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**REFERENCES ON FIELD PERMEABILITY TESTS
PERFORMED IN BOREHOLES AND MONITORING
WELLS**

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References on Field Permeability Tests Performed in Boreholes and Monitoring Wells

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1. AFNOR, 1992. Norme NF P94-132. *Essai d'eau Lefranc*. Association Française de normalisation, Paris.
2. AFNOR, 2002. Norme NF X 30-424. *Détermination du coefficient de perméabilité d'un terrain par essais d'infiltration à charge constante en forage*. Association Française de normalisation, Paris.
3. AFNOR, 2002. Norme NF X 30-425. *Détermination du coefficient de perméabilité d'un terrain par essais d'infiltration à charge variable en forage fermé*. Association Française de normalisation, Paris.
4. Agarwal, R.G., Al-Hussainy, R., and Ramey, J.J.Jr. 1970. An investigation of wellbore storage and skin effect in unsteady liquid flow: I. Analytical treatment. *Society of Petroleum Engineers Journal*, September, pp. 279-290.
5. Al Dhahir, Z.A., and Morgenstern, N.R. 1969. Intake factors for cylindrical piezometer tips. *Soil Science*, **107**(1): 17-21.
6. Alfaro, M.C., and Wong, R.C.K. 2001. Laboratory studies on fracturing of low-permeability soils. *Canadian Geotechnical Journal*, **38**: 303-315.
7. Aller, L., Bennett, T.W., Hackett, G., Petty, R.J., Lehr, J.H., Sedoris, H., Nielsen, D.M., and Denne, J.E. 1989. *Handbook of suggested practices for the design and installation of ground-water monitoring wells*. National Water Well Association, Dublin.
8. Amoozegar, A. 1989. Comparison of the Glover solution with the simultaneous-equation approach for measuring hydraulic conductivity. *Soil Science Soc. Am. Jnl*, **53**: 1462-1367.
9. Amoozegar, A., and Warrick, A.W. 1986. Hydraulic conductivity of saturated soils: Field methods. In *Methods of Soil analysis, Part 1. Physical and Mineralogical Methods*, agronomy monograph Series 9, Klute, A. Ed., American Society of Agronomy, Madison, Wis., pp. 735-770.
10. ASTM D4044. *Standard test method (field procedure) for instantaneous change in head (slug) tests for determining hydraulic properties of aquifers*. Annual book of standards, vol. 04.08, ASTM, West Conshohocken, Penn.
11. ASTM D4050. *Standard test method (field procedure) for withdrawal and injection well tests for determining hydraulic properties of aquifers*. Annual book of standards, vol. 04.08, ASTM, West Conshohocken, Penn.
12. ASTM D4104. *Standard test method (analytical procedure) for determining transmissivity of nonleaky confined aquifers by overdamped response to instantaneous change in head (slug test)*. Annual book of standards, vol. 04.08, ASTM, West Conshohocken, Penn.
13. ASTM D4631. *Standard test method for determining transmissivity and storativity of low permeability rocks by in situ measurements using the pressure pulse technique*. Annual book of standards, vol. 04.08, ASTM, West Conshohocken, Penn.
14. ASTM D5092. *Standard practice for design and installation of ground water monitoring wells in aquifers*. Annual book of standards, vol. 04.08, ASTM, West Conshohocken, Penn.
15. ASTM D5521. *Standard Guide for development of groundwater monitoring wells in granular aquifers*. Annual book of standards, vol. 04.08, ASTM, West Conshohocken, Penn.
16. ASTM D5785. *Standard test method (analytical procedure) for determining transmissivity of confined nonleaky aquifers by underdamped well response to instantaneous change in head (slug test)*. Annual book of standards, vol. 04.09, ASTM, West Conshohocken, Penn.
17. ASTM D5881. *Standard test method (analytical procedure) for determining transmissivity of confined nonleaky aquifers by critically damped well response to instantaneous change in head (slug test)*. Annual book of standards, vol. 04.09, ASTM, West Conshohocken, Penn.
18. ASTM D5912. *Standard test method (analytical procedure) for determining hydraulic conductivity of an unconfined aquifer by overdamped well response to instantaneous change in head (slug)*. Annual book of standards, vol. 04.09, ASTM, West Conshohocken, Pa.
19. ASTM D6286. *Standard Guide for selection of drilling methods for environmental site characterization*. Annual book of standards, vol. 04.09, ASTM, West Conshohocken, Penn.
20. Audoin, O. and Bodin, J. 2007. Analysis of slug tests with high-frequency oscillations. *Journal of Hydrology*, **334**(1-2): 282-289.

21. Avci, C.B. 1994. Analysis of in-situ permeability in non penetrating wells. *Ground Water*, **32**(2): 312-322.
22. Ayers, J., and Gosselin, D.C. 1995. Design of a multi-level monitoring well for continuous sample collection. *Ground Water Monitoring and Remediation*, **15**(4): 119-124.
23. Baird A.J, and Gaffney, S.W. 1994. Cylindrical piezometer responses in a humified fen peat. *Nordic Hydrology*, **25**: 167-182.
24. Baird, A.J., Surridge, B.W.J. and Money, R.P. 2004. An assessment of the piezometer method for measuring the hydraulic conductivity of a *Cladium mariscus*—*Phragmites australis* root mat in a Norfolk (UK) fen. *Hydrological Processes*, **18**: 275-291.
25. Banton, O. 1993. Field-determined and laboratory-determined hydraulic conductivities considering anisotropy and core surface area. *Soil Science Society of America Journal*, **57**(1): 10-15.
26. Banton, O., Côté, D., and Trudelle, M. 1991. Détermination au champ de la conductivité hydraulique saturée à l'aide de l'infiltromètre à charge constante de Côté : théorie et approximations mathématiques. *Canadian Journal of Soil Science*, **71**: 119-126.
27. Barker, J.A. 1988. A generalized radial flow model for hydraulic tests in fractured rock. *Water Resources Research*, **24**(10): 1796-1804.
28. Barker, J.A., and Black, J.H. 1983. Slug tests in fissured aquifers. *Water Resources Research*, **5**(2): 98-104.
29. Barker, J.A., and Herbert, R. 1989. Nomograms for the analysis of recovery tests on large diameter wells. *Quarterly Journal of Engineering Geology*, **22**: 151-158.
30. Barua, G. and Hoffmann, M.R. 2005. Theory of seepage into an auger hole in a confined aquifer. *Journal of Irrigation and Drainage Engineering*, **131**(5): 440-450.
31. Bauer, C., Homand, F., and Henry, J.P. 1995. In situ low permeability pulse test measurements. *Int. J. Rock Mech. Min. Sci. & Geomech. Abstr.*, **32**(4): 357-363.
32. Beckie, R., and Harvey, C.F. 2002. What does a slug test measure: An investigation of instrument response and the effect of heterogeneity. *Water Resources Research*, **38**(12): 26.1-14.
33. Belitz, K.W., Dripps, W., and Fairchild, J.E. 1995. Slug tests in elastic, unconfined aquifers: incorporating the free surface. *Water Resources Research*, **31**(12): 3329-3336.
34. Benson, C.H., Hardianto, F., and Motan, E. 1994. Representative specimen size for hydraulic conductivity of compacted clay. *In Hydraulic conductivity and waste contaminant transport in soil. Edited by D.E. Daniel and S.J. Trautwein. ASTM, Philadelphia, Penn. Special Technical Publication STP 1142*, pp.3-29.
35. Benson, C.H., Gunter, J., Boutwell, G., Trautwein, S., and Berzanskis, P. 1997. Comparison of four methods to assess hydraulic conductivity. *ASCE Journal of Geotechnical and Geoenvironmental Engineering*, **123**(10): 929-937.
36. Belitz, K., and Dripps, W. 1999. Cross-well slug testing in unconfined aquifers: A case study from the Sleepers River Watershed, Vermont. *Ground Water*, **37**(3): 438-447.
37. Binkhorst, G.K., and Robbins, G.A. 1988. Conducting and interpreting slug tests in monitoring wells with partially submerged screens. *Ground Water*, **36**(2): 225-229.
38. Binkhorst, G.K., and Robbins, G.A. 1994. A review and assessment of factors affecting hydraulic conductivity values determined from slug tests. EPA/600/R-93/202, Environmental Protection Agency, Washington, D.C.
39. Bjerg, P.L., Hinsby, K., Christensen, T.H., and P. Gravesen. 1992. Spatial variability of hydraulic conductivity of an unconfined aquifer determined by a mini slug test. *Journal of Hydrology*, **136**: 107-122.
40. Bjerrum, L., Nash, J.K.T.L., Kennard, R.M., and R.E. Gibson. 1972. Hydraulic fracturing in field permeability testing. *Geotechnique*, **22**(2): 319-332.
41. Black, J.H. 1978. The use of slug tests in groundwater investigations. *Water Services*, March, 174.
42. Black, J.H. 1985. The interpretation of slug tests in fissured rocks. *Quarterly Journal of Engineering Geology*, **18**: 161-171.
43. Black, J.H., and Kipp, K.L. Jr. 1977a. Observation well response time and its effect upon aquifer test results. *Journal of Hydrology*, **34**: 297-306.
44. Black, J.H., and Kipp, K.L. Jr. 1977b. The significance and prediction of observation well response delay in semi-confined aquifer-test analysis. *Ground Water*, **15**(6).
45. Boast, C.W., and Kirkham, D. 1971. Auger hole seepage theory. *Soil Science Society of America Proceedings*, **35**(3): 365-373.
46. Boersma, L. 1965. Field measurement of hydraulic conductivity below a water table. *In Methods of Soil Analysis, Part 1*, Edited by C.A. Black. American Society of Agronomy, Madison, Wis. Agronomy No.9, pp. 222-233.

