# MINUTES

## JOINT COMMITTEE ON ENERGY AND ENVIRONMENTAL POLICY

November 9, 2010
Room 144-S—Statehouse

### Members Present

Representative Carl Holmes, Vice-chairperson
Senator Pat Apple
Senator Janis Lee
Senator Roger Reitz
Senator Mark Taddiken
Representative Mitch Holmes
Representative Tom Sloan
Representative Vince Wetta

### Staff Present

Cindy Lash, Kansas Legislative Research Department
Heather O'Hara, Kansas Legislative Research Department
Matt Sterling, Office of the Revisor of Statutes
Renae Hansen, Committee Assistant

### Others Attending

See attached list.

Vice-chairperson Holmes called the Committee to order at 10:00 a.m.

## UPDATE ON FEDERAL STIMULUS FUNDING (ARRA) FOR ENERGY

### Energy Funding and Programs

Ray Hammarlund, Director, Kansas Energy Office, Kansas Corporation Commission (KCC), presented the Committee with information on the ARRA-funded initiatives overseen by the KCC including: Renewable Energy Incentives Grants, Public Projects Grants, Energy Managers Grants, Efficiency Kansas and the Take Charge Challenge (Attachment 1).

Other material provided to the Committee included:

- Recovery Act Block Grant Programs Projects Map (Attachment 2);
- Efficiency Kansas Partner Lenders and Partner Utilities Map (Attachment 3);
- Number of Efficiency Kansas Audits Approved Graph (Attachment 4); and
- Energy Efficiency Building Codes Working Group Member List (Attachment 5).

**Energy Efficiency Conservation Block Grant**

Ryan Freed, Energy Efficiency Programs Manager, Kansas Energy Office, provided details of the grant funds (see Attachment 1). Additionally, he presented information about the ARRA programs and where they currently are operating in the state. He described the Take Charge Challenge headed up by the Climate and Energy Project. Mr. Freed further explained the Efficiency Kansas program, how it works, and how it is being used. The program was developed with several goals in mind:

- To stimulate the economy through the creation of a market around energy-efficiency;
- To make cost-effective energy-efficiency improvements; and
- To use the Recovery Act funds to make a long-term investment in the Kansas economy.

He noted the price of an energy audit has been reduced to $100 for the consumer by subsidizing the balance of the cost through the Kansas Energy Office.

In response to questions, Mr. Freed noted that the $500 rebate given to customers is determined by individual submission from customers. A list of qualified energy auditors can be found on the web-site, www.efficiencykansas.com. The state is paying an additional $300 for the audit and will pay $200 for the post audit once the work is complete. There are more than 70 auditors certified in the state for this program. Most auditors are very busy since the implementation of the $100 customer cost audit. He noted that the Recovery Act money is to be spent by March 2012. If it appears not all the money will be spent by Efficiency Kansas by that time, the Kansas Energy Office may consider allowing loans for a commercial lighting program. That decision will be made in the first quarter of 2011.

**Voluntary Energy Efficiency Building Codes**

Liz Brosius, Outreach and Education Manager, Kansas Energy Office, discussed the Kansas Energy Efficiency Building Codes Initiative (see Attachment 1). Ms. Brosius noted that the working group endorsed an approach based on respect for Home Rule privileges;

encouragement of free market transformation; and development of sensible, understandable and effective standards based on sound building science principles.

In response to questions, Ms. Brosius noted that new additions to existing homes have to meet the codes, but renovations of existing portions do not. She explained that the words "change in occupancy" relates to the use of the building and not a change in tenants. The goal is, by 2017, for 90 percent of all new single family home construction to meet the energy conservation requirements set forth by the federal legislation. Legislators questioned whether Kansas might have to return federal funds if the state does not meet the requirements. Ms. Brosius said the Department of Energy has not commented on this issue.

**Rate Design Project and Electricity Regulators Grant**

Janet Buchanan, Senior Managing Research Analyst, KCC, discussed the comprehensive utility rate design project (see Attachment 1). Ms. Buchanan explained how the evaluation of the change in rate designs might take place. Christensen Associates Energy Consulting was selected to conduct the evaluation, and gained initial input from meetings with representatives of KCC staff, CURB, Westar, Midwest Energy, and Kansas City Power and Light (KCP&L).

Ms. Buchanan also discussed the ARRA State Electricity Regulators Grant, which provided funding for four additional staff and training for new and existing staff. A chart in her testimony shows when and how the money is being disseminated.

In response to questions Ms. Buchanan said there are not target numbers for evaluating the success of the programs. Mr. Freed commented that making sure customers are making good investments in energy efficiency is the goal, rather than any target numbers. Committee members want to ensure that consumers actually are receiving the benefits being touted. Ms. Buchanan said that in regard to the rate design changes, the KCC wants to come up with something that is amicable to both the electric providers and the utility customers. The first meeting to discuss a preliminary rate design is scheduled for January 11, 2011, and will be an all day meeting. There are competing interests in the new rate structuring process, including consideration of individuals with circumstances that prevent them from changing their energy usage, such as certain health issues.

**Update on Federal Stimulus Funding (ARRA) for Weatherization**

Steve Weatherford, President, Kansas Development Finance Authority, discussed ARRA funding for the Kansas Weatherization Assistance Program (K-WAP) (Attachment 6). He noted there are eight local service providers for the weatherization program and directed the Committee to a map showing service providers' areas. A chart in his testimony showed the amount of funding Kansas received for weatherization over the last seven years and the source of the funding. Mr. Weatherford also discussed the State Energy Efficient Appliance Rebate Program (SEEARP). This program provides rebates to low income families who replace old, inefficient appliances with Energy Star label appliances. Included in his testimony is a detailed county by county map showing where Kansans have benefited from this program.

In response to questions Mr. Weatherford noted that an energy audit is required and it must show that the work will pay for itself over time. Committee members encouraged Mr. Weatherford to collect data that would show whether consumers actually are benefiting from the program, through lower energy costs for example.

**Committee Discussion and Development of ARRA Recommendations**

Committee members expressed the following concerns and questions about the ARRA-funded energy and weatherization programs:

- The money is not being spent quickly enough to provide many Kansans with benefits;
- There is a lack of data to show whether any of the programs are accomplishing their objectives;
- Performance needs to be measured;
- Are we getting life cycle payback on the programs;
- Does the Legislature have the authority to stop the programs when there is no analytical data to review;
- Many banks are requiring a second mortgage on a dwelling before they will provide a loan for Efficiency Kansas improvements, which is likely slowing consumer interest; and
- Public awareness of the programs needs to be increased.

Committee members reiterated that it is difficult to make recommendations without data showing whether the programs are achieving conservation benefits.

The Committee made the following recommendations regarding ARRA programs for energy and weatherization:

- The KCC and the KHRC should develop measures to demonstrate the value and efficiency of the ARRA programs they administer.
- The agencies should continue to monitor the programs for effectiveness.
- The Kansas Energy Office should speak about conservation more frequently in public forums.

## DEEPWATER HORIZON IMPACT

Representative Carl Holmes gave a slide presentation on the impact of the oil spill in the Gulf of Mexico (Attachment 7). The presentation contained photos of the rescue effort, and provided an overview of the spill and its present impact. Representative Holmes presented a brief overview of the impact to the State of Kansas. Additionally he spoke about the economic

impact of the drilling operation to the Gulf region. He presented a list of environmental impact damages. He noted that it will affect our oil supply.

**Presentation of Follow-up Information From Previous Meetings**

The following information was provided in response to questions raised at previous meetings of the Committee:

- Alternative Fuels Summary, Kansas Department of Health and Environment (KDHE), Bureau of Air (Attachment 8);

- Proposal letter to the Honorable Lisa Jackson, Administrator, U.S. EPA (Attachment 9);

- Kansas Water Office response memorandum, including a map of regions used for gallons per capita per day analysis (Attachment 10). Tracy Streeter, Director, Kansas Water Office, discussed their response;

- City of Wichita Aquifer Storage and Recovery (ASR) Project Phase II (Attachment 11);

- Website for Texas Water Development (Attachment 12);

- Texas Reservoir Capital Costs (Attachment 13);

- KCP&L, discussion letter on Section 316 of the Clean Water Act (Attachment 14) Scott Jones KCP&L, discussed the letter;

- Bill Eastman, Westar, spoke to the Committee about possible dredging of John Redmond Reservoir. Westar would be looking to the Legislature to help influence the dredging process. Mr. Eastman noted that there are many things that could impact Westar in the next two to four years based on EPA rulings;

- KDHE representatives spoke to the Committee about the LaCyane modification, NBAF, key permits: Sunflower and Abengoa, and BPU facilities in Kansas City and how they are just now getting started on analyzing those modifications;

- Study referenced by Dr. Dan Rogers (Attachment 15);

- Kansas Department of Agriculture, Division of Water Resources (Attachment 16) Paul Graves, Kansas Department of Agriculture, gave an overview of the additional testimony they presented in Attachment 16.

**Discussion and Recommendations (Non-ARRA)**

Following discussion, the Committee made the following recommendations:

- A letter based on language proposed on KCP&L regarding the Sec. 316(b) regulation, and signed by all members of the Committee, should be sent to the EPA, the Department of Energy, and the Office of Management and Budget.

- A Joint Resolution of the House and Senate should be sent to Congress registering concern over the Section 316(b) legislation. It should be co-addressed to EPA Region 7 Administrator Brooks.

*Senator Reitz moved introduction of a joint resolution registering concern over the Clean Air Act Sec. 316(b) regulation, seconded by Representative Mitch Holmes. Motion carried.*

The Committee may hold a meeting on a Friday in January to submit final suggestions.

The Committee approved the minutes from September 9, 2010 and October 7-8, 2010.

The meeting adjourned at 2:57 p.m.

Prepared by Renae Hansen

Edited by Cindy Lash

Approved by the Committee on:

January 21, 2011

(Date)

**JOINT COMMITTEE ON ENERGY AND ENVIRONMENT POLICY**
GUEST LIST

DATE: November 9, 2010

| NAME | REPRESENTING |
|---|---|
| Ryan Freed | KCC |
| Ray Hammarlund | KCC |
| Liz Brosius | KCC |
| TOM DAY | KCC |
| Janet Buchanan | KCC |
| DEREK HEIN | HEIN LAW FIRM |
| ROB MEMEY | KEMPNEY & ASSOC. |
| Ken PETERSON | KS Petroleum Council |
| Leslie Kaufman | Ks Co-op Council |
| Joe Dick | KCBPA |
| Shane Lyle | KGS |
| [illegible] | KEC |
| [illegible] | KMEA |
| LARRY BERG | MIDWEST ENERGY |
| Ward Loyd | KCC |
| SEAN MILLER | CAPITOL STRATEGIES |
| Sarah Sexton-Bowser | Kansas Assn Ethanol Processors |
| [illegible] | Curb |
| MICK COBB | CURB |

**JOINT COMMITTEE ON ENERGY AND ENVIRONMENT POLICY**
GUEST LIST

DATE: November 9, 2010

| NAME | REPRESENTING |
|---|---|
| Whitney Damron | ONEOK / Enpia |
| Scott Jones | KCPL |
| Ron Gaches | Atmos Energy |
| Clare Gustin | Sunflower Electric |
| Scott Allegrucci | GPACE |
| Sarah Green | KDA |
| Paul Graves | KDA |
| [illegible] | KIOWE |
| John Donley | KS Lusk. Assn |
| Jason French | BP America |
| Kent Askren | KEB |
| BILL EASTMAN | WESTAR |
| Chris Cardinal | Sierra Club |
| Tom Gross | KDHE |
| [illegible] | KDHE |
| Wes Ashton | Black Hills |
| | |
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| | |

KANSAS
CORPORATION COMMISSION

*Mark Parkinson, Governor*
*Thomas E. Wright, Chairman*
*Joseph F. Harkins, Commissioner*
*Ward Loyd, Commissioner*

# ARRA-funded Initiatives at the Kansas Corporation Commission

KCC Testimony to the Joint Committee on Energy and Environmental Policy
November 9, 2010

**Overview and Introduction** – Ray Hammarlund, Kansas Energy Office Director

Senator McGinn and Ladies and Gentlemen of the Committee, I am Ray Hammarlund, Director of the Kansas Energy Office (KEO). I am happy to be here today, along with other Kansas Corporation Commission (KCC) staff, to update you on our work and to report our progress with all funding from the American Recovery and Reinvestment Act (ARRA) of 2009.

As you will recall, the ARRA was passed by Congress and signed into law in February 2009. As part of the Recovery Act, the Kansas Energy Office received $47.7 million from the Department of Energy: $9,593,500 through the Energy Efficiency and Conservation Block Grant (EECBG) and $38,284,000 through the State Energy Program (SEP). The majority of the ARRA funding was used to establish several energy efficiency and renewable energy programs and outreach activities.

**Renewable Energy Incentives Grants ($2.5 million)**
This program funds 25% (up to $250,000) of renewable energy projects undertaken by local jurisdictions, including school districts, community colleges, technical schools, universities, cities, counties, and state agencies.

**Public Projects Grants ($4 million)**
This program funds up to $150,000 of energy-efficiency upgrades to public facilities for projects that are either too small for the State's Facility Conservation Improvement Program (FCIP) or exceed the statutory 30-year payback period for energy savings.

**Energy Managers Grants ($1.7 million)**
Under this new program, the KEO provided grants (up to $170,000) to 11 coalitions of local governments to hire energy managers and fund related expenditures for up to two years.

**Efficiency Kansas ($37.2 million)**
This long-term program is designed to help Kansans identify and finance cost-effective energy-efficiency improvements in their homes and small businesses. The program takes a whole house approach to energy efficiency to ensure that the improvements work together and generate the greatest energy savings for each dollar spent.

**Take Charge Challenge 2011 ($940,000)**
The Energy Office is partnering with the Climate and Energy Project (CEP) to implement the Take Charge Challenge 2011, a friendly competition to save energy, involving 16 communities in 4 different regions of the state. CEP will manage the Challenge and the KEO will provide will

provide up to $100,000 for an energy efficiency or renewable energy project as an award for the winning community in each region

**Comprehensive Utility Rate Design ($350,000)**
The KCC hired Christensen Associates Energy Consulting, LLC (Christensen) to assist in developing and guiding a comprehensive, collaborative planning process to evaluate redesign of utility rate structures to encourage consumers to utilize energy in an efficient manner and evaluate other means for educating consumers about the actual cost of energy.

Finally, as a recipient of ARRA funding from the Department of Energy, the State of Kansas provided assurances that it would develop a plan to achieve compliance with federal energy codes requirements for residential and commercial buildings. More details about this initiative and all of the ARRA-funded programs and activities are provided later in this testimony.

**Update on ARRA Programs** – Ryan Freed, KEO Energy Efficiency Programs Manager

As mentioned earlier, the KEO received $9.8 million in Energy Efficiency & Conservation Block Grant funds. These funds were distributed to local units of government for energy efficiency and renewable energy projects through four grant programs.

**Renewable Energy Incentives Grant**
The KEO set aside $2.5 million for mid- to large-scale renewable energy projects for eligible Kansas cities and counties. A total of 13 projects have received approval from the KEO, 6 have executed contracts and the remaining 7 are awaiting approval from the U.S. Department of Energy. These projects include 3 wind turbine projects, 3 solar photovoltaic installations, and 7 ground-source heat pumps.

**Public Projects Grant**
The Public Projects Grant was instituted to assist small cities and counties in making energy-efficiency improvements in their facilities. The KEO approved 42 projects for this grant, for a total of $4 million, to assist small cities and counties in making energy-efficiency improvements in their facilities. This grant intentionally targeted smaller jurisdictions, specifically those with less than 100,000 total square feet of building space and less than $100,000 in annual utility bills. Several projects have begun construction and should be completed by the end of the year. The KEO expects the bulk of construction to begin after the next heating season.

**Energy Managers Grant**
While grants for energy-efficient upgrades provide needed improvements to facilities, the Energy Managers Grant provides coalitions of local units of government with in-house energy expertise. The KEO has approved 11 coalitions for this grant representing 40 local units of government. The KEO hosted Certified Energy Manager training for the energy managers in Topeka, which prepared the energy managers for their responsibilities. Energy managers will catalogue energy use in the coalition's facilities, and present a plan to reduce energy costs within the first 6 months of their employment.

**Take Charge Challenge**
The final block grant program at the KEO is the 2011 Take Charge Challenge. This challenge, operated by the Climate and Energy Project (CEP), encourages communities to compete against one another to save the most energy. Community members are encouraged to make energy-efficiency improvements in their homes and businesses.

Following the recent DOE approval of the 2011 Take Charge Challenge, the Climate and Energy Project (CEP) is moving ahead to recruit the remaining cities, establish leadership teams in each of the 16 cities, and hire 5 regional coordinators who will work directly with cities in their region.

The cities of Manhattan, Lawrence, Goodland, Colby, Oakley, Hoxie, Wakeeney, Paoloa, Gardner, Fort Scott, Parsons, and Chanute have all agreed to participate and are in the process of establishing city leadership teams and issuing city council resolutions. CEP is still waiting for confirmation from Baldwin City, Ottawa, Iola, and Pittsburg. If these cities choose not to participate, other cities will be invited. The KEO is monitoring progress through weekly calls with CEP and facilitating collaboration with KACEE/Kansas Green Schools on any school-based energy efficiency initiatives.

CEP anticipates having all 16 cities on board and ready to launch first initiative by January 2011.

**Efficiency Kansas**
Efficiency Kansas was created to provide new and existing Kansas businesses an opportunity in the emerging energy efficiency market. With $38 million in Recovery Act funds, the KEO created Efficiency Kansas, a revolving loan fund to provide low-cost financing for energy-efficiency improvements to homes and small businesses.

The program was developed with several goals in mind: (1) to stimulate the economy through the creation of a market around energy-efficiency; (2) to make cost-effective energy-efficiency improvements; and (3) to use the Recovery Act funds to make a long-term investment in the Kansas economy.

Prior to the start of Efficiency Kansas, the KEO could identify fewer than 10 energy auditors advertising their services in Kansas. The energy audit provides homeowners a customized plan for making energy-efficiency improvements to their home and is critical to ensuring that funds are used in the most cost-effective projects. The KEO provided $100,000 to help create two energy auditor training sites, the Metropolitan Energy Center and Neosho County Community College. To ensure access to the training, the KEO also offered $150,000 in tuition scholarships to the energy auditor trainings.

Today, there are over 73 energy auditors listed as participants in the Efficiency Kansas program. Some of these auditors represent Kansas entrepreneurs that saw an opportunity for a new business. Others represent existing HVAC and remodeling contractors that have enhanced their businesses with the addition of energy auditing.

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In addition to working with these businesses, the KEO has also teamed up with partner lenders and utilities to offer the financing. Today, there are more than 100 lender branches where Kansans can get an Efficiency Kansas loan. Kansans are also able to access financing through one of 16 partner utilities.

Through these partners, the KEO has made more than $500,000 in energy-efficiency improvements in Kansas homes and small businesses. These improvements are collectively saving more than $40,000 a year.

To continue to increase participation in the Efficiency Kansas program, the KEO instituted a program in September to subsidize the cost of an energy audit. Working with qualified energy auditors, the KEO created a program to lower the cost of an energy audit to only $100 for the first 1,500 customers. Since the beginning of that program, the KEO has received more than 100 audits for review, and several auditors report having so much business they are turning customers away. Kansans can receive their audit for only $100 whether they choose to finance their improvements through Efficiency Kansas or not. This program highlights the value of an energy audit and the benefit of a customized approach to making energy-efficiency improvements.

In addition to this program, the first 1,500 Kansans to receive an Efficiency Kansas loan are also eligible for a $500 rebate for improvements to their home's thermal envelope. Improvements such as insulation and air-sealing are among the most cost-effective improvements. They are also fuel-neutral, meaning that improvements to the home's envelope will save customers money on both electric and gas bills. In addition to saving money, these improvements also make customers much more comfortable in their homes.

Before Efficiency Kansas, many Kansans hadn't heard of an energy audit, and their only exposure to energy-efficiency was the Energy Star brand. Today, energy audits are providing Kansans with clear proposals to help them save energy. Businesses participating in the program are able to offer customers more services, and customers are able to afford more improvements due to the cost-effectiveness requirements of the program. This long-term investment in the Kansas economy is a testament to the ingenuity and perseverance of Kansas businesses.

**Kansas Energy Efficiency Building Codes Initiative** – Liz Brosius, KEO Outreach & Education Manager

Like all other states that received ARRA funds from the Department of Energy, Kansas was required to provide assurances that it would make progress on several initiatives, including the adoption of energy codes for residential and commercial buildings, as specified in H.R. 1, Section 410.

> *The state, or applicable units of local government, will adopt a building energy code for residential buildings that achieves energy savings equivalent to the 2009 IECC standards and, for commercial buildings, the ANSI/ASHRAE/IESNA 90.1-2007 standard.*
>
> *The state will develop a plan for jurisdictions to achieve compliance within 8 years of the date of enactment in at least 90 percent of new or renovated residential and commercial building space.*

To assist the State in meeting the federal requirement, the KCC established the Energy Efficiency Building Codes Working Group in May 2009. The Working Group includes codes officials and representatives from the building community, realtors, architects, the League of Kansas Municipalities, the Kansas Association of Counties, as well as other interested stakeholders. The KEO was assigned responsibility for the energy codes initiative.

Early in the process, the Working Group endorsed an approach based on (1) respect for Home Rule privileges, (2) encouragement of free market transformation, and (3) development of sensible, understandable, and effective standards based on sound building science principles. The federal requirements were restated in the following goals:

> By 2017, 90% of new and renovated residential structures meet the 2009 IECC standard.
>
> By 2017, 90% of new and renovated commercial structures meet the ANSI/ASHRAE/IESNA Standard 90.1-2007.

To achieve the above goals, the KEO has committed to work with local jurisdictions to encourage voluntary adoption of the target codes, or their equivalent. Building permit data from 2008 suggests that the State can achieve the 90% goal, if codes are adopted by jurisdictions in about 9 counties (Butler, Douglas, Johnson, Leavenworth, Pottawatomie, Riley, Sedgwick, Shawnee, and Wyandotte).

In recent weeks, staff has been contacting codes officials in larger jurisdictions to verify which codes are currently adopted and identify plans for future updates. Although the survey is not finalized, several jurisdictions have indicated plans to adopt codes in the next year that either meet or exceed the target codes.

Staff has also begun to meet with community leaders, codes officials, and builders to learn about the issues facing different jurisdictions and outreach opportunities. Recent meetings with representatives from Wichita Area Builders Association, Sedgwick County, Hutchinson, Kansas City metro area (Mid-American Regional Council), and the League of Kansas Municipalities have confirmed the need for ongoing outreach. The KEO understands that this is a long-term

process (we have until 2017 to meet our goals) and has recently reallocated staff responsibilities to allow for greater focus on this initiative.

As some of you may know, originally the Working Group had planned to introduce amendments to two statutes. Proposed amendments were drafted for KSA 66-1227, to have the target codes adopted as "applicable state standards" for new and renovated residential and commercial construction. Amendments to KSA 66-1228 were also proposed, in which the Kansas Energy Efficiency Disclosure Form would be updated with IECC 2009 standards.

However, rather than introduce these bills at this time, both the Working Group and the KCC decided to focus in 2011 on reaching out in a concerted and systematic way to raise awareness about the State's energy codes goal and encourage voluntary adoption by local government. As part of this effort, we will also encourage the use of the Kansas Energy Efficiency Disclosure form in areas where it is not currently being used.

**Comprehensive Utility Rate Design Project** – Janet Buchanan, Senior Managing Research Analyst

**Background**

The Commission undertook efforts in two proceedings, Dockets No. 08-GIMX-441-GIV and 08-GIMX-442-GIV to establish parameters for encouraging and evaluating energy efficiency program proposals put forth by regulated utilities. In the context of these dockets, the Commission made several statements regarding the role of prices and education in encouraging consumers to use energy services more efficiently. Here are a few excerpts:

> The Commission believes dynamic pricing is a critical component of energy efficiency programming. As noted, dynamic pricing has the potential to reduce peak energy demand.[1]
>
> The Commission encourages utilities to continue to propose dynamic pricing programs as well as other rate design schemes that provide the proper incentives to utilize energy efficiently. Examples include time-of-use rates, critical peak rates, and seasonal price differentials.[2]
>
> In their evaluation of [Demand Response or pricing] programs, the Commission will be mindful of their effect on elderly, low-income, or handicapped customers who may be unable to easily shift or curtail energy use. Utilities are urged to consider such effects in their program design and to be prepared to provide the Commission with the appropriate information and analysis.[3]

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[1] Docket No. 08-GIMX-442-GIV, "Order Setting Efficiency Policy Goals, Determining a Benefit-Cost Test Framework, and Engaging a Collaborative Process to Develop Benefit-Cost Test Technical Matters and an Evaluation, Measurement, and Verification Scheme," paragraph 57.
[2] Id, paragraph 59.
[3] Id, paragraph 62.

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> ... the Commission sees the utility bill as a potentially effective means of providing energy efficiency information to consumers and even changing consumer behavior....Of course, the utility bill plays an integral role in time-of-use pricing programs.[4]
>
> To receive the maximum benefit from energy efficiency programs, the Commission believes programs should be implemented to educate consumers regarding the actual cost of providing energy to their homes and businesses. Educational programs should encourage customers to use a utility's capacity and energy in the most reasonably efficient manner. This may necessitate new rate design proposals which will provide consumers with greater information about the cost of energy. [5]
>
> The Commission also is particularly interested in exploring the use of a utility's monthly bill to provide information to consumers that will allow them to make informed decisions regarding energy use. Providing information to encourage energy efficiency through bills is being considered by many utilities and has been discussed in the press.[6]

With these policy goals in mind, the Commission determined that it would be prudent to utilize a portion of the funding the Kansas KEO received from the American Recovery and Reinvestment Act (ARRA) through the State Energy Program (SEP) to launch a comprehensive and informal investigation into efficient rate design and education for consumers about the actual cost of the energy they utilize. Additionally, the Commission recognized that changes rate design can have wide ranging ramifications as can decisions to deploy expensive metering technology. Thus, a comprehensive investigation would permit the Commission to gather as much information about potential rate design options as possible, in one setting, rather than in a piecemeal manner as applications came before it. The informal nature of the investigation would allow all interested parties to contribute and Commissioners would be able to participate and learn in a setting that is more conducive to education than the formal hearing process. The Commission set aside $1 million to devote to this project.

On June 29, 2009, the Commission issued a request for proposals (RFP), PR Number 017298, through the Department of Administration. Mr. Galen D. Greenwood served as the Procurement Officer. Responses were requested by July 21, 2009. The term of the contract was to be the latter of September 15, 2009, or the date of the award of the contract through December 31, 2011. Once responses were received, a committee was formed to review the proposals and interview respondents. Ultimately, the committee agreed that Christensen Associates Energy Consulting (Christensen) was best suited to the project. The contract was awarded for $333,333 plus the expense associated with bringing additional experts to participate in workshops. The remaining funds are to be placed in the Efficiency Kansas program upon approval from the Department of Energy.

Staff, CURB, Westar, Midwest Energy and KCP&L met with representatives of Christensen on January 11 and 12, 2010 to discuss the preliminary thoughts and reactions of each entity to rate design changes. Christensen then summarized those conversations and created a project plan.

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[4] Id, paragraph 69.
[5] Id, paragraph 29.
[6] Id, paragraph 30.

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Christensen then proceeded by creating a document describing various rate design options that would lead to more efficient use of energy. On April 15, 2010, interested parties were invited to a workshop at the Commission to review the rate design document and contribute additional rate design options to that list for discussion. Subsequently, Christensen summarized the comments from that workshop and suggested several rate design options to be reviewed with data from Kansas utilities. Westar, Midwest Energy and KCP&L were asked to provide Kansas specific data on their customers' current usage to Christensen. Christensen is in the process of reviewing this data and using it to model the affect of each rate design option on consumer usage and bills.

During the time that Christensen was gathering data and modeling results, the Commission proceeded with a discussion of education. A workshop was held May 18, 2010, and presentations were made by experts working in the field of educating consumers on energy efficiency issues and by experts reviewing data to determine the success of particular methods.

**Current Status**
Once data from the utilities is compiled and modeling completed, it is anticipated that Christensen will provide a report on rate design options and effects to interested parties in December 2010. There will be one or a series of workshops to discuss each rate design option and the pros and cons associated with each in January and February 2010. It is hoped that the workshops will provide the Commissioners and interested parties with tools to weigh the benefits of the rate design (reduced usage) against the potential costs (increased costs associated with meters if needed, potentially increased bills, etc.). Additionally, Christensen will provide information about minimizing effects on consumers through transitioning from one rate design to another. While many utilities in other areas of the country plan pilot studies to examine rate designs, it is hoped that this process can provide similar information, for a greater number of rate design options, without creating disruption for the consumer. It is also expected that one or more additional workshops will be planned in 2011 to discuss education of consumers through bill format, technology, and other means.

**Future Developments**
Because this is an informal project, there will not be a formal Commission ruling that results from this project. Rather, it is hoped that all interested parties will have gained useful insight and data that can be used in proposing rate design changes within the context of individual utility applications before the Commission. It is expected that Christensen will create a final "White Paper" discussing the modeling results and the information presented at the workshops so that the Commission and other interested parties have a document that can be referenced as needed within individual formal proceedings as support for suggested rate changes.

**ARRA State Electricity Regulators Assistance Grant** – Janet Buchanan, Senior Managing Research Analyst

**Project Background**
The National Energy Technology Laboratory within the Department of Energy made $821,422 available to the Kansas Corporation Commission (KCC) to ensure that the KCC will be able to meet the increased demands caused by the American Recovery and Reinvestment Act of 2009 (ARRA). This grant is known as the State Electricity Regulators Grant (SER).

The American Recovery and Reinvestment Act of 2009 (ARRA) will provide significant funding in the next few years to address a wide variety of electricity-related issues, both directly to utilities and in areas that will indirectly spur utility spending. In addition, electric utilities and other entities in the electric power sector will invest unprecedented amounts of their own money. The KCC anticipates a wave of filings and action in this arena that will require its oversight and approval. All of these investments, ultimately, will have an impact on the reliability, security, cost, and environmental impacts of electricity delivered to Kansas ratepayers and others in the region. Consequently, the KCC anticipates a substantial increase in workload stemming from this wave of federal and private sector investment which will add to our already full docket. The State Electricity Regulators Grant is allowing the KCC to manage this increased workload.

**Progress**

The Commission filed its application for funding on August 28, 2009. The SER was awarded in October 2009. Since that time, the KCC has hired an Advisory attorney and an engineer in the Utilities Division to address ARRA electricity-related issues. Additionally, the KCC hired an engineer specializing in reservoir analysis and carbon sequestration and storage to assist with issues in the Conservation Division. In September 2010, the budget was amended to hire an additional employee within the Utilities Division to address Smart Grid issues and monitor Westar's SmartStar project.

The ARRA funds are also being used to provide training for these new employees as well as existing employees to develop expertise to address emerging energy issues. The funds have been used to sponsor the "Smart Grid and Energy Storage Roundtable" September 18, 2009. Current Commission employees, staff members of regulated utilities, Legislators, and other interested parties were invited to attend this training on Smart Grid and Energy Storage issues. In addition to presentations, smart grid vendors were present to demonstrate and discuss the capabilities of their smart meter systems.

The funds were also used to sponsor the "Electricity Law Seminar: Rates, Prudence, Transmission, Demand Response and Renewables" on December 17 and 18, 2009. Current Commission employees, Legislators, and other interested parties were invited to attend this training session presented by Scott Hempling. Many of the KCC's Utilities Division, Advisory Division, Litigation Division and Conservation Division employees have been able to attend other training sessions on monitoring and verification of carbon dioxide sequestration, underground storage issues, innovative renewable energy technologies, energy efficiency, wind energy, smart grid technology, rate design, etc. With the addition of another employee in September 2010, funds for training have been reduced for the remainder of the grant period.

**Table 1: ARRA State Electricity Regulator's Assistance Grant Funding Profile**

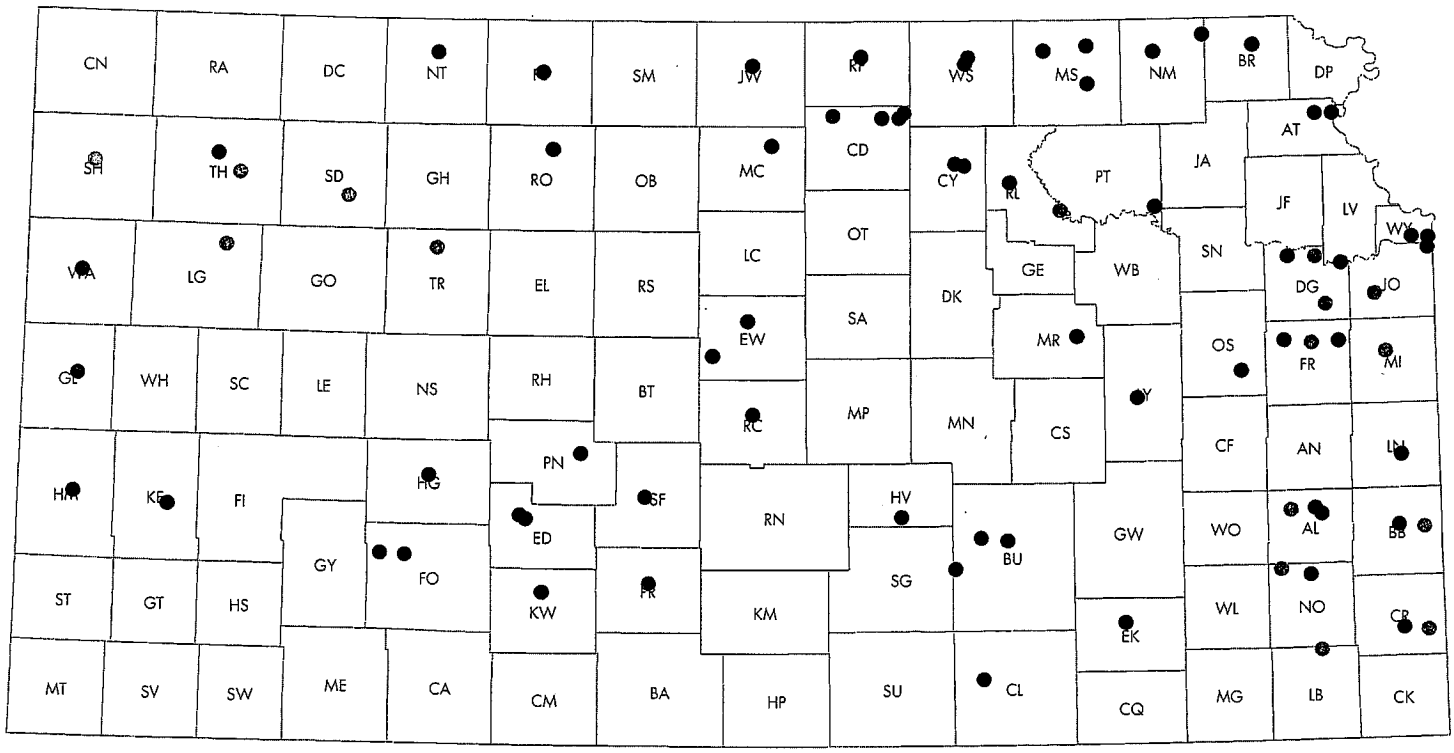
| Budget Category | Actual Year 1 (11/1/09-6/30/10) | Actual Year 2 (7/1/10-9/30/10) | Projected Remainder Year 2 (10/1/10-6/30/11) | Projected Year 3 (7/1/11-6/30/12) | Total |
|---|---|---|---|---|---|
| Personnel | 71,801.35 | 49,894.97 | 274,962.86 | 324,857.83 | 721,517 |
| Fringe Benefits | | | | | 0 |

1-9

| | | | | | |
|---|---|---|---|---|---|
| Training/Travel | 17,559.12 | 36,118.64 | 6,911.12 | 6,911.12 | 67,500 |
| Equipment | 3,744.42 | | 5,080.29 | 5,080.29 | 13,905 |
| Supplies | 1,140.36 | 137.94 | 1,791.88 | 1,929.82 | 5,000 |
| Contractual | | | | | 0 |
| Other | 4,298.29 | | 4,600.86 | 4,600.86 | 13,500 |
| Total Direct Charges | 98,543.54 | 86,151.55 | 293,347.00 | 343,379.91 | 821,422 |
| Indirect Charges | 0.00 | 0.00 | 0.00 | 0.00 | 0 |
| Total | 98,543.54 | 86,151.55 | 293,347.00 | 343,379.91 | 821,422 |

1-10

# Recovery Act Block Grant Programs and Projects




**Map Key**

- **Renewable Energy Grants**
  Helping public facilities lower utility costs through clean, renewable energy resources.
- **Public Projects Grants**
  Encouraging cost-effective improvements to public facilities across Kansas.
- **Energy Manager Grants (city)**
- **Energy Manager Grants (county)**
  Providing coalitions of local government with the expertise to save energy and taxpayer dollars.
- **Take Charge Challenge**
  Will provide program funds and final awards to cities participating in a friendly competition among 16 Kansas communities to save energy.

