



Jay Haley, PE  
Partner

#### Project Assignment

Mechanical Engineer, Wind Engineering Consultant

#### Registrations

Registered Mechanical Engineer - North Dakota, Minnesota

#### Educational Background

1985: Bachelor of Science, Mechanical Engineering  
University of North Dakota, Grand Forks, ND

#### Work History

2000-Present: Mechanical Engineer/Partner, EAPC, Grand Forks, ND

1998-2000: Mechanical Engineer, EAPC, Grand Forks, ND

1989-1998: Senior Design Engineer, Energy and Environmental Research  
Center, Grand Forks, ND

1985-1989: Director of Engineering, Ideal Aerosmith, Inc., East Grand Forks,  
MN

#### Professional Experience

Mr. Haley has been involved in wind energy since 1983. He's performed or supervised the wind resource assessments and energy assessments for hundreds of projects totaling more than 40,000 MW, of which, more than 8,000 MW are currently in operation. He has also provided Independent Engineering reviews of other consultant's wind assessment reports for various potential investors on 50+ projects totaling more than 5,000 MW.

He is also a certified WAsP user as well as a WindPRO training instructor, and has conducted more than 40 training courses and trained more than 500 wind industry personnel in the proper use of WindPRO and WAsP as it relates to wind resource and energy assessment and site suitability.

He's been involved in the planning, permitting, design, construction, and operation of wind farms. He's made hundreds of public presentations on wind energy and has been the wind industry's primary spokesperson in ND. Mr. Haley has been a member of the National Wind Coordinating Committee, the North Dakota Wind Coordinating Committee, Co-Chair of the Energy Cluster of ND's New Economy Initiative, Vice-Chairman of the ND Renewable Energy Partnership, Founding Executive Board member of the ND SEED Coalition, a member of U.S. Senator Dorgan's wind conference planning committee, and is also the founding Chairman of the Wind Energy Council, a regional trade organization in the upper Midwest.

Mr. Haley is an appointed technical expert representing the U.S. delegation on the International Standards Committee IEC 61400-15 - *Assessment of Wind Resource, Energy Yield and Site Suitability Input Conditions for Wind Power Plants*.





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## Relevant Experience – Wind Resource and Energy Assessment and Wind Farm Design – Selected Projects

2018 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, YPF Energía Eléctrica S.A., Fray Guen Wind Farm, 100 MW

2018 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, Eólica Rionegrina S.A., PE Cerro Policia Wind Farm, 600 MW

2018 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, Sequoia Energy, Assiniboia Wind Farm, 200MW

2018 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, Allete Clean Energy, South Peak Wind Farm, 100 MW

2017 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, Allete Clean Energy, Bowman Wind Farm, 208 MW

2017 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, Allete Clean Energy, Top of Iowa Repower, 80 MW

2017 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, Allete Clean Energy, Storm Lake I Repower, 309 MW

2016 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, TradeWind Energy, Cedar Run Wind Farm, 200 MW

2016 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, TradeWind Energy, Seven Cowboy Wind Farm, 300 MW

2016 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, Minnesota Power, Tri County South Wind Farm, 104 MW

2015 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, Bluestem Energy, West Liberty Wind Farm, 4 MW

2015 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, AV3 WindPower, Green Hills Wind Farm, 60 MW

2015 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, TradeWind Energy, Lindahl West, 300 MW

2015 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, TradeWind Energy, Thunder Ranch Wind Farm, 300 MW

2014 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, Allete Clean Energy, Chanarambie/Viking Repower, 97 MW



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2014 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, TradeWind Energy, Rose Rock, 108 MW

2014 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, NRG Patagonia, Valle Hermosa, 12 MW

2013 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, Allete Clean Energy, Clean Energy I Wind Farm, 102.4 MW

2013 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, Minnesota Power, Bison IV Wind Farm, 204.8 MW

2012 - Wind Resource and Energy Assessment, Project Resources Corp., Lakeswind Wind Farm, 50 MW

2011 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, Minnesota Power, Bison III Wind Farm, 105 MW

2011 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, Minnesota Power, Bison II Wind Farm, 105 MW

2010 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, Basin Electric, PrairieWinds SD I Wind Farm, 162 MW

2010 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, Minnesota Power, Bison IB Wind Farm, 45 MW

2010 - Wind Resource and Energy Assessment, Site Suitability, Wind Farm Design, and CFD Analysis, PowerWorks, Sawtooth Wind Farm, 22.4 MW

2009 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, Minnesota Power, Bison IA Wind Farm, 36.9 MW

