

**CHAPTER THREE  
SECTION 3.2  
HAZARD PROFILE-DAM FAILURE**

**AFFECTED JURISDICTIONS**

**COMMUNITIES**

**Unincorporated Pottawatomie County**

**City of Shawnee**

*This page intentionally left blank*

## DAM FAILURE

---



A dam is defined as a barrier constructed across a watercourse for the purpose of storage, control, or diversion of water. Dams typically are constructed of earth, rock concrete, or mine tailings. A dam failure is the collapse, breach, or other failure of a dam structure resulting in potential downstream flooding. Dam failures typically occur when spillway is inadequate and excess flow overtops the dam, or when internal erosion (piping) through the dam or

foundation occurs. The Oklahoma Water Resources Board (OWRB) coordinates a state dam safety program that ensures the safety of more than 4,500 dams in the state, with priority placed on the protection of downstream life and property. The program requires inspections every three to five years for low and significant hazard structures, respectively. The program requires annual inspection of the state's 364 high-hazard dams, so designated due to the presence of occupied dwellings immediately downstream. Dam failures can result from any one or a combination of five reasons:

- Overtopping caused by water spilling over the top of a dam
- Structural failure of materials used in dam construction
- Cracking caused by movements like the natural settling of a dam or an earthquake
- Inadequate maintenance and upkeep such as failure to remove trees, repair internal seepage problems
- Piping – when seepage through a dam is not properly filtered and soil particles continue to progress and form sink holes in the dam

The map on the following page indicates the location of dams throughout Pottawatomie County. Red markers represent dams rated as High Hazards by OWRB. Yellow markers indicated Significant Hazard Dams and green markers indicate Low Hazard Dams.

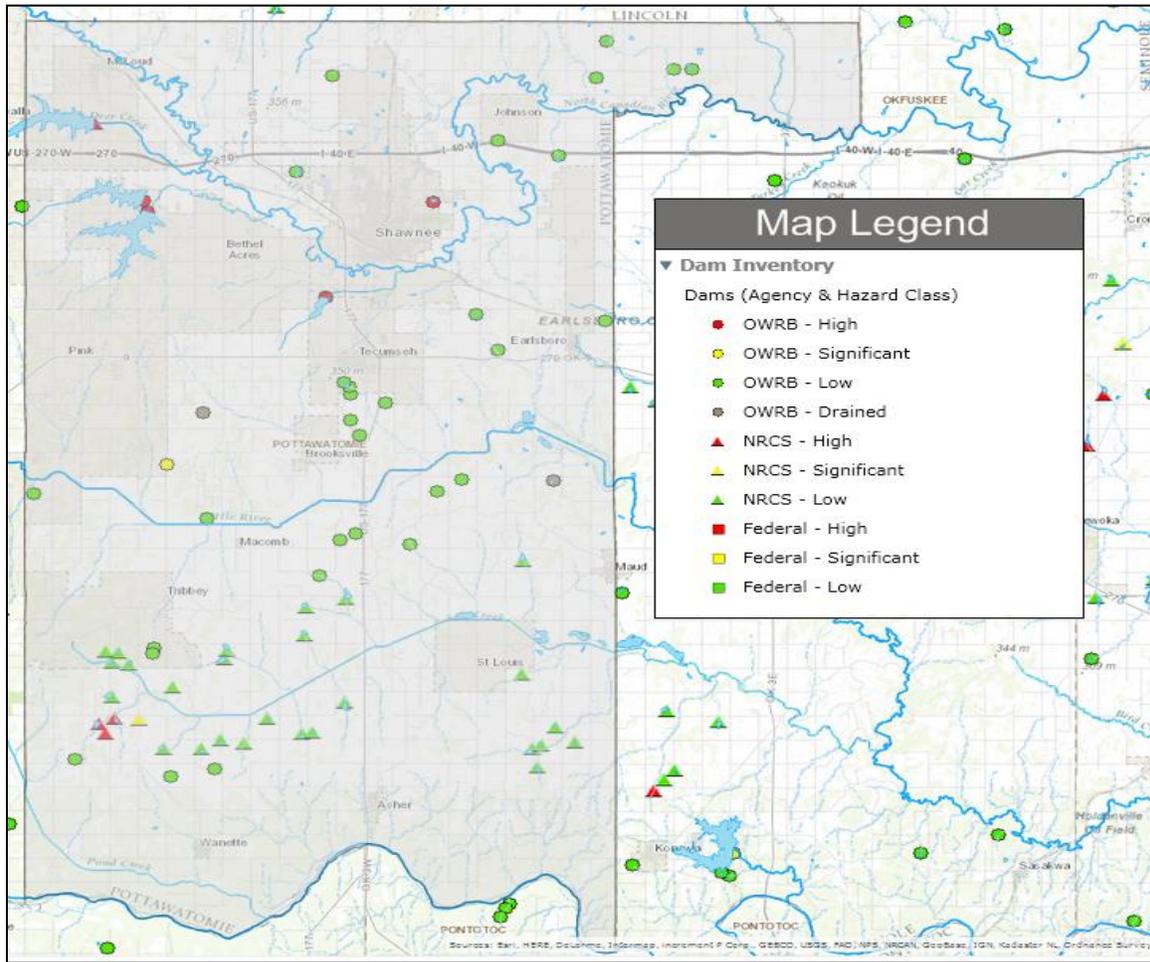


Table 3-4 gives an explanation on the different levels of dam failure and why they are rated as such.

Table 3-4 OKLAHOMA WATER RESOURCES BOARD (OWRB) CLASSIFICATION OF HAZARD POTENTIAL		
Category	Loss of Life	Economic Loss
Low	None-No probable future development may be zoned to prevent future development	Minimal-undeveloped to occasional structure or agriculture
Significant	None-Potential for future development exists; habitable structures may exist in inflow design flood floodplain; however, dam failure would not endanger lives that would not be endangered if structure did not exist	Appreciable notable agriculture, industrial, or structural

<b>Table 3-4 OKLAHOMA WATER RESOURCES BOARD (OWRB) CLASSIFICATION OF HAZARD POTENTIAL</b>		
Category	Loss of Life	Economic Loss
High	Yes (one or more habitable structures with loss of life due to dam failure likely)	Excessive extensive community, industrial, or agricultural losses; potential loss of life

## LOCATION

There are nine dams in Pottawatomie County and one in neighboring Cleveland County that could affect Pottawatomie County in the event of a dam failure. The City of Shawnee is at risk of dam failure from the Granada Lake Dam, Wes Watkins Reservoir, and Shawnee Twin Lakes Dam Number 1 and 2. No other incorporated jurisdictions in Pottawatomie County



would be affected by a Dam Failure, only the unincorporated areas. The unincorporated community of Dale and Dale Public School could be affected by a major breach of the Wes Watkins Dam. With the exception of Dale PS, No other public schools or Gordon Cooper Technology Center would be affected by a dam failure in Pottawatomie County. Eight of the dams are rated by OWRB as High Hazard and two are significant hazard dams. Dams are ranked as “high hazard” by OWRB if the possibility of loss of life exists downstream should the dam fail. Although the OWRB has a specified inspection schedule, it is the responsibility of the dam owner to REQUEST these inspections, and that does not necessarily happen in accordance with the schedule. However, most owners do at least have some type of inspection on an annual basis.

The OWRB requires submittal and subsequent approval of plans and specifications prior to dam modifications. The OWRB also coordinates periodic training sessions and workshops on dam safety issues and regulations for dam owners and engineers.

Dam Emergency Action Plans were reviewed for all high hazard dams. Where available information was found, inundation flood depths are provided either here or in **Appendix B-Section B.5**. Flood depth information was not available for all dams so a data deficiency project is located in Chapter 4 to locate the missing data for inclusion into the next plan update.

**Table 3-5 POTTAWATOMIE COUNTY HAZARDOUS DAM DATA**

Name of Dam Site	Year Completed	Dam Height (Feet)	Dam Length (Feet)	Max Storage (Acre feet)	Max Discharge (Feet)	Normal Storage (Acre feet)	Surface Area (Acres)
Shawnee Twin Lakes #1 (H)	1935	55 ft.	2,570 ft.	36500 ac.ft.	31,000 ft.	22600 ac.ft.	1336 ac.
Shawnee Twin Lakes #2 (H)	1960	50 ft.	3,650 ft.	18900 ac.ft.	31,000 ft.	11400 ac.ft.	1100 ac.
Wes Watkins Dam (H)	1994	54 ft.	3,055 ft.	40735 ac.ft.	60,898 ft.	14065 ac.ft.	1142 ac.
Tecumseh Lake Dam (H)	1934/1957	30 ft.	2,363 ft.	2370 ac.ft.	8,500 ft.	1118 ac.ft.	127 ac.
Thunderbird Lake Dam* (S)	1965	144 ft.	7,263 ft.	106669 ac.ft.	2,840 ft.	103 <sup>9</sup> ac.ft.	5377 ac.
Granada Lake (H)	1976	16 ft.	796 ft.	70 ac. ft	1,254 ft	70 ac. ft	0 ac.
SCS Salt Creek Site 13 (H)	1961	28 ft.	1250 ft.	745 ac. ft.	1,240 ft.	131 ac. ft.	26 ac.

<b>Table 3-5 POTTAWATOMIE COUNTY HAZARDOUS DAM DATA</b>							
<b>Name of Dam Site</b>	<b>Year Completed</b>	<b>Dam Height (Feet)</b>	<b>Dam Length (Feet)</b>	<b>Max Storage (Acre feet)</b>	<b>Max Discharge (Feet)</b>	<b>Normal Storage (Acre feet)</b>	<b>Surface Area (Acres)</b>
<b>SCS Salt Creek Site 14 (H)</b>	1961	25 ft.	1100 ft.	146 ac. ft.	770 ft.	27 ac. ft.	6 ac.
<b>SCS Salt Creek Site 15 (H)</b>	1961	24 ft.	950 ft.	263 ac. ft.	910 ft.	60 ac. ft.	13 ac.
<b>SCS Salt Creek Site 16 (S)</b>	1961	23 ft.	800 ft.	183 ac. ft.	825 ft.	36 ac. ft.	7 ac.

