

Professional Resume

Richard Dee Purkeypile, P.E. Purkeypile Consulting, LLC

Dam Safety Engineering & Water Resources Consulting

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EDUCATION B.S., Agricultural Engineering, Texas Tech University, 1984

REGISTRATION Professional Engineer, State of Texas, No. 68027
Texas Firm Registration No. 11617

EXPERIENCE Mr. Purkeypile is a Licensed Texas Professional Engineer (LTPE) with extensive experience in hydraulic and hydrologic engineering and has been involved with Dam Safety Engineering during his 27 year career in engineering. Mr. Purkeypile has previously worked with the Texas Commission on Environmental Quality (TCEQ) and its predecessor agencies in the Hydrology Section, the Hydraulics Unit and the Dam Safety Program for 15 years. He was a senior engineer for the last five years of his tenure with that agency dealing with Hydraulics and Hydrology, Breach Analysis, Stability Analysis, Dam Safety Inspection, and Plan Review and Approval for new and modified dams in Texas.

After leaving the TCEQ, Mr. Purkeypile worked with Freese and Nichols, Inc., for three years and was involved in dam design and rehabilitation, large basin-wide hydrologic and hydraulic modeling and the inspection of 200 dams through a contract with the TCEQ. Projects completed with Freese and Nichols include: the emergency breach analysis of Mansfield Dam (278-foot high water supply and flood control dam near Austin, Texas) as a result of the September 11 terrorist incident, the preliminary design and development of a regional park dam for Williamson County, the inspection of Longhorn Dam and Decker Creek Dam for the City of Austin, the development of plans and specifications for the design of a dam used as a focal center for wildlife observation and a senior center for the City of Carrollton, completion of two complex, basin wide hydrologic and hydraulic routings for Brushy Creek Watershed and the City of New Braunfels, as well as the project management of the inspection of 200 dams for the State of Texas through contracts with the TCEQ. Additionally, Mr. Purkeypile provided hydrologic training to TCEQ Dam Safety staff.

Mr. Purkeypile joined the R. J. Brandes Company (RJBCO) in 2002. Through RJBCO, Mr. Purkeypile operated as a senior engineering consultant specializing in water resources and related fields. He provided consulting assistance on projects involving surface water problems dealing with hydrology, hydraulics, drainage, flooding, litigation support, dam safety engineering, dam embankment and spillway design, breach analysis, inundation

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mapping, emergency action plans, early warning systems, vulnerability assessments of dams, water rights, water quality, nonpoint source pollution control, and storm water management. Representative projects include: the safety inspection of 40 dams through a TCEQ contract, providing expert witness services for rainfall-runoff, flooding and dam safety issues and the inspection, assessment and modification of a high hazard dam in Kerr County to safely pass the Probable Maximum Flood (PMF) with reinforced concrete armoring of the dam. The R. J. Brandes Company was acquired by TRC Environmental Corporation in 2005.

Mr. Purkeypile's projects with TRC included the rehabilitation of Meeker Lake Dam, a high hazard dam located near the City of Weatherford, Texas. Additionally, Mr. Purkeypile inspected 178 high and significant hazard dams for the TCEQ as part of on-going technical assistance to the State of Texas to inspect and assess high hazard dams in Texas. Mr. Purkeypile developed two regional detention ponds for the City of Seguin which allowed over 100 homes to be removed from the 100-year floodplain, completed the breach analyses for Meeker Lake Dam and the City of Blossom Lake Dam, performed H&H analyses of several small earthen dams, assisted with litigation support for the Texas Department of Transportation (TxDOT) and designed several small recreational dams in Texas.

Mr. Purkeypile formed a sole proprietorship in late 2009 and performed H&H analyses, breach analyses and developed emergency action plans for several dams: Spohn Ranch Lake Dam, W.O. Gross Lake Dam, Southern Cross Ranch Dam, ESC Robertson Lake Dam, Laurel Creek Dam and Denman Park Dam. Mr. Purkeypile also developed a plan to decommission Old Lake Winters Dam and performed several on-site assessments of dams that are in need of significant repair.

