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## REFERENCES

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## ACRONYMS AND ABBREVIATIONS

AADT	annual average daily traffic	NAAQS	National Ambient Air Quality Standards
AARC	annual average rate of change	NAC	Noise Abatement Criteria
AASHTO	American Association of State Highway and Transportation Officials	NEPA	National Environmental Policy Act
APE	Area of Potential Effects	NHPA	National Historic Preservation Act
BEBR	Bureau of Business and Economic Research	NRCS	Natural Resources Conservation Service
BMPs	Best Management Practices	NRHP	National Register of Historic Places
CAA	Clean Air Act Amendments of 1990	NWI	National Wetland Inventory
CO	carbon monoxide	NOx	oxides of nitrogen
CEQ	Council on Environmental Quality	O3	ozone
cfs	cubic feet per second	PAHs	polycyclic aromatic hydrocarbons
the Cities	the City of Logan and the City of Providence	PM10	particulate matter under 10 microns in diameter
CMPO	Cache Metropolitan Planning Organization	PM2.5	particulate matter less than 2.5 microns in diameter
CO	carbon monoxide	RDA	South Logan Redevelopment Area
Corps	U.S. Army Corps of Engineers	ROW	right-of-way
dB	decibel	SHPO	State Historic Preservation Office
dba	decibels on the A-weighted scale	SIPs	State air quality implementation plans
DO	dissolved oxygen	SO2	sulfur dioxide
EIS	Environmental Impact Statement	Study	South Logan Area Transportation Study
EPA	U.S. Environmental Protection Agency	SWP3	Storm Water Pollution Prevention Plan
FEMA	Federal Emergency Management Agency	TAZs	Traffic Analysis Zones
FHWA	Federal Highway Administration	TDM	CMPO 2030 Travel Demand Model
FIRMS	Flood Insurance Rate Maps	TIP	Transportation Improvement Program
FTA	Federal Transit Authority	TSM	Transportation System Management
GOPB	Governor's Office of Planning and Budget	TSS	total suspended solids
ILS	Intensive Level Survey	UDWR	Utah Division of Wildlife Resources
lead	Pb	UDOT	Utah Department of Transportation
LEQ(h)	hourly equivalent sound level	UPDES	Utah Pollutant Discharge Elimination System
LOS	level of service	USFWS	U.S. Fish and Wildlife Service
LPA	Locally Preferred Alternative	v/c	volume to capacity
LRTTP	Long-Range Transportation Plan		
Main Street	US 89/91		
mg/L	milligrams per liter		
MOA	Memorandum of Agreement		
MS4s	Municipal Separate Storm Sewer Systems		
MSATs	mobile air source toxics		

