

# EDWARD MICHAEL TRUJILLO

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## **ACADEMIC POSITIONS:**

Assoc. Professor, Department of Chemical Engineering, University of Utah, 1984-present

Adjunct Professor of Civil and Environmental Engineering, University of Utah, 1994-present

Assistant Dean, Minority Affairs, College of Engineering, University of Utah, 1991-1994

## **EDUCATION:**

B.S., Ch.E., University of Arizona 1969

M.S., Ch.E., California Institute of Technology 1970

Ph.D., Ch.E., University of Utah 1975

## **HONORS AND AWARDS:**

Nominated for Board of Directors, American Institute of Chemical Engineers, New York City, 2015.

American Institute of Chemical Engineers, for Excellence and Service as Chair of the Career and

Education Operating Council, presented at 2014 AIChE Annual Meeting, Atlanta, November 15, 2014.

Elected Fellow, American Institute of Chemical Engineers, 2013

Gary Leach Award, American Institute of Chemical Engineers, as a member of the Centennial Celebration Steering Committee, 2009.

American Institute of Chemical Engineers, for Excellence and Service as Chair of the Student Chapters Committee for 2008-2009, presented at National AIChE Student Conference, Nashville, November 9, 2009.

American Institute of Chemical Engineers, Outstanding Student Chapter Advisor for 2008 (only one per year), presented at National AIChE Student Conference, Philadelphia, November 16, 2008.

University of Utah Diversity Award, University of Utah, Salt Lake City, May, 1998 - The first individual to receive this award.

Community Service Award, Chicano Scholarship Committee, University of Utah, Salt Lake City, May 8, 1997

Outstanding Service, Utah MESA/STEP Inc., Taylorsville, Utah, May, 1994

Outstanding Service to Education, Utah State Board of Education, Salt Lake City, May, 1994

Outstanding Service Award, College of Engineering, University of Utah, September, 1992

Education Award, New Horizons Association, Salt Lake City, September, 1991

Ethnic Studies Service Award, University of Utah, May, 1991

Utah MESA/MEP Award, University of Utah, May, 1991

President's Award, Society of Hispanic Professional Engineers, June, 1988

Littleton JayCee of the Month, Littleton JayCeers, Colorado, July, 1979

Recipient of Graduate Research Assistantship plus Tuition, California Institute of Technology

Graduated from University of Arizona with High Distinction

Recipient of Inspiration Consolidated Copper Company Scholarship Four years, University of Arizona

**TECHNICAL SOCIETIES:**

American Institute of Chemical Engineers (AIChE)  
Society for Biological Engineering (SBE)  
American Chemical Society (ACS)  
Society of Petroleum Engineers of AIME (SPE)  
Society for Mining, Metallurgy, and Exploration (SME)  
Society of Hispanic Professional Engineers (SHPE)  
Society of Mexican American Engineers and Scientists (MAES)  
Tau Beta Pi  
Phi Kappa Phi  
Sigma Xi

**TECHNICAL REVIEWER FOR:**

U.S. Environmental Protection Agency – STAR Fellowship Program  
U.S. Environmental Protection Agency – SBIR Phase I: Waste Management and Monitoring  
National Science Foundation – Bioengineering and Environmental Division  
National Science Foundation - Chemical & Transport Systems Division  
U.S. Environmental Protection Agency - National Center for Envir. Research & QA  
U.S. Dept. of Agriculture - National Research Initiative Competitive Grants Program  
Environmental Science and Technology Journal  
Biotechnology and Bioengineering Journal  
Applied Biochemistry and Biotechnology Journal  
Journal of Biotechnology  
National Research Council  
Chemical Engineering Communications  
Biotechnology Progress  
Industrial and Engineering Chemistry Research  
John Wiley & Sons Inc.  
Kluwer Academic Publishers - Adsorption Journal  
University of Utah – Research – Intramural Grants, Seed Grants

**ACADEMIC EXPERIENCE:**

Department of Chemical Engineering, University of Utah, Associate Professor, 1984-present; Assistant Dean for Minority Affairs, College of Engineering, 1991 - 94; Adjunct Associate Professor of Civil Engineering, 1994-present, Instructor, 1971-1975

**Courses taught (Quarter System) as Instructor 1971-1975:**

ChE 360 - Engineering Thermo  
ChE 364 - Heat Transfer  
ChE 350 - Fluid Mechanics  
ChE 374 - Projects Laboratory I

**Courses taught (Quarter System) as Associate Professor 1984-1998:**

CHEN 110 - Computer Literacy for Chemical Engineers  
CHEN 310 - Fund. Process Engr. I  
CHEN 311 - Fund. Process Engr. II  
CHEN 360 - Engineering Thermo  
CHEN 375 - Projects Laboratory II  
CHEN 376 - Projects Laboratory III  
CHEN 362 - Chemical Kinetics  
(developed new course) CHEN 567 - Bioseparations

	CHEN 551 - Biochemical Engr.
	CHEN 569 - Bioprocess Fundamentals
(augmented existing course)	CHEN 552 - Bioreactor Design
(developed new course)	CHEN 591 - Bioremediation
	CHEN 650 - Fluid Mechanics I
(developed new course)	CHEN 651 - Fluid Mechanics II
	CHEN 662 - Chem. Reaction I

Courses taught (Semester System) as Associate Professor 1998-present:

(developed course for semester)	CHEN 1703 - Topics in Chemical Engineering
(helped teach new course for 2013)	CHEN 1705 – CheE Design and Innovation
	CHEN 3553 – Chemical Reaction Engineering
	CHEN 3453 – Heat Transfer
(added service requirement-2013)	CHEN 4753/4755 - Undergraduate Seminar
	CHEN 4903 - Projects Laboratory I
	CHEN 4905 – Projects Laboratory II
(developed new course: coPI)	CHEN 4975 – Hydrogen Sustainability (2004-05)
(developed new course)	CHEN 5103/CVEEN 6603 - Biochemical Engineering
(developed new lab course)	CHEN 5104 - Biochemical Engineering Lab
	CHEN 6553 – Chemical Reaction Engineering

**PATENTS and Disclosures:**

“Removing Toxic Metals and Disinfecting Contaminated Water Simultaneously using Immobilized Biochar Beads,” by Edward Trujillo, Brock Erickson, D. Kelton Shelley and Austin Eiting, University of Utah, Invention Disclosure Number U-6181, May, 2016

“Improved Method for Producing Biofuels from Synthesis Gas Fermentation,” by Edward M. Trujillo, University of Utah, Invention Disclosure Number U-5114, June 3, 2011.

“Method and Apparatus for Multi-layer Growth of Anchorage Dependent Cells,” by Catherine Rappaport, Edward Trujillo, John Gladysz, Masoud Abbasi, Christian Rocaboy, Yvonne Rensch and Michael Kempe, University of Utah, University disclosure U-2671, (United States Patent Application publication 20040023374A1), February 5, 2004

“Novel System for Multilayer Growth of Anchorage-Dependent Cells,” by Edward M. Trujillo and Catherine Rappaport, University of Utah, (United States Patent No. 5,702,949) December 30, 1997.

"Removal of Selenium and Other Hazardous Metals using Reductive Precipitation," by Edward M. Trujillo and Joseph Turner, University of Utah, Disclosure Number U-2971, February 14, 2000.

"New Technique for measuring the surface shear modulus of substratums used for growing anchorage-dependent cells and for cell adhesion," by Edward M. Trujillo and Masoud Abbasi, University of Utah, Disclosure Number U-2766, November 5, 1998.

