

## Publically Available Reports

**Ratigan, J. L., 2011.** *2011 Subsidence Monitoring Report for Williams Energy Services Mitchell Facility, Kansas*, PB-0327, prepared by PB Energy Storage Services, Inc., Houston, TX, for Williams Energy Services, McPherson, KS.

**Ratigan, J. L., 2011.** *Level Surveys and Subsidence Analysis, Spindletop Salt Dome, 2011 Report*, PB-0325, prepared by PB Energy Storage Services, Inc., Houston, TX, for Air Liquide, Houston, TX; Coastal Caverns, Houston, TX; Centana Pipeline, Houston, TX; Entergy, Beaumont, TX; and Golden Triangle Storage, Beaumont, TX.

**Ratigan, J. L., 2011.** *Level Surveys and Subsidence Analysis, Targa Midstream Services, L.P., West Hackberry Salt Dome, 2011 Report*, PB-0308, prepared by PB Energy Storage Services, Inc., Houston, TX, for Targa Midstream Services, L.P., Houston, TX.

**Ratigan, J. L., 2011.** *Level Surveys and Subsidence Analysis, Sour Lake Salt Dome, Hardin County, Texas, 2010 Report to The Railroad Commission of Texas*, PB-0302, prepared by PB Energy Storage Services, Inc., Houston, TX, for Motiva Enterprises, Port Arthur, TX; and Flint Hills Resources, Wichita, KS.

**Ratigan, J. L., 2011.** *Level Surveys and Subsidence Analysis, Barbers Hill Field, Chambers County, Texas, 2010 Report to the Railroad Commission of Texas*, PB-0298, prepared by PB Energy Storage Services, Inc., Houston, TX, for the Mont Belvieu Operators, Mont Belvieu, TX.

**Buchholz, S. A., J. D. Osnes, K. L. DeVries, and J. L. Ratigan, 2010.** *Temperature Logging as a Mechanical Integrity Test (MIT) for Gas-Filled Caverns – Final Report*, RSI-2158, prepared by RESPEC, Rapid City, SD, and PB Energy Storage Services, Inc., Houston, TX, for Gas Storage Technology Consortium, University Park, PA.

**Ratigan, J. L., 2010.** *Level Surveys and Subsidence Analysis, Targa Midstream Services, L.P., West Hackberry Salt Dome, 2010 Report*, PB-0269, prepared by PB Energy Storage Services, Inc., Houston, TX, for Targa Midstream Services, L.P., Houston, TX.

**Ratigan, J. L., 2010.** *2009 Subsidence Monitoring Report for Williams Energy Services Mitchell Facility, Kansas*, PB-0268, prepared by PB Energy Storage Services, Inc., Houston, TX, for Williams Energy Services, McPherson, KS.

**Ratigan, J. L., 2010.** *2009 Subsidence Monitoring Report for Williams Energy Services Conway Station Facility, Kansas*, PB-0267, prepared by PB Energy Storage Services, Inc., Houston, TX, for Williams Energy Services, McPherson, KS.

**Ratigan, J. L., 2010.** *2009 Subsidence Monitoring Report for Williams Energy Services Conway Underground East (CUE) Facility, Kansas*, PB-0266, prepared by PB Energy Storage Services, Inc., Houston, TX, for Williams Energy Services, McPherson, KS.

**Ratigan, J. L., 2010.** *Level Surveys and Subsidence Analysis, Spindletop Salt Dome, 2009 Report*, PB-0261, prepared by PB Energy Storage Services, Inc., Houston, TX, for Air Liquide, Houston, TX; Coastal Caverns, Houston, TX; Centana Pipeline, Houston, TX; Entergy, Beaumont, TX; and Golden Triangle Storage, Beaumont, TX.

**Ratigan, J. L., 2010.** *Level Surveys and Subsidence Analysis, Barbers Hill Field, Chambers County, Texas, 2009 Report to the Railroad Commission of Texas*, PB-0259, prepared by PB Energy Storage Services, Inc., Houston, TX, for the Mont Belvieu Operators, Mont Belvieu, TX.

**Ratigan, J. L., 2010.** *Level Surveys and Subsidence Analysis, Sour Lake Salt Dome, Hardin County, Texas, 2009 Report to The Railroad Commission of Texas*, PB-0258, prepared by PB Energy Storage Services, Inc., Houston, TX, for Motiva Enterprises, Port Arthur, TX; and Flint Hills Resources, Wichita, KS.

**Ratigan, J. L., 2009.** *Level Surveys and Subsidence Analysis, Pierce Junction Salt Dome, Harris County, 2008 Report to the Railroad Commission of Texas*, PB-0246, prepared by PB Energy Storage Services, Inc., Houston, TX, for Texas Brine Company, LLC, Houston, TX; and Enterprise Products Operating, L.P., Mont Belvieu, TX.

**Ratigan, J. L., 2009.** *Level Surveys and Subsidence Analysis, Enterprise Products Stratton Ridge Salt Dome, 2009 Report to The Railroad Commission of Texas*, PB-0239, prepared by PB Energy Storage Services, Inc., Houston, TX, for Enterprise NGL Pipelines, LLC, Sugar Land, TX.

**Ratigan, J. L., 2010.** *Level Surveys and Subsidence Analysis, Markham Salt Dome, Markham, Texas, 2009 Report to the Railroad Commission of Texas*, PB-0238, prepared by PB Energy Storage Services, Inc., Houston, TX, for Texas Brine Company, LLC, Houston, TX.

**Ratigan, J. L., 2009.** *Level Surveys and Subsidence Analysis, Petal Salt Dome, Petal, Mississippi, 2009 Report*, PB-0237, prepared by PB Energy Storage Services, Inc., Houston, TX, for EPCO, Inc., Houston, TX; LDH Energy, Houston, TX; and Targa Resources Inc., Houston, TX.

**Ratigan, J. L., 2009.** *Level Surveys and Subsidence Analysis, Sour Lake Salt Dome, Hardin County, Texas, 2008 Report to The Railroad Commission of Texas*, PB-0232, prepared by PB Energy Storage Services, Inc., Houston, TX, for Motiva Enterprises, Port Arthur, TX; and Flint Hills Resources, Wichita, KS.

