resulted in enough oil to cause a dull sheen within 20 miles of shore. However, a projected threat to the shoreline does not necessarily mean that oil will come ashore. Figure 2 shows the percentage of spill model scenarios that resulted in enough oil to cause a dull sheen in a given 20 by 20 mile grid.

Figure 1: Probability of Shoreline Threat, as of Day 120, for a 33,000 barrels/day release for 90 days

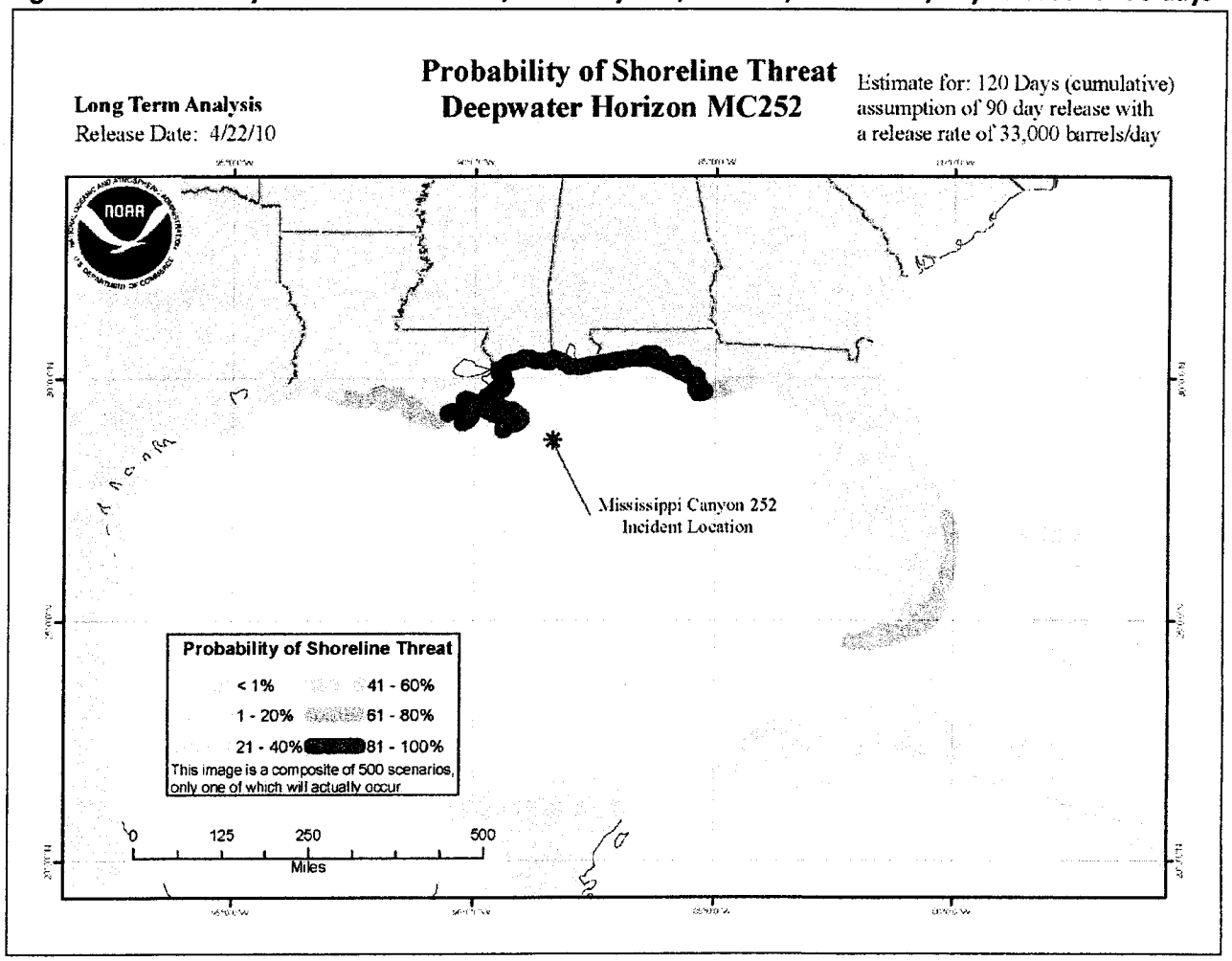
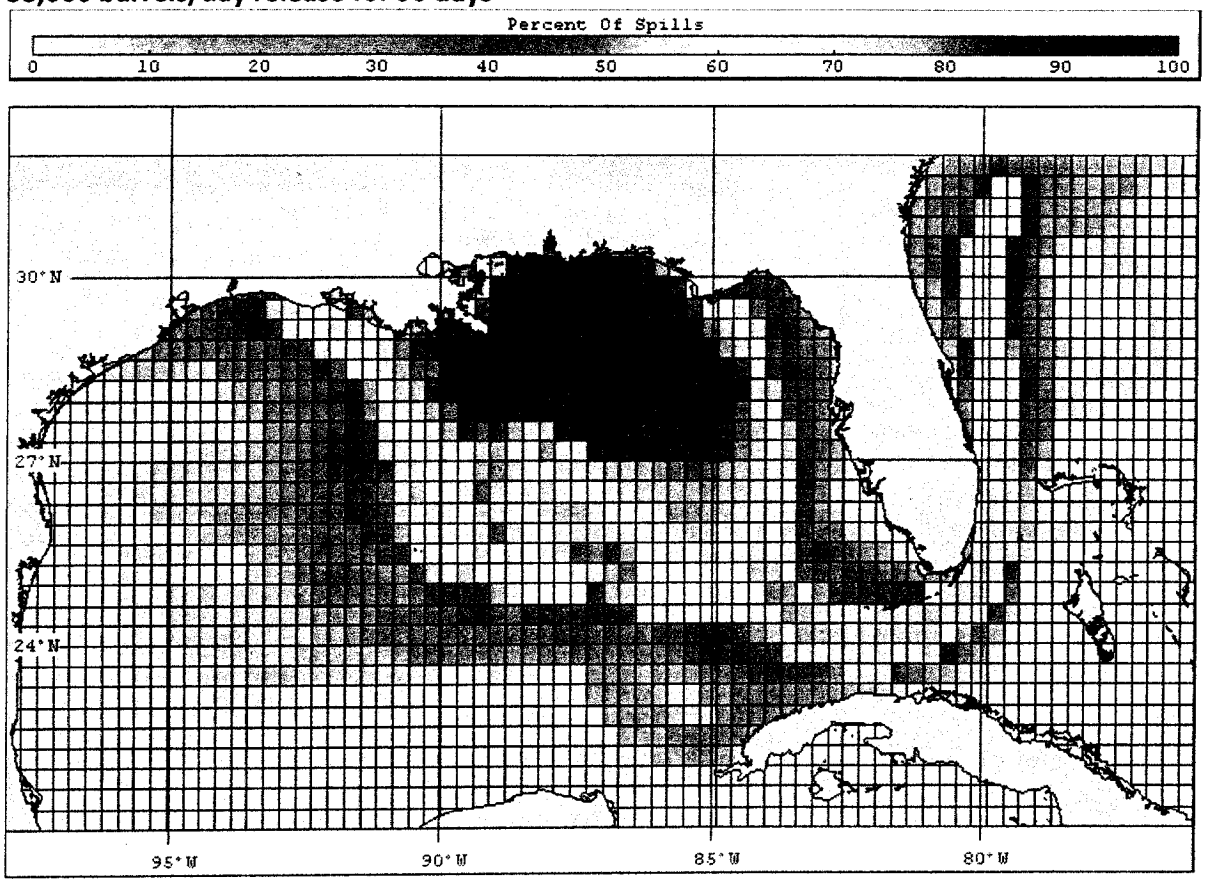


Figure 2: Percent of Spill Scenarios that would cause a dull sheen in a given grid as of Day 120 for a 33,000 barrels/day release for 90 days



Project Overview

The amount of oil being released by the Deepwater Horizon well has triggered widespread concern. Reports about the Loop Current, which could carry oil from the Gulf of Mexico around the tip of Florida, have expanded the geographic scope of interest. Responders across the Gulf and on the East Coast have been asking whether they should be preparing for the arrival of Deepwater Horizon oil. The public wants to understand the possible geographic scope of the environmental and economic impacts of the spill. Although there are limits to forecasting future impacts, this analysis provides some insights on the likelihood of various outcomes.