## Energy Manager Grant Coalition Members (Coalition leader is shown in bold)

**Clifton**
Clyde
Clifton-Clyde USD 224
Clay County

**Dodge City**
Ford County
Dodge City USD 443

**El Dorado**
Butler Community College
El Dorado USD 490
Circle USD 375 (Towanda)
Butler County

**Emporia**
Emporia USD 253
Flint Hills Technical College

**Eudora**
Eudora USD 491
Baldwin City

**Fort Scott**
Fort Scott Community College
Bourbon County
Fort Scott USD 234

**Franklin County**
Ottawa USD 290
Ottawa

**Greensburg**
Kiowa County
Kiowa County Mem. Hosp.
Greensburg USD 422

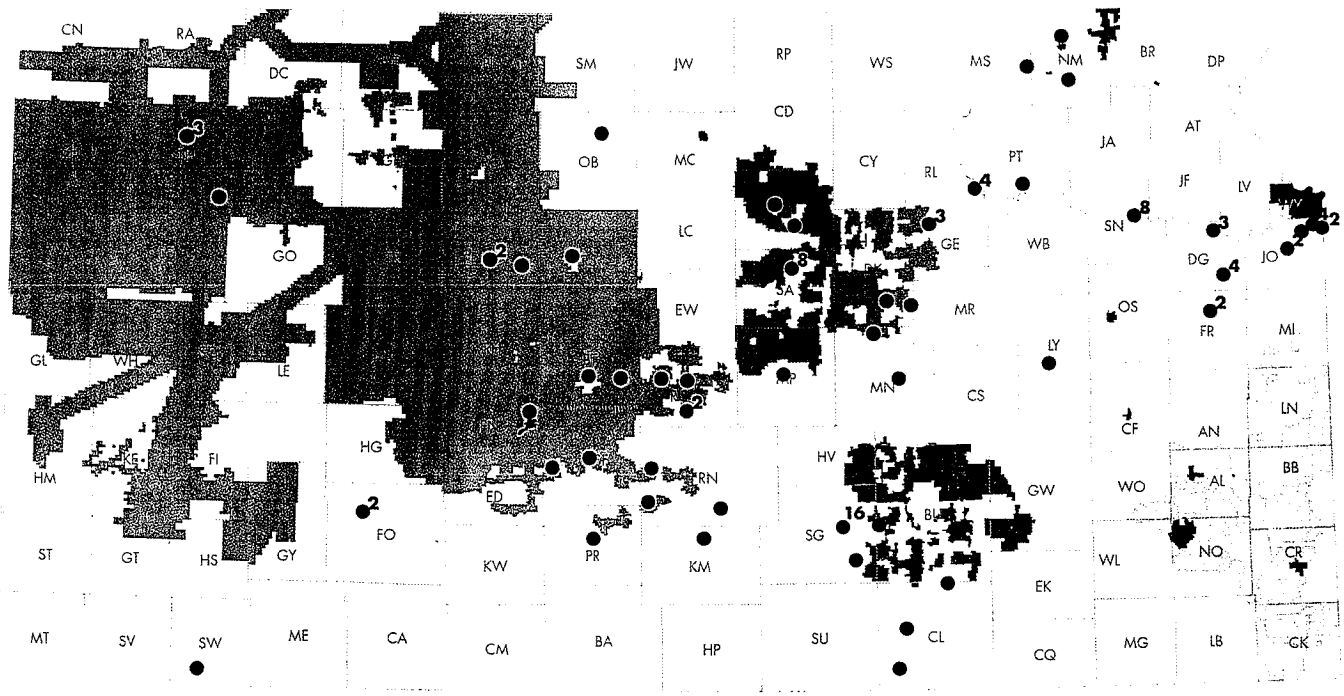
**Rice County**
Lyons
Sterling
Lyons USD 405
Sterling USD 376

**Unified Greeley County**
Greeley County Health Services
Greeley County USD 200

**Winfield**
Arkansas City
Wellington

JOINT COMMITTEE ON ENERGY AND ENVIRONMENTAL POLICY
DATE: 11/9/10
ATTACHMENT 2

# Efficiency Kansas
# Partner Lenders and Partner Utilities




**Map Key**

- Partner Lenders
  *(If location has more than one lender, number is indicated)*
- Butler Rural Electric Cooperative Association, Inc.
- DS&O Electric Cooperative, Inc.
- Heartland Rural Electric Cooperative, Inc.
- Midwest Energy, Inc.
- Municipal Utility

**Partner Lenders** (104 branches)

Alden State Bank
Capitol Federal
Citizens Bank of Kansas
Farmers & Merchants Bank of Colby
Farmers State Bank of Oakley
First Bank
First Bank, Sterling
First National Bank and Trust Co. of Junction City
First National Bank of Hope
Kansas State Bank Ottawa & KC
Mid America Bank
Mid American Credit Union
St. John National Bank
Sunflower Bank
Tampa State Bank
The Baldwin State Bank
The Bennington State Bank

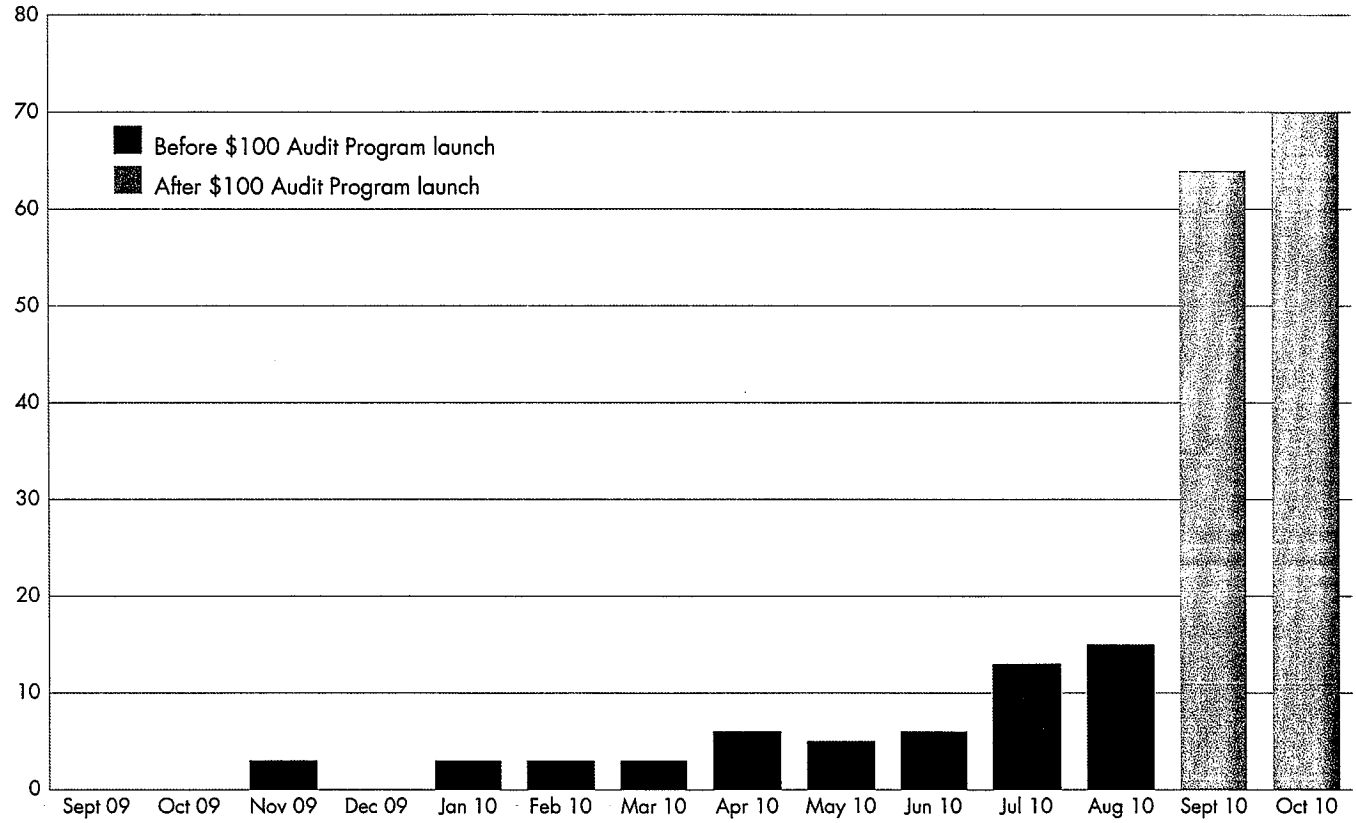
**Partner Utilities (cooperatives)**

Butler Rural Elec. Coop. Assn., Inc.
D.S.O. Rural Elec. Coop., Inc.
Heartland Rural Elec. Coop., Inc.
Midwest Energy, Inc.

**Partner Utilities (municipals)**

Kansas City Board of Public Utilities
City of Beloit
City of Burlington
City of Centralia
City of Chanute
City of Girard
City of Horton
City of Iola
City of Larned
City of Moran
City of Osage City
City of Sabetha
City of Seneca

# Number of Efficiency Kansas Audits Approved




KANSAS
CORPORATION COMMISSION
Kansas Energy Office
9 November 2010

JOINT COMMITTEE ON ENERGY AND ENVIRONMENTAL POLICY
DATE: 11/9/10
ATTACHMENT 4

## Energy Efficiency Building Codes Working Group

**Members**

Tim Ryan, Chair, City of Overland Park
Randall Allen, Kansas Association of Counties
Samuel Alpert, Construction Users Council of Greater Kansas City
Trudy Aron, American Institute of Architects, Kansas Chapter
Luke Bell, Kansas Association of Realtors
Dorothy Barnett, Climate and Energy Project
Sandy Jacquot, League of Kansas Municipalities
Leslie Kaufman, Kansas Cooperative Council
Jerry Mallory, Johnson County Contractor Licensing
Tina Rakes, City of Baldwin City
George Schluter, National Association of Home Builders
Martha Smith, Kansas Manufactured Housing Association
Bruce Snead, KSU Engineering Extension
Chris Wilson, Kansas Building Industry Association

KANSAS HOUSING

RESOURCES CORPORATION

# TESTIMONY BEFORE JOINT COMMITTEE ON ENERGY AND ENVIRONMENT

November 9th, 2010

Stephen R. Weatherford, President Kansas Housing Resources Corporation

## SUMMARY OF PROGRAM ACTIVITY UNDER AMERICAN RECOVERY AND REINVESTMENT ACT

Kansas Housing Resources Corporation (KHRC) administers six programs that were either impacted or created by the American Recovery and Reinvestment Act of 2009 (ARRA). These programs are the: Kansas Weatherization Assistance Program, Housing Credit Exchange Program, Tax Credit Assistance Program, Homelessness Prevention and Rapid Re-Housing Program, Community Services Block Grant Program and the State Energy Efficiency Appliance Rebate Program. The purpose of this presentation is to provide information on energy related programs.

## *Kansas Weatherization Assistance Program (K-WAP)*

Program Summary: KHRC administers K-WAP with funding from the U.S. Department of Energy (DOE) and the Low Income Home Energy Assistance Program (LIEAP). The program's goal is to make households in income-eligible, single or multi-family dwellings more energy efficient, thereby reducing the utility bills of these families. Funds may be used for leakage reduction, incidental repairs, health and safety measures, furnace and cooling system repair/replacement, insulation, and replacement of inefficient refrigerators. DOE regulations limit the eligibility to those with incomes at or below 200% of the poverty level ($20,800

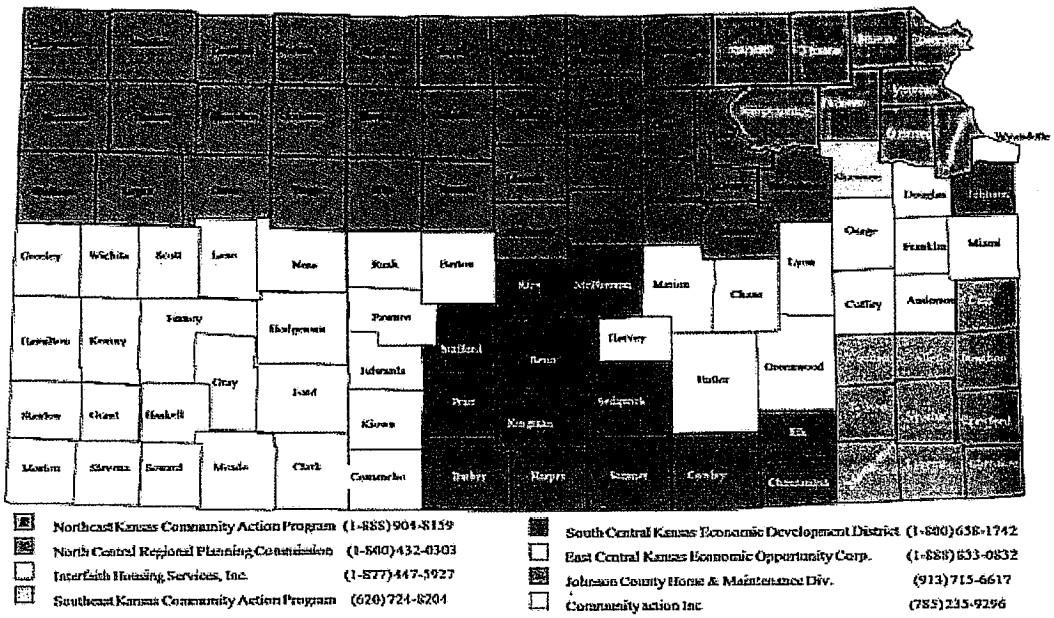
611 S. Kansas Ave., Ste. 300, Topeka, Kansas 66603-3803 / (785) 296-5865 fax (785) 2

annually for a single person or $42,400 annually for a family of 4 in Kansas). Recent regulations included an increase in the per-home cost of repair and improvements from $2,500 to $6,500. On average, Kansas weatherization providers have spent $5,375 on repairs per home.

The weatherization program is operated through a network of eight local service providers. Each agency provides weatherization for their region of the state. The following map identifies each service provider and the region in which they operate.

2009 Service Provider Map

**Counties Served by Kansas Weatherization Assistance Program**




**Funding**: As previously mentioned, funding for K-WAP has traditionally come from both DOE and LIEAP. In 2009 however, the Recovery Act also provided an additional $56 million for a three-year period ending July 2012. With the substantial increase in 2009 total funding and based on the regional weatherization agencies own appraisal of their capacity to ramp up operations, KHRC set aside $13 million establishing a multi-family program focusing on weatherizing Tax Credit properties, USDA Rural Development properties, and project-based

Section 8 properties that had no direct HUD funds for energy-efficiency improvements. The multi-family program is intended to sunset once ARRA funding is exhausted.

The following chart lists a seven-year funding history for the weatherization program. In 2009, DOE and LIEAP provided $7.8 million for weatherization, however for 2010 funding for weatherization dropped to just over $5 million.

| WEATHERIZATION FUNDING (5 YEAR HISTORY) | | | |
|---|---|---|---|
| Year | DOE | LIEAP | Total |
| 2010 | $ 1,988,468 | $ 3,282,132 | $ 5,270,600 |
| 2009 | $ 5,001,866 | $ 2,856,708 | $ 7,858,574 |
| 2008 | $ 2,518,837 | $ 2,497,970 | $ 5,016,807 |
| 2007 | $ 2,264,099 | $ 2,501,390 | $ 4,765,489 |
| 2006 | $ 2,706,214 | $ 4,415,873 | $ 7,122,087 |
| 2005 | $ 2,262,771 | $ 2,149,146 | $ 4,411,917 |
| 2004 | $ 2,390,904 | $ 2,548,024 | $ 4,938,928 |
| Average | $ 2,733,308 | $ 2,893,035 | $ 5,626,343 |

**ARRA Production Update:** According to a DOE representative, Kansas ranks in the top one-third of production when compared to all 57 states, territories and tribes. This past July, Kansas reached a major Recovery Act milestone by completing 30 percent of the state's planned weatherization production. By November 12th, the network will have surpassed the 50 percent production mark, well ahead of DOE's performance goals. Of the 2894 total homes now weatherized, 838 are attributed to the multi-family division.

While Kansas has completed nearly one-half of the state's planned number of homes, we have not yet spent half of our funding. Due to the efficiency in service demonstrated, KHRC now expects to complete 1054 more homes than originally estimated. Instead of 5820 homes weatherized with ARRA funding, Kansas is on track to complete a total of 6875 homes, nearly 20 percent over initial projections.

Based on DOE estimating rules, KHRC estimates 131 weatherization-related jobs have been created by ARRA funds.

**Traditional DOE Update:** To date, WAP providers in Kansas have effectively utilized 100 percent of 2009 funding and over 50% of the 2010 funds. In all, 1467 homes have been weatherized with traditional DOE funding.

**Overall:** Combining ARRA with "traditional" DOE/LIEAP funding from 2009 and 2010, Kansas weatherization providers have completed a total of 4361 homes, with over 5386 homes in progress. The "in progress" total includes homes placed on the waiting list which have been approved for services. Currently, our waiting list is 1364 homes.

**Monthly Production Rate:** In February of this year, DOE established a target production rate for Kansas of 294 homes per month. For the month of September, network providers completed a total of 353 homes or 117% of DOE's standard. Since the production standard was released last February, Kansas has surpassed the DOE standard by 450 homes with an overall production rate of 117 percent.

| MONTH | DOE STANDARD | TRADITIONAL DOE/LIEAP | ARRA | TOTAL | PRODUCTION RATE |
|---|---|---|---|---|---|
| SEPTEMBER | 294 | 49 | 304 | 353 | 117% |
| AUGUST | 294 | 60 | 280 | 340 | 115% |
| JULY | 294 | 61 | 195 | 256 | 87% |
| JUNE | 294 | 68 | 178 | 246 | 84% |
| MAY | 294 | 84 | 270 | 354 | 120% |
| APRIL | 294 | 0 | 232 | 232 | 79% |
| MARCH | 294 | 191 | 433 | 624 | 212% |
| FEBRUARY | 294 | 21 | 331 | 352 | 120% |
| JANUARY | 294 | 54 | 285 | 339 | 115% |

## *State Energy Efficient Appliance Rebate Program (SEEARP)*

**Program Summary**: The Recovery Act provided $296 million to implement Section 124 of the Energy Policy Act of 2005 establishing DOE support for State administered rebate programs for residential ENERGY STAR appliance products. States received formula-based funding to establish or supplement already established ENERGY STAR appliance rebate programs. The program is called the State Energy Efficient Appliance Rebate Program or SEEARP. The state of

Kansas received $2.7 million for SEEARP.

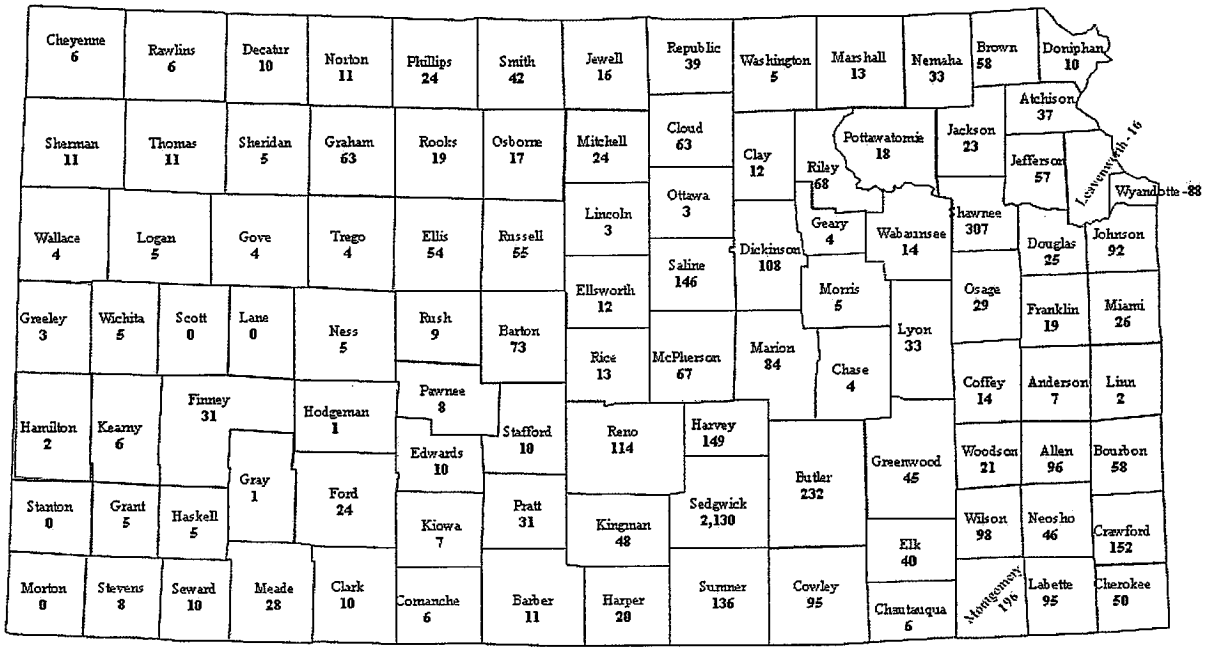
Under the Kansas plan, SEEARP provided rebates to low-income consumers who purchased ENERGY STAR® refrigerators, clothes washers, freezers, dishwashers and window air conditioners. Rebate amounts for high-efficiency appliances ranged from $200 to $800. New appliances qualified only if they earned the ENERGY STAR® label. Old appliances to be recycled had to be at least ten-years-old.

SEEARP was designed after another successful energy-efficiency initiative launched by KHRC called the Residential Appliance Replacement (RAR) Program. In 2009, KHRC launched RAR which allowed income-eligible homeowners and renters to replace old, energy-hungry and unsafe appliances with new, energy-efficient and environmentally-friendly models. Appliances eligible for replacement included refrigerators, water heaters, heating and cooling systems and window air units.

Funded by the Low Income Energy Assistance Program, RAR converted a $4 million dollar investment into nearly $19 million in lifetime energy savings for low-income families based on a DOE energy savings calculator.

**Achievement:** The SEEARP program and its predecessor, Residential Appliance Replacement (RAR), have been extremely popular. Under the SEEARP program, KHRC issued 3,843 voucher rebates to Kansas residents and 2,105 rebates through RAR. A distribution map of for the combined programs follows.

# RAR 1 & SEEARP COUNTIES MAP




## Residential Appliance Replacement Program II

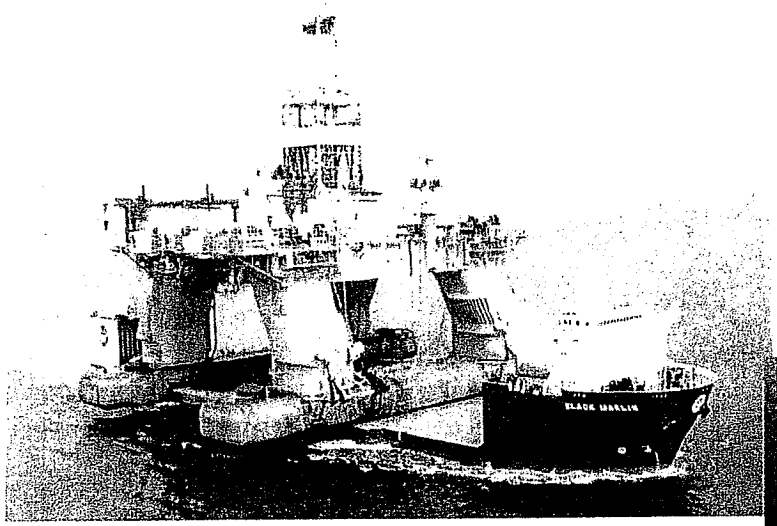
KHRC is currently working on the launch of a new version of RAR. The new program will be administered similar to SEEARP and offer vouchers for ENERGY STAR® refrigerators, clothes washers, freezers and dishwashers. Participants will be encouraged to apply for the program online. More details will be announced soon.

JOINT COMMITTEE ON ENERGY AND ENVIRONMENTAL POLICY
DATE: 11/9/10
ATTACHMENT 7

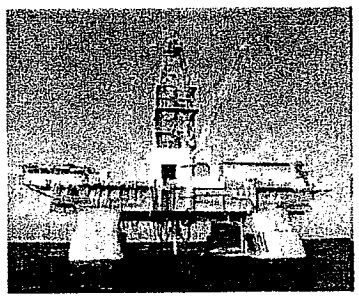
# Deepwater Horizon Impact

# DEEPWATER HORIZON 2001-2010

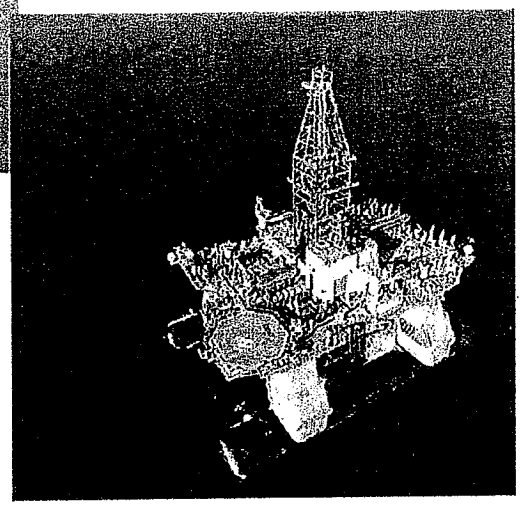




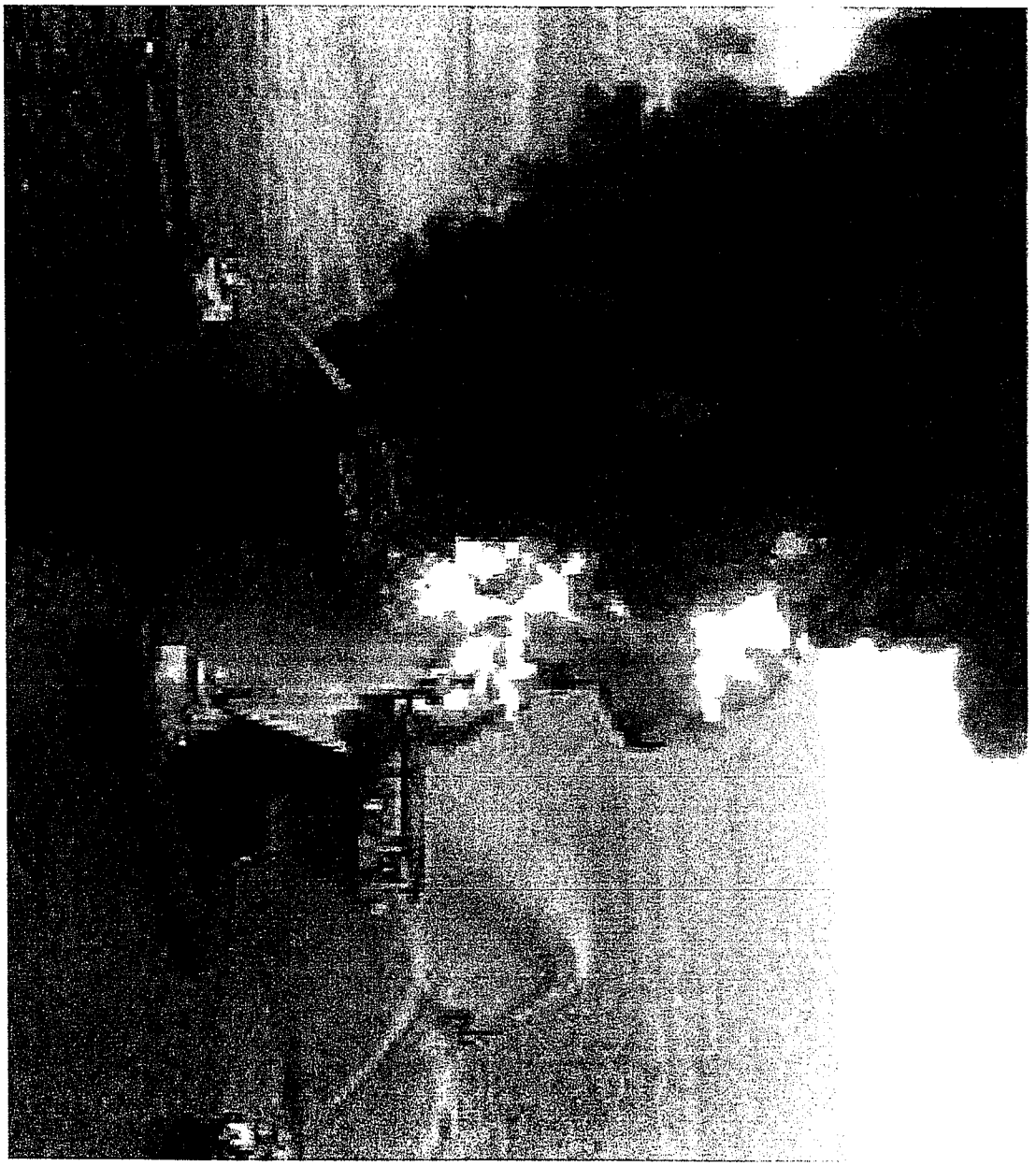
A sister rig, the Nautilus, being transported on a Heavy-Lift vessel



L and R, the Deepwater Horizon on location in better days



The Energy Council
September 24, 2011
By: Eric N. Smith
Tulane Energy Institute



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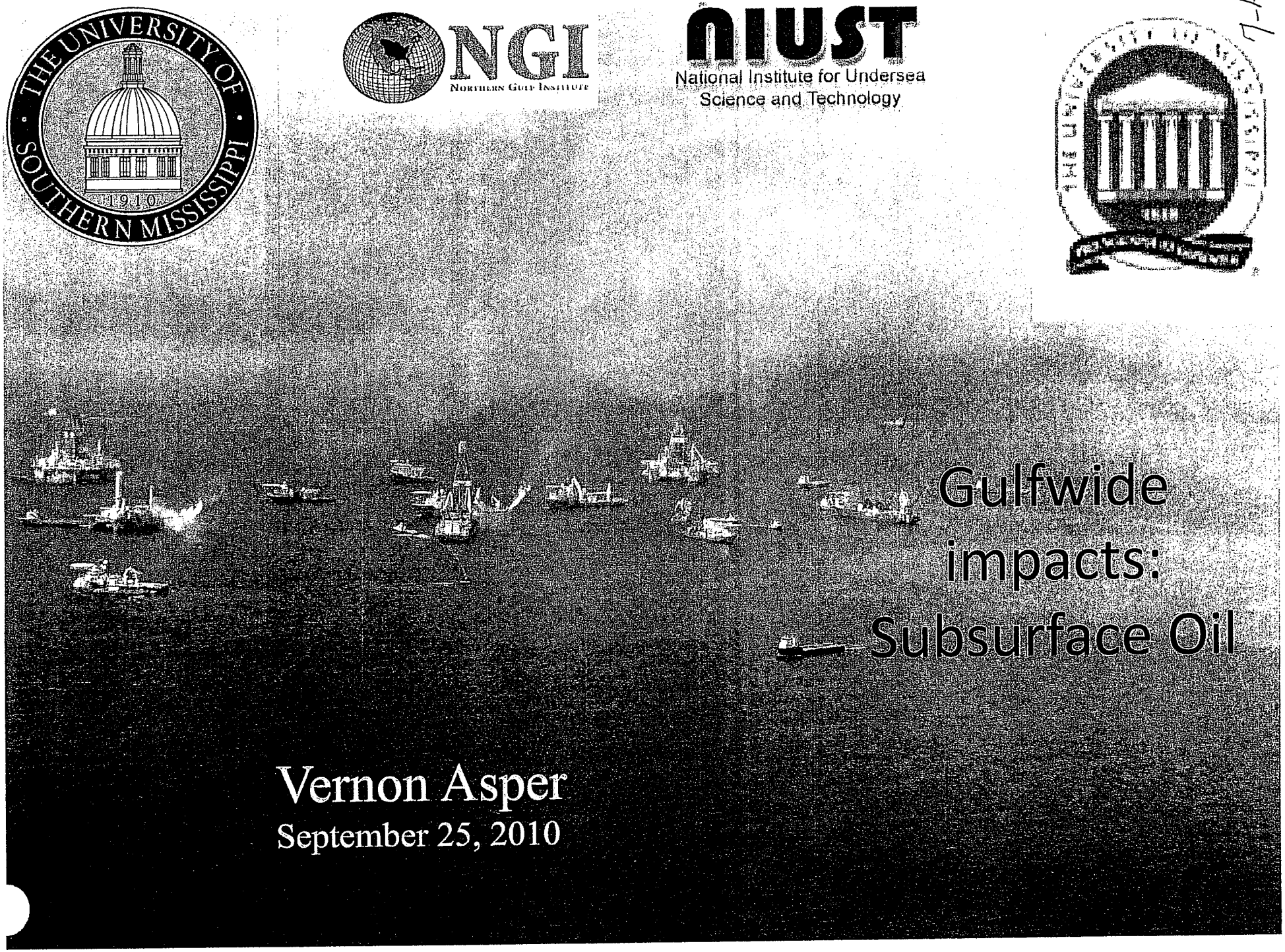
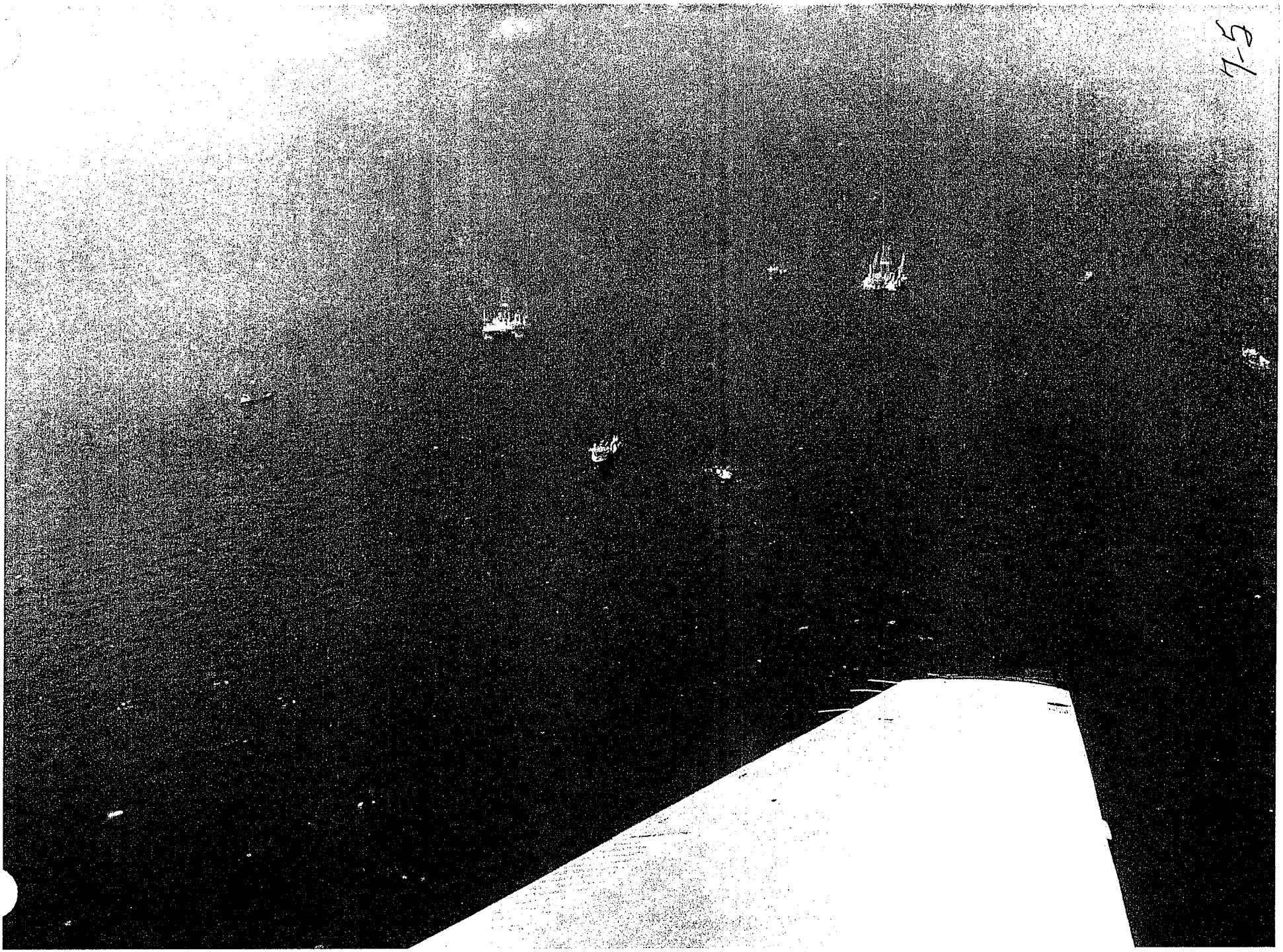