**Ratigan, J. L., 2009.** *Level Surveys and Subsidence Analysis, Barbers Hill Field, Chambers County, Texas, 2008 Report to the Railroad Commission of Texas*, PB-0230, prepared by PB Energy Storage Services, Inc., Houston, TX, for the Mont Belvieu Operators, Mont Belvieu, TX.

**Ratigan, J. L., 2008.** *Level Surveys and Subsidence Analysis, Petal Salt Dome, Petal, Mississippi, 2008 Report*, PB-0223, prepared by PB Energy Storage Services, Inc., Houston, TX, for Enterprise Products Operating L.L.C., Houston, TX; LDH Energy, Houston, TX; and Targa Resources Inc., Houston, TX.

**Ratigan, J. L., 2008.** *Brine String Integrity Survey and Model Evaluation, Final Report (July 1, 2006, to June 30, 2008)*, PB-0156-8, prepared by PB Energy Storage Services, Inc., Houston, TX, for Gas Storage Technology Consortium, University Park, PA.

**Ratigan, J. L., 2008.** *Level Surveys and Subsidence Analysis, Markham Salt Dome, Markham, Texas, 2007 Report to the Railroad Commission of Texas, PB-0213*, prepared by PB Energy Storage Services, Inc., Houston, TX, for Texas Brine Company, LLC, Houston, TX.

**Ratigan, J. L., 2008.** *Level Surveys and Subsidence Analysis, Sour Lake Salt Dome, Hardin County, Texas, 2007 Report to The Railroad Commission of Texas, PB-0211*, prepared by PB Energy Storage Services, Inc., Houston, TX, for Motiva Enterprises, Port Arthur, TX; and Huntsman Corporation, Sour Lake, TX.

**Ratigan, J. L., 2008.** *Level Surveys and Subsidence Analysis, Pierce Junction Salt Dome, Harris County, 2007 Report to the Railroad Commission of Texas, PB-0202*, prepared by PB Energy Storage Services, Inc., Houston, TX, for Texas Brine Company, LLC, Houston, TX; and Enterprise Products Operating, L.P., Mont Belvieu, TX.

**Ratigan, J. L., 2008.** *Level Surveys and Subsidence Analysis, Barbers Hill Field, Chambers County, Texas, 2007 Report to the Railroad Commission of Texas, PB-0198*, prepared by PB Energy Storage Services, Inc., Houston, TX, for the Mont Belvieu Operators, Mont Belvieu, TX.

**Meece, M. W., P. Vajjha, and J. L. Ratigan, 2007.** *Mechanical Integrity Test Report, Enterprise Products Operating L.P. Wilson Well No. 2, Boling Salt Dome, PB-0186*, prepared by PB Energy Storage Services, Inc., Houston, TX, for Enterprise Products Operating, L.P., Houston, TX.

**Ratigan, J. L., 2007.** *Level Surveys and Subsidence Analysis, Enterprise Products Stratton Ridge Salt Dome, 2007 Report to The Railroad Commission of Texas, PB-0185*, prepared by PB Energy Storage Services, Inc., Houston, TX, for Enterprise NGL Pipelines, LLC, Sugar Land, TX.

**Meece, M. W., M. J. Olesko, and J. L. Ratigan, 2007.** *Mechanical Integrity Test Report, Enterprise Products Operating L.P. Wilson Well No. 1, Boling Salt Dome, PB-0182*, prepared by PB Energy Storage Services, Inc., Houston, TX, for Enterprise Products Operating, L.P., Houston, TX.

**Ratigan, J. L., 2007.** *Subsidence-Monitoring Plan for AGL Resources Golden Triangle Storage Spindletop Salt Dome, Jefferson County, Texas, PB-0183*, prepared by PB Energy Storage Services, Inc., Houston, TX, for AGL Resources, Houston, TX.

**Ratigan, J. L. and B. C. Lampe, 2007.** *2007 Subsidence Monitoring Report for Williams Energy Services Conway Station Facility, Kansas, PB-0180*, prepared by PB Energy Storage Services, Inc., Houston, TX; and RESPEC, Rapid City, SD, for Williams Energy Services, McPherson, KS.

**Ratigan, J. L. and B. C. Lampe, 2007.** *2007 Subsidence Monitoring Report for Williams Energy Services Conway Underground East (CUE) Facility, Kansas, PB-0179*, prepared by PB Energy Storage Services, Inc., Houston, TX; and RESPEC, Rapid City, SD, for Williams Energy Services, McPherson, KS.

**Ratigan, J. L. and B. C. Lampe, 2007.** *2007 Subsidence Monitoring Report for Williams Energy Services Mitchell Facility, Kansas, PB-0178*, prepared by PB Energy Storage Services, Inc., Houston, TX; and RESPEC, Rapid City, SD, for Williams Energy Services, McPherson, KS.

**Ratigan, J. L., 2007.** *Level Surveys and Subsidence Analysis, Markham Salt Dome, Markham, Texas, 2006 Report to the Railroad Commission of Texas, PB-0176*, prepared by PB Energy Storage Services, Inc., Houston, TX, for Texas Brine Company, LLC, Houston, TX.

**Ratigan, J. L., 2007.** *Level Surveys and Subsidence Analysis, Barbers Hill Field, Chambers County, Texas, 2006 Report to the Railroad Commission of Texas, PB-0170*, prepared by PB Energy Storage Services, Inc., Houston, TX, for the Mont Belvieu Operators, Mont Belvieu, TX.

**Ratigan, J. L., 2007.** *Level Surveys and Subsidence Analysis, Pierce Junction Salt Dome, Harris County, 2006 Report to the Railroad Commission of Texas, PB-0172*, prepared by PB Energy Storage Services, Inc., Houston, TX, for Texas Brine Company, LLC, Houston, TX; and Enterprise Products Operating, L.P., Mont Belvieu, TX.

**Ratigan, J. L., 2007.** *Subsidence-Monitoring Plan for Coastal Caverns, Inc. Spindletop Salt Dome, Jefferson County, Texas, PB-0166*, prepared by PB Energy Storage Services, Inc., Houston, TX, for Coastal Caverns, Inc., Houston, TX.

**Ratigan, J. L., 2007.** *Level Surveys and Subsidence Analysis, Sour Lake Salt Dome, Hardin County, Texas, 2006 Report to The Railroad Commission of Texas, PB-0165*, prepared by PB Energy Storage Services, Inc., Houston, TX, for Motiva Enterprises, Port Arthur, TX; and Huntsman Corporation, Sour Lake, TX.

