

# Westwood

**JAY HALEY, PE**  
**Mechanical Engineer, Wind Engineering Consultant**

## Overview

Mr. Haley has been involved in wind energy since 1983. He has 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.

Mr. Haley been involved in the planning, permitting, design, construction, and operation of wind farms. He has 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 was also 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*.

## Relevant Experience

### **WIND RESOURCE, ENERGY ASSESSMENT, AND WIND FARM DESIGN**

***Energía Eléctrica S.A., Fray Guen Wind Farm*** – Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, 100 MW

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

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***Sequoia Energy, Assiniboia Wind Farm*** – Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, 200 MW

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

***Allete Clean Energy, Bowman Wind Farm*** – Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, 208 MW

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

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

***TradeWind Energy, Cedar Run Wind Farm*** – Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, 200 MW

***TradeWind Energy, Seven Cowboy Wind Farm*** – Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, 300 MW

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

***Bluestem Energy, West Liberty Wind Farm*** – Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, 4 MW

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

***TradeWind Energy, Lindahl West*** – Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, 60 MW

***TradeWind Energy, Thunder Ranch Wind Farm*** – Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, 300 MW

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

*TradeWind Energy, Rose Rock* – Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, 108 MW

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

*Allete Clean Energy, Clean Energy I Wind Farm* – Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, 102.4 MW

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

*Project Resources Corp., Lakeswind Wind Farm* – Wind Resource and Energy Assessment, 50 MW

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

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

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

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

*PowerWorks, Sawtooth Wind Farm* – Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, 22.4 MW

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

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

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

***PPM Energy, Rugby Wind Farm*** – Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, 150 MW

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

***FPL Energy, SD Wind Energy Center*** – Wind Resource and Energy Assessment, Site Suitability and Wind Farm Design, 40.5 MW

## **NOISE AND SHADOW FLICKER STUDIES**

***Orion Renewable Energy, Turkey Ridge Wind Farm, LLC*** – Shadow Flicker Study, 318 MW

***Orion Renewable Energy, Banner County Wind Farm, LLC*** – Shadow Flicker Study, 130 MW

***Orion Renewable Energy, Knox County Wind Farm, LLC*** – Shadow Flicker Study, 182 MW

***Scout Clean Energy, Sweetland Wind Farm, LLC*** – Shadow Flicker Study, 224 MW

***Orion Renewable Energy, Clearwater Wind Farm, LLC*** – Shadow Flicker Study, 670 MW

***Scout Clean Energy, Three Waters Wind Farm, LLC*** – Shadow Flicker Study, 185 MW

***Scout Clean Energy, Three Waters Wind Farm, LLC*** – Shadow Flicker Study, 195 MW

***Terra-Gen, TG High Prairie Wind Farm, LLC*** – Noise and Shadow Flicker Studies, 387.4 MW

***NextEra, Crowned Ridge II Wind Farm*** – Noise and Shadow Flicker Studies, 300 MW

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*NextEra, Crowned Ridge I Wind Farm* – Noise and Shadow Flicker Studies, 300 MW

*Project Resources Corp., Red Barn, LLC* – Noise and Shadow Flicker Studies, 129.5 MW

*Geronimo Energy, Blazing Star Wind Farm* – Shadow Flicker Studies, 200 MW

*Project Resources Corp., Lakeswind Wind Farm* – Noise Study, 50 MW

*Capital Power, Black Fork Wind Farm* – Shadow Flicker Study, 200 MW

*Tenaska, Inc., Nobles 2 Wind Farm* – Shadow Flicker Study, 250 MW

*Invenergy, Freeborn Wind Farm* – Noise and Shadow Flicker Studies, 100 MW

*Geronimo Energy, Blazing Star II Wind Farm* – Shadow Flicker Study, 200 MW

*Project Resources Group, Rock Aetna Wind Farm* – Noise Study, 24 MW

*Orion Renewable Energy Group, Jordan Creek Wind* – Noise and Shadow Flicker Studies, 298 MW

*Geronimo Energy, Blazing Star Wind Farm* – Shadow Flicker Study, 200 MW

*Tenaska, Inc., Nobles 2 Wind Farm* – Shadow Flicker Study, 250 MW

*Orion Renewable Energy Group, Charlie Creek Wind Farm* – Noise and Shadow Flicker Studies, 271 MW

*EDF Renewables, Red Pine Wind Farm* – Noise and Shadow Flicker Studies, 200 MW

*TradeWind Energy, Cedar Run Wind Farm* – Shadow Flicker Study, 200 MW

*Minnesota Power, Tri-County South Wind Farm* – Noise and Shadow Flicker Studies, 104 MW

*Starwood Energy Group, Trishe Wind Energy Project* – Shadow Flicker Study, 115 MW

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**TradeWind Energy, Alta Farms II Wind Farm** – Noise and Shadow Flicker Studies, 200 MW

**Bluestem Energy, West Liberty Wind Farm** – Noise and Shadow Flicker Studies, 4 MW

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

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

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

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

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

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

**TradeWind Energy, Blue Star Wind Farm** – Noise and Shadow Flicker Studies, 15 MW

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

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

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

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

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

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

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

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

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

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

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

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

## **DUE DILIGENCE**

***TradeWind Energy, Seven Cowboy*** – Independent Review of Energy Assessment and Existing Production, 300 MW

***TradeWind Energy, Alta Farms II*** – Independent Review of Energy Assessment and Existing Production, 200 MW

***TradeWind Energy, NorthStar, and RedRock*** – Independent Review of Energy Assessment and Existing Production, 500 MW

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

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

***Clean Energy, Chanarambie/Viking*** – Independent Review of Energy Assessment and Existing Production, 97 MW

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

***TradeWind Energy Breckenridge*** – Independent Review of Energy Assessment and Existing Production, 100 MW

***Greycliff Energy, LLC, Greycliff Wind Farm*** – Independent Review of Energy Assessment and Existing Production, 20 MW

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

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

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

***Sigma Energy Solutions & Starwood Energy Group, Pattern Energy*** – 