THE UNIVERSITY OF SOUTHERN MISSISSIPPI
1910
NGI
Northern Gulf Institute
NIUST
National Institute for Undersea Science and Technology
Gulfwide impacts: Subsurface Oil
Vernon Asper
September 25, 2010



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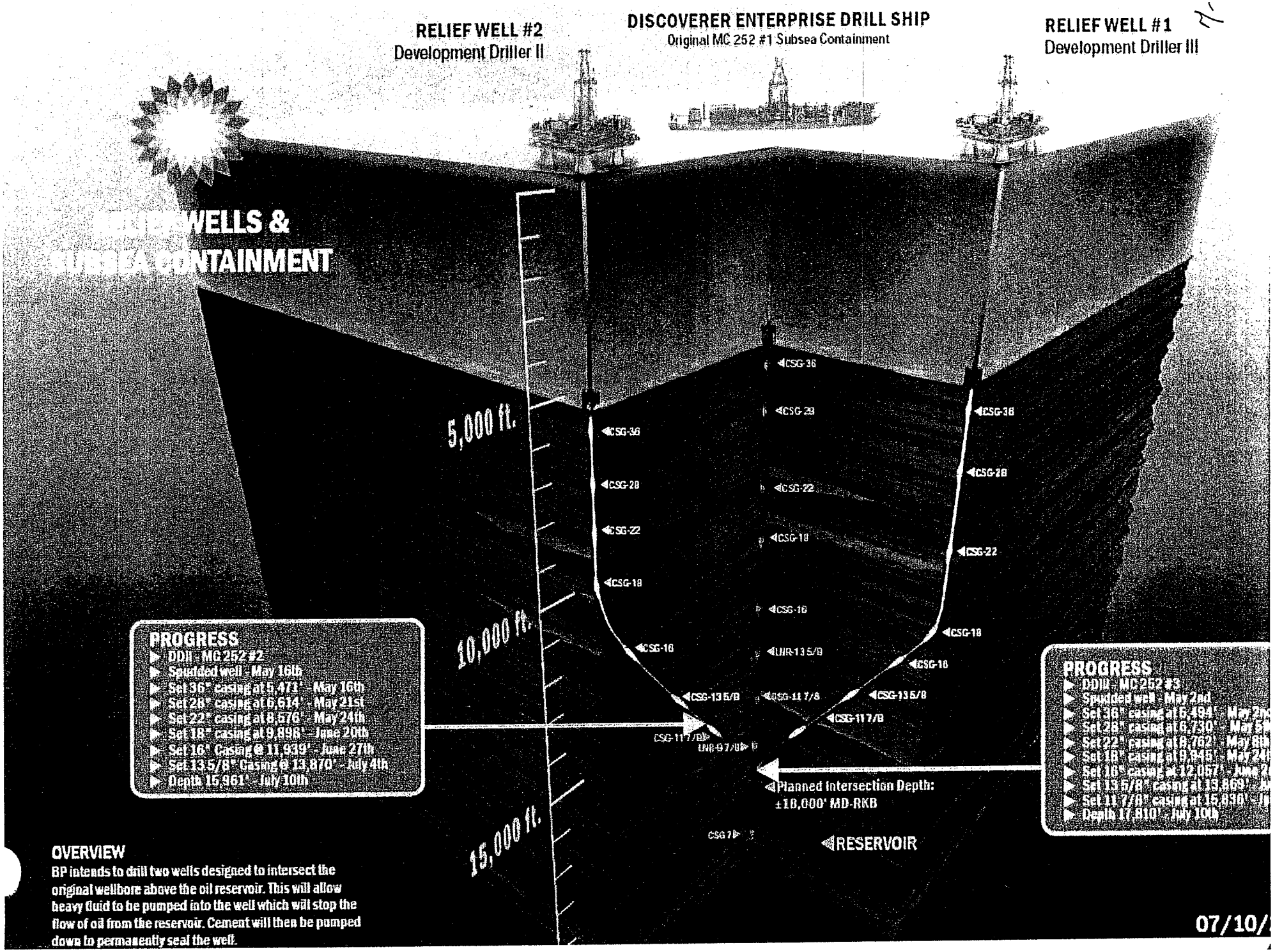
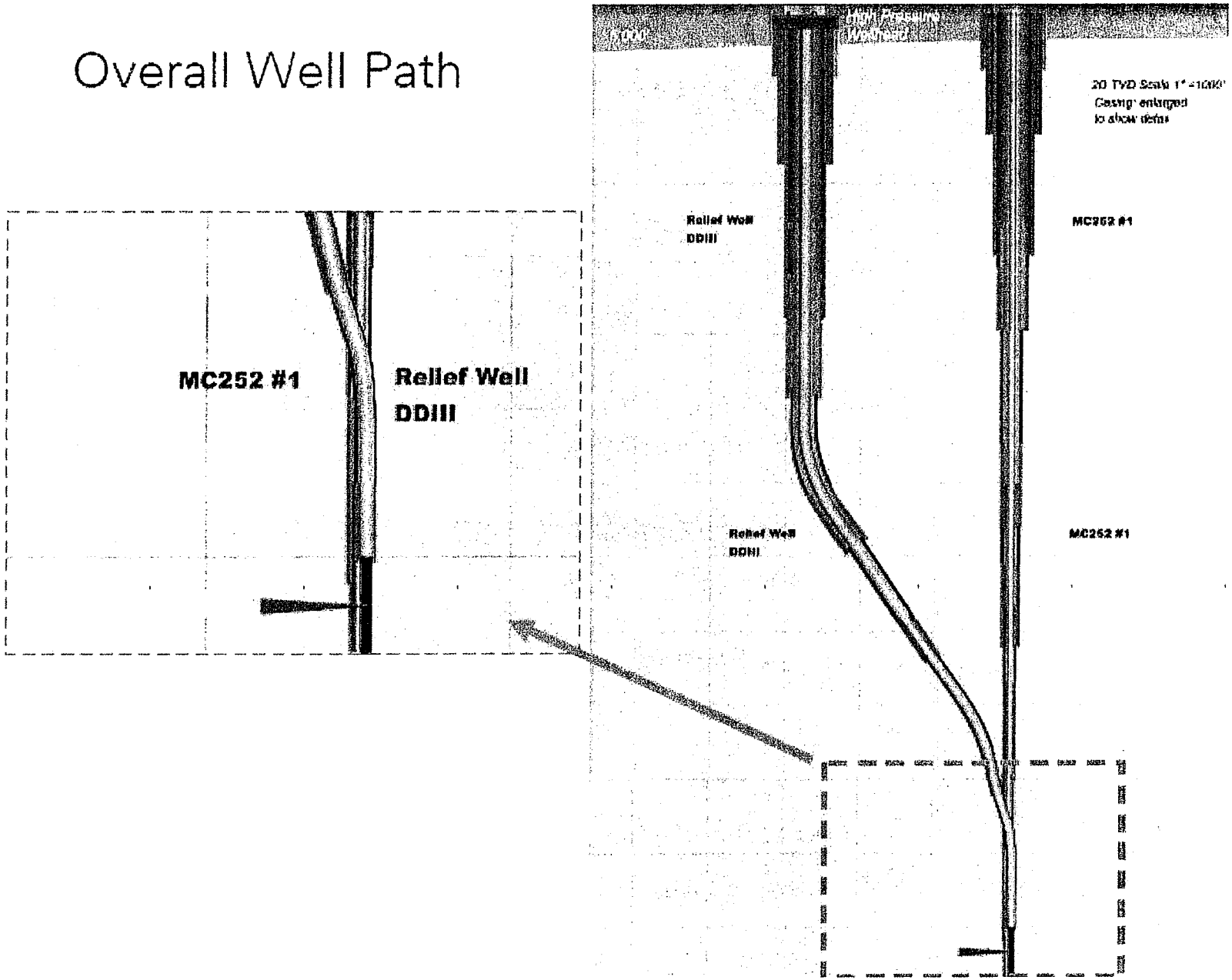

RELIEF WELL #2
Development Driller II
DISCOVERER ENTERPRISE DRILL SHIP
Original MC 252 #1 Subsea Containment
RELIEF WELL #1
Development Driller III
WELLS &
NTAINMENT
5,000 ft.
10,000 ft.
15,000 ft.
CSG-36
CSG-29
CSG-36
CSG-28
CSG-22
CSG-18
CSG-16
UNR-13 5/8
CSG-13 5/8
CSG-11 7/8
CSG-11 7/8
UNR-9 7/8
CSG 7
PROGRESS
DDII - MC 252 #2
Spudded well - May 16th
Set 36" casing at 5,471' - May 16th
Set 28" casing at 6,614' - May 21st
Set 22" casing at 8,576' - May 24th
Set 18" casing at 9,896' - June 20th
Set 16" Casing @ 11,939' - June 27th
Set 13 5/8" Casing @ 13,870' - July 4th
Depth 15,961' - July 10th
PROGRESS
DDII - MC 252 #3
Spudded well - May 2nd
Planned Intersection Depth:
±18,000' MD-RKB
RESERVOIR
OVERVIEW
BP intends to drill two wells designed to intersect the original wellbore above the oil reservoir. This will allow heavy fluid to be pumped into the well which will stop the flow of oil from the reservoir. Cement will then be pumped down to permanently seal the well.
07/10/

# Overall Well Path

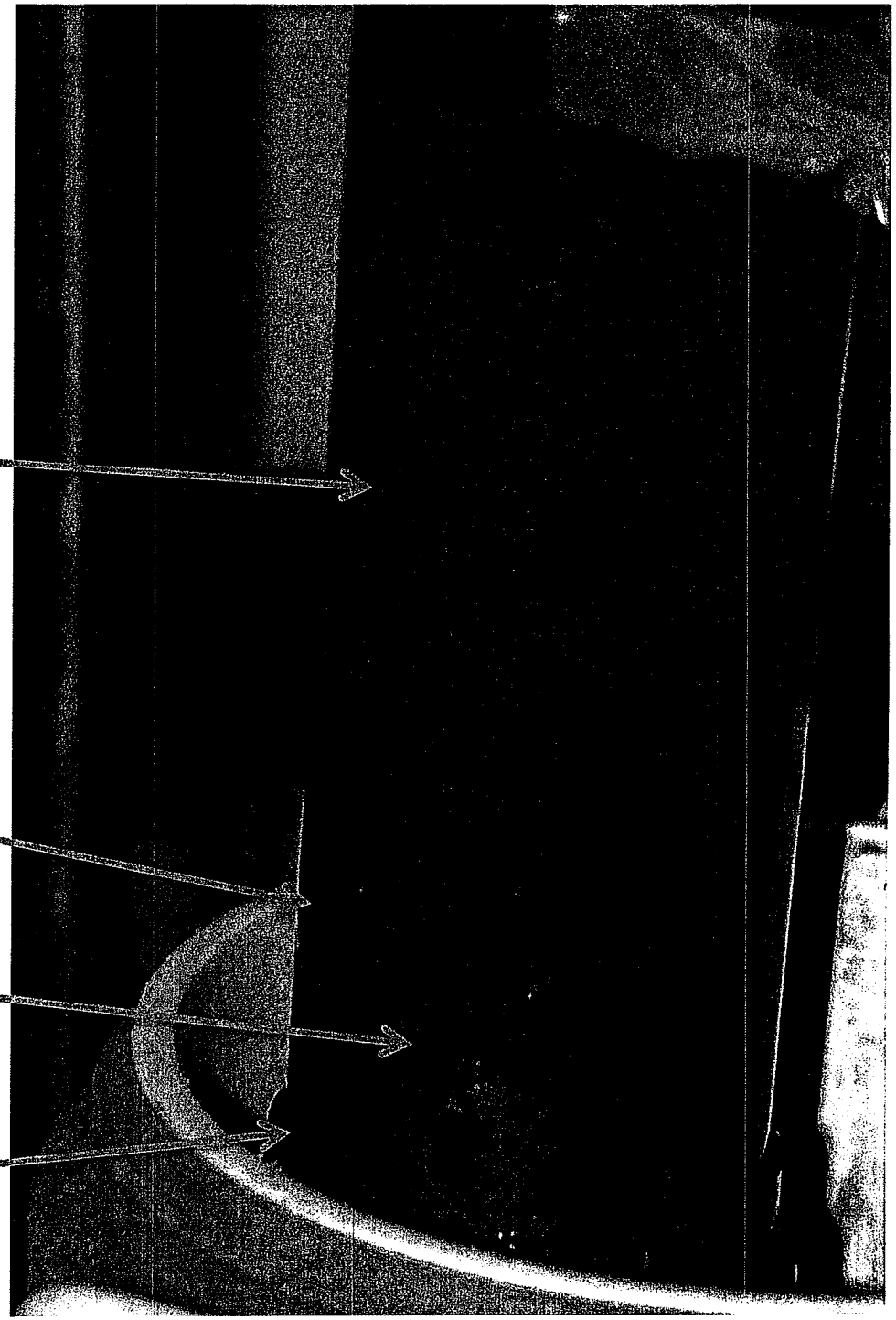


# Overview of the Spill

- **Began April 20, 2010 with the explosion of the Deepwater Horizon drilling platform in the Gulf of Mexico, 11 people perished**
- **Capped on July 15, 2010**
- **Estimates of ~55,000 barrels of crude oil flowed from the well per day, covering 2,500 square miles**
- **>200M gallons of oil spilled – Largest spill in US history**
- **Volume of spill = <1/4 Superdome** (Superdome would hold 750M gal, Gulf of Mexico 500M superdomes of water, or 0.4MMM gals)
- **Current estimates are that 1/3 of the oil reached the surface, 2/ was dispersed at depth**
- **>1.8M gallons of dispersant used at depth and on the surface**
- **Impact possible to: people, environment, economy, and geology**
- **Some impacts will be seen in coming years, most impacts will be short lived**

# Oil ON the seafloor

- Careful coring
- Bubbles
- Oil snow
- Oil
- Old mud



# What we think we know

- The oil appears to be gone from the water
  - Practically none on the surface
- Deep plumes mostly gone
  - Concentrations in the "parts per billion" range
- Oil on the seafloor in significant quantities


what we know we don't know

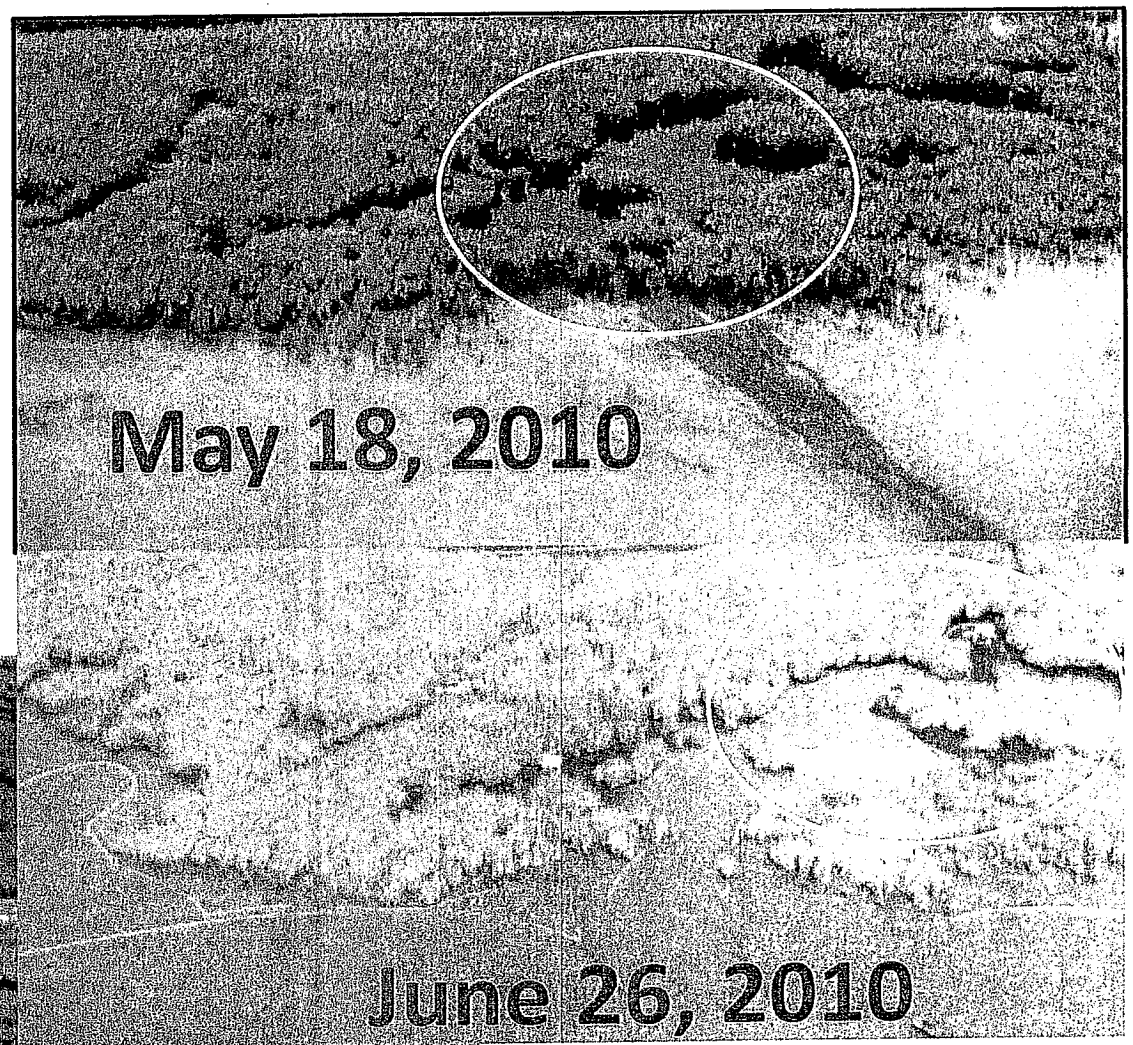
# Pass a Loutre

Original Assessment: HEAVY

Habitat: Marsh, Phagmities

Response Action:

- Skimming
- Sorbents
- Natural Attenuation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# Pass a Loutre

Original Assessment: HEAVY

Habitat: Marsh, Phagmities

Response Action:

- Skimming
- Sorbents
- Natural Attenuation

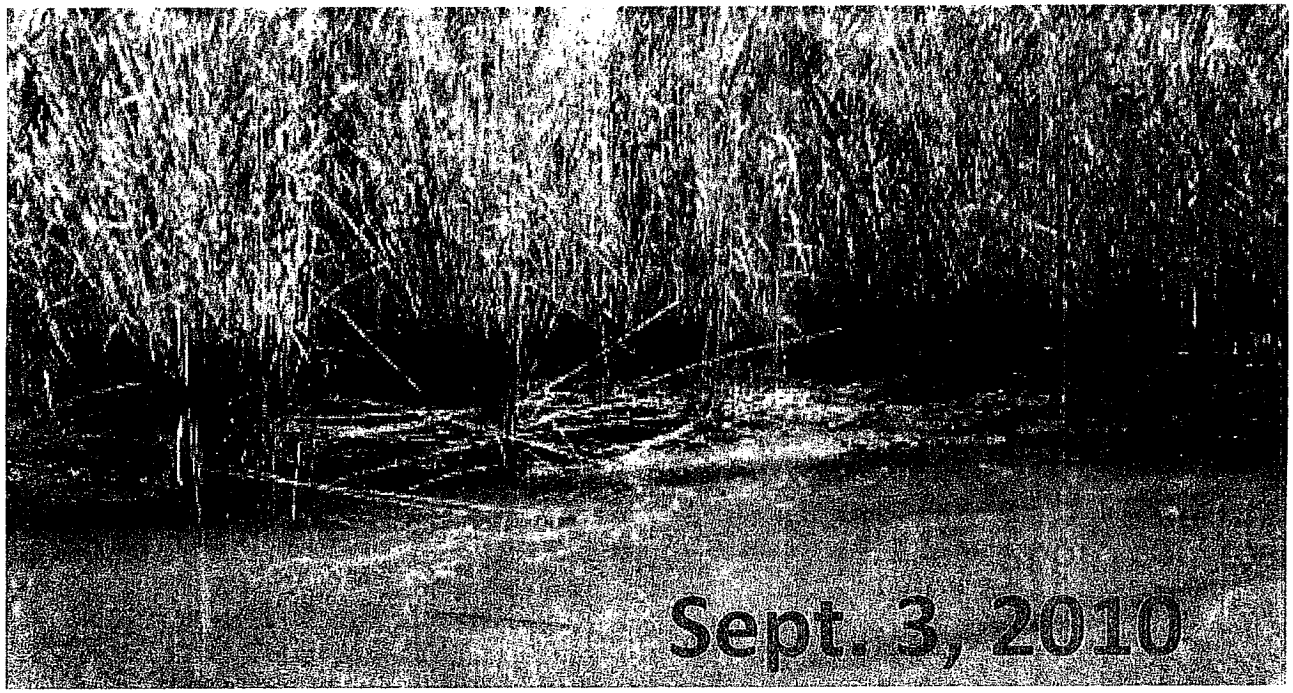
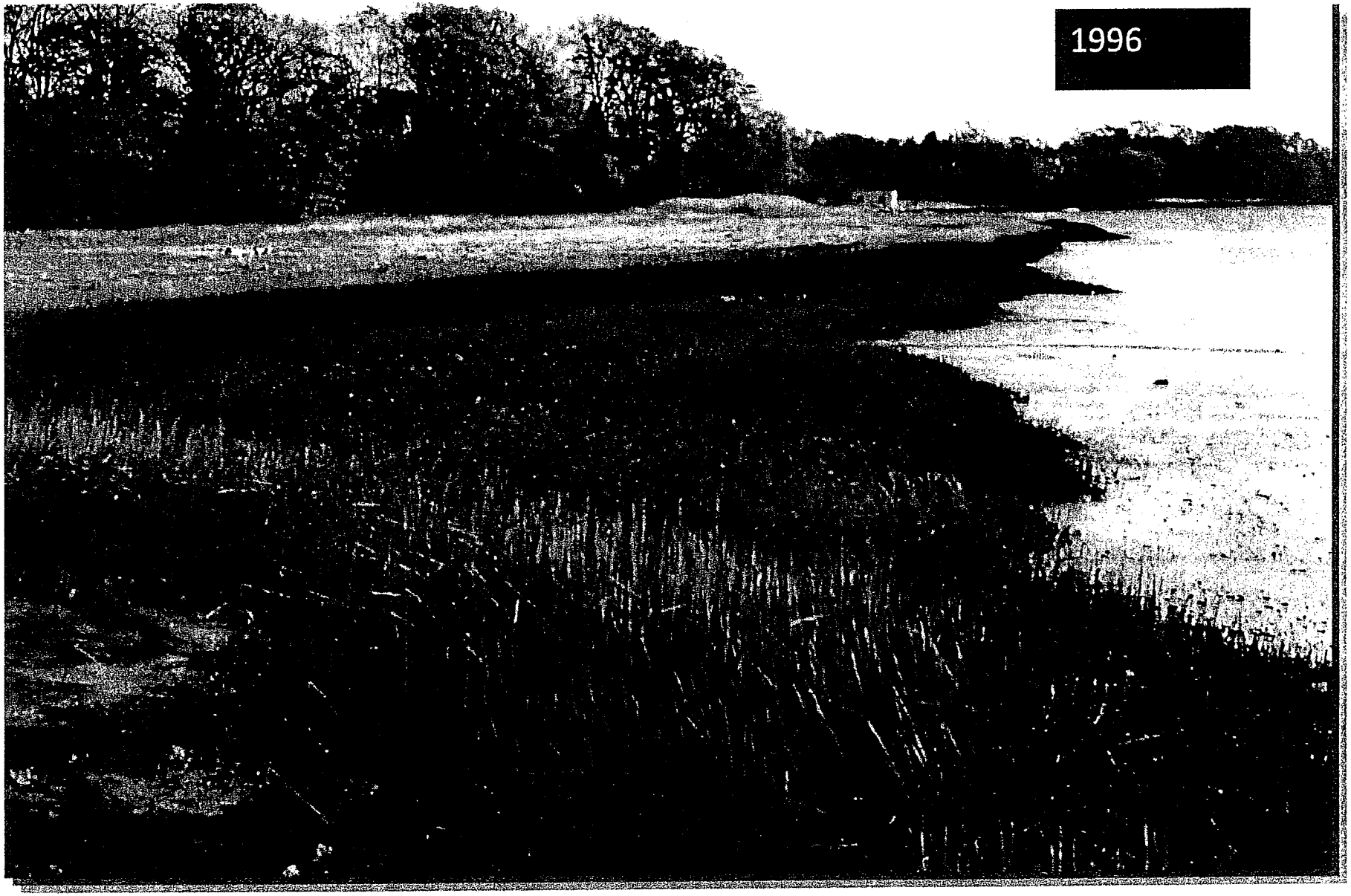
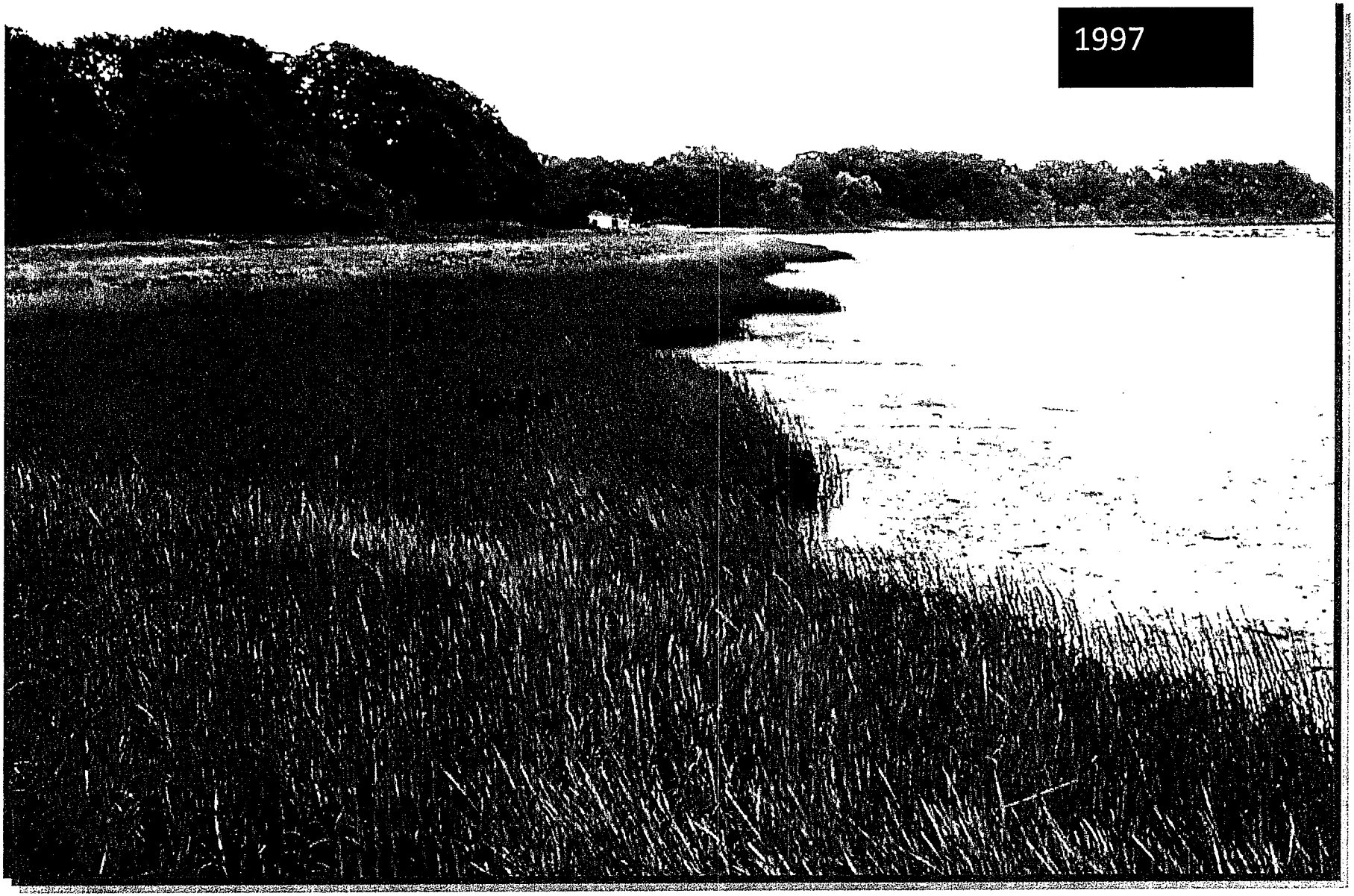
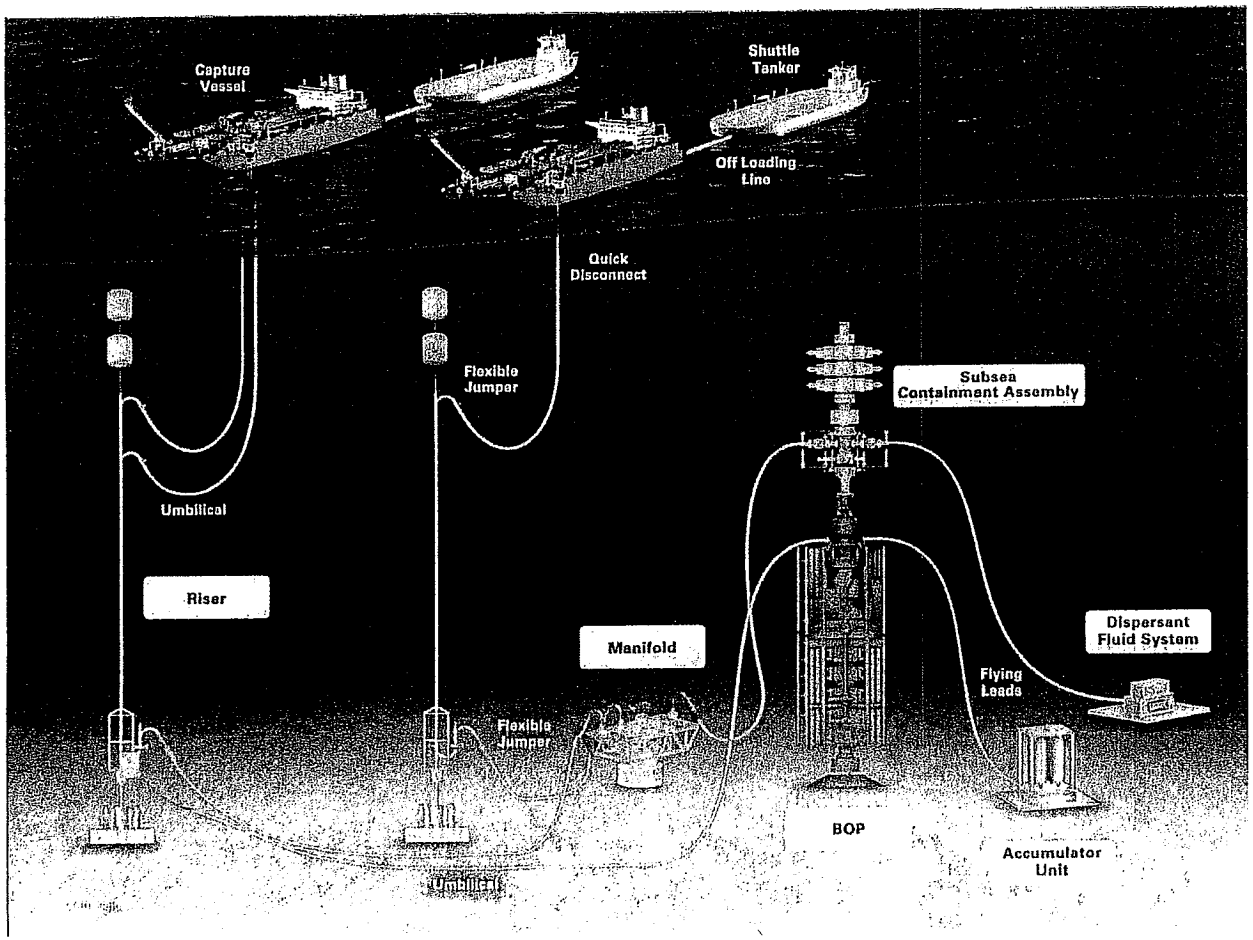