"Oxygen Solubility Enhancers to Improve the Recovery and Biodegradation of DNAPLS," by Edward M. Trujillo and Milind D. Deo, University of Utah, Disclosure Number U-2305, March 4, 1996.

**COPYRIGHTED MATERIAL:**

“TOUGHER: A graphical user interface to TOUGH/TOUGHREACT,” You Li, Marcin Niewiadomski and Edward M. Trujillo, Disclosure number U-4703, University of Utah, July 23, 2009.

“A Geochemical 3-Dimensional, 3-Phase Model of Acid Mine Drainage - AMD3D3PG,,” Cheng-Kuo Lin and Edward M. Trujillo, Disclosure number U-2283, University of Utah, March, 1996.

“Geochemical Model of Acid Mine Drainage - Predicting Accelerated Weathering (Humidity) Tests,” Cheng-Kuo Lin and Edward M. Trujillo, Registration Number TX 689-043, Disclosure number U-2124, University of Utah, May 8, 1995.

“Six-Component Packed-Bed Computer Program for Immobilized Biomass Beads,” E.M. Trujillo, Registration Number TX 499-098, University of Utah, June 24, 1991.

“Operating Manual for Six-Component Packed-Bed Computer Program for Immobilized Biomass Beads,” E.M. Trujillo, Registration Number TX 499-099, University of Utah, June 24, 1991.

## **PUBLICATIONS:**

### **REFEREED JOURNALS:**

Kim A. Lapakko and Edward Trujillo, “Pyrite Oxidation Rates from Laboratory Tests on Waste Rock,” accepted for publication in the Proceedings of the Tenth International Conference on Acid Rock Drainage (ICARD-2015), Santiago, Chile, April, 2015.

Butterfield, Anthony, Kyle Branch and Edward Trujillo, “First-Year Hands-On Design Course: Implementation & Reception,” Chemical Engineering Education, pp 19-26, Vol. 49 No.1, Winter, 2015.

Sunkavalli, Surya and Edward Trujillo, “Investigation of the humidity cell testing procedure for the prediction of acid rock drainage,” published in the Proceedings of the Ninth International Conference on Acid Rock Drainage (ICARD-2012), Ottawa, Canada, May, 2012.

Li, Y.; M. Niewiadomski, E. Trujillo and S. Sunkavalli, “TOUGHER: A User-friendly Graphical Interface for TOUGHREACT,” Computers & GeoSciences, v.37, pp. 775-782, 2011.

Li, Y.; M. Niewiadomski, E. Trujillo, and S. Sunkavalli, “A User-friendly Graphical Interface to TOUGHREACT,” published in the Proceedings of the 2009 TOUGH Symposium, Lawrence Berkeley National Laboratory, Berkeley, CA, September 14-16, 2009

Niewiadomski, M., E. Trujillo, Y. Li, and S. Sunkavalli, “Modeling Acid Rock Drainage in a Mine Rock Pile using a Modified Version of TOUGHREACT,” published in the Proceedings of the 2009 TOUGH Symposium, Lawrence Berkeley National Laboratory, Berkeley, CA, September 14-16, 2009

Roper, D. Keith Edward Trujillo and Rachel Bradshaw, “Photovoltaic Hydrogen Production Prototype: Sustainable Energy for Residences,” Journal of Green Building, College Publishing, Volume 3, Number 3, pp. 133-141, Summer, 2008.

Roper, D. Keith and Edward Trujillo, “Photovoltaic Hydrogen Production Prototype for Hydrogen Sustainability,” Journal of Engineering for Sustainable Development, College Publishing, Volume 1, Number 1, pp. 77-84, Summer, 2006.

White, William, Kim Lapakko and Edward Trujillo, “Progress of BLM-funded Acid Rock Drainage Research,” published in the Proceedings of the 24<sup>th</sup> Annual conference of the National Association of Abandoned Mine Land Programs (NAAML), [www.onenet.net/~naamlp](http://www.onenet.net/~naamlp), Park City, UT, USA, September 15-18, 2002

Rappaport, Catherine, Yvonne Rensch, Masoud Abbassi, Michael Kempe, Christien Rockaboy, John Gladysz and Edward M. Trujillo, "New Perfluorocarbon System for Multilayer Growth of Anchorage-Dependent Mammalian Cells," *BioTechniques*, Vol. 32, No. 1, pp. 142-151, January, 2002.

Lin, C-K, E. M. Trujillo, and W. W. White, "A Three-dimensional, Three-phase Geochemical Kinetic Model for Acid Rock Drainage," in Proceedings of the Fourth International Conference on Acid Rock Drainage, Vancouver, American Society of Surface Mining and Reclamation, Vol. II, pp.479-495, June, 1997.

Rappaport, Catherine, Edward M. Trujillo and Lih-Farn Soong, "Novel Oxygenation System Supports Multilayer Growth of HeLa Cells," *BioTechniques*, Vol. 21, no. 4, pp. 672-677, October, 1996.

Fuh, C. Bor, E.M. Trujillo, and J.Calvin Giddings, "Hydrodynamic Characterization of SPLIT Fractionation Cells," Separation Science & Technology, 30 (20), pp. 3861-3876, 1995.

Trujillo, E.M., M. Spinti, and H.Zhuang "Immobilized Biomass: A New Class of Heavy-Metal-Selective Ion Exchangers," Chapter 6 in "Ion Exchange Technology: Advances in Pollution Control", edited by A.K. Sengupta, published by Technomic Publishing Co., pp. 225-270, 1995.

Spinti, M., Zhuang, H., and E.M. Trujillo, "Evaluation of Immobilized Biomass Beads for Removing Heavy Metals from Wastewaters," Water Environment Research., Sept/Oct., Vol. 67, No. 6, pp. 943-952, 1995.

White, B., E. M. Trujillo, C.-K Lin, "Chemical Predictive Modeling of AMD from Waste Rock: Model Development and Comparison of Modeled Output to Experimental Data," Proceedings of the Third International Conference on the Abatement of Acidic Drainage, Pittsburgh, American Society of Surface Mining and Reclamation, Vol. 1, pp. 157-166, 1994.

Trujillo, E.M., "Osmosis," in Macmillan Encyclopedia of Chemistry, edited by Joseph J. Lagowski, published by Macmillan Publishing Co., 1994.

Trujillo, E.M., "Osmotic Pressure Measurements of Dissociating Proteins," J. Membrane Sci., Vol. 69, pp. 213-222, 1992.

Trujillo, E.M., T.H. Jeffers, C. Ferguson, H.Q. Stevenson, "Mathematically Modeling the Removal of Heavy Metals from a Wastewater Using Immobilized Biomass," Envir. Sci. & Tech., Vol. 25, No. 9, pp.1559-1565, September, 1991.

Chang, S.Y., T.A. Ring, and E.M. Trujillo, "Coagulation Kinetics of Amorphous Colloidal Silica Suspensions With and Without Hydroxypropyl Cellulose Polymer," Colloid & Polymer Science, Vol. 269, pp 843-849, (1991).

Trujillo, E.M., "The Transient Response of Encapsulated Enzymes in Hollow-Fiber Reactor," Biotechnology and Bioengineering, Vol. 29, pp 529-543, March (1987).

Argabright, P.A., J.S. Rhudy, and E.M. Trujillo, "Chapter 15: Anatomy of a Full-Field Polymer-Augmented Waterflood Project," in Advances in Chemistry Series, Vol.213, "Water-Soluble Polymers," Edited by J.E. Glass, pp 269-311 (1986).