Beyond the continuing intensive efforts to contain, recover, and remove the oil, the Federal government will closely monitor the movement of the oil over time, particularly focusing on the relationship between the Loop Current and the oil slick to help sharpen the outlook for impact to South Florida and neighboring Caribbean nations. This information will give coastal states and communities warning about potential threats of shoreline impacts to ensure that adequate preparedness measures can be taken.

At present, the Loop Current does not appear to be a major source of transport of Deepwater Horizon oil to the Florida Straits or Gulf Stream. The top of the Loop Current has pinched off as an eddy that is spinning clockwise in the Gulf, recirculating within the Gulf any oil that it has entrained. NOAA will continue to follow the eddy and the Loop Current closely.

To perform the analysis of potential for long-term impact to shorelines, NOAA ran the computer model using 15 years of data on past winds and ocean currents in the Gulf of Mexico. NOAA ran this model five hundred times to reflect the uncertainty in forecasting future winds and ocean currents; each model run used a randomly selected subset of the 15-year data set. Each run of the computer model predicts oil movement over a 120-day period. It is important to note that although modeling is useful in characterizing what is more or less likely to happen, it cannot provide precise predictions about oil movement. The modeling is based on a 120 day projection starting from day one of the spill. It does not take the current footprint of the spill—which, approximately 70 days after the start of the spill, has not entered the Loop Current—as the starting point.

A peer review of the data and NOAA method was conducted by experts from the U.S. Navy, Minerals Management Service, Texas A&M, Texas General Land Office, Scripps Institution of Oceanography, and BP. The final modeling analysis reflects their technical input.

Assumptions and Caveats

In running this computer model, NOAA used the following parameters and assumptions:

- One key assumption in modeling the spill is the flow rate of oil into the Gulf of Mexico. The scenario assumes two different rates (one prior to the cutting of the riser pipe and a second one after the cutting of the riser pipe), then it subtracts out the oil removed from the environment, e.g., by skimming and burning. A gross flow rate of 40,000 barrels per day is used from the sinking of the Deepwater Horizon on April 22 until the cutting of the riser pipe on June 3. This number represents the upper bound of the estimate developed by the National Incident Command Flow Rate Technical Group (FRTG). After the cutting of the riser pipe, the model assumes that the gross flow rate increases to 60,000 barrels per day, again at the upper limit of the range provided by the FRTG (the lower bound is 35,000 barrels/day). These gross flow rates are then adjusted to account for the various mitigation efforts – skimming, oil burning, and subsurface oil collection – to calculate a *net* flow of 33,000 barrels per day for 90 days . The net flow rate reflects an average of 7,000 barrels per day for oil burning and skimming throughout the 90-day period, and an average of 20,000 barrels per day for subsurface containment through the top hat system after it was put in place on June 5. These adjustments are averaged over the 90 days of flow which reflects the approximate three-month window necessary for a relief well to be drilled. The model does not account for the use of dispersant in reducing the overall volume of surface oil.

- The estimated net flow of 33,000 barrels per day was used as a conservative but reasonable estimate that may overstate coastal risk somewhat. Other reasonable scenarios were examined that involved different gross flow rates and benefits from mitigation efforts, but the overall pattern of shoreline threat was not appreciably changed, so the 33,000 barrel per day scenario was selected for presentation. For example, sub-surface containment has exceeded 20,000 barrels per day for short time periods, and the sub-surface capacity to capture more than 50,000 barrels per day is expected to be operational by the beginning of July. The efficacy of skimming and burning operations varies with the weather, so calm weather may increase the daily removal rate through these mitigation measures, while rough weather may decrease the daily removal rate. The risk that a hurricane may require the relocation of surface vessels participating in the subsurface collection of oil, however, could result in a higher rate of flow from the well for some period of time. Finally, uncertainty about the

timing of completing the relief well obviously affects the duration of the spill. As better information becomes available, updated analyses will be posted at the web link cited at the end of this fact sheet.