**\*Located in Cleveland County**

## **SHAWNEE TWIN LAKES 1 & 2**

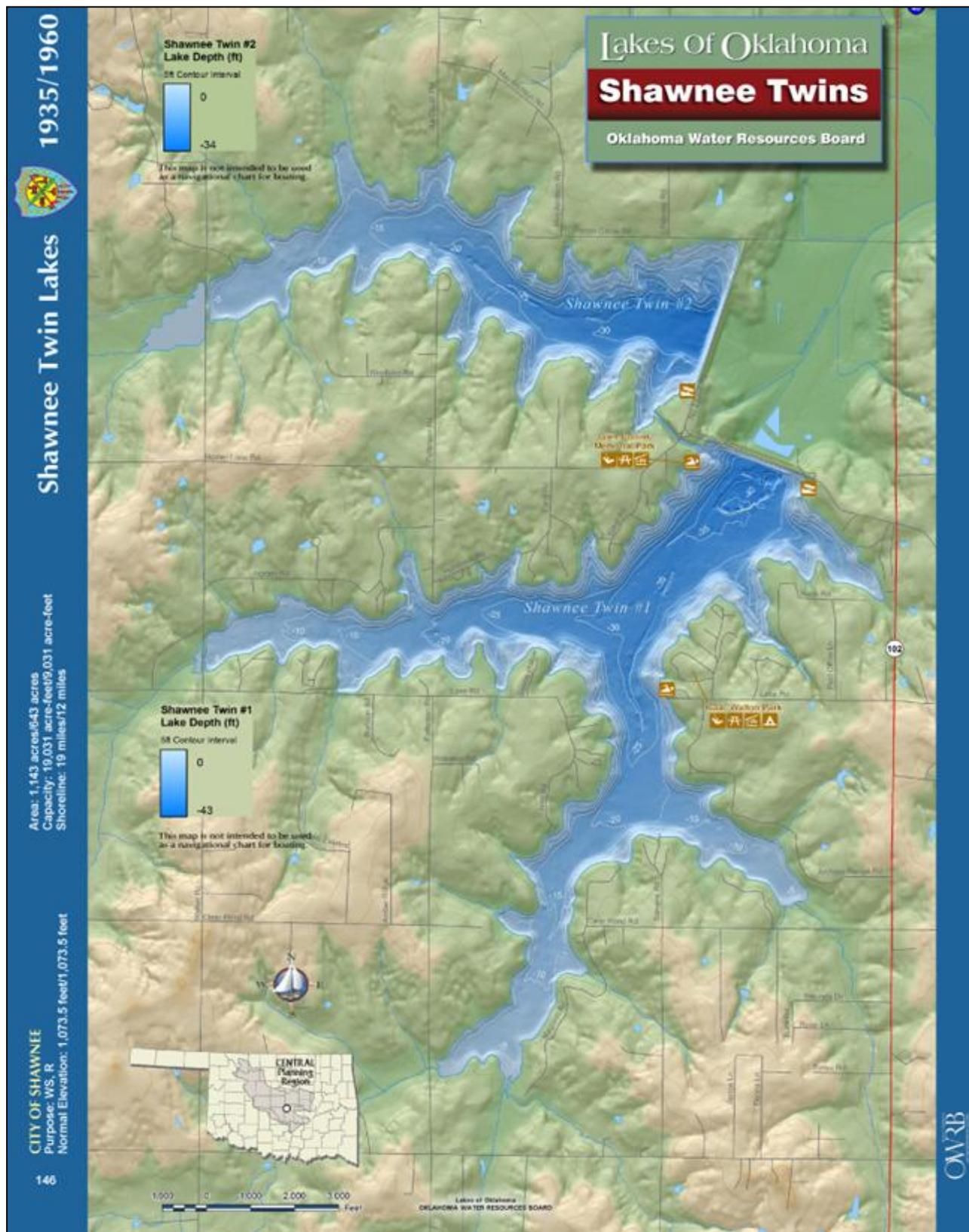
Shawnee Twin Lakes in Pottawatomie County is located west of Shawnee. Shawnee Twin Lakes has 25 miles of shoreline and 2,436 surface acres. This lake offers recreation such as fishing, camping, and boating along with providing a water supply.

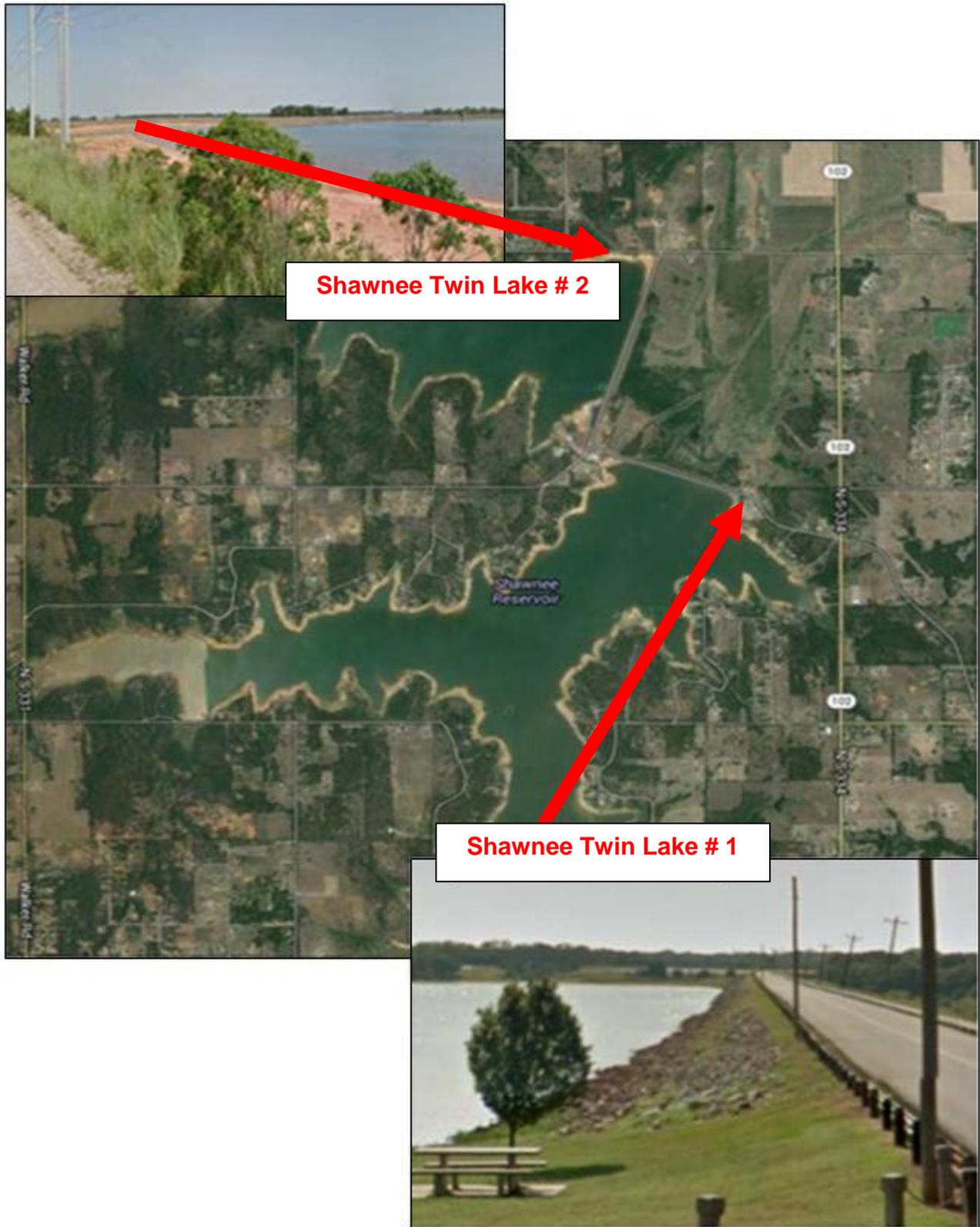
The Shawnee Twin Lakes, on South Deer Creek in Pottawatomie County, are municipal lakes owned and operated by the City of Shawnee. Lake #1 was built in 1935, covers a surface area of 1,336 acres and has 16 miles of shoreline. Lake #2 was built in 1960, has a surface area of 1,100 acres and nine miles of shoreline. The lakes are connected by a 10-foot-deep canal constructed in 1962.

Shawnee residents approved a referendum in 1994, permitting full recreation of Lake # 1, which included fishing, swimming, skiing, and personal watercraft. A fully enclosed fishing dock provides all-weather fishing. Only boats and fishing are allowed on Lake # 2.