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## REFERENCES

- Allan J.D. 1995. Stream Ecology: Structure and Function of running waters. Boston: Kluwer Academic Publishers. 388 p.
- Anderson P.B., Susong D.D., Wold S.R., Heilweil V.M., Baskin R.L. 1994. Hydrogeology of Recharge Areas and Water Quality of the Principal Aquifers along the Wasatch Front and Adjacent Areas, Utah. Washington (D.C.): U.S. Geological Survey. Water-Resources Investigations Report 93-4221.
- Arabasz W.J., Pachmann J.C., Brown E.D. 1992. Observational Seismology and the Evaluation of Earthquake Hazards and Risk in the Wasatch Front Area, Utah. *In*: Gori P.L. and Hays W.W. (Editors). Assessment of Regional Earthquake Hazards and Risk along the Wasatch Front, Utah. Washington (D.C.): United States Government Printing Office. U.S. Geological Survey Professional Paper 1500-A-J. 251 p.
- Atkin W. 2004. Assistant regional engineer, Utah Division of Water Rights. Personal communication with Darren Olsen of BIO-WEST, Inc., Logan, Utah, regarding impacts from and possible mitigation opportunities for road construction in the Project Area. 9/9/2004.
- Bankhead S. 2005. City Manager, Providence City Planning Commission. Personal communication with Ross Peterson of BIO-WEST, Inc., regarding development around Spring Creek. 8/4/2005.
- Barbour M.T., Gerritsen J., Snyder B.D., Stribling J.B. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. Washington (D.C.): U.S. Environmental Protection Agency; Office of Water. EPA 841-b-99-002.
- [BEBR] Bureau of Business and Economic Research. 2005. University of Utah, Utah Indicators, Economic Indicators for Utah Counties. Location: [http://www.business.utah.edu/updir/1442\\_bebr\\_Tables2.xls](http://www.business.utah.edu/updir/1442_bebr_Tables2.xls). 8/4/05.
- Bergerson E.P. 1973. Fish Production and Movements in the Lower Logan River, Utah [Dissertation]. Logan (UT): Utah State University. 183 p.
- [BIO-WEST] BIO-WEST, Inc. 2002. Subsurface Investigation Report, Barker's White Pine Gallery, Logan, Utah. Logan (UT): BIO-WEST, Inc. 15 p.
- [BIO-WEST] BIO-WEST, Inc. 2004a. South Logan to Providence Transportation Corridor Scoping Summary. Logan (UT): City of Logan, Utah Department of Transportation, and the Federal Highway Administration. 11 p.

- [BIO-WEST] BIO-WEST, Inc. 2004b. Tony Grove-Franklin Basin: Logan Canyon Construction Project 2003 Water Quality Monitoring Annual Report. Logan (UT): BIO-WEST.
- Bjorkland L.J., McGreevy L.J. 1971. Ground-water Resources of Cache Valley, Utah and Idaho. Salt Lake City: Utah Department of Natural Resources. Technical Publication No. 36. 61 p.
- Black B.D., Giraud R.E., Mayes B.H. 2000. Paleoseismic Investigation of the Clarkston, Junction Hills, and Wellsville Faults, West Cache Fault Zone, Cache County, Utah. Salt Lake City: Utah Geological Survey, Special Study 98. 23 p.
- Budy P., Mchugh P., Thiede G. 2004. Logan River Whirling Disease Study: Factors Affecting Trout Population Dynamics, Abundance, and Distribution in the Logan River, Utah. Logan (UT): U.S. Geological Survey, Utah Cooperative Fish and Wildlife Research Unit, Utah State University. 63 p.
- Budy P., Mchugh P., Thiede G., Vandyke E. 2005. Logan River Whirling Disease Study: Factors Affecting Trout Population Dynamics, Abundance, and Distribution in the Logan River, Utah. Logan (UT): U.S. Geological Survey, Utah Cooperative Fish and Wildlife Research Unit, Utah State University. 129 p.
- Burton G.A. Jr., Pitt R.E. 2002. Stormwater Effects Handbook: A Toolbox for Watershed Managers, Scientists, and Engineers. Boca Raton (FL): Lewis Publishers. 911 p.
- Brummer J.E., McCalpin J. 1995. Geologic Map of the Richmond Quadrangle, Cache County, Utah and Franklin County, Idaho. Salt Lake City: Utah Geological Survey, Miscellaneous Publication 95-3. Scale 1:24,000. 22 p.
- Burton G.A. Jr., Pitt R.E. 2002. Stormwater Effects Handbook: A Toolbox for Watershed Managers, Scientists, and Engineers. Boca Raton (FL): Lewis Publishers. 911 p.
- Bushman R. 2005. Logan Transit District manager, City of Logan, Utah. Personal communication with Ross Peterson of BIO-WEST, Inc., Logan, Utah, regarding future transit routes. 4/18/05.
- City of Logan. 1996. City of Logan Transportation Master Plan. Logan (UT): City of Logan.
- City of Logan. 1998. City of Logan General Plan. Logan (UT): City of Logan.
- City of Logan. 2005a. City of Logan Zoning Map. Location: <http://arcims.loganutah.org/website/ZoningMap/viewer.htm>. 3/15/2005.