2008 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, Basin Electric, PrairieWinds ND I Wind Farm, 115.5 MW

2006 – Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, Trimont Area Wind Farm, TAWF-II, 100.5 MW

2004 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, PPM Energy, Rugby Wind Farm, 150 MW

2003 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, FPL Energy, ND Wind I & II, 61.5 MW

2003 - Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, FPL Energy, SD Wind Energy Center, 40.5 MW



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### Relevant Experience – Noise and Shadow Flicker Studies – Selected Projects

- 2018 – Noise and Shadow Flicker Studies, Terra-Gen, TG High Prairie Wind Farm, LLC, 387.4MW
- 2018 – Noise and Shadow Flicker Studies, Project Resources Corp., Red Barn, LLC, 129.5 MW
- 2018 – Shadow Flicker Study, Geronimo Energy, Blazing Star Wind Farm, 200MW
- 2017 – Noise Study, Project Resources Corp., Lakeswind Wind Farm, 50 MW
- 2017 – Shadow Flicker Study, Capital Power, Black Fork Wind Farm, 200 MW
- 2017 – Shadow Flicker Study, Tenaska, Inc., Nobles 2 Wind Farm, 250 MW
- 2017 – Noise and Shadow Flicker Studies, Invenergy, Freeborn Wind Farm, 100MW
- 2017 – Shadow Flicker Study, Geronimo Energy, Blazing Star II Wind Farm, 200MW
- 2016 – Noise Study, Project Resources Group, Rock Aetna Wind Farm, 24 MW
- 2016 – Shadow Flicker Study, Orion Renewable Energy Group, Jordan Creek Wind Farm, 298 MW
- 2016 – Shadow Flicker Study, Geronimo Energy, Blazing Star Wind Farm, 200 MW
- 2016 – Shadow Flicker Study, Tenaska, Inc., Nobles 2 Wind Farm, 250 MW
- 2016 - Noise and Shadow Flicker Studies, Orion Renewable Energy Group, Charlie Creek Wind Farm, 271 MW
- 2016 – Noise and Shadow Flicker Studies, EDF Renewables, Red Pine Wind Farm, 200 MW
- 2016 – Shadow Flicker Study, TradeWind Energy, Cedar Run Wind Farm, 200 MW
- 2016 - Noise and Shadow Flicker Studies, Minnesota Power, Tri-County South Wind Farm, 104 MW
- 2016 – Shadow Flicker Study, Starwood Energy Group, Trishe Wind Energy Project, 115 MW
- 2016 – Noise and Shadow Flicker Studies, TradeWind Energy, Alta Farms II Wind Farm, 200 MW
- 2015 – Noise and Shadow Flicker Studies, Bluestem Energy, West Liberty Wind Farm, 4 MW



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2015 – Noise and Shadow Flicker Studies, TradeWind Energy, Chisholm II Expansion, 65 MW

2015 – Noise and Shadow Flicker Studies, AV3 WindPower, Green Hills Wind Farm, 60 MW

2015 – Noise and Shadow Flicker Studies, TradeWind Energy, Lindahl West Wind Farm, 300 MW

2015 – Noise and Shadow Flicker Studies, TradeWind Energy, Limestone Bluff Wind Farm, 356 MW

2015 – Noise and Shadow Flicker Studies, TradeWind Energy, Red Dirt Wind Farm, 300 MW

2015 – Noise and Shadow Flicker Studies, TradeWind Energy, Hallam NE Volkswind, 200 MW

2015 – Noise and Shadow Flicker Studies, TradeWind Energy, Blue Star Wind Farm, 150 MW

2015 – Noise and Shadow Flicker Studies, TradeWind Energy, Wild Plains Wind Farm, 300 MW

2015 – Noise and Shadow Flicker Studies, TradeWind Energy, Diamond Vista Wind Farm, 300 MW

2015 – Noise and Shadow Flicker Studies, TradeWind Energy, Armadillo Flats Wind Farm, 235 MW

2015 – Noise and Shadow Flicker Studies, TradeWind Energy, Thunder Ranch Wind Farm, 300 MW

2015 – Noise and Shadow Flicker Studies, TradeWind Energy, Sundance Wind Farm, 200 MW

2015 – Noise and Shadow Flicker Studies, TradeWind Energy, Cimarron Bend Wind Farm, 200 MW

2015 – Noise and Shadow Flicker Studies, TradeWind Energy, Rock Creek Wind Farm, 300 MW

2015 – Noise and Shadow Flicker Studies, TradeWind Energy, English Farms Wind Farm, 170 MW