47. Boisson J.Y., Cabrera J., Bertrand L., and Heitz, J.F. 1998. In situ and laboratory measurements of very low permeability in the Tournemire argillites (Aveyron). Comparison of methodologies and scale effect. *Bulletin de la Société Géologique de France*, **169**(4): 595-604.
48. Boutwell, G.P., and Tsai, C.N. 1992. The two-stage field permeability test for clay liners. *Geotechnical News*, **10**(2): 32-34.
49. Bouwer, H. 1989. Bouwer and Rice slug test - an update. *Ground Water*, **27**: 304-309.
50. Bouwer, H., and Jackson, R.D. 1974. Determining soil properties. *In Drainage for Agriculture, Edited by J. van Schilfgaarde, American Society of Agronomy, Madison, Wis.*, pp. 611-672.
51. Bouwer, H., and Rice, R.C. 1976. A slug test for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells. *Water Resources Research*, **12**(3): 423-428.
52. Bouwer, H. 1996. Discussion of Bouwer and Rice slug test review articles. *Ground Water*, **34**(1): 171.
53. Bradbury, K.R., and Muldoon, M.A. 1990. Hydraulic conductivity determination in unlithified glacial and fluvial materials. *In Ground water and vadose zone monitoring. Edited by D.M. Nielsen and A.I. Johnson. ASTM, Philadelphia, Penn. Special Technical Publication STP 1053*, pp.138-151.
54. Braester, C., and R. Thunvik. 1984. Determination of formation permeability by double packer tests. *Journal of Hydrology*, **72**: 375-389.
55. Brand, E.W., and Premchitt, J. 1980. Shape factors of cylindrical piezometers. *Geotechnique*, **30**(4): 369-384.
56. Brand, E.W., and Premchitt, J. 1982. Response characteristics of cylindrical piezometers. *Geotechnique*, **32**(3): 203-216.
57. Brauns, J., Bieberstein, A., and Reith, H., 2003. A testing unit for monitoring well permeability in situ. *Geotechnical Testing Journal*, **26**: 235-239
58. Bredehoeft, J.D., and Papadopoulos, S.S. 1980. A method for determining the hydraulic properties of tight formations. *Water Resources Research*, **16**: 233-238.
59. Bredehoeft, J.D., Cooper, H.H. Jr., and Papadopoulos, S.S. 1966. Inertial and storage effects in well-aquifer systems: An analog investigation. *Water Resources Research*, **2**(4): 697-707.
60. Brilliant, J. 1966. La mesure *in situ* des perméabilités locales. *Géotechnique*, **3**(1): 33-52.
61. Bromhead, E.N. 1996. Interpretation of constant head in situ permeability test in soil zones of finite extent. *Geotechnique*, **46**(1): 133-144.
62. Brown, D.L., Narasimhan, T.N., and Demir, Z. 1995. An evaluation of the Bouwer and Rice method of slug test analysis. *Water Resources Research*, **31**(5): 1239-1246.
63. Bureau of Reclamation 1977. *Ground Water Manual*. U.S. Department of the Interior, Superintendent of Documents, U.S. Government Printing Office, Washington, D.C.
64. Burger, R.L., and Belitz, K. 1997. Measurement of anisotropic hydraulic conductivity in unconsolidated sand: a case study from a shoreface deposit, Oyster, Virginia. *Water Resources Research*, **33**(6): 1515-1522.
65. Burkland, P.W., and Raber, E. 1983. Method to avoid ground water between two aquifers during drilling and well completion procedure. *Ground Water Monitoring Review*, **3**(4): 48-55.
66. Burns, W.A. Jr. 1969. New single-well test for determining vertical permeability. *Transactions AIME*, June, pp.743-752.
67. Butler J.J. Jr. 1996. Slug tests in site characterization: Some practical considerations. *Environmental Geoscience*, **3**(3): 154-163.
68. Butler, J.J. Jr. 1998. *The design, performance, and analysis of slug tests*. Lewis Publishers, CRC Press, Boca Raton, Fla.
69. Butler, J.J. Jr. 2002. A simple correction for slug tests in small-diameter wells. *Ground Water*, **40**: 303-307.
70. Butler J.J. Jr., and Healey, J.M. 1998. Relationship between pumping-tests and slug-test parameters: Scale effect or artifact? *Ground Water*, **36**(2): 305-313.
71. Butler J.J. Jr., and Hyder, Z. 1994. An assessment of the Nguyen and Pinder method for slug tests analysis. *Ground Water Monitoring and Remediation*, **14**(4): 124-131.
72. Butler J.J. Jr., and Zhan, X. 2004. Hydraulic tests in highly permeable aquifers. *Water Resources Research*, **40**: doi: 10.1029/2003WR002998, 12 p.
73. Butler J.J. Jr., Bohling, G.C., Hyder, Z., and McElwee, C.D. 1994. The use of slug tests to describe variations in hydraulic conductivity. *Journal of Hydrology*, **156**: 133-162.
74. Butler J.J. Jr., Dietrich, P., Wittig, V., and Christy, T. 2007. Characterizing hydraulic conductivity with the direct-push permeameter. *Ground Water*, **45**(4): 409-419.

75. Butler J.J. Jr., Garnett, E.J., and Healey, J.M. 2003. Analysis of slug tests in formations of high hydraulic conductivity. *Ground Water*, **41**(5): 620-630.
76. Butler J.J. Jr., Healey, J.M., McCall, G.W., Garnett, E.J., and Loheide II, S.P. 2002. Hydraulic tests with direct push equipment. *Ground Water*, **40**(1): 25-36.
77. Butler, J.J. Jr., McElwee, C.D., and Liu, W. 1996. Improving the quality of parameter estimates obtained from slug tests. *Ground Water*, **34**(3): 480-490.
78. Calver, A. 2001. Riverbed permeabilities: Information from pooled data. *Ground Water*, **39**(4): 546-553.
79. Cambefort, H. 1965. Curiosités des massifs alluvionnaires et des nappes d'eau. *Annales de l'ITBTP*, **211-212**: 922-947.
80. Campanella, R.G., and Robertson, P.K. 1988. Current status of the piezocone test. *Proc. 1st Int. Symposium on Penetration Testing, Orlando (ISOPT-1), A.A. Balkema, Rotterdam, vol.1, pp.93-116.*
81. Campanella, R.G., Davies, M.P., Kristiansen, H., and Daniel, C. 1997. Environmental site characterization of soil deposits using in-situ test methods. *Proc., 50th Canadian Geotechnical Conference, Ottawa, pp. 381-388.*
82. Campanella, R.G., Robertson, P.K., and Gillespie, D. 1986. Factors affecting the pore pressure and its measurement around a penetrating cone. *Proceedings, 39th Canadian Geotechnical Conference, Ottawa, pp. 291-299.*
83. Campbell, M.D., Starrett, M.S., Fowler, J.D., and Klein, J.J. 1990. Slug tests and hydraulic conductivity. *Ground Water Management*, **2**: 85-99..
84. CAN/BNQ 1988. *Soils – Determination of permeability at the end of a casing*. Canadian Standards Association and Bureau de normalisation du Québec, CAN/BNQ 2501-130-M88.
85. CAN/BNQ. 1988. *Soils — determination of permeability by the Lefranc method*. Canadian Standards Association and Bureau de normalisation du Québec, CAN/BNQ 2501-135-M88.
86. Cardenas, M.B., and Zlotnik, V.A. 2003. A simple constant-head injection test for streambed hydraulic conductivity estimation. *Ground Water*, **41**(6): 867-871.
87. Carslaw, H.S., and Jaeger, J.C. 1959. *Conduction of Heat in Solids*, 2nd Edition. Oxford University Press, Amen House, London, U.K.
88. Cassan, M. 2000. Application des essais Lefranc à l'évaluation du coefficient d'anisotropie hydraulique des sols aquifères. *Revue Française de Géotechnique*, **90**: 25-43.
89. Cassan, M. 1980. *Les essais d'eau dans la reconnaissance des sols*. Eyrolles, Paris.
90. Cassan, M. 1993. *Aide-mémoire d'hydraulique souterraine*. Presses des Ponts et Chaussées, Paris.
91. Cazaux, D. 1998. In situ measurement and control of permeability of materials used in hydraulic barriers for environmental protection. State-of-the-art and developments (in French). Ph.D. Thesis, INSA, Lyon, France, 335 p.
92. Chakrabarty, C., and Enachescu, C. 1997. Using the deconvolution approach for slug tests analysis: Theory and application. *Ground Water*, **35**(5): 797-806.
93. Chapuis, R.P. 1987. Piézomètres hydrauliques et risques d'erreur associés. National Research Council Canada, Associate Committee on Geotechnical Research Technical Memorandum No.143, NRCC28546, pp. 117-145.
94. Chapuis, R.P. 1988. Determining whether wells and piezometers give water levels or piezometric levels. *In Ground water contamination: field methods. Edited by A.G. Collins and A.I. Johnson. ASTM, Philadelphia, Penn. Special Technical Publication STP 963*, pp. 162-171.
95. Chapuis, R.P. 1989. Shape-factors for permeability tests in boreholes and piezometers. *Ground Water*, **27**(5): 647-654.
96. Chapuis, R.P. 1992. Fracturing Pressure of Soil Ground by Viscous Materials: Discussion. *Soils and Foundations*, **32**(3): 174-175.
97. Chapuis, R.P. 1998a. Overdamped slug test in monitoring wells: Review of interpretation methods with mathematical, physical and numerical analysis of storativity influence. *Canadian Geotechnical Journal*, **35**(3): 697-719.
98. Chapuis, R.P. 1998b. Poor borehole sampling and consequences for permeability evaluation. *Proceedings, 8th Congress of the International Association of Engineering Geology and the Environment, Vancouver, 21-25 September 1998, Edited by D. Moore and O. Hungr. A.A. Balkema, Rotterdam, The Netherlands, Vol. 1, pp. 417-423.*
99. Chapuis, R.P. 1998c. Ultrasonic method for evaluation of annular seals for wells and instrumented holes: Discussion. *Geotechnical Testing Journal*, **21**(4): 370-371.
100. Chapuis, R.P. 1999. Borehole variable-head permeability tests in compacted clay liners and covers. *Canadian Geotechnical Journal*, **36**(1): 39-51.

101. Chapuis, R.P. 2001. Extracting piezometric level and hydraulic conductivity from tests in driven flush-joint casings. *Geotechnical Testing Journal*, **24**(2): 209-219.
102. Chapuis, R.P. 2002. The 2000 R.M. Hardy Lecture: Full-scale hydraulic performance of soil-bentonite and compacted clay liners. *Canadian Geotechnical Journal*, **39**(2): 417-439.
103. Chapuis, R.P. 2005. Numerical modeling of rising-head permeability tests in monitoring wells after lowering the water level down to the screen. *Canadian Geotechnical Jnl*, **42**(4): 705-715.
104. Chapuis, R.P. 2005. Using the velocity graph method to interpret rising-head permeability tests after dewatering the screen. *Geotechnical Testing Journal*, **28**(3): 305-312.
105. Chapuis, R.P. 2006. Interpreting variable-head tests performed in open holes or monitoring wells with several screens. *Geotechnical Testing Journal*, **29**(6): 467-473.
106. Chapuis, R.P. 2006. Measuring the hydraulic conductivity of soil-bentonite backfill: Discussion. *ASCE Journal of Geotechnical and Geoenvironmental Engineering*, **130**: 809-812.
107. Chapuis, R.P. 2007. Quand l'abondance de données complique l'interprétation des essais de perméabilité. *Proc.*, 60^e CCG et 8^e Conférence conjointe CGS/IAH-CNC, Ottawa, 8 pages.
108. Chapuis, R.P. 2007. Numerical modelling of reservoirs or pipes in groundwater seepage. *Proc.*, 60th CGC and 8th Joint CGS/IAH-CNC Conference, Ottawa, 8 pages.
109. Chapuis, R.P., and Cazaux, D. 2002. Pressure-pulse test for field hydraulic conductivity of soils: Is the usual interpretation method adequate? *In* Evaluation and remediation of low and dual porosity environments. *Edited by* M.N. Sara and L.G. Everett. ASTM International, West Conshohocken, Penn. Special Technical Publication STP **1415**, pp. 66-82.
110. Chapuis, R.P., and Chenaf, D. 2002. Slug tests in a confined aquifer: Experimental results in a large soil tank and numerical modeling. *Canadian Geotechnical Journal*, **39**(1): 14-21.
111. Chapuis, R.P., and Chenaf, D. 2003. Variable-head field permeability tests in driven casings: Physical and numerical modeling. *Geotechnical Testing Journal*, **26**(3): 245-256.
112. Chapuis, R.P., and Sabourin, L. 1989. Effects of installation of piezometers and wells on groundwater characteristics and measurements. *Canadian Geotechnical Journal*, **26**(4): 604-613.
113. Chapuis, R.P., and Wendling, G. 1991. Monitoring wells: measurement of permeability with minimal modification of groundwater. *Canadian Journal of Civil Engineering*, **18**(5): 871-875.
114. Chapuis, R.P., Dallaire, V., Marcotte, M., and Chouteau, M. 2007. Falling-head permeability tests using monitoring wells in unconfined aquifers. *Geotechnical Testing Jnl*, **30**(2):104-112.
115. Chapuis, R.P., Dallaire, V., Marcotte, M., Chouteau, M., Acevedo, N., and Gagnon, F. 2005. Evaluating the hydraulic conductivity at three different scales within an unconfined aquifer at Lachenaie, Quebec. *Canadian Geotechnical Journal*, **42**(4): 1212-1220.
116. Chapuis, R.P., Gill, D.E., and Wendling, G. 1987. Comparaisons des valeurs de conductivité hydraulique obtenues soit par essais de pompage soit par essais de laboratoire. *Proc.*, 40th Canadian Geotechnical Conference, Regina, pp. 291-300.
117. Chapuis, R.P., L'Écuyer, M., and Aubertin, M. 1993. Field permeability tests in mine tailings. *Proc.*, 46th Canadian Geotechnical Conference, Saskatoon, pp. 51-60.
118. Chapuis, R.P., Morin, R., and Gill, D.E. 1992. Développement et évaluation d'un perméamètre autoforeur pour sols silteux. *Proc.*, 45th Canadian Geotechnical Conference, Toronto, pp. 77A.1-10.
119. Chapuis, R.P., Paré, J.J., and Lavallée, J.G. 1981. Essais de perméabilité à niveau variable. *In* *Proc.*, 10th International Conference on Soil Mechanics and Foundation Engineering, Stockholm, Sweden, 15-19 June 1981, A.A. Balkema, Rotterdam, Vol. 1, pp. 401-406.
120. Chapuis, R.P., M. Soulié, and G. Sayegh. 1990. Laboratory modelling of field permeability tests in cased boreholes. *Canadian Geotechnical Journal*, **27**(5): 647-658.
121. Chen, C-S. 2006. An analytic data analysis method for oscillatory slug tests. *Ground Water*, **44**(4): 604-608.
122. Chen, C-S., and Chang, C-C. 2002. Use of cumulative volume of constant head injection test to estimate aquifer parameters with skin effects: Field experiment and data analysis. *Water Resources Research*, **38**(5): 14.1-14.6
123. Cherry, J.A. 1983. Piezometers and other permanently installed devices for groundwater and quality monitoring. *Proc.*, Conference on Groundwater and Petroleum Hydrocarbons: Protection, Detection and Restoration, Petroleum Association for Conservation of the Canadian Environment, Toronto, Ont., pp. iv1-iv19.
124. Chesnaux, R., and Chapuis, R.P. 2007. Detecting and quantifying leakage through defective borehole seals: A new methodology and laboratory verification. *Geotechnical Testing Journal*, **30**(1): 17-24.
125. Chesnaux, R., Chapuis, R.P., and Molson, J.W. 2006. A new method to characterize hydraulic short-circuits in defective borehole seals. *Ground Water*, **44**(5): 676-681.