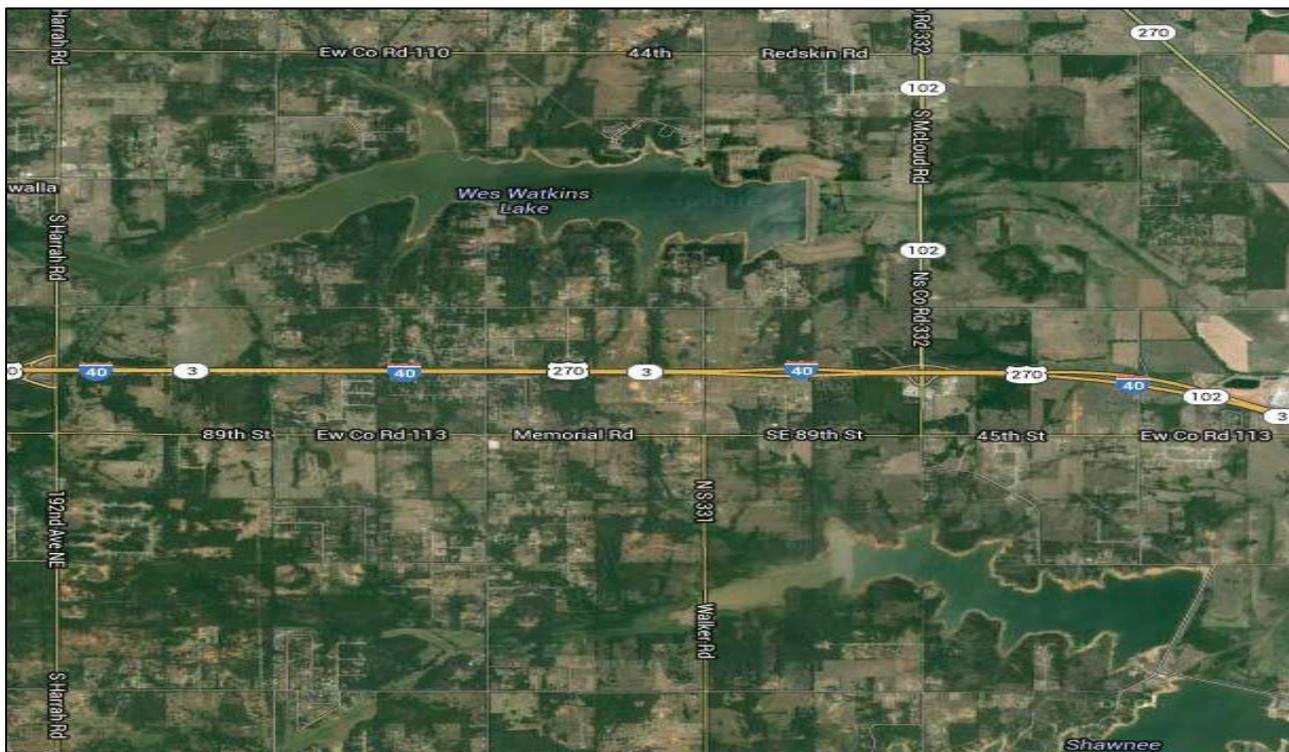
<b>Table 3-6 SHAWNEE TWIN LAKE No. 2 INFORMATION</b> Sources: Oklahoma Water Resources Board	
<b>County</b>	Pottawatomie
<b>Year Built</b>	1935
<b>Operated By</b>	City of Shawnee
<b>Stream</b>	South Deer Creek
<b>Purpose</b>	Water Supply/Recreation
<b>Shoreline</b>	16 miles
<b>Normal Area</b>	1,336 acres
<b>Normal Pool Elevation</b>	1,067 ft.
<b>Normal Pool Capacity</b>	22,600 ac-ft.

<b>Table 3-7 SHAWNEE TWIN LAKE No. 1 INFORMATION</b> Sources: Oklahoma Water Resources Board	
<b>County</b>	Pottawatomie
<b>Operated By</b>	City of Shawnee
<b>Year Built</b>	1960
<b>Stream</b>	South Deer Creek
<b>Purpose</b>	Water Supply/Recreation
<b>Shoreline</b>	9 miles
<b>Normal Area</b>	474 acres
<b>Normal Pool Elevation</b>	1,100 ft.
<b>Normal Pool Capacity</b>	11,400 ac-ft.





## SHAWNEE TWIN LAKES 1 AND 2 DAM SITES



## WES WATKINS RESERVOIR

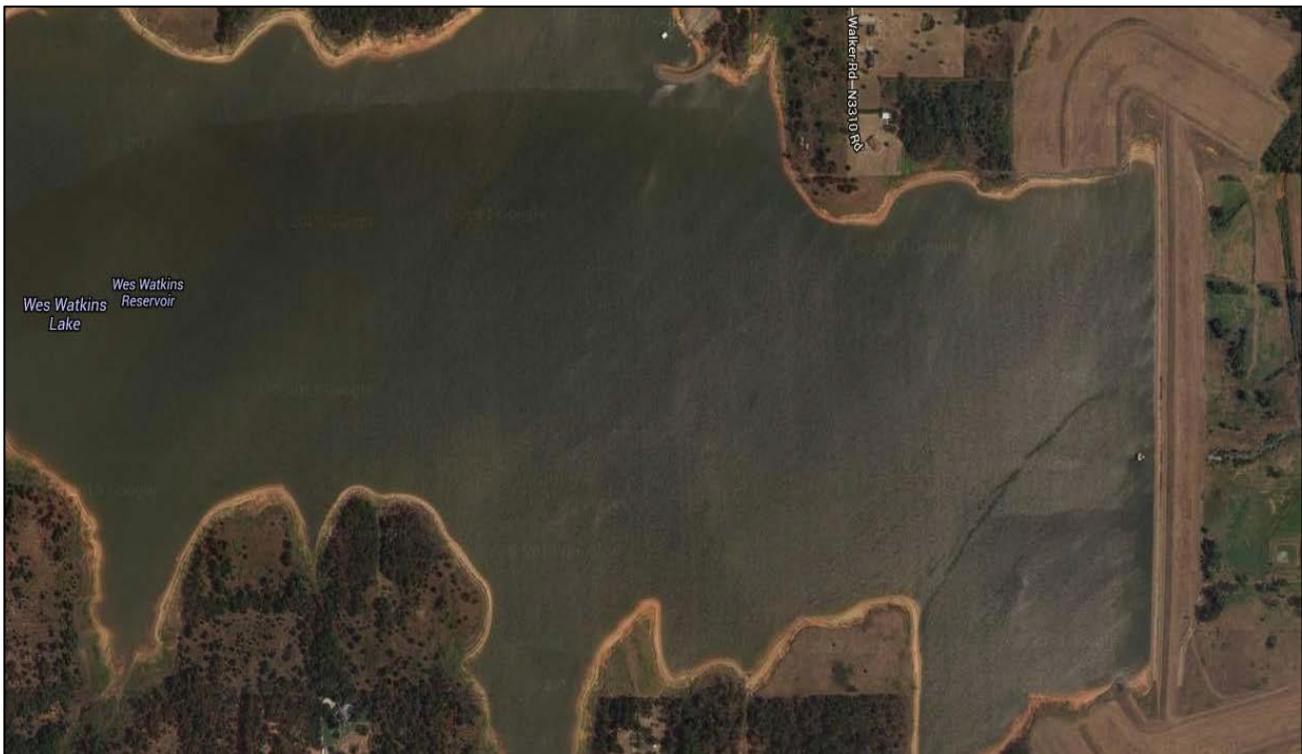
Built in August of 1999, Wes Watkins Lake is still a relatively young reservoir. The large areas of flooded timber found on the lake provide quality fishing. According to Oklahoma Wildlife Department officials, the 1,142-acre lake is operated by the City of McLoud for the City of Shawnee, which has imposed special fishing regulations on the lake. The lake is operated by the City of McLoud as of July 1, 2010. The reservoir was named in honor of former Oklahoma Congressman Wes Watkins.

A breach of this dam would not impact any recreation area associated with the lake. The unincorporated community of Dale which includes approximately seventy five homes and the Dale Public Schools are at risk from flooding in the event of a dam failure. Highways 102 and 270; both major arteries along with many local roads would be inundated and impassable causing motorist and emergency services to find other routes around the flooding.

Table 3-8      WES WATKINS RESERVOIR INFORMATION Sources: Oklahoma Water Resources Board	
<b>County</b>	Pottawatomie
<b>Operated By</b>	City of McLoud
<b>Year Built</b>	1997
<b>Stream</b>	North Deer Creek
<b>Purpose</b>	Flood Control/Water Supply/Recreation
<b>Shoreline</b>	17 miles
<b>Normal Area</b>	1,142 acres
<b>Normal Pool Elevation</b>	1,074 ft.
<b>Normal Pool Capacity</b>	14,065 ac-ft.