Photo courtesy of Dr. Irv Mendelssohn


1996


1997

# Containment Company

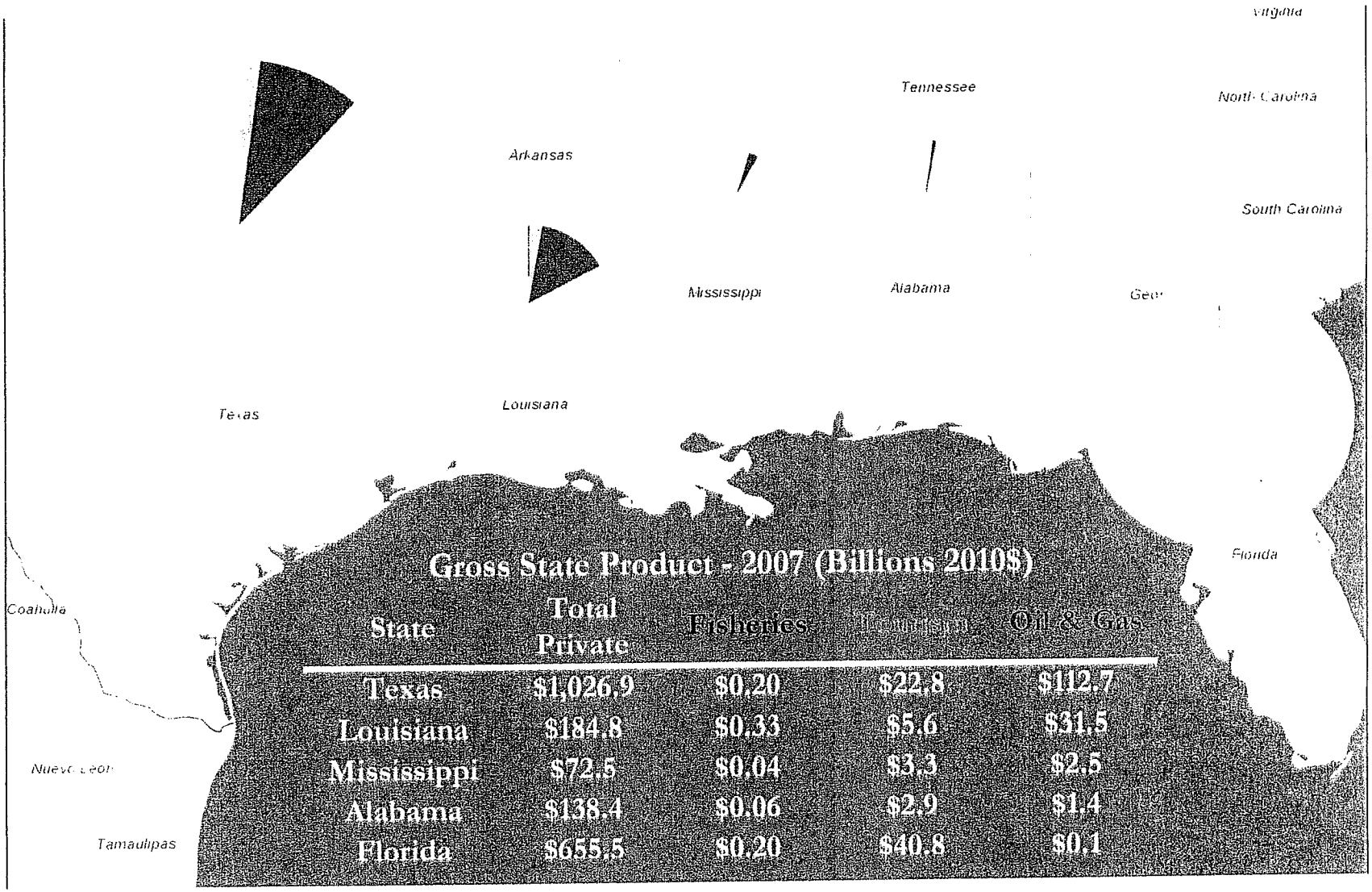



–Provide flexible & adaptable systems
–Contain the well subsea
–Provide subsea production capability
–Subsea equipment, risers, etc.
–Vessels that will safely capture, store and offload the oil

# DOI/BOEMRE's Clear, Consistent Direction

- Improvement needed in three areas before drilling will be allowed:
- Prevention of another blowout
- Demonstrate increased intervention capability
- Demonstrate increased oil spill response capability

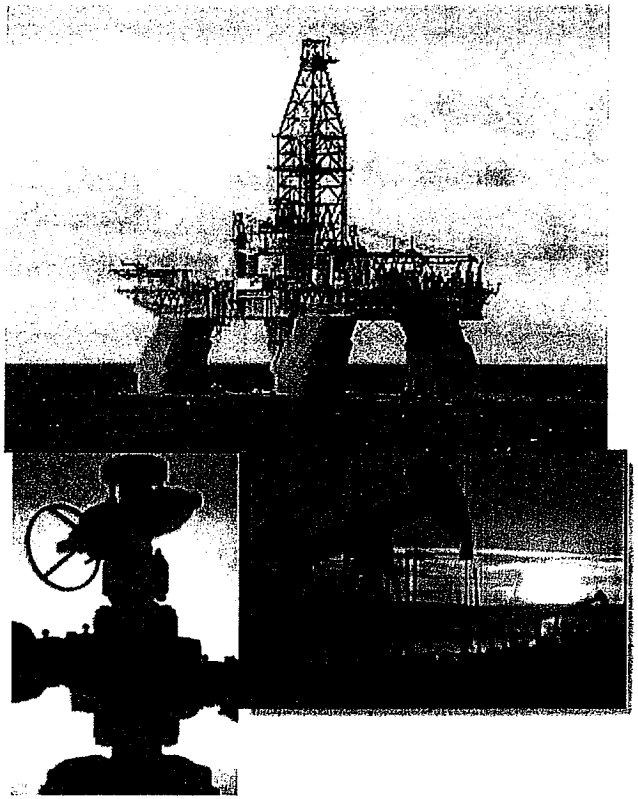
# Size of Impacted Sectors




**Gross State Product - 2007 (Billions 2010$)**

| State | Total Private | Fisheries | Tourism | Oil & Gas |
|---|---|---|---|---|
| Texas | $1,026.9 | $0.20 | $22.8 | $112.7 |
| Louisiana | $184.8 | $0.33 | $5.6 | $31.5 |
| Mississippi | $72.5 | $0.04 | $3.3 | $2.5 |
| Alabama | $138.4 | $0.06 | $2.9 | $1.4 |
| Florida | $655.5 | $0.20 | $40.8 | $0.1 |

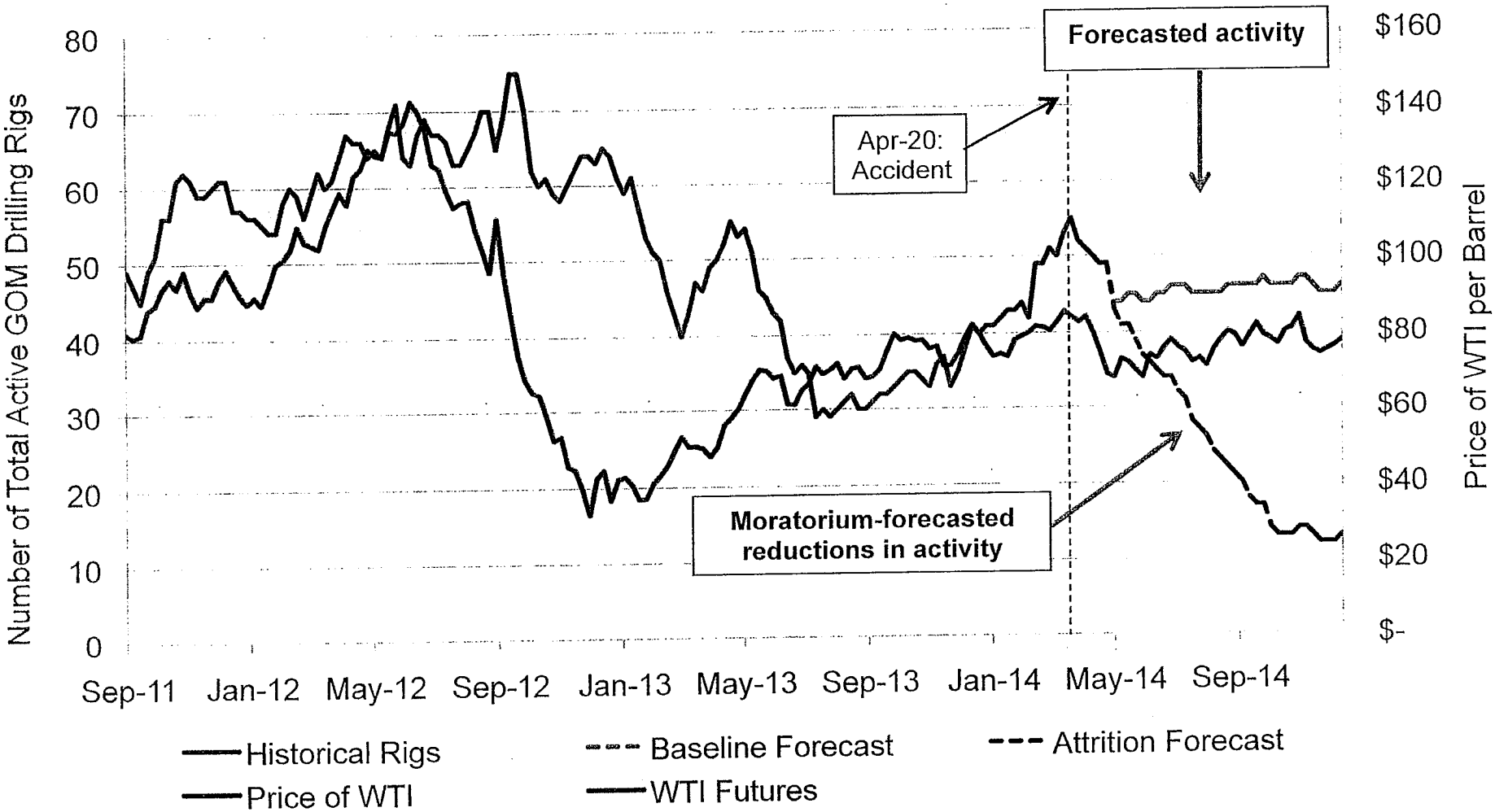
## GOM Offshore Oil and Gas – Economic Overview



- In 2008, over **420 MMBbls** of oil and **2.4 Tcf** of natural gas were produced in the Gulf of Mexico OCS.
- Employs over **200,000 workers** in the Gulf Coast region. Over **100,000 workers** associated with offshore activities.
- Contributes almost **$100 billion** to Gulf Coast states' GDP.
- GOM accounts for **30** percent of total U.S. crude oil production.
- Deepwater areas produced **76** percent of all GOM crude oil production in 2007.

Note: Gulf Coast states include Louisiana, Texas, Mississippi and Alabama
Source: Bureau of Economic Analysis, US Department of Commerce; Energy Information Administration, U.S. Department of Energy; and Baker Hughes.

## Gulf of Mexico Offshore Rig Forecast – Moratorium Impact




Sources: Dept. of Interior, Energy Information Administration, Baker Hughes, CME Group (NYMEX)

# Deepwater is where Oil Is Being Found

Fig. 11-1
Deepwater Areas with Hydrocarbons Potential (shown in the shaded areas)

Since 2006 half of the reserves added are in deep water and 70% of the significant new finds are in deep water

Moreover the size of discoveries is significant ~150 mm bbls for offshore deep water discoveries vs. ~25 mm bbls for onshore discoveries

7-27

# Gulf Coast Oil

- 30% of US total crude oil production
- $60 to $120 million per well drilling cost
- 200 to 300 men per drilling crew
- $1.5 billion in capital infrastructure cost per rig

# Kansas Impact

- Kansas refineries reduced Gulf oil usage after Hurricane Activity
- Before 40,000 barrels per day 4 years ago
- Today around 10,000 barrels per day
- About 350,000 barrels per day for all refineries
- Switched to Canadian oil from Gulf Coast Oil
- Moratorium on Offshore oil will increase costs

7-24

- 5 Rigs have left Gulf for other countries
- 8 Additional Rigs are considering leaving
- Moratorium now modified with new rules
- Factors contributing to disaster
- Improper cement work
- Faulty blowout preventer
- Fewer stability rings on well piping
- Additional study is on going

# Environmental Damage

- No baseline on animals for comparison
- Gulf coast has always had natural tar balls
- Beach tar balls and swimming
- Coral damage found this week in 4500' water
- Oyster damage from fresh water
- Marsh grass damage from booms
- Booms worked open water and bays
- Booms now stored if needed again

**Alternative Fuels Summary** **KDHE, Bureau of Air** **10-5-2010**

Section 211 of the federal Clean Air Act provides for the regulation of gasoline fuels in order to ensure that all areas of the country meet the National Ambient Air Quality Standards (NAAQS). The Act establishes performance standards for gasoline fuels regarding emissions of ozone precursors and toxics, and for oxygenate. Areas that do not meet the NAAQS either must adopt or may, with restrictions, adopt alternate fuels with lower emissions of volatile organic compounds (VOCs) depending upon the severity of the ozone problem. 40 CFR 80.27 specifies the applicability of the fuel provisions to different locations in the United States. There are two ways that alternative fuels to reduce VOC emissions can be implemented:

- Reformulated gasoline (RFG) has lower levels of VOCs, including aromatics, olefins, and benzene, than conventional gasoline. It has a lower Reid vapor pressure (RVP), the common measure of gasoline volatility. Gasoline with a lower RVP evaporates more slowly than conventional gasoline. Federal law requires 2% oxygen by weight in RFG, which is typically accomplished by adding ethanol or methyl tertiary butyl ether. Ozone nonattainment areas classified as severe or extreme are generally required to use RFG. Areas classified as marginal, moderate or serious may opt-in to the RFG program at the request of the Governor. Kansas City was classified as sub-marginal, and therefore was not eligible to use RFG fuels.

- Low-RVP gasoline is a less evaporative form of conventional gasoline also known as a boutique fuel. The federal government at 40 CFR 80.27 requires areas that meet the National Ambient Air Quality Standards (NAAQS) attainment areas, including those in Kansas, to use 9.0 psi RVP gasoline from May 1st to September 15th each year. If an area is designated nonattainment, the federal gasoline requirement drops to 7.8 psi RVP from June 1st through September 15th each year. Other state-specific blends of low-RVP gasoline are 7.2 psi RVP and 7.0 psi RVP.

Kansas took action to reduce the volatility of gasoline in the Kansas City area in the mid 90's by adopting a regulation that lowered the RVP requirement from 9.0 psi RVP to 7.8 psi RVP and then to 7.2 psi RVP. Kansas next attempted to adopt RFG in Kansas City in 1999 in an effort to further reduce emissions. In 2000, the U.S. Court of Appeals for the District of Columbia ruled that EPA exceeded its authority by allowing former nonattainment areas (such as Kansas City) to opt-in to the federal RFG program. The current fuel regulation, K.A.R. 28-19-719, was adopted in 2001, and requires that gasoline sold in Johnson and Wyandotte counties between June 1st and September 15th not exceed 7.0 psi RVP.

The federal Energy Policy Act of 2005 imposes limits on the number of boutique fuels being used nationwide. Existing boutique fuel programs may increase in size or expand to new areas if EPA approves a state's fuel program into the State Implementation Plan (SIP), however new low-RVP fuel blends cannot be introduced.

KDHE met with Wichita environmental officials and fuel suppliers for Sedgwick County several years ago to pursue the voluntary introduction of a low-RVP gasoline in order to take a proactive step towards reducing ozone precursor emissions. The attempt was not successful.

DRAFT

Hon. Lisa Jackson
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460
Mail Code: 1101A

Dear Administrator Jackson:

The Joint Committee on Energy and Environmental Policy of the Kansas Legislature convened on September 9, 2010, and heard testimony on air quality issues. At this meeting, Mr. Karl Brooks, EPA Region 7 Administrator, and Mark Smith, EPA Region 7 Chief of the Air Permitting and Compliance Branch, gave testimony to the Joint Committee on air quality standards, including the burning of the Flint Hills. In addition, the Joint Committee heard testimony from the Kansas Department of Health and Environment (KDHE) on the progress of the Kansas Flint Hills Smoke Management Plan.

After hearing all available testimony, the Joint Committee is writing to express its concern regarding the lack of exemption for the Flint Hills in the EPA's ozone emissions standards.

The Flint Hills is one of the last great preserves of tallgrass prairie in the country. The National Park Service states that while tallgrass prairie once covered 140 million acres of North America; today, less than four percent remains, most of which is located in Kansas' Flint Hills. It is an ecosystem of its very own that is sacred to the people of Kansas and the burning of the prairie each spring is a rite of passage for most. Of the 6,267,000 acres that are considered part of this region, approximately thirty-five percent of the total prairie acres in the Flint Hills are burned on an annual basis. Nearly half of the total acres that constitute the Flint Hills are burned at least once in a four-year period. This burning is required to maintain the integrity of and to preserve the tallgrass prairie for future generations. Burning allows Kansans to control woody plant invasions, improve wildlife habitat, and to increase livestock

gain and improve grazing distribution, which is vital to the cattle industry in our state.

There is scientific consensus for prescribed fire in the Flint Hills. One of the greatest threats to the tallgrass prairie ecosystem is forestation, which results from fire suppression. Burning widely is prescribed by range specialists and ecologists to maintain the ecological integrity of the tallgrass prairie. The Flint Hills require a fire at least once every one to five years to prevent the invasion of trees, but in many cases, burning consecutive years in a row is necessary to prevent the encroachment of woody plant species. The native plants and animals of the Flint Hills depend upon Kansans to maintain the integrity of the ecosystem in which they live and it is the responsibility of the citizens of this state to preserve this great land not only for the good of the environment, but for the people of the United States and future generations.

Burning the tallgrass prairie is unlike forest fires or any other natural phenomenon that we see in nature. Our prairie fires are man-made and man-managed one time per year to ensure that the greatest benefit can be derived from the fire. The timing of the burn is crucial to its success and years of academic study show that late spring burning in the Flint Hills yields the highest forage yield, the highest livestock gain, and the best woody plant control. The percentage of plant cover for the native grasses of the Flint Hills increase by up to half a percent if allowed to burn in late spring as opposed to early spring. By burning the tallgrass prairie in the late spring as opposed to early or mid-spring, the biomass increases from below 2,500 pounds per acre to over 3,000 pounds per acre. The increase in available biomass feeds and nourishes Kansas cattle herds, which experience an increased weight gain of approximately 27 pounds per head when the burning occurs in late spring.

According to testimony presented to the Joint Committee, burning in the Flint Hills has an annual

economic impact of $35-$40 million dollars through increased livestock gain and weed and brush control. In addition, absence of fire from the Flint Hills on a frequent basis will lead to the loss of the tallgrass prairie ecosystem.

The EPA's ozone emissions standards are of great concern to the Joint Committee on Energy and Environmental Policy. Kansas recorded ozone exceedances in 2003, 2009, and 2010, and ozone monitoring data shows definitively that burning the Flint Hills in the late spring was the cause of these exceedances on the days they occurred. Because the burning in the Flint Hills is an annual, extraordinary event that cannot be changed in time or place, and because it clearly increases the amount of ozone emitted in Kansas to level that forces our metropolitan areas into non-compliance, we believe that the burning of the Flint Hills should be exempted from the EPA's ozone emissions standards.

Recent legislative actions support our opinion on this topic. During the 2010 Legislative Session, Kansas Senate Concurrent Resolution 1623 was passed by both the Kansas Senate and Kansas House of Representatives. The resolution urges Congress to require the EPA to exclude air monitoring data from use in determining exceedances and National Ambient Air Quality Standards (NAAQS) violations when the emissions are as a result of prairie burning in the Flint Hills and to treat data as exceptional under 40 CFR Part 50.14.

On April 22, 2010, Representative Jerry Moran introduced United States House Resolution 5118. The resolution would add a new section 330 to the Clean Air Act that would require both the state and EPA Administrator to exclude emissions data from prescribed fires in the Flint Hills region if the emissions cause an NAAQS violation. If the data is excluded, neither the state nor the EPA Administrator could find that a State Implementation Plan (SIP) violation has occurred. The new section would prohibit



9-3

smoke management plans. The new section also would state that fires may not be considered a stationary source. In addition, no Title V permit would be required for burns in the Flint Hills.

When Administrator Brooks testified before the Joint Committee on Energy and Environmental Policy, he stated that one of the key points that should govern all of our work for the people we serve is "managing necessary pasture-burning to serve both ranchowners' needs and their downwind neighbors' health requires some give and take, some factual knowledge, and some recognition that local-level solutions can work even in a legal setting where the goals are established by national law." We quite agree. The Joint Committee on Energy and Environmental Policy believes that the best solutions for air quality issues in Kansas as a result of burning in the Flint Hills can best be managed by the local-level officials that interact and implement burn management solutions every year in the Flint Hills.

The burning of the Flint Hills is a delicate balance between economics, tradition, and environmental interests, but more importantly, it is about the preservation of an ecosystem. While ozone emissions standards should and must be met, they should not be met at the cost of losing our country's last tallgrass prairie. We urge you to consider an exemption of the Flint Hills from the EPA's ozone emissions standards, because by not exempting the Flint Hills, the EPA is forcing farmers and ranchers to alter the burning of prairie land that must be burned, which in turn affects the quality of the grasslands, the beef we produce, and the Kansas economy as a whole.

The EPA is affecting not only Kansans and their livelihoods, but the nation itself, as the last great prairie must be properly burned in order to survive.



9-4

DRAFT

Sincerely,

Senator Carolyn McGinn, Chairperson

CC: Congressman Jerry Moran
Congresswoman Lynn Jenkins
Congressman Dennis Moore
Congressman Todd Tiahrt
Congressman-Elect Mike Pompeo
Congressman-Elect Kevin Yoder
Congressman-Elect Tim Huelskamp
Senator Pat Roberts
Senator Sam Brownback
Karl Brooks, EPA Region 7
John Mitchell, KDHE



9-5

KANSAS
WATER OFFICE

*Mark Parkinson, Governor*
*Tracy Streeter, Director*

www.kwo.org

**M E M O R A N D U M**

**DATE:** November 9, 2010

**TO:** Joint Committee on Energy and Environmental Policy

**FROM:** Tracy Streeter, Director

**SUBJECT:** Follow up Questions

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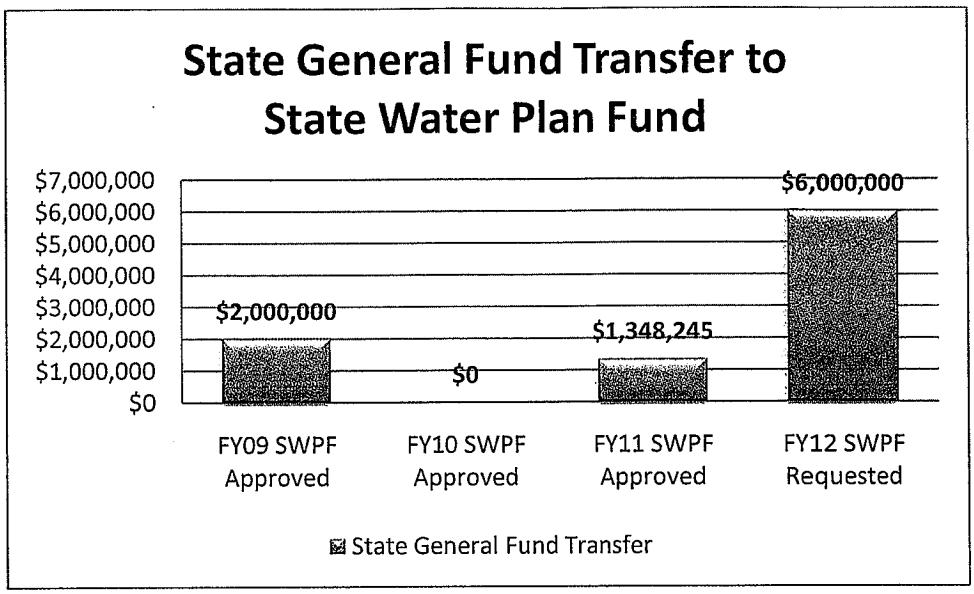
At and following the joint committee's hearing on October 7th and 8th, committee members asked a number of questions on a variety of water related topics. These questions are listed below, with answers and information following.

1. What is the amount of State General Funding that the State Water Plan Fund has received in the last three years?
2. What is the cost of treated drinking water compared to bottled water? How does the cost of treated water differ between rural water districts and municipalities? How does the cost of water in Kansas compare to other states?
3. What are the potential aquifer storage and recovery (ASR) sites in Kansas?
4. How much does the Kansas Water Authority estimate it would need to fully implement the Reservoir Roadmap?
5. Provide information on the bathymetric survey of reservoirs and the quantity of sediment in the reservoirs.
6. Explain the problem with the Hartford levee and its relation to John Redmond.
7. How much sediment is in John Redmond reservoir? How many streambank stabilization projects would have to be implemented to address the sedimentation in John Redmond?
8. What is the cost benefit ratio of dredging?
9. What are the potential new site locations for state reservoirs? Please provide a preliminary look of the site database.
10. Can the state "walk away" from a reservoir? What are the implications?

1. **What is the amount of State General Funding that the State Water Plan Fund has received in the last three years?**

In the past three fiscal years, the State Water Plan Fund (SWPF) has received a total of $3,348,245 in demand transfers from the State General Fund (SGF). The following chart illustrates the annual transfer from SGF to the SWPF. The Kansas Water Authority recommends the full demand transfer of $6,000,000 in FY2012.



2. **What is the cost of treated drinking water compared to bottled water? How does the cost of treated water differ between rural water districts and municipalities? How does the cost of water in Kansas compare to other states?**

**The Cost of a Gallon of Bottled Water vs. Public Water**

| Region | Based on 5000 gal/mo | Based on 10,000 gal/mo |
|---|---|---|
| 1 | $0.011 | $0.008 |
| 8 | $0.023 | $0.020 |

| Cost of Bottled Water | |
|---|---|
| Based on Bottled water from "quick shop" ($1.29/16.9 oz) | $9.77 |
| Based on Bottled water in bulk ($0.25) | $1.89 |

Source: Kansas Municipal Water Use Report (2008) - Average monthly charge for customer water use by region. Region 1 is the westernmost tier of counties; Region 8 is the easternmost tier of counties.

**Comparison between City and RWD Cost of Drinking Water**

| Region | City | RWD |
|---|---|---|
| 1 | 15.80 | 21.00 |
| 2 | 15.88 | 38.50 |
| 3 | 15.65 | 14.75 |
| 4 | 19.53 | 42.75 |
| 5 | 19.24 | 37.00 |
| 6 | 21.88 | 38.14 |
| 7 | 26.80 | 39.08 |
| 8 | 31.70 | 36.20 |
| State Avg | 25.02 | 37.12 |

Source: Kansas Municipal Water Use Report (2008) - Region 1 is the westernmost tier of counties; Region 8 is the easternmost tier of counties.

A survey of 2008 water rates conducted by the Kansas Department of Health and Environment shows a statewide average cost for rural water districts for 5000 gallons is $37.12; for cities, the same quantity is $25.02.

**Comparison with Other States**

Oklahoma

Tulsa – 389,625, $17.15

Norman – 109,063, $14.00

Stillwater- 46,157 – 31.32

Ardmore – 24,850, SC; $23.52

Missouri

Belton - 24,591, $36.87/month

Carthage - 13,916, $20.36

Columbia - 100,800, $23.25

### 3. What are the potential aquifer storage and recovery (ASR) sites in Kansas?

Aquifer Storage & Recovery (ASR) is the purposeful recharge and temporary storage of water in an aquifer with the intent to recover all or a portion of the water from the same aquifer in the future. Artificial recharge provides a tool to maintain or increase reliable water supplies. An ASR project can meet the need for temporary detention and storage of water during times of abundance and recovery of that water in times of scarcity and as such can be an important component of sustainable water management. Wichita has developed the first ASR project in Kansas.

BASIC ASR Requirements:

- Streamflow, reservoir, treated wastewater or other water source availability
- Storage Area (space in formation, ideally above the water table; transmissivity)
- Means to transmit the source water to and recharge into the aquifer
- Means to recover the stored water.

**ASR POTENTIAL IN KANSAS**

Alluvial aquifers, including terrace deposits and paleochannels (ancient, currently inactive river channel systems, some of which are buried) are often the best types of aquifers in Kansas for ASR. These aquifers commonly can transmit water rapidly and usually underlie or are adjacent to rivers or streams. Many parts of the High Plains aquifer, including the Ogallala aquifer portion, are also suitable for ASR if a water source is available. Other aquifers in Kansas have limitations, such as lower transmissivity (Dakota aquifer) or substantial depth requiring more expensive injection wells (Ozark aquifer). Saline or mineralized water in some aquifers is a limitation to ASR suitability in some locations.

Potential ASR projects have been considered by local groups in a few specific areas (See map):

- Upper Arkansas River Basin: Alluvial aquifer in Kearny and Finney Counties and along the Bear Creek Fault. Aquifer recharge is an acceptable beneficial use under the Arkansas River compact. A few other areas were also identified as possible recharge sites for the Ogallala aquifer.

- Upper Republican River Basin: Possible recharge sites along the South Fork, Republican River, for alluvial aquifer recharge. Also potential passive recharge with impoundment in Sherman or Cheyenne County. Source would be water the area is to receive under Republican River compact.

- Prairie Dog Creek: Alluvial aquifer downstream of Keith Sebelius Reservoir could be a useful ASR site to capture flows when stream is high, and make releases to stream when additional flow is needed to meet interstate compact target flows.

- Lower Republican River Basin: NW Republic County where a buried paleochannel provides storage. Another consideration is the alluvial aquifer of Republican River, above the MDS gages in Concordia and Clay Center.

- City of Hays: Discussed groundwater recharge along Big Creek in a 2005 effluent study and a 2006 wastewater treatment study. The City has a well field in the area but is limited in its use due to downstream water users.

- City of Abilene: Interest in enhancing recharge to the Sand Springs and alluvial aquifers along the Smoky Hill River to improve water availability to their city well field.

- City of McPherson: Water Supply Augmentation Investigation, 2005, reviewed opportunities and costs to recharge the McPherson Intensive Groundwater Control Area (IGUCA). The report states that to maintain sustainable yield to support growth action is needed to recharge the aquifer. Six sources of water were investigated.

The map overlays streams in Kansas on the major aquifers. The width of the stream is related to its average flow; the higher the flow, the wider the stream. It is based on stream gages' period of record through 2005. Stream gage



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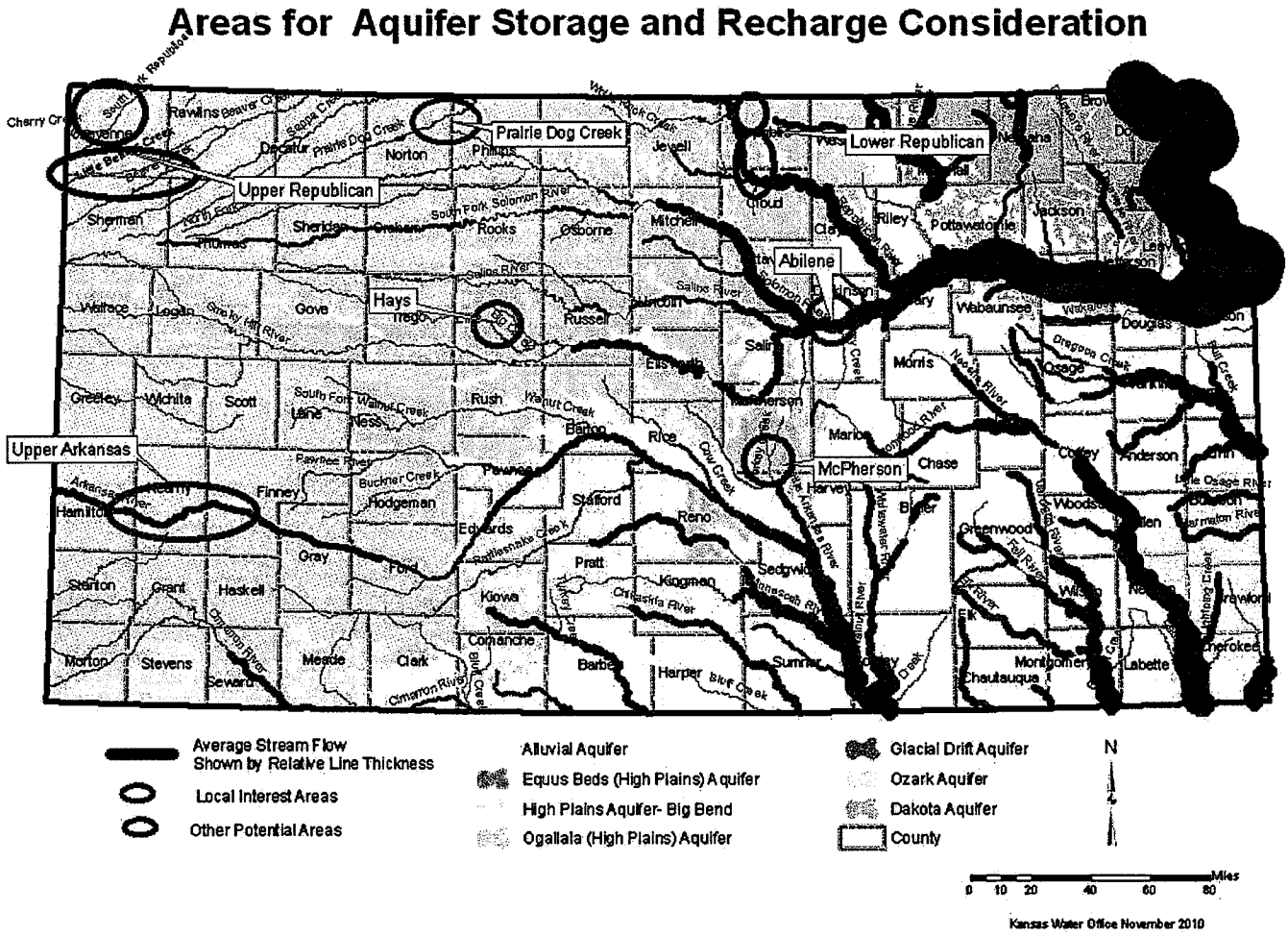
data, such as on the Arkansas River, can go back 100 years, and as such, some river segments may indicate a higher average flow than has occurred in the last several decades (such as along the upper Arkansas River in Gray County). However, the map provides a good visual of where high stream flows can occur and what aquifers are proximal. Reservoirs could also capture high flows and potentially release excess water to a recharge site.




STATE AND FEDERAL LAWS

Kansas Water Appropriation Act K.A.R. 5-12-1 thru 4 addresses the permit to appropriate water for artificial recharge, and the additional permit to recover that water this includes ASR accounting. KDHE has requirements (UIC) in article K.A.R.28-46. The Safe Drinking Water Act Section 1421(d)(2) and Underground Injection Control (UIC) regulations 40 CFR 144.12 provide the legal framework, minimum standard that must be meet with injection of recharge to an aquifer. ASR wells are part of Class V injection wells. In 2007, 16 states had regulations for ASR. Kansas has joined that list since.