126. Chiasson, P. 2005. Methods of interpretation of borehole falling-head tests performed in compacted clay liners. *Canadian Geotechnical Journal*, **42**: 79-90.
127. Chiasson, B., and Chiasson P. 1997. Interprétation de l'essai de perméabilité en bout de tubage. Proc., 50th Canadian Geotechnical Conference, Ottawa, pp. 600-607.
128. Childs, E.C. 1952. The measurement of hydraulic permeability of saturated soil in situ - Part I. Principles of a proposed method. Proc. of the Royal Society of London, **215A**: 525-535.
129. Childs, E.C., Cole, A.H., and Edwards, D.H. 1953. The measurement of hydraulic permeability of saturated soil in situ - Part II. Proc. of the Royal Society of London, **216A**: 72-89.
130. Childs, E.C., Collis-George, N., and Holmes, J.W. 1957. Permeability measurements in the field as assessment of anisotropy and structure development. *Journal of Soil Science*, **8**(1): 27-41.
131. Chirlin, G.R. 1989. A critique of the Hvorslev method for slug test analysis: the fully penetrating well. *Ground Water Monitoring Review*, **9**(2): 130-138.
132. Chirlin, G.R. 1990. The slug test: The first four decades. *Ground Water Management*, **1**: 365-381.
133. Cho, J.S., Wilson, J.T., and Beck F.P. Jr. 2000. Measuring vertical profiles of hydraulic conductivity with in-situ direct push methods. *Journal of Environmental Engineering*, **126**(8): 775-777.
134. Choi, H. 2007. Numerical model for analyzing slug tests in vertical cutoff walls. *Journal of Geotechnical and Geoenvironmental Engineering*, **133**(10): 1249-1258.
135. Choi, H. and Daniel, D.E. 2006. Slug test analysis in vertical cutoff walls: I. Analysis methods. *Journal of Geotechnical and Geoenvironmental Engineering*, **132**(4): 429-438.
136. Choi, H. and Daniel, D.E. 2006. Slug test analysis in vertical cutoff walls: II. Applications. *Journal of Geotechnical and Geoenvironmental Engineering*, **132**(4): 439-447.
137. Cohen, R.M., and R.R. Rabold. 1988. Simulation of sampling and hydraulic tests to assess a hybrid monitoring well design. *Ground Water Monitoring Review*, **8**(1): 51-59.
138. Connell, L.D. 1994. The importance of pulse duration in pulse test analysis. *Water Resources Research*, **30**(8): 2403-2411.
139. Cooper H.H. Jr., Bredehoeft, J.D., and Papadopoulos, I.S. 1967. Response of a finite-diameter well to an instantaneous change of water. *Water Resources Research*, **3**(1): 263-269.
140. Cosenza, P., Ghoreychi, M., de Marsily, G., Vasseur, G., and Violette, S. 2002. Theoretical predictions of poroelastic properties of argillaceous rocks from in situ specific storage coefficient. *Water Resources Research*, **38**(10): 25.1-25.12.
141. Custodio, E. 1995. The impact of vertical water flow in boreholes on monitoring operations. *Hydrogéologie*, **3**: 3-12.
142. Dachler, R. 1936. *Grundwasserströmung* (Flow of Ground Water), Julius Springer, Wien, 141 p.
143. Dagan, G. 1978. A note on packer, slug, and recovery tests in unconfined aquifers. *Water Resources Research*, **14**(5): 929-934.
144. Dagan, G. 1993. High order correction of effective permeability of heterogeneous isotropic formations of lognormal conductivity distribution. *Transport in Porous Media*, **12**: 279-290.
145. Daniel, D.E. 1989. In situ hydraulic conductivity tests for compacted clay. *Journal of Geotechnical Engineering*, **115**(9): 1205-1226.
146. D'Astous, A.Y., Ruland, W.W., Bruce, J.R.G., Cherry, J.A., and Gilham, R.W. 1989. Fracture effects in the shallow groundwater zone in weathered Sarnia area. *Canadian Geotechnical Journal*, **26**: 43-56.
147. Day, S.R., and Daniel, D.E. 1985. Field permeability tests for clay liners. In *Hydraulic barriers in soil and rock*. ASTM, Philadelphia, Penn. Special Technical Publication STP **874**, pp. 276-288.
148. Dax, A. 1987. A note on the analysis of slug tests. *Journal of Hydrology*, **91**: 153-177.
149. DeGroot, D.J., and Luttenegger, A.J. 1994. A comparison between field and laboratory measurements of hydraulic conductivity in a varved clay. In *Hydraulic conductivity and waste contaminant transport in soil*. Edited by D.E. Daniel and S.J. Trautwein. ASTM, Philadelphia, Penn. Special Technical Publication STP **1142**, pp. 300-317.
150. De Marsily, G. 1986. *Quantitative Hydrogeology*. Academic Press.
151. Demir, Z., and Narasimhan, T.N. 1994. Towards an improved interpretation of Hvorslev tests. *ASCE Journal of Hydraulic Engineering*, **120**(4): 477-494.
152. Dinwiddie, C.L., Molz, F.J. III, and Castle, J.W. 2003. A new small drill hole minipermeameter probe for in situ permeability measurement: Fluid mechanics and geometrical factors. *Water Resources Research*, **39**(7): 1178, doi: 10.1029/2001WR001179.
153. Dixon, N., and Bromhead, E.N. 1999. Depth-dependent permeability in London clay measured using standpipe piezometer equilibration data. *Geotechnique*, **49**(5): 651-660.

154. Dhouib, A., Shahrour, I., Lafhaj, Z., and Delfaut, A. 1998. Essais Lefranc pour la mesure de la perméabilité in situ : étude théorique et interprétation pratique. *Revue française de Géotechnique*, **84**: 27-36.
155. Doll, P., and Schneider, W. 1995. Lab and field measurements of the hydraulic conductivity of clayey silts. *Ground Water*, **33**(6): 884-891.
156. Dunaj, P.J., DeGroot, D.J., and Ostendorf, D.W. 2006. High frequency data acquisition system for field measurement of hydraulic conductivity in a sand aquifer. *ASCE GeoCongress 2006*, pp. 1-6.
157. Dunn, C.S., and Razouki, S.S. 1975. Interpretation of in situ permeability tests on anisotropic deposits. *Transportation Research Record*, **532**: 430-438.
158. Dunnicliff, J. 1999. Instrumentation. *Geotechnical News*, **17**(1): 33-35.
159. Dunnivant, F.M., Porro, I., Bishop, C., Hubbell, J., Giles, J.R., and Newman, N.E. 1997. Verifying the integrity of annular and back-filled seals for vadose-zone monitoring wells. *Ground Water*, **35**(1): 140-148.
160. Elci, A., Molz, F.J., and Waldrop, W.R. 2001. Implication of observed and simulated ambient flow in monitoring wells. *Ground Water*, **39**(6): 853-862.
161. Elrick, D.E., and Reynolds, W.D. 1985. An analysis of the percolation test based on three-dimensional saturated-unsaturated flow from a cylindrical test hole. *Soil Science*, **142**: 308-321.
162. Elrick, D.E., and Reynolds, W.D. 1992. Methods for analyzing constant-head well permeameter data. *Soil Science. Soc. Am. J.*, **56**: 320-323.
163. Elrick, D.E., Reynolds, W.D., and Tan, K.A. 1989. Hydraulic conductivity measurements in the unsaturated zone using improved well analyses. *Ground Water Monitoring Review*, **9**: 184-193.
164. Elrick, D.E., Parkin, G.W., Reynolds, W.D., and Fallow, D.J. 1995. Analysis of early-time and steady-state single-ring infiltration under falling head conditions. *Water Resources Research*, **31**(8): 1883-1993.
165. Elsworth, D. 1993. Analysis of piezocone dissipation data using dislocation methods. *Journal of Geotechnical Engineering, ASCE*, **119**(10): 1601-1623.
166. EPA 2005. *Groundwater sampling and monitoring with direct push technologies*. EPA 540/R-04/005.
167. Everts, C.J., and Kanwar, R.S. 1993. Effect of purging on hydraulic conductivity measured in piezometers installed in an aquitard. *Journal of Hydrological Sciences*, **38**(2): 89-101.
168. Ezra, D. 1995. Put ground water into perspective: Passive multilayer sampler provides a vertical profile of aquifer composition. *International Ground Water Technology*, December, pp. 21-22.
169. Fahey, M., and Randolph, M.F. 1984. Effects of disturbance on parameters derived from self-boring pressuremeter tests in sand. *Geotechnique*, **34**(1): 81-97.
170. Fallow, D.J., Elrick, D.E., Reynolds, W.D., Baumgartner, N., and Parkin, G.W. 1994. Field measurement of hydraulic conductivity in slowly permeable materials using early-time infiltration measurements in unsaturated media. *In Hydraulic conductivity and waste contaminant transport in soil. Edited by D.E. Daniel and S.J. Trautwein*, ASTM, Philadelphia, Penn., Special Technical Publication STP **1142**, pp. 375-389.
171. Farrar, J.A. 1996. Research and standardization needs for direct push technology applied to environmental site characterization. *In Sampling environmental media, Edited by J.H. Morgan*, ASTM, Philadelphia, Penn. Special Technical Publication STP **1282**, pp. 98-107.
172. Faust, C.R., and Mercer, J.W. 1984a. Evaluation of slug tests in wells containing a finite-thickness skin. *Water Resources Research*, **20**(4): 504-506.
173. Faust, C.R., and Mercer, J.W. 1984b. Evaluation of slug tests in wells containing a finite-thickness skin: Reply. *Water Resources Research*, **21**(9): 1462.
174. Fernuijk, N., and Haug, M. 1990. Evaluation of in situ permeability testing methods. *Journal of Geotechnical Engineering, ASCE*, **116**(2): 297-311.
175. Ferris, J.G., and Knowles, D.B. 1954. The slug test for estimating transmissibility. *U.S. Geological Survey Ground Water Note 26*, 7 p.
176. Ferris, J.G., Knowles, D.B., Brown, R.H. and Stallman, R.W. 1962. Theory of aquifer tests. *U.S. Geological Survey Water Supply Paper 1536-E*, pp. 69-174.
177. Fisher, A.T. and Zwart, G. 1997. Packer experiments along the Décollement of the Barbados accretionary complex: Measurements of in situ permeability. *Proceedings of the Ocean Drilling program, Scientific results*, Vol. 156, pp. 199-218.
178. Forchheimer, Ph. 1930. *Hydraulik*, 3rd edition, B.G. Teubner, Leipzig und Berlin, 596p.
179. Forster, C.B., and Gale, J.E. 1981. Field assessment of the use of borehole pressure transients to measure the permeability of fractured rock masses. Report LBL-11829, SAC-34, Lawrence Berkeley lab, Berkeley, California.