Mr. Purkeypile formed Purkeypile Consulting, LLC, in July of 2010 for the purpose of providing professional engineering services to owners of dams in Texas. Mr. Purkeypile has also acted as a dam safety engineering consultant to engineering firms that do not have experience with unsteady flow breach analysis of dams or an in-house specialist in dam engineering.

PROFESSIONAL AFFILIATIONS Association of State Dam Safety Officials
Texas Floodplain Managers Association

PROFESSIONAL TRAINING U.S. Army Corps of Engineers (USACE) - HEC-1, HEC-HMS, HEC-2, HEC-RAS (steady flow), HEC-RAS (unsteady flow), UNET (unsteady flow through a network of open channels)
National Weather Service (NWS) - DAMBRK (breach analysis)
Colorado School of Mines - Finite Elements in Geotechnical Engineering
Bureau of Reclamation (BOR) - Safety Evaluation of Existing Dams

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**PROFESSIONAL
HISTORY**

2010 to Present Purkeypile Consulting, LLC, President

Purkeypile Consulting, LLC provides dam safety engineering and water resources consulting for clients in Texas. Specialized dam safety engineering consultation is also provided to dam owners in Arkansas, Oklahoma, Missouri, Illinois and Wisconsin. Mr Purkeypile is currently only licensed in the State of Texas; however, specialized engineering consultation is provided to engineering firms that have engineers licensed in other states and who are familiar with dam engineering yet need specialized consultation. Purkeypile Consulting works closely with the project engineer who directly reviews and approves the consultation work provided by Purkeypile Consulting.

Typical dam engineering services include: on-site inspection and assessment, hydrologic and hydraulic analysis, detailed breach analysis using unsteady flow computer models, operation & maintenance plans, stability analysis, emergency action plan (EAP) preparation, plans & specifications for the construction of new dams and the repair, rehabilitation and upgrading of existing dams which have been damaged or are inadequate to pass the required test flood of the particular state's regulatory agency.

New dam construction often requires water rights permitting. Mr. Purkeypile provides consulting in water rights permitting for new and existing dams.

Mr. Purkeypile provides additional water resources consultation in the form of FEMA 100-year floodplain analysis including letters of map change (CLOMR, LOMR, LOMR-F, LOMA), litigation support for flooding issues and issues related to dams and dam safety and levee inspection and certification.

2009 to 2011 Richard Dee Purkeypile, P.E., Purkeypile Consulting, LLC, President

2005 to 2009 TRC, Austin, Texas, Water Resources Consultant, Principal Engineer

2002 to 2005 R. J. Brandes Company, Austin, Texas, Water Resources Consultant, Senior Engineer

1999 to 2002 Freese & Nichols, Inc., Austin, Texas, H&H Discipline Leader, Senior Engineer

1985 to 1999 Texas Commission on Environmental Quality (TCEQ) and its predecessor agencies, Dam Safety Team, Senior Engineer

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**PROJECT
HISTORY**

2010 to Present Purkeypile Consulting, LLC Projects:

- **Whitewater Springs Dam:** Performed on-site assessment resulting in recommendations for the repair of the dam and upgrading to pass the State of Texas' hydrologic criteria. Performed H&H analysis and breach analysis of the dam to be used in an Emergency Action Plan. Future phases include the development of plans and specifications to repair severe erosion in existing spillway and adding an emergency spillway.
- **Lake Crook and Lake Gibbons Dams (City of Paris, Texas):** Performed on-site assessment of the city's water supply structures in conjunction with Hayter Engineering, Inc. Developed recommendations for repair and maintenance. Developed H&H analysis and breach analysis of both dams, including two additional NRCS floodwater retarding structures in the basin. Developed Emergency Action Plan for the dams.
- **Beacon Lake Dam:** Technical peer review of plans and specifications developed by Baird, Hampton & Brown, Inc., for a 100-acre lake that will be covered with a weighted geomembrane to prevent seepage through the lake bed. Included review of plans, specifications and bid documents. Provided technical memo relating comments, observations and recommendations.
- **Randell Lake Dam (City of Denison, Texas):** Developed plans and specifications for a weighted-filter berm to safely collect seepage through this 101 year old dam. Future phases include: replacing 23 small radial gates with reinforced concrete ogee-crest weirs, stabilizing the upstream slopes bulkhead with rock rip rap, constructing a new spillway stilling basin with roller compacted concrete, decommissioning the old raw water intake structure.
- **Boot Ranch:** Performed on-site assessment of a four dams in conjunction with a state dam safety program inspection. Updated the H&H analysis of four dams. Performed a detailed breach analysis and developed an EAP for each dam. Developed O&M Plans for all four dams. Provided value engineering for a large stilling basin construction project. Future phase to include plans and specifications to repair significant damage associated with two spillways.
- **Coolwater Ranch Dams:** Performed on-site assessment of a new dam, performed a detailed H&H analysis of the dam and four other downstream dams. Performed a detailed breach analysis and developed an EAP and an O&M Plan for the dam. Performed a 100-year floodplain study for the delineation of the floodplain to comply with sanitary sewer regulations.
- **York Pond Dam:** Performed on-site assessment of the dam as a consultant to TRC Environmental Corporation after a drop inlet principal spillway failure, located in Illinois. Recommendations were made to repair the concrete spillway and erosion damage. Performed an H&H analysis to determine adequacy of the dam.