Argabright, P.A., J.S. Rhudy, and E.M. Trujillo, "Anatomy of a Full-Field Polymer-Augmented Waterflood Project," Polym. Mater. Sci. and Engr., Vol. 51, pp 13-19 (1984).

Trujillo, E. M., "The Static and Dynamic Interfacial Tension Between Crude Oils and Caustic Solutions," Society of Petroleum Engineers Journal, Vol 23, pp 645-656, August (1983).

**PRESENTATIONS:**

“Process for Removing Heavy Metals and Disinfecting Wastewater using Immobilized Biochar,” Edward Trujillo (presenter), Poster Session 445, to be presented at the 2016 AIChE Annual Meeting, San Francisco, CA, November 15, 2016.

“Removal of Heavy Metals from Wastewater Using Immobilized Biochar,” Edward Trujillo (presenter), presented at the 2014 AIChE Annual Meeting, Atlanta, GA, November 20, 2014.

“Acid Rock Drainage: Chemical Engineering in a Geological World,” E. M. Trujillo (presenter), present at the University of Utah, Department of Chemical Engineering Seminar, Salt Lake City, Utah, November 13, 2012.

“Pyrite Oxidation in a Packed Bed Configuration,” Edward Trujillo (presenter), Surya Sunkavalli, presented at the 2012 AIChE Annual Meeting, , Pittsburg, PA, November 1, 2012.

“Mathematical Simulation of Acid Rock Drainage,” Surya Sunkavalli (presenter), Edward Trujillo, Marcin Niewiadomski and You Li, presented at the 2010 AIChE Annual Meeting, Salt Lake City, UT, November 7-12, 2010.

“Modified Humidity Cell Testing Program for the Prediction of Acid Rock Drainage,” Surya Sunkavalli (presenter), E. M. Trujillo, Danilo Garcia and Sally Kaiser, presented at the 240<sup>th</sup> ACS National Meeting & Exposition, Boston, MA, August 22-26, 2010.

“Opportunities After Graduate School,” E. M. Trujillo (presenter), presented at the 2010 SHPE Region III RLDC conference, Salt Lake City, UT, March 26-27, 2010.

“The Importance of MESA,” E. M. Trujillo (presenter), presented at West High School, MESA Parent Night, Salt Lake City, November 4, 2009

“A User-friendly Graphical Interface for TOUGHREACT,” Y. Li, M. Niewiadomski, E. Trujillo, and S. Sunkavalli, presented as a poster at the 2009 TOUGH Symposium, Lawrence Berkely National Laboratory, Berekely, CA, September 14-16, 2009

“Modeling Acid Rock Drainage in a Mine Rock Pile using a Modified Version of TOUGHREACT,” M. Niewiadomski (presenter), E. Trujillo, Y. Li, and S. Sunkavalli, presented at the 2009 TOUGH Symposium, Lawrence Berkely National Laboratory, Berekely, CA, September 14-16, 2009

“Why Join AIChE – Benefits of Membership,” E.M. Trujillo (presenter), presented at AIChE Great Salt Lake Local Section Meeting, February 26, 2009

“In-situ Evaporation of Water within Mining Rock Piles,” E.M. Trujillo (presenter) and Paul S. Evans, presented at 2008 AIChE National Meeting, Environmental Division, Session 86 –Fundamentals of Environmental Engineering, Philadelphia, PA, November 17, 2008.

“Acid Rock Drainage,” E.M. Trujillo (presenter), presented at the University of Utah, E-LEAP class, Salt Lake City, Utah, April 5, 2007.

“Modeling Acid Rock Drainage- Predicting the Future of Mining Rock Piles,” E. M. Trujillo (presenter), present at the University of Utah, Department of Metallurgical Engineering Seminar, Salt Lake City, Utah, April 19, 2006.

“Predicting Acid Rock Drainage using Mathematical Models,” E. M. Trujillo (presenter), present at the local chapter of The Mining and Metallurgical Society of America (MMSA), Alta Club, Salt Lake City, Utah, January 6, 2004.

"ADTI Modeling Committee – Status Report," E. M. Trujillo (presenter), presented at ADTI/INAP meeting, Elko, Nevada, March 26, 2003.

"Acid Rock Drainage Modeling and Its Applications," E. M. Trujillo (presenter), presented at local SME section meeting, Salt Lake City, Utah, February 20, 2003.

“Progress of BLM-funded Acid Rock Drainage Research,” William White (presenter), Kim Lapakko, Edward Trujillo, presented at the 24<sup>th</sup> Annual conference of the National Association of Abandoned Mine Land Programs (NAAML), Park City, UT, USA, September 15-18, 2002

"Reducing Water Pollution in the Mining Industry with Better Acid Rock Drainage Predictive Models," E. M. Trujillo (presenter), Graduate Seminar, Department of Chemical & Fuels Engineering, University of Utah, Salt Lake City, Utah, January 17, 2002.

"Biotechnology - An Overview," E. M. Trujillo (presenter), Undergraduate Seminar, Department of Chemical & Fuels Engineering, University of Utah, Salt Lake City, Utah, September 28, 1998.

“A Three-dimensional, Three-phase Geochemical Kinetic Model for Acid Rock Drainage,” Lin, C-K, E. M. Trujillo (presenter), and W. W. White, presented at the Fourth International Conference on Acid Rock Drainage, Vancouver, CANADA, American Society of Surface Mining and Reclamation, May 30 - June 5, 1997.

“Development of a Service Learning Course in Biochemical Engineering,” Edward M. Trujillo (presenter), a Workshop presented at Utah State University in conjunction with Utah Campus Compact, April 30, 1997.

“Development of Mathematical Models Describing Acid Rock Drainage,” Edward M. Trujillo (presenter), Invited Lecturer, VTT Chemical Technology, Outokumpu, FINLAND, July 24, 1996.

“Explaining Engineering: Resources & Videos,” Edward M. Trujillo (presenter), a Workshop presented at *Making an Impact - a Conference for Women & Minorities in the Science and Engineering Fields*, University of Utah, Salt Lake City, April 19-20, 1996.

“An Investigation of a Potential Pollution Problem in the Mining Industry - Acid Rock Drainage,” invited lecturer, E.M. Trujillo, Department of Chemical Engineering, Brigham Young University, Provo, Utah, March 21, 1996

“An Investigation of a Potential Pollution Problem in the Mining Industry - Acid Mine Drainage,” Edward M. Trujillo (presenter), Cheng-Kuo Lin, Freddy Guard, University of Utah, William W. White, USBM, MAES National Symposium and Career Fair, Orlando, Florida, January 10-13, 1996

“Acid Mine Drainage - Its Generation and Treatment,” invited lecturer, E.M. Trujillo, Department of Chemical & Nuclear Engineering, University of New Mexico, Albuquerque, New Mexico, August 8-10, 1995

“Removal of Toxic Heavy Metals using Immobilized Peat Moss,” M. Spinti (presenter) and E. M. Trujillo, presented at the 69<sup>th</sup> ACS Colloid & Surface Science Symposium, University of Utah, Salt Lake City, June, 1995

“Acid Mine Drainage,” E. Trujillo (presenter), Cheng-Kuo Lin, W.W. White, presented at AIChE local chapter meeting, Great Salt Lake Section, Salt Lake City, November, 1994.

“Chemical Predictive Modeling of Acid Mine Drainage from Waste Rock During Exploration and Development,” White, W.W. (presenter), E.M. Trujillo, and Cheng-Kuo Lin, presented at the Fourth Annual Mine Waste Remediation Technology Conference, Butte, Montana, August 9-12, 1994.