180. Foster et al. 1995. Piezometer installation using a cone penetrometer. *Ground Water Monitoring and Remediation*, **15**(4): 70-73.
181. Frink, P. Beljin, M., and Trope, P. 1997. Notes on estimation of hydraulic conductivity using slug test analysis. *Journal of Hydrologic Engineering*, **2**(1): 18-25.
182. Frevert, R.K., and Don Kirkham 1948. A field method for measuring the permeability of soil below a water table. *Proc., 28th Annual Meeting, Highway Research Board, Washington*, pp. 433-442.
183. Gass, T.E. 1986. Monitoring well development. *Water Well Journal*, **40**(1): 52-55.
184. Gibson, R.E., 1963. An analysis of system flexibility and its effect on time-lag in pore-water measurement. *Geotechnique*, **13**(1): 1-11.
185. Gibson, R.E., 1966. A note on the constant head test to measure soil permeability *in situ*. *Geotechnique*, **16**(3): 256-257.
186. Gibson, R.E., 1970. An extension to the theory of the constant head *in situ* permeability test. *Geotechnique*, **20**(2): 193-197.
187. Glasbergen, P., Wijland, G.C., and Langemeijer, H.D. 1991. Permeability tests for unconsolidated inhomogeneous formations of low permeability. In *Heterogeneity of Groundwater Flow and Site Evaluation*, Proceedings of a NEA workshop, 22-24 October 1990, OECD, Paris, pp. 314-325.
188. Gloaguen, E., Chouteau, M., Marcotte, D., and Chapuis, R.P. 2001. Estimation of hydraulic conductivity of an unconfined aquifer using cokriging of GPR and hydrostratigraphic data. *Journal of Applied Geophysics*, **47**: 135-152.
189. Groenevelt, P.H., Odell, B.P., and Elrick, D.E. 1996. Time domains of early-time and steady-state pressure infiltrometer data. *Soil Sci. Soc. Am. J.*, **60**: 1713-1717.
190. Guyonnet, D., Mishra, S., and McCord, J. 1993. Evaluating the volume of porous medium investigated during slug tests. *Ground Water*, **31**(4): 627-633.
191. Guyonnet, D., Amraoui, N., and Kara, R. 2000. Analysis of transient data from infiltrometer tests in fine-grained soils. *Ground Water*, **38**(3): 396-402.
192. Hale, J.R. 2004. Fractured rock transmissivity estimates from oscillatory slug test data. In *US EPA/NGWA Fractured Rock Conference*, September 13-16, 2004, Portland, Maine.
193. Hayashi, K., Ito, T., and Abé, H. 1987. A new method for the determination of in situ hydraulic properties by pressure pulse tests and application to the Higashi Hamichantai geothermal field. *Journal of Geophysical Research*, **92**(B9): 9168-9174.
194. Henebry, B.J., and Robbins, G.A. 2000. Reducing the influence of skin effects on hydraulic conductivity determinations in multilevel samplers installed with direct push methods. *Ground Water*, **38**(6): 882-886.
195. Herbert, R., and Kitching, R. 1981. Determination of aquifer parameters from large-diameter dug well pumping tests. *Ground Water*, **19**(6): 593-599.
196. Hirasaki, G.J. 1972. Pulse test and other early transient pressure analyses for in-situ estimation of vertical permeability. *Society of Petroleum Engineers Paper 4055, SPE-AIME 47th Annual Fall Meeting*, Oct. 8-11, San-Antonio, TX.
197. Herzog, B.L. 1994. Slug test for determining hydraulic conductivity of natural geologic deposits. In *Hydraulic conductivity and waste contaminant transport in soil. Edited by D.E. Daniel and S.J. Trautwein*, ASTM, Philadelphia, Penn. Special Technical Publication STP **1142**, pp. 95-110.
198. Herzog, B.L., and Morse, W.J. 1986. Hydraulic conductivity at a hazardous waste disposal site: Comparison of laboratory and field determined values. *Waste Management and Research*, **4**(2): 177-187.
199. Herzog, B.L., and Morse, W.J. 1990. Comparison of slug test methodologies for determination of hydraulic conductivities in fine-grained sediments. In *Ground water and vadose zone monitoring. Edited by D.M. Nielsen and A.I. Johnson*, ASTM, Philadelphia, Penn. Special Technical Publication STP **1053**, pp. 152-164.
200. Herzog, B.L., Chou, S.-F.J., Valkenburg, J.R., and Griffin, R.A. 1988. Changes in volatile organic chemical concentrations after purging slowly recovering wells. *Ground Water Monitoring Review*, **8**(4): 93-99.
201. Hickey, E., and Chiasson, P. 2000. Field hydraulic measurement and simulation. *Proc., 53rd Canadian Geotechnical Conf.*, Montreal, Qué., 15-18 October 2000, vol. 1, pp. 701-708.
202. Hinsby, K., Bjerg, P.L., Andersen, L.J., Skov, B., and Clausen, E.V. 1992. A mini slug test method for determination of a local hydraulic conductivity of an unconfined sandy aquifer. *Journal of Hydrology*, **136**: 87-106.
203. Ho, J.N., and Murphy, J. 1995. Analyzing the recovery of a finite-diameter well after purging at an unknown rate - A substitute for slug-testing: Discussion. *Ground Water*, **33**(1): 153.

204. Hogan, J.M., van der Kamp, G., Barbour, S.L., and Schmidt, R. 2006. Field methods for measuring hydraulic properties of peat deposits. *Hydrological Processes*, **20**: 3635-3649.
205. Homand, F., Giraud, A., Escoffier, S., Koriche, A., and Hoxha, D. 2004. Permeability determination of a deep argillite in saturated and partially saturated conditions. *International Journal of Heat and Mass Transfer*, **47**: 3517-3531.
206. Hsieh, P.A. 1998. How good are estimates of transmissivity from slug tests in fractured rock? *Ground Water*, **36**(1): 37-48.
207. Hurst, W. 1953. Establishment of the skin effect and its impediment to fluid flow into a well bore. *Petrol. Eng.*, **25**: B16.
208. Hvorslev, M.J. 1951. *Time-lag and soil permeability in ground-water observations*. Bulletin 36, U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, Miss.
209. Hyder, Z., and J.J. Butler Jr. 1995. Slug tests in unconfined formations: An assessment of the Bouwer and Rice technique. *Ground Water*, **33**(1): 16-22.
210. Hyder, Z., J.J. Butler Jr., McElwee, C.D., and Liu, W. 1994. Slug tests in partially penetrating wells. *Water Resources Research*, **30**(11): 2945-2957.
211. Hyder, Z., Butler, J. J. Jr., and McElwee, C. D., 1993. An approximate technique for analysis of slug tests in wells screened across the water table: Kansas Geol. Survey Open-File Rept. 93-44, 20 p.
212. Illman, W.A. 2004. Interpretation of pressure recovery data from packer inflation. *Water Resources research*, **40**: doi: 10.1029/2004WR003310, 7 p.
213. Illman, W. A. 2004. Analysis of permeability scaling within single boreholes. *Geophysical Research Letters*, **31**, L06503, doi: 10.1029/2003GL019303.
214. Illman, W. A., and Neuman, S. P. 2000. Type-curve interpretation of multirate single-hole pneumatic injection tests in unsaturated fractured rock. *Ground Water*, **38**(6): 899-911.
215. Illman, W. A., and Neuman, S. P. 2001. Type-curve interpretation of a cross-hole pneumatic test in unsaturated fractured tuff. *Water Resources Research*, **37**(3): 583-604.
216. Illman, W. A., and Neuman, S. P. 2003. Steady-state analyses of cross-hole pneumatic injection tests in unsaturated fractured tuff. *Journal of Hydrology*, **281**: 36-54.
217. Jabro, J.D., and Evans, R.G. 2006. Discrepancies between analytical solutions of two borehole permeameters for estimating field-saturated hydraulic conductivity. *Applied Engineering in Agriculture*, **22**(4): 549-554.
218. Jain, P., Powell, J., Townsend, T.G., and Reinhart, D.R. 2006. Estimating the hydraulic conductivity of landfilled municipal solid waste using the borehole permeameter test. *Journal of Environmental Engineering*, **132**(6): 645-652.
219. Jiao, J.J., and Leung, C.M. 2003. Spreadsheets for the analysis of aquifer test and slug test data. *Ground Water*, **41**(1): 9-10.
220. Jones, L. 1993. A comparison of pumping and slug tests for estimating the hydraulic conductivity of unweathered Wisconsin age till in Iowa. *Ground Water*, **31**(6): 896-904.
221. Johnson, C.R., Greenkorn, R.A., and Woods, E.G. 1966. Pulse-testing: A new method for describing reservoir flow properties between wells. *Journal of Petroleum Technology*, **18**: 1599-1604.
222. Kabala, Z.J. 1993. The dipole flow test: A new single-borehole test for aquifer characterization. *Water Resources Research*, **29**: 99-107.
223. Kabala, Z.J. 1994. Measuring distributions of hydraulic conductivity and specific storativity by the double flowmeter test. *Water Resources Research*, **30**: 685-690.
224. Kabala, Z.J., Pinder, F., and Milly, P.C.D. 1985. Analysis of well-aquifer response to a slug test. *Water Resources Research*, **21**(9): 1433-1436.
225. Kabir, M.G., and Lutenecker, A.J. 1990. In situ estimation of the coefficient of consolidation of clays. *Canadian Geotechnical Journal*, **27**: 58-67.
226. Kacimov, A.R. 2000. Analytical solution for transient flow into a hemispherical auger hole. *Journal of Hydrology*, **228**: 1-9.
227. Kaempffer, A.T. 2003. Update on bentonite chips and pellets for sealing piezometers in boreholes. *Geotechnical News*, **21**(4): 32-37.
228. Kamal, M.M. 1960. The use of pressure transients to describe reservoir heterogeneity. *J. Petrol. Technol.*, August, pp. 1060-1070.
229. Kamal, M.M., and Brigham, W.E. 1976. Design and analysis of pulse tests with unequal pulse and shut-in periods. *J. Petrol. Technol.*, Trans, AIME, **261**: 205-212.
230. Kallstenius, T., and Wallgren, A. 1956. Pore pressure measurements in field investigations. *Proc. of the Royal Swedish Geotechnical Institute*, No. 13.