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- **Hayton Dam:** Performed an on-site assessment of this 145 year old grist mill dam located in Wisconsin as a consultant to TRC Environmental Corporation. Developed O&M plan, performed Stability Analysis and directed H&H and breach analyses of the dam. Developed plans and specifications for the repair and stabilization of the old masonry section and cracked concrete sections of the dam, including using injected polyurethane resins to stop leakage and seepage through various sections of the dam.
- **Rio Hondo Lake Dam No.1:** Performed H&H analysis of this concrete wall and buttress dam. Performed Stability Analysis of the dam.
- **Park Lake Dam H&H and EAP Document with Detailed Breach Analysis:** Performed an H&H analysis of this small dam. Performed a “simplified” breach analysis followed by a detailed breach analysis to prove low hazard classification due to lack of impact to downstream houses. Inundation map used for an Emergency Action Plan (EAP).
- **Whippoowill Dam Assessment, H&H and EAP Development:** Performed an on-site assessment of the dam. Provided an inspection report with recommendations for the maintenance of the dam. Provided an operations & maintenance (O&M) plan. Performed an H&H analysis to determine hydraulic adequacy of the dam.
- **Lamshead Ranch Tank Dam Assessment and EAP Development:** Performed an on-site assessment of this 13-foot high earthen dam. Provided recommendations to repair or replace a washed-out principal spillway system.
- **W.O. Gross Lake Dam Assessment:** Performed an on-site assessment of this 13-foot high earthen dam. Provided recommendations to repair or replace a washed-out principal spillway system. Surveyed the centerline of the dam and associated spillways to be used in an H&H analysis. Developed plans & specifications to replace washed-out principal spillway conduits.
- **Walker Canyon Dam Assessment:** Performed an on-site assessment of this 36-foot high dam. The assessment provided recommendations for remediation of seepage issues, spillway adequacy issues and erosion issues. Further analysis included the determination of the hydraulic adequacy of the dam with recommendations to improve the spillway. 100-year flood design was found to be the most cost effective spillway design due to lack of downstream impact of this low hazard dam.
- **Spohn Ranch Dam Assessment and EAP Development:** Performed an on-site assessment of the dam located near Laredo, Texas. Developed an EAP for the dam using the TCEQ’s simplified breach analysis method. Developed plans and specifications to modify the dam to store the 100-year flood volume and safely pass the design flood with a new emergency spillway. Used hydraulic analysis to develop plans and specifications to construct a diversion berm to re-direct flows from an 18 square mile drainage area away from the reservoir.
- **Lake Olden Dam Breach Analysis:** Performed a dynamic breach analysis of this cyclopean concrete ogee crest dam to determine if any adverse impact

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occurs to several dozen homes located along the shores of Lake Leon Dam which is located downstream of Lake Olden Dam. The breach analysis was used to develop inundation maps, which were included in an Emergency Action Plan (EAP) for the dam. The failure of the dam did not cause any adverse impact to downstream residents.