“Chemical Predictive Modeling of AMD from Waste Rock: Model Development and Comparison of Modeled Output to Experimental Data,” White, B., E. M. Trujillo (presentors), C.-K Lin, presented at the Third International Conference on the Abatement of Acidic Drainage, Pittsburgh, PA, April 25-29, 1994.

“Utah MESA/MEP,” Trujillo, E.M. (presenter), presented at the Annual Utah Education Assoc. State convention, Salt Lake City, Utah, October 1, 1993.

“Heavy Metal Removal from Waste Streams using Immobilized Biomass Beads,” E. Trujillo, M. Spinti (presenter) and H. Zhuang, presented at AIChE Summer National Meeting, Seattle, August 15-18, 1993.

“Mathematical Modeling of Acid Mine Drainage,” Cheng-Kuo Lin (presenter) and E. M. Trujillo, presented at the Utah Academy of Sciences, Arts, & Letters, Spring Meeting, Cedar City, Utah, May 7, 1993.

“Evaluation of Immobilized Biomass Beads for Removing Heavy Metals from Wastewater,” E. Trujillo (presenter), H. Zhuang, M. Spinti, presented at the AIChE 1992 Annual Meeting, Miami Beach, November 1-6, 1992.

“Waste Preprocessing in Space,” E. Trujillo, presented at 1992 Annual Fall Meeting of the Biomedical Engineering Society, Salt Lake City, October 16-18, 1992.

“Removal of Heavy Metals Using Immobilized Biomass,” E. Trujillo, M. Spinti (presenter), H. Zhuang, presented at ACS 1992 Spring National Meeting, San Francisco, April, 1992.

“Oxygen Transfer Properties at Perfluorocarbon/Aqueous Interfaces Stabilized with Perfluorocarbon Proteins,” E. Trujillo(presenter), D. Larsen, C. Rappaport, L.-F. Soong, M. Hales, presented at AIChE 1991 Annual National Meeting, Los Angeles, November , 1991.

“Biosorption of Metal Ions on Immobilized Biomass Beads,” E. Trujillo, presented at AIChE 1990 Summer National Meeting, San Diego, August, 1990.

“The Influence of Cellular Colloid Osmotic Pressure on Survival and Behavior of Cells in Vitro,” E. Trujillo with C. Rappaport (presenter), D. Freise, paper presented at 21<sup>st</sup> Annual Meeting of the Fine Particle Society, San Diego, August, 1990.

“Biosorption of Heavy Metals,” presented at U.S. Bureau of Mines, Salt Lake City, August, 1990.

“Biosorption of Metal Ions on Biomass Beads,” E. Trujillo, presented at Chemical Engineering Department Seminar, University of Utah, May, 1990.

“Colloid Stability of Monodisperse Silica Sols in the Presence of Hydroxypropyl Cellulose in Aqueous Salt Solution,” E. Trujillo, S.-Y. Chang, T.A. Ring (presenter), presented at 199<sup>th</sup> ACS National Meeting, Boston, April, 1990.

“Biotechnology,” E. Trujillo,presented at AIChE local chapter meeting, Salt Lake City, January, 1989.

“Enzyme Technology: An Overview,” E. Trujillo, presented at Fuels Department Seminar, University of Utah, November, 1986.

“Enhanced Oil Recovery - Polymer Field Testing,” E. Trujillo, presented at AIChE local chapter meeting, Salt Lake City, November, 1985.

### **THESES:**

Trujillo, E.M., “The Transient Response of Encapsulated Enzymes,” Ph.D. Dissertation, University of Utah, 1975

Trujillo, E.M., “An Approach Toward Membrane Selectivity by Mechanical Stretching,” M.S. Thesis, California Institute of Technology, 1970

### **RESEARCH GRANTS**

Principal Investigator, Chemical Engineering Incentive Seed Grant (\$50,000), “Removal of Heavy Metals from Wastewater using Immobilized Biochar,” January 1, 2014 – January 1, 2017.

Principal Investigator, University Research Seed Grant (\$28,000), “Improved Method for Producing Biofuels from Synthesis Gas Fermentation,” January 1, 2012 – July 1, 2013.

Principal Investigator, Chevron Mining Inc., Project No. 50501942 (\$166,727), Proposal: “Geochemical Modeling of a Questa Rock Pile,” January 1, 2009 – March 31, 2010.

Co-Principal Investigator, Molycorp Inc., with Terrence Chatwin as co-PI, Project No. 50501101 (\$4,718,524), Proposal: “Effect of Weathering on the Stability of Questa Mine-Rock Piles,” September 1, 2003-December 31, 2008

Principal Investigator, Molycorp Inc., Project No. 50501432 (\$438,848), Proposal: “Effect of Weathering on the Stability of Questa Mine Rock Piles- Humidity Cell Testing,” February 1, 2006 – December 31, 2008.

Principal Investigator, Molycorp Inc., Project No. 50501104 (\$528,643), Proposal: “Effect of Weathering on the Stability of Questa Mine Rock Piles- Modeling Aspects,” September 1, 2003 – December 31, 2008.

Principal Investigator, U.S. Bureau of Land Management, Project Nos. 55700151, 55700169, 55700188 (\$45,000), Proposal: "Mine-Waste Characterization," March 1, 2003-June 30, 2006.

Principal Investigator, U.S. Bureau of Land Management, Sponsor No. JSP012019, Project No. 55700134 (\$43,500), Proposal: "Prediction of Contaminated Drainage from Metal-mine Waste, Part II," Oct 1, 2001-June 30, 2003.

Principal Investigator, U.S. Bureau of Land Management, Sponsor No. JSP012003, Project No. 55700118 (\$43,500), Proposal: "Prediction of Contaminated Drainage from Metal-mine Waste," Feb. 2, 2001- August 31, 2002.

Principal Investigator, U.S. Bureau of Land Management, Contract No. 5-26766 (\$43,500), Proposal: "Prediction of Acid Mine Drainage from Waste Rock and Open-Pit Lakes," October 1, 1998- June 1, 2000.

Principal Investigator, Utah Engineering Experiment Station, Kennecott Utah Copper Corporation, Contract No. 5-20882 (\$59,516), Proposal: "Investigation of the Removal of Selenium from Wastewaters using Ferrous Ion," January 1, 1999-December 31, 1999.

Principal Investigator, University Research Committee, (\$5,926), Proposal: "Measurements of Oxygen in a Novel Tissue Culture System," January 1, 1999- December 31, 2000.

Principal Investigator, U.S. Bureau of Land Management, Contract No.5-26696 (\$21,974), Proposal: "Prediction of Water Quality from Open-Pit Mines - A Modeling Approach," April 1, 1998 - March 31, 1999.

Principal Investigator, U.S. Bureau of Land Management, Contract No.5-26694 (\$20,026), Proposal: "Humidity Cell Testing of a Waste Rock containing Arsenic Minerals," April 1, 1998 - March 31, 1999.

Principal Investigator, Nutri-Pro Design LC, Inc., Contract No.5-25360 (\$24,651), Proposal: "Characterization of the Perfluoroalkylated Substratum for 3D Growth of Mammalian Cells," October, 1997 – June, 1998.

Principal Investigator, U.S. Bureau of Land Management, Contract No.5-24520 (\$25,000), Proposal: "Acid Mine Drainage - Math Models," October, 1996 - September, 1997, extended to March, 1998.

Principal Investigator, Nutri-Pro Design LC, Inc., Contract No.5-25066 (\$18,000), Proposal: "Perfluoroalkylation of Proteins and Design of a New Controlled Oxygenation Perfluorocarbon System," August, 1996 - November, 1996.