231. Karasaki, K., Long, J.C.S., and Witherspoon, P. 1988. Analytical models of slug tests. *Water Resources Research*, **24**: 115-126.
232. Keller, C.K., and van der Kamp, G. 1992. Slug tests with storage due to entrapped air. *Ground Water*, **30**(1): 2-7.
233. Keller, C.K., van der Kamp, G., and Cherry, J.A. 1986. Fracture permeability and ground-water flow in clayey till near Saskatoon, Saskatchewan. *Canadian Geotechnical Journal*, **23**(2): 229-240.
234. Keller, C.K., van der Kamp, G., and Cherry, J.A. 1988. Hydrogeology of two Saskatchewan tills, I. Fractures, bulk permeability and spatial variability of downward flow. *Jnl of Hydrology*, **101**: 97-121.
235. Keller, C.K., van der Kamp, G., and Cherry, J.A. 1989. A multiscale study of the permeability of thick clayey till. *Water Resources Research*, **25**(11): 2299-2317.
236. Kemblowski, M.W. and Klein, C.L. 1988. An automated numerical evaluation of slug test data. *Ground Water*, **26**(4): 435-438.
237. Kipp, K.L. Jr. 1985. Type curve analysis of inertial effects in the response of a well to a slug test. *Water Resources Research*, **21**(9): 1397-1408.
238. Kirkham, D. 1945. Proposed method for field measurement of soil below the water table. *Soil Science Society Am. Proc.*, **10**: 58-68.
239. Kraemer, C.A., Hankins, J.B., and Mohrbacher, C.J. 1990. Selection of single-well hydraulic test methods for monitoring wells. *In* Ground water and vadose zone monitoring. *Edited by* D.M. Nielsen and A.I. Johnson. ASTM, Philadelphia, PA, STP **1053**, pp. 125-137.
240. Krauss, I. 1974. Die Bestimmung der Transmissivität von Grundwasserleitern aus dem Einschwingverhalten des Brunnen-Grundwasserleitersystems. *Zeitschrift für Geophysik*, **40**: 381-400.
241. Krauss, I. 1977. Determination of the transmissibility from the free water level oscillation in well-aquifer systems. *In* Proceedings of the 3rd International Hydrology Symposium, Fort Collins, Colo., 27-29 June 1977. *Edited by* H.J. Morel-Seytoux, J.D. Salas, T.G. Sanders, and R.E. Smith. Colorado State University, Colorado, pp. 268-279.
242. Lafhaj, Z., and Sharhour, I. 2000. Use of the boundary element method for the analysis of permeability tests in boreholes. *Engineering Analysis with Boundary Elements*, **24**(9): 695-698.
243. Lafhaj, Z., and Shahrour, I. 2006. Influence of the presence of a partially saturated layer on the interpretation in field permeability tests. *Mechanics Research Communications*, **33**: 568-575.
244. Lafhaj, Z., and Shahrour, I. 2007. Use of water borehole tests for the determination of the permeability of anisotropic soils. *Computers and Geotechnics*, **34**: 57-59.
245. Lafleur, J., et Giroux, F. 1983. Perméabilité in situ des argiles superficielles de la mer de Champlain. *Bulletin I.A.E.G.*, **26-27**: 229-238.
246. Landon, M.K., Rus, D.L., and Harvey, F.E. 2001. Comparison of instream methods for measuring hydraulic conductivity in sandy streambeds. *Ground Water*, **39**(6): 870-885.
247. Lapham, W.W., Wile, F.D., and Koberta, M.T. 1997. Guidelines and standards procedures for studies of ground-water quality: Selection and installation of wells, and supporting documentation. U.S. Geological Survey Water-Resources Investigation Report 96-4233, Reston, Va.
248. Le Borgne, T., Bour, O., Paillet, F.L., and Caudal, J.P. 2006. Assessment of preferential flow path connectivity and hydraulic properties at single-borehole and cross-borehole scales in a fractured aquifer. *Journal of Hydrology*, **328**: 347-359.
249. Leap, D.L. 1984. A simple pneumatic device and technique for performing rising water level slug tests. *Groundwater Monitoring Review*, **4**(4): 141-146.
250. Lee, D.M., Reynolds, W.D., Elrick, D.E., and Clothier, B.E. 1985. A comparison of three techniques for measuring saturated hydraulic conductivity. *Canadian Journal of Soil Science*, **65**(3): 563-573.
251. Lee D.R., and Cherry J.A. 1978. A field exercise on groundwater flow using seepage meters and mini-piezometers. *Journal of Geological Education*, **27**: 6-10.
252. Lefèbvre, G., Philibert, A., Bozozuk, M., and Paré, J.J. 1981. Fissuring from hydraulic fracturing of clay soil. *Proc., 10th International Conference on Soil Mechanics and Foundation Engineering*, Stockholm, Balkema, Vol. 2, pp. 513-518.
253. Lefranc, E. 1936. Procédé de mesure de la perméabilité des sols dans les nappes aquifères et application au calcul du débit des puits. *Le Génie Civil*, **CIX**(15): 306-308.
254. Lefranc, E. 1937. La théorie des poches absorbantes et son application à la détermination du coefficient de perméabilité en place et au calcul du débit des nappes d'eau. *Le Génie Civil*, **CXI**(20): 409-413.
255. Levy, B.S. and Pannell, L. 1991. Evaluation of a pressure system for estimating in situ hydraulic conductivity. *Proc., 5th National Outdoor Action Conference*, NWWA, Dublin OH, pp. 131-146.

256. Levy, B.S., Pannell, L.J., and Dadoly, J.P. 1993. A pressure-packer system for conducting rising head tests in water table wells. *Journal of Hydrology*, **148**: 189-202.
257. Little, J.A., Silver, R.K., and Joseph, J.B. 1995. In situ permeability testing of partially saturated soils using a sealed double ring infiltrometer. *Proc., 1st Int. Conf. on Unsaturated Soils*, Paris, Balkema, vol. 2, pp. 525-534.
258. Lomen, D.O., Warrick, A.W., and Zhang, R. 1987. Determination of hydraulic conductivity from auger holes and pits: an approximation. *Journal of Hydrology*, **90**: 219-229.
259. Loudière, D., et Fatton, A. 1983. Essais de perméabilité Porchet pour les études de lagunage. *Bulletin I.A.E.G.*, **26-27**: 467-471.
260. Lutenegeger, A.J., and DeGroot, D.J. 1994. Hydraulic conductivity of borehole sealants. *In Hydraulic conductivity and waste contaminant transport in soil. Edited by D.E. Daniel and S.J. Trautwein.* ASTM, Philadelphia, Penn. Special Technical Publication STP **1142**, pp. 439-460.
261. Lutenegeger, A.J., Kemmis, T.J., and Hallberg, G.R. 1983. Origin and properties of glacial till and diamictos. *In Special Publication, ASCE Geotechnical Engineering Division, ASCE Convention*, Houston, TX, pp. 310-331.
262. Luthin, J.N., and Kirkham, D. 1949. A piezometer method for measuring permeability of soil *in situ* below a water table. *Soil Science*, **68**: 349-358.
263. Maasland, M., and Kirkham, D. 1959. Measurement of the permeability of triaxially anisotropic soil. *ASCE Journal of the Soil Mechanics and Foundations Division*, **85**(SM3): 25-34.
264. Mace, R.E. 1999. Estimation of hydraulic conductivity in large-diameter, hand-dug wells using slug-test methods. *Journal of Hydrology*, **219**: 34-45.
265. Manchester, K.R., 1990. Oscillatory responses due to inertial effects and observation well water level fluctuations induced by pneumatic and vacuum slug tests methods. M.S. Thesis, Dept. of Geological Engineering, Montana College of Mineral Science and Technology, Butte, Montana.
266. Mandel, J. 1939. Note sur le calcul des infiltrations. *Annales des Ponts et Chaussées*, Juillet, pp. 57-110.
267. Mas-Pla, J., Yeh, T.-C., J., Williams, T.M., and McCarthy, J.F. 1997. Analyses of slug tests and hydraulic conductivity variations in the near field of a two-well tracer experimental site. *Ground Water*, **35**(3): 492-501.
268. Mathias, S.A. and Butler, A.P. 2007. Shape factors for constant-head double-packer permeameters. *Water Resources Research*, **43**(6): No. W06430.
269. McElwee, C.D. 2001. Application of a non-linear slug test model. *Ground Water*, **39**(5): 737-744.
270. McElwee, C.D. 2002. Improving the analysis of slug tests. *Journal of Hydrology*, **269**: 122-133.
271. McElwee, C.D., and Butler, J.J. Jr. 1996. Experimental verification of a general model for slug tests. *Kansas Geological Survey Open-File Report* 96-47.
272. McElwee, C.D., and Zemansky, G.M. 2005. Effect of a mobile fine fraction on slug test results. *Natural Resources Research*, **14**(1): 31-37.
273. McElwee, C.D., and Zenner, M.A. 1998. A nonlinear model for analysis of slug-test data. *Water Resources Research*, **34**(1): 55-66.
274. McElwee, C.D., and Zenner, M.A. 1993. Unified analysis of slug tests including nonlinearities, initial effects and turbulence. *Kansas Geological Survey Open-File Report* 93-45.
275. McElwee, C.D., Bohling, G.C., and Butler, J.J. Jr. 1995. Sensitivity analysis of slug tests. Part 1. The slugged well. *Journal of Hydrology*, **164**(4): 53-67.
276. McElwee, C.D., Butler, J.J. Jr., Bohling, G.C., and Liu, W. 1995. Sensitivity analysis of slug tests. Part 2. Observation wells. *Journal of Hydrology*, **164**(4): 69-87.
277. McGuire, V., and Zlotnik, V.A. 1995. Characterizing vertical distribution of horizontal hydraulic conductivity in an unconfined sand and gravel aquifer using double packer slug tests. *Ground Water*, **33**(5): 850 (summary only).
278. McInley, R.M., Vela, S., and Carlton, L.A. 1968. A field application of pulse-testing for detailed reservoir description. *J. Petrol. Technol., Trans. AIME*, **243**: 313-321.
279. McIntyre, D.S., Cunningham, R.B., Vatanakul, V., and Stewart, G.A., 1979. Measuring hydraulic conductivity in clay soils: Methods, techniques and errors. *Soil Science*, **128**(3): 171-183.
280. McKay, L.D., Cherry, J.A., and Gilham, R.W. 1993. Field experiments in a fractured clay till - 1. Hydraulic conductivity and fracture aperture. *Water Resources Research*, **29**: 1149-1162.
281. McLane, G. A., Harrity, D. A., and Thomsen, K. O. 1990. A pneumatic method for conducting rising and falling head tests in highly permeable aquifers. *Proc., 1990 NWWA Outdoor Action Conf.*, pp. 1219-1231.
282. Meiri, D. 1989. A tracer test for detecting cross-contamination along a monitoring well column. *Ground Water Monitoring Review*, **9**(2): 78-81.