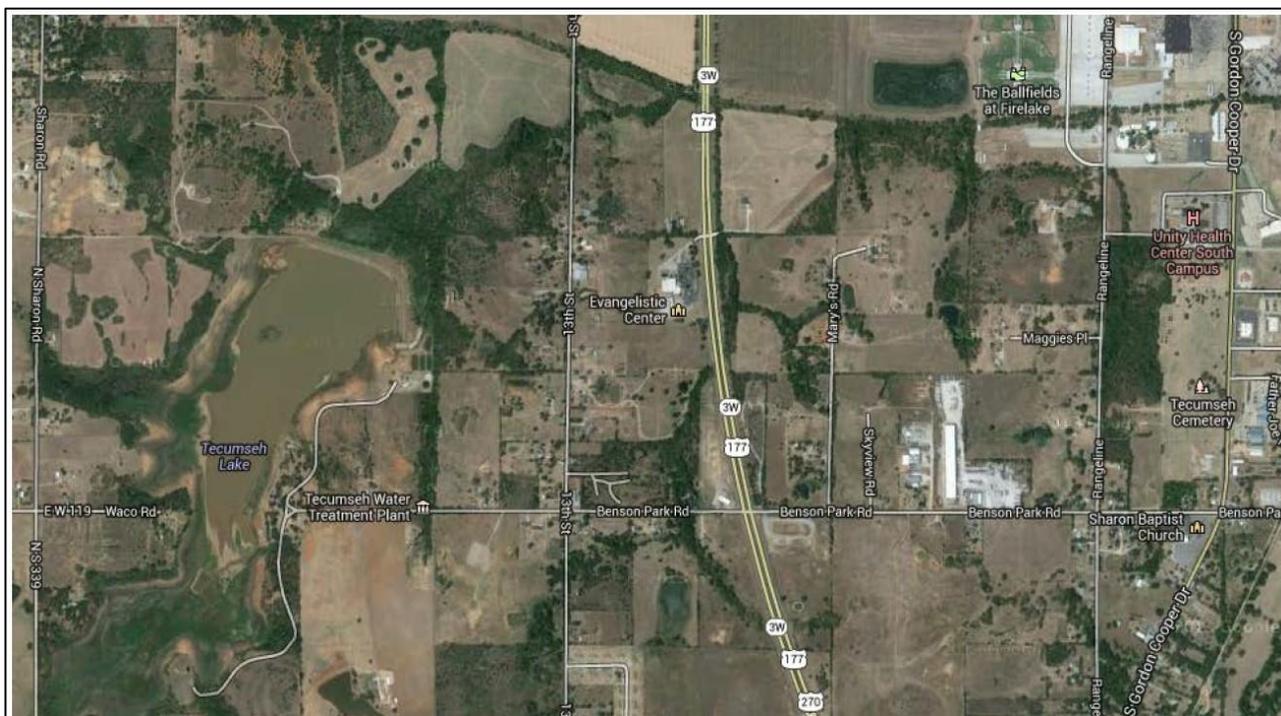
## WES WATKINS LAKE AND DAM







# TECUMSEH LAKE

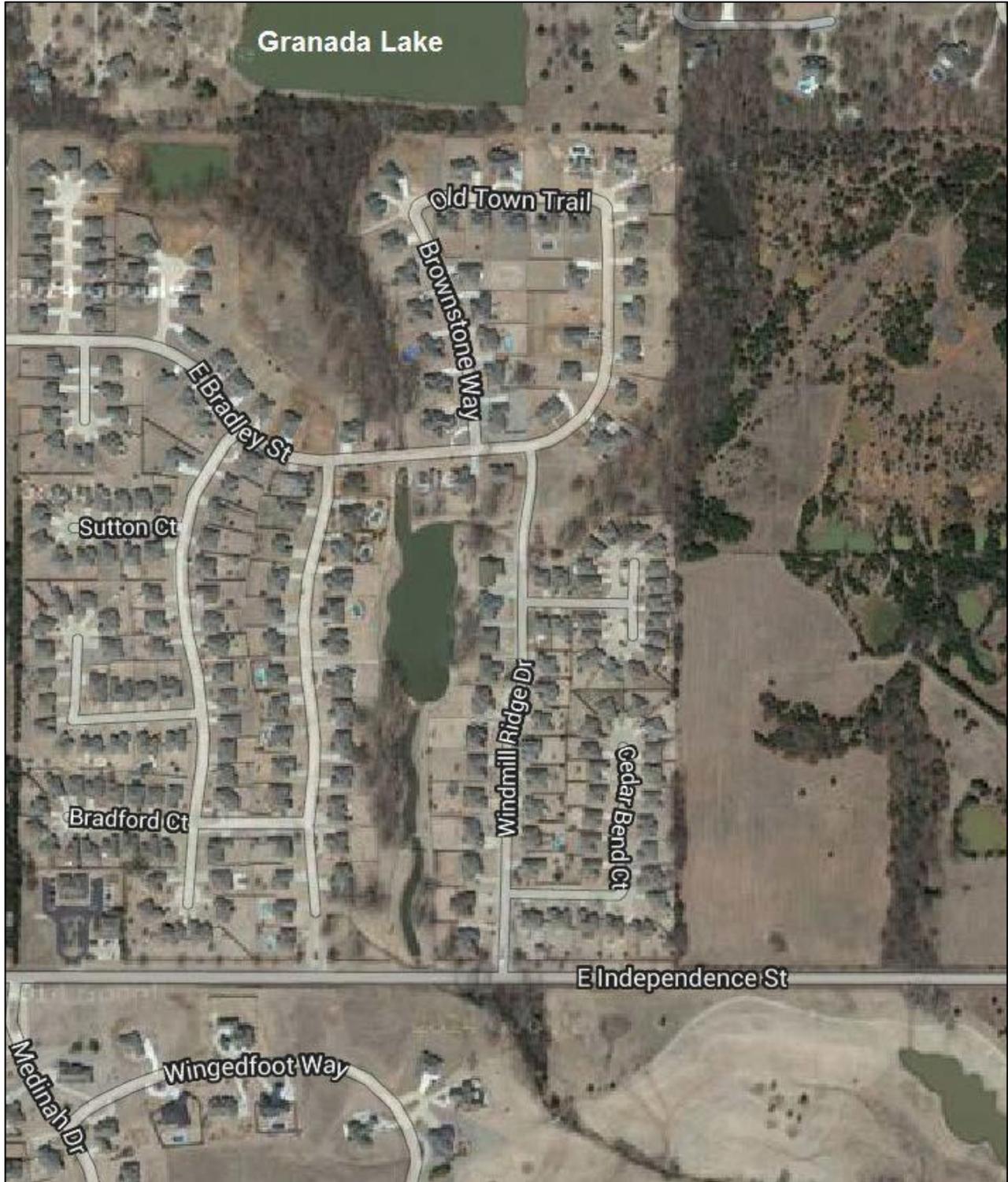


## GRANADA LAKE (HIGH HAZARD DAM)

This lake is located within the Shawnee City Limits and is controlled through a private Limited Liability Corporation. No schools would be affected by a breach of this dam.

The Emergency Action Plan list forty three residences that could be affected by a breach of the dam located within the neighborhoods of Windmill Ridge and Woodlands. E Independence Street, a main travel route would also be inundated restricting travel and forcing motorists and emergency services to detour around the flood waters. A dam inundation map is provided in **Appendix B-Section B.5** for Granada Lake.

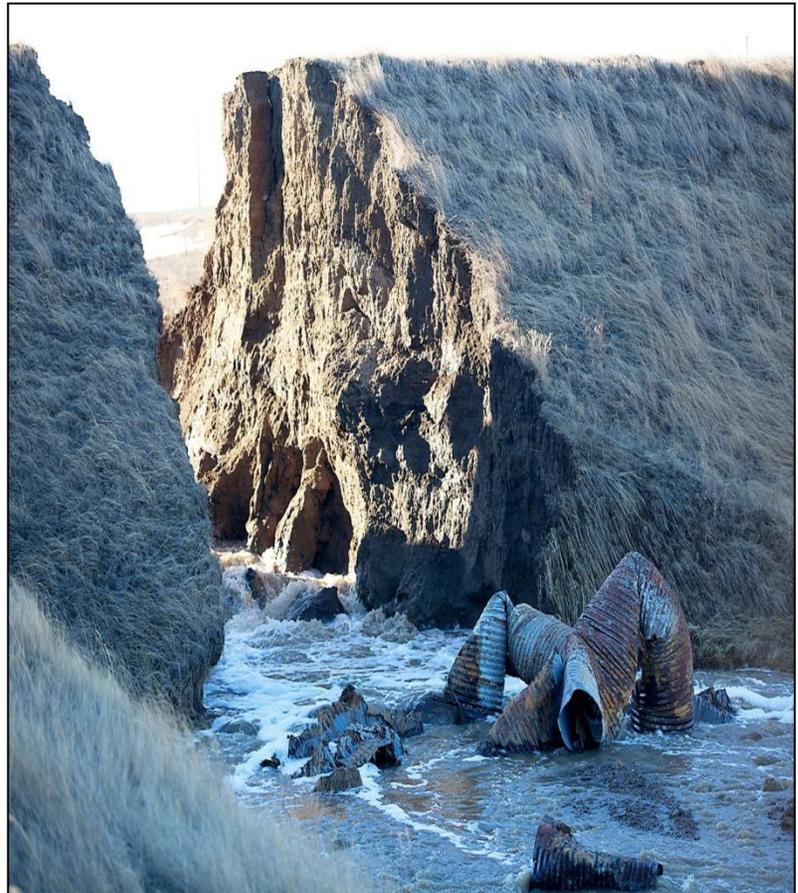




## **SCS- SALT CREEK SITE 13, 14, 15 (HIGH HAZARD DAMS) SCS- SALT CREEK SITE 16 (SIGNIFICANT HAZARD DAMS)**

By means of the Standard State Soil Conservation Districts Act of February 1937, states were strongly encouraged to legislate mandatory soil conservation in order to qualify for SCS benefits. Oklahoma passed such a law in April of that year. Thus, Soil Conservation Districts were created, and SCS specialists worked through districts.

In 1936 the Soil Conservation and Domestic Allotment Act established the Agricultural Conservation Program (ACP). The Agricultural Stabilization and Conservation Service (ASCS) and the SCS administered the first cost-sharing "green" program designed to encourage farmers to restore and improve soil fertility, minimize wind and water erosion, and conserve resources and wildlife.



Floods, another means of soil loss, led to the destruction of crops, productive land, fences, livestock, homes, and human lives. Interest in flood control began in spring 1934 when the Washita River flooded, killing seventeen people. On June 22, 1936, Congress passed the Omnibus Flood Control Act (PL 74-738), to protect watersheds, prevent floods, and complement the downstream flood control program. SCS-Salt Creek Sites 13, 14, 15, and 16 were all constructed under this legislation.

All four of these dams are located in rural Pottawatomie County. A dam breach of any of the four would result only in agricultural land and a residential structure being inundated. No participating communities, schools or Gordon Cooper Technology Center would be affected. School bus routes could be affected in which case drivers would have to find alternative routes.