Principal Investigator, U.S. Bureau of Land Management, Contract No.5-26728 (\$22,000), Proposal: "Humidity Cell Testing - Lewistown BLM Samples," April, 1996 - December, 1996.

Principal Investigator, U.S. Bureau of Land Management, Contract No.5-26764 (\$25,000), Proposal: "Acid Drainage Model," April, 1996 - December, 1996.

Principal Investigator, U.S. Bureau of Mines Grant No. 5-26624 (\$38,477), Proposal: A Mathematical Model of Acid Mine Drainage (cont'd), October, 1994 - December, 1995.

Principal Investigator, CIMD, University of Arizona (\$1,759), Proposal: Role of Precipitation in Removing Heavy Metals from Wastewaters using Biobeads," for undergraduate research, July 1994.

Principal Investigator, U.S. Bureau of Mines Grant No. 5-26707 (\$20,000), Proposal: A Mathematical Model of Acid Mine Drainage (cont'd), October, 1992 - September, 1994.

Principal Investigator, U.S. Bureau of Mines Grant No. 5-26704, 5-26706 (\$25,000), Proposal: Development of an Acid Mine Drainage Model, April, 1991 - September, 1992.

Principal Investigator, University Research Committee (\$3900), University of Utah, Proposal: Purchase of a CP-3000 Constant Pressure Pump, April, 1991.

Principal Investigator, University Research Committee Grant (\$5000), University of Utah, Proposal: Supercritical Fluid Extraction of Natural Products, November, 1990.

Principal Investigator, EPA Grant No. R-817440-01-0 (\$214,280): Removal of Heavy Metals from Contaminated Waters Using Immobilized Biomass Beads, 1990-1992.

Principal Investigator, NSF Grant No. BCS-9011647 (\$21,775) Proposal with C. Rappaport: Improved Perfluoro-carbon Microcarriers Used for Cell Culture, 1990-91.

Principal Investigator, Biomedical Sciences Support Grant (\$2000), University of Utah, Proposal: Improved Microcarriers for Cell Culture, 1989

Principal Investigator, NSF Grant No. CBT-8796166 (\$26,663) Continuation Proposal, Original by Dr. T.A. Ring: Steric Interaction in Concentrated Suspensions of Monodisperse Particles, 1988

Co-Principal Investigator, with Dr. Catherine Rappaport, Center for Biopolymers at Interfaces (\$13,250), University of Utah, Proposal: The Use of Protein-Coated Perfluorocarbons in Tissue Culture, 1988

Principal Investigator, Biomedical Sciences Support Grant (\$5000), University of Utah, Proposal: Improved Purification of Murine Mabs, 1987

Principal Investigator, University Research Committee Faculty Grant (\$3600), University of Utah, Proposal: Microparticles for Improved Ultrafiltration of Protein Solutions, 1986

Principal Investigator, Starting Grant - Center for Biopolymers at Interfaces (\$5000), University of Utah, Proposal: Adsorption of Biopolymers on Submicron Particles, 1986

Principal Investigator, Biomedical Sciences Support Grant (\$3000), University of Utah, Proposal: Encapsulated Enzymes for Enzyme Therapy, 1974

### **EDUCATIONAL GRANTS**

Department of Chemical Engineering representative, 2007-2008, co-PI 2008-2013, University of Utah, "STEP: Utah's Engineers - A statewide initiative for growth", National Science Foundation (\$2,000,000 overall - Dr. Cynthia Furse, overall PI, Dr. Trujillo responsible for Dept. of Chemical Engineering portion, \$238,876), September 1, 2007-August 31, 2013.

Co-Principal Investigator, with Keith Roper as PI, "Photoelectrochemical Hydrogen Production Prototype," (\$10,000), EPA P3 Award - A National Student Design Competition for Sustainability focusing on People, Prosperity, and the Planet, Washington, D.C., September, 2004-May, 2005.

"A Service Learning Project for Biochemical Engineering Students - Treatment of Landfill Leachate," (\$2,000), Education grant from Campus Compact 1996/1997 MINI-GRANT for Learn and Serve America Grants, Salt Lake City, January, 1997

Consultant, NSF grant, Robert Squires, PI, Purdue University, "Supplemental Award to Undergraduate Faculty Enhancement Grant-Educational Applications of Computer Simulations of Chemical Engineering Processes," (\$6000), 1992.

Committee Member (Engineering Representative) Patricia Roberts Harris Fellowship Program (\$300,000+), awarded to College of Engineering and the University of Utah, 1987-93

Principal Investigator, NACME Incentive Grants (\$2000), awarded to University of Utah, 1987

Principal Investigator, NACME Incentive Grants (\$2500), awarded to University of Utah, 1986

Principal Investigator, NACME Field Service and Retention Grant (\$15,000), awarded to University of Utah, 1985, Renewed (\$10,000), 1987

Recipient, University of Utah Faculty Fellow Curriculum Development Award for 1986-87 (\$2950).

Recipient, University of Utah John R. Park Teachers Fellowship for 1985 (\$1470)

### **UNIVERSITY COMMITTEE ACTIVITY:**

Member, Department Faculty Search Committee, 2015-2016

Elected Member, College of Engineering, University of Utah Academic Senate, 2014-2017

Chair, Internal Review Committee, University of Utah Graduate School, reviewing the Department of Metallurgical Engineering, 2010.

Chair, University Diversity Committee, University of Utah, 2004-2009 [First chair of this new University committee], ex-officio member, 2009-2010.

Member, Diversity Advisory Committee, Graduate School, University of Utah, January 2007-present.

Faculty Advisor, University of Utah SHPE student chapter, 2007-2010,. The Chapter hosted the regional (10 intermountain states involved) RLDC SHPE conference in March, 2010.

Faculty Advisor, Student Chapter of AIChE, Department of Chemical Engineering, (chapter hosted regional AIChE student conference in March 2000, National student conferences in November, 2007 and November 2010), University of Utah, August 1999 - June 2000, July 2001-2008

Member, University NCAA Certification Committee, Bylaws and Governance, 2004-2005

Chair, University Athletics Advisory Council, , University of Utah, 2002-2004

Member, University Athletics Advisory Council, 1997-2002.

Member, Department ABET committee, Department of Chemical Engineering, University of Utah, 2001-present.

Member, Department Undergraduate committee, Department of Chemical Engineering, University of Utah, 2001-present.

Chair, Department Laboratory Faculty committee, and Undergraduate Lab Supervisor, Department of Chemical Engineering, University of Utah, 2001-2006.

Member and Coordinator, Department BIOGROUP, Department of Chemical Engineering, University of Utah, 2001-2006.

Member, University EO/AA Coordinating Committee, 2001-2010

Member, University Graduate Review Committee, Graduate School, University of Utah, Internal Review of Mining Engineering in the College of Mines and Earth Sciences, 2001

Chair, Curriculum Committee, Department of Chemical and Fuels Engineering, member of College of Engineering Curriculum Committee, University of Utah, 1999-2001

Member, College ABET committee, College of Engineering, University of Utah, 1999-2001.

Director, Undergraduate Studies, member of Executive Committee, Chair of Undergraduate Committee, Department of Chemical & Fuels Engineering, University of Utah, August 1999-June 2000.

Appointed member, Search Committee, Associate Vice President for Diversity, University of Utah, Feb. 1999 - May 1999.

Elected Member, College of Engineering Council, representing the Department of Chemical & Fuels Engineering, December, 1998-2000.

Member, College of Engineering Dean's Review Committee reporting to the Academic Vice-President, March - May, 1998.

Member, Interdisciplinary Graduate Recruitment Committee, Department's representative, 1998-present.