- **Denman Park Dam Assessment and EAP Development (City of San Antonio):** Performed a downstream hazard investigation, H&H analysis and breach analysis of this small, high hazard dam. Developed inundation maps and provided recommendations to upgrade the dam to pass the TCEQ's design storm. Developed an EAP and a tree removal plan for the placement of a Korean Pavilion on the dam crest.
- **Laurel Creek Dam H&H Analysis:** Performed an H&H analysis of this high hazard dam. Provided recommendations to upgrade the dam to pass the TCEQ's design storm and repair the significant beaver damage to the structure. The owners will decide either to remove the dam or upgrade the dam. Developed plans and specifications to repair the dam and add a new reinforced concrete spillway.
- **ESC Robertson Lake Dam Assessment and EAP Development:** Performed a hydrologic and hydraulic analysis of the 28-foot high, significant hazard dam located near the Village of Salado, Texas. Developed an emergency action plan (EAP) for the dam including a detailed breach analysis.
- **Apache Springs Dam EAP:** Performed a breach analysis of Apache Springs Dam, a 25-foot high concrete armored overtopping structure located near Mountain Home, Texas. An emergency action plan (EAP) was developed for the high hazard dam which provides emergency response coordinators with inundation maps that can be used to safely evacuate downstream residents in the unlikely event that the dam should fail.

2005 -2010 TRC Environmental Corporation Projects:

- **Randell Lake Dam H&H Analysis and EAP Development:** Performed an H&H analysis for this 70-foot high dam. A breach analysis and an EAP will be developed for the structure. The City of Denison plans to repair the dam and Mr. Purkeypile will develop plans and specifications to repair a large scour hole in the spillway discharge channel, design a weighted filter berm for a heavily seeping section of the embankment and stabilization of a failing upstream bulkhead.
- **Hunt Overflow Weir:** Mr. Purkeypile designed and managed the construction of a 3.5-foot tall overflow weir on the North Fork of the Guadalupe River. The structure is a reinforced concrete weir and splash pad that is anchored into the river bed. Large limestone blocks and ledge rock were used to create an aesthetic and natural look to the structure. The weir will also have an integrated kayak sluice to allow safe passage of recreationists on the river. A water rights permit was obtained for the recreational use of the pond.

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- **McMillan Dam & Lake Ransom Canyon Dam Assessments 2009:** TRC will perform the on-site assessment of both dams for the city of Lubbock. The on-site assessment team includes HDR, Fugro and TRC. The assessment will identify any structural, geotechnical and hydraulic inadequacies of the dams and provide recommendations for the remediation of the dams.
- **McMillan Dam & Lake Ransom Canyon Dam Hydrologic & Hydraulic Analysis 2009:** TRC will perform the H&H analysis of the two dams and determine the hydraulic adequacy of the dams to pass the State of Texas' required test flood. The analysis will incorporate the large drainage area, compensating for the significant losses associated with playa lake storage of rainfall runoff. Additionally, the City of Lubbock's playa lake drainage system will be utilized as part of the hydrologic model development.
- **TCEQ Dam Safety Inspections FY 2009:** Currently performing 80 dam safety inspections as part an outsourced contract with the TCEQ. The inspections include: observation of deficiencies, review of the hydraulic adequacy of the dam's spillways, provision of detailed recommendations for repair of deficiencies such as: slope stability, erosion damage, wave action damage, overtopping prevention and determination of spillway geometry and embankment height to needed to safely pass the PMF storm event.
- **Blossom City Lake Dam Hydrologic & Hydraulic Analysis and Breach Analysis:** Currently performing a hydrologic and hydraulic analysis for this high hazard dam to determine the current adequacy and the modifications needed to safely pass the Probable Maximum Flood. The breach analysis will be used to develop inundation maps and an Emergency Action Plan.
- **Meeker Lake Dam Breach Analysis:** Currently performing a breach analysis of the dam to determine the critical storm event that results in the development of an Emergency Action Plan that has inundation maps which will be used for the safe evacuation of residents located downstream of the dam.
- **TCEQ Dam Safety Inspections FY 2008:** Performed 98 dam safety inspections as part an outsourced contract with the TCEQ. The inspections include: observation of deficiencies, review of the hydraulic adequacy of the dam's spillways, provision of detailed recommendations for repair of deficiencies such as: slope stability, erosion damage, wave action damage, overtopping prevention and determination of spillway geometry and embankment height to needed to safely pass the PMF storm event.
- **Qualico Communities:** Performed an on-site assessment of a 29-foot high, significant hazard dam located in Travis County. Performed a hydrologic and hydraulic analysis of the dam and its spillway. Provided recommendations for rehabilitation and modifications to bring the dam into compliance with the TCEQ's rules on dam safety.
- **Cool Water Ranch:** Performed on-site assessment of 16 dams located within the boundaries of Cool Water Ranch located near Hunt, Texas.
- **Rattlesnake Springs Ranch Water Resources Assessment:** Performed a comprehensive water resources assessment for a ranch in Kerr County which

