

## SESSION 5: Brazos River Authority – Morris Sheppard Dam

**Mike Ittis & Daryl Spiewak**

**Brazos River Authority**



**Brazos River Authority**

**MORRIS SHEPPARD DAM**

**AT**

**POSSUM KINGDOM LAKE**

**Brazos River Authority**



## Brazos River Authority

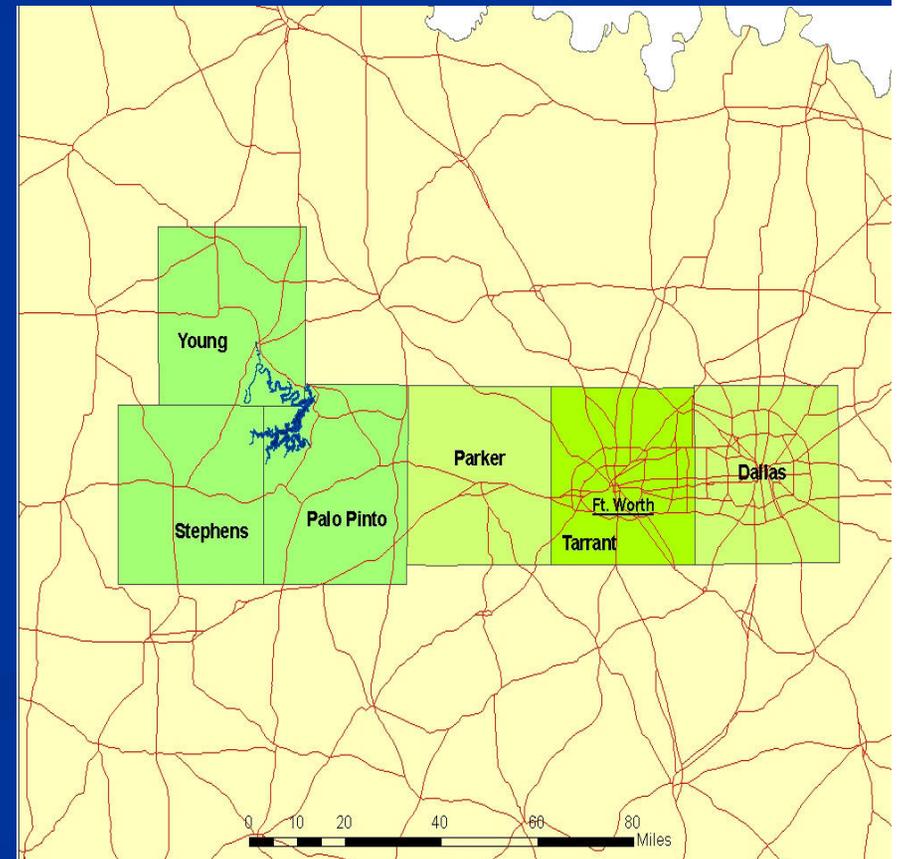
- What the heck is Possum Kingdom?
- A little about the Dam
- Significant events
- Dedication to security
- Questions



## Brazos River Authority

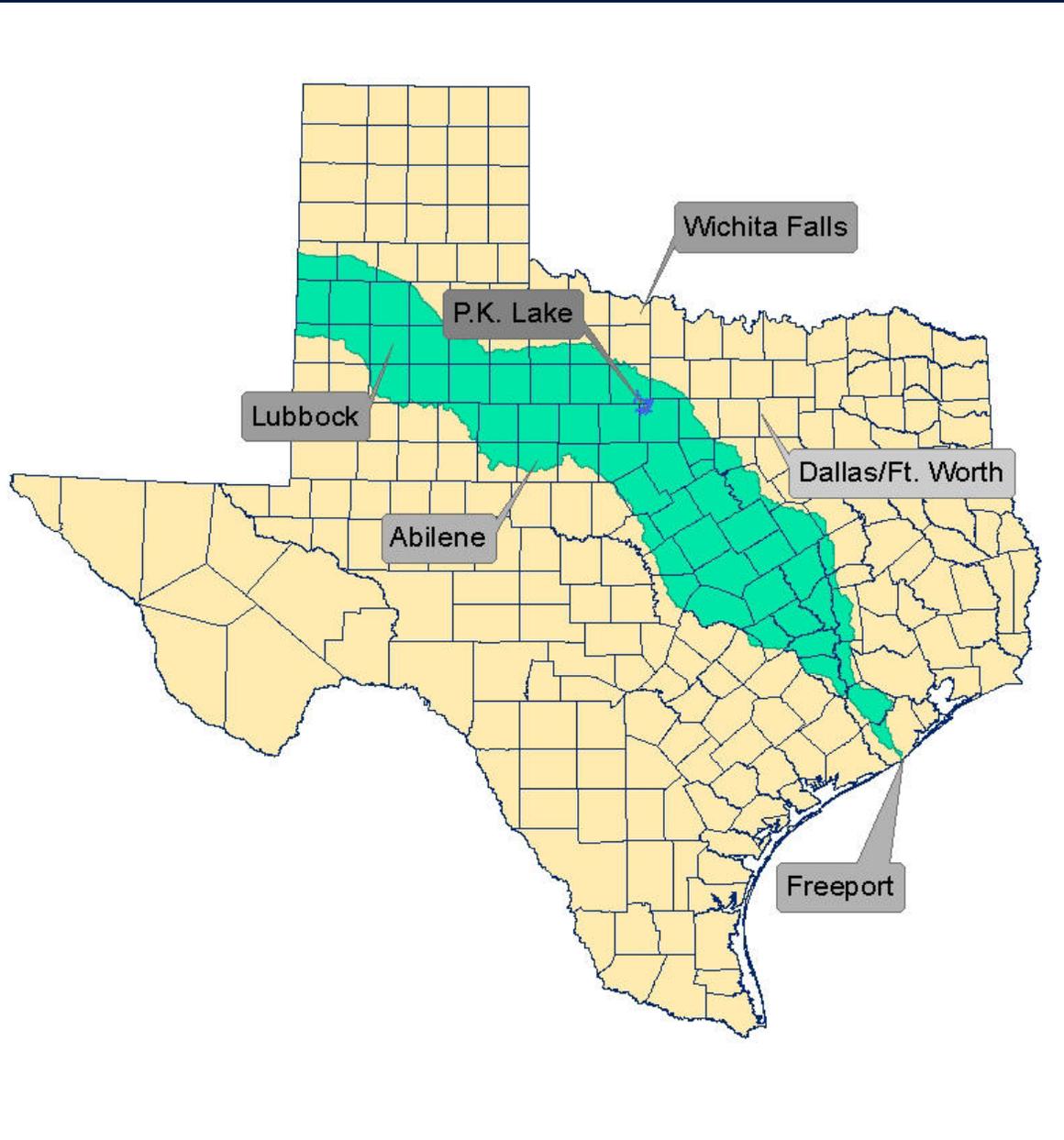
# WHAT THE HECK IS POSSUM KINGDOM??