Member, College of Engineering, Academic Senate Representative Selection Committee, 1998.

Member, University Research Committee, University of Utah, 1997-2000, Chair, University Research Awards Committee 1999, 2000, member 1998.

Frosh Advisor, Department of Chemical & Fuels Engineering, University of Utah, 1997-2000. Put together the first comprehensive first year guide for students (approx. 25 pages) and subsequent updates.

Member, Department Undergraduate Recruitment Committee, Department of Chemical & Fuels Engineering, University of Utah, 1995-2003. Helped coordinate first Career Fair for the department- Jan 6, 1996.

Chair, Academic Standards & Curriculum, Environmental Engineering Program, College of Engineering/College of Mines, University of Utah, 1995-1999

Member, Executive Committee, Environmental Engineering Program, University of Utah, 1995-present

Member, Steering Committee, Center for Teaching & Learning Excellence, University of Utah, 1995-97.

Member, Advisory Committee, Center for Teaching & Learning Excellence, University of Utah, 1994-97.

Member, University Diversity Requirement Committee, Undergraduate Council, University of Utah, 1994. Committee drafted proposal for a University-Wide Diversity Requirement which was adopted by the Board of Regents in 1994

Member, Review of Tenured Faculty Committee, Department of Chemical & Fuels Engineering, University of Utah, 1993-94

Founder and Chair, University Environmental Committee, 1991-1994, Member, 1994-present. Committee established the foundation for the Environmental Engineering Program established by the Board of Regents in 1995 and other programs, such as the Environmental Studies program.

Member, Board of Directors, Joseph H. Merrill Loan Fund Endowment, College of Engineering, University of Utah, 1992-1995.

Chair, Search Committee, Asst. Director for Minority Recruitment, High School Services, University of Utah, 1992.

Elected Member, University of Utah Undergraduate Council, Representing the College of Engineering, 1991-1994.

Member, University Task Force for Women in Math, Science and Engineering, 1991.

Member, University Committee for the Advancement of Women and Minorities in Science and Math-Related Areas, 1991

Member, University Search Committee for Associate Academic Vice President, 1990-91

Non-voting member, University Search Committee for Associate Provost, 1990

Participant, University Search Committee for Academic Vice- President, 1990

Chair, College Search Committee for MEP Director, 1989

Member, University Graduate School's Patricia Roberts Harris Fellowship (GPOP) Committee, 1987-1994

Member, University Equal Opportunity Commission, 1986-1989, Chair - Minority Committee, 1989.

Member, (Charter Member) University Faculty Affirmative Action Committee, 1986-1989

Chair, College Minority Engineering Scholarship Committee, 1984-1990, Member, 1990-96

Member, College Teaching Excellence Committee, 1988-1990

Member, College Engineering Scholarship Committee, 1986-1990, 1991-1994

Faculty Advisor, MESO (Minority Engineering Student Organization), SHPE (Society of Hispanic Professional Engineers), 1984-97

Faculty Advisor, MAES (Society of Mexican-American Engineers & Scientists), 1994-97.

Faculty Coordinator, MEP (Minority Engineering Program), 1984-1995

Chair, Chemical Engineering Department Scholarship Committee, 1986-1990, 1991-1994; Member, 1994-present.

Sophomore Advisor, Department of Chemical Engineering, 1984-1990

Member, Advisory Board - Supplemental Instruction Program, University of Utah, 1985-1988

Member, Financial Aid Committee - Graduate Satisfactory Academic Progress, University of Utah, 1986

Member, College of Engineering - Engineering Week Committee, 1986-87

Chair, Department Curriculum Committee, 1987-1989, Member, 1985-87

Member, Department Computer Committee, 1995-2000

## **INDUSTRIAL EXPERIENCE:**

### **FULL TIME:**

Marathon Oil Company, Littleton, Colorado, 1975-84:

Advanced Research Engineer, 1979-84; Research Engineer, 1975-79

Conducted research in enhanced oil recovery, primarily polymer and alkaline flooding, was project consultant for four field tests involving polymer injectivity and distribution

Kimberly-Clark Corporation, Fullerton, California, 1970-71: Production chemical engineer  
Engineer involved in tissue manufacturing

**SUMMERS:**

National Aeronautics and Space Administration, Houston, Texas, Summer, 1969: Aeronautical engineer  
Assisted NASA project engineer in feasibility study to upgrade a simulation chamber for crew training

Dow Chemical Company, Freeport, Texas, Summer, 1968: Chemical Engineer in Chlor-Alkali Division  
Assisted senior chemical engineer on recovery of chlorine from flue gas

Inspiration Consolidated Copper Company, Miami, Arizona, Summer, 1966:  
Laboratory Assistant in Chemical, Analysis Department

**PROFESSIONAL SOCIETY ACTIVITIES:**

Member, Career and Education Operating Council, American Institute of Chemical Engineers, 2010-2015

Member, AIChE International Committee, American Institute of Chemical Engineers, 2010-present

Chair, SCC International Student Chapters Committee, American Institute of Chemical Engineers, 2010-2013

Chair, Student Chapters Committee (SCC), American Institute of Chemical Engineers, 2008-2009; Past Chair, 2009-2010

First Vice-Chair, Student Chapters Committee, American Institute of Chemical Engineers, 2007-2008

Second Vice-Chair, Student Chapters Committee, American Institute of Chemical Engineers, 2006-2007

Member, National AIChE Centennial Committee, American Institute of Chemical Engineers, 2007-2009

Member, National Research Council, SME (Society for Mining, Metallurgy, and Exploration), 2006-2008.

Chair, Modeling Committee, ADTI-MMS, Acid Drainage Technology Initiative – Metal Mining Sector, Denver Colorado, 6/2001-6/2003, member 1999-2010

Session Chair, Waste Rock Mechanisms - Gas, 5<sup>th</sup> International Conference on Acid Rock Drainage (ICARD), Denver, Colorado, May 21-24, 2000

Chair, Registration Committee, also attendee, ASEE Summer School for Chemical Engineering Faculty, Snowbird, Utah, American Society for Engineering Education, August 9-14, 1997

Elected member, National Board of Directors, Society of Mexican American Engineers and Scientists, Los Angeles, California, 1996-1999

Coordinator, Society of Mexican American Engineers and Scientists, 1995 National Student Leadership Conference, Hilton Hotel, Salt Lake City, October 26-29, 1995

Session Co-Chair, General Papers, ACS 69<sup>th</sup> Colloid & Surface Science Symposium, University of Utah, Salt Lake City, held June 11-14, 1995

Chair, Great Salt Lake Section, American Institute of Chemical Engineers, 1994-95, Vice-Chair, 1993-94, Director 1995-2000

Founder and President, Utah Chapter of the Society of Hispanic Professional Engineers, Inc., 1987-1988, member 1988-present, President 1992-93

Member, National Nominating Committee, AIChE, 1979

Vice-Chair, General Arrangements Committee, AIChE Summer National Meeting, Denver, August 28-31, 1983

Session Co-Chair, Joint AIChE-IMIQ Technical Meeting, Acapulco, October 15-17, 1980

Vice-Chair, Registration Committee, The Second Pacific Chemical Engineering Congress (PACHEC '77), Denver, August 28-31, 1977

Chair, Rocky Mountain Section, AIChE, 1980-81; Vice-Chair, Rocky Mountain Section, AIChE, 1979-80; Secretary, Rocky Mountain Section, AIChE, 1978-79; Treasurer, Rocky Mountain Section, AIChE, 1977-78

Member, AIChE Programming Committee and SPE Liaison, Fuels and Petrochemical Division, 1977-80

### **COMMUNITY ACTIVITIES:**

Panel Member, "Career Development for Ph.D.s and Postdocs," session at Society for the Advancement of Chicanos and Native Americans in Science, session chair. Mr. Stan Inman, Director, University of Utah Career Services, Salt Lake City Convention Center, Salt Lake City, October 11, 2008.