The following data is from the Emergency Action Plan provided by Soil Conservation. No additional data is available for Salt Creek Site 16.

## Residents/Businesses/Highways at Risk

### Salt Creek Dam No. 13

House/ business no.*	Resident/business	Address	Phone no.	Distance downstream from dam (ft.)	Ground Elevation	Water depth ground level (ft.)
PDL1	Confidential	32037 Trousdale Rd. Wanette, OK	405-383- 2325	2,750	982.2	2.8

A detailed breach inundation study has not been completed for this dam. The above infrastructure at risk was determined by the use of LIDAR data, a visual review of the downstream area and an analysis of the following data.

***The limits of flooding, flooding depths and flow wave travel times are approximate and should be used only as a guide for establishing evacuation zones. In the event of an actual dam failure, conditions may vary, resulting in a variation of the breach inundation area, flooding depths, and timing from those shown in the summary.***

Hydraulic model used: TR-60 (peak discharge); TR-66 (hydrograph)

Model assumptions:

- “Sunny Day” Breach (no inflow into the reservoir)
- Water surface elevation in reservoir prior to breach = 1024.9
- Auxiliary spillway elevation = 1023.7
- Total volume of breach hydrograph = 933.9 acre-ft.
- Height of water at time of breach = 21.4 ft.
- Peak breach discharge = 18,801 ft<sup>3</sup>/s
- Downstream area defined by field surveys consisting of four cross sections.

### Breach Area Impact Map Salt Creek Dam No. 13



## Residents/Businesses/Highways at Risk

### Salt Creek Dam 14

House/ business no.*	Resident/business	Address	Phone no.	Distance downstream from dam (ft.)	Ground Elevation	Water depth ground level (ft.)
PDL1	Confidential	32037 Trousdale Rd. Wanette, OK	405-383- 2325	4,250	989.2	1.1

A detailed breach inundation study has not been completed for this dam. The above infrastructure at risk was determined by the use of LIDAR data, a visual review of the downstream area and an analysis of the following data.

Hydraulic model used: TR-60 (peak discharge); TR-66 (hydrograph)

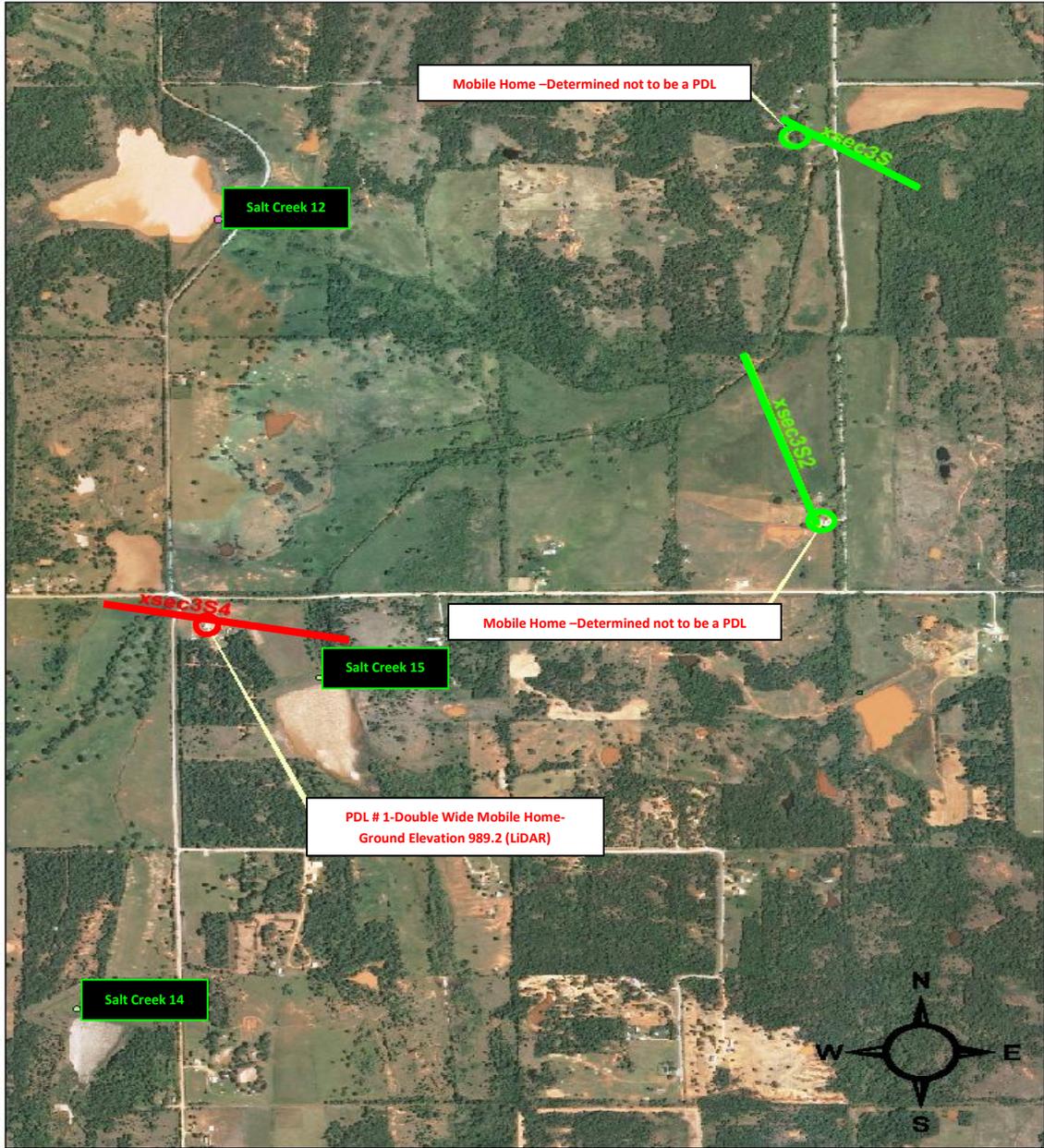
Model assumptions:

- “Sunny Day” Breach (no inflow into the reservoir)
- Water surface elevation in reservoir prior to breach = 1039.8
- Auxiliary spillway elevation = 1036.3
- Total volume of breach hydrograph = 229.7 acre-ft.
- Height of water at time of breach = 21.8 ft.
- Peak breach discharge = 7,101 ft<sup>3</sup>/s
- Downstream area defined by field surveys consisting of four cross sections.

***The limits of flooding, flooding depths and flow wave travel times are approximate and should be used only as a guide for establishing evacuation zones. In the event of an actual dam failure, conditions may vary, resulting in a variation of the breach inundation area, flooding depths, and timing from those shown in the summary.***

### Breach Area Impact Map

## Salt Creek Watershed Site No.14 Hazard Classification Review



## Residents/Businesses/Highways at Risk

### Salt Creek Dam 15

House/ business no.*	Resident/Business	Address	Phone no.	Distance downstream from dam (ft.)	Ground Elevation	Water depth ground level (ft.)
PDL1	Confidential	32037 Trousdale Rd. Wanette, OK	405-383- 2325	500	989.2	2.1

A detailed breach inundation study has not been completed for this dam. The above infrastructure at risk was determined by the use of LIDAR data, a visual review of the downstream area and an analysis of the following data.

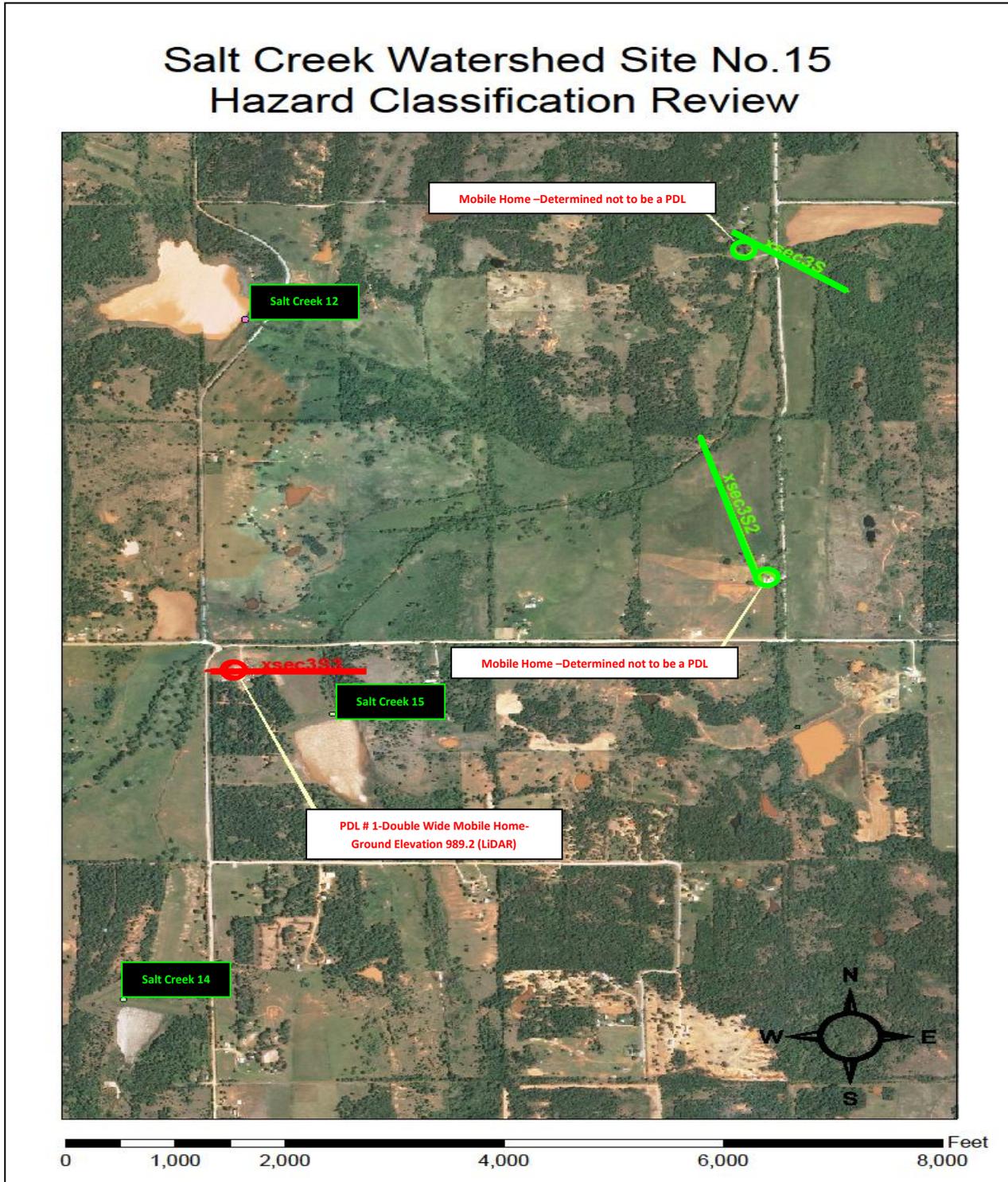
Hydraulic model used: TR-60 (peak discharge); TR-66 (hydrograph)