- Water conservation reservoir/hydro facility operated by Brazos River Authority
- 80 miles west of Fort Worth, Texas
- Contained within three counties
  - Palo Pinto
  - Young
  - Stephens
- Mid-way in Upper Basin of Brazos





## Brazos River Authority





## Brazos River Authority

# ALL ABOUT POSSUM KINGDOM LAKE

- Born in 1941
- 310 miles of shoreline
- Over 550,000 acre feet
- Lake covers 17,000 acres
- Over 14,000 acres of adjacent land
- 4,000 private boat docks
- 13 Public Marinas
- 1,600 leased properties
- Powerhouse with two, 12 Megawatt generators





## Brazos River Authority

### ORGANIZATIONAL STRUCTURE AND FUNDING

- “Quasi-State” Organization
- 21 Directors appointed by Texas Governor
- GM/CEO
- Sale of Water and Electricity - - No tax dollars



## Brazos River Authority

### WORK FORCE INCLUDES . . .

- Nine Texas Peace Officers
- Multi-skilled
  - Marine safety certified
  - Scuba certified
  - Lifeguard certified
  - Boat accident investigators
  - Multiple weapons certification

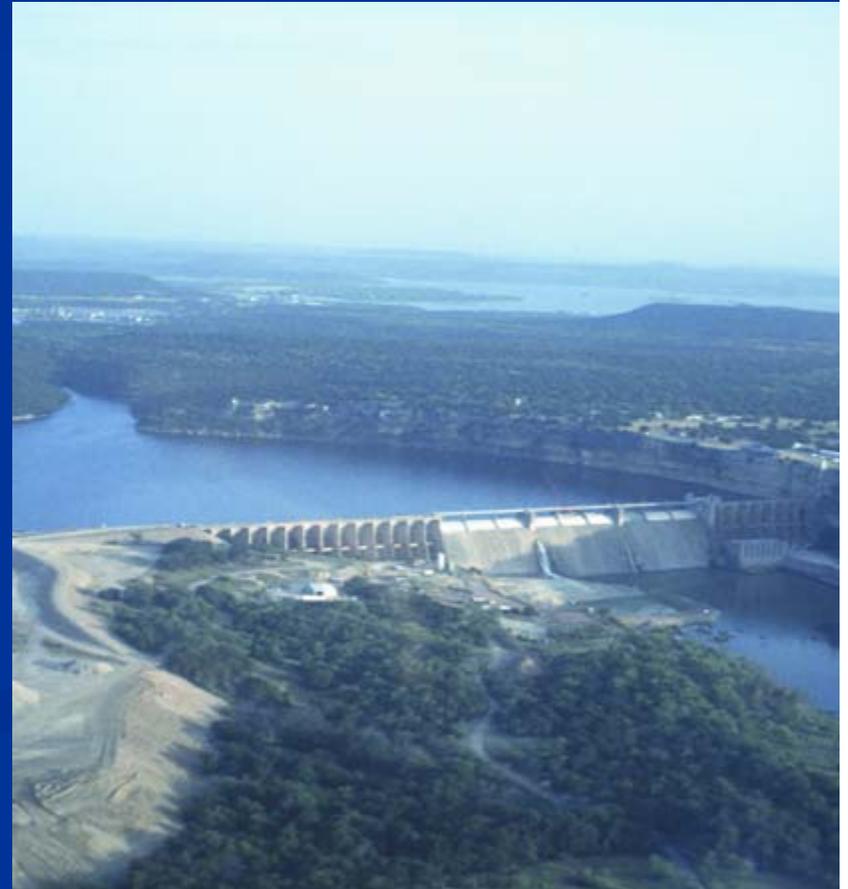