- City of Logan. 2005b. Proposed Future Land Use Plan. Location: <http://www.ci.logan.ut.us/commdev/documents/LUMapPresentation050225.pdf>. 3/15/2005.
- City of Providence. 2000. Providence City Master Plan. Providence (UT): Providence City Planning Commission and City Council.
- City of Providence. 2005. Providence City Zoning Map. Providence (UT): City of Providence.
- City of River Heights. 2004. River Heights City Master Plan, Official Zoning and Sensitive Area Map. River Heights(UT): City of River Heights.
- [CMPO] Cache Metropolitan Planning Organization. 2005a. CMPO 2030 Long Range Transportation Plan. Logan (UT): Cache Metropolitan Planning Organization.
- [CMPO] Cache Metropolitan Planning Organization. 2005b. CMPO Transportation Improvement Program (TIP) 2006-2010. Logan (UT): CMPO. 11 p.
- Dalley R. 2005. Air Monitoring Center Manager, Utah Division of Air Quality, West Valley City, Utah. Personal Communication with Ross Peterson of BIO-WEST, Inc., Logan, Utah, regarding PM2.5 attainment status in Cache County.
- de la Hoz Franco E.A. 2003. Assessing the Effects of Disease and Other Environmental Factors on the Dynamics, Abundance, and Distribution of Endemic Trout Populations in the Logan River, Utah [M.S. thesis]. Logan (UT): Utah State University.
- Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Vicksburg (MS): U.S. Army Waterways Experiment Station. Technical Report Y-87-1.
- [EPA] Environmental Protection Agency. 1999. Report to Congress on Phase II Storm Water Regulations. Washington (D.C.): EPA.
- [EPA] Environmental Protection Agency. 2006. Location: <http://epa.gov/oar/oaqps/pm25/pmfine/designvalues2000-2002.pdf>. 1/19/2006.
- Eisler R. 1985. Cadmium hazards to fish, wildlife, and invertebrates: a synoptic review. Laurel (MD): U.S. Fish and Wildlife Service, Patuxent Research Center. Biological Report 85 (1.2).
- Eisler R. 1986. Chromium hazards to fish, wildlife, and invertebrates: a synoptic review. Laurel (MD): U.S. Fish and Wildlife Service, Patuxent Research Center. Biological Report 85 (1.6).

- Eisler R. 1987. Polycyclic aromatic hydrocarbon hazards to fish, wildlife, and invertebrates: a synoptic review. Laurel (MD): U.S. Fish and Wildlife Service, Patuxent Research Center. Biological Report 85 (1.11).
- Eisler R. 1988. Lead hazards to fish, wildlife, and invertebrates: a synoptic review. Laurel (MD): U.S. Fish and Wildlife Service, Patuxent Research Center. Biological Report 85 (1.14).
- Eisler R. 1991. Cyanide hazards to fish, wildlife, and invertebrates: a synoptic review. Laurel (MD): U.S. Fish and Wildlife Service, Patuxent Research Center. Biological Report 85 (1.23).
- Eisler R. 1993. Zinc hazards to fish, wildlife, and invertebrates: a synoptic review. Laurel (MD): U.S. Fish and Wildlife Service, Patuxent Research Center. Biological Report 10.
- Eisler R. 1998a. Copper hazards to fish, wildlife, and invertebrates: a synoptic review. Laurel (MD): U.S. Fish and Wildlife Service, Patuxent Research Center. Biological Science Report USGS/BRD/BSR--1997-0002.
- Eisler R. 1998b. Nickel hazards to fish, wildlife, and invertebrates: a synoptic review. Laurel (MD): U.S. Fish and Wildlife Service, Patuxent Research Center. Biological Science Report USGS/BRD/BSR--1997-0001.
- Evans J.P., Oaks R.Q., Jr. 1996. Three-dimensional Variations in Extensional Fault Shape and Basin Form: the Cache Valley Basin, Eastern Basin and Range Province, United States. Boulder (CO): Geological Society of American Bulletin, v. 108. pp. 1,580-1,593.
- Evans J.P., McCalpin J., Holmes D.C. 1996. Geologic Map of the Logan 7.5' Quadrangle, Cache County, Utah. Salt Lake City: Utah Geological Survey, Miscellaneous Publication 96-1. Scale 1:24,000.
- Environmental Laboratory. 1987. U.S. Army Corps of Engineers Wetlands Delineation Manual. Vicksburg (MS): U.S. Army Waterways Experiment Station. Technical Report Y-87-1. 92 p. plus appendices.
- [EPA] Environmental Protection Agency. 1999. Report to Congress on the Phase II Storm Water Regulations. Washington (D.C.) : EPA.
- [Fehr & Peers] Fehr & Peers Associates, Inc. 1999. CMPO Long Range Pedestrian/Bicycle Plan. Logan (UT): Cache Metropolitan Planning Organization.
- [FHWA] Federal Highway Administration. 1987. Technical Advisory T 6640.8A, Guidance for Preparing and Processing Environmental and Section 4(f) Documents. Washington (D.C.): FHWA. 50 p. plus appendices.