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included the site inspection of seven dams with recommendations for the repair and upgrading of several of the dams which had been overtopped by recent rainfall events.

- **Stone Valley Detention Pond:** Performed hydrologic and hydraulic analysis of a small detention pond located within the city of Lampasas. Provided recommendations for the armoring of PMF overtopping flows using high performance turf reinforcement mat.
- **Wentzville Dam Assessment:** Performed an assessment of a small dam near St. Louis, Missouri that has a significant seepage condition. Provided recommendations for limiting the loss of fines through the embankment with the installation of a weighted filter berm to control seepage flow.
- **Manadas Creek Lake Dam:** Performed a site assessment of the dam including a determination of wetlands around the lake area. Provided recommendations for the modification of the dam to pass the 100 % PMF design flood for this high hazard dam. Currently, plans and specifications are being developed for the dam to safely pass the 100% PMF. The design will include leveling the dam crest and decommissioning the original spillway in order to preserve a seepage condition which is considered to be a wetland. A new spillway will be designed to safely pass up the 100 year frequency flood. A secondary spillway will safely pass all flows up to the PMF.
- **TCEQ Dam Safety Inspections FY 2007 (contract continued in FY 2008 & 2009):** Performed 45 dam safety inspections as part an outsourced contract with the TCEQ. Observed deficiencies, reviewed hydraulic adequacy of spillways, provided detailed recommendations for repair of deficiencies such as: slope stability, erosion damage, wave action damage, overtopping prevention. Determined spillway geometry and embankment height to needed to safely pass the PMF storm event.
- **Gabriel's Overlook Dam Assessment:** Performed an emergency assessment of this 25-foot high, high hazard dam which had experienced overtopping and slide on the downstream slope after a large storm event. Provided recommendations for the emergency repair of the slide to stabilize dam. serious seepage conditions were also addressed with the proposed installation of a weighted filter berm to control seepage and stabilize the downstream toe of the dam
- **Mo Ranch Dam:** Performed an on-site assessment of this 17-foot high concrete wall and pier overtopping structure. Provided recommendations for remediation of potential scour conditions and maintenance for the dam.
- **City of Seguin – Regional Detention Ponds:** Developed hydrologic and hydraulic models for flood control regional detention ponds that will bring approximately 50 homes out of the 100 year floodplain and greatly reduce property damage. Studies to be used for FEMA CLOMR and LOMR application. Developed pond size and spillway geometry and rating curve to safely pass the 100 year flood and the PMF.