**Vajjha, P., M. W. Meece, and J. L. Ratigan, 2007.** *Mechanical Integrity Test Report, Enterprise Products Operating L.P. Wilson Well No. 4, Boling Salt Dome, PB-0164*, prepared by PB Energy Storage Services, Inc., Houston, TX, for Enterprise Products Operating, L.P., Houston, TX.

**Eyermann, T. J. and J. L. Ratigan, 2007.** *Cavern Solution-Mining Plan for Mid-Continent Fractionation and Storage Wells C-63, C-64, C-6,5 and C-66, PB-0161*, prepared by PB Energy Storage Services, Inc., Houston, TX, for Mid-Continent Fractionation and Storage, LLP, McPherson, KS.

**Ratigan, J. L., 2006.** *2006 Subsidence Monitoring Report for Williams Energy Services Conway Station Facility, Kansas, PB-0154*, prepared by PB Energy Storage Services, Inc., Houston, TX, for Williams Energy Services, McPherson, KS.

**Ratigan, J. L., 2006.** *2006 Subsidence Monitoring Report for Williams Energy Services Conway Underground East (CUE) Facility, Kansas, PB-0153*, prepared by PB Energy Storage Services, Inc., Houston, TX, for Williams Energy Services, McPherson, KS.

**Ratigan, J. L., 2006.** *2006 Subsidence Monitoring Report for Williams Energy Services Mitchell Facility, Kansas, PB-0152*, prepared by PB Energy Storage Services, Inc., Houston, TX, for Williams Energy Services, McPherson, KS.

**Ratigan, J. L., L. Venegas, and F. J. Jurica, 2006.** *Mechanical Integrity Test, Enterprise Petal Well No. 3, PB-0151*, prepared by PB Energy Storage Services, Inc., Houston, TX, for Enterprise Products Operating, L.P., Houston, TX.

**Ratigan, J. L. and T. J. Eyermann, 2006.** *Test and Core Well Investigations at Mitchell, Kansas, PB-0150*, prepared by PB Energy Storage Services, Inc., Houston, TX, for Mid-Continent Fractionation and Storage, LLC, McPherson, KS.

**Ratigan, J. L. and T. J. Eyermann, 2006.** *Test and Core Well Investigations at the CUE Facility at Conway, Kansas, PB-0148*, prepared by PB Energy Storage Services, Inc., Houston, TX, for Mid-Continent Fractionation and Storage, LLC, McPherson, KS; National Cooperative Refinery Association, McPherson, KS; and ONEOK Hydrocarbon, L.P., Tulsa, OK.

**Ratigan, J. L., 2006.** *Level Surveys and Subsidence Analysis, Barbers Hill Field, Chambers County, Texas, 2005 Report to the Railroad Commission of Texas, PB-0136*, prepared by PB Energy Storage Services, Inc., Houston, TX, for the Mont Belvieu Operators, Mont Belvieu, TX.

**Ratigan, J. L., J. D. Osnes, R. D. Arnold, and K. D. Mellegard, 2006.** *Test and Core Well Investigations at the Mid-Continent Fractionation and Storage, LLC, Conway West Underground Facility, PB-0137*, prepared by PB Energy Storage Services, Inc., Houston, TX; and RESPEC, Rapid City, SD, for Mid-Continent Fractionation and Storage, LLC, McPherson, KS.

**Ratigan, J. L., 2006.** *Level Surveys and Subsidence Analysis, Markham Salt Dome, Markham, Texas, 2005 Report to the Railroad Commission of Texas, PB-0134*, prepared by PB Energy Storage Services, Inc., Houston, TX, for Texas Brine Company, LLC, Houston, TX.

**Ratigan, J. L., 2006.** *Level Surveys and Subsidence Analysis, Sour Lake Salt Dome, Hardin County, Texas, 2005 Report to The Railroad Commission of Texas, PB-0133*, prepared by PB Energy Storage Services, Inc., Houston, TX, for Motiva Enterprises, Port Arthur, TX; and Huntsman Corporation, Sour Lake, TX.

**Ratigan, J. L., 2005.** *Core Plan, Williams Energy Services, Conway West Facility, PB-0124*, prepared by PB Energy Storage Services, Inc., Houston, TX, for Mid-Continent Fractionation and Storage, LLC, McPherson, KS.

**Osnes, J. D., D. A. Hoag, K. L. DeVries, P. E. Nelson, and J. L. Ratigan, 2005.** *Geomechanical Study of the Main Pass Energy Hub™ Natural Gas Storage Caverns, RSI-1849*, prepared by RESPEC, Rapid City, SD; and PB Energy Storage Services, Inc., Houston, TX; for PB Energy Storage Services, Inc., Houston, TX.

**Ratigan, J. L., 2005.** *Core Test Well Plan, Williams Energy Services, Mitchell Terminal, PB-0123*, prepared by PB Energy Storage Services, Inc., Houston, TX, for Williams Energy Services, McPherson, KS.

**Ratigan, J. L., 2005.** *Subsidence Monitoring Plan for Williams Energy Services Mitchell Facility, Kansas, PB-0122*, prepared by PB Energy Storage Services, Inc., Houston, TX, for Williams Energy Services, McPherson, KS.

**Ratigan, J. L., 2005.** *Subsidence Monitoring Plan for Williams Energy Services Conway Underground East (CUE) Facility, Kansas, PB-0121*, prepared by PB Energy Storage Services, Inc., Houston, TX, for Williams Energy Services, McPherson, KS.

**Ratigan, J. L., 2005.** *Subsidence Monitoring Plan for Williams Energy Services Conway Station Facility, Kansas, PB-0120*, prepared by PB Energy Storage Services, Inc., Houston, TX, for Williams Energy Services, McPherson, KS.

**Ratigan, J. L., 2005.** *Core Test Well Plan, National Cooperative Refinery Association and Williams Energy Services Conway Underground East (CUE) Terminals, PB-0119*, prepared by PB Energy Storage Services, Inc., Houston, TX, for National Cooperative Refinery Association, McPherson, KS; and Williams Energy Services, McPherson, KS.

**Ratigan, J. L., 2005.** *Level Surveys and Subsidence Analysis, Pierce Junction Salt Dome, Harris County, 2005 Report to the Railroad Commission of Texas*, PB-0110, prepared by PB Energy Storage Services, Inc., Houston, TX, for Texas Brine Company, LLC, Houston, TX; and Enterprise Products Operating, L.P., Houston, TX.