283. Melville, J.G., Molz, F.J., Guven, O., and Widdowson, M.A. 1991. Multilevel slug tests with comparisons to tracer data. *Ground Water*, **29**(6): 897-907.
284. Mieussens, C., et Ducasse, P. 1977. Mesure en place des coefficients de perméabilité et des coefficients de consolidation horizontaux et verticaux. *Canadian Geotechnical Journal*, **14**(1): 76-90.
285. Mieussens, C. 1983. Mesure en place de la perméabilité des sols fins. *Bulletin of the International Association of Engineering Geology*, **26-27**: 483-488.
286. Milligan, V. 1975. Field measurement of permeability in soil and rock. *Proceedings ASCE Conference on In-situ Measurement of Soil Properties*, Raleigh, NC, vol. 2, pp. 3-36.
287. Moench, A.F. 1984. Double-porosity models for a fissured groundwater reservoir with fracture skin. *Water Resources Research*, **20**(7): 831-846.
288. Moench, A.F., and Hsieh, P.A. 1985a. Slug-testing in wells with finite thickness skin. *Proc., 10th Workshop on Geothermal Reservoir Engineering*, Stanford Univ., Ca., Jan. 22-24, pp. 169-175.
289. Moench, A.F., and Hsieh, P.A. 1985b. Analysis of slug-test data in a well with finite-thickness skin. *In Memoirs, 17th International Congress on the Hydrogeology of Rocks of Low Permeability*, pp. 17-29, USA Chapter of IAH, Tucson, AZ.
290. Moench, A.F., Hsieh, P.A., Faust, C.R., and Mercer, J.W. 1985. Comment on "Evaluation of slug tests in wells containing a finite-thickness skin". *Water Resources Research*, **21**(9): 1459-1462.
291. Molz, F.J., Boman, G.K., Young, S.C., and Waldrop, W.R. 1994. Borehole flowmeters: Application and data analysis. *Journal of Hydrology*, **163**(3-4): 347-371.
292. Morin, R.H., LeBlanc, D.R., and Teasdale, W.E. 1988. A statistical evaluation of formation disturbance produced by well-casing installation methods. *Ground Water*, **26**(2): 207-217.
293. Nastev, M., Savard, M.M., Lapcevic, P., Lefebvre, R., and Martel R. 2004. Hydraulic properties and scale effects investigation in regional rock aquifers, south-western Quebec, Canada. *Hydrogeology Journal*, **12**: 257-269.
294. Neuzil, C.E. 1982. On conducting the modified "slug test" in tight formations. *Water Resources Research*, **18**: 439-441.
295. Neuzil, C.E. 1986. Groundwater flow in low-permeability environments. *Water Resources Research*, **22**: 1163-1195.
296. Neville, C.J., and Markle, J.M. 2000. Interpretation of constant-head tests: Rigorous and approximate analyses. *Proc., 1st IAH-CNC and CGS Groundwater Specialty Conf.*, Montreal, pp. 359-366.
297. Nguyen, V., and Pinder, G.F. 1984. Direct calculation of aquifer parameters in slug test analysis. *In Groundwater hydraulics. Edited by J. Rosensheim and G.D. Bennett. American Geophysical Union, Washington, D.C. Water Resources Monograph 9*, pp. 222-239.
298. Nielsen, D.M., and Schalla, R. 1991. Design and installation of groundwater monitoring wells. *In Practical Handbook of Ground-Water Monitoring*, Ed. by D.M. Nielsen, Lewis Pub., Boca Raton, Fl.
299. Novakowski, K.S. 1989. Analysis of pulse interference tests. *Water Resources Research*, **25**(11): 2377-2387.
300. Novakowski, K.S. 1993. Interpretation of the transient flow rate obtained from constant-head tests conducted in situ in clays. *Canadian Geotechnical Journal*, **30**(4): 600-606.
301. Novakowski, K.S., and Bickerton, G.S. 1997. Measurement of hydraulic properties of low-permeability rock in boreholes. *Water Resources Research*, **33**(11): 2509-2517.
302. Olson, R.E., and Daniel, D.E. 1981. Measurement of the hydraulic conductivity of fine-grained soils. *In Permeability and groundwater contaminant transport*, ASTM, Philadelphia, PA, Special Technical Publication STP **746**, pp. 18-64.
303. Orient, J.P., Nazar, A., and Rice, R.C. 1987. Vacuum and pressure test methods for estimating hydraulic conductivity. *Ground Water Monitoring and Remediation*, **7**(1): 49-50.
304. Ostendorf, D.W., DeGroot, D.J., Dunaj, P.J. and Kakubowski, J. 2005. A closed-form slug test theory for high permeability aquifers. *Ground Water*, **43**(1): 87-101.
305. Ostendorf, D.W., DeGroot, D.J., and Dunaj, P.J. 2007. Water hammer dissipation in pneumatic slug tests. *Water Resources Research*, **43**: doi: 10.1029/2005WR004817, 10 p.
306. Ostrowski, L.P., and Kloska, M.B. 1987. Use of pressure derivatives in analysis of slug test data from fine-grained glacial tills. *Society of Petroleum Engineers, SPE paper 18595*.
307. Palmer, C.D., and Paul, D.G. 1987. Problems in the interpretation of slug test data from fine-grained glacial tills. *Proc., Focus Conference on Northwestern Ground Water Issues*, May 5-7, Portland, OR, National Water Well Association, pp. 99-123.
308. Pane, V., Croce, P., Znidarcic, D. Ko, H-Y., Olsen, H.W., and Schiffman, R.L. 1983. Effects of consolidation on permeability measurements on soft clay. *Geotechnique*, **33**(1): 67-72.

309. Pandit, N.S., and Miner, R.F. 1986. Interpretation of slug test data. *Ground Water*, **24**: 743-749.
310. Papadopoulos, I.S., Bredehoeft, J.D., and Cooper, H.H. 1973. On the analysis of slug test data. *Water Resources Research*, **9**(4): 1087-1089.
311. Papadopoulos, S.S., and Cooper H.H. Jr. 1967. Drawdown in a well of large diameter. *Water Resources Research*, **1**: 241-244.
312. Papp, J. 1995. Prevent unwanted migration with bentonite. *International Ground Water Technology*, December, pp. 18-20.
313. Patchett, R. G. 1993. Pneumatic well insert: Performing pneumatic rising head tests in wells with screens straddling the water table. *Ground Water Management No. 15, Proc., 7th National Outdoor Action Conf. (Las Vegas, NV)*, pp. 395-403.
314. Patterson, R.J., and Devlin, J.F. 1985. An improved method for slug tests in small-diameter piezometers. *Ground Water*, **23**: 804-805.
315. Paul, D.G. 1987. The effect of construction, installation and development techniques on the performance of monitoring wells in fine-grained glacial tills. M.S. Thesis, Dept. of geological and Geophysical Sciences, Univ. of Wisconsin-Milwaukee, WI.
316. Pekarun, O., Benson, C., and Edil, T. 1998. Significance of defects in annular well seals. *Practice Periodical of Hazardous, Toxic and Radioactive Waste*, **2**(2): 65-71.
317. Penman A.D.M. 1961. A study of the response time of various piezometers. In *Pore Pressure and Suction in Soils*, Butterworths, London, pp. 53-58.
318. Peres, A.M.M., Onur, M., and Reynolds, A.C. 1989. A new analysis procedure for determining aquifer properties from slug tests data. *Water Resources Research*, **25**(7): 1591-1602.
319. Philip, J.R. 1985. Approximate analysis of the borehole permeameter in unsaturated soil. *Water Resources Research*, **21**: 1025-1033.
320. Philip, J.R. 1993. Approximate analysis of falling-head lined borehole permeameter. *Water Resources Research*, **29**(11): 3763-3768.
321. Pickens, J.F., Grisak, G.E., Avis, J.D., Belanger, D.W., and Thury, M. 1987. Analysis and interpretation of borehole hydraulic tests in deep boreholes: Principles, model development and applications. *Water Resources Research*, **23**(7): 1341-1375.
322. Picking, L.W. 1994. Analyzing the recovery of a finite-diameter well after purging at an unknown rate - A substitute for slug-testing. *Ground Water*, **32**(1): 91-95.
323. Picking, L.W. 1995. Analyzing the recovery of a finite-diameter well after purging at an unknown rate - A substitute for slug-testing: Reply. *Ground Water*, **33**(1): 153.
324. Pickup, G.E., and Hern, C.Y. 2002. The development of appropriate upscaling procedures. *Transport in Porous Media*, **46**: 119-138.
325. Poirier, S.E., DeGroot, D.J., and Ostendorf, D.W. 2004. Field measurement of hydraulic conductivity in a clayey sand drumlin. *Proc., 57th Canadian Geotechnical Conference and 5th Joint IAHR-CNC-CGS Conference, Québec, Que., 24-27 October 2004, Session 7B*. pp. 1-8.
326. Premchitt, J., and Brand, E.W. 1981. Pore pressure equalization of piezometers in compressible soils. *Geotechnique*, **31**(1): 105-123.
327. Priddle, M. 1989. A slug test packer for five-centimeter (two-inch) wells. *Ground Water*, **27**: 713-714.
328. Prosser, D.W. 1981. A method of performing response tests on highly permeable aquifers. *Ground Water*, **19**(6): 588-592.
329. Prudic, D.E. 1982. Hydraulic conductivity of a fine-grained till, Cattaraugus County, New York. *Ground Water*, **20**(2): 194-204.
330. Ramey, H.J. 1982. Well-loss function and the skin effect: A review. In *Recent Trends in Hydrogeology*, Narasimhan, T.N. Editor. Geol. Society of America, Special Paper 189, pp. 265-271.
331. Ramey, H.J., and Agarwal, R.G. 1972. Annulus unloading rates as influenced by wellbore storage and skin effect. *Transactions Soc. Petrol. Engrs.*, **253**: 453-462.
332. Ramey, H.J. Jr., Agarwal, R.G., and Martin, I. 1975. Analysis of slug-test or DST flow period data. *J. Canadian Petrol Technol.*, **14**(3): 37-47.
333. Randolph, M.F., and Booker, J.R. 1982. Analysis of seepage into a cylindrical permeameter. *Proc., 4th Int. Conf. on Num. Methods in Geomechanics, Edmonton, Vol. 1*, pp. 349-357.
334. Rat, M., Laviro, F., and Jorez, J.C. 1970. Essai Lefranc. *Bulletin de Liaison des Laboratoires Routiers*, No. Spécial N, pp. 56-66.
335. Rat, M., and Laviro, F. 1974. Mesures du coefficient de perméabilité par essais ponctuels. *Bulletin de Liaison des Laboratoires des Ponts et Chaussées*, pp. 179-182.