Panel Member, "What is it like to be a University Professor," panel discussion for the RonaldE. McNair Post-Baccaulaureate Achievement Program, Westminster College, July, 2008.

Panel Member, "What is it like to be a University Professor," panel discussion for the RonaldE. McNair Post-Baccaulaureate Achievement Program, Westminster College, July 11, 2006.

Panel Member, "Higher Education: Important Guidelines," panel discussion for the High-Gear Program, College of Engineering, University of Utah, June 22, 2005.

Panel Member, "What is it like to be a University Professor," panel discussion for the RonaldE. McNair Post-Baccaulaureate Achievement Program, Westminster College, June 17, 2005.

Member, Emission Permitting Rule Group, Utah Division of Air Quality, Utah State Department of Environmental Quality, Salt Lake City, Utah, August 1996-97.

Commissioner, Salt Lake County Environmental Quality Advisory Commission, Salt Lake City-County Health Department, Salt Lake City, Utah, Jan. 1995- Jan. 1997.

Member, Pollution Prevention Committee, Department of Environmental Quality, State of Utah, 1993-96 - Committee planned the first Utah conference "Pollution Prevention Across the Curriculum", Sundance Resort, Sundance, Utah, August 11-13, 1994.

Judge, Intermountain Junior Science & Humanities Symposium, Salt Lake City, UT, 1994.

Co-Chair, NAMEPA Region D Annual Conference-"Building Educational Partnerships for Engineering Education," Salt Lake City, UT, November, 1993.

Co-Chair, Coalition to Increase Minority Degrees (CIMD) -Undergraduate Research Committee, Tempe, AZ, 1991-94

Founding Member, Board of Directors, Utah MESA/MEP, Salt Lake City, 1985-1996, Chair, Board of Directors, Utah MESA/MEP 1985-86, Re-elected Chair 1993-94

Member, Higher Education Committee, Utah MESA/STEP, Salt Lake City, Utah, 1996-present

Chair, Education Committee, Utah Hispanic Association, Salt Lake City, 1988-90.

Member, Centro Civico Mexicano, Salt Lake City, 1987-93

Chair, Accomodations, National Association for Chicano Studies Convention, Salt Lake City, April 9-11, 1987

Member, Littleton JayCees, Littleton, Colorado, 1977-82

Member, Board of Directors, Colorado Minority Engineering Association, Denver, Colorado, 1982-84

Member, Organizing Committee, Colorado Minority Engineering Association, Denver, Colorado, 1980-82

President, Utah Ballet Folklorico Company, Salt Lake City, Utah, 1973-74

Secretary-Treasurer, Utah Ballet Folklorico Company, Salt Lake City, Utah, 1972-73

English Instructor, VIP Program - A Model Cities Project in Salt Lake City, Administered by the Guadalupe Center, 1973-75

### **TECHNICAL REPORTS:**

Trujillo, E. M., "Maual for TOUGHER software", University of Utah, Salt Lake City, UT, February, 2011.

Trujillo, E.M., Marcin Niewdiadomski, Surya P. Sunkavalli, You Li, Danilo Garcia, " Geochemical Modeling of a Questa Mine Rock Pile," contract period 1-1-2009 to 3-31-2010, final progress report to Chevron Mining, Inc., Questa, New Mexico, on Contract 2303033, University of Utah, Salt Lake City, UT, May, 2010.

Trujillo, E.M., Paul Evans, Andrew Klinker, Caleb Tracy, "Effect of Weathering on the Stability of Questa Mine-Rock Piles – Geochemical Modeling Aspects," contract period 9-1-2003 to 5-31-2006, final progress report to Molycorp, Inc., Questa, New Mexico, on Contract 2303033, University of Utah, Salt Lake City, UT, May, 2006.

Trujillo, E.M., Wes Eldredge, Joe Mayne, Chris Jackson, "Effect of Weathering on the Stability of Questa Mine-Rock Piles – Geochemical Modeling Aspects," contract period 9-1-2003 to 5-31-2005, final progress report to Molycorp, Inc., Questa, New Mexico, on Contract 2303033, University of Utah, Salt Lake City, UT, May, 2005.

Trujillo, E.M., Wes Eldredge, Joe Mayne, Chris Jackson, "Effect of Weathering on the Stability of Questa Mine-Rock Piles – Geochemical Modeling Aspects," contract period 9-1-2003 to 8-31-2004, midterm progress report to Molycorp, Inc., Questa, New Mexico, on Contract 2303033, University of Utah, Salt Lake City, UT, August, 2004.

Trujillo, E.M., Joe Turner, Tom Cantrell, "Investigation of the Removal of Selenium from a Wastewater using Ferrous Iron," final report to Kennecott Utah Copper Corporation, North Facilities RIFS, Magna Utah, on Contract TS-23, University of Utah, Salt Lake City, UT, February 25, 2000.

Trujillo, E.M., Gautham Krishnamoorthy, Miguel Dumett, "Prediction of Acid Mine Drainage from Waste Rock and Open Pit Lakes"; final report to the U.S. Bureau of Land Management, Department of the Interior on Contract J910P82017; University of Utah, Salt Lake City, UT, November, 2000.

Trujillo, E.M., Miguel Dumett, Freddy Guard, "Acid Mine Drainage – Mathematical Models"; final report to the U.S. Bureau of Land Management, Department of the Interior on Contract J910P72013; University of Utah, Salt Lake City, UT, April, 1998.

Trujillo, E.M., C-K Lin, F. Guard, "Development of an Acid Mine Drainage Model - II"; final report to the U.S. Bureau of Mines, Department of the Interior on Contract 1432-J02500002; University of Utah, Salt Lake City, UT, August, 1996.

Trujillo, E.M., C-K Lin, S. Leonora, "Development of an Acid Mine Drainage Model"; final report to the U.S. Bureau of Mines, Department of the Interior on Contract 1432-J02300003; University of Utah, Salt Lake City, UT, October, 1994.

Trujillo, E.M., M. Spinti, H. Zhuang, "Removal of Heavy Metals from Contaminated Waters using Immobilized Biomass Beads", final report to the U.S. Environmental Protection Agency on EPA Exploratory Research Grant No. R-817440-01-0, University of Utah, Salt Lake City, UT, 1993.

Trujillo, E.M., "Polymer Feasibility Test: West Side Yates Field," Marathon Oil Company, Denver Research Center, June, 1984.

Trujillo, E.M., "Designing Pipeline and Pumping Systems for Concentrated Polymer Solutions," Marathon Oil Company, Denver Research Center, June, 1984.

Trujillo, E.M., "Polymer Flooding the Rapdan Field - Laboratory Work," Marathon Oil Company, Denver Research Center, September, 1982.

Trujillo, E.M., "Caustic Flooding the Haynesville Buckrange Sand - Laboratory Work," Marathon Oil Company, Denver Research Center, August, 1982.

Trujillo, E.M., "Polymer Feasibility Tests, Haynesville Buckrange Field Work," Marathon Oil Company, Denver Research Center, August, 1982.

Trujillo, E.M., "Polymer Flooding Haynesville Buckrange Sand - Laboratory Work," Marathon Oil Company, Denver Research Center, August, 1982.