Model assumptions:

- “Sunny Day” Breach (no inflow into the reservoir)
- Water surface elevation in reservoir prior to breach = 1014.2
- Auxiliary spillway elevation = 1010.7
- Total volume of breach hydrograph = 339 acre-ft.
- Height of water at time of breach = 22.7 ft.
- Peak breach discharge = 10,186 ft<sup>3</sup>/s
- Downstream area defined by field surveys consisting of four cross sections.

***The limits of flooding, flooding depths and flow wave travel times are approximate and should be used only as a guide for establishing evacuation zones. In the event of an actual dam failure, conditions may vary, resulting in a variation of the breach inundation area, flooding depths, and timing from those shown in the summary.***

### Breach Area Impact Map



Salt Creek Site 16 is listed as a significant hazard dam and there is no emergency action plan for this dam. No data is available for Salt Creek Site 16.

---

## **THUNDERBIRD LAKE AND DAM (SIGNIFICANT HAZARD DAM)**

The Little River valley was the subject of several Army United States Army Corps of Engineers studies in 1936 and 1947 for flood control. In 1953 the issue of water supply was raised among a council of local governments consisting of Norman, Midwest City, Del City, Moore and Tinker Air Force Base, and it was forecast that by the 1970s and 1980s the cities would be requiring all available water to meet municipal demand.

The Norman Project was authorized by act of Congress, Public Law 86-529, 86th Congress, June 27, 1960 (74 Stat. 225). A feasibility study in 1954 led to a plan report in May 1961 and construction began on Norman Dam in 1962 and was completed in 1965 by the United States Bureau of Reclamation. Oklahoma State Highway 9 was re-routed in 1963 from present-day Alameda Street to its current location, south of the lake. Construction began on the pipelines and pumping facilities in 1963 and was completed in 1965.

The earthen dam has a height of 144 feet and impounds 171,400 acre-feet of water. The Bureau owns the dam, which is operated by the local Central Oklahoma Master Conservancy District.

The dam is located at the confluence of Hog Creek and Little River about 13 miles east of Norman, and about 30 miles southeast of Oklahoma City, Oklahoma. The dam has an earth-fill embankment with a volume of about 3 million cubic yards. The crest of the dam is 30 feet wide,

7,263 feet long, and about 144 feet high. The spillway is located in the left abutment and has a morning-glory inlet with an ungated crest of 22-feet 4-inch diameter.

Owned by the Bureau of Reclamation, the reservoir supplies water to Norman, Midwest City, Del City, Moore, and Tinker Air Force Base. Lake Thunderbird is thus located within one of the most densely populated areas of Oklahoma. Lake Thunderbird State Park boasts 1,874 acres adjacent to the lake for camping, swimming, picnicking, hiking and just plain relaxing. The Bureau of Reclamation has met their goals of providing not

only water supply but fish and wildlife habitat and recreational opportunities at Thunderbird Reservoir. No irrigation features or power development are included in the project.

## Flood Control

The Little River Basin is long and narrow, with stream-flow generally in a southeast direction. Runoff from the upper portions of the basin is rapid during storm periods and the duration of flooding varies from a few hours to several days. Releases from the flood-control pool are made in accordance with regulations prepared by the Corps of Engineers, dated January 1965, in concurrence with the Bureau of Reclamation, and in close cooperation with the Central Oklahoma Master Conservancy District, the entity which has assumed operation and maintenance responsibility for the project facilities. Construction of Norman Dam has reduced the flood hazards on Little River to its confluence with the Canadian River, and flood control operation will continue to provide benefits to the down-stream areas. A breach of this dam would not impact any recreation area associated with the lake and would only affect rural agricultural lands in Pottawatomie County. Highway 102 would be inundated and impassable forcing



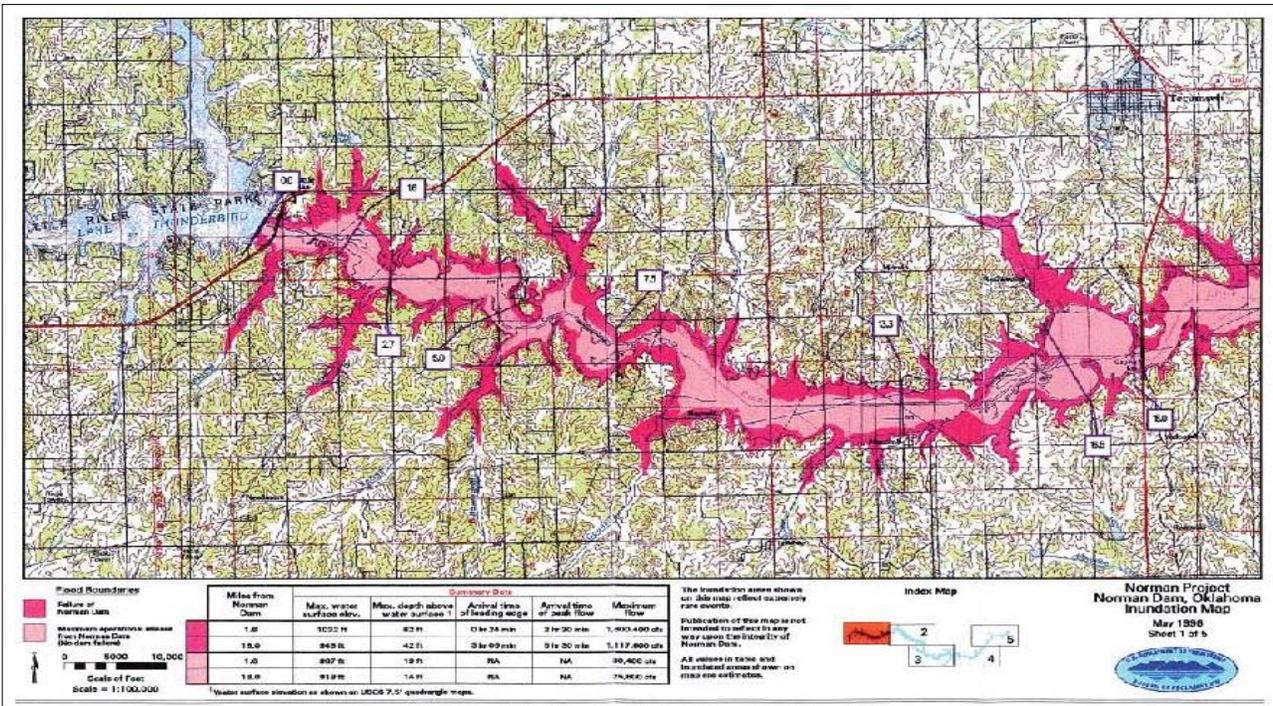
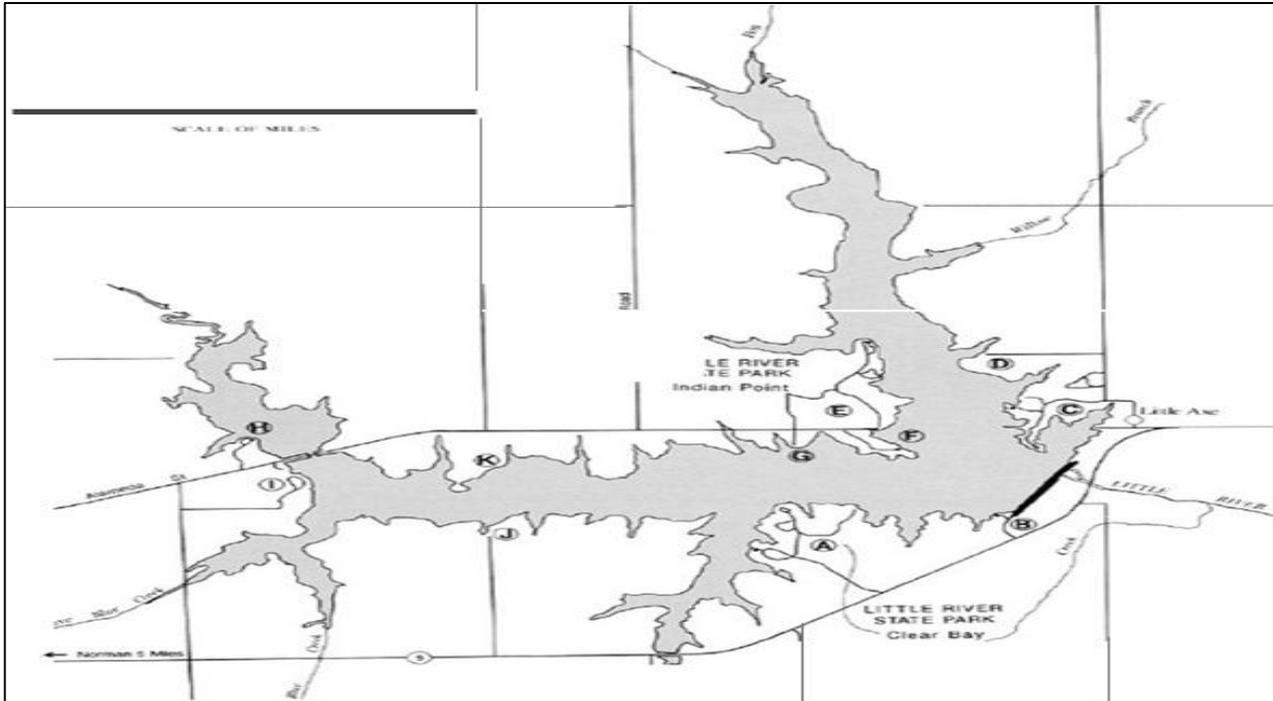
commuters and emergency response to find alternate routes around the flood waters.