2015 – Noise and Shadow Flicker Studies, TradeWind Energy, Sunwind Doyle Wind Farm, 200 MW

2015 – Noise and Shadow Flicker Studies, TradeWind Energy, NorthStar and RedRock Wind Farms, 500 MW

2015 – Noise and Shadow Flicker Studies, TradeWind Energy, Emmons-Logan Wind Project, 304 MW

2015 – Noise and Shadow Flicker Studies, TradeWind Energy, Butler Wind Farm, 150 MW

### **Relevant Experience – Due Diligence – Select Projects**

2016 - Independent Review of Energy Assessment and Existing Production, TradeWind Energy, Seven Cowboy, 300 MW

2016 - Independent Review of Energy Assessment and Existing Production, TradeWind Energy, Alta Farms II, 200 MW

2015 - Independent Review of Energy Assessment and Existing Production, TradeWind Energy, NorthStar and RedRock, 500 MW

2015 - Independent Review of Energy Assessment and Existing Production, TradeWind Energy, Rock Creek Wind Farm, 300 MW

2015 - Independent Review of Energy Assessment and Existing Production, TradeWind Energy, Thunder Ranch Wind Farm, 300 MW

2014 - Independent Review of Energy Assessment and Existing Production, Allete Clean Energy, Chanarambie/Viking, 97 MW

2014 - Independent Review of Energy Assessment and Existing Production, Wind Energy Development, LLC, Picillo Wind Farm, 3 MW

2014 - Independent Review of Energy Assessment and Existing Production, TradeWind Energy, Breckenridge, 100 MW

2013 - Independent Review of Energy Assessment and Existing Production, Greycliff Energy, LLC, Greycliff Wind Farm, 20 MW

2013 - Independent Review of Energy Assessment and Existing Production, Allete Clean Energy, Armenia Wind Farm, 100.5 MW

2013 - Independent Review of Energy Assessment and Wind Turbine Site-Suitability, Sigma Energy Solutions, Clara, Brazil, 10.5 MW

2013 - Independent Review of Energy Assessment and Wind Turbine Site-Suitability, Sigma Energy Solutions & GE Energy Finance, Shilo Wind Farm, 150 MW

2013 - Independent Review of Energy Assessment and Wind Turbine Site-Suitability, Sigma Energy Solutions & Starwood Energy Group, Pattern Energy 10 project portfolio, 2000 MW

2010 - Independent Review of Energy Assessment and Wind Turbine Site-Suitability, Alliant Energy, Whispering Willow East Wind Farm, 200 MW

2009 - Independent Review of Energy Assessment and Wind Turbine Site-Suitability, Sigma Energy Solutions & AIG, RePower 6 project portfolio, 99 MW

2008 - Independent Review of Energy Assessment and Wind Turbine Site-Suitability, Sigma Energy Solutions & GE Energy Financial, Aeolus IV, 4 project portfolio, 488 MW

2007 - Independent Review of Energy Assessment and Wind Turbine Site-Suitability, Sigma Energy Solutions & GE Energy Financial, Aeolus III, 3 project portfolio, 319.5 MW

2006 - Independent Review of Energy Assessment and Wind Turbine Site-Suitability, Sigma Energy Solutions & GE Energy Financial, Desert Sky, 160.5 MW

2006 - Independent Review of Energy Assessment and Wind Turbine Site-Suitability, Sigma Energy Solutions & GE Energy Financial, Aeolus II, 3 project portfolio, 356 MW

2005 - Independent Review of Energy Assessment and Wind Turbine Site-Suitability, Sigma Energy Solutions & GE Energy Financial, Kumeyaay , 50 MW

2004 - Independent Review of Energy Assessment and Wind Turbine Site-Suitability, Nebraska Public Power District, Ainsworth Wind Farm, 59.4 MW

### **Relevant Experience – Expert Testimony**

2016 - Noise & Shadow Flicker Expert Testimony, Orion Renewable Energy Group, Charlie Creek Wind Farm Conditional Use Permit, Billings County Planning and Zoning Commissioner's Permit Hearing, Medora, ND

2016 - Shadow Flicker Expert Testimony, Orion Renewable Energy Group, Jordan Creek Wind Farm Conditional Use Permit, Warren County Board of Zoning Appeals, West Lebanon, IN

2015 - Noise & Shadow Flicker Expert Testimony, Sage Law Partners, Sand Canyon, Tehachapi, CA

2014 - Noise & Shadow Flicker Expert Testimony, TradeWind Energy, Lindahl Wind Farm Conditional Use Permit, Williams County Planning and Zoning Commissioner's Permit Hearing, Williston, ND