- [FHWA] Federal Highway Administration. 1993. U.S. Highway 89, Logan Canyon Highway, Cache and Rich Counties, Utah, Final Environmental Impact Statement (FEIS). Washington (D.C.): FHWA. FHWA-UT-EIS-90-02-f.
- [FHWA] Federal Highway Administration. 1996. Community Impact Assessment: A Quick Reference for Transportation. Washington (D.C.): Office of Environment and Planning.
- [FHWA] Federal Highway Administration, Maryland Division Office. 2005. Environmental Justice Guidelines. Location: <http://www.fhwa.dot.gov/mddiv/ejguide.htm>. 8/3/2005.
- [FHWA and UDOT] Federal Highway Administration and Utah Department of Transportation. Determination of Eligibility and Finding of Effect, 100 East from 300 South to Providence Lane (1200 South), Logan, Cache County, Utah. Salt Lake City: UDOT.
- Gilliam D. 2005. Administrative Officer, University of Utah's David Eccles School of Business Bureau of Business and Economic Research. Personal communication with Ross Peterson of BIO-WEST, Inc., regarding economic indicator data for Cache County. 8/2/2005.
- Furniss M.J., Roelofs T.D., Yee C.S. 1991. Road construction and maintenance. Pages 297-323 in W.R. Meehan (editor). Influences of forest and rangeland management on salmonid fishes and their habitats. Bethesda (MD): American Fisheries Society Special Publication 19
- Goessel K. 1999. Tertiary Stratigraphy and Structural Geology, Wellsville Mountains to Junction Hills, North-Central Utah [Master Thesis]. Logan (UT): Utah State University. 220 p.
- [GOPB] Governor's Office of Planning and Budget. 2005. Demographic and Economic Analysis Section Web Site. Location: <http://governor.utah.gov/dea>. 8/4/05.
- Hecker S. 1993. Quaternary Tectonics of Utah with Emphasis on Earthquake-Hazard Characterization. Salt Lake City: Utah Geological Survey Bulletin 127. 157 p.
- Hayward C.L., Cottam C., Woodbury A.M., Frost H.H. 1976. Birds of Utah. Great Basin Naturalist Memoirs 1:1-22.
- Jensen K. 2006. Economic Development Director, Office of the Mayor, City of Logan, Utah.. Personal communication with Blaise Chanson of BIO-WEST, Inc., Logan, Utah, regarding hotel and conference center sited development. Email and telephone 10/04/06.
- Jensen R. 2005. Superintendent, Logan City School District. Personal conversation with Ross Peterson of BIO-WEST, Inc., regarding April 2005 enrollment. 8/4/2005.