<b>Table 3-10 LAKE THUNDERBIRD INFORMATION</b> <b>Sources: Oklahoma Water Resources Board</b>	
<b>County</b>	Cleveland
<b>Operated By</b>	Bureau of Reclamation
<b>Year Built</b>	1965
<b>Stream</b>	Little River
<b>Purpose</b>	Flood Control/Water Supply/Recreation/Fish and Wildlife
<b>Shoreline</b>	59 miles
<b>Normal Area</b>	5,377 acres
<b>Normal Pool Elevation</b>	1,039 ft.
<b>Normal Pool Capacity</b>	106,669 ac-ft.
<b>Flood Pool Area</b>	8,800 acres
<b>Flood Pool Elevation</b>	1,049.4 ft.
<b>Flood Pool Capacity</b>	196,200 ac-ft.
<b>Water Supply Storage</b>	105,900 ac-ft.
<b>Water Supply Yield</b>	21,700 ac-ft





# LITTLE RIVER STATE PARK



## EXTENT

---

The Conservation District has indicated that, “As a general rule in the absence of a formal breach inundation map, we consider the area five miles downstream at the top-of-dam elevation and below to be the potential area of risk.” (See the map in **Appendix B-Section B.5** for estimated dam inundation zones of dams)

As with any location in which man-made structures are built, potential failure of the structure could place lives and property at risk. The best way to minimize potential failure is to identify structures whose failure could cause the greatest loss of life and/or property, and to require those structures to undergo a rigorous inspection regimen. From a hazard management perspective, the most noteworthy structures are those categorized as high-hazard dams. This designation relates solely to potential impacts of a structural breach; it is not an indication of the Quality of construction or maintenance.

At the point where water starts entering homes, flooding is considered a severe event. Water entering homes creates serious problems whether it is ½ inch or 3 inches. Officials consider water in excess of 1 inch on the interior of structures is considered major. Severe damage to floors, walls, and contents is difficult to repair and repeated flooding often causes mold and long-term damages. A small break or seepage eliciting only 1-inch of flow per minute and causing nominal crop damage is considered a minor severity. Dam failure releasing a volume of one foot water affecting businesses and home is considered a major event. Flood waters of 1-2 inches on roadways slows down traffic but is not generally considered serious. Water over roadways becomes a serious problem when water is deep enough to make the roadway invisible causing damage, road closures, and detours.

## PREVIOUS OCCURRENCES

---

There is no data or other information available that there has ever been a dam breach in Pottawatomie County; however, historical records are sparse and may not contain all events into the early 20<sup>th</sup> century. There are no significant hazard dams located in Pottawatomie County according to the Oklahoma Water Resources Board data.



## PROBABILITY OF FUTURE EVENTS

---

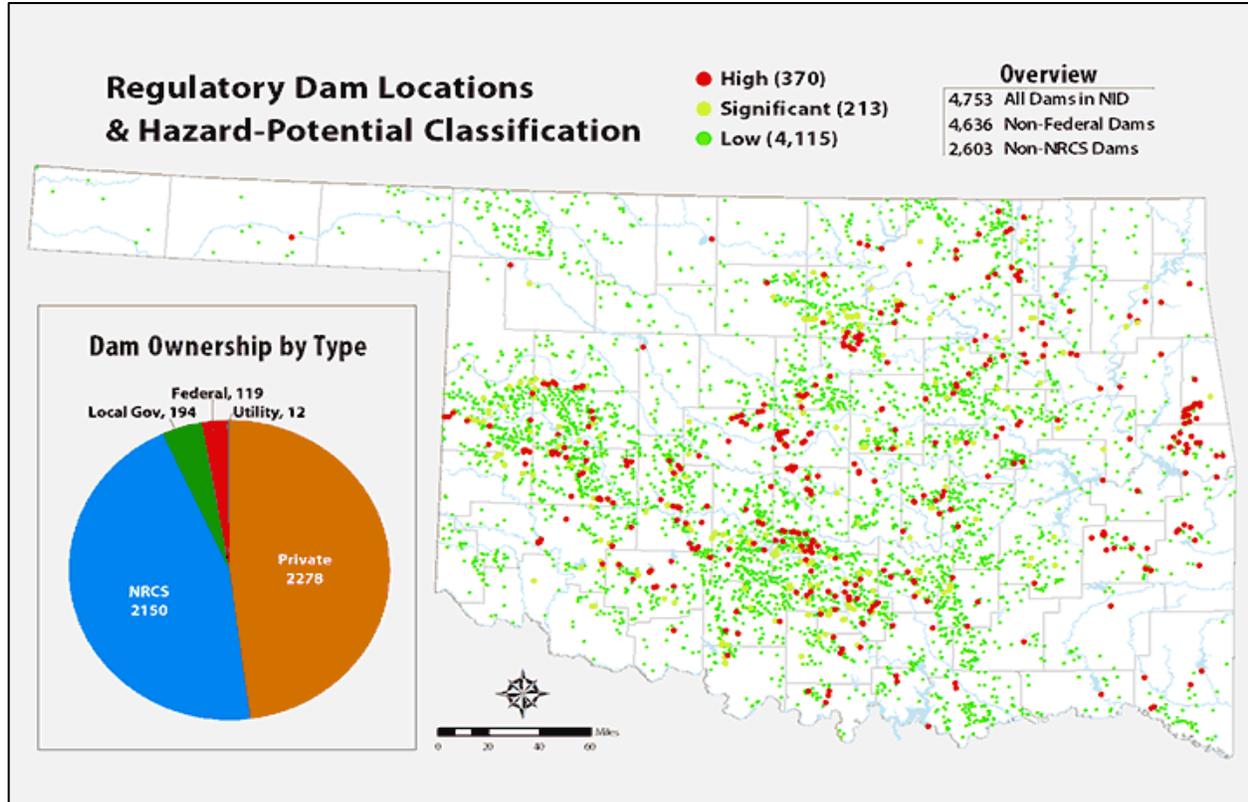
Soil, concrete, and metal components deteriorate causing weakening and additional maintenance and eventually replacement.

U.S. Natural Resources Conservation has undertaken rehabilitation of some of the dams in Oklahoma. The federal government provides 65 percent of the funding for rehabilitation projects and project sponsors provide 35 percent. Projects are selected on a priority basis with those with high safety and health concerns receiving the highest priority.

The probability of an actual dam failure in Pottawatomie County is considered **“UNLIKELY”** for unincorporated Pottawatomie County, Shawnee, and Dale Public Schools. For all other participating jurisdictions, public schools, and Gordon Cooper Technology Center it is **“NONE”**

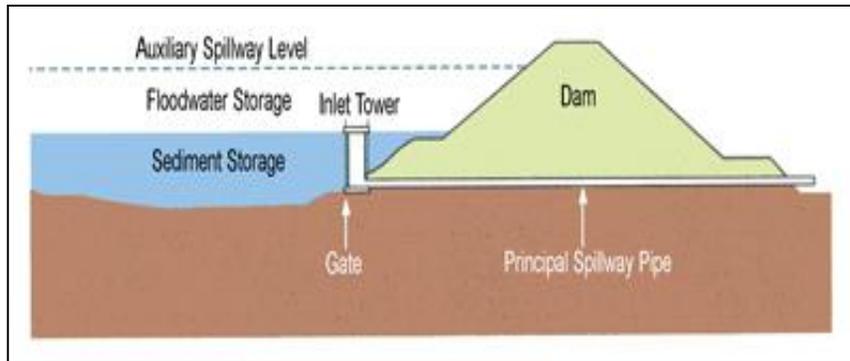
## VULNERABILITY AND IMPACT

Dam failures are generally catastrophic if the structure is breached or significantly damaged. Dam failure can occur with little warning. Intense storms may produce a flood in a few hours or even minutes for upstream locations.



Vulnerability and Impact is assessed in several ways: (1) the benefit to human society arising from the dam; agriculture, water, damage prevention and power, and the benefit to nature and wildlife. (2) The harm caused by dam failure is another way of determining vulnerability and impact. The disruption to human lives through relocation, the loss of employment due to business loss, the loss of life, and loss of wildlife. The property losses of homes, vehicles, and businesses are all a major factor when considering the vulnerabilities and impacts of dam failure. Additionally, the loss of transportation routes forces people to find alternate routes, the loss of communications facilities, loss of critical structures and facilities, and massive economic losses can be devastating to the region.