336. Ratnam, S., and Soga, K. 2003. An evaluation of geometric factors used in the two-stage borehole test (ASTM D6391-99) using the finite element method. *Geotechnical Testing Journal*, **26**: 228-234.
337. Ratnam, S., Soga, K., and Whittle, R.W. 2001. Revisiting Hvorslev's intake factors using the finite element method. *Géotechnique*, **51**(7): 641-645.
338. Raymond, G.P., and Azzouz, M.M. 1969. Permeability determination for predicting rates of consolidation. Institution of Civil Engineers, London, pp. 285-293.
339. Rehbindler, G., and Apazidis, N. 1994. Oscillation of the water level in a well connected to a confined aquifer. *Applied Scientific Research*, **52**: 51-65.
340. Remenda, V.H., and van der Kamp, G. 1997. Contamination from sand-bentonite seal in monitoring wells installed in aquitards. *Ground Water*, **35**(1): 39-46.
341. Renard, P., and de Marsily, G. 1997. Calculating equivalent permeability: a review. *Advances in Water Resources*, **20**(5-6): 253-278.
342. Reynolds, W.D., and Elrick, D.E. 1986. A method for simultaneous in situ measurement in the vadose zone of field-saturated hydraulic conductivity, sorptivity and the conductivity-pressure head relationship. *Ground Water Monitoring Review*, **6**(1): 84-95.
343. Reynolds, W.D., and Elrick, D.E. 1985. In situ measurement of field-saturated hydraulic conductivity, sorptivity and the α -parameter using the Guelph permeameter. *Soil Science*, **140**(4): 292-302.
344. Reynolds, W.D., and Elrick, D.E. 1987. A laboratory and numerical assessment of the Guelph permeameter method. *Soil Science*, **144**(3): 282-299.
345. Reynolds, W.D., and Elrick, D.E. 1990. Ponded infiltration from a single ring: I. analysis of steady flow. *Soil Sci. Soc. Am. J.* **54**: 1233-1241.
346. Reynolds, W.D., Elrick, D.E., and Topp, G.C. 1983. A reexamination of the constant head well permeameter method for measuring saturated hydraulic conductivity above the water table. *Soil Science*, **136**: 250-268.
347. Reynolds, W.D., Elrick, D.E., and Clothier, B.E. 1985. The constant head well permeameter: effect of unsaturated flow. *Soil Science*, **139**: 172-180.
348. Rijnders, J.P. 1973. Application of pulse-test methods in Oman. *J. Petrol. Technol.*, September, pp. 1025-1032.
349. Robertson, P.K., Sully, J.P., Woeller, D.J., Lunne, T. Powell, J.J., and Gillepsie, D.G. 1991. Estimating coefficient of consolidation from piezocone tests. *Canadian Geotechnical Journal*, **29**: 539-550.
350. Roque, A.J., and Gomes Coelho, A. 1994. In situ measurement of hydraulic conductivity by borehole infiltration tests. *Proceedings, 7th IAEG Congress, Balkema*, pp. 391-400.
351. Ross, B. 1985. Theory of the oscillating slug test in deep wells. *Memoirs of the 17th Int. Congress on the Hydrogeology of Rocks of Low Permeability, Int. Association of Hydrogeologists*, **17**(1): 44-51.
352. Ross, H.C., and McElwee, C.D. 2007. Multi-level slug tests to measure 3-D hydraulic conductivity distributions. *Natural Resources Research*, **16**(1): 67-79.
353. Rovey, C.W. II, and Cherkauer, D.S. 1995. Scale dependency of hydraulic conductivity measurements. *Ground Water*, **33**(5): 769-780.
354. Rovey, C.W. II, and Niemann, W.L. 1998. Discussion of relationship between pumping-test and slug-test parameters: Scale effect of artifact? *Ground Water*, **36**(6): 866-867.
355. Rovey, C.W. II., and Niemann, W.L. 1998. Wellskins and slug tests: where's the bias? *Journal of Hydrology*, **243**(1-2): 120-132.
356. Rovey, C.W. II. 1998. Digital simulation of the scale effect in hydraulic conductivity. *Hydrogeology*, **6**(2): 216-225.
357. Roy, P. 1992. Measurements of soil permeability anisotropy by three techniques. M.Sc. Thesis, McGill University, Montreal, Canada.
358. Rupp, D.E., Selker, J.S., and Simunek, J. 2001. A modification to the Bouwer and Rice method of slug-tests analysis for large diameter, hand-dug wells. *Ground Water*, **39**(2): 308-314.
359. Sageev, A. 1986. Slug test analysis. *Water Resources Research*, **22**(8): 1323-1333.
360. Sarsby, R.W. 2000. *Environmental Geotechnics*. Thomas Telford, Bodman, Cornwall, GB.
361. Scaturro, D.M., and Widdowson, M.A. 1997. Experimental evaluation of a drive-point ground-water sampler for hydraulic conductivity measurement. *Ground Water*, **35**(4): 713-720.
362. Schneebeli, G. 1954. Mesure *in situ* de la perméabilité d'un terrain. *Comptes-rendus des 3^{èmes} Journées d'Hydraulique*, Alger, pp. 270-279.
363. Schneebeli, G. 1966. *Hydraulique souterraine*. Eyrolles, Paris, 362 p.

364. Schwartz, F.W. 1975. Response testing of piezometers in fractured porous media. *Canadian Geotechnical Journal*, **12**: 408-412.
365. Scotter, D.R., Clothier, D.E., and Harper, E.R. 1982. Measuring saturated hydraulic conductivity and sorptivity using twin rings. *Australian Journal of Soil Research*, **20**(4): 295-304.
366. S.E.B.J. 1978. *Manuel d'inspecteur*. Société d'Énergie de la Baie James, Montréal, Québec, Canada.
367. Selvadurai, A.P.S. 2003. Intake shape factors for entry points in porous media with transversely isotropic hydraulic conductivity. *International Journal of Geomechanics*, **3**(2): 152-159.
368. Selvadurai, A.P.S., and Carnaffan, P. 1997. A transient pressure pulse method for the measurement of permeability of a cement grout. *Canadian Jnl of Civil Engineering*, **24**: 489-502.
369. Sellwood, S.M., Healey, J.M., Birk, S., and Butler, J.J. Jr. 2005. Direct-push hydrostratigraphic profiling: Coupling electrical logging and slug tests. *Ground Water*, **43**(1): 19-29.
370. Seo, H.H., and Choe, J. 2001. Numerical simulations for effects of anisotropy and heterogeneity on well responses to slug tests. *Environmental Geology*, **40**: 1066-1074.
371. Shapiro, A.M. 1989. Interpretation of oscillatory water levels in observation wells during aquifer tests in fractured rock. *Water Resources Research*, **25**(10): 2129-2137.
372. Shapiro, A.M., and Greene, E.A. 1995. Interpretation of prematurely terminated air-pressurized slug tests. *Ground Water*, **33**(4): 539-546.
373. Shapiro, A.M., and Hsieh, P. A. 1998. How good are estimates of transmissivity from slug tests in fractured rock? *Ground Water*, **36**(1): 37-48.
374. Shinohara, K. 1980. A study of inertial effect in the wellbore in pressure transient well testing. Ph.D. Thesis, Stanford University, Dept. of Petroleum Engineering.
375. Shinohara, K., and Ramey, H.J. 1979. Slug tests data analysis, including the inertial effect of the fluid in the wellbore. Paper presented at the 54th Annual fall Technical Conference and Exhibition of the Society of Petroleum Engineers, American Institute of Mechanical Engineers, Las Vegas, Nev., September 23-26.
376. Shinshi, Y., Kano, H., Takeuchi, S., and Nakano, K. 2003. Comparison of analysis methods of slug test data sets: usage of Hvorslev and Cooper et al. methods. *Proceedings, International Conference on Groundwater Engineering, Recent Advances*, pp. 471-474.
377. Singh, S.K. 2007. New methods for aquifer parameters from slug test data. *Journal of Irrigation and Drainage Engineering*, **133**(3): 272-275.
378. Smiles D.E., and Young, E.G. 1956. Hydraulic conductivity determination by several field methods in sand tank. *Soil Science*, **99**: 83-87.
379. Spane, F.A. 1996. Applicability of slug interference tests for hydraulic characterization of unconfined aquifers. (1) Analytical assessment. *Ground Water*, **34**(1): 66-74.
380. Spane, F.A., and Wurstner, S.K. 1993. DERIV: A computer program for calculating pressure derivatives for use in hydraulic test analysis. *Ground Water*, **31**(5): 814-822.
381. Spane, F.A., Thorne, P.D., and Swanson, L.C. 1996. Applicability of slug interference tests for hydraulic characterization of unconfined aquifers: (2) Field test examples. *Ground Water* **34**(5): 925-923.
382. Springer, R.K., and Gelhar, L.W. 1991. Characterization of large scale aquifer heterogeneity in glacial outwash by analysis of slug tests with oscillatory response, Cape Cod, Massachusetts. WRI Report 91-4034, U.S. Geological Survey, Reston, VA, pp. 36-40.
383. Stanford, K. L. 1997. A field investigation of slug tests in wells screened across the water table. MS thesis, Univ. Kansas, 120 p.
384. Stanford, K.L. and McElwee, C.D. 2000. Analyzing slug tests in wells screened across the water table: A field assessment. *Natural Resources Research*, **9**(2): 111-124.
385. Stanford, K. L., Butler, J. J., Jr., McElwee, C. D., and Healey, J. M. 1996. A field study of slug tests in wells screened across the water table. *Kansas Geol. Survey Open-File Rpt. 96-46*, 26 p.
386. Stone, D.B., and Clarke, G.K.C. 1993. Estimation of subglacial hydraulic properties from induced changes in basal water pressure: A theoretical framework for borehole response tests. *Journal of Glaciology*, **39**(132): 327-340.
387. Strobel, M.L. Strobel, C.J., and Delin, G.L. 1998. Design for a packer/vacuum slug test system for estimating hydraulic conductivity in wells with LNAPLs, casing leaks, or water tables intersecting the screens. *Ground Water Monitoring and Remediation*, **18**(4): 77-80.
388. Sudicky, E.A., MacQuarrie, K., and Neville, C.J. 1990. *Aquitest*, v.3.2. Department of Earth Sciences, University of Waterloo, Waterloo, Ont.
389. Sully, J.P., Campanella, R.G., and Robertson, P.K. 1988. Overconsolidation ratio of clays from penetration pore pressures. *Journal of Geotechnical Engineering, ASCE*, **114**(2): 209-216.