- Kariya K.A., Roark M.D., Hanson K.M. 1994. Hydrology of Cache Valley, Cache County, Utah, and Adjacent Part of Idaho, with Emphasis on Simulation of Groundwater Flow. Salt Lake City, Utah: Utah Department of Natural Resources. Utah Department of Natural Resources Technical Publication No. 108. 120 p.
- Kappesser G. 1983. Bedload Transport on the Logan River. Logan (UT): Wasatch-Cache National Forest. 2 p.
- Keeslar V. 2005. City Manager, City of Providence, Utah. Personal communication with Ross Peterson of BIO-WEST, Inc., Logan, Utah, regarding planned development in Providence City. 4/20/05.
- Koehler G.M., Brittell J.D. 1990. Managing spruce-fir habitat for lynx and snowshoe hares. *Journal of Forestry* 88(10):10-14.
- Laws E.A. 1993. Aquatic Pollution: An introductory text. New York (NY): John Wiley and Sons, Inc. Second edition. 611 p.
- Laymon S.A., Halterman M.D. 1989. A proposed management plan for yellow-billed cuckoos in California. *In*: D. Abell, Technical Coordinator. Proceedings of the California Riparian Systems Conference: Protection, management and restoration for the 1990s. Berkeley (CA): U.S. Department of Agriculture. Forest Service Report # PSW-110.
- Leigh, Scott & Cleary, Inc. 1996. Cache Metropolitan Area Transportation Plan. Logan (UT): Cache Metropolitan Planning Organization.
- Lentsch L., Converse Y., Perkins J. 1997. Conservation Agreement and Strategy for Bonneville Cutthroat Trout (*Onchorhynchus clarki Utah*) in the State of Utah. Publication Number 97-19. Salt Lake City: Utah Division of Wildlife Resources. 80 p.
- Lentsch L., Toline C.A., Kershner J., Hudson J.M., Mizzi J. 2000. Range-wide Conservation Agreement and Strategy for Bonneville Cutthroat Trout (*Onchoryhynchus clarki Utah*). Publication Number 00-19. Salt Lake City: Utah Division of Wildlife Resources. 97 p.
- Machette M.N., Personius S.F., Nelson A.R. 1992. Paleoseismology of the Wasatch Fault Zone: A summary of Recent Investigations, Interpretations, and Conclusions. *In*: Gori, P. L. and Hays, W.W. Assessment of Regional Earthquake Hazards and Risk along the Wasatch Front, Utah. Washington (D.C.): United States Government Printing Office, U.S. Geological Survey Professional Paper 1500-A-J. 251 p.
- Martin R.S. 2006. Definition of PM2.5. Location: <http://www.engineering.usu.edu/uwrl/martin/PM2.5>. 1/19/2006.