The communities of Windmill Ridge and Woodlands in the City of Shawnee and unincorporated town of Dale would be the only communities in

Pottawatomie County impacted by a dam failure. A breach of **Granada Dam** would inundate/flood approximately 43 residences in Shawnee forcing residents to relocate and costly repairs to residences. A breach in the **Wes Watkins Dam** would virtually flood the entire community of Dale including the public schools. Schools would be closed until repairs could be made. Highways 102 and 120 are main transportation arteries through Pottawatomie County and are at risk of inundation/wash out from dam failure. The loss of these transportation routes would force commuters to find alternate routes with added travel time and expense. Also, response times for emergency response agencies would be dramatically increased. Crops and livestock lost to inundation from a dam failure would cause a great financial loss to the farmers, ranchers, and to the economies of the county and jurisdictions surrounding those losses.

**TECUMSEH DAM:** A breach of this dam would not impact any recreation area associated with the lake. Highway 270, a major thoroughfare would be inundated and unpassable by flood waters forcing commuters and first response agencies to find detours. Hardesty Road and several residences along Hardesty Rd are at risk of inundation from a dam failure.

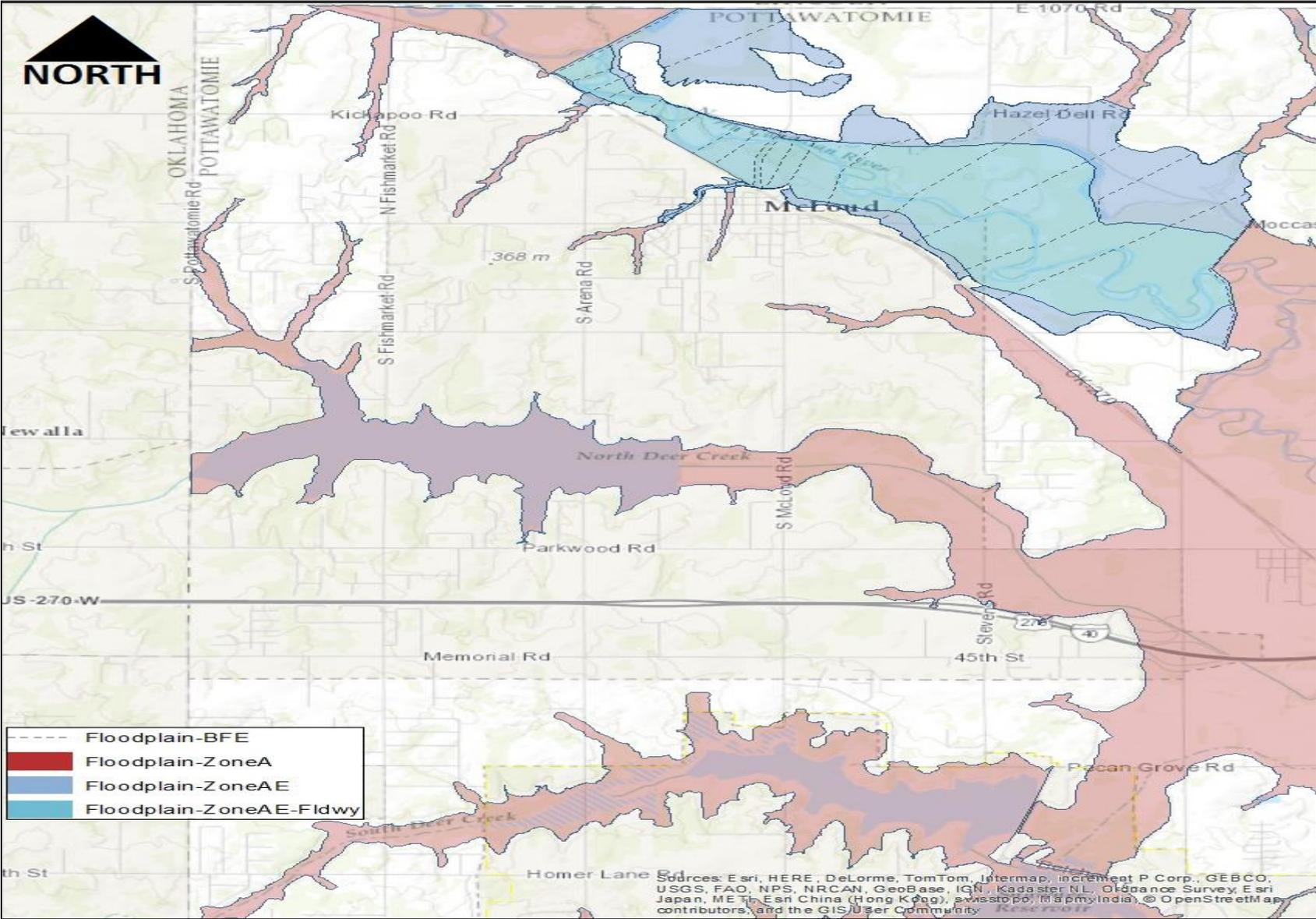
**SALT CREEK DAMS: #13, 14 15 and 16:** All four of these dams are located in rural Pottawatomie County. A dam breach of any of the four would result only in agricultural land and a residential structure being inundated. No participating communities, schools or Gordon Cooper Technology Center would be affected. School bus routes

could be affected in which case drivers would have to find alternative routes. The following data is from the Emergency Action Plan provided by Soil Conservation. No additional data is available for Salt Creek Site 16.

**THUNDERBIRD DAM:** A breach of this dam would not impact any recreation area associated with the lake and would only affect rural agricultural lands in Pottawatomie County. Highway 102 would be inundated and impassable forcing commuters and emergency response to find alternate routes around the flood waters.

**SHAWNEE TWIN LAKES:** A breach of this dam would not impact any recreation area associated with the lake. Agricultural and residential areas along the North Canadian River from I-40 to US 177 would be impacted. Major thoroughfares (Section line roads, US 177 and State Highway 102) would be inundated and unpassable by flood waters forcing commuters and first response agencies to find detours. Hardesty Road and several residences along Hardesty Rd and the south side of the North Canadian River from US 177 to State Highway 3 are at risk of inundation from a dam failure.





The tables on this page represent the insets from the map located in **Appendix B-Section B.5** showing the Dam Inundation Zones for Wes Watkins Dam Panel -1 and Panel-2. (Additional Inundation Maps in **Appendix B-Section B.5**.)

Wes Watkins Reservoir Panel No. 1 Information				
PDL_ID	Residence/Business	Structures	Water Depth (ft from ground)	Time to Peak Flow (H:MM)
NDC0002	House	1	1.3	01:56
NDC0003	Commercial	1	6.7	02:48
NDC0004	House	1	3.4	02:50
NDC0005	Mobile Home	2	0.3	03:12
NDC0006	Church	1	0.8	03:14
NDC0007	Mobile Home	16	2.5	03:16
NDC0008	School	11	2.7	03:16
NDC0009	Church	1	2.5	03:18
NDC00010	Commercial	1	2.5	03:18
NDC00011	House	66	2.4	03:19
NDC00012	Commercial	1	3.4	03:19
NDC00013	House	1	4.8	03:24
NDC00014	Mobile Home	4	2.8	03:26
NDC00015	House	1	1.6	03:28
NDC00016	Mobile Home	5	3.6	03:28
NDC00017	House	1	3.6	03:30
NDC00019	House	1	1.5	06:57
PDL_ID	Bridge/Roadbed	Structures	Water Depth (ft from roadbed)	Time to Peak Flow (H:MM)
NDC0001	Bridge	1	5.5	00:44
NDC00018	Roadbed/Tracks	1	7.6	03:32

Wes Watkins Reservoir Panel No. 2 Information				
PDL_ID	Residence/Business	Structures	Water Depth (ft from ground)	Time to Peak Flow (H:MM)
NDC0002	House	1	1.3	01:56
NDC0003	Commercial	1	6.7	02:48
NDC0004	House	1	3.4	02:50
NDC0005	Mobile Home	2	0.3	03:12
NDC0006	Church	1	0.8	03:14
NDC0007	Mobile Home	16	2.5	03:16
NDC0008	School	11	2.7	03:16
NDC0009	Church	1	2.5	03:18
NDC00010	Commercial	1	2.5	03:18
NDC00011	House	66	2.4	03:19
NDC00012	Commercial	1	3.4	03:19
NDC00013	House	1	4.8	03:24
NDC00014	Mobile Home	4	2.8	03:26
NDC00015	House	1	1.6	03:28
NDC00016	Mobile Home	5	3.6	03:28
NDC00017	House	1	3.6	03:30
NDC00019	House	1	1.5	06:57
PDL_ID	Bridge/Roadbed	Structures	Water Depth (ft from roadbed)	Time to Peak Flow (H:MM)
NDC0001	Bridge	1	5.5	00:44
NDC00018	Roadbed/Tracks	1	7.6	03:32

## CONCLUSION

---

Shawnee Twin Lakes #1, Shawnee Twin Lakes #2, and the Tecumseh Lake Dam, are all beyond their design anticipated life span and will closely be monitored for major maintenance and eventual replacement. Preserving the integrity of the dams from overtopping by floodwaters should be a high priority.

Most of the lakes in Pottawatomie County are Soil Conservation Service lakes and are relatively small in size, creating only a minor threat to life and property. Shawnee Twin Lakes #1 and the Wes Watkins Lake create the biggest concerns due to the reliance of many communities in Pottawatomie County on their water source and also due to the threat on life and property.



~~~~~

## SOURCES

---

*Local Emergency Management Records*

*OWRB - Oklahoma Water Resources Board*

*([www.owrb.ok.gov](http://www.owrb.ok.gov))*

*This page intentionally left blank*