**Ratigan, J. L., 2005.** *Level Surveys and Subsidence Analysis, Markham Salt Dome, Markham, Texas, 2004 Report to the Railroad Commission of Texas*, PB-0109, prepared by PB Energy Storage Services, Inc., Houston, TX, for Texas Brine Company, LLC, Houston, TX.

**Ratigan, J. L., 2005.** *Level Surveys and Subsidence Analysis, Barbers Hill Field, Chambers County, Texas, 2004 Report to the Railroad Commission of Texas*, PB-0106, prepared by PB Energy Storage Services, Inc., Houston, TX, for the Mont Belvieu Operators, Mont Belvieu, TX.

**Ratigan, J. L., 2005.** *Level Surveys and Subsidence Analysis, Enterprise Products Stratton Ridge Salt Dome, 2004 Report to The Railroad Commission of Texas*, PB-0105, prepared by PB Energy Storage Services, Inc., Houston, TX, for Enterprise NGL Pipelines, Sugar Land, TX.

**Ratigan, J. L., 2005.** *Level Surveys and Subsidence Analysis, Sour Lake Salt Dome, Hardin County, Texas, 2004 Report to The Railroad Commission of Texas*, PB-0100, prepared by PB Energy Storage Services, Inc., Houston, TX, for Motiva Enterprises, Port Arthur, TX; and Huntsman Corporation, Sour Lake, TX.

**Ratigan, J. L., D. A. Blankenship, P. E. Nelson, K. D. Mellegard, and R. D. Arnold, 2004.** *Test and Core Well Investigations at the Koch Terminal, Hutchinson, Kansas*, PB-0055, prepared by PB Energy Storage Services, Inc., Houston, TX; and RESPEC, Rapid City, SD; for Koch Hydrocarbons, Hutchinson, KS.

**Ratigan, J. L., 2004.** *Level Surveys and Subsidence Analysis, Markham Salt Dome, Markham, Texas, 2003 Report to the Railroad Commission of Texas*, PB-0089, prepared by PB Energy Storage Services, Inc., Houston, TX, for Texas Brine Company, LLC, Houston, TX.

**Ratigan, J. L., 2004.** *Level Surveys and Subsidence Analysis, Pierce Junction Salt Dome, Harris County, 2004 Report to the Railroad Commission of Texas*, PB-0087, prepared by PB Energy Storage Services, Inc., Houston, TX, for Texas Brine Company, LLC, Houston, TX; and El Paso Field Services, Houston, TX.

**Ratigan, J. L., 2004.** *Level Surveys and Subsidence Analysis, Barbers Hill Field, Chambers County, Texas, 2003 Report to the Railroad Commission of Texas*, PB-0082, prepared by PB Energy Storage Services, Inc., Houston, TX, for the Mont Belvieu Operators, Mont Belvieu, TX.

**Ratigan, J. L., 2003.** *Level Surveys and Subsidence Analysis, Sour Lake Salt Dome, Hardin County, Texas, 2003 Report to The Railroad Commission of Texas*, PB-0079, prepared by PB Energy Storage Services, Inc., Houston, TX, for Motiva Enterprises, Port Arthur, TX; and Huntsman Corporation, Sour Lake, TX.

**Ratigan, J. L., 2003.** *Level Surveys and Subsidence Analysis, Pierce Junction Salt Dome, Harris County, 2003 Report to the Railroad Commission of Texas*, PB-0067, prepared by PB Energy Storage Services, Inc., Houston, TX, for Texas Brine Company, LLC, Houston, TX; and El Paso Field Services, Houston, TX.

**Ratigan, J. L., 2003.** *Level Surveys and Subsidence Analysis, Barbers Hill Field, Chambers County, Texas, 2002 Report to the Railroad Commission of Texas, PB-0064*, prepared by PB Energy Storage Services, Inc., Houston, TX, for the Mont Belvieu Operators, Mont Belvieu, TX.

**Ratigan, J. L., 2002.** *Level Surveys and Subsidence Analysis, Sour Lake Salt Dome, Hardin County, Texas, 2002 Report to The Railroad Commission of Texas, PB-0062*, prepared by PB Energy Storage Services, Inc., Houston, TX, for Motiva Enterprises, Port Arthur, TX; and Huntsman Corporation, Sour Lake, TX.

**Ratigan, J. L., R. W. Blair, and M. W. Meece, 2002.** *Investigation of Casing Ovality in Enterprise Well No. 1W, PB-0054*, prepared by PB-KBB, Inc., Houston, TX, for Enterprise Products Texas Operating, L.P., Houston, TX.

**Ratigan, J. L., 2002.** *January 2001 Natural Gas Explosions in Hutchinson, Kansas – Expert Opinions Report*, prepared for Foulston & Siefkin L.L.P., Bank of America Center, 100 N. Broadway, Suite 700, Wichita, KS.

**Ratigan, J. L., 2002.** *Level Surveys and Subsidence Analysis, Pierce Junction Salt Dome, Harris County, 2002 Report to the Railroad Commission of Texas, PB-0050*, prepared by PB-KBB, Inc., Houston, TX, for Texas Brine Company, LLC, Houston, TX, and El Paso Field Services, Houston, TX.

**Ratigan, J. L., 2002.** *Application for a Class III Injection Well Permit, PB-0047*, prepared by Gulf South Pipeline, LP, Houston, TX, for Injection & Mining Division, Office of Conservation, Department of Natural Resources, State of Louisiana, Baton Rouge, LA.

**Ratigan, J. L., 2002.** *Level Surveys and Subsidence Analysis, Barbers Hill Field, Chambers County, Texas, 2001 Report to the Railroad Commission of Texas, PB-0045*, prepared by PB-KBB, Inc., Houston, TX, for the Mont Belvieu Operators, Mont Belvieu, TX.

**Ratigan, J. L., 2001.** *Level Surveys and Subsidence Analysis, Sour Lake Salt Dome, Hardin County, Texas, 2001 Report to The Railroad Commission of Texas, PB-0044*, prepared by PB-KBB, Inc., Houston, TX, for Motiva Enterprises, Port Arthur, TX; and Huntsman Corporation, Sour Lake, TX.