- McCalpin J. 1989. Surficial Geologic Map of the East Cache Fault Zone, Cache County, Utah. Denver: United States Geological Survey, Miscellaneous Filed Studies Map MF-2107. 1:50,000.
- McCalpin J. 1994. Neotectonic Deformation along the East Cache Fault Zone, Cache County, Utah. Salt Lake City: Utah Geological Survey, Special Study 83. 37 p.
- Meaker M. 2005. Written memorandum of April 14, 2005 to Logan City Engineering Division, City of River Heights Administration, and Residents of 500 South Street. Location: Administrative File, BIO-WEST, Inc. Logan, Utah.
- Meyers J. 2006. Position, Preferred Properties. 2006. Personal communication with Ross Peterson of BIO-WEST, Inc., regarding rental vacancy rates in Cache Valley. 1/18/2006.
- MK Centennial. 2000. CMPO 2025 Long-Range Transportation Plan. Logan (UT): Cache Metropolitan Planning Organization. 103 p. plus appendices.
- [MLS] Wasatch Front Regional Multiple Listing Service. 2006. Location: <http://www.utahreal-estate.com/>. 1/18/2006 .
- National Aquatic Monitoring Center. 2005. Buglab Interactive Mapping and Data Retrieval Site. Location: <http://www.usu.edu/buglab/>. 6/27/2005.
- Nielson J.L., Nielson M. 7/28/2004. [Letter to Ivan Hooper, Wilbur Smith Associates, regarding future development of southeast portion of Logan City]. Location: Administrative File, BIO-WEST, Inc., Logan, Utah.
- Nielson J. 2005. Director of Planning, City of Logan. Personal communication with Ross Peterson of BIO-WEST, Inc., Logan, Utah, regarding planned and future development in the Project Area.
- Oaks R.Q. 2000. Final Report, Geologic History of the Tertiary Deposits Between the Lower Bear River Drainage Basin and the Cache Valley Basin, North Central Utah, Based on a study of the Salt Lake Formation, the Colinston Conglomerate, and the Wasatch Formation with Application to Groundwater Resources and Fault-Related Geological Hazards. Logan (UT): Department of Geology, Utah State University. 65 p.
- Parrish J.R., Howe F.P., Norvell R.E. 2002. Utah Partners in Flight Avian Conservation Strategy Version 2.0. Salt Lake City: Utah Partners in Flight Program, Utah Division of Wildlife Resources. UDWR Publication Number 02-27. i-xiv +. 302 p.

- Raleigh R.F., Zuckerman L.D., Nelson P.C. 1986. Habitat suitability index models and instream flow suitability curves: brown trout. Washington, (D.C.): U.S. Department of the Interior, U.S. Fish and Wildlife Service. Biological Report 82 (10.124). 65 p.
- Richard Chong and Associates. 2004. Logan South Main Blight Study. Salt Lake City: City of Logan, Utah.
- Rogers M. Administrative Secretary, Cache County School District. Personal communication with Ken Sim of BIO-WEST, Inc., concerning student enrollment. 3/30/2006.
- Rosgen D. (1996). Applied River Morphology. Pagosa Springs (CO): Wildland Hydrology. 352 p.
- Sigler W.F., Sigler J.W. 1996. Fishes of Utah: A Natural History. Salt Lake City: University of Utah. 375 p.
- Smith K.A. 1997. Stratigraphy, Geochronology, and Tectonics of the Salt Lake Formation (Tertiary) of Southern Cache Valley, Utah [ Masters Thesis]. Logan (UT): Utah State University. 245 p.
- Solomon B.J. 1999. Surficial Geologic Map of the West Cache Fault Zone and Nearby Faults, Box Elder and Cache Counties, Utah. Salt Lake City: Utah Geological Survey, Final Technical Report, National Earthquake Hazard Reduction Program Objective II.5. 20 p.
- Southworth D., Johnson W.S. 2005. A Cultural Resources Survey and Building Inventory along the 100 East Street Corridor Located in Logan, Cache County, Utah. Ogden (UT): Sagebrush Cultural Resources Report No. 1323-02.
- Tanner L. 2005. Director of Administrative Services, City of Logan, Utah. Personal communication with Ross Peterson of BIO-WEST, Inc., Logan, Utah, regarding South Logan RDA. 4/20/05.
- Thompson P., Tolentino S., Sorenson K., Nielson B. 2000. Bonneville Cutthroat Trout (*Oncorhynchus clarki Utah*) Survey and Monitoring Activities in the Logan River (Sections 05-07) Drainage, 1999. Publication Number 00-3. Salt Lake City: Utah Division of Wildlife Resources. 75 p.
- [UDAF] Utah Department of Agriculture and Food. 2003. Utah Department of Agriculture and Food Web Site: Utah Noxious Weed List. Location: [http://ag.utah.gov/plantind/nox\\_utah.html](http://ag.utah.gov/plantind/nox_utah.html). 6/4/2003.