## Brazos River Authority

### A LITTLE ABOUT THE DAM

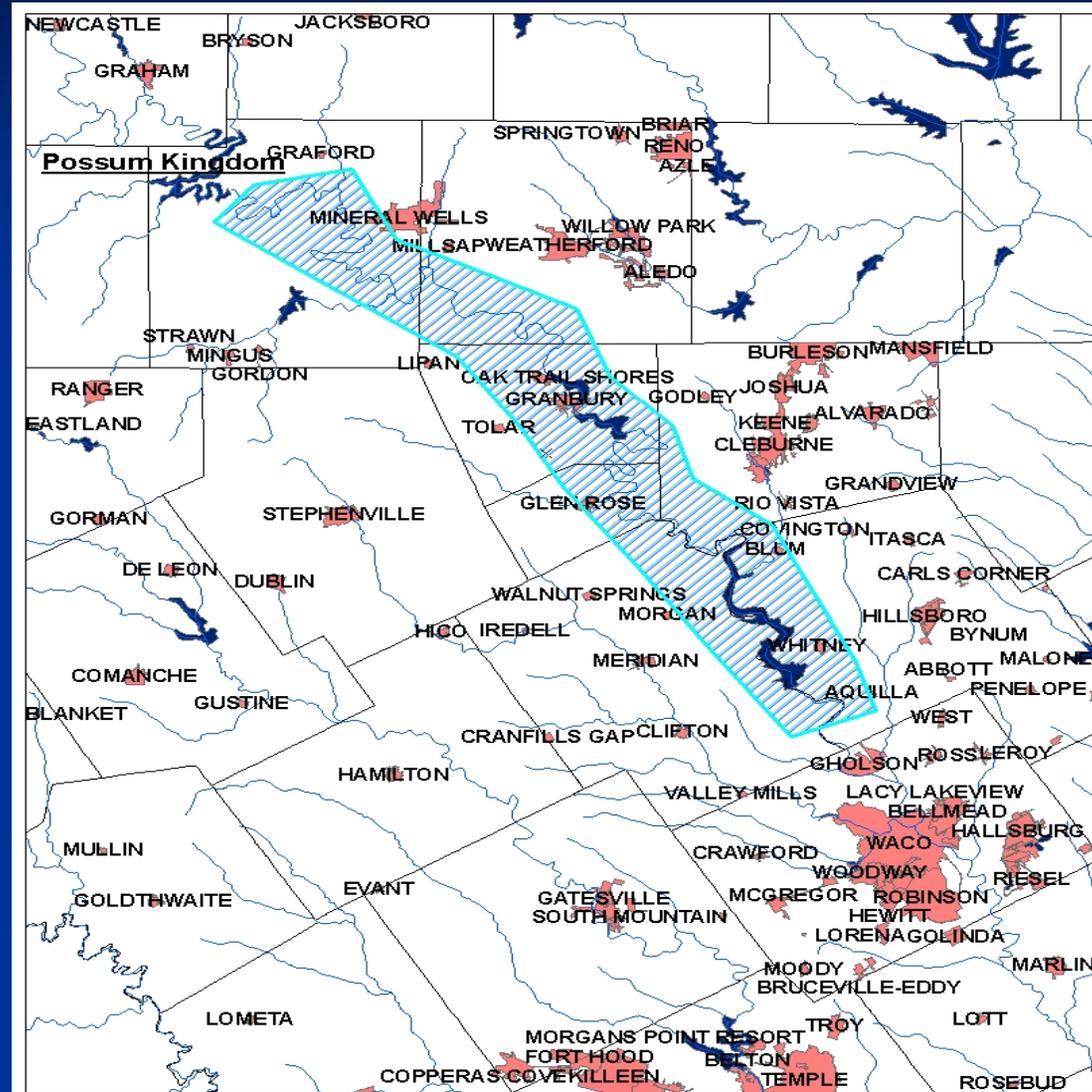
- Flat slab, massive buttress, hollow Core dam
  - Nine manually operated spillway gates
  - 40 buttresses
  - four operating piers
- Works Progress Administration project
- 1940s vintage powerhouse





## Brazos River Authority

# FAILURE IMPACT





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## SIGNIFICANT EVENTS

### FOUR INCH DAM DISPLACEMENT

- 1987, the dam “moved”
- Immediate actions
- Long term fix - - add weight
- Drilled “tunnel” to deliver concrete
- Ongoing movement survey

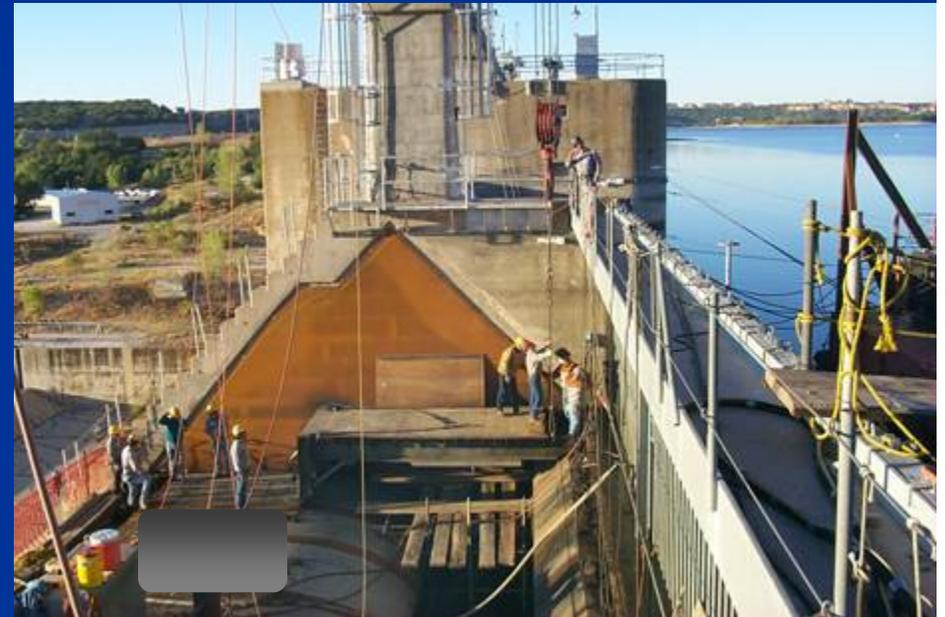




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## **SIGNIFICANT EVENTS GATE REHABILITATION**

- High chloride content in water
- Significant corrosion
- Numerous attempts to repair
- Gate failure – 1994
- Replacement the answer
- On-going 12-year process
- Routine maintenance program





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## **SIGNIFICANT EVENTS**

### **DAM/POWERHOUSE REHABILITATION**



Gate roller channel (supports the locking bar and gate roller)