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- **Hunt Low Water Dam:** Created conceptual drawings for a kayak friendly low water dam on the Guadalupe River. Drawings will be converted to plans and specifications for final construction.
- **City of Bastrop – Flooding Issues:** Reviewed hydraulic models for flooding issues related to a new development within the city. Provided recommendations for model evaluation and litigation support for the city.
- **Village of Bee Cave – Central Park Dam:** Developed conceptual plans for the construction of a small urban recreational dam. Determined hazard class, design storm, spillway width, dam height and lake siting.
- **Texas Water Development Board – Reservoir Siting:** Developed costs for five potential future surface water supply reservoirs and their associated dams in Texas. Costs included: construction, land acquisition, environmental mitigation and debt service.
- **Meeker Lake Dam Plans and Specifications:** Developed plans and specifications for the repair of erosion damage to upstream slope and spillway. Designed expansion of existing spillway to accommodate the PMF. Plans also include mitigation of leaking low flow pipe outlet structure that could cause piping failure of the dam.
- **Meeker Lake Dam Assessment:** Performed on-site assessment of this dam. Provided recommendations and order of magnitude costs for the repair of the failing upstream slope, leaking low flow outlet, severely eroded spillway and hydraulically inadequate spillway.
- **Rufe Evans Lake Dam:** Performed on-site assessment of this dam. Provided recommendations and order of magnitude costs for the repair of the failing upstream slope and the severely eroded spillway as well as for the expansion of the hydraulically inadequate spillway to pass the PMF. Recommendations also included control of excessive seepage on the downstream slope with a weighted filter and stability berm.
- **City of Sequin/Lowe’s:** Developed hydrologic and hydraulic models of drainage area above Lowe’s distribution site to determine dimensions and placement of rerouted creek for the 100 year flood. Model will be submitted for FEMA CLOMR and LOMR (“as-built”). A 25 year flood frequency detention pond will be integrated into the new channel to attenuate the additional flows expected from the project’s 200 acres of impervious cover.
- **TxDOT H&H Models for Little Walnut Creek:** Reviewed existing HEC-HMS and HEC-RAS models of Little Walnut Creek at the IH-35 crossing in Austin, Texas. Models were revised to determine impact of TxDOT’s proposed direct connect flyover project. Various bridge, culvert and detention pond options were modeled in an attempt to create no increase in the 100 year water surface elevation.
- **City of Marlin/ Falls County WCID –** Re-created hydrologic and hydraulic routings for an extensive flood prone creek area near Marlin, Texas. Three dams are to be constructed by the NRCS as flood retarding structures and one larger dam will be constructed for municipal water supply as well as flood

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retarding. Performed comparative analysis of the impact of the reduction in flows created by the four dams on the replenishment of wetlands located downstream of the dams per Corps of Engineers' requirements for the 1 through the 100 year frequency flood events.

- **Parker Dam** – Performed hydrologic (HEC-1) and hydraulic analysis (HEC-RAS) of this high hazard, hydraulically inadequate dam. Performed level survey of the top of dam and cross sections through the spillway to be used in the HEC-RAS hydraulic analysis of the dam. Provided recommendations for the modification of the dam to pass the state's requirements for a high hazard dam.
- **Apache Springs Dam** – Performed periodic assessment of this high hazard structure after the dam had been modified by RJBCO to safely pass the Probable Maximum Flood (PMF). Performed an on-site inspection of the dam including analysis of the potential seepage as noted by piezometer readings.
- **Gove Ranch Dam** – Performed hydrologic and hydraulic analysis for the design of a 24 foot high earthen dam in Milam County, Texas. Designed plans and specifications for the dam construction. Performed on-site construction phase services.
- **Lake Sheridan Dam** – Performed hydrologic and hydraulic assessment of the spillway adequacy of this existing dam to determine if the dam is hydraulically adequate according to Texas Commission on Environmental Quality rules. Performed a level survey of the dam crest and spillway sections.
- **Rio Vista Dam** – Performed emergency assessment of overflow dam on the San Marcos River. Provided recommendations for structural repair of the dam for the City of San Marcos. Provided cost proposal for the repair of the dam.
- **City of Killeen** – Provided recommendations for the repair of a failing slope on a 24 foot high dam owned by the city. Unstable upstream slope conditions were encroaching on the dam crest. Three alternatives for slope stabilization were provided to the city.
- **Zimmerhansel Dam** – Performed the inspection and assessment of earthen embankment with slope stability problems. Determined hydraulic adequacy of the dam and made recommendations to upgrade the dam to pass the required test flood (PMF) by adding a new spillway. Designed integrated seepage filter and stability berm for the embankment.
- **Boot Ranch Development Dams** – Performed assessment of four dams on golf course development property near Fredericksburg, Texas. Rehabilitated a 25 foot high earthen dam with significant seepage problems. Developed plans and specifications for the rehabilitation of Boot Ranch Dam 1441 to safely pass the design storm required by the TCEQ. Coordinated with state and federal agencies on cultural resources and environmental issues such as impacts to waters of the U.S. and wetlands mitigation. Developed plans and specifications for the rehabilitation of Beaver Lake Dam.
- **City of Seguin, Walnut Branch Regional Detention Ponds** - Performed hydrologic and hydraulic routings of various frequency storm events to

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determine regional detention pond embankment size and spillway outlet configuration.