- The model assumes that the "weathering" of the oil – the process by which oil naturally breaks down and changes in the environment – occurs in a way that is typical of oils similar to the Deepwater Horizon oil. The longer it takes oil to travel, the more it will degrade, disperse, lose toxicity, and break into streamers and tar balls. Again, the model does not account for the use of dispersants.

- The model considers oil a threat to the shoreline if there is enough oil to cause a dull sheen within 20 miles from the coast. A dull sheen was used as the threshold because that is enough oil to be toxic to some organisms in the water column and potentially require the closure of fisheries. Anything less than a dull sheen, the model does not consider to be a threat to the shoreline.

- A threat to the shoreline does not necessarily mean that oil will come ashore. Winds and currents will have to move the oil or tar balls onto the shore. Booms and other countermeasures would be used to mitigate the potential coastal contact. Therefore, the model may over-estimate the degree of potential shoreline threats from the spill.

Interpreting the Analysis

The probability map shown is a composite of the 500 individual scenarios for a net release of 33,000 barrels per day for 90 days. The colors indicate the percentage of the scenarios that resulted in enough oil to cause a dull sheen within 20 miles of shore or the 20 by 20 mile grid over a 120-day period. Main findings are summarized on page one.

There are several important factors to remember when interpreting the results:

1. The probability maps display the cumulative outcome of 500 individual scenarios. For example, if 250 of the 500 scenarios displayed a shoreline threat for a particular coastal area, the probability for shoreline threats at that area would be 50%. However, it is important to understand that only one scenario will actually occur. In other words, not all the areas with probabilities for shoreline threats will actually be affected. The winds, currents, flow rate, and mitigation efforts that actually occur during the release period will determine oil movement.

2. This model considers surface oil only. The longer it takes oil to travel, the more it will degrade, disperse, lose toxicity, and break into streamers and tar balls. For example, any oil that enters the Loop Current will take at least 8 – 12 days to reach the Florida Straits, but could take much longer. Over that time, the oil will degrade and disperse, and any shoreline impacts to southeast Florida or beyond would be in the form of scattered tar balls, not a large surface slick of oil.

3. NOAA is closely monitoring the movement of oil from the Deepwater Horizon spill through aerial and satellite observations. NOAA is also providing daily forecasts to predict where the oil is going to go within the next 72 hours. Although the Loop Current is not presently a significant source of transport of oil to the Florida Straits, should a significant amount of surface oil enter the Loop Current and begin to move toward the Florida Straits and eastern

seaboard, NOAA will be able to see it, predict the movement, and help guide preparedness, response and cleanup efforts.

4. Oil movement could continue beyond the 120-day time frame used in the model runs.

5. Unlike the 72-hour projections reported daily by NOAA, the long-term model reported here does not initiate with the current footprint of the oil spill as the starting point – it initiates with a release from the source on Day 1. To date, about 70 days after the start of the spill, a significant amount of oil has not entered the Loop Current because of the specific location and configuration of the currents, though in some of the modeling runs, oil is projected to have done so. In that key respect, conditions thus far have been more favorable in reality than some of the 500 model runs generated would represent.