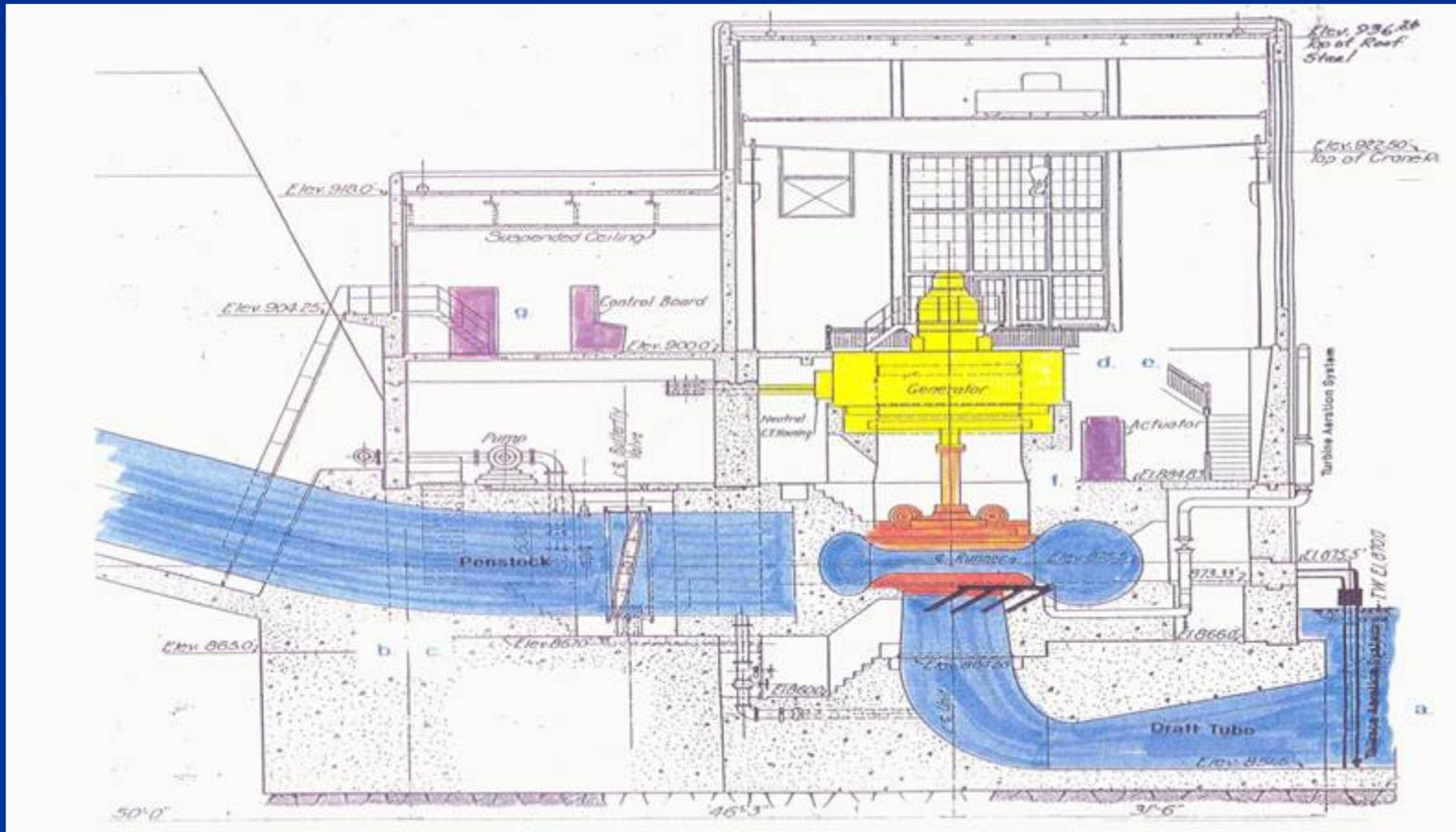


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## SIGNIFICANT EVENTS

# DAM/POWERHOUSE REHABILITATION

- Chlorides strike again





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## **SIGNIFICANT EVENTS**

### **DAM/POWERHOUSE REHABILITATION**

– **Impact on concrete**





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## **SIGNIFICANT EVENTS**

### **DAM/POWERHOUSE REHABILITATION**

– 1940 Powerhouse architecture





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## DEDICATION TO SECURITY

### BEGINS AT THE TOP

- Direction from the Governor “. . . *We must take every measure necessary to protect our water supply from sabotage*”





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## **DEDICATION TO SECURITY**

### **BEGINS AT THE TOP**

- **Board of Directors Security Committee**



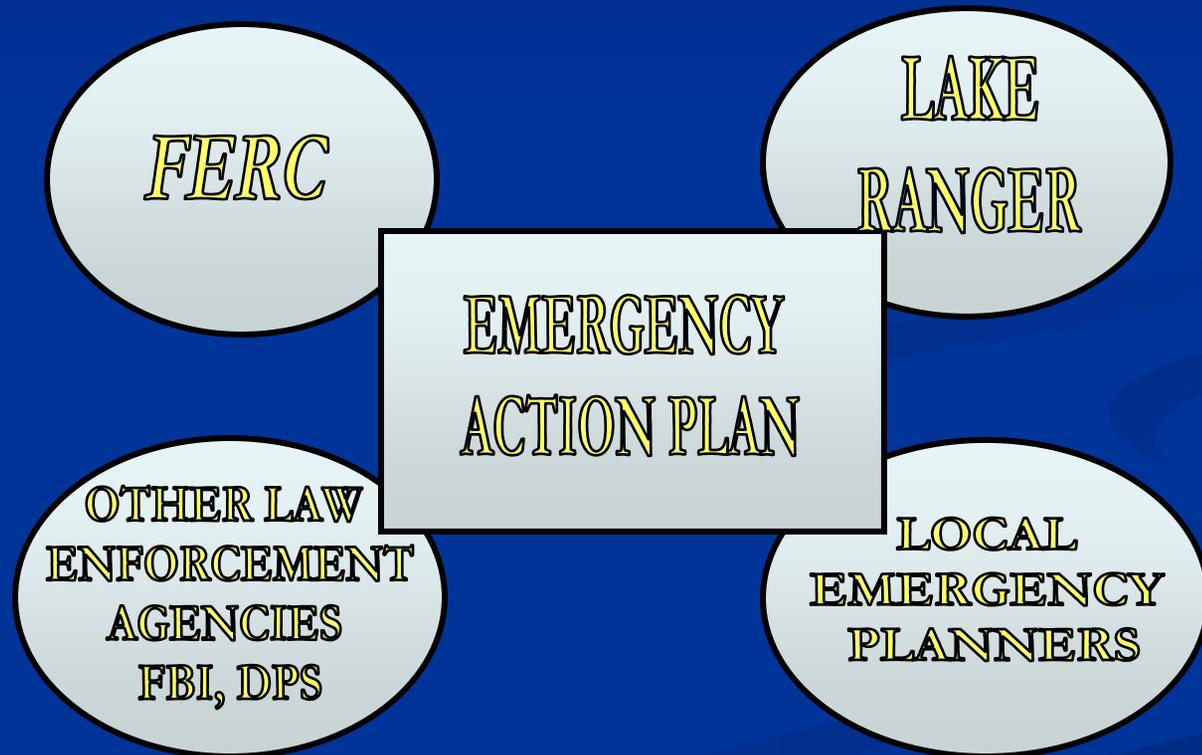
- **General Manager/CEO**  
**Security Council**