4. **How much does the Kansas Water Authority estimate it would need to fully implement the Reservoir Roadmap?**

About $3.9 billion is needed in the next 40 years to secure, protect and restore Kansas reservoirs. Volume II of the Reservoir Roadmap contains estimated financial resources needed to secure all available storage in federal reservoirs; protect state and municipal owned storage from losses due to sedimentation and poor water quality impacts; and restore adequate storage to meet anticipated needs. Key budget needs are organized in this chapter by their ability to Secure, Protect, and Restore Kansas water resources. Volume II can be viewed in its entirety at:

http://www.kwo.org/ReservoirRoadmap/Rpt_Reservoir_Roadmap_Volume_II.pdf

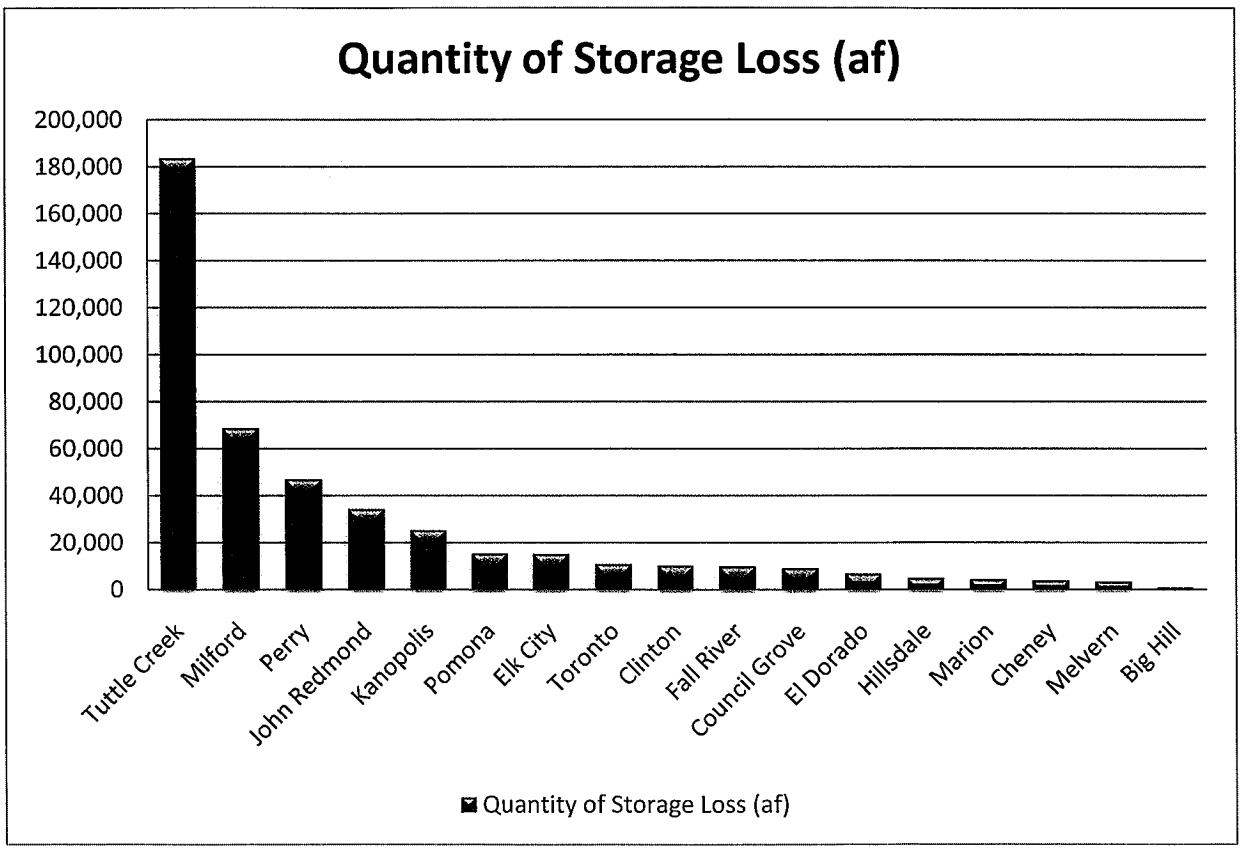
The following table detailing the budget needs for the next 10, 20 and 40 years to fully implement the Reservoir Roadmap.

| Reservoir Roadmap | 10 Yr Total | 20 Yr Total | 40 Yr Total |
|---|---|---|---|
| | | | |
| **SECURE** | | | |
| Reservoir Debt Service & Storage Purchase (P & I) | $16,000,000 | $107,000,000 | $108,000,000 |
| Reservoir Operation and Maintenance | $21,000,000 | $67,000,000 | $447,000,000 |
| Unfunded Liability | $0 | $19,000,000 | $68,000,000 |
| Purchase of Additional Federal Storage | $13,000,000 | $35,000,000 | $119,000,000 |
| Development of New Large Reservoir | $0 | $300,000,000 | $1,293,000,000 |
| Development of New Small Reservoirs | $7,000,000 | $26,000,000 | $97,000,000 |
| Minimum Pool Agreement | $400,000 | $2,000,000 | $5,000,000 |
| Planning and Design | $3,000,000 | $7,000,000 | $12,000,000 |
| **Total Secure** | **$60,400,000** | **$563,000,000** | **$2,149,000,000** |
| | | | |
| **PROTECT** | | | |
| Implementation of Best Management Practices | $19,000,000 | $57,000,000 | $189,000,000 |
| Riparian and Wetland Protection and Development | $13,000,000 | $33,000,000 | $121,000,000 |
| Riparian and Wetland Easements | $16,000,000 | $57,000,000 | $57,000,000 |
| Streambank Stabilization | $32,000,000 | $115,000,000 | $115,000,000 |
| Planning and Design | $36,000,000 | $41,000,000 | $51,000,000 |
| **Total Protect** | **$116,000,000** | **$303,000,000** | **$533,000,000** |
| | | | |
| **RESTORE** | | | |
| Sediment Removal Small Reservoirs | $87,000,000 | $163,000,000 | $163,000,000 |
| Sediment Removal Large Reservoirs | $180,000,000 | $995,000,000 | $995,000,000 |
| Dam Safety/ Rehabilitation | $35,000,000 | $44,000,000 | $84,000,000 |
| Planning and Design | $5,000,000 | $6,000,000 | $6,000,000 |
| **Total Restore** | **$307,000,000** | **$1,208,000,000** | **$1,248,000,000** |
| | | | |
| **Total Reservoir Sustainability** | **$483,400,000** | **$2,074,000,000** | **$3,930,000,000** |

5. **Provide information on the bathymetric survey of reservoirs and the quantity of sediment in the reservoirs.**

Recognizing the critical need for information on reservoir sedimentation and conditions, the Kansas Water Office has been contracting with the Kansas Biological Survey (KBS) since 2007 to complete bathymetric surveys of the state's highest priority lakes. Bathymetric surveys acquire acoustic echosounding data to map the surface of a reservoir floor and estimate sediment thickness. To date, 36 federal and non-federal reservoirs have been surveyed in Kansas using this technology. Information from these surveys is used to estimate the loss in water storage capacity and the rate of sedimentation. For the reservoirs providing water supply, the quantity of storage lost to sedimentation is shown in the chart below. The Kansas Water Office has assigned a priority ranking of reservoirs with John Redmond Reservoir remaining the state's highest priority for improving the water supply condition (listed in the table below). The ranking takes into consideration the capacity lost to sedimentation and potential future commitments of water supply yield from each reservoir. Below the priority table, a list of the municipalities and industries that rely on the storage provided by these reservoirs is provided.

Completed bathymetric survey reports are available on-line at:
http://www.kwo.org/Kansas%20Water%20Plan/Bathymetry.htm



| Reservoir | Original Capacity (af) | Current Capacity (af) | % Lost | Current Water Supply Yield (mgd) | Current Total Committed (mgd) | Potential Total Committed (mgd) | Potential Committed / Water Supply Yield |
|---|---|---|---|---|---|---|---|
| Kanopolis | 73,200 | 47,968 | 34% | 8.4 | 1.0 | 22.9 | 272% |
| John Redmond | 82,230 | 48,010 | 42% | 28.2 | 25.2 | 25.2 | 89% |
| Tuttle Creek | 425,312 | 241,747 | 43% | 186 | 154 | 154 | 83% |
| Clinton | 129,171 | 119,106 | 8% | 18.6 | 15.9 | 18.0 | 97% |
| El Dorado | 163,942 | 157,315 | 4% | 22.2 | 11.0 | 22.2 | 100% |
| Fall River | 30,401 | 20,643 | 32% | 6.0 | 4.3 | 4.3 | 71% |
| Cheney | 167,070 | 163,390 | 2% | 43.7 | 47.0 | 43.7 | 100% |
| Hillsdale | 82,207 | 77,499 | 6% | 15.9 | 6.2 | 14.8 | 93% |
| Pomona | 70,603 | 55,340 | 22% | 8.3 | 2.8 | 5.8 | 70% |
| Toronto | 27,320 | 16,507 | 40% | 8.0 | 3.2 | 3.2 | 40% |
| Council Grove | 52,375 | 43,394 | 17% | 8.7 | 4.7 | 5.1 | 58% |
| Milford | 415,403 | 346,785 | 17% | 113 | 40.7 | 63.5 | 56% |
| Melvern | 154,370 | 151,171 | 2% | 7.6 | 3.1 | 5.1 | 67% |
| Elk City | 52,556 | 37,422 | 29% | 15.1 | 2.5 | 3.3 | 22% |
| Perry | 243,220 | 196,394 | 19% | 71.9 | 12.0 | 19.2 | 27% |
| Marion | 84,948 | 80,742 | 5% | 5.4 | 1.7 | 1.7 | 31% |
| Big Hill | 27,216 | 26,586 | 2% | 8.4 | 1.1 | 1.2 | 15% |

The following municipalities and industries rely on the storage provided by these reservoirs. These entities would be impacted by loss of storage in these reservoirs.

**Big Hill**
- PWWSD#4

**Clinton**
- Lawrence
- Baldwin
- Douglas County RWDs 1, 2, 3, 4, 5 and 6
- Osage RWD #5
- Shawnee RWD #8

**Council Grove**
- Emporia
- Council Grove

**Elk City**
- Coffeyville
- Coffeyville Resources

**Hillsdale**
- Johnson County RWD 7
- Miami County RWDs 1, 2, and 3
- Spring Hill
- Gardner
- Franklin County RWD 1
- Edgerton

**John Redmond**
- KG&E (Wolf Creek Nuclear Power Plant)

**Kanopolis**
- Post Rock Water District

**Marion**
- Hillsboro
- Marion
- Peabody
- Jost Farms (Annual Surplus Water contracts)

**Melvern**
- Burlingame
- Harveyville
- Osage City
- PWWSD #12

**Milford**
- Westar (Jeffrey Energy Center)

**Pomona**
- Osage County RWD 3

**Kansas River Water Assurance District No. 1 (Milford, Perry, Tuttle)**
- Junction City
- Manhattan
- Westar (Jeffrey Energy Center)
- Topeka
- Hills Pet Nutrition
- Westar (Tecumseh Energy Center)
- Innovia Films
- Westar (Lecompton Energy Center)
- Lawrence
- DeSoto
- Bonner Springs
- Olathe
- WaterOne
- Kansas City BPU

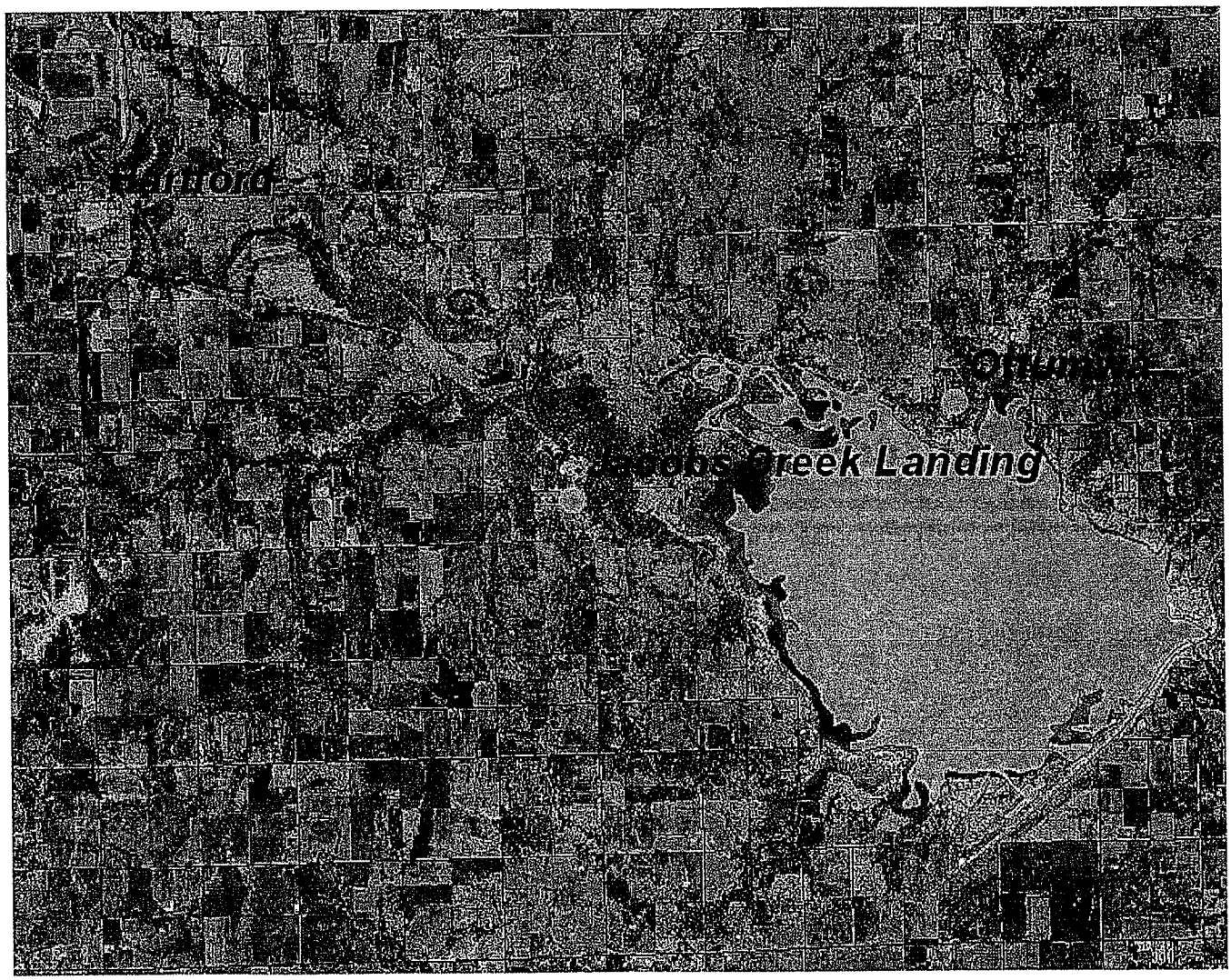
**Cottonwood & Neosho Water Assurance District No. 3 (Council Grove, Marion, John Redmond)**
- Emporia
- Parsons
- Erie
- Council Grove
- PWWSD #5
- Westar (Neosho Energy Center)
- Chanute
- Burlington
- Iola
- Humboldt
- Oswego
- Woodson County RWD 1
- Cottonwood Falls
- Crawford County RWD 6
- Monarch Cement Company
- Kansas Army Ammunition Plant – Parsons
- Ash Grove Cement Company
- Chetopa
- St. Paul

**Marais des Cygnes Water Assurance District No. 2 (Pomona and Melvern)**
- Paola
- Melvern
- Ottawa
- Franklin County RWD 6
- Osawatomie
- LaCygne
- Kansas City Power & Light Company
- Marais des Cygnes Public Utility Authority

**6. Explain the problem with the Hartford levee and its relation to John Redmond.**

The Kansas Water Office continues to be frustrated by the repeated delays in progress towards achieving reallocation of storage at John Redmond Reservoir, a process that was initiated 14 years ago. Without the reallocation, the citizens of the Neosho basin would not have sufficient water supply if we were to encounter a significant drought as early as 2012. A reallocation of storage could extend the available storage for these citizens another 20-30 years.

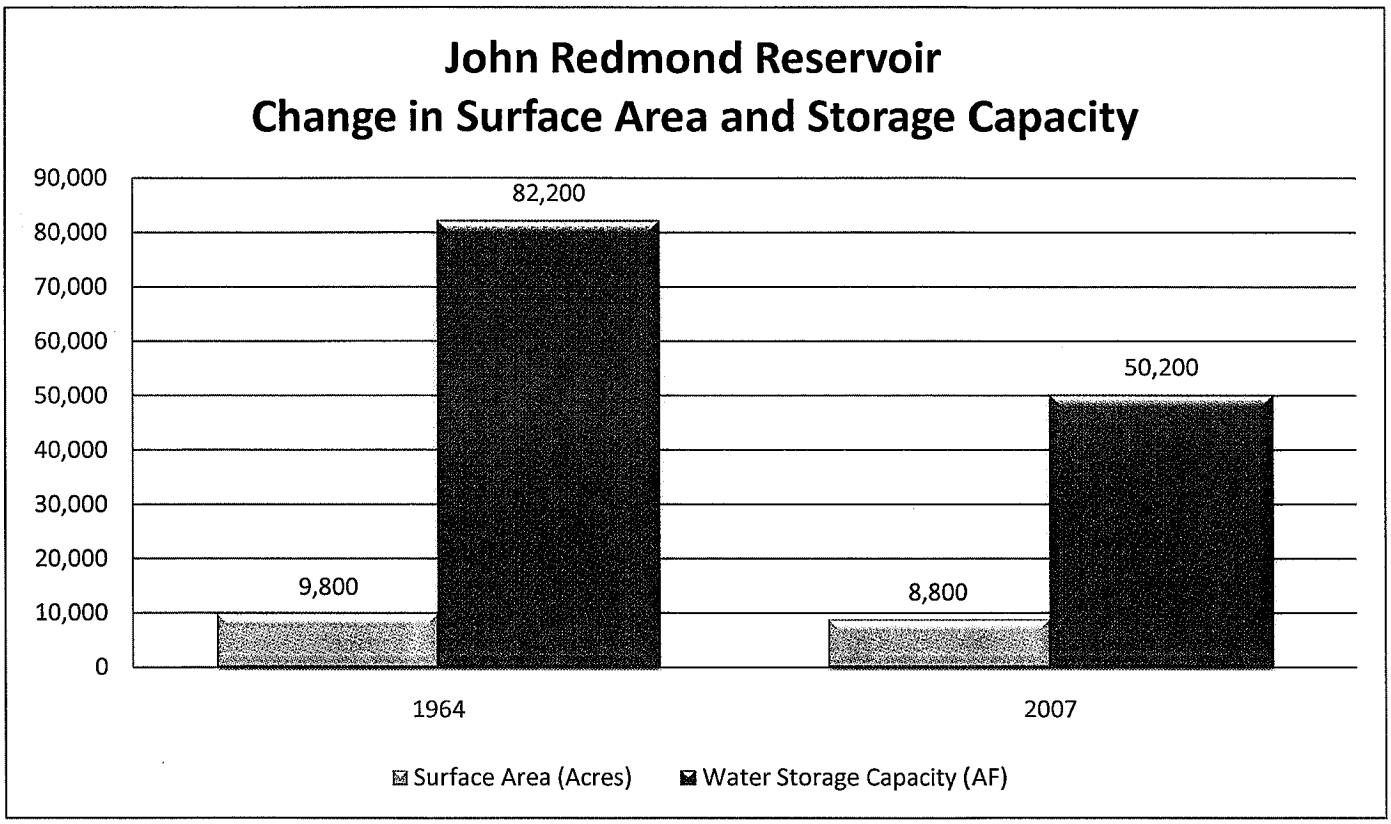
The map below illustrates the location of the town of Hartford to John Redmond Reservoir. During high water events, backwater from John Redmond extends upstream to Hartford. The Hartford levee protects the town from flooding during these events. According to a Corps Engineer Circular (EC 1165-2-210), a reallocation that would require raising the conservation pool is not permitted while a project is classified as Unsafe, Potentially Unsafe, or Conditionally Unsafe. The Hartford levee is classified as Potentially Unsafe due to seepage and inadequate freeboard concerns.



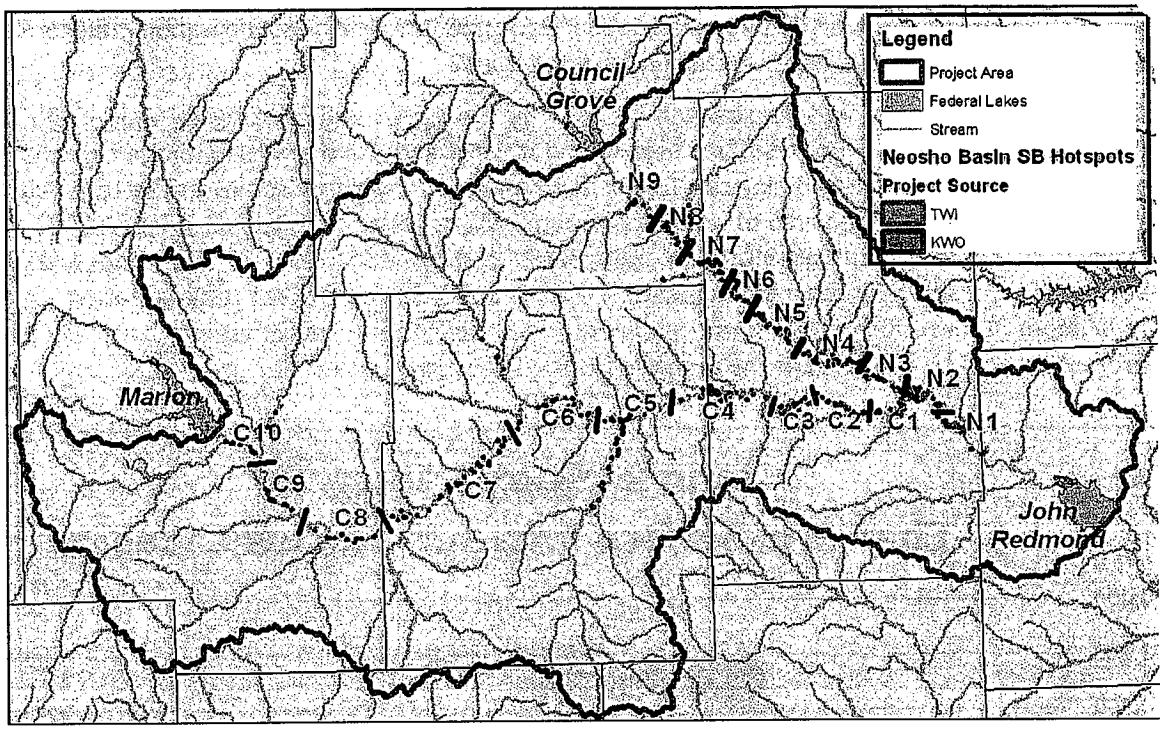

10-10

7. **How much sediment is in John Redmond reservoir? How many streambank stabilization projects would have to be implemented to address the sedimentation in John Redmond?**

John Redmond Reservoir was constructed in 1964 by the Corps with an original design life of 50 years. At construction, the reservoir had a surface area of about 9,800 acres and a water storage capacity of 82,200 acre-feet (AF). In 2007, the Kansas Biological Survey completed a bathymetric survey of the reservoir and concluded that the surface area had reduced to about 8,800 acres with a water storage capacity of 50,200 AF. Decreases in surface area and volume are attributed to sedimentation. Since 1964, John Redmond has lost an estimated 42 percent of its conservation-pool storage capacity as of 2010. The estimated sedimentation rate of 739 AF per year is about 80 percent more than the sedimentation rate (404 AF/year) that was originally projected for the conservation pool by the Corps at the time the reservoir was completed.




There is growing evidence that a significant source of sediment in streams in many areas of the country is generated from stream channels and edge of field gullies. Streambank erosion can also contribute nutrients, such as phosphorus, which can cause water quality impairments. The Kansas Water Office has identified stream reaches recommended for stabilization projects (see map and table below).




| Reach | Number of Sites | Estimated Bank Length (Feet) | Estimated Stabilization Cost (Includes Engineering, Design, and Construction Oversight) | Estimated Sediment Reduction (Tons/Year) | Estimated Water Storage Secured (AF) |
|---|---|---|---|---|---|
| **N1** | 11 | 11,256 | $1,198,261 | 33,761.80 | 31 |
| **N2** | 23 | 18,913 | $2,058,554 | 55,812.33 | 51 |
| **N3** | 25 | 6,861 | $913,326 | 12,841.07 | 12 |
| **N4** | 27 | 10,655 | $1,300,172 | 16,017.52 | 15 |
| **N5** | 20 | 10,152 | $1,181,541 | 16,911.52 | 16 |
| **N6** | 16 | 5,936 | $733,894 | 11,230.93 | 10 |
| **N7** | 22 | 9,056 | $1,095,544 | 13,009.56 | 12 |
| **N8** | 17 | 4,480 | $603,167 | 4,998.49 | 5 |
| **N9** | 10 | 2,699 | $360,911 | 2,712.46 | 2 |
| **C1** | 18 | 6,201 | $779,508 | 22,559.60 | 21 |
| **C2** | 16 | 7,986 | $932,083 | 27,180.67 | 25 |
| **C3** | 22 | 7,807 | $974,800 | 11,830.05 | 11 |
| **C4** | 27 | 12,141 | $1,443,763 | 22,389.44 | 21 |
| **C5** | 36 | 14,656 | $1,776,957 | 14,297.67 | 13 |
| **C6** | 19 | 5,087 | $681,793 | 6,552.04 | 6 |
| **C7** | 32 | 11,088 | $1,392,030 | 15,004.21 | 14 |
| **C8** | 14 | 5,453 | $667,211 | 8,757.76 | 8 |
| **C9** | 11 | 4,565 | $551,384 | 9,852.17 | 9 |
| **C10** | 9 | 2,898 | $370,197 | 4,398.33 | 4 |
| ***Neosho*** | 171 | 80,008 | $9,445,369 | 167,296 | 154 |
| ***Cottonwood*** | 204 | 77,882 | $9,569,726 | 142,822 | 132 |
| **Total** | 375 | 157,890 | $19,015,096 | 310,118 | 286 |

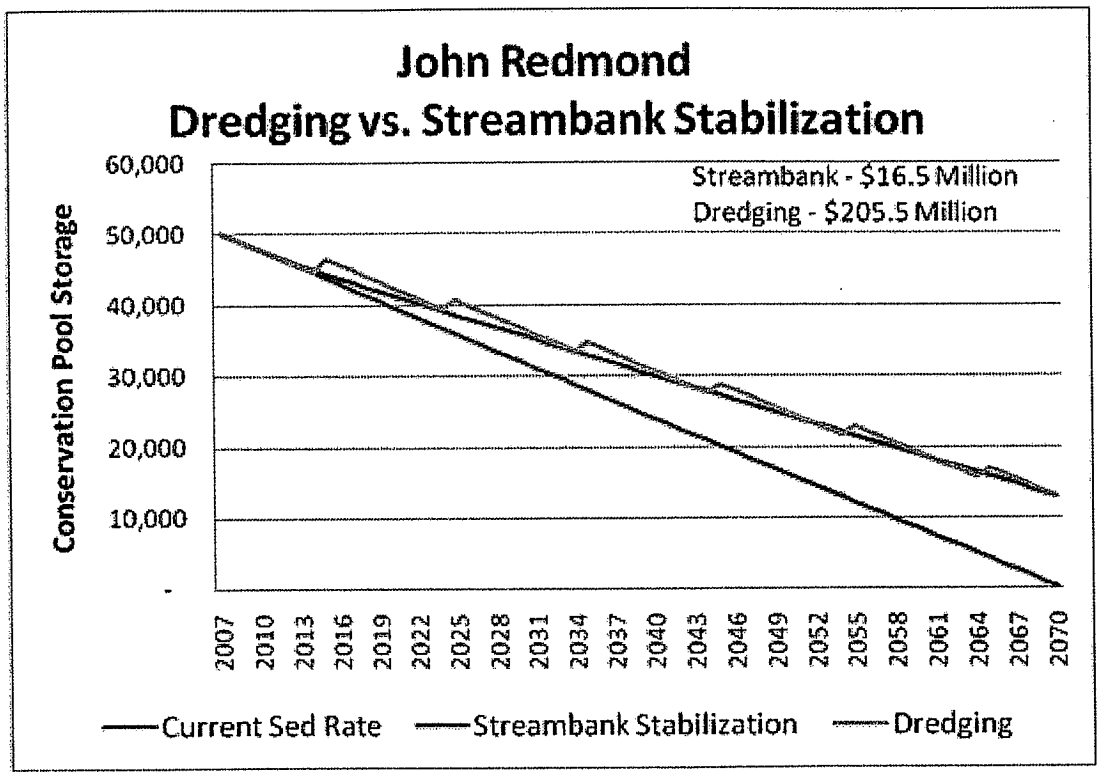
In an effort to establish priority for implementation of these projects, the following approach is recommended for the next five years.

| Year | Reaches | Estimated Cost | Estimated Sediment Reduction (Tons/Year) | Estimated Water Storage Secured (AF) |
|---|---|---|---|---|
| 2011 | C1 and Complete N2 | $1,780,022 | 50,417 | 46 |
| 2012 | Complete N3 and C2 | $1,812,153 | 38,907 | 36 |
| 2013 | C3 and Complete C4 | $2,227,240 | 29,811 | 27 |
| 2014 | C5 and N4 | $3,077,129 | 30,315 | 28 |
| 2015 | C6 and C7 | $2,073,823 | 21,556 | 20 |

The total five-year cost to implement the recommended streambank stabilization projects above John Redmond is $10,970,367. If implemented, the annual contribution of sediment to John Redmond could be reduced by 171,005 tons per year, securing 157 AF of storage each year – a 21% reduction in the annual sedimentation rate. After the five years, if we continued to implement streambank stabilization on the identified hot spots until all were addressed, the total cost would be $19,015,096 and the percent reduction in annual sedimentation rate to John Redmond would increase to 43%.

**8. What is the cost benefit ratio of dredging?**

The following chart compares the cost effectiveness of stabilizing each of the identified streambanks above John Redmond versus dredging to achieve the same amount of reservoir storage. Implementing streambank stabilization preserves a similar quantity of conservation pool storage at John Redmond Reservoir, but for significantly less cost. The blue line shows John Redmond reservoir storage with the current sedimentation rate through the year 2017. The red line shows the projected storage if all of the identified streambank erosion sites were stabilized over an eight year period starting 2011 and ending in 2018. Finally, the green line shows the storage if no additional streambank sites are stabilized and dredging is used to ensure the same amount of storage. Under the dredging option, 2,727 acre-feet would be dredged in 2015, and 2,000 acre-feet in each 10 years thereafter. The overall cost for implementing the remaining streambank projects is $16.5 million and dredging would result in a total cost of $205.5 million. These costs are not adjusted for interest or inflation.

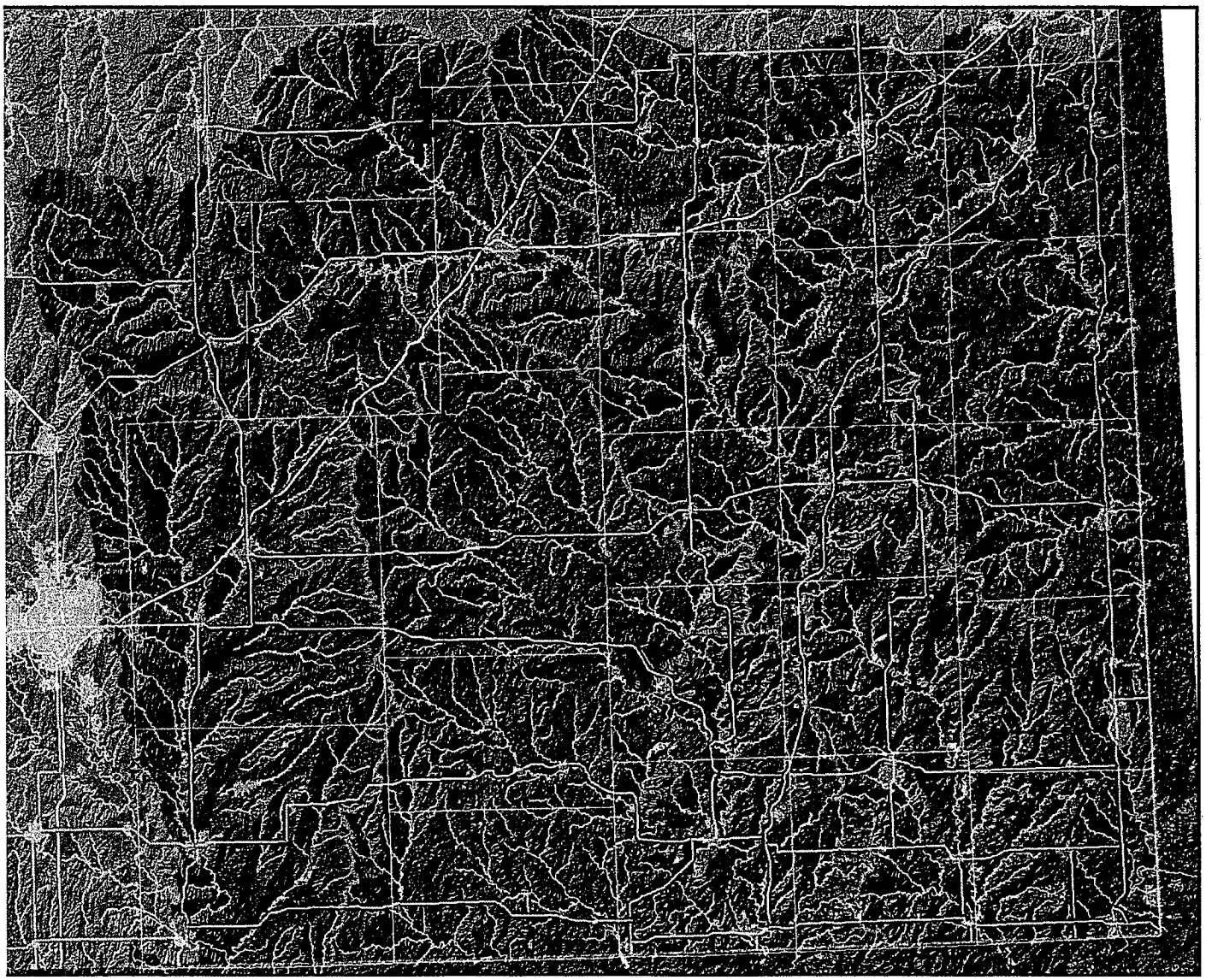



The current economic impact of a reservoir is an important variable when evaluating the benefit of implementing restoration and protection activities to reduce sedimentation. Recreational visitation and spending at John Redmond Reservoir and the surrounding communities provides about $19 million annually and supports 109 jobs. Wolf Creek Nuclear Power Plant, who relies on the water supply from John Redmond Reservoir to maintain their cooling water supply lake, supports 682 jobs in Coffey County and contributes $7.9 million annually in economic output.

9. **What are the potential new site locations for state reservoirs? Please provide a preliminary look of the site database.**

The topography of Kansas makes viable reservoir sites extremely rare. Although the need for enhanced reservoir storage supply is not an immediate issue in many Kansas basins, the process of identifying potential sites, *now,* is critical to the Kansas Water Office (KWO) directive of managing water supply storage to meet future water supply needs. A host of criteria will ultimately be considered during the siting phases of any new reservoir under consideration, however, to minimize future reservoir construction costs these rare sites should be protected from future projects that would substantially increase those construction costs.

Potential sites that may meet regional demands are being identified using maximum "depth to flood" (DTF) imagery and analysis developed by Kansas Applied Remote Sensing (KARS) personnel. An image of potential sites indentified with the DTF technology is included below.