Trujillo, E.M., "Economic and Feasibility Study - EOR in the Grass Creek Curtis Sandstone," Marathon Oil Company, Denver Research Center, August, 1981.

Trujillo, E.M., "Caustic Flooding for the Tensleep - Final Report," Marathon Oil Company, Denver Research Center, August, 1981.

Trujillo, E.M., "Laboratory Waterfloods and Pseudorelative Permeabilities for Tensleep and Curtis Reservoir Core," Marathon Oil Company, Denver Research Center, August, 1980.

Trujillo, E.M., "The Static and Dynamic Interfacial Tensions Between Crude Oils and Caustic Solutions," Marathon Oil Company, Denver Research Center, April, 1979.

Trujillo E.M., "Caustic Flooding for the Tensleep Formation in Wyoming - An Interim Report," Marathon Oil Company, Denver Research Center, April, 1977.

Trujillo, E.M., "Theoretical Approaches to Membrane Selectivity," Department of Chemical Engineering, University of Utah, 1972.

**Graduate Students Supervised as Chair:**

Munhall, K Scott, Ph.D. (Chemical Engineering), left University 2011, "Bioremediation of Perchlorates," Supervisor: Ed Trujillo

Sunkavalli, Surya Prakash, PhD. (Chemical Engineering), graduated 2011, "Prediction of Acid Rock Drainage," Supervisor: Ed Trujillo

Olufeko, Abi, Ph.D. (Chemical Engineering), switched major 2010, "Humidity cell testing," Supervisor: Ed Trujillo

Lin, Cheng-Kuo, Ph.D. (Chemical Engineering), graduated 1996, "Modeling Acid Mine Drainage," Supervisor: Ed Trujillo

Spinti, Mark, Ph.D. (Chemical Engineering), graduated 1996, "The Evaluation and Mathematical Modeling of Metal Ion Removal from Water by Immobilized Sphagnum Peat Moss Beads," Supervisor: Ed Trujillo

Soong, Lih-Farn, Ph.D. (Chemical Engineering), graduated 1995, "Development of a System for Improved Oxygenation of Anchorage-Dependent Mammalian Cells," Supervisor: Ed Trujillo

Riffo, Arturo, MS. (Civil and Environmental Engineering, nonthesis), graduation 2010, "Remote Sensing for Water Management," Supervisor: Ed Trujillo

Li, You, MS. (Computer Science - nonthesis), graduated 2009, "User-Friendly Software Package for the TOUGHREACT program," Supervisor: Ed Trujillo

Evans, Paul, MS. (Chemical Engineering), graduated 2008, "Modeling the Effects of Evaporation on Acid Rock Drainage in Mine Rock Samples," Supervisor: Ed Trujillo

Eldredge, Weston, MS (Chemical Engineering), graduated 2005, "Temperature Effects in Unsaturated Waste Rock Piles Experiencing Acid Rock Drainage," Supervisor: Ed Trujillo

Arens, Stacey, ME (Environmental Engineering), graduated 2004, "An Investigation of the SEAR (Surfactant Enhanced Aquifer Remediation) Treatment at Hill AFB," Supervisor: Ed Trujillo

Teratanavat, Ratachet (Andy), MS (Chemical Engineering), graduated 2004, "Laboratory Testing of Acid Rock Drainage," Supervisor: Ed Trujillo

Krishnamoorthy, Gautham, MS (Chemical Engineering), 2001, "Humidity Cell Testing of Waste Rock," Supervisor: Ed Trujillo

Dunn, David, M.E. (Environmental Engineering), 1998, "An Investigation of the Seasonal Changes in Nitrifying Ability at Central Valley Waste Water Treatment Plant," Supervisor: Ed Trujillo

Guard, Freddy, M.S. (Chemical Engineering), 1997, "Humidity Cell Testing - An Experimental and Theoretical Approach," Supervisor: Ed Trujillo

Razaghi, Ahmad, M.E. (Chemical Engineering), 1994, No thesis or project - pharmaceutical interest, Supervisor: Ed Trujillo

Zhuang, Hanna, M.S. (Chemical Engineering), 1993, "Immobilized Biomass Polysulfone Beads for Removal of Heavy Metals from Wastewaters," Supervisor: Ed Trujillo

Larsen, Doug, M.S. (Chemical Engineering), 1991, "Oxygen Transport in Perfluorocarbon Systems," Supervisor: Ed Trujillo

Yang, Zhixian, M.S. (Chemical Engineering), 1990, "Interaction of Polyvinylpyrrolidone and Bovine Serum Albumin by Osmometry and Light Scattering," Supervisor: Ed Trujillo

Li, Howard, M.S. (Chemical Engineering), 1989, "Electrophoretic Migration of Proteins," Supervisor: Ed Trujillo

Soong, Lih-Farn, M.S. (Chemical Engineering), 1988, "Light Scattering and Ultrafiltration of Macromolecules," Supervisor: Ed Trujillo

Kuo, Hai-Hang, M.S. (Chemical Engineering), 1987, "Porous Ceramic Enzyme Reactor," Supervisor: Ed Trujillo

Ng, Philip, M.E. (Chemical Engineering), 1987, "Indirect Estimation of Fermentation Concentrations," Supervisor: Ed Trujillo

Lee, Stephen, M.E. (Chemical Engineering), 1985, "Design of an Enzyme Reactor," Supervisor: Ed Trujillo

**LISTING OF UNDERGRADUATE STUDENTS SUPERVISED BY PROF. TRUJILLO, COMPLETING BS THESIS:**

NAME	DEGREE	STATUS	YEAR	THESIS TITLE
Brent Roth	B.S.	Completed	2001	SCF Extraction of Plants
Jennifer Major (Honors)	B.S.	Completed	2000	Plant Growth in Recycled Oil Filters
Uyen Bui	B.S.	Completed	1999	Fermentation of Yeast Cells
Lien Diep	B.S.	Completed	1999	Fermentation of Yeast Cells
Wing K. Yee	B.S.	Completed	1997	Control system for Microfermentor
Sony Rai*	B.S.	Completed	1996	Anaerobic removal of metals
David Fikstad	B.S.	Completed	1996	Ultrasonic Adsorption thru Skin
Tom Martin*	B.S.	Completed	1995	Precipitation of Heavy Metals
Sherwin Leonora	B.S.	Completed	1994	Acid Mine Drainage
Michael Odekirk	B.S.	Completed	1993	Solvent Extraction of Scandium
Brent Nielsen	B.S.	Completed	1992	Modeling the Bioleaching Process
John Swanson	B.S.	Completed	1990	SCF Extraction System: Dev. & Appl.
Quinn Stevenson	B.S.	Completed	1990	Biosorp. of Heavy Metals on Biomass
Regan Howell	B.S.	Completed	1989	Osmotic Pressures of PVP Macromol.
Russel Rainey	B.S.	Completed	1987	Purific. of Monoclonal Antibody I13

\* Undergraduate Research Projects, all others B.S. theses.

**Consulting/Industrial Affiliations:**

URS, Salt Lake City  
PT Freeport Indonesia, INDONESIA  
Sardinia Gold Mining, ITALY  
ProPacific, Salt Lake City, UT  
NutriPro Design LC, Salt Lake City, UT

Technical Research Associates, Salt Lake City, UT  
EnviroSearch International, Salt Lake City, UT  
U.S. Overseas Private Investment Corporation, Washington D.C.  
Hogan & Hartson L.L.P., Denver, CO  
Harrison Western Environmental Services, Lakewood, CO  
PROSEP Technologies, CANADA  
Molycorp Inc., Questa Mine, Questa, New Mexico