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DEDICATION TO SECURITY

REQUIRES COORDINATION/COMMUNICATION





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**DEDICATION TO SECURITY  
BASED ON A SECURITY SYSTEM**

- Assumptions
  - Pre-event surveillance
  - Threat is real





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## **DEDICATION TO SECURITY**

### **BASED ON A SECURITY SYSTEM (Continued)**

#### **FIVE ELEMENTS**

- Employee/Community Awareness
- Surveillance
  - Electronic/Human
  - Human
- Physical Security
- Interdiction
- Unpredictable Security Patterns



## Brazos River Authority

# DEDICATION TO SECURITY

## BASED ON A SECURITY SYSTEM (Continued)

### EMPLOYEE/COMMUNITY AWARENESS

- Neighborhood watch program



- Must Communicate the “threat exists”
  - Lower Colorado River Authority
  - Glen Rose
  - Unusual surveillance at Possum Kingdom
- Difficult to sustain over time
- Visible program



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## **DEDICATION TO SECURITY**

### **BASED ON A SECURITY SYSTEM (Continued)**

#### **SURVEILLANCE**

— Human



— Electronic





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## **DEDICATION TO SECURITY**

### **BASED ON A SECURITY SYSTEM (Continued)**

#### **PHYSICAL SECURITY**

- Based on vulnerability and threat assessments
- Common sense approach
- Mindful of “weak links”





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# DEDICATION TO SECURITY

BASED ON A SECURITY SYSTEM (Continued)

## INTERDICTION



6/28/2004 9:09am



6/28/2004 10:14am





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**DEDICATION TO SECURITY**

**BASED ON A SECURITY SYSTEM (Continued)**

**UNPREDICTABLE SECURITY PATTERNS**

**RANDOM**

**ANTI-TERRORIST**

**MEASURES**

**RAMS**



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# **QUESTIONS**



# SECURITY and the EAP

for

MORRIS SHEPARD DAM,  
POSSUM KINGDOM LAKE

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# Procedure

- Security Program
- Emergency Planning
- Emergency Action Plan

# Security Program

## ■ PURPOSE

- Prevent successful completion of a malevolent action against the facility

# Security Program

## ■ PROGRAM COMPONENTS

■ Deter

■ Detect

■ Delay

■ Respond

**FBI** Advisory

If you receive a suspicious letter or package  
**What should you do?**

- 1 **Handle with care**  
Don't shake or bump
- 2 **Isolate and look for indicators**
- 3 **Don't Open, Smell or Taste**
- 4 **Treat it as Suspect!**  
Call 911

**If parcel is open and/or a threat is identified...**

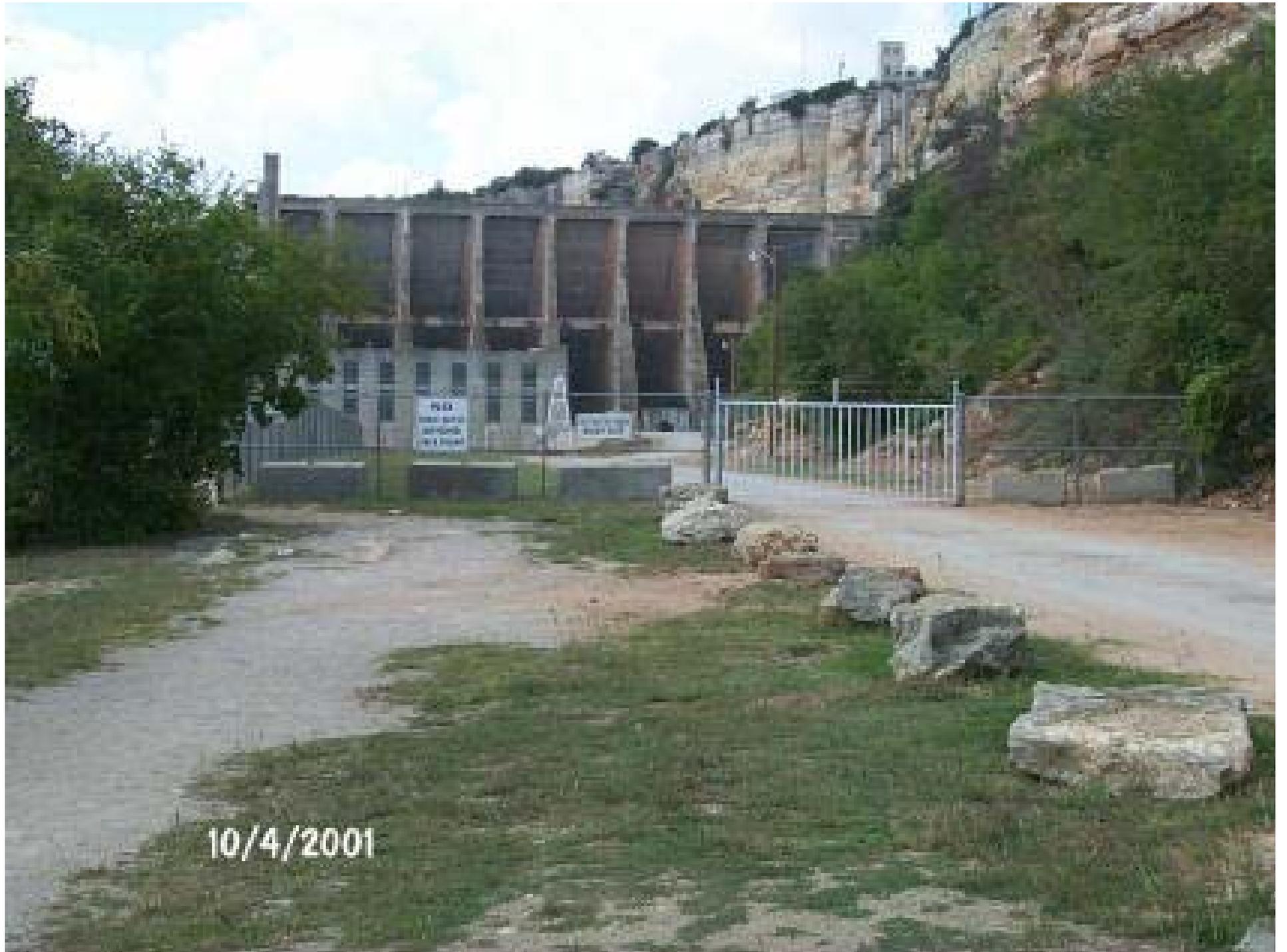
<b>For a Bomb</b> Evacuate Immediately Call 911 (Police) Contact local FBI	<b>For Radiological</b> Limit Exposure - Don't Handle Distance (Evacuate area) Shield yourself from object Call 911 (Police) Contact local FBI	<b>For Biological or Chemical</b> Isolate - Don't Handle Call 911 (Police) Wash your hands with soap and warm water Contact local FBI
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# Security Program