**Sites identified using Depth to Flooding methodology suitable for water supply storage in Eastern Kansas. Blue sites are existing reservoirs. Pink sites will be further evaluated for feasibility. Methodology has not yet been applied to the Kansas River, Lower Arkansas, and Smoky-Hill Saline basins.**

To ensure the state has adequately evaluated the alternatives and impacts and is prepared to construct a new reservoir in the future, the following steps should be initiated within the next five years.

| Calendar Year | Process/Task | Estimated Funding to Complete |
|---|---|---|
| 2010 | Initial site selection (Phase I - *completed*) | Funded |
| 2012 | Complete site assessments (Phase II) and preliminary economic evaluation of potential future reservoir sites in Neosho River Basin | Funded |
| 2013 – 2014 | Conduct feasibility study of candidate sites to evaluate engineering, land acquisition and permitting requirements | $200,000 |
| 2015 | Kansas Water Authority review of most feasible options. If needed, introduction of legislation for protection of future reservoir sites | No funding |

10-16

**10. Can the state "walk away" from a reservoir? What are the implications?**

Storage space was purchased through contracts with the federal government that obligates the state to the repayment of principal and interest, as well as proportional share of operation and maintenance costs. These contracts "continue in full force and effect" through the life of the project. Negotiations would be necessary to reassign to another party or back to the federal government. There are 3 general situations:

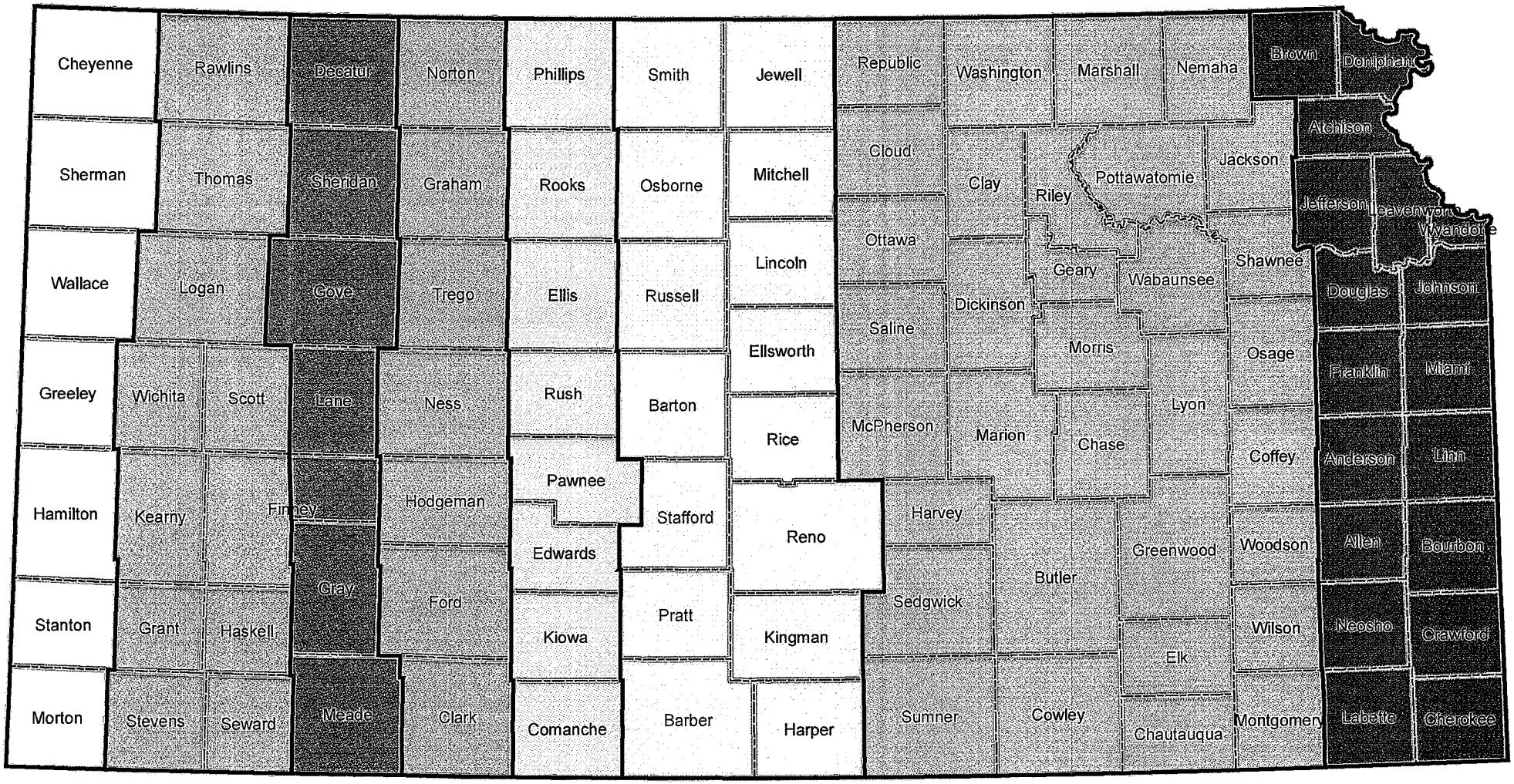
**State has paid for the storage and owns storage which is not committed to a contract (Reserve storage).** Operation and maintenance is an ongoing obligation. State could possibly negotiate to sell or give the storage back to the COE.

**State has, either fully paid for or is making payments on, storage that is under contract with a municipal and industrial user.** Operation and maintenance is an ongoing obligation. Contracts between the state and federal government and contracts between the state and M&I users would have to be terminated and contracts between the federal government and the M & I users would have to be negotiated. The M & I users would then be directly responsible for O & M obligations.

**The state has a contract for the storage but is currently not making any payments for principal and interest or operation and maintenance (unfunded liability).** No payments for P & I or O & M are being made. In one reservoir, Clinton, all the yield is under contract with M & I users; it is anticipated that Hillsdale will also be fully committed within the next year. Perry, Milford and Big Hill represent the best opportunities to "walk away from storage", though whether this is in the best interest of the people of the state has not been determined.

81-01

# Figure 1
## Regions Used for Gallons Per Capita Per Day (GPCD) Analysis



CITY OF
WICHITA

**Public Works & Utilities**

November 9, 2010

Re: ASR Phase II Electrical Costs

Dear members of the Joint Committee on Energy & Environmental Policy:

Electricity is going to be a significant operational cost for Wichita's 30 MGD ASR Phase II Surface Water Treatment Plant and Intake. The technologies required for disinfection and destruction of Atrazine are extremely energy intensive, but are preferable to the costs and operational requirements of the alternative chemical treatments. The estimated annual electrical cost for operating ASR Phase II 120 days a year is $710,000.

Kind regards,

Debra Ary, P.E.
Superintendent of Production and Pumping

**Production and Pumping Division**
1815 W Pine * Wichita, KS 67203
**T:** 316.269.4760 **F:** 316.858.7779
www.wichita.gov

# KANSAS LEGISLATIVE RESEARCH DEPARTMENT

68-West–Statehouse, 300 SW 10th Ave.
Topeka, Kansas 66612-1504
(785) 296-3181 ◆ FAX (785) 296-3824
kslegres@klrd.ks.gov http://www.kslegislature.org/klrd

November 9, 2010

**To:** Joint Committee on Energy and Environmental Policy

**From:** Cindy Lash, Heather O'Hara, and Raney Gilliland, Committee Staff

**Re:** Texas Water Development Board Follow-Up Information

You requested information during the October meeting from the Texas Water Development Board on the costs of dredging versus the costs of building new reservoirs. The Board has provided an internet link to a study they completed in December 2005, which is a cost-benefit analysis of dredging versus building new reservoirs. This internet link was previously provided in an e-mail to Joint Committee members on November 4, 2010. The study can be found here:

http://www.twdb.state.tx.us/RWPG/rpgm_rpts/2004483534_Dredging.pdf

If you require any further information on this topic, please do not hesitate to let us know.

# Texas Reservoir Capital Costs

*This table displays capital costs of several major reservoirs designated by the Texas Legislature as unique sites for the construction of a reservoir. All of the reservoirs are recommended water management strategies in the 2011 Texas Regional Water Plans, however, this list does not include all recommended reservoir strategies from the plans. More detail on itemized costs by category is provided on accompanying worksheets for each reservoir; more information on the regional water planning process in Texas can be found online at www.twdb.state.tx.us.*

| Region | Strategy Name | Supplier/ Sponsor | Supply (acre-feet/ year)* | Imp. Date | Total Capital Costs** | Land | Dam/ Reservoir Construction*** | Environmental/ Permitting | Transmission | Interest During Construction |
|---|---|---|---|---|---|---|---|---|---|---|
| B | Lake Ringgold | City of Witchita Falls | 27,000 | 2050 | $382,900,000 | $16,500,000 | $151,000,000 | $16,500,000 | $97,650,000 | $64,500,000 |
| C | Marvin Nichols Reservoir | North Texas Municipal Water District/ Tarrant Regional Water District/ Upper Trinity Regional Water District | 489,840 | 2030 | $830,894,000 | $96,784,000 | $335,872,000 | $235,426,000 | $2,364,693,000 | $394,863,000 |
| C | Lower Bois d' Arc Creek Reservoir | North Texas Municipal Water District | 123,000 | 2020 | $615,498,000 | $86,625,000 | $101,991,800 | $103,458,000 | $256,659,300 | $66,764,000 |
| C | Lake Ralph Hall | Upper Trinity Regional Water District | 52,437 | 2020 | $286,401,000 | $22,600,000 | $168,035,000 | $7,500,000 | $64,613,000 | $23,653,000 |
| G | Cedar Ridge Reservoir | City of Abilene | 23,380 (safe) | 2020 | $260,988,000 | $24,519,000 | $120,936,000 | $30,842,000 | $47,763,000 | $25,428,000 |
| G | Brushy Creek Reservoir | City of Marlin | 2,090 | 2010 | $13,251,907 | $0 | $6,778,785 | $918,625 | $47,763,000 | $13,251,907 |
| H | Allens Creek Reservoir | Brazos River Authority/ City of Houston | 99,650 | 2020 | $222,752,400 | *Itemized cost data not available from sponsor* | | | | |
| I | Lake Columbia | Angelina and Neches River Authority | 75,700 | 2020 | $231,865,000 | $31,319,000 | $172,985,000 | $27,561,000 | $10,410,250 | $1,385,000 |
| N | Lake Texana Stage II | City of Corpus Christi | 22,964 | 2060 | $232,828,000 | $15,082,000 | $164,447,000 | $14,725,000 | $12,267,000 | $26,307,000 |
| N | Nueces Off-Channel Reservoir | City of Corpus Christi | 30,340 | 2030 | $105,201,950 | $13,142,000 | $150,244,000 | $12,700,000 | $91,642,000 | $32,849,000 |
| O | Lake 07 | City of Lubbock | 17,650 | 2020 | $39,364,400 | $734,000 | $24,167,400 | $744,000 | $8,620,000 | $5,099,000 |

*Based on firm yield unless otherwise noted.
**Total capital costs are as reported in Regional Water Planning database and may include water treatment costs (all other itemized costs exclude cost of water treatment).
***Construction cost estimates based on September 2008 price indices for commodities.

DATE: 11/9/10
ATTACHMENT #3
JOINT COMMITTEE ON ENERGY AND ENVIRONMENTAL POLICY

November 9, 2010

Senator Carolyn McGinn
Chairwoman, Joint Committee on Energy and Environmental Policy
State Capitol, Topeka, KS

Dear Chairwoman McGinn,

During the October 7 and 8 meetings of your committee, many of the state's electric utilities spoke to the impact proposed EPA regulations may have on existing and future electric generating plants. KCP&L was asked to respond to the committee as to what measures your committee or the Kansas Legislature could take to preempt, delay or change proposed regulation 316(b) regarding the potential need for cooling towers at existing or future electric generating plants.

Section 316 of the Clean Water Act (CWA) applies to cooling water intake structures (CWIS). The issue is whether EPA's new rules will require closed-cycle cooling, i.e., cooling towers, for most all plants. It is not a human health issue. According to EPRI, there are a total of 444 electric generating facilities (40 nuclear and 404 fossil) that do not have cooling towers installed and could be affected. EPRI has conducted a detailed analysis and has concluded that capital costs would be in excess of $64 billion excluding the significant operation and maintenance costs and lost revenue from extended outages. KCP&L believes La Cygne Generating Station and Wolf Creek Nuclear Generating Station are two Kansas plants that may be impacted by the proposed rule.

EPA is expected to issue a proposed revised § 316(b) rule by February 2011 and finalize it by July 2012. Industry desires a rule consistent with the remanded Phase II rule, which allowed for the consideration of costs and benefits when setting performance standards and in providing cost-benefit variances from those standards in certain circumstances. The revised CWIS rule will cover large existing steam-electric generators and existing small generators and manufacturers.

The most significant measure you and your colleagues could take at this pre-proposal stage would be to send, letters to EPA, copying OMB and DOE urging a flexible rule which is protective of the environment but does not come at an unreasonable cost in terms of energy reliability, consumer rate increases and ill considered environmental implications. We also encourage you to submit comments to EPA about the proposed regulations during the appropriate comment period next year. In addition, please communicate directly with our Congressional delegation as to the effect of this regulation. Our delegation can then engage EPA staff. We have enclosed a model comment letter prepared by EEI designed to assist in soliciting third-party support.

Your interest in these often complicated topics is appreciated and we will be glad to aid in drafting a letter to EPA or address any questions your committee may have.

Sincerely,

Paul Ling, Manager Environmental Services

Enclosure

KCP&L P O Box 418679 Kansas City MO 64141 9679 1-888-471-5275 toll

**JOINT COMMITTEE ON ENERGY AND ENVIRONMENTAL POLICY**
DATE: 11/9/10
ATTACHMENT 14

**Requiring Cooling Towers as the Single Best Technology Available for Regulating Cooling Water Intake Structures Overrides 30 years of Precedent and Would Have an Adverse Impact on State Programs**

**What Federal and State Agencies Need to Know**

EPA is expected to issue a proposed revised § 316(b) rule by February 2011 and finalize it by July 2012. The issue is whether EPA's new rule will require closed-cycle cooling, i.e., cooling towers, for most generation facilities or some subset of facilities and whether the agency will accommodate consideration of cost-benefit analyses as a means to determine the most effective cost of compliance. It is not a human health issue. A one-size fits all requirement of cooling towers is a costly proposition that would have negative environmental, energy, price, and reliability impacts.

Section 316(b) of the Clean Water Act (CWA) requires that cooling water intake structures reflect the best technology available (BTA) for minimizing adverse environmental impacts. No uniform technological requirement is suitable for such site-specific decisions.

In 2009, the U.S. Supreme Court held in *Entergy Corp. v. Riverkeeper, Inc.*, No. 07-588 that EPA has discretion to consider costs relative to benefits in developing cooling water intake structure (CWIS) regulations under the CWA setting the stage for EPA rulemaking. The Court observed that EPA has been applying cost-benefit considerations to permits under § 316(b) for more than 30 years, substantiating the reasonableness of this approach.

EPA has stated that states don't have the expertise or desire to administer a regulatory program that allows each state to make the most scientifically valid and cost-effective method of regulating intake impacts, despite the fact this has proven effective for more than 30 years. A mandate for cooling towers is a departure from proven practice and favors an inflexible, one-size-fits-all national standard. Such a standard will be detrimental to multi-use resource management. It will require States that have taken responsible action regulating cooling water intake structures to redo all completed permits.

Prior to the proposal going to inter-agency review, it is crucial industry educate and seek support from key federal and state decisionmakers. Consequently we ask that you contact your congressional delegation, Governors' offices, State Attorneys General, PUCs and Department of Environmental Quality offices to seek support for the idea of a flexible rule that offers multiple compliance options similar to that issued in the 2004 rulemaking. At this pre-proposal stage, what is needed is letters to EPA, copying OMB and DOE urging a flexible rule which is protective of the environment but does not come at an unreasonable cost in terms of energy reliability, consumer rate increases and ill considered environmental implications.

We expect inter-agency review to begin in November. Please have your federal and state stakeholders address their concerns to EPA in either an e-mail or letter.

14-2

If by e-mail, comments should be sent to the following addresses:

The Honorable Lisa P. Jackson, Jackson.lisa@epa.gov
cc: The Honorable Cass R. Sunstein, cass_sunstein@omb.eop.gov
The Honorable Dr. Steven Chu; The.Secretary@hq.doe.gov

If by mail, send them to the following addresses:

The Honorable Lisa P. Jackson
Administrator, U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202-564-4700
Jackson.lisa@epa.gov

The Honorable Dr. Steven Chu
Secretary of Energy
United States Department of Energy
Forrestal Building
1000 Independence Ave., SW
Room 7A-257
Washington, DC 20585
202-586-6210
the.secretary@hq.doe.gov

The Honorable Cass R. Sunstein
Administrator
Office of Information and Regulatory Affairs
Office of Management and Budget
Executive Office of the President
Eisenhower Executive Office Building
1650 Pennsylvania Ave., NW
Room 262
Washington, DC 20503
202-395-4852
cass_sunstein@omb.eop.gov

Copies of the letter should also be sent to:

Pete Rouse
White House Chief of Staff
The White House
1600 Pennsylvania Avenue
Washington, DC 20500

While there is no special format by which correspondence has to be prepared, portions of a sample comment letter are set forth below:

Dear Administrator Jackson:

[INSERT NAME OF MEMBER OF CONGRESS/STATE/STATE AGENCY] is writing to you to express my/our substantial concerns regarding the Agency's upcoming draft rule governing cooling water intake structures (CWIS). Section 316(b) of the Clean Water Act (CWA) requires that cooling water intake structures reflect the best technology available (BTA) for minimizing adverse environmental impacts. No uniform technological requirement is suitable for such site-specific decisions. In fact, EPA's past rulemakings have shown that the "environmental impact" of cooling water intake structures depends heavily on the features of each site and the specific design of the power plant. Over the course of many years of study pursuant to § 316(b) and state environmental laws, States have found that (1) the nature and extent of any impingement or entrainment losses, and the impact of such losses on the aquatic environment, depend on a wide variety of inherently site-specific factors, and (2) not all impingement- and entrainment-related losses adversely impact the health and sustainability of fishery resources. "...given the wide range of various factors that affect the environmental impact posed by Phase II existing facilities, different technologies or different combinations of technologies can be used and optimized to achieve the performance standards." 69 Fed. Reg. 41,598 col. 2. Uncertainty is inherent in predicting the efficacy of intake technologies. Id. 41,600 col. 2. A number of site-specific factors may significantly affect the cost and practicality of installing particular technologies. Id. 41,603 col. 2.

We oppose any rule that would mandate a one-size-fits-all means of compliance i.e., cooling towers especially without including a cost-benefit test as a means to determine the most effective cost of compliance. It is imperative that a proposed rule preserve the authority of States to make rational local resource management decisions.

Accordingly, EPA acknowledged and developed data in the 2004 § 316(b) Phase II rulemaking, showing that retrofitting closed-cycle cooling not only entails huge capital and operation and maintenance expenditures (especially in comparison to other alternatives) but also may not be feasible in all cases due to land or other constraints and may create a variety of adverse environmental impacts. These adverse impacts include increasing air emissions, including emissions of greenhouse gases; decreasing capacity in several North American Electric Reliability Corporation (NERC) regions, caused by premature plant closures and by substantial energy penalties at plants that remain open but are forced to retrofit, threatening reliability in some regions; and increasing evaporative water losses, noise, drift, icing, increased solid waste production, aesthetic impacts, and variety of other effects. These substantial costs and adverse effects, as well as the availability of other effective options, led the Agency in 2004 to conclude that retrofitting closed-cycle cooling is not BTA for existing facilities. There is no basis for reversing these earlier findings.

[INSERT PARAGRAPH EXPLAINING WHY A RULE REQUIRING COOLING TOWERS AT ALL FACILITIES OR FACILITIES ON MARINE WATERS PARTICULARLY WITHOUT A MEANINGFUL COST-BENEFIT TO DETERMINE THE MOST EFFECTIVE COST OF COMPLIANCE WILL HAVE AN ADVERSE IMPACT ON THE STATE'S ABILITY

TO MANAGE IT RESOURCES WITH ATTENTION TO LOCAL NEEDS, NEGATIVELY AFFECT STATES RIGHTS, REFERENCING, AS APPROPRIATE, SPECIFIC STATE REGULATIONS OR POLICIES AND, NEGATIVELY IMPACT STATE ENERGY RESOURCES, ENERGY PLANNING AND GREENHOUSE GAS EMISSIONS]

For all the above reasons, we strongly urge you to issue a flexible proposal allowing meaningful consideration of site-specific factors to avoid the unnecessary installation of cooling towers. This type of approach maximizes the ability to achieve the most environmentally effective and cost-effective reductions in environmental harm. It does so while respecting the States that have taken responsible action in regulating CWIS and does so in a manner that is consistent with the 2009 Supreme Court decision in *Entergy Corp. v. Riverkeeper, Inc.*, No. 07-588 that states EPA has the discretion to consider costs relative to benefits in developing CWIS regulations.

While a cooling towers mandate would impose significant costs on utility operations (2-4% energy penalty and a conservative capital expenditure of approximately $215-$220/kW or a capital expense of over $64 billion nationally) and create additional environmental challenges noted above, it would prevent States from making local resources decisions and create the untenable situation of requiring States to revisit the many completed permit decisions.

Thank you for the opportunity to voice our concerns on this draft regulation during its formative development.

Sincerely,

14-5

# When the Well Runs Dry: The Value of Irrigation to the Western Kansas Economy

**John C. Leatherman, Hanas A. Cader and Leonard E. Bloomquist**

The authors wish to thank reviewers at the *Kansas Policy Review* for helpful comments that improved the clarity of presentation. Any remaining errors are the sole responsibility of the authors.


## Abstract

In western Kansas, irrigated crops production has given rise to one of the world's premier livestock production and food processing industries. Given current usage trends, however, portions of the Ogallala Aquifer will become effectively exhausted for irrigated agricultural use in the foreseeable future. Without irrigation, highly productive farmland in western Kansas will begin reverting to dryland farming. This research provides preliminary estimates of how the loss of irrigated agriculture might affect the western Kansas economy. A social accounting matrix, a system of accounting that comprehensively charts the financial flows of a region, is used to estimate the overall importance of agriculture in the northwestern, west central and southwestern regions of the state. An analysis provides estimates of the impacts of removing the additional value irrigation adds to crops production. Without irrigation, the economy would shrink by an estimated one-half billion dollars in total output and nearly $140 million total value added annually. About 3,300 jobs would be lost. Various scenarios explored associated losses to livestock production and meat processing.


## Introduction

Despite a long period of national economic growth and expansion during the 1990s, many rural communities throughout the Great Plains continued to experience population out-migration and economic decline. This pattern has been evident throughout much of western Kansas. Yet, even there, a number of communities such as Garden City, Dodge City and Liberal have thrived and grown. In large measure, the relative prosperity can be attributed to the underground water resources that support irrigated agriculture, and in turn livestock production and meat packing. But, those water resources are finite, leading many to speculate about what lies ahead when pumping water for irrigation becomes financially prohibitive.

In this paper, we offer a glimpse of what may lie ahead by presenting the direct and indirect impacts associated with a scenario wherein the crops production associated with irrigated agriculture is removed from the region's economy and replaced by a dryland production regime. While we know that certain areas of western Kansas still have relatively abundant water supplies and can assume that water use technologies and efficiencies will continue to improve, other areas are at or near exhaustion. Still, this cautionary tale presages what may lie ahead sooner for some areas and eventually for all should current water use trends continue unabated.

The paper continues with a discussion of the dwindling water resources and agricultural crops production in the Ogallala Aquifer region of western Kansas. We provide estimates of the importance of agricultural production through the use of a social accounting matrix of the region, an accounting system that comprehensively models the economy. To estimate the economic impacts of irrigated agriculture, we assume all value associated with the incremental increase in crops production for irrigated lands is lost. The social accounting matrix then projects the combined direct and indirect impacts to the economy.

## Background[1]

Overall, the 1990s was a good decade for many nonmetropolitan areas of America (Fuguitt and Beale 1996; Johnson 1999; Johnson and Beale 1994, 1998a, 1998b). While those places having proximity to metropolitan areas or possessing natural amenities experienced population growth, many other remote, agriculturally-dependent, and "amenity-poor" rural communities continued to lose population. In rural areas of the Great Plains, population out-migration has been especially persistent and widespread (Albrecht 1993; Rathge and Highman 1998). For these places, persistent population loss has been associated with growing labor shortages, aging populations, rising poverty, and an increasing deficit of human capital resources necessary to maintain economic viability. Yet, even within these remote regions, some rural communities have experienced stability and growth in recent decades. Such has been the case in certain portions of the Ogallala Aquifer region of western Kansas.

The Kansas Ogallala region includes 32 western counties in Kansas that overlie the Ogallala and other water bearing aquifers. Agricultural production in the region includes both dryland and irrigated crops production and livestock ranching. The groundwater resources have spurred the development of intensive irrigated agriculture in the region. Its high-yielding feed grain production supports a large-scale feedlot industry, which in turn supports one of the world's premier

beef packing industries (Broadway 1995, 2000; Bussing and Self 1981; Drabenstott, Henry and Mitchell 1999; Saito and Yagakaki 1998).

The 2000 census showed that the region had a total population of 209,515 persons, residing in or near 91 incorporated places (Figure 1). Most of these are small farm communities. Three important exceptions are Garden City, Dodge City and Liberal, the major urban centers of the region, whose combined population accounted for just over one third of the region's total. Local businesses also have become increasingly concentrated in these urban centers, to the detriment of both small towns in the nonirrigated areas and in counties with high levels of irrigation but without a large urban center (Williams and Bloomquist 1996).

Over the past several decades, different parts of the Ogallala region have experienced varying rates of population growth and demographic change due to the irrigated agriculture development patterns and the associated value-added industries. During the 1990s, the region as a whole gained 7.5% in population, or 14,649 people. However, 46 of the 91 incorporated places lost population. Population decline was most acute in the smallest communities, with some of them losing as much as 30% over the decade.

Irrigation also appears to be an important factor shaping rural demographic change in the region. Irrigated areas have had faster population growth, lower median ages, and usually more success in retaining local youth. The thriving feedlots and beef packing industries have also attracted a substantial number of Latino and Asian immigrants to places like Garden City, Dodge City and Liberal (Benson 1994; Broadway 1994). In comparison, the non-irrigated areas tend to have experienced persistent population loss and an aging of their populations. The shrinking population in many small towns of the region has created a very difficult situation for the people that remain.

That irrigation plays an important role in sustaining the rural population in the Kansas Ogallala region raises a concern about the long-term economic sustainability of its communities. The saturated thickness of the Ogallala Aquifer and the related usable lifetime of the groundwater vary considerably across the region. Figures 2 and 3 depict the saturated thickness and estimated usable life of the High Plains Aquifer in Kansas. The Ogallala is a substantial and important component of the High Plains Aquifer. In the Kansas portion shown in Figures 2 and 3, the Ogallala comprises the three western lobes of the aquifer. The southeastern lobe is hydrologically distinct from the Ogallala. The primary difference between the Ogallala and additional peripheral water bodies comprising the High Plains Aquifer in that its rate of recharge is much slower and its withdrawal is occurring at an unsustainable pace.

Some areas of western Kansas will have groundwater supplies available for many years to come. In the southwest, in particular, there exists areas with supplies that should last for many decades, and depletion is problematic only around the periphery. In other areas, the economic depletion of the aquifer is complete or rapidly approaching. The future of many communities in the study area and in other parts of the Ogallala Aquifer region may very well hinge upon their ability to adjust to the "planned depletion" of the aquifer.

**Figure 1**
**Incorporated Places in the Kansas Ogallala Region, Kansas**

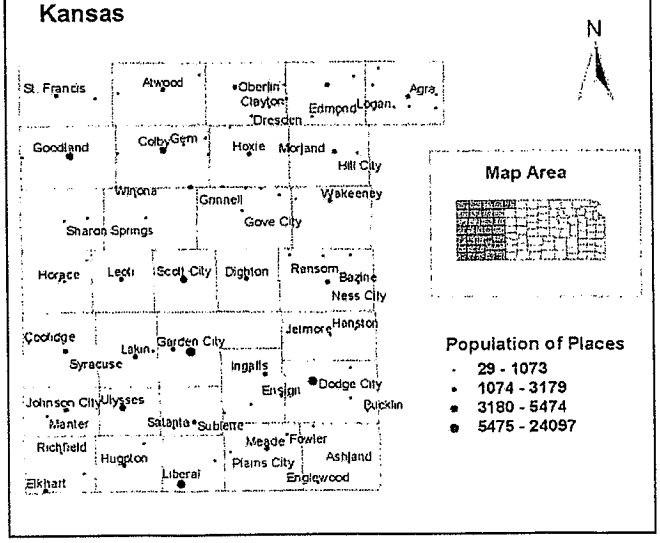



**Figure 2**
**Saturated Thickness of the High Plains Acquifer**

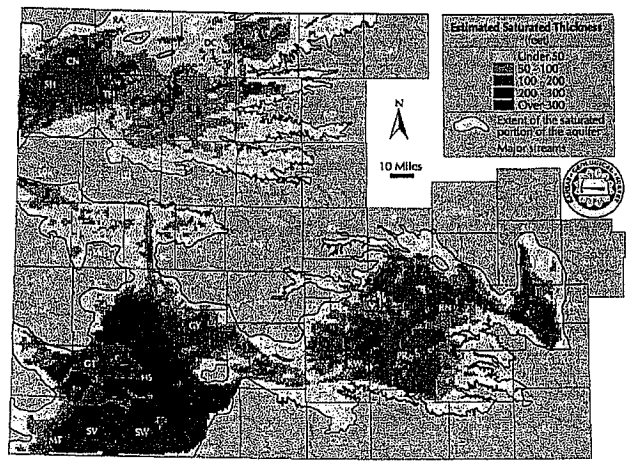



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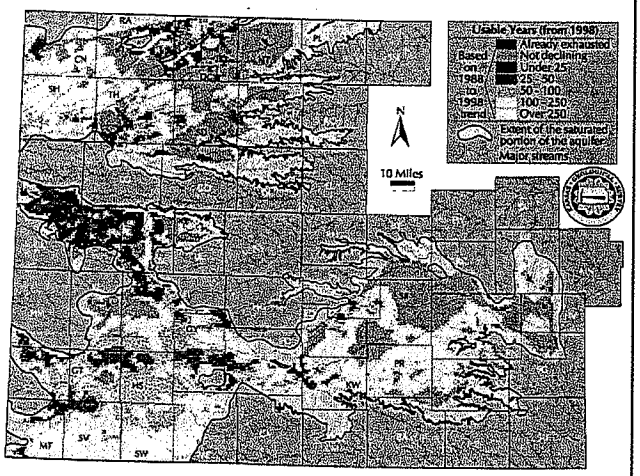
**Figure 3**
**Estimated Usable Lifetime of the High Plains Acquifer***

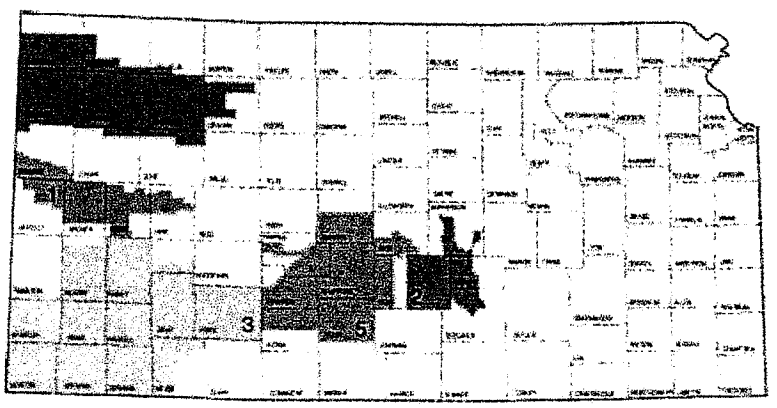



*Useable lifetime is exhausted when saturated thickness is 30 feet or less.

In response to concerns relating to the depletion of the Ogallala and High Plains Aquifers, Kansas has established local units of government, called groundwater management districts, to provide water-use administration, planning, and information. Five groundwater management districts were created in the 1970s in the western and central parts of the state (Figure 4). The primary use of ground water in these areas is irrigation, although several districts also face issues of municipal supply.

For purposes of this analysis, we focus on the area encompassing Groundwater Management Districts 4, 1, and 3. These are part of the Ogallala Aquifer system, and are especially susceptible to depletion because their hydrologic characteristics do not allow replenishment in a time frame conducive to current usage patterns.

**Figure 4**
**Kansas Groundwater Management Districts**




## Crops Production in the Ogallala Region

For purposes of tracking agricultural production in the state, the Kansas Agricultural Statistics Service divides the state into nine agricultural statistics districts. The three western-most districts correspond closely to the groundwater management districts and serve as the focus for this study (Figure 5).

The three western agricultural districts are highly productive crops producers, especially for field corn and wheat. Examination of Figure 6 suggests the most productive areas correspond closely to areas with available groundwater.

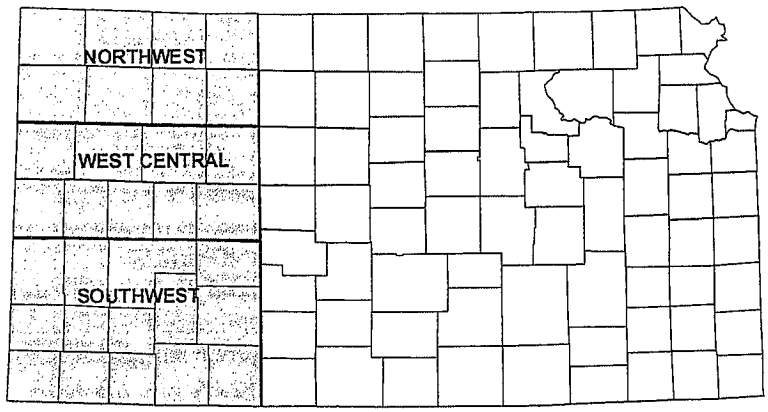
Additional detail relating to county and regional commodity production is shown in Table 1. The three districts combined to annually produce about a half-billion dollars worth of corn and another $375 million worth of wheat on average from 1997 through 2001.

A fairly high percentage of this value is directly attributable to irrigation. Estimates of the value of irrigation are provided in Table 2. The values reported are inflation-adjusted five-year averages. This estimation technique assumes that without irrigation, the existing county dryland cropping regime would be substituted on the irrigated acreage after deducting for some percentage of land that would be assumed to go fallow. The share of land going fallow was assumed to be 30 percent in the northwestern region counties, 33 percent in the west central region counties, and 40 percent in the southwestern region counties. The regional shares selected were somewhat arbitrary, but not unreasonable according to farmers familiar with the region.

Assuming the dryland cropping regime, the value of corn production declines dramatically. Approximately 80 percent of the average value of corn production would likely be lost without irrigation, driven by huge losses in the southwestern region. Production of other more drought-resistant crops would increase, but their value would not nearly replace the value of corn production. The substantial reliance of corn production on irrigation suggests that neither livestock production or food processing could be maintained at its current levels without access to groundwater resources.

15-3

Figure 5
Western Kansas Agriculture Statistics Districts



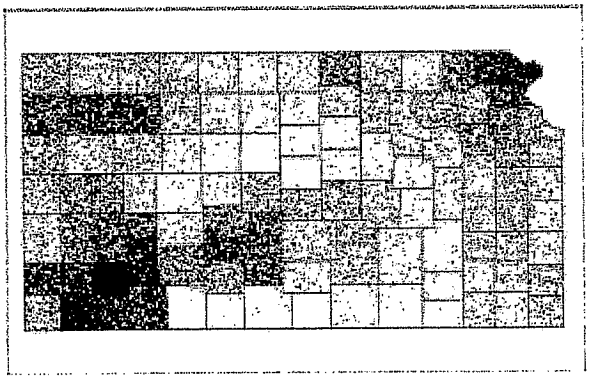

## Social Accounting Matrix Analysis

As a descriptive tool, social accounting matrix (SAM) analysis can be thought of as an accounting system that comprehensively accounts for financial flows in a region at a point in time. As an analytic tool, SAM analysis represents transactions between economic sectors and institutions (households, enterprises, government). Given these interpretations, the SAM model can be used to assess the impacts of alternative policies and economic events in the regional economy (Pyatt and Round 1985).