- **TCEQ Dam Safety Inspections FY 2006** – Performed 20 dam safety inspections as an extension of an outsourced contract with the TCEQ. Provided recommendations for maintenance, repair and modifications of these high hazard dams.
- **TxDOT Litigation Support** – Reviewed a FEMA 100-year Flood Insurance Study (FIS) of Willow Springs Creek in San Marcos for TxDOT South Travis/Hays County Area office. Reviewed existing, revised and revised surveyed conditions HEC-2 model and developed new existing and proposed conditions hydraulic modes. Proposed condition reflected proposed TxDOT bridge over the creek. Provided litigation support to TxDOT regarding downstream landowner working with TxDOT Area Engineer and the Texas Attorney General’s Office.
- **Apache Springs Dam** – Performed an assessment of this high hazard dam leading to modification of the dam to safely pass the Probable Maximum Flood (PMF). Reinforced concrete armoring was applied to the dam crest, downstream slope and apron. Scour damage in the streambed below a smaller concrete wall and buttress dam located on the property was repaired with a reinforced concrete scour pad. Designed foam skimmer for the dam project to remove fractionated organics from spillway area. Developed PS&E.

2003-2005

R. J. Brandes Company Projects:

- **TCEQ Dam Safety Inspections FY 2004-2005** – Performed 40 dam safety inspections as part an outsourced contract with the TCEQ. Observed deficiencies, reviewed hydraulic adequacy of spillways, provided detailed recommendations for repair of deficiencies such as: slope stability, erosion damage, wave action damage, overtopping prevention. Determined spillway geometry and embankment height to pass PMF storm.
- **Ralph Hall Dam** – Developed preliminary designs and plans for a large water supply reservoir for Upper Trinity Regional Water District on the North Sulphur River. Performed hydrologic analysis of existing and proposed conditions for 100 square mile drainage area. Performed hydraulic analysis of labyrinth weir principal spillway and ogee crest emergency spillway. Designed both spillway structures, discharge outlets and a 100-foot high, zoned earth embankment.
- **Flooding Issues in Driscoll, Texas** – Investigated hydraulic models used by the U.S. Army Corps of Engineers, FEMA, SCS and private consultants to resolve flooding issues related to obstruction of floodwaters by overgrown streams, bridges and very flat drainage areas along the Texas coast. Reviewed and prepared technical documents for litigation support.
- **Guadalupe River Flooding Issues, Cuero, Texas** – Investigated issues related to the breaching of a diversion berm associated with a hydroelectric dam on the Guadalupe River. Historic rainfall data and gage data were

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analyzed to determine the level of protection provided by the berm for an adjacent property owner. Reviewed and prepared technical documents for litigation support.

- **Freese and Nichols, Inc.** –Assisted the Brushy Creek WCID in obtaining a variance to the hydrologic criteria for dams in the State of Texas. The variance was granted under the condition that each dam will have an Emergency Action Plan, be part of an Early Warning System and will be upgraded to a minimum of 50 percent of the PMF.

1999 to 2002 Freese and Nichols, Inc., Projects

- **Brushy Creek WCID** - Served as project manager and project engineer for the rehabilitation of 17 high hazard NRCS flood prevention dams located within the Upper Brushy Creek Watershed located in Williamson County. Developed basin wide “effective” hydraulics and hydrology models assuming ultimate or complete build-out of the watershed.
- **Regional Detention Pond G** – Performed preliminary engineering design for a proposed regional detention pond for the City of Austin. Designed earthen embankment with rock rip rap and articulated block erosion protection to protect the dam up to the PMF level event. Compared the HEC-1 model with the older TR-20 hydrologic model to determine differences in routings.
- **Medina Dam Emergency:** Provided emergency assistance to the TNRCC Dam Safety Program as a result of the July 4, 2002, flood event near Medina, Texas. Coordinated field investigation with TNRCC central office management and the Texas Department of Public Safety’s Division of Emergency Management. Ultimately made recommendation to evacuate downstream communities due to a rising reservoir elevation and the erosion of the dam abutment.
- **Sam Gideon Reservoir:** Developed hydraulic profile of discharges through the emergency spillway. Determined depth and velocity of flows through the spillway which might cause buoyant condition of the slab. Determined if obstructed drain outlets could also destabilize the spillway chute due to unreleased hydrostatic pressures.
- **East Fork Above Lavon WS SCS Site 3C Dam** – Performed hydrologic and hydraulic routings for 1-year through 500-year rainfall events using HEC-1. Developed Probable Maximum Flood (PMF) hydrographs for the watershed. Performed simplified breach analysis of the structure using HEC-1. Routed breach outflow hydrographs through the downstream valley using HEC-RAS.
- **Mansfield Dam 9-11 Vulnerability Assessment:** Performed emergency breach analysis of Mansfield Dam and coordinated the development of inundation mapping and warning times for downstream residents in the event of a catastrophic failure of the dam.
- **Josey Ranch Lake Dam** – Redesigned an existing dam, breached by a piping event, to pass the PMF. Designed three spillways, plunge pools, discharge