## ■ GENERAL GUIDELINES

- Deter
- Detect Far
- Delay Near
- Assess Alarms
- Communication
- Response Force
- Equipment & Guards Deter, Detect & Delay





10/4/2001





10/10/2001

# Security Program

## ■ FEATURE DESIGN ELEMENTS

- Intrusion Detection
- Entry Control
- Access Delay
- Communications
- Response Force
- Procedures
- Investigations
- Training

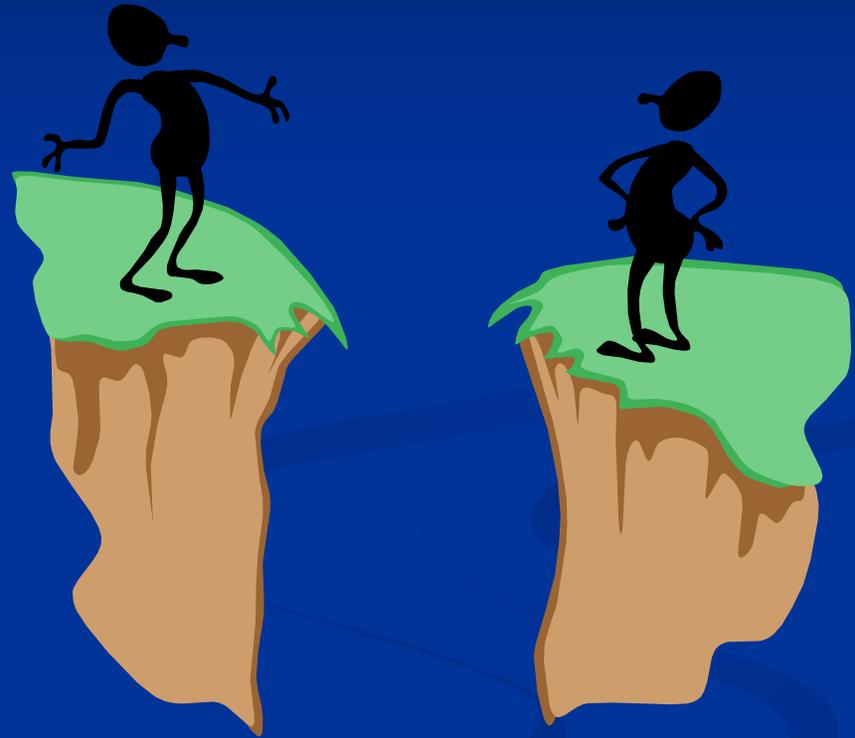
# Security Program

## ■ KEY TO SUCCESS

- Integration of people, procedures, and equipment into a system that protects assets from malevolent adversaries