2012 – Ice Throw Risk Expert Testimony, Vorys, Sater, Seymour and Pease LLP, Element Power, Buckeye Wind Farm Certificate of Environmental Compatibility and Public Need, Ohio Power Siting Board Public Hearing, Columbus, OH

2011- Noise & Shadow Flicker Expert Testimony, enXco, Merricourt Wind Farm Siting Application to the North Dakota Public Service Commission, Public Hearing, Ashley, ND

2011 - Shadow Flicker & Ice Throw Risk Expert Testimony, Element Power, Black Fork Wind Farm, Certificate of Environmental Compatibility and Public Need, Ohio Power Siting Board Public Hearing, Columbus, OH

2009 - General Wind Expert Testimony, New Frontier I & II Wind Farm Conditional Use Permit, McHenry County Commissioners Permit Hearing, Towner, ND

2008 - General Wind Expert Testimony, Peak Wind, Opposing Next Era's Ashtabula Wind Farm Conditional Use Permit, Barnes County Commissioner's Permit Hearing, Valley City, ND

2007 - General Wind Expert Testimony, EcoEnergy, New Holstein Wind Farm, Calumet County Commissioners Permit Hearing, Chilton, WI

2005 - General Wind Expert Testimony, Boone Heritage Wind Farm Conditional Use Permit, Boone County Commissioners Permit Hearing, Belvidere, IL

2004 - General Wind Expert Testimony, Bureau Valley High School Conditional Use Permit, Bureau County Commissioners Permit Hearing, Springfield, IL

2003 - General Wind Expert Testimony, Acciona Conditional Use Permit, Velva Wind Farm, McHenry County Commissioner's Permit Hearing, Towner, ND

### **Relevant Experience – Course Instructor**

Dec-2013 WindPRO Advanced Course – Las Vegas, NV

Sept-2011 Wind Energy Workshop – Buenos Aires, AR

Jan-2011 WindPRO In-House Training, Clipper – Carpentaria, CA

Nov-2010 WindPRO Basic Course – Boston, MA

Nov-2010 WindPRO Advanced Course – Montreal, QB

Sept-2010 WindPRO Advanced Course – Oklahoma City, OK

May-2010 WindPRO Advanced Course – Dallas, TX

Nov-2009 WindPRO Basic Course – Boston, MA

Sept-2009 WindPRO Advanced Course – Minneapolis, MN

May-2009 WindPRO Advanced Course – Chicago, IL

Nov-2008 WindPRO In-House Training, DNV-GEC, Webinar

Nov-2008 WindPRO Basic Course – Boston, MA

Oct-2008 WindPRO In-House Training, MN Power – Duluth, MN

Sept-2008 WindPRO Advanced Course – Minneapolis, MN



Jun-2008 WindPRO Basic Course – Houston, TX  
May-2008 WindPRO Basic Course – Toronto, ON  
Feb-2008 WindPRO Basic Course – Austin, TX  
Jan-2008 WindPRO Basic Course – Minneapolis, MN  
Dec -2007 WindPRO In-House Training, Basin Electric – Bismarck, ND  
Oct-2007 WindPRO Basic Course – Quebec City, QB  
Sept-2007 WindPRO In-House Training, Clemson Univ. – Clemson, SC  
Sept-2007 WindPRO Basic Course – Minneapolis, MN  
Aug-2007 WindPRO In-House Course, TradeWind Energy – Lenexa, KS  
Jul-2007 WindPRO Seminar – Boston, MA  
Jun-2007 WindPRO Advanced Course – Los Angeles, CA  
Jun-2007 WindPRO In-House Course, BP Alt. Energy – Oakland, CA  
Mar-2007 WindPRO Basic Course – Grand Forks, ND  
Jan-2007 WindPRO Basic Course – Boston, MA  
Oct-2006 WindPRO Basic Course – Winnipeg, MB  
Sept-2006 WindPRO Basic Course – Grand Forks, ND  
Oct-2005 WindPRO Basic Course – Toronto, ON  
Sept-2005 WindPRO Basic Course – Grand Forks, ND  
May-2005 WindPRO Basic Course – Denver, CO  
Mar-2005 WindPRO Basic Course – Grand Forks, ND  
Oct 2004 WindPRO Basic Course – Montreal, QB  
April-2004 WindPRO Basic Course – Chicago, IL  
Sept-2003 WindPRO Basic Course – Grand Forks, ND  
May-2003 WindPRO Basic Course – Austin, TX  
Aug-2002 WindPRO Basic Course – Grand Forks, ND