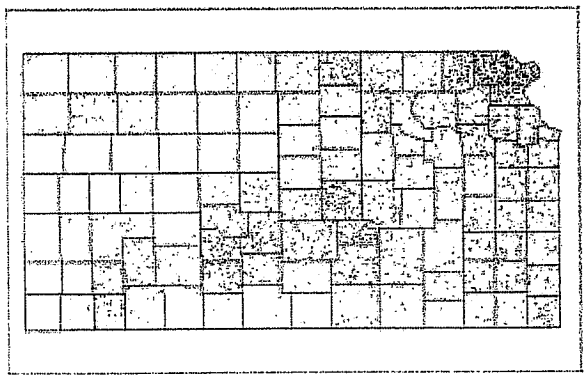
The simplest and most efficient way to represent the interaction between economic sectors and institutions

Figure 6
Selected Kansas Crops Production, 2000

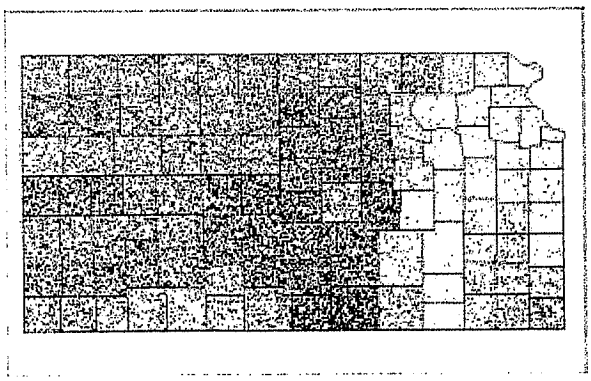
Corn Production



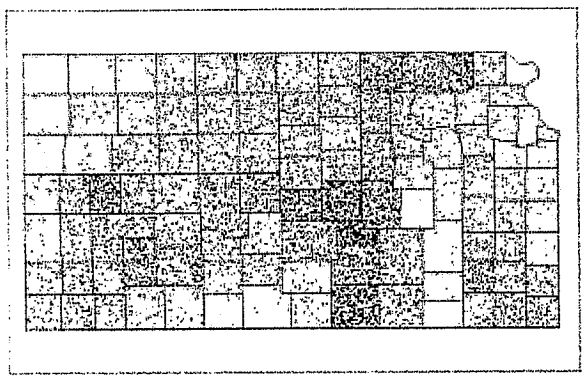
Soybean Production



Wheat Production



Sorghum Production



Note: Each dot represents 15,000 bushels.
Source: Kansas Farm Facts, 2001.

15-4

**Table 1**
**1997-2001 Average Annual Value of Production for Selected Commodities in Western Kansas (2001$)**

| County & District | Corn | Sorghum | Hay & Pasture | Soybean | Sunflower | Wheat |
|---|---|---|---|---|---|---|
| Cheyenne | 9,820,580 | 217,358 | 1,987,894 | 581,154 | 1,655,272 | 11,737,478 |
| Decatur | 9,140,410 | 2,288,658 | 2,988,874 | 442,873 | 364,280 | 11,372,549 |
| Graham | 4,896,612 | 4,225,413 | 2,643,773 | 0 | 0 | 8,520,156 |
| Norton | 7,972,000 | 3,220,886 | 2,863,977 | 0 | 153,069 | 9,430,047 |
| Rawlins | 7,340,574 | 2,280,305 | 4,798,314 | 0 | 793,650 | 14,350,013 |
| Sheridan | 27,989,640 | 3,608,232 | 3,030,917 | 0 | 0 | 12,178,219 |
| Sherman | 23,789,353 | 1,002,926 | 2,368,010 | 1,326,966 | 4,323,669 | 16,747,363 |
| Thomas | 32,428,191 | 3,945,497 | 1,674,302 | 1,967,745 | 1,448,865 | 19,317,134 |
| Other Counties[1] | 0 | 1,851,414 | 0 | 1,496,809 | 681,557 | 0 |
| **Northwest** | 123,377,364 | 21,082,729 | 22,356,063 | 7,186,531 | 9,290,259 | 103,352,944 |
| Gove | 7,545,985 | 7,180,313 | 2,301,636 | 408,121 | 0 | 12,104,978 |
| Greeley | 2,783,092 | 2,189,751 | 621,681 | 0 | 241,855 | 15,727,063 |
| Lane | 2,929,254 | 5,142,899 | 526,043 | 396,659 | 207,313 | 11,794,372 |
| Logan | 5,751,333 | 3,481,452 | 1,075,139 | 0 | 326,989 | 11,158,285 |
| Ness | 873,751 | 4,795,048 | 2,433,853 | 0 | 161,806 | 13,148,601 |
| Scott | 11,560,736 | 10,032,684 | 787,350 | 357,667 | 107,650 | 14,974,926 |
| Trego | 1,969,453 | 4,099,466 | 2,602,662 | 0 | 0 | 9,887,040 |
| Wallace | 11,371,705 | 671,925 | 1,378,642 | 0 | 1,167,036 | 7,320,303 |
| Wichita | 11,148,120 | 6,134,923 | 1,933,146 | 0 | 468,792 | 14,514,907 |
| Other Counties | 0 | 3,300,536 | 0 | 1,349,862 | 769,793 | 0 |
| **West Central** | 57,933,433 | 44,812,131 | 13,660,157 | 2,899,745 | 3,451,234 | 110,630,613 |
| Clark | 428,404 | 1,758,892 | 2,788,695 | 0 | 0 | 5,129,557 |
| Finney | 34,249,726 | 7,509,650 | 25,119,034 | 2,213,686 | 333,525 | 19,398,837 |
| Ford | 18,712,852 | 8,516,373 | 8,286,467 | 1,577,940 | 52,079 | 16,454,881 |
| Grant | 19,982,356 | 2,517,066 | 6,392,146 | 0 | 328,763 | 9,831,729 |
| Gray | 40,329,391 | 7,134,596 | 13,846,190 | 2,025,052 | 0 | 15,609,334 |
| Hamilton | 3,701,389 | 3,988,647 | 4,373,724 | 0 | 0 | 13,249,825 |
| Haskell | 51,388,290 | 2,329,235 | 2,556,758 | 1,347,035 | 360,170 | 12,412,063 |
| Hodgeman | 2,641,788 | 3,681,382 | 1,994,495 | 245,173 | 0 | 10,547,857 |
| Kearny | 17,359,871 | 3,110,230 | 13,934,175 | 297,429 | 51,320 | 11,076,483 |
| Meade | 30,721,190 | 3,273,107 | 3,265,103 | 1,678,420 | 25,941 | 8,562,809 |
| Morton | 6,481,157 | 3,762,358 | 1,493,816 | 0 | 73,655 | 8,864,593 |
| Seward | 20,425,099 | 2,736,613 | 7,066,217 | 1,004,251 | 28,937 | 5,634,804 |
| Stanton | 25,493,727 | 3,082,366 | 2,062,634 | 0 | 109,740 | 12,968,819 |
| Stevens | 39,393,494 | 5,479,105 | 6,245,217 | 316,448 | 273,546 | 9,242,740 |
| Other Counties | 51,908,863 | 1,691,154 | 0 | 646,692 | 674,270 | 0 |
| **Southwest** | 311,357,565 | 60,596,941 | 99,424,687 | 13,312,727 | 2,631,488 | 158,984,375 |
| **Western KS** | 492,668,189 | 126,491,801 | 135,440,437 | 23,399,003 | 15,372,981 | 372,967,932 |

[1]Other counties includes values that had been suppressed from individual county totals.
Source: Kansas Farm Facts, various years.

within a region and with the rest of the world is through a transactions table. A transactions table is a square matrix that identifies all of the economic entities within a region, including production sectors, households, business enterprises, and governments. It includes accounts to represent their purchases, sales, taxes, savings and trading relationships between each other and with the rest of the world. The SAM describes

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**Table 2**
**Estimated Change in the Total Value of Production by Type of Crop Assuming Only Dryland Production in Western Kansas (2001$)**

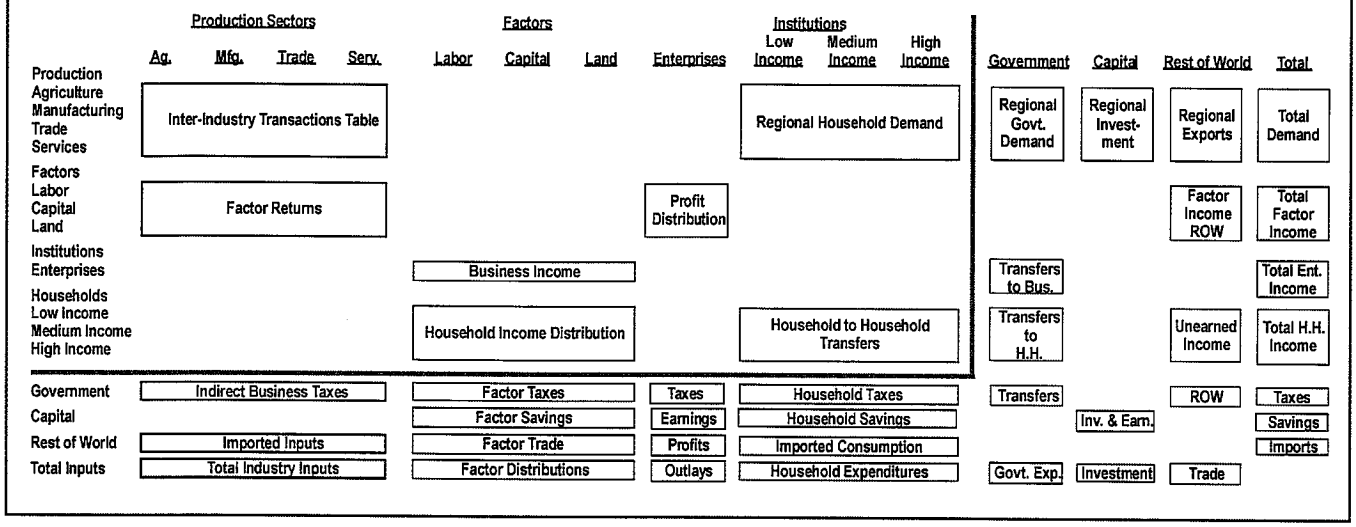
| County & District | Corn | Sorghum | Soybean | Hay & Pasture | Wheat | Sunflower |
|---|---|---|---|---|---|---|
| Cheyenne | -8,462,676 | -94,037 | -325,199 | 330,768 | 1,210,598 | 5,366,890 |
| Decatur | -2,126,404 | -3,443 | -242,249 | 143,735 | 358,452 | 15,858 |
| Graham | -1,450,899 | -69,071 | -37,887 | 110,409 | 214,224 | 0 |
| Norton | -1,561,063 | 31,426 | -85,196 | 105,078 | 227,286 | 5,027 |
| Rawlins | -2,991,840 | -7,818 | -122,467 | 247,933 | 427,424 | 41,060 |
| Sheridan | -20,151,574 | 711,996 | -522,832 | 859,865 | 2,370,403 | 0 |
| Sherman | -20,987,299 | -37,536 | -753,535 | 699,859 | 1,215,402 | 1,617,422 |
| Thomas | -24,463,371 | 425,263 | -1,000,873 | 340,251 | 2,611,360 | 289,559 |
| Other Counties | 0 | 323,297 | -660,628 | 0 | 0 | 496,410 |
| **Northwest** | -81,209,364 | 1,590,576 | -6,394,574 | 3,490,658 | 9,638,816 | 1,486,159 |
| Gove | -2,717,283 | 141,238 | -190,674 | 11,625 | 301,239 | 0 |
| Greeley | -3,979,628 | -7,491 | -51,577 | 61,116 | 132,191 | 21,624 |
| Lane | -2,066,064 | -75,127 | -221,173 | 38,906 | 78,309 | 15,258 |
| Logan | -3,129,908 | 27,561 | -241,996 | 59,226 | 363,508 | 13,185 |
| Ness | -435,475 | -65,655 | -62,355 | 43,777 | 21,402 | 2,631 |
| Scott | -7,788,094 | 302,893 | -204,792 | 116,694 | 197,750 | 14,032 |
| Trego | -545,486 | -20,091 | -83,426 | 54,041 | 22,008 | 0 |
| Wallace | -9,696,019 | -51,797 | -51,519 | 379,540 | 526,943 | 353,284 |
| Wichita | -9,113,000 | -95,323 | -233,670 | 476,307 | -488,794 | 116,564 |
| Other Counties | 0 | 23,467 | -215,227 | 0 | 0 | 2,124 |
| **West Central** | -39,455,940 | 345,766 | -2,577,369 | 1,440,034 | 1,459,674 | 344,854 |
| Clark | -310,254 | -32,230 | -75,839 | 98,947 | 117,301 | 0 |
| Finney | -33,203,659 | 1,126,895 | -1,293,862 | 10,364,451 | 2,464,641 | 134,409 |
| Ford | -17,812,760 | -87,842 | -937,530 | 1,640,850 | 1,357,056 | 10,006 |
| Grant | -18,343,462 | -459,235 | -89,610 | 3,947,140 | -2,870,401 | 200,437 |
| Gray | -39,339,405 | 1,650,730 | -1,196,205 | 6,589,396 | 87,831 | 0 |
| Hamilton | -3,183,873 | -218,420 | -63,685 | 259,975 | 295,896 | 0 |
| Haskell | -48,837,437 | 1,787,600 | -727,594 | 3,893,406 | -1,411,239 | 299,195 |
| Hodgeman | -2,356,479 | -306,255 | -142,550 | 188,385 | -382,830 | 0 |
| Kearny | -15,378,880 | 271,813 | -158,997 | 3,319,416 | 387,348 | -51,320 |
| Meade | -24,047,852 | -373,205 | -993,968 | 1,930,106 | 647,238 | 80,859 |
| Morton | -6,159,227 | -142,154 | -28,175 | 337,300 | -1,001,958 | 14,037 |
| Seward | -15,551,629 | -82,618 | -584,547 | 3,634,001 | -960,602 | 151,523 |
| Stanton | -24,180,115 | 587,763 | -40,024 | 1,387,718 | -1,418,939 | -109,740 |
| Stevens | -37,852,312 | 1,715,151 | -144,170 | 4,631,951 | -3,351,445 | 274,631 |
| Other Counties | -10,139,798 | 1,513,953 | -119,080 | 0 | 0 | 118,063 |
| **Southwest** | -298,068,350 | 6,147,627 | -12,847,520 | 40,951,883 | -6,224,401 | 1,101,475 |
| **Western KS** | -418,733,654 | 8,083,969 | -21,819,463 | 45,882,575 | 4,874,089 | 2,932,488 |

the full circular flow of economic transactions occurring in the economy (Keuning and de Ruijter 1988). It comprehensively accounts for all types of economic transactions, thereby allowing a wide range of impact and policy analyses.

A schematic of a social accounting matrix appears in Figure 7. A SAM can be thought of as consisting of four quadrants. The partitioned quadrant in the upper left depicts the region's economy. Economic activity flows in a counter-clockwise flow. Leakages from the

15-6

**Figure 7**
**Simplified Single-Region Social Accounting Matrix**




region flow to the lower-left quadrant in the form taxes, savings and imported purchases. Inputs into the region flow from the upper-right quadrant in the form of non-local demand for regional goods and services and from various transfer payments and non-local sources of income. The lower-right quadrant includes a variety of balancing accounts to ensure that all inputs equal outputs.

More formally, following Adelman and Robinson (1986), assuming households are endogenous and using matrix notation and the framework applied in this research, the endogenous portion of the SAM appears as:

$$(1) \qquad A^* = \begin{bmatrix} A00C \\ F000 \\ 0Y00 \\ 00HT \end{bmatrix}$$

where: $A^*$ is the SAM matrix of direct coefficients $(n + f + m + k, n + f + m + k)$
$A$ is the matrix of direct coefficients for production activities $(n, n)$
$F$ is the matrix of factor income (value added) coefficients $(f, n)$
$Y$ is the matrix of factor income distribution coefficients $(m, f)$
$C$ is the matrix of household expenditure coefficients $(n, k)$
$H$ is the matrix of household income distribution coefficients $(k, m)$
$T$ is the matrix of inter-institutional transfer coefficients $(k, k)$
$n$ is the number of production sectors
$f$ is the number of factors
$m$ is the number of institutions
$k$ is the number of household income classes

Combining households and institutions, the balance equation for supply and demand can be written:

$$(2) \qquad \begin{bmatrix} X \\ F \\ Y \end{bmatrix} = A^* \begin{bmatrix} X \\ F \\ Y \end{bmatrix} + \begin{bmatrix} ex \\ ef \\ ey \end{bmatrix}$$

where: $X$ is a vector of sectoral supply $(n, 1)$
$F$ is a vector of factor income categories $(f, 1)$
$Y$ is a vector of institutional incomes $(m + k, 1)$
$ex$ is a vector of exogenous demand for regional commodities $(n, 1)$
$ef$ is a vector of factor income $(f, 1)$
$ey$ is a vector of exogenous institutional income $(m + k, 1)$

A SAM inverse multiplier matrix is calculated by inverting the $(I\text{-}A^*)$ matrix that related regional sectoral supply, factor incomes, and institutional incomes to exogenous demand. This is of the form:

$$(3) \qquad \begin{bmatrix} X \\ F \\ Y \end{bmatrix} = M \begin{bmatrix} ex \\ ef \\ ey \end{bmatrix}$$

where M is the $(I\text{-}A^*)^{-1}$ inverted coefficients matrix.

15-7

The inverted coefficients matrix yields the SAM multiplier table. The model is completely demand driven, with no supply constraints specified. Changes in demand are introduced through the exogenous vectors. In our analysis the exogenous changes take the form of the incremental reduction in crops production value associated with irrigated agriculture.

### Economic Analysis and Assumptions

To conduct the analyses of the economic impact of irrigation, the IMPLAN system was used to construct a SAM for each of the three regions calibrated to 2000, the most recent year for which data were available (Minnesota IMPLAN Group 1999). Within the SAMs are a variety of information about the regional economies during 2000. Several descriptive items were extracted from the SAMs and are reported in Table 3.

Industry output serves as the broadest measure of economic activity, and can be thought of as a gross regional product. Output might be roughly interpreted as the total value of net regional sales necessary to accommodate both internal and external demand for regional goods and services. Employment figures represent estimates of total employment, including all full- and part-time jobs. Several measures of regional income are reported. Labor income represents employee compensation (salaries and wages) plus proprietary income from farming and small business proprietorships. Total income is the broadest income measure and includes employee compensation, proprietary income, other property income (dividends, interest, rents, corporate profits, etc.) and indirect business taxes (primarily sales taxes). Technically, total income is called value added and represents the broadest measure of income generated by regional economic activity.

In 2000, the eight northwestern counties accounted for about $2 billion worth of output, 27,000 jobs and nearly $1 billion in total income. The nine west central Kansas counties had about the same total value of output, about 18,000 jobs and over a half-billion dollars total income. The 14-county southwestern region, which includes the major urban cities, is the largest region, by far. In 2000, the southwestern region accounted for nearly $13 billion in output, about 88,000 jobs and $3.5 billion in total income.

Considering the distribution of economic activity across the economic sectors in each of the regions, agriculture plays an important role. Across the regions, agriculture was typically the first or second largest source of sales. Other sectors, however, typically serve as primary sources of income and jobs. Trade, services and government (including schools) are other important sources of economic activity. The importance of meat packing in the southwestern district is observed in the manufacturing sector.

When considering questions relating to the relative contribution of different economic entities, direct measures of output, jobs and income provide one indication. It is well known, however, that different economic sectors, households, and other entities are closely tied such that activity in one area of the economy "ripples" to affect other economic sectors and entities. More precisely, there are two primary sources for the "ripple effect." The first arises from businesses buying and selling to one another during the process of producing goods and services. The second source of impact arises from households spending labor income for typical household goods and services. This household spending tends to broadly distribute the economic impact of an event. For example, if a meat packer gets a new order for $1 million worth of meat, the firm will call in more labor who, in turn, will spend their wages on a wide variety of goods and services.

A SAM can be used to measure the ripple effect of individual economic sectors. This is done by creating economic multipliers for each of the industry sectors. Multipliers are estimated for households, as well, to capture the effects of household spending.

To estimate the total "economic impact" of the industry and household sectors, it is important to distinguish between the various sources of impact. To be fair, distinctions should be made between the impact that arises as a result of interactions between entities exclusively *within a region* and the interactions between regional entities and the *rest of the world.*

For this analysis, we only consider economic activity associated with non-local demand for locally-produced goods and services as well as other income attracted to the region from non-local sources. It's the capacity to draw income/revenue from outside the region that creates impact beyond that which would otherwise exist serving only endogenous demand. Thus, to complete the analysis of the impact of agriculture (and other sectors), we multiply the regional multiplier matrix by a vector representing final demand (money coming from outside the region).

Table 4 shows the share of economic activity associated with various industry sectors and household income groups. Three types of shares are shown: total output, total income (generated from regional production), and household income (income from all sources). Households are split into nine income classes.

To interpret the information in the table, read down the column. For the industry sectors, the values represent the share of total output (total income and household income) associated with external demand for the goods and services produced by that sector. For

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**Table 3**
**Structure of the Western Kansas Economy (2000$)**

| | Industry Output (millions) | Employment (number) | Labor Income (millions) | Total Income (millions) |
|---|---|---|---|---|
| **Northwestern KS** | | | | |
| Agriculture | 527.659 | 4,802 | 57.989 | 138.742 |
| Mining | 86.414 | 513 | 9.977 | 26.270 |
| Construction | 156.369 | 1,539 | 46.532 | 52.816 |
| Manufacturing | 110.513 | 601 | 15.628 | 21.628 |
| TCPU[1] | 196.984 | 1,043 | 39.634 | 82.318 |
| Trade | 226.518 | 5,709 | 97.568 | 156.934 |
| FIRE[1] | 207.342 | 1,342 | 33.633 | 141.570 |
| Services | 238.884 | 6,272 | 121.181 | 40.238 |
| Government | 169.249 | 5,078 | 124.919 | 143.796 |
| **Totals** | 1,918.955 | 27,008 | 547.863 | 903.341 |
| **West Central KS** | | | | |
| Agriculture | 1,185.386 | 5,102 | 70.822 | 144.880 |
| Mining | 25.539 | 147 | 2.524 | 7.010 |
| Construction | 75.807 | 871 | 18.758 | 21.933 |
| Manufacturing | 77.640 | 357 | 9.906 | 14.271 |
| TCPU | 171.607 | 998 | 34.357 | 72.311 |
| Trade | 160.133 | 3,410 | 69.202 | 112.002 |
| FIRE | 143.812 | 898 | 22.265 | 98.597 |
| Services | 118.377 | 2,883 | 52.163 | 64.528 |
| Government | 115.236 | 3,772 | 85.252 | 96.959 |
| **Totals** | 2,073.618 | 18,606 | 366.510 | 632.580 |
| **Southwestern KS** | | | | |
| Agriculture | 2,862.490 | 9,583 | 143.538 | 279.128 |
| Mining | 346.191 | 1,619 | 43.374 | 121.316 |
| Construction | 568.447 | 5,721 | 170.208 | 195.565 |
| Manufacturing | 5,106.7131 | 4,385 | 475.014 | 601.067 |
| TCPU | 1,103.779 | 4,160 | 180.392 | 386.911 |
| Trade | 798.593 | 17,524 | 348.333 | 562.066 |
| FIRE | 639.094 | 3,778 | 104.006 | 440.715 |
| Services | 818.606 | 15,990 | 367.139 | 443.197 |
| Government | 529.080 | 15,082 | 414.214 | 473.757 |
| **Totals** | 12,769.623 | 88,425 | 2,251.053 | 3,500.371 |
| **Western KS Total** | 16,762.196 | 134,039 | 3,165.426 | 5,036.292 |

[1]TCPU is transportation, communication, & public utilities; FIRE is finance, insurance & real estate.

the household income groups, the values represent the share of total output (total income and household income) associated with externally-generated income for each household income class.

In the case of northwestern Kansas, about 84 percent of total output were associated with industry production of goods and services. About 16 percent was associated with household income transfers from outside the region. Agricultural production was closely associated with about 40 percent of all output in the region. After taking into account all the direct and indirect linkages, it was associated with about 30 percent of total income from production and 17 percent of all household income in the region.

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**Table 4**
**Percentage of Total Economic Activity Associated with Industries and Household Income Groups by Region in 2000**

| | Northwest Kansas | | | West Central Kansas | | | Southwest Kansas | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total Output | Total Income | Household Income | Total Output | Total Income | Household Income | Total Output | Total Income | Household Income |
| **Industry** | | | | | | | | | |
| Agriculture | 40.2 | 30.5 | 17.2 | 42.9 | 26.5 | 18.7 | 40.9 | 30.6 | 19.4 |
| Mining | 5.2 | 4.3 | 2.4 | 0.4 | 0.3 | 0.2 | 0.5 | 0.6 | 0.3 |
| Construction | 12.1 | 10.9 | 7.6 | 2.4 | 2.4 | 2.1 | 8.6 | 10.0 | 7.4 |
| Manufacturing | 2.0 | 1.4 | 0.9 | 2.7 | 2.4 | 1.8 | 29.0 | 23.1 | 15.7 |
| TCPU | 6.5 | 6.4 | 3.7 | 4.8 | 4.7 | 3.6 | 2.4 | 3.0 | 1.8 |
| Trade | 2.0 | 2.8 | 1.7 | 3.8 | 4.3 | 3.2 | 1.0 | 2.0 | 1.3 |
| FIRE | 1.3 | 1.8 | 0.9 | 2.5 | 3.1 | 2.2 | 0.5 | 1.0 | 0.5 |
| Services | 1.5 | 1.8 | 1.3 | 4.3 | 5.5 | 4.0 | 1.1 | 1.8 | 1.4 |
| Government | 12.9 | 20.1 | 14.2 | 32.1 | 44.2 | 33.9 | 6.5 | 15.1 | 11.8 |
| **Subtotal** | 83.7 | 79.9 | 49.8 | 95.8 | 93.4 | 69.7 | 90.4 | 87.0 | 59.6 |
| **Households** | | | | | | | | | |
| <$5k | 1.6 | 2.0 | 4.6 | 0.3 | 0.5 | 2.2 | 0.8 | 1.1 | 3.2 |
| $5-$10k | 1.5 | 1.8 | 4.2 | 0.3 | 0.5 | 2.2 | 0.6 | 0.8 | 2.3 |
| $10-$15k | 3.3 | 4.0 | 9.5 | 0.8 | 1.2 | 5.2 | 1.9 | 2.5 | 7.1 |
| $15-$20k | 3.2 | 4.0 | 9.4 | 0.7 | 1.1 | 4.7 | 1.6 | 2.1 | 6.2 |
| $20-$30k | 2.9 | 3.6 | 8.9 | 0.7 | 1.1 | 5.0 | 1.8 | 2.5 | 7.4 |
| $30-$40k | 1.5 | 1.9 | 5.0 | 0.5 | 0.8 | 3.8 | 1.2 | 1.6 | 5.5 |
| $40-$50k | 1.2 | 1.4 | 4.1 | 0.4 | 0.6 | 3.2 | 0.9 | 1.2 | 4.2 |
| $50-$70k | 0.7 | 0.8 | 2.4 | 0.2 | 0.4 | 2.2 | 0.5 | 0.7 | 2.6 |
| $70k+ | 0.5 | 0.6 | 2.0 | 0.2 | 0.3 | 1.9 | 0.4 | 0.5 | 2.1 |
| **Subtotal** | 16.3 | 20.1 | 50.2 | 4.2 | 6.6 | 30.3 | 9.6 | 13.0 | 40.5 |
| **Totals** | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Among the interesting findings of the analysis are those associated with the household income column and the household income classes. Reading down the household income column, only about 60 percent of household income comes from regional production activity. This is to say that only about 60 percent of regional household income comes from working within the region. The rest of the income comes from sources outside the region. These sources include Social Security payments, pension payments, non-local investment income and government transfer payments, such as commodity support payments. Few realize the significance of federal government transfer payments to household well-being.

In the area of the table representing household income classes, the share of regional economic activity associated with the receipt of non-local income is shown. Between perhaps five and 15 percent of total regional output is dependent on that income. About ten to 15 percent of all income in the region generated by regional industries is dependent on outside income transfers. And, 30 to 40 percent of total household income comes from non-local sources.

Note the differences observed across the income class groups. The larger percentages observed in the classes in the lower income classes up to about $40,000 or $50,000 suggests these are the income groups that have the largest relative impact on local economic activity. In general, the middle income groups will have the largest relative impact on regional economic well-being, followed by the lower income groups. The highest income groups will typically have a lesser relative impact. This finding is particularly relevant to rural areas where we have observed long-term trends of population out-migration and the bifurcation of the income distribution, where high income households are controlling greater shares of wealth and households tend to be clustering at the low and high ends of the income distribution (Stauber 2001).

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In general, the results across the regions confirm the importance of agriculture to the area's economy. Only in southwestern Kansas with its meat packing industry does the impact of another sector approach that of agriculture. Thus, it is appropriate to be concerned about that which threatens the region's economic base. Such is the case with the dwindling supply of irrigation water.

## Economic Impacts of Irrigation

To estimate the economic impact of irrigation and imply potential losses should it become economically unavailable, we shocked our multiplier matrix with a vector of changes in the value of production to food grains, feed grains, hay & pasture, and oil bearing crops accounts (Table 2). The value of the changes was established by first assuming that some of the irrigated acreage would go fallow were irrigation eliminated. The share of land going fallow was assumed to be 30 percent in the northwestern region counties, 33 percent in the west central region counties, and 40 percent in the southwestern region counties. On the remaining formerly-irrigated acreage, a crop regime identical to the existing dryland patterns in each county was assumed to exist. The level of production and prices for the dryland crops were established using the 1997-2001 inflation-adjusted averages (2001$). Thus, the economic shock consisted of the incremental value of irrigation, given the methods of valuation and the assumption of an alternative land use. Table 5 estimates the impacts across several dimensions of the private economy.

Reviewing the water depth and availability information presented earlier, recall that the west central region is currently at greatest risk of running out of economically available irrigation water in the relatively near-term. The northwest region is at risk in the relative mid-term, and the southwest region is at risk in the long-term. Within each of these regions, specific areas are at greater or lesser risk. For our analysis, we simply eliminated all of it. This, then, represents a gross worst-case scenario in present terms, and does not take into account any future adjustments in technologies or efficiencies, or the future value of money. While such simplifying assumptions raise legitimate questions regarding analysis validity, we believe there is relatively greater value to raising questions about potential future conditions while there remains time to make rational policy choices. The estimates are only intended to create awareness about the direction of impacts and their potential scale and scope.

Looking first at the west central region, the direct loss of value associated with irrigation was about $38.5 million annually (see Table 2). When all the direct and indirect effects are counted, the total annual loss to the economy was estimated to be about $52 million worth of output, $14 million in all types of income and about 380 jobs. While concentrated in the agricultural sector (including agricultural services where many closely-allied jobs are located), the impacts were widely spread throughout the economy to many interconnected sectors.

In northwestern Kansas, the direct reduction in output associated with irrigated agriculture was assumed to be about $71 million annually. There, total annual output declined by about $99 million, about $35 million in all type of income were lost and the number of jobs declined by about 800. The southwest has the largest irrigation values. The assumed loss was over $298 million annually. The associated impacts totaled an annual reduction of about $375 million in output, nearly $89 million in all types of income, and about 2,200 jobs were lost.

Across the entire region, if all irrigated agriculture returned to dryland farming, the potential impact could exceed one-half billion dollars in total annual output, 3,300 jobs, and nearly $140 million in all types of income lost. For perspective, this would represent a permanent annual reduction of between about two and three percent of the economy, depending whether we are considering levels of output, employment or income.

## Potential Indirect Impact of Irrigation

The analysis, thus far, has limited identification of impacts to those directly connected to pre-harvest crops production. It is known, however, that the western Kansas economy consists of a large vertically-integrated food processing system. Abundant feed grains supply livestock feedlots that in turn finish cattle for processing and shipment. An inspection of Kansas ES-202 unemployment compensation tax records for 2000 showed that there were 126 feedlots employing nearly 2,200 people and five major meat processing facilities employing over 12,000 people in the study region.

Assuming a dramatic reduction in the production of feed grains upon which this system rests, it would be reasonable to believe that at least some of this forward-linked activity also would be affected. Indeed, most analysts believe the eventual destination of much livestock production will shift north into western Nebraska where Ogallala water supplies are much more abundant. To gather some sense of the scale of this integrated system of activity, the analysis is extended to incorporate several scenarios involving the simultaneous reduction in livestock feedlot and meat packing activities.

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**Table 5**
**Estimated Direct and Indirect Annual Reductions in Regional Economic Activity Associated with Conversion to Dryland Agriculture (2003$)**

| | Total Output | Employment | Labor Income | Total Income |
|---|---|---|---|---|
| **Northwestern KS** | | | | |
| Agriculture | -77,588,456 | -539 | -7,431,122 | -23,011,876 |
| Mining | -766,822 | -4 | -80,684 | -222,752 |
| Construction | -1,025,126 | -18 | -597,307 | -656,677 |
| Manufacturing | -709,549 | -5 | -133,663 | -183,085 |
| TCPU | -3,990,814 | -28 | -979,551 | -1,699,306 |
| Trade | -7,190,840 | -122 | -3,035,378 | -4,963,307 |
| FIRE | -4,075,530 | -31 | -610,660 | -2,776,316 |
| Services | -2,964,154 | -60 | -1,344,128 | -1,615,744 |
| Government | -743,245 | -4 | -152,135 | -233,277 |
| **Totals**[1] | -99,067,926 | -813 | -14,377,997 | -35,375,709 |
| **West Central KS** | | | | |
| Agriculture | -42,240,796 | -274 | -3,002,301 | -9,117,972 |
| Mining | -233,899 | -1 | -23,113 | -64,205 |
| Construction | -231,498 | -5 | -119,319 | -133,722 |
| Manufacturing | -658,542 | -4 | -100,56 | 8-142,288 |
| TCPU | -2,484,483 | -19 | -611,660 | -1,062,577 |
| Trade | -2,937,745 | -44 | -1,239,368 | -2,028,040 |
| FIRE | -1,796,199 | -12 | -274,791 | -1,224,790 |
| Services | -1,101,771 | -23 | -465,507 | -577,308 |
| Government | -293,185 | -2 | -62,543 | -82,853 |
| **Totals**[1] | -51,987,005 | -386 | -5,908,077 | -14,442,660 |
| **Southwestern KS** | | | | |
| Agriculture | -294,002,400 | -1,300 | -14,320,903 | -42,175,356 |
| Mining | -3,769,195 | -17 | -471,270 | -1,319,774 |
| Construction | -3,631,446 | -63 | -2,060,309 | -2,297,625 |
| Manufacturing | -5,549,275 | -33 | -1,011,701 | -1,408,316 |
| TCPU | -17,389,134 | -115 | -4,400,988 | -7,764,570 |
| Trade | -21,966,712 | -323 | -9,281,238 | -15,188,591 |
| FIRE | -17,144,296 | -115 | -2,707,109 | -11,820,909 |
| Services | -11,299,731 | -193 | -4,903,190 | -6,245,681 |
| Government | -2,031,885 | -12 | -522,406 | -741,417 |
| **Totals**[1] | -376,838,273 | -2,178 | -39,733,345 | -89,016,472 |
| **Western Kansas** | -527,893,204 | -3,377 | -60,019,419 | -138,864,841 |

[1]Rows may not sum to totals due to rounding and changes in the value of regional inventories.