# Vulnerability Assessment

- Systematic Process
- Team-oriented
- Consensus-based
- Fact-based
- Defendable

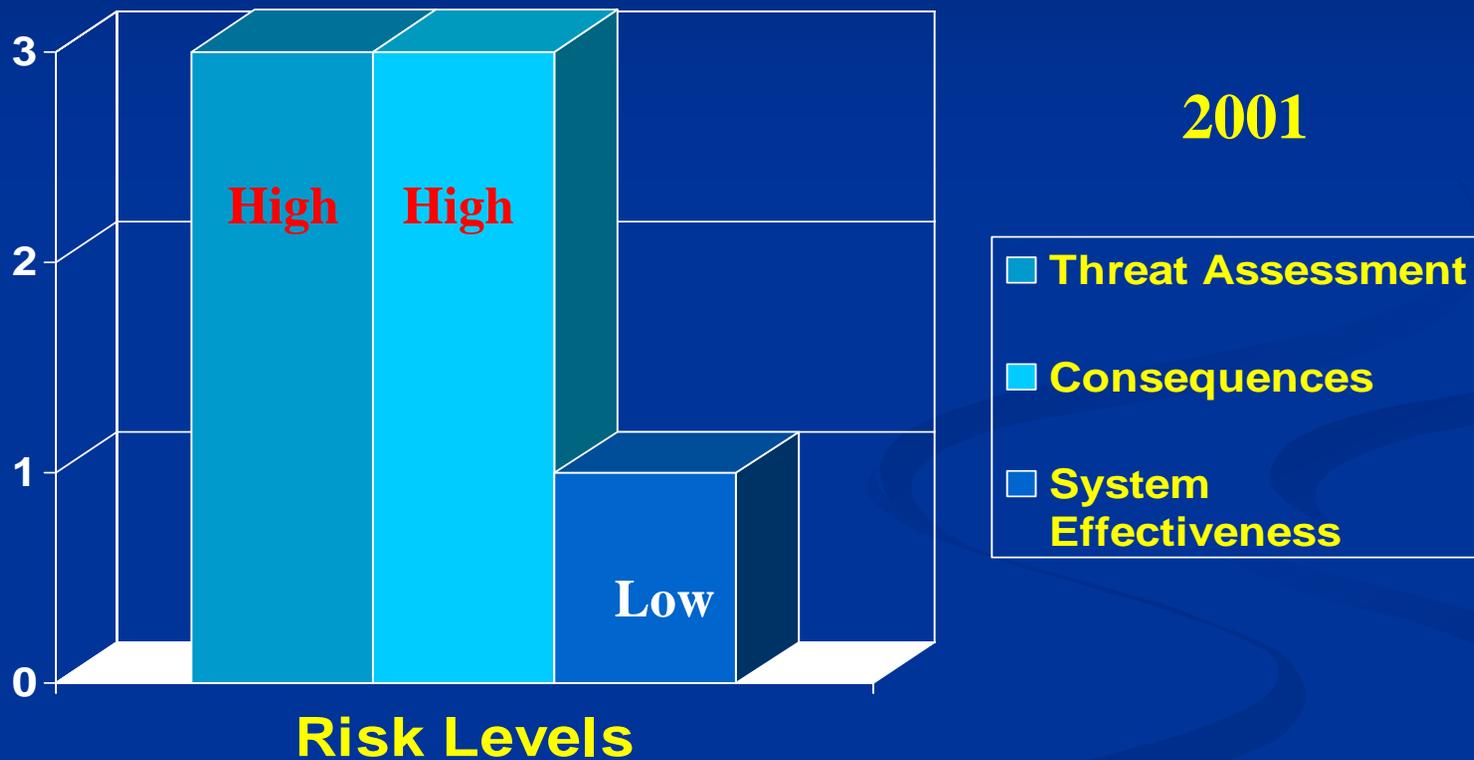


■ Gap Analysis

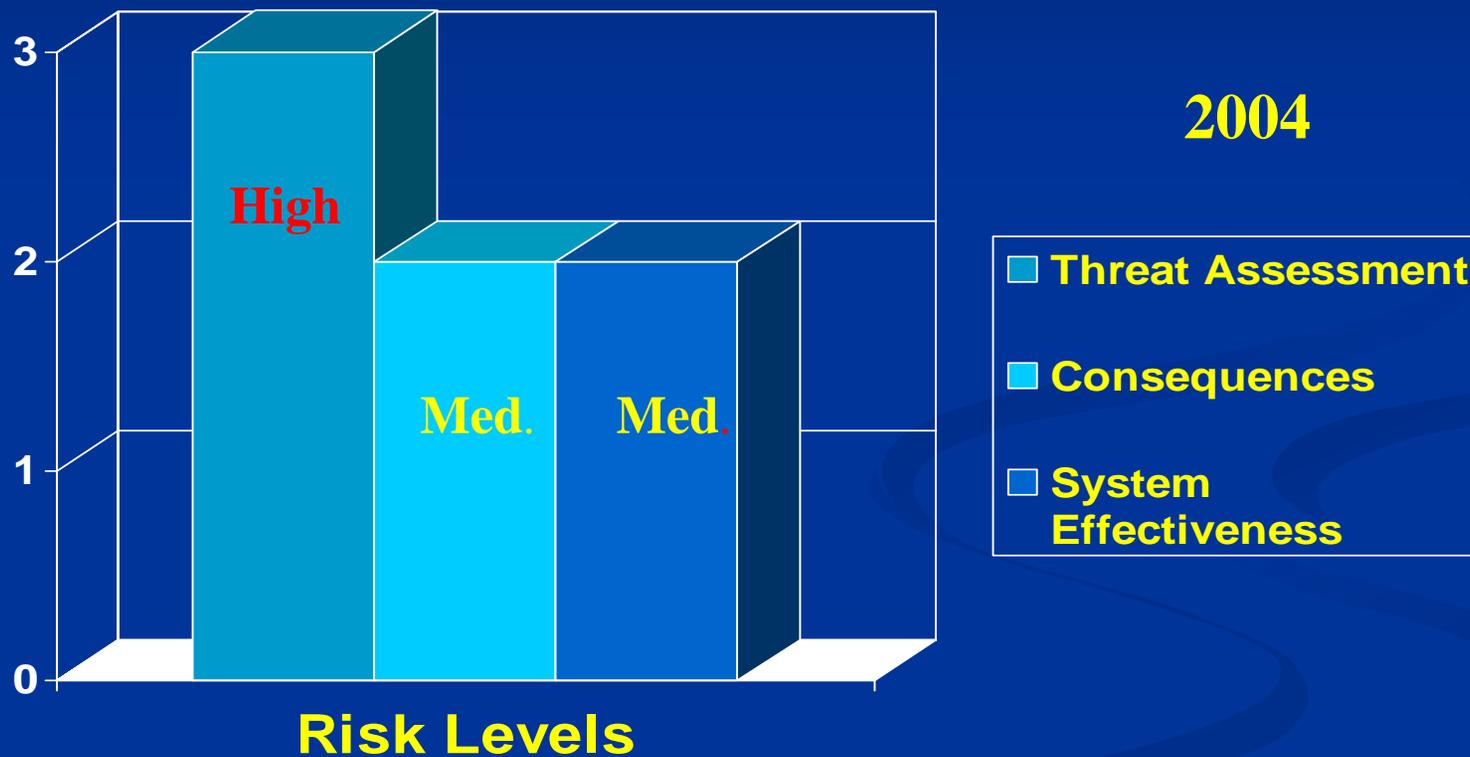
# RAM – D Process

- Customized Fault Tree
- Threat Assessment
- Likelihood of Attack
- Consequences
- System Effectiveness
- Risk Analysis
- Risk Reduction (part of EAP)
- Impacts and Upgrades