390. Surridge, B.W.J. Baird, A.J., and Heathwaite, A.L. 2005. Evaluating the quality of hydraulic conductivity estimates from piezometer slug tests in peat. *Hydrological Processes*, **19**: 1227-1244.
391. Swamee, P.K. and Singh, S.K. 2007. Estimating storage coefficient and transmissivity for slug tests data. *Journal of Irrigation and Drainage Engineering*, 133(5): 505-507.
392. Takeda, M., Zhang, M. and Takeno, N. 2007. Quantitative evaluation of the effects of hydrogeological boundary and initial conditions on slug tests. *Practice Periodical of Hazardous, Toxic, and Radioactive Waste Management*, **11**(1): 48-59.
393. Tavenas, F.A., Jean, P., Leblond, P., and Leroueil, S. 1983. The permeability of natural soft clays. Part 2: Permeability characteristics. *Canadian Geotechnical Journal*, **20**(4): 645-660.
394. Tavenas, F., Tremblay, M., Larouche, G., and Leroueil, S. 1986. In situ measurement of permeability in soft clays. *Proc., ASCE Specialty Conference In Situ '86*, Blacksburg, Virginia, pp. 1034-1048.
395. Tavenas, F., Diene, M., and Leroueil, S. 1986. Analysis of in situ constant head permeability test. *Proc., 39th Canadian Geotechnical Conf., Ottawa*, pp. 71-77.
396. Tavenas, F., Diene, M., and Leroueil, S. 1990. Analysis of the in situ constant-head permeability test in clays. *Canadian Geotechnical Journal*, **27**: 305-314.
397. Taylor, D.W. 1948. *Fundamentals of soil mechanics*. Chapman & Hall, London.
398. Taylor, K.S., Wheatcraft, S., Hess, J., Hayworth, J., and Molz, F. 1990. Evaluation of methods for determining the vertical distribution of hydraulic conductivity. *Ground Water*, **28**(1): 88-98.
399. Teeter, R.M., and Clemence, S.P. 1986. In-situ permeability measurement of slurry trench cutoff walls. *Proc., Conference on the Use of In Situ Tests in Geotechnical Engineering*, ASCE, New York.
400. Terzaghi, K. 1943. *Theoretical soil mechanics*. John Wiley, New York, 510 p.
401. Terzaghi, K., and Peck, R.B. 1967. *Soil mechanics in engineering practice* (2nd edition). John Wiley & Sons, New York.
402. Thompson, D.B. 1987. Computer Notes: A microcomputer program for interpreting time-lag permeability tests. *Ground Water*, **25**(2): 212-218.
403. Torstensson, B.A. 1984. A new system for groundwater monitoring. *Ground Water Monitoring Review*, Fall, pp. 131-138.
404. Trast, J.M., and Benson, C.H. 1995. Estimating field hydraulic conductivity of compacted clay. *ASCE Journal of Geotechnical Engineering*, **121**(10): 736-739.
405. Trautwein, S., and Boutwell, G. 1994. In situ hydraulic conductivity tests for compacted liners and caps. *In Hydraulic conductivity and waste contaminant transport in soil. Edited by D.E. Daniel and S.J. Trautwein*. ASTM, Philadelphia, PA, STP **1142**, pp. 184-226.
406. Uffink, G.J.M. 1984. Theory of the oscillating slug test. National Institute for Public Health and Environmental Hygiene (in Deutsch), Bilthoven, Netherlands. Unpub. Research Report, 18 p.
407. Ursat, P. 1992. Le Perméafor, appareillage de diagraphie de perméabilité. *Bulletin de Liaison des Laboratoires des Ponts et Chaussées*, **74**: 19-26.
408. US Navy. 1974. *Design manual — soil mechanics, foundations, and earth structures*. Naval Facilities Engineering Command, Alexandria, Va., and US Government Printing Office, Washington, D.C., NAVFAC DM7.
409. Van Bavel, C.H.M., and Kirkham, D. 1948. Field measurement of soil permeability using auger holes. *Proc. Soil Science Society of America*, **13**: 90-96.
410. Van der Kamp, G. 1976. Determining aquifer transmissivity by means of well response tests: The underdamped case. *Water Resources Research*, **12**: 71-77.
411. Van der Kamp G. 2001. Methods for determining the in situ hydraulic conductivity of shallow aquitards - a review. *Hydrogeology Journal*, **9**: 5-16.
412. Van der Kamp, G., and Keller, C.K. 1993. Casing leakage in monitoring wells: Detection, confirmation and prevention. *Ground Water Monitoring and Remediation*, **13**(4): 136-141.
413. Van Everdingen, A.F. 1953. The skin effect and its influence on the productive capacity of a well. *Transactions AIME*, **249**: 171-176.
414. Van Rooy, D. 1988. A note on the computerized interpretation of slug test data. Institute of Hydrodynamics and Hydraulic Engineering, Technical University of Denmark, Lyngby, Denmark, Progress Report 66.
415. Vargas, C., and Ortega-Guerrero, A. 2004. Fracture hydraulic conductivity in the Mexico City clayey aquitard: Field piezometer rising-head tests. *Hydrogeology Journal*, **12**: 336-344.
416. Vauclin, M., Angulo, J., Amarillo, R., and Thony, J.L. 1993. The multi-disk infiltrometer (in French). *In Geoconfine-93*, ed. M. Arnould, M. Barrès and B. Côme, pp. 351-356, Balkema, Rotterdam.
417. Vela, S., and McKinley, R.M. 1970. How areal heterogeneities affect pulse-test results. *Soc. Petrol. Eng. Jnl, Trans. AIME*, **249**: 181-191.

418. Vonhof, J.A. 1975. Hydrodynamic response - or slug test as a means to monitor the progress of well development. *Canadian Geotechnical Journal*, **12**(1): 1-12.
419. Walter, G.R., and Thompson, G.M. 1982. A repeated pulse technique for determining the hydraulic properties of tight formations. *Ground Water*, **20**(2): 186-193.
420. Weber, W.G. 1968. In situ permeabilities for determining rates of consolidation. *Highway Research Record*, **243**: 49-61.
421. Weight, W.D., and Wittman, G.P. 1999. Oscillatory slug-test data sets: A comparison of two methods. *Ground Water*, **37**(6): 827-835.
422. Wendling, G., Chapuis, R.P., and Gill, D.E. 1997. Quantifying the effects of well development in unconsolidated material. *Ground Water*, **35**: 387-399.
423. Wheaton, J., and B. Bohman, 1999. Geophysical investigations of cased well completions. *Ground Water Monitoring and Remediation*, **19**(1): 143-151.
424. White, I., and M.J. Sully 1987. Macroscopic and microscopic capillary length and time scales from field infiltration. *Water Resources Research*, **23**: 1524-1522.
425. Widdowson, M.A., Molz, F.J., and Melville, J.G. 1990. An analysis technique for multilevel and partially penetrating slug test data. *Ground Water*, **28**(6): 937-945.
426. Widdowson, M.A., Molz, F.J., and Melville, J.G. 1989. Analysis of multilevel slug data to determine hydraulic conductivity distribution. In *Proceedings of Solving Ground Water Problems with Models*, Indianapolis, In., IGWMC Editor, pp. 699-713.
427. Wilkinson, W.B. 1968a. Constant head *in situ* permeability tests in clay strata. *Geotechnique*, **18**(2): 172-194.
428. Wilkinson, W.B. 1968b. Constant head *in situ* permeability tests in clay strata. *Highway Research Record*, **243**: 49-61.
429. Williams, J.H., and Conger, R.W. 1990. Preliminary delineation of contaminated water-bearing fractures intersected by open-hole bedrock wells. *Ground Water Monitoring Review*, **10**(4): 118-126.
430. Wilson, D., and Campanella, R.G. 1997. A rapid in-situ hydraulic conductivity measurement in sands using a UBC modified BAT penetrometer. *Proc., 50th Canadian Geotech. Conf., Ottawa*, pp. 34-40.
431. Woods, E.G. 1970. Pulse-test response of a two-zone reservoir. *Soc. Petrol. Eng. Jnl, Trans. AIME*, **249**: 245-256.
432. Wylie, A., and Magnuson, S. 1995. Spreadsheet modeling of slug tests using the van der Kamp method. *Ground Water*, **33**(2): 326-329.
433. Xiang, J., 1994. Improvements in evaluating constant-head permeameter test data. *Journal of Hydrology*, **162**: 77-97.
434. Xiang, J., Scanlon, B.R., Mullican III, W.F., Chen, L., and Goldsmith, R.S. 1997. A multistep constant-head borehole test to determine field saturated hydraulic conductivity of layered soils. *Advances in Water Research*, **20**(1).
435. Yamad, H., Nakamura, F., Watanabe, Y., Murakami, M., and Nogami, T. 2005. Measuring hydraulic permeability in a streambed using the packer test. *Hydrological Processes*, DOI: 10.1002/hyp.5688.
436. Yang, Y.J., and Gates, T.M. 1997. Wellbore skin effect in slug-test data analysis for low-permeability geologic materials. *Ground Water*, **35**(6): 931-937.
437. Yang, S.Y., and Yeh, H.D. 2007. On the solutions of modeling a slug test performed in a two-zone confined aquifer. *Hydrogeology Journal*, **15**: 297-305.
438. Yang, S.Y., and Yeh, H.D. 2005. Laplace-domain solutions for radial two zone flow equations under the conditions of constant-head and partially penetrating well. *Journal of Hydraulic Engineering*, **131**(3): 209-216.
439. Yang, S.Y., and Yeh, H.D. 2004. A simple approach using Bouwer and Rice's method for slug test data analysis. *Ground Water*, **42**(5): 781-784.
440. Yeh, H.D., and Chen, Y.J. 2007. Determination of skin and aquifer parameters for a slug-test with wellbore-skin effect. *Journal of Hydrology*, **342**(3-4): 283-294.
441. Yeh, H.D., and Yang, S.Y. 2006. A novel analytical solution for a slug test conducted in a well with a finite-thickness skin. *Adv. in Water Resources*, **29**: 1479-1489.
442. Yeh, H.D., Yang, S.Y., and Peng, H.Y. 2003. A new closed-form solution for radial two-layer drawdown equation under constant-flux pumping in a finite-radius well. *Advances in Water Resources*, **26**(5): 747-757.
443. Yesiller, N. 1995. Ultrasonic nondestructive testing method for evaluation of annular seals. *Geotechnical News*, December, pp. 24-27.

444. Yesiller, N., Benson, C.H., and Edil, T.B. 1997. Field evaluation of ultrasonic method for assessing well seals. *Ground Water Monitoring and Remediation*, **17**(3): 169-176.
445. Yesiller, N., Edil, T.B., and Benson, C.H. 1997. Ultrasonic method for evaluation of annular seals for wells and instrumented holes. *Geotechnical Testing Journal*, **20**(1): 17-28.
446. Young, S.C., and Pearson, H.S. 1995. The electromagnetic borehole flowmeter: description and application. *Ground Water Monitoring and Remediation*, **15**(4): 138-147.
447. Youngs, E.G. 1968. Shape factors for Kirkham's piezometer method for determining the hydraulic conductivity of soil in situ for soils overlying an impermeable floor or infinitely permeable stratum. *Soil Science*, **106**: 235-237.
448. Zhan, X., and Butler, J.J. Jr. 2003. Mathematical derivations of semi analytical solutions for hydraulic tests in highly permeable aquifers. *Kansas Geological Survey Open-File Report 2003-60*, 24 p.
449. Zhang, L., and Dusseault, M.B. 1997. Evaluation of formation damage from a constant-head borehole test. *International Journal of Rock Mechanics Min. Sci.*, **34**(314): 561-561(1).
450. Zhang, R. 1997. Determination of soil sorptivity and hydraulic conductivity from the disk infiltrometer. *Journal of the Soil Science Society of America*, **61**(4).
451. Zenner, M.A. 2002. Analysis of slug tests in bypassed wells. *Journal of Hydrology*, **263**(1-4): 72-91.
452. Zlotnik, V. 1994. Interpretation of slug and packer tests in anisotropic aquifers. *Ground Water*, **32**(5): 761-766.
453. Zlotnik, V.A., and Ledder, G. 1996. Theory of dipole flow in uniform anisotropic aquifers. *Water Resources Research*, **32**(4): 1119-1128.
454. Zlotnik, V.A., and McGuire, V.L. 1998. Multi-level slug-tests in highly permeable formations: 2. Hydraulic conductivity identification, method verification, and field application. *Journal of Hydrology*, **204**: 283-296.
455. Zlotnik, V.A., and McGuire, V.L. 1998. Multi-level slug-tests in highly permeable formations: 1. Modified Springer-Gelhar model. *Journal of Hydrology*, **204**: 271-282.
456. Zlotnik, V.A., and Zurbuchen, B.R. 1998. Dipole probe: Design and field applications of a single-borehole device for measurements of vertical variations in hydraulic conductivity. *Ground Water*, **36**(6): 884-893.
457. Zlotnik, V.A., Zurbuchen, B.R., and Ptak, T. 2001. The steady-state dipole-flow tests for characterization of hydraulic conductivity statistics in a highly permeable aquifer: Horkheimer Insel Site, Germany. *Ground Water*, **39**(4): 504-516.
458. Zninardic, D., and Piccoli, S. 1995. Field measurements of hydraulic conductivity. *Proc., 4th Int. Symposium on Field Measurements in Geomechanics*, Bergamo, Italy, April 10-12, pp. 489-494.
459. Zurbuchen, B.R., Zlotnik, V.A., and Butler, J.J. Jr. 2002. Dynamic interpretation of slug tests in highly permeable aquifers. *Water Resources Research*, **38**(3): 7.1-7.18

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