**Ratigan, J. L., 2001.** *Napoleonville Salt Dome Enron Brine No. 1 — Evaluation of Cavern Shape, SZUS-0037*, prepared by Sofregaz US, Houston, TX, for LRCI Inc., Houston, TX.

**Ratigan, J. L., 2001.** *Subsidence-Monitoring Plan for New York LP Gas Storage, SZUS-0035*, prepared by Sofregaz US, Houston, TX, for New York LP Gas Storage, Harford, NY.

**Ratigan, J. L., 2001.** *Level Surveys and Subsidence Analysis, Barbers Hill Field, Chambers County, Texas, 2000 Report to the Railroad Commission of Texas, SZUS-0033*, prepared by Sofregaz US, Houston, TX, for the Mont Belvieu Operators, Mont Belvieu, TX.

**Ratigan, J. L., 2000.** *Subsidence-Monitoring Plan for Sour Lake Salt Dome, Hardin County, Texas, SZUS-0027*, prepared by Sofregaz US, Houston, TX, for Buckeye Gulf Coast Pipe Lines, LLC, Sour Lake, TX; and Motiva, Port Arthur, TX.

**Ratigan, J. L., 2000.** *Level Surveys and Subsidence Analysis, Barbers Hill Field, Chambers County, Texas, 1999 Report to the Railroad Commission of Texas, SZUS-0023*, prepared by Sofregaz US, Houston, TX, for the Mont Belvieu Operators, Mont Belvieu, TX.

**Ratigan, J. L., P. Montoulives, and J. D. Osnes, 1999.** *Salt Cavern Thermal Simulator — Software Requirements Document*, SZUS-0008, prepared by Sofregaz US, Houston, TX; and RESPEC, Rapid City, SD; for the Gas Research Institute, Chicago, IL.

**Ratigan, J. L., 1999.** *Commercial Potential of Natural Gas Storage in Lined Rock Caverns (LRC)*, SZUS-0005, prepared by Sofregaz US, Houston, TX, and LRC, Sweden, for U.S. Department of Energy, Federal Energy Technology Center, Morgantown, WV.

**Ratigan, J. L., 1999.** *Level Surveys and Subsidence Analysis, Barbers Hill Field, Chambers County, Texas, 1998 Report to the Railroad Commission of Texas*, SZUS-0003, prepared by Sofregaz US, Houston, TX, for the Mont Belvieu Operators, Mont Belvieu, TX.

**Ratigan, J. L., J. D. Osnes, and P. E. Nelson, 1998.** *Geomechanical Analysis of the Salt Web Separating Caverns No. 1/1A and No. 2 at the Coastal States Crude Gathering Company Storage Terminal in the Pierce Junction Salt Dome*, RSI-1079, prepared by Sofregaz US, Houston, TX; and RESPEC, Rapid City, SD, for Coastal States Crude Gathering Company, Houston, TX.

**Ratigan, J. L., 1998.** *Subsidence Monitoring Plan for Pierce Junction Salt Dome, Harris County, Texas*, RSI-1039, prepared by RESPEC, Rapid City, SD, for Coastal States Crude Gathering Company, Houston, TX, and Texas Brine Company, Houston, TX.

**Ratigan, J. L., 1998.** *Level Surveys and Subsidence Analysis, Barbers Hill Field, Chambers County, Texas, 1997 Report to the Railroad Commission of Texas*, RSI-0950, prepared by RE/SPEC Inc., Rapid City, SD, for the Mont Belvieu Operators, Mont Belvieu, TX.

**Ratigan, J. L., 1998.** *Casing Failures and Remedial Actions at Teppco's North and South Terminals, Mont Belvieu, Texas*, RSI-0944, prepared by RE/SPEC Inc., Rapid City, SD, for David Jackson, Austin, TX.

**Ratigan, J. L., 1996.** *Level Surveys and Subsidence Analysis, Barbers Hill Field, Chambers County, Texas, 1995 Report to the Railroad Commission of Texas*, RSI-0693, prepared by RE/SPEC Inc., Rapid City, SD, for the Mont Belvieu Operators, Mont Belvieu, TX.

**Ratigan, J. L., 1995.** *Level Surveys and Subsidence Analysis, Barbers Hill Field, Chambers County, Texas, 1994 Report to the Railroad Commission of Texas*, RSI-0591, prepared by RE/SPEC Inc., Rapid City, SD, for the Mont Belvieu Operators, Mont Belvieu, TX.

**Chen, R., J. D. Osnes, and J. L. Ratigan, 1994.** *Visual SalGas User's Manual (Version 1.20)*, RSI-0528, prepared by RE/SPEC Inc., Rapid City, SD, for Marketing Recipients.

**Nieland, J. D., R. Chen, and J. L. Ratigan, 1994.** *Numerical Modeling of Weeks Island Subsidence*, RSI-0509, prepared by RE/SPEC Inc., Rapid City, SD, for DynMcDermott Petroleum Operations Company, New Orleans, LA.



**Ratigan, J. L., 1994.** *Level Surveys and Subsidence Analysis, Barbers Hill Field, Chambers County, Texas, 1993 Report to the Railroad Commission of Texas*, RSI-0500, prepared by RE/SPEC Inc., Rapid City, SD, for the Mont Belvieu Operators, Mont Belvieu, TX.

**Ratigan, J. L., 1993.** *Level Surveys and Subsidence Analysis, Barbers Hill Field, Chambers County, Texas, 1992 Report to the Railroad Commission of Texas*, RSI-0460, prepared by RE/SPEC Inc., Rapid City, SD, for the Mont Belvieu Operators, Mont Belvieu, TX.

**Ratigan, J. L., 1992.** *Level Surveys and Subsidence Analysis at Barbers Hill Field, Chambers County, Texas, 1991 Report to the Railroad Commission of Texas*, RSI-0423, prepared by RE/SPEC Inc., Rapid City, SD, for the Mont Belvieu Operators, Mont Belvieu, TX.

**Ratigan, J. L., J. D. Nieland, and W. J. Boyle, 1992.** *Guidance for Improving the Interpretation of the Disturbed Rock Zone Database*, RSI-0418, prepared by RE/SPEC Inc., Rapid City, SD, for Parsons Brinckerhoff Quade & Douglas, Inc., San Francisco, CA.

**Ratigan, J. L., 1992.** *Characterization of the Disturbed Rock Zone in Rock Salt: A Status Report*, RSI-0415, prepared by RE/SPEC Inc., Rapid City, SD, for AGM, Inc., College Station, TX.