Because most of the feedlots and virtually all of the meat processing is located in the southwestern counties, that region was used for the impact analysis. Inclusion of the entire western Kansas region would increase the scale of the resulting impacts modestly.

In the first scenario investigated, labeled 'low impact scenario' in Table 6, we added a reduction of meat processing to the commodity production reduction in our irrigation scenario. Livestock feedlots were left unchanged. Indeed, this scenario has already occurred, when in December, 2000, the ConAgra meat processing facility in Garden City burned. The plant has been shuttered since with no indication it will ever be rebuilt. The figure most frequently cited in the local media was 2,300 jobs lost. Given that the analysis focused on the southwestern counties, the value of crop reductions

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**Table 6**
**Estimated Direct and Indirect Annual Reductions in Regional Economic Activity in Southwestern Kansas Associated with Conversion to Dryland Agriculture and Loss of Associated Feedlots and Meat Processors (2003$)**

| | Total Output | Employment | Labor Income | Total Income |
|---|---|---|---|---|
| **Low Impact Scenario** | | | | |
| Agriculture | -687,728,576 | -2,225 | -34,147,592 | -77,472,088 |
| Mining | -7,181,362 | -33 | -897,890 | -2,514,524 |
| Construction | -8,375,860 | -143 | -4,706,188 | -5,234,925 |
| Manufacturing | -932,668,288 | -2,425 | -80,548,464 | -99,769,602 |
| TCPU | -60,549,844 | -412 | -15,658,149 | -27,769,602 |
| Trade | -68,003,192 | -1,114 | -28,959,540 | -47,172,940 |
| FIRE | -56,253,692 | -316 | -9,046,196 | -38,218,936 |
| Services | -46,327,476 | -842 | -20,864,786 | -25,788,528 |
| Government | -267,259 | -42 | -1,849,195 | -2,570,940 |
| **Totals**[1] | -1,874,121,722 | -7,583 | -196,845,419 | -326,469,855 |
| **Medium Impact Scenario** | | | | |
| Agriculture | -2,122,358,656 | -5,046 | -108,793,144 | -211,379,176 |
| Mining | -14,098,276 | -65 | -1,762,709 | -4,936,446 |
| Construction | -21,400,724 | -364 | -12,087,414 | -13,395,900 |
| Manufacturing | -1,872,254,816 | -4,880 | -162,132,368 | -200,399,888 |
| TCPU | -152,674,832 | -1,061 | -39,964,604 | -71,208,464 |
| Trade | -172,089,840 | -2,872 | -73,394,152 | -119,451,600 |
| FIRE | -138,141,808 | -765 | -21,893,138 | -94,014,800 |
| Services | -120,694,880 | -2,223 | -54,906,060 | -67,333,424 |
| Government | -18,184,558 | -111 | -4,840,794 | -6,834,016 |
| **Totals**[1] | -4,652,767,558 | -17,464 | -480,370,164 | -789,646,495 |

[1]Rows may not sum to totals due to rounding and changes in the value of regional inventories.

modeled was limited to only the reductions occurring in the southwestern region.

The loss of this single facility adds substantially to the impact scenario. Total regional output declined by over $1.8 billion. Job losses exceeded 7,500 and total income declined by nearly one-third of a billion dollars. The combined loss of commodities production and this single processing facility would reduce total economic activity (output) by nearly 15 percent of total activity in the southwest.

In the moderate impact scenario, the reduction in commodity production is coupled with the loss of 40 percent of regional livestock feedlots (1,109 jobs) and two meat processing facilities (4,600 jobs). These figures are arbitrary given that we have no indication of what would actually happen as irrigation declines. The analysis method employed deducts not only the direct and indirect impacts associated with production, but also assumes the newly unemployed leave the region. Therefore, the household spending impacts associated with labor income and household income transfers also are deducted from the regional economy.

In this scenario, the value of regional economic activity declines by over $4.6 billion in output. Over 17,000 jobs are lost and total regional income declines by nearly $800 million. For perspective, this represents about 36 percent of regional output, 20 percent of employment, and 23 percent of total income in 2000.

It should be pointed out that the impact estimates are somewhat over-stated given the analysis technique employed. The analysis assumes all labor associated with the negative shock leaves the region. More realistically, many of the people affected would likely find alternative ways to make a productive living within the region. Indeed, following closure of the ConAgra facility in 2000, meat processors throughout southwestern Kansas and the lower Great Plains heavily recruited these workers. Certainly, some would have stayed. Still, some portion of the reported impact would be realized.

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## Discussion and Conclusions

In this research project, we reviewed information relating to the declining supply of underground water resources in the Ogallala Aquifer region of western Kansas. These resources currently support a highly productive irrigated crops production system which, in turn, provides the basis for a very valuable food processing industry. This crops-livestock-food processing system has in many ways helped several areas of western Kansas combat long-term trends toward the decline of Great Plains rural communities. Thus, it is hard to overstate what these resources have meant to the region.

We know, however, that current usage patterns will eventually lead to a situation where it will become economically infeasible to pump water for agricultural irrigation. The time frame wherein that will occur ranges from the relative near term to many, many years away, depending where in the region the activity is located. Nevertheless, there is considerable and justifiable concern for what it will mean to the region to lose access to this resource. This analysis attempted to provide general estimates of what the agricultural sector and irrigation in particular contribute to regional economic activity. Further, it attempted to provide preliminary estimates of what might happen should irrigated crop land be converted to a dryland cropping system.

Utilizing an economic accounting system of the region, we estimated that the overall agricultural sector is closely associated with about 40 percent of gross regional product, about 30 percent of income generated through regional production and about 20 of total household income. By most standards, this is an extraordinary level of dependence on an industry sector. It might be better were the region more economically diverse, but such things are not readily altered.

We analyzed a scenario where the incremental additional value of irrigated crops was removed from the economy. Such a scenario involved the simplifying assumption that all of the value was instantly lost. Measuring the impact, we estimated the loss to the economy to be about three percent in total regional output, two percent of employment, and two percent of household income. This translates into about $500 million in total output, 3,300 jobs, and about $140 million in regional income. These are permanent annual reductions.

These estimates may be considered conservative insofar as we did not take into consideration possible interactions with livestock production or food processing. Nearly 80 percent of the value of corn production in western Kansas is closely tied to irrigation. It's certainly possible that as livestock feed availability declines, the cost of obtaining it increases, and the cost of producing meat animals increases. This could place the region at a relative competitive disadvantage with other crops/livestock-producing regions, and the level of processing activity could stagnate or decline.

Certainly, the impacts we identified should not be interpreted as portending the demise of western Kansas communities. But, several things do become clear. The declining productivity of irrigation wells should provide individual irrigators sufficient time to adjust to altered production strategies and household income flows. Thus, the transition for individual crops producers should not be too traumatic. That will not necessarily be true for other types of business activities.

In the long-term, however, the overall economy will shrink. The gradual loss of irrigation represents the continuing squeeze on many agricultural support industries as markets for fertilizers and chemicals, well drilling and irrigation system maintenance, and grain transport and processing continue to decline. As these firms decline, regional household income also will drop, spreading the effect throughout the economy. Thus will continue the ongoing negative trends leading to the decline of many Great Plains communities.

This leaves only consideration of what might be done about the situation. One alternative is to simply allow economic forces to continue the resource withdrawal until it becomes economically infeasible to use for irrigation purposes. This strategy facilitates the economic transition. Alternately, public policy my seek to provide incentives toward resource preservation in the effort to prolong resource-dependent economic activities. But, given the reality that these resources are finite and use levels exceed replenishment (trends that seem likely to continue), the transition is only delayed and not averted. And, whether the costs of preservation policies yields a net societal benefit is an open question.

Even while such debate may continue, one thing remains certain. Change for many western Kansas communities is inevitable. While opportunity yet remains, those communities might be advised to prepare. Among the few alternative within local control are to aggressively pursue strategies of economic investment and diversification. Obviously, this point is not lost on local leaders and such a solution defies easy remedy. Still, leaders should maintain their sense of urgency in their efforts to foster new opportunities for regional economic growth.

### Notes

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15-15

**Responses to the Joint Committee on Energy & Environmental Policy Regarding the Water Rights Conservation Program**

Kansas Department of Agriculture
Division of Water Resources
November 8, 2010

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**Executive Summary:**

- The Water Rights Conservation Program (WRCP) is one of about a dozen due and sufficient causes for nonuse to prevent abandonment of a water right.
- New enrollments in the program were discontinued in 2009 due to budget cuts.
- More than 900 water rights remain enrolled in WRCP for the remainder of their contracts, up to 10 years.
- Most enrollments are groundwater irrigation water rights in Western Kansas GMD 1 and Southwest Kansas GMD 3.
- Many, if not most, of those water rights would be protected from abandonment by other due and sufficient causes for nonuse, including the closed areas provision enacted in SB 316.
- Any reinstatement of a WRCP-like program should provide for funding and enrollments must be limited in duration and non-renewable to be consistent with the Water Appropriation Act.
- In evaluating WRCP, we determined an alternate approach would be better. The conservation use water right proposed in SB 510 provides added value and flexibility for water right owners and has the potential to conserve more water for future use.
- Under conservation use, a water right owner would not have to divert water to avoid losing the water right. This would conserve water for future use within the legal framework for water rights rather than through an exception such as WRCP.
- Conservation use would not promote "water hoarding." Under existing law, entities can acquire additional water rights for growth and future uses, such as Sunflower Electric has done to plan for their new generating unit at Holcomb.
- Only existing, perfected (vested or certified) water rights would be eligible to change to conservation use, so concerns about speculative appropriation of water in "open" areas are unfounded.

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**Detailed Responses:**

In a November 3, 2010 email, Heather O'Hara of Kansas Legislative Research Department requested the following information on behalf of the Committee:

- A description of how WRCP is used.
- Maps illustrating WRCP participation.
- Responses to concerns about WRCP expansion and SB 510 provisions.

Our response is organized to correspond with the three main issues in the request that form the headings below.

1. A description of how WRCP is used

   The Water Rights Conservation Program was adopted in Kansas administrative regulation K.A.R. 5-7-4 (attached) effective July 1, 1994, and amended twice, effective September 22, 2000, and December 28, 2009.

   WRCP established a system of contracts between water right owners and the chief engineer in which the water right owner agreed to suspend water use for a definite length of time, from five to 10 consecutive years. In exchange, WRCP constituted due and sufficient cause for nonuse of a water right per K.A.R. 5-7-1 (attached), preventing forfeiture of the water right by abandonment.

   WRCP was not limited to areas closed to new water appropriations but includes areas "designated by the chief engineer as an area where it would be in the public interest to allow water rights to be placed in the WRCP" (K.A.R. 5-7-4). A number of water rights in other designated areas were enrolled in the program. This includes areas that are not closed but are fully appropriated.

   The WRCP regulation is authorized under the Kansas Water Appropriation Act's general authority of the chief engineer to adopt rules regulations and standards (K.S.A. 82a-706a). The WRCP regulation contributed to implementing the chief engineer's general duty to conserve water (K.S.A. 82a-706) and abandoning water rights after five consecutive years of nonuse without due and sufficient cause (K.S.A. 82a-718).

   However, there is no specific statutory authorization or requirement for a water rights conservation program.

   In 2008, the Legislative Division of Post Audit required KDA and other administrative agencies to identify program areas not specifically required by statute. This was part of a process to identify potential cost reductions to accommodate substantially reduced state revenues during a global economic recession.

   WRCP was one of such program areas identified by KDA, as it is not required by statute.



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Subsequently, KDA and other administrative agencies had to make rounds of budget cuts. WRCP was a program area essentially discontinued by KDA as a result of these budget cuts.

This was implemented through the December 28, 2009, amendments to the WRCP regulation, K.A.R. 5-7-4. These amendments stated that applications for enrollment WRCP would not be accepted after December 31, 2009.

However, previously executed WRCP contracts continue to be honored for the remainder of the contract term.

As of November 6, 2009, there were a total of 996 water rights enrolled in WRCP – about 3 percent of all active water rights in the state. The vast majority of enrolled water rights were for irrigation use, with several municipal, industrial, thermal exchange, stockwater and recreation water rights also enrolled. A large majority of enrolled water rights were in GMD 1 and GMD 3. The total authorized quantity of the enrolled water rights was 266,409 acre-feet.

As of November 5, 2010, a total of 962 water rights remain enrolled in WRCP, with the same type and geographic distribution as in November 2009. Some contracts expired during the past year. The total authorized quantity of the enrolled water rights is 255,888 acre-feet.

The total authorized quantity is not an accurate measure of how much water is conserved through WRCP. Many or most of the water rights enrolled in WRCP have wells with substantially reduced yields due to groundwater depletion or other reasons. These water rights are physically unable to divert their authorized quantity.

Also, some of the water rights enrolled in WRCP, particularly many of the municipally owned water rights enrolled, could be covered by other due and sufficient causes for nonuse, such as the standby well or physical problems provisions in K.A.R. 5-7-1.

Hundreds of water rights were re-enrolled in WRCP many times. When new WRCP enrollments were discontinued for budget reasons, DWR staff were already considering whether to cap the number of re-enrollments in WRCP because indefinite re-enrollments is inconsistent with the nonpermanent nature of other due and sufficient causes for nonuse of a water right.

Any re-instatement of a WRCP-like program should include both a fee structure and make clear that the program is limited in duration and non-renewable.

This concern was part of the genesis for the conservation use water right concept in SB 510. Rather than rely on an increasing number of exceptions to the Kansas Water Appropriation Act (due and sufficient cause for nonuse), it reframes conservation for future use of water as an affirmative action by a water right owner to change the water right's authorized use. This places conservation use on equal footing with other water rights and better protects the owner's property interests.

The initial reason to discontinue WRCP was based on a Legislative Post Audit report that identified agency functions that could be eliminated, or functions that cost money but are not required by statute. Staff had to perform a time-intensive status review of each water right considered for WRCP to determine if the water right was in good standing. The estimated annual cost to the agency was in the range of $25,000 to $50,000 per year to administer WRCP. KDA sought a fee increase in 2008 to cover the cost of the program by charging $20 per year of enrollment. The Legislature did not act on the proposed fee increase.

Lack of funding for WRCP was also part of the concept for conservation use water rights, as there is an established regulatory process and statutory fees for water right changes, and these fees cover a higher percentage of the agency's processing costs than the WRCP fees.

2. Maps illustrating WRCP participation

   Attached are maps illustrating the locations, types and numbers of WRCP-enrolled water rights as of November 2009 and November 2010.

   As previously noted, most of the water rights enrolled in WRCP are irrigation rights (932 of 962, or 97 percent of the total).

   Three-quarters of the water rights in WRCP are located in Western Kansas GMD 1 and Southwest Kansas GMD 3.

3. Responses to concerns about WRCP expansion and SB 510 provisions

   **WRCP Expansion/Concerns:**

   As noted above, the Legislative Post Audit report and budget cuts were the main reasons for discontinuing the Water Rights Conservation Program. However, other concerns



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about WRCP included the lack of a legislative mandate, lack of adequate funding, and the possibility that its ongoing administration through renewals may have been inconsistent with the Kansas Water Appropriation Act.

We recommend that any re-instatement of a WRCP-like program should both include adequate funding and enrollments should be limited in duration and non-renewable.

**SB 510/Conservation Use:**

We have heard several concerns about the conservation use water right concept in SB 510. Our responses to these concerns are:

a) Hoarding water: Establishing conservation use as a beneficial use of water will not create water hoarding opportunities. Opportunities already exist for individuals or entities that are able to acquire water rights for future uses. It is not normally considered hoarding, but rather prudent planning. For example, Sunflower Electric (through its subsidiary Wheatland Electric) acquired dozens of irrigation water rights with a plan to one day convert those to industrial use for operating the proposed new generating unit in Holcomb. A number of public water suppliers have taken similar steps. The only difference if conservation use is established will be the water rights acquired for future use will not have to be pumped during the interim to avoid abandonment.

b) Blocking new diversion uses in open areas: The proposed conservation use water right will not permit speculators to tie up unallocated water. Only established water rights that are vested (pre-1945) or certified (post-1945) will be allowed to convert to conservation use. There will be no new permits issued for conservation use. In addition to preventing speculation, this is necessary because there does not seem to be a good way to quantify reasonable needs or to perfect a new conservation use water right. Instead, only water rights perfected for other beneficial uses will be eligible for conversion to conservation use.

c) Future changes from conservation: Conservation use water rights will be subject to the same statutes and regulations that govern changes from any beneficial use to another beneficial use, except some new regulations will have to be developed to address the unique circumstances of conservation use water rights, just as there are specific regulations to address certain other types of beneficial uses. In processing a change to a conservation use water right, the water right will revert to the prior beneficial use before it was changed to conservation use and it will be then be processed accordingly. For example, if an irrigation water right is



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converted to conservation use, then later the owner applies to convert it to industrial use, the change will be processed under the regulations governing changes from irrigation use to industrial use.

d) Effect on juniors, if a nearby senior returns to diversion use: The Kansas Water Appropriation Act establishes a prior appropriation system in which water rights have relative seniority. Newer water rights are "junior" to older, "senior" water rights. In areas of the state where water rights were permitted under safe yield rules, the quantities allocated to senior rights were already "on the books" when the amount available to junior rights were computed and allocated, so junior rights should be unharmed if a senior right stops diverting for a time then begins diverting again in the future. In overappropriated areas of the state, the effect of a senior right resuming diversion might have more noticeable effects due to declining water supplies. In either case, under Kansas law "first in time is first in right," unless the senior right's point of diversion is moved closer to a junior right and causes impairment. Also, well-spacing rules and other measures are in place to minimize the chances of significant interference between wells.

**K.A.R. 5-7-1. Due and sufficient cause for nonuse.** (a) Each of the following circumstances shall be considered "due and sufficient cause," as used in K.S.A. 82a-718, and amendments thereto:

(1) Adequate moisture from natural precipitation exists for the production of grain, forage, or specialty crops, as determined by the moisture requirements of the specific crop.

(2) A right has been established or is in the process of being perfected for use of water from one or more preferred sources in which a supply is available currently but is likely to be depleted during periods of drought.

(3) Water is not available from the source of water supply for the authorized use at times needed.

(4) Water use is temporarily discontinued by the owner for a definite period of time to permit soil, moisture, and water conservation, as documented by any of the following:

(A) Furnishing to the chief engineer a copy of a contract showing that land that has been lawfully irrigated with a water right that has not been abandoned is enrolled in a multiyear federal or state conservation program that has been approved by the chief engineer;

(B) enrolling the water right in the water right conservation program in accordance with K.A.R. 5-7-4; or

(C) any other method acceptable to the chief engineer that can be adequately documented by the owner before the nonuse takes place.

(5) Management and conservation practices are being applied that require the use of less water than authorized. If a conservation plan has been required by the chief engineer, the management and conservation practices used shall be consistent with the conservation plan approved by the chief engineer to qualify under this subsection.

(6) The chief engineer has previously approved the placement of the point of diversion in a standby status in accordance with K.A.R. 5-1-2.

(7) Physical problems exist with the point of diversion, distribution system, place of use, or the operator. This circumstance shall constitute due and sufficient cause only for a period of time reasonable to correct the problem.

(8) Conditions exist beyond the control of the owner that prevent access to the authorized place of use or point of diversion, as long as the owner is taking reasonable affirmative action to gain access.

(9) An alternate source of water supply was not needed and was not used because the primary source of supply was adequate to supply the needs of the water right owner.

(10) The chief engineer determines that a manifest injustice would result if the water right were deemed abandoned under the circumstances of the case.

(11) The water right is located in an area of the state that is closed to new appropriations of water by regulation or order of the chief engineer but is not closed by a safeyield analysis.

(b) In addition to circumstances considered due and sufficient cause pursuant to subsection (a), both of the following requirements shall also be met to constitute due and sufficient cause for nonuse of water:

(1) The reason purporting to constitute due and sufficient cause shall have in fact prevented, or made unnecessary, the authorized beneficial use of water.

(2) Except for the temporarily discontinued use of water as provided by paragraph (a)(4) and for physical problems with the point of diversion or distribution system as provided by paragraph (a)(7), the owner shall maintain the diversion works in a functional condition.

(c) Each year of nonuse for which the chief engineer finds that due and sufficient cause exists shall be considered to interrupt the successive years of nonuse for which due and sufficient cause does not exist.

(d) When a verified report of the chief engineer, or the chief engineer's authorized representative, is made a matter of record at a hearing held pursuant to K.S.A. 82a-718, and amendments thereto, that establishes nonuse of a water right for five or more successive years, the water right owner shall have the burden of showing that there have not been five or more successive years of nonuse without due and sufficient cause. (Authorized by K.S.A. 82a-706a; implementing K.S.A. 82a-706a and K.S.A. 2009 Supp. 82a-718; modified, L. 1978, ch. 460, May 1, 1978; amended May 1, 1986; amended May 31, 1994; amended Oct. 24, 2003; amended May 21, 2010.)

**K.A.R. 5-7-2. Waiver of hearing**. The owner of a water right may waive any hearing on the questions of abandonment and termination of such right by letter to the chief engineer requesting that it be terminated and its priority forfeited. In the event of such waiver the chief engineer shall cause the termination and forfeiture of priority date to be made a matter of record in his office and shall notify the owner of the water right of his or her action by regular mail. (Authorized by K.S.A. 82a-706a; modified, L. 1978 ch. 460, May 1, 1978.)

**K.A.R. 5-7-4. Water rights conservation program**. (a) Applications for enrollment in the water rights conservation program (WRCP) shall not be accepted after December 31, 2009. Applications received on or before December 31, 2009, shall be considered for enrollment in the program. Enrollment in the WRCP approved by the chief engineer and continued compliance with the WRCP shall constitute due and sufficient cause for nonuse pursuant to K.S.A. 82a-718, and amendments thereto, and K.A.R. 5-7-1.

(b) In order to qualify for enrollment in the WRCP, all of the following requirements and conditions shall be met:

(1) The point of diversion shall be located in either of the following locations:

(A) In an area that is closed to new appropriations of water, except for temporary permits, term permits, and domestic use; or

(B) in some other area designated by the chief engineer as an area where it would be in the public interest to allow water rights to be placed in the WRCP. In areas within the boundaries of a groundwater management district, the recommendations of the board of the district shall be taken into consideration by the chief engineer.

(2) Each of the owners of the water right shall agree to totally suspend all water use authorized by that water right for the duration of the contract.

(3) The owner or owners of the water right shall sign a contract with the chief engineer, or the chief engineer's authorized representative, before placing the water right into the WRCP. The contract shall be binding on all successors in interest to the water right owner.

(4) Only an entire water right may be placed into the WRCP. If a portion of a water right has been abandoned, the portion that is still in good standing may be enrolled in the WRCP. If a water right is administratively divided by the chief engineer, each portion of a formally divided water right shall be considered to be an entire water right for the purpose of this regulation.

(A) If at least five successive years of nonuse have occurred before application for enrollment in the WRCP, a determination of whether or not that water right is subject to abandonment before entry into the program, including an analysis of any reasons given that might constitute due and sufficient cause for nonuse, shall be made by the chief engineer.

(B) If, after review of the information, it appears that the right has been abandoned, the statutory procedures, including the right to a hearing, shall be followed to determine whether or not the right has been abandoned.

(5) Only the portion of a water right in good standing at the time of application for enrollment may be entered into the WRCP.

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(c) Other requirements of enrollment in the WRCP program shall include the following:

(1) Water rights shall be placed into the WRCP for a definite period of calendar years of no fewer than five and no more than 10.

Each WRCP contract shall terminate upon expiration of the time period specified in the contract.

(2) The water right owner or operator shall not be required to maintain the diversion works or delivery system during the period of the WRCP contract. If the pump is removed from a well, the well shall be properly capped or sealed during the contract. These requirements shall be in addition to those made by the Kansas department of health and environment pursuant to the groundwater exploration and protection act, K.S.A. 82a-1201 et seq., and amendments thereto.

(3) A certificate determining the extent to which a water right has been perfected shall be issued by the chief engineer before entering the water right into the WRCP if all of the following conditions are met:

(A) An applicant has a permit to appropriate water for beneficial use and has perfected all, or any portion, of the water right authorized by the permit.

(B) The time in which to perfect the water right has expired, including any authorized extensions of time.

(C) A field inspection has been completed.

(4) If the time to perfect the water right, or any authorized extension of that right, has not expired, enrollment in the WRCP shall be considered as suspending the time to perfect. Upon expiration of the WRCP contract pertaining to this water right, the time to perfect shall again commence, and the applicant shall be required to perfect the water right within the remainder of the time allowed to perfect, or any authorized extension of that time.

(5) Each year after authorized enrollment in the WRCP, the water use correspondent shall indicate on the water use report that no water was used because the water right was enrolled in the WRCP.

(6) If the owner breaches, or causes or allows a breach of, the WRCP contract with the chief engineer, each year of nonuse between the effective date of the contract and the date of the breach shall be counted as years of nonuse without due and sufficient cause for the purpose of determining whether or not the water right has been abandoned pursuant to K.S.A. 82a-718, and amendments thereto. Before this penalty is imposed, the owner shall be given an opportunity to show either of the following:

(A) A breach of contract did not occur.

(B) A breach occurred, but either was minor or has been cured, and should not constitute grounds for imposing the penalty. (Authorized by K.S.A. 82a-706a; implementing K.S.A. 82a-706, K.S.A. 82a-713, K.S.A. 2008 Supp. 82a-714, as amended by L. 2009, Ch. 51, § 4, and K.S.A. 2008 Supp. 82a-718; effective July 1, 1994; amended Sept. 22, 2000; amended Dec. 28, 2009.)

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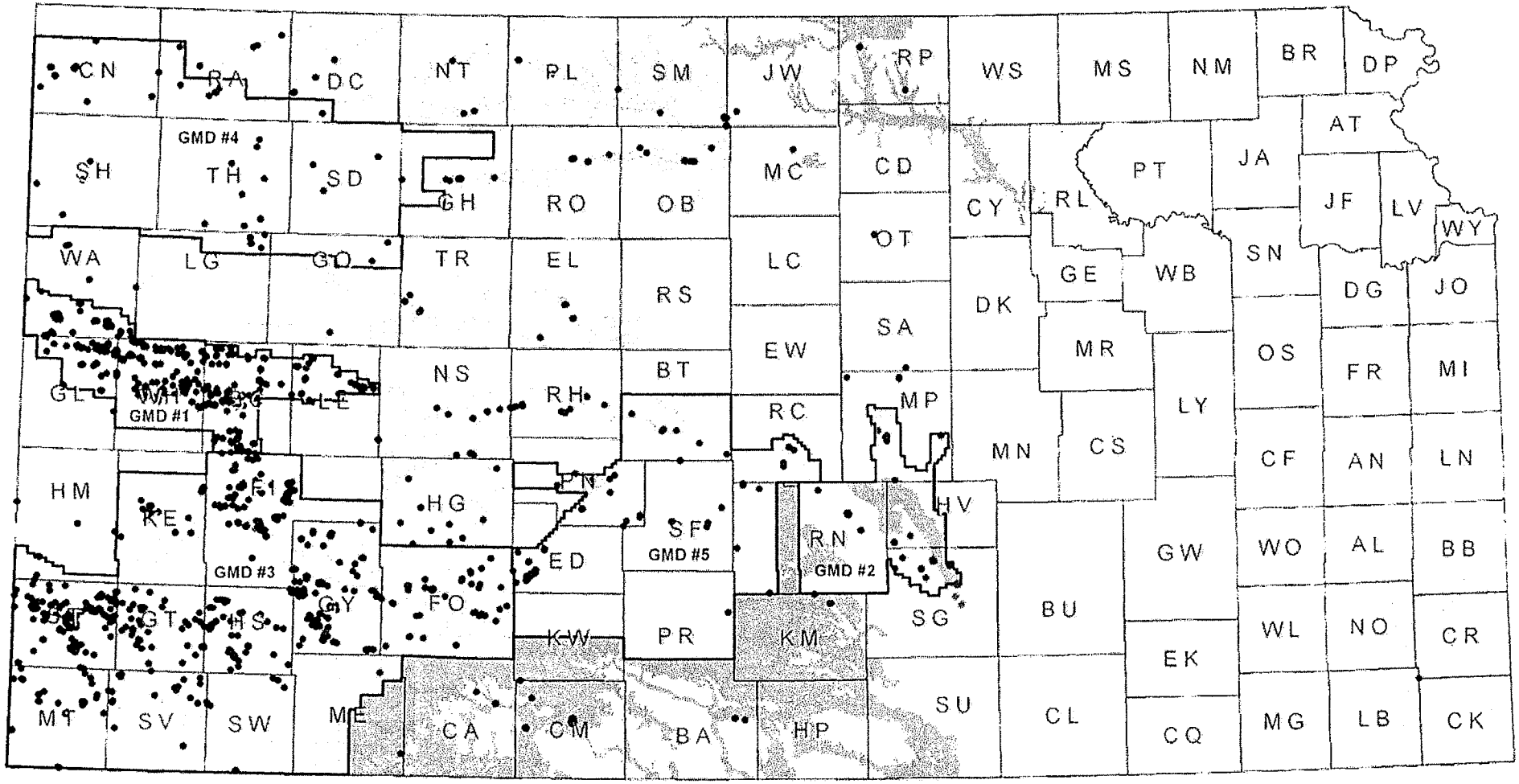
# Water Rights Enrolled in WRCP

16.13



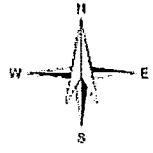

*Kansas Department of Agriculture*
*Administrative Services, GIS*
*November 6, 2009*

Legend

- Industrial Pds
- Irrigation Pds
- Municipal Pds
- Recreation Pds
- Stockwater Pds
- Thermal Exchange Pds

Closed

Restricted



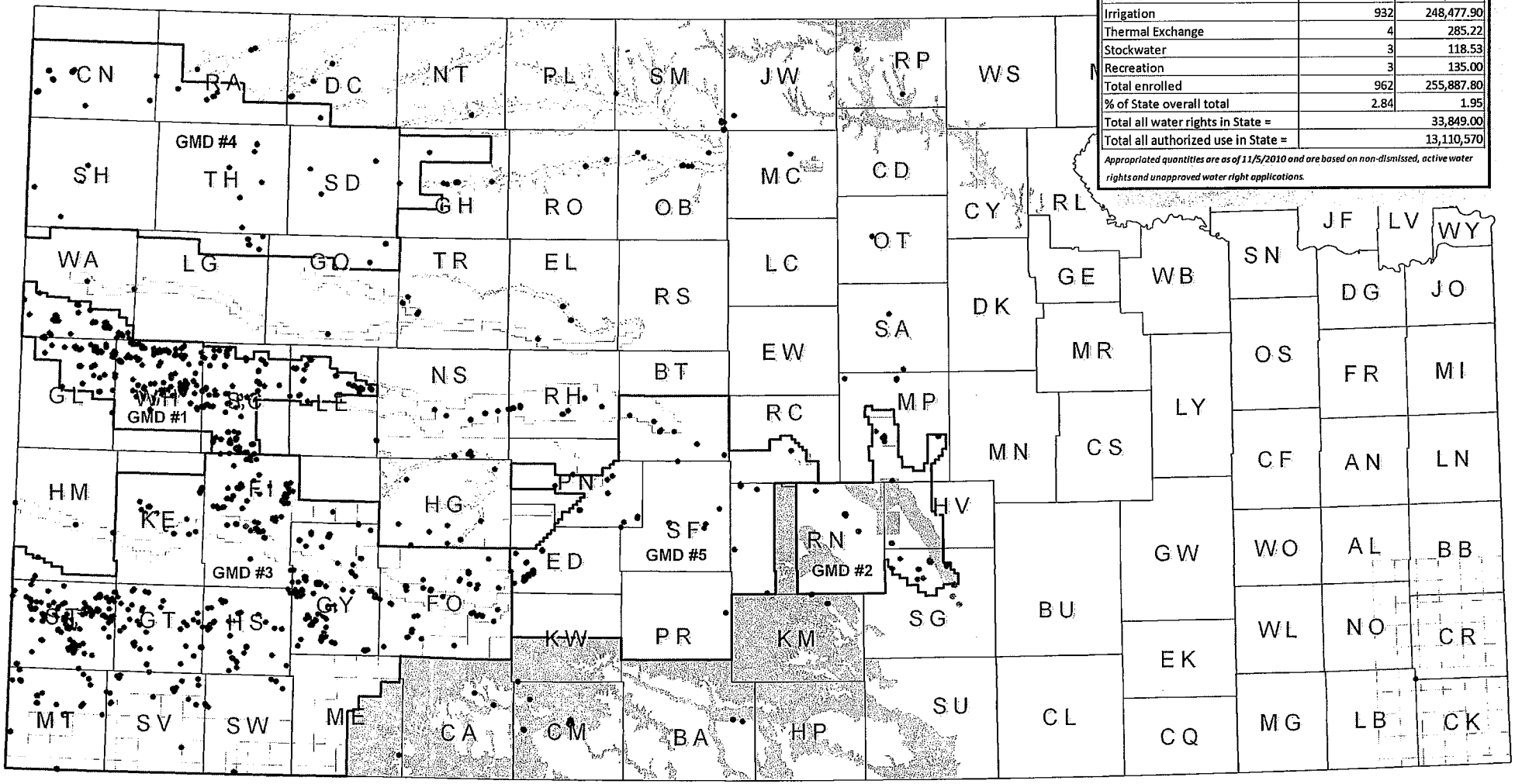

State

| Authorized use | # of WRCP-enrolled water rights | Authorized quantity (AF) |
|---|---|---|
| Municipal | 14 | 1,490.65 |
| Industrial | 10 | 5,527.61 |
| Irrigation | 962 | 258,852.02 |
| Thermal Exchange | 4 | 285.22 |
| Stockwater | 3 | 118.53 |
| Recreation | 3 | 135.00 |
| Total enrolled | 996 | 266,409.03 |
| % of State overall total | 2.97 | 2.00 |
| Total all water rights in State = | | 33,581.00 |
| Total all authorized use in State = | | 13,300,510 |

# Water Rights Enrolled in WRCP

| Authorized use | # of WRCP-enrolled water rights | Authorized quantity (AF) |
|---|---|---|
| Municipal | 11 | 1,343.16 |
| Industrial | 9 | 5,527.99 |
| Irrigation | 932 | 248,477.90 |
| Thermal Exchange | 4 | 285.22 |
| Stockwater | 3 | 118.53 |
| Recreation | 3 | 135.00 |
| Total enrolled | 962 | 255,887.80 |
| % of State overall total | 2.84 | 1.95 |
| Total all water rights in State = | | 33,849.00 |
| Total all authorized use in State = | | 13,110,570 |

*Appropriated quantities are as of 11/5/2010 and are based on non-dismissed, active water rights and unapproved water right applications.*




*Kansas Department of Agriculture*
*Administrative Services, GIS*
*November 5, 2010*

Legend

- Industrial Pds
- Municipal Pds
- Stockwater Pds
- Irrigation Pds
- Recreation Pds
- Thermal Exchange Pds
- Closed
- Restricted