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channels and erosion protection for the upstream slope, emergency spillway discharge channel and the low flow outlet area. Developed PS&E.

- **FY 2001 TNRCC Dam Safety Inspections:** Served as project manager for the inspection of 100 dams for the TNRCC's Dam Safety Program, fiscal year 2001. Coordinated the activities of four inspection and provided quality control for all 100 dam inspection reports.
- **GBRA Dam Safety Inspections:** Performed dam safety inspections of three of six low head hydroelectric dams located on the Guadalupe River below the City of New.
- **Williamson County Regional Park Dam -** Developed preliminary design location for a proposed dam. Coordinated Karst specialist to identify critical environmental features that recharged underlying aquifer.
- **FY 2000 TNRCC Dam Safety Inspections:** - 100 Dam Safety Inspections Project - Served as project manager for the inspection of 100 high and significant hazard dams as part of an outsourced services contract with the TNRCC. Performed 50 inspections. Coordinated the efforts of three inspection teams consisting of approximately twelve Freese and Nichols' staff engineers, engineers-in-training and student interns as well as a subcontracted engineering firm.
- **City of New Braunfels -** Served as senior engineer on a comprehensive hydrologic study of the City of New Braunfels and Comal County in which more than 150 sub-watersheds were delineated and their runoff characteristics were determined.
- **Comal County NRCS Dams Feasibility Study –** Performed preliminary engineering studies of the impact of the five existing NRCS flood prevention dams that most impacted the City of New Braunfels. Performed hydrologic and hydraulic analysis of the proposed dam sites to determine the attenuation of flooding within the city using HEC-1, HEC-2 and HEC-RAS.

1985 to 1999

**Texas Commission on Environmental Quality (TCEQ) Projects
(formerly the Texas Natural Resource Conservation Commission and the
Texas Water Commission), Senior Engineer, Dam Safety Team**

- **Executive Director's Task Force on Dam Safety –** Under the direction of the Executive Director of the Commission, participated in a task force of consulting engineers, dam owners, federal and state agencies, insurance industry representatives and other parties interested in dams in Texas directed at evaluating the current dam safety program and determining appropriate changes to the Commission rules regarding hydrologic criteria.
- **Historical Rainfall in Texas -** Researched the occurrence of all known large rainfall events in Texas. Study results revealed Texas has hydrologic regions that are not adequately represented in the traditional Rainfall Frequency Atlas of the United States (TP-40).

Professional Resume
Richard Dee Purkeypile, P.E.
Purkeypile Consulting, LLC

- **Woodville Area Flood, September 27, 1996** – Performed basin wide hydrologic and hydraulic analysis using HEC-1 & HEC-2, for 10 area dams which overtopped and failed as a result of 16 inches of rainfall in 24 hours with 13 inches of rain falling in a 4-hour period.
- **H&H Analysis** - Performed approximately 200 spillway adequacy analyses using HEC-1, DAMS-2, HEC-2. Performed rainfall optimization/reduction using USACE-HMR-52 for approximately 20 drainage areas associated with dams.
- **Breach Analysis** - Performed approximately 60 breach analyses of existing and proposed dams using the NWS-DAMBRK breach program.
- **Dam Safety Inspections** - Performed dam safety inspections of approximately 400 dams. Performed forensic analysis of the failure mechanisms of approximately 30 dam failures in Texas. Failures occurred by overtopping, seepage, piping, slides and structural instability.