**Boyle, W. J., J. L. Ratigan, and B. A. Stenson, 1992.** *Review of the WIPP Disturbed Rock Zone Database*, RSI-0404, prepared by RE/SPEC Inc., Rapid City, SD, for Parsons Brinckerhoff Quade & Douglas, Inc.

**Ratigan, J. L., L. L. Van Sambeek, K. L. DeVries, and J. D. Nieland, 1991.** *The Influence of Seal Design on the Development of the Disturbed Rock Zone in the WIPP Alcove Seal Tests*, RSI-0400, prepared by RE/SPEC Inc., Rapid City, SD, for Sandia National Laboratories, Albuquerque, NM.

**Osnes, J. D., J. L. Ratigan, M. C. Loken, and D. K. Parrish, 1989.** *Documentation of SPECTROM-55: A Finite Element Thermohydrogeological Analysis Program*, DOE/CH/1037-4, prepared by RE/SPEC Inc., Rapid City, SD, for the Department of Energy, Chicago Operations Office, Argonne, IL.

**Ratigan, J. L. and T. Brandshaug, 1986.** *Simulation of the Sandia Laboratory Salt Block II Brine Migration Experiment*, RSI-0261, prepared by RE/SPEC Inc., Rapid City, SD, for the Office of Nuclear Waste Isolation, Battelle Memorial Institute, Columbus, OH.

**Ratigan, J. L., 1984.** *Documentation of SPECTROM—58: A Finite Element Brine Migration Analysis Program*, RSI-0265, prepared by RE/SPEC Inc., Rapid City, SD, for the Office of Nuclear Waste Isolation, Battelle Memorial Institute, Columbus, OH.

**Ratigan, J. L., M. C. Loken, R. A. Wagner, K. M. Linde, and F. H. Mutter, 1984.** *Engineering Design and Analysis*, OCRD/SUB-83/E512-10100/11, prepared by RE/SPEC Inc., Rapid City, SD, for the Office of Crystalline Repository Development, Battelle Memorial Institute, Columbus, OH.

**Ratigan, J. L., 1980.** *Immobilized Waste Vault: Container Near-Field Thermal Rock Mechanics Analyses*, TR-53, Atomic Energy of Canada Limited, Niagara Falls, Ontario.

**Ratigan, J. L., 1979.** *Simulation of a Bench Scale Experiment With an Empirical Creep Law*, ONWI-99, prepared by RE/SPEC Inc., Rapid City, SD, for the Office of Nuclear Waste Isolation, Battelle Memorial Institute, Columbus, OH.

**Ratigan, J. L., 1977.** *Groundwater Movements Around a Repository: Thermal Analyses/Conduction Heat Transfer*, Phase 2 Technical Report 02/Part 1, prepared for KBS (Sweden) by Hagconsult AB in association with Acres Consulting Services Ltd. and RE/SPEC Inc.

**Ratigan, J. L., 1977.** *Groundwater Movements Around a Repository: Thermal Analyses/Advective Heat Transfer*, Phase 2 Technical Report 02/Part 2, prepared for KBS (Sweden) by Hagconsult AB in association with Acres Consulting Services Ltd. and RE/SPEC Inc.

**Ratigan, J. L., 1977.** *Groundwater Movements Around a Repository: Rock Mechanics Analyses*, Phase 2 Technical Report 04, prepared for KBS (Sweden) by Hagconsult AB in association with Acres Consulting Services Ltd. and RE/SPEC Inc.

**Ratigan, J. L., 1977.** *Groundwater Movements Around a Repository: Repository Domain Groundwater Flow Analyses/Permeability Perturbation*, Phase 2 Technical Report 05/Part 1, prepared for KBS (Sweden) by Hagconsult AB in association with Acres Consulting Services Ltd. and RE/SPEC Inc.

**Ratigan, J. L., R. G. Charlwood, and E. L. Skiba, 1976.** *Radioactive Waste Repository Study: Thermal Loading*, Topical Report 02, prepared for AECL (Canada) by Acres Consulting Services Ltd. in association with RE/SPEC Inc., DSMA Ltd., and Hagconsult AB.

**Ratigan, J. L., A. F. Fossum, and W. G. Pariseau, 1975.** *Design Aspects of the Alpha Repository: IV. Structural Analysis of Excavation Geometries*, ORNL-SUB-4269-11, prepared by RE/SPEC Inc., Rapid City, SD, for Holifield National Laboratory with Union Carbide Corporation, Nuclear Division, Oak Ridge, TN.

## SMRI Publications

**Skaug, Nils T., Joe L. Ratigan, and Brandon C. Lampe, 2011.** “A Critical Look at the Nitrogen-Brine Interface Mechanical Integrity Test”, *Solution Mining Research Institute Fall Meeting*, York, England, October 2–5.

**Patterson, Doug, Mort Houston, and Joe L. Ratigan, 2011.** “Detection of Geologic Structures Impacting Solution-Mined Cavern Shapes in Domal Salt - An Update with Case Histories”, *Solution Mining Research Institute Fall Meeting*, York, England, October 2–5.

**Ganter, B., J. L. Ratigan, and J. D. Osnes, 2009.** *Cavern Abandonment Field Tests in a Deep Cavern*, Research Project Report 2008-1, prepared by Enterprise Products Operating L.L.C., Houston, TX; PB Energy Storage Services, Inc., Houston, TX; and RESPEC, Rapid City, SD, for Solution Mining Research Institute, Clarks Summit, PA.

**Ratigan, J. L., 2008.** “Brine String Integrity Survey and Model Evaluation,” *Solution Mining Research Institute Spring Meeting*, Austin, TX, October 12–15.

**Patterson, D., X. M. Tang, and J. L. Ratigan, 2008.** “Mapping Structural Geology From Solution-Mined Storage Cavern Wellbores for Selecting Casing Shoe and Leaching String Depths,” *Solution Mining Research Institute Spring Meeting*, Austin, TX, October 12–15.

**Brassow, C. L., J. L. Ratigan, and K. L. DeVries, 2008.** “Experiences in Permitting the First New LPG Storage Facility in Texas in 28 Years,” *Solution Mining Research Institute Spring Meeting*, Porto, Portugal, April 27–30, pp. 211–228.