# Risk Analysis - Before Upgrades



# Risk Analysis - After Upgrades

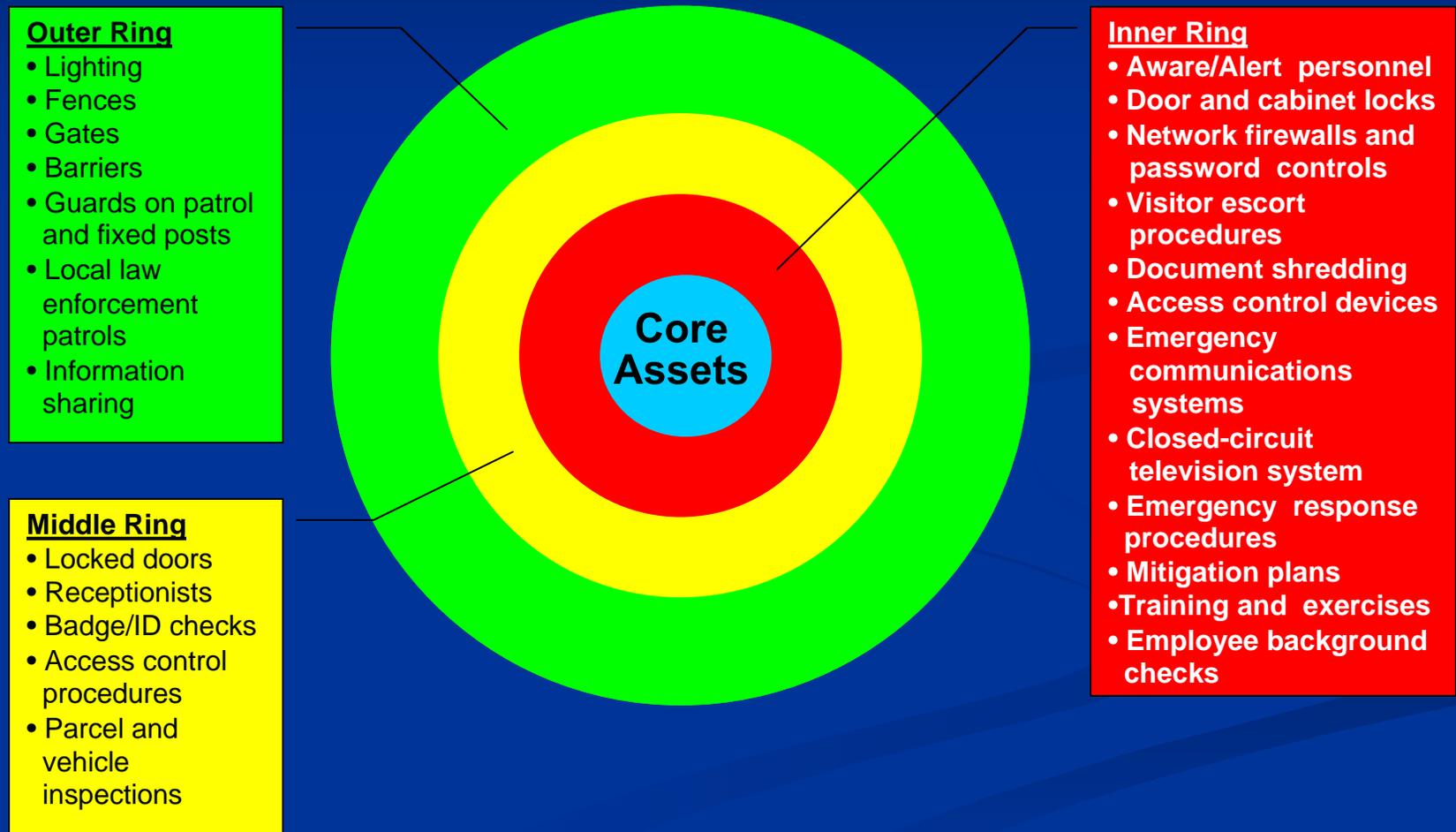


Example: Consequences reduced from High to Medium through quicker response, less damage downstream, alternate warning methodologies, etc.

# Physical Security Expenses\*

- |         | <u>Total</u> | <u>Dams</u> |
|---------|--------------|-------------|
| ■ FY 02 | >\$ 93,000   | >\$ 25,000  |
| ■ FY 03 | >\$1.14M     | >\$905,000  |
| ■ FY 04 | >\$1.04M     | >\$800,000  |
- \*Not including salaries, staff time, and low-cost projects.

# Rings of Protection



# Why Plan?

- No crystal ball
- It's our responsibility
- Our citizens depend on us
- Because if we don't, lives could be lost
- Manage consequences
- Laws and rules



# Planning Guidelines

- You don't know what you don't know, so...
- Invest in the first 12 hours
- Anticipate resources
- Anticipate shortfalls
- Know who to call
- Know when to call
- Know what to say



# Preparation

- Learn what you don't know...
- Worst case scenarios
- Develop protocols and checklists
- The Three C's
  - Coordination
  - Communication
  - Cooperation

# Preparation

- The key is knowing when you need help!

**HELP!**



**HELP!**

# Plans and SOPs

- Emergency Action Plans
- Flood Operating Procedures
- Oil Spill Response Plan
- HAZMAT Response Plan
- Bomb Threats Plan
- Suspicious Packages Plan
- Site Security Plans



# Example of Plan Execution

- Potential dam failure occurs
- BRA makes warnings & notifications
- BRA attempts to fix problem
- Locals evacuate, if necessary
- BRA provides situational awareness
- BRA attempts to mitigate damages
- Recovery and restoration of facilities

# Evaluation

- How did you do?
- Identify
  - Strengths
  - Weaknesses
  - Resource Shortfalls
  - Failures
- Sustain strengths
- Fix the problems



# Exercising the Plan

- How do you know the plan works?
- Drills identify problems
- Better to fail in a dry-run...
- Many benefits
  - Understanding
  - Relationships
  - Positive image
  - Trust



# Revision

- Things change...
- If not recently revised, things in it won't work
- Emergency plans are dynamic
  - Environment changes
  - Variables change
  - Resources change
- Testing identifies problems
- Updates are critical to success

# Revision

- Updates are critical to successful response and recovery operations



# Emergency Action Plan Use

- Annual Training
- Annual Testing
- Annual Updating
- Coordinate with Federal, State & Local Officials
- Participate in Local & State Exercises



Governor's Division of  
Emergency Management



U.S. Department of  
Homeland Security



**We Won't Let This Happen!**