NOAA will continue to revise this model as new data are gathered. Updated scenarios and more information about the model can be found at:
http://response.restoration.noaa.gov/deepwaterhorizon/longterm_outlook

SE Florida Regional
Climate Change COMPACT

The Southeast Florida Response to Deepwater Horizon Oil Spill
A Call for Comprehensive Energy Policy and Protection of Florida's Waters
Sign-On

You have the support of BROWARD COUNTY LEAGUE OF CITIES, INC. for the "Southeast Florida's Response to Deepwater Horizon Oil Spill – A Call for Comprehensive Energy Policy and Protection of Florida's Waters" Sign-on Letter

Date: July 1, 2010

Administrator/Manager or Authorizing Entity:

Name: Roy Gold, President Signature: _____
Address: 115 South Andrews Avenue, Suite 122
Fort Lauderdale, Florida 33301
Mayor/Manager's email: bloc@bellsouth.net

Please add my comments in support for the Letter (optional):

_____
_____
_____

Note: The SE Florida Compact Counties request your support and are compiling a list of all entities signing on to this letter. Upon approval, we would appreciate your submittal of this form, a copy of the letter of support, and any current resolutions addressing oil drilling, energy and climate change to pwebster@broward.org or:

Patti Webster
Broward County Natural Resources Planning and Management Division
1 North University Drive, Suite 301
Plantation, Florida 33324

Please call (954-519-0310) or e-mail pwebster@broward.org with any questions.

environmental and economic consequences of the Deepwater Horizon Oil Spill provide irrefutable evidence of the need for immediate federal and state action.

In conjunction with the Compact Counties, we urge the following of our federal and state leadership:

1. The United States Congress must pass comprehensive Climate Legislation;
2. Congress must ensure passage of a complete energy and climate bill before the end of the 111th Congressional Session;
3. Florida's Congressional Delegation in the House and Senate must be engaged to ensure a bill reaches the President's desk this year;
4. The United States Congress must call for full restoration of damaged natural resources in the Gulf and full restitution to impacted economies by the responsible party;
5. The Florida Legislature must not lift the ban on oil drilling within Florida's Territorial Waters and Congress must ban oil drilling and exploration on Florida's Outer Continental Shelf. State and Federal leaders must demonstrate their firm resolve to protect Florida's shores; and
6. The nation must be encouraged to enact additional conservation measures and develop and transition to alternative renewable energy sources.

We call on the leadership of President Obama, the United States Congress and the Florida Legislature to join us in protecting the nation, our state and region.

Sincerely,

BROWARD COUNTY LEAGUE OF CITIES, INC.

By_____

SE Florida Regional
Climate Change COMPACT

June 25, 2010

President Barack Obama - The White House Office of Intergovernmental Affairs
Governor Charlie Crist – Executive Office of the Governor, State of Florida
Florida U.S Congressional Delegation
Florida Senate
Florida House of Representatives

RE: Sign-on to "Southeast Florida's Response to Deepwater Horizon Oil Spill – A Call for Comprehensive Energy Policy and Protection of Florida's Waters"

Dear President Obama, Members of Congress and Florida State Legislators,

On behalf of the BROWARD COUNTY LEAGUE OF CITIES, INC., please consider our signature as an affirmation of our support for the "Southeast Florida's Response to Deepwater Horizon Oil Spill – A Call for Comprehensive Energy Policy and Protection of Florida's Waters."

On June 24, 2010, partners in the Southeast Florida Climate Compact convened a regional press event to respond to the Deepwater Horizon Oil Spill in an urgent call for comprehensive federal energy policy and a demand for a permanent ban on oil drilling and exploration in Florida's territorial waters and along Florida's outer continental shelf. The Climate Compact dates to October 2009 when Palm Beach, Broward, Miami-Dade and Monroe Counties jointly convened a landmark event – the Southeast Florida Regional Climate Leadership Summit. At the event, the regional Climate Compact was unveiled, establishing a partnership between the four counties in legislative policies and planning activities relating to climate change and energy policy at national and state levels.

The Compact Counties, who jointly represent 5.5 million residents and approximately one-third of the State of Florida's economy, have a long history of strong opposition to oil drilling activities in Florida's waters. This opposition has been driven by a firm understanding of the untenable risks that such activities pose for South Florida's sensitive environmental resources and economy. The devastating nature of the Deepwater Horizon Oil Spill has not only served to reinforce this long-standing policy position but also to generate more recent calls by the Compact Counties for a comprehensive federal energy policy designed to substantially reduce our nation's overall reliance on domestic and non-domestic sources of oil and to lead the transition to a clean energy economy. The