**Osnes, J. D., K. L. DeVries, J. L. Ratigan, M. W. Meece, M. Thompson, and G. W. Spencer, 2007.** “A Case History of the Threaded Coupling Production Casing Failure in Gas Caverns—Part 1: Detection and Geomechanical Analysis,” *Solution Mining Research Institute Fall Meeting*, Halifax, Nova Scotia, October 7–10, pp. 41–69.

**Thompson, M., G. W. Spencer, M. W. Meece, R. W. Blair, and J. L. Ratigan, 2007.** “A Case History of the Threaded Coupling Production Casing Failure in Gas Caverns—Part 2: Well Repair, Testing, and Return to Service,” *Solution Mining Research Institute Fall Meeting*, Halifax, Nova Scotia, October 7–10, pp. 71–84.

**Ratigan, J. L., D. B. Singleton, and W. K. Behrens, 2007.** “A Comprehensive Evaluation of Ground Motion Associated With Frasch Sulphur Mining in a Gulf Coast Salt Dome,” *Solution Mining Research Institute Spring Meeting*, Basel, Switzerland, April 29–May 2, pp. 49–67.

**Nieland, J. D., J. L. Ratigan, and T. V. McCauley, 2006.** “Geomechanical Assessment of the LOOP LLC Crude Oil Storage Facility in the Clovelly Salt Dome, Louisiana,” *Solution Mining Research Institute Fall Meeting*, Rapid City, SD, October 2–4, pp. 233–252.

**Nieland, J. D. and J. L. Ratigan, 2006.** “Geomechanical Evaluation of Two Gulf Coast Natural Gas Storage Caverns,” *Solution Mining Research Institute Spring Meeting*, Brussels, Belgium, April 30–May 3, pp. 61–90.

**Cartwright, M. J. and J. L. Ratigan, 2005.** “Case History–Solution Mining a Cavern That Intersects a Plane of Preferred Dissolution,” *Solution Mining Research Institute Fall Meeting*, Nancy, France, October 2–5. pp. 91–107.

**Ratigan, J. L., 2003.** “An Introduction to the Displacement and Motion of Hanging Tubulars in Caverns,” *Solution Mining Research Institute Fall Meeting*, Chester, United Kingdom, October 5–8, pp. 253–267.

**Ratigan, J. L., 2003.** “The Solution Mining Research Institute Cavern Sealing and Abandonment Program, 1996 Through 2002,” *Solution Mining Research Institute Spring Meeting*, Houston, TX, April 27–30, pp. 141–164.

**Ratigan, J. L., 2002.** “Regulation of Salt Solution Mining and Hydrocarbon Storage in Salt Caverns in the United States,” *Solution Mining Research Institute Fall Meeting*, Bad Ischl, Austria, October 6.

**Ratigan, J. L., A. McClain, J. Nichols, and S. Hoffine, 2002.** “Fugitive NGL at the Williams Midstream Natural Gas Liquids Conway Underground Storage Facility – Geologic and Hydrogeologic Studies, Cavern Well Testing, and NGL Recovery Plans,” *Solution Mining Research Institute Spring Meeting*, Banff, Alberta, Canada, April 28–May 1, pp. 339–362.

**Ratigan, J. L. and N. A. Heitmann, 2001.** “Heat Transfer and Thermodynamic Considerations for Gas Storage – Theoretical and Practical Viewpoints,” *Solution Mining Research Institute Fall Meeting*, Albuquerque, NM, October 7–10, pp. 175–189.

**Ratigan, J. L., 2001.** *Research Program Plan of the Solution Mining Research Institute, Rev. 0, January 2001*, SZUS-0029, prepared by Research Committee of the Solution Mining Research Institute, Encinitas, CA, for Solution Mining Research Institute, Encinitas, CA.

**Ratigan, J. L., 2000.** “Anomalous Subsidence at Mont Belvieu, Texas,” *Solution Mining Research Institute Fall Meeting*, San Antonio, TX, October 15–18, pp. 37–56.

**Cartwright, M., M. McLaughlin, J. L. Ratigan, and D. A. Blankenship, 2000.** “Case History: A Sinkhole at the EGP Fuels Company LPG Storage Terminal, Mont Belvieu, Texas,” *Solution Mining Research Institute Fall Meeting*, San Antonio, TX, October 15–18, pp. 127–143.

**Ratigan, J. L., 2000.** “A Status Report on the Solution Mining Research Institute Cavern Sealing and Abandonment Program,” *Solution Mining Research Institute Fall Meeting*, San Antonio, TX, October 15–18.

**Ratigan, J. L., 1996.** “Pipelines and Sinkholes: When is There a Problem?,” *Solution Mining Research Institute Spring Meeting*, Houston, TX, April 14–17.

**Ratigan, J. L., J. D. Nieland, R. Chen, K. D. Mellegard, and T. W. Pfeifle, 1995.** “Numerical Modeling of Weeks Island Subsidence and Laboratory Testing of Weeks Island Salt,” *Solution Mining Research Institute Spring Meeting*, New Orleans, LA, April 30–May 3.

**Ratigan, J. L. and R. Blair, 1994.** “Temperature Logging in Drillholes in Domal Salt,” *Solution Mining Research Institute Fall Meeting*, Hannover, Germany, September 25–October 1, pp. 561–579.

**Ratigan, J. L., J. D. Nieland, and J. D. Osnes, 1993.** “Rock Mechanics Aspects of Natural Gas Storage in Domal Salt,” *Solution Mining Research Institute Fall Meeting*, Lafayette, LA, October 25–26.

**Ratigan, J. L., 1991.** “Ground Subsidence at Mont Belvieu, Texas,” prepared by RE/SPEC Inc., Rapid City, SD, *Spring Meeting of the Solution Mining Research Institute*, Atlanta, GA.

## Journal and Symposia Papers

**Ratigan, J. L., 2009.** “Liquefied Petroleum Gas Storage in Salt Caverns at Mont Belvieu, Texas, USA,” *Proceedings, 9th International Symposium on Salt*, China National Convention Center, Beijing, China, September 4–6, S. Zuoliang (ed.), Gold Wall Press, Beijing, China, Vol. 1, pp. 449–456.

**Yee, J. K., J. L. Ratigan, and N. Cocavessis, 2009.** “LPG and Refined Products Storage in Solution-Mined Caverns in Bedded and Domal Salt Deposits in Texas and Mississippi,” *Proceedings, 9th International Symposium on Salt*, China National Convention Center, Beijing, China, September 4–6, S. Zuoliang (ed.), Gold Wall Press, Beijing, China, Vol. 1, pp. 383–391.

**Voigt, J., F. Crotogino, G. Durup, J. Ratigan, and H. von Tryller, 2009.** “Solution Mining Research Institute (SMRI) – Issues and Impact for the Mining and Storage Cavern Industry,” *Proceedings, 9th International Symposium on Salt*, China National Convention Center, Beijing, China, September 4–6, S. Zuoliang (ed.), Gold Wall Press, Beijing, China, Vol. 1, pp. 281–294.

**Ratigan, J. L., 1997.** “Ground Subsidence at Mont Belvieu, Texas, 1988 Through 1993,” *Proceedings, Ground Water Protection Council Annual Forum*, Cleveland, OH, September 20-24.

**Ratigan, J. L., 1995.** “Using Rock Mechanics to Determine Roof Stability in Bedded Salt,” presented at *Railroad Commission of Texas Conference on Suitability of Solution-Mined Caverns for Oil and Gas Waste Disposal*, Austin, TX, September 13.

**Ratigan, J. L., 1995.** “Underground Storage of Hydrocarbons in Salt Formations,” *American Gas Association Operating Section Operations Conference*, Las Vegas, NV, May 7–10.

**Ratigan, J. L., 1995.** “Ground Subsidence at Mont Belvieu, Texas, 1988 Through 1993,” *Proceedings, 35th U.S. Symposium on Rock Mechanics*, University of Nevada, Reno, NV, June 5–7, J. J. K. Daemen and R. A. Schultz (eds.), A. A. Balkema, Rotterdam, pp. 561–566.

**Ratigan, J. L. and T. J. Vogt, 1993.** “LPG Storage at Mont Belvieu, Texas: A Case History,” *SPE Advanced Technology Series*, Vol. 1, No. 1, April, pp. 204–211.

**Van Sambeek, L. L., J. L. Ratigan, and F. D. Hansen, 1993.** “Dilatancy of Rock Salt in Laboratory Tests,” *Proceedings, 34th U.S. Symposium on Rock Mechanics*, University of Wisconsin–Madison, Madison, WI, June 27–30, B. C. Haimson (ed.), *International Journal of Rock Mechanics and Mining Sciences & Geomechanics Abstracts*, Pergamon Press, Vol. 30, No. 7, pp. 735–738.

**Ratigan, J. L., 1992.** “The Use of the Fracture Reopening Pressure In Hydraulic Fracturing Stress Measurements,” *Rock Mechanics and Rock Engineering*, Vol. 25 (4), pp. 225–236, March.

**Ratigan, J. L. and T. J. Vogt, 1991.** “A Note on the Use of Precision Level Surveys to Determine Subsidence Rates,” *International Journal of Rock Mechanics and Mining Sciences*, Vol. 28, No. 4, pp. 337–341.

**Ratigan, J. L., 1990.** “Scale Effects in the Hydraulic Fracture Test Associated With the Estimation of Tensile Strength,” *Proceedings of the 1st International Workshop on Scale Effects in Rock Masses*, Loen, Norway, June.

**Ratigan, J. L. and K. L. DeVries, 1989.** “Potential Geomechanics Problems Resulting From Closely Spaced Storage Wells in Dome Salt,” SPE 19085, *1989 SPE Gas Technology Symposium*, Dallas, TX, June 7–9.

**Ratigan, J. L., K. L. DeVries, and D. A. Blankenship, 1988.** *Simulation of Bench-Scale and Field Tests in Avery Island Dome Salt*, Applied Mechanics and Engineering Sciences Conference (Abstracts), University of California at Berkeley, June.

**Ratigan, J. L., 1984.** “A Finite Element Formulation for Brine Transport in Rock Salt,” *International Journal for Numerical and Analytical Methods in Geomechanics*, Vol. 8, No. 3.

**Ratigan, J. L., 1983.** “A Statistical Fracture Mechanics Determination of the Apparent Tensile Strength in Hydraulic Fracture,” *Hydraulic Fracturing Stress Measurements*, National Academy Press, Washington, D.C.

**Ratigan, J. L., 1982.** “An Examination of the Tensile Strength of Brittle Rock,” *Proceedings, 23rd U.S. Symposium on Rock Mechanics*, University of California, Berkeley, CA, August 25–27, R. E. Goodman and F. E. Heuzé (eds.), Society of Mining Engineers of AIME, pp. 423–440.

**Ratigan J. L., 1981.** *A Statistical Fracture Mechanics Approach to the Strength of Brittle Rock*, Ph.D. Dissertation, Department of Civil Engineering, University of California, Berkeley, CA.

**Ratigan, J. L. and R. E. Goodman, 1981.** “Modeling of Static Mining Subsidence in a Nonlinear Medium,” *Implementation of Computer Procedures and Stress-Strain Laws in Geotechnical Engineering*, Acorn Press, Durham, NC.

**Ratigan, J. L., R. A. Wagner and P. F. Gnirk, 1981.** “Thermomechanical Behavior of Backfilled Disposal Rooms for Waste Retrieval Considerations in a Salt Dome Repository”, *Proceedings, Rapid Excavation and Tunneling Conference*, San Francisco, CA, May 3–7, R. L. Bullock and H. J. Jacoby (eds.), Society of Mining Engineers, New York, NY, Vol. 2, pp. 1288–1306.

**Ratigan, J. L., J. D. Osnes, T. Brandshaug, and A. S. Burgess, 1981.** “Temperature History for CANDU Reprocessing Waste and Immobilized Fuel in an Underground Vault in Plutonic Rock,” *Proceedings, 22nd U.S. Symposium on Rock Mechanics*, Massachusetts Institute of Technology, Cambridge, MA, July.

**Ratigan, J. L. and U. E. Lindblom, 1978.** “The Single-Hole Concept of Heat Extraction From Hot Dry Rock Masses,” *Geothermal Resources Council Transactions*, Vol. 2, pp. 559–562.

**Ratigan, J. L. and L. L. Van Sambeek, 1977.** “Analysis of Transient Thermal History of Underground Excavations for Radioactive Waste Isolation,” *ROCKSTORE 77*, Stockholm, Sweden, Vol. 2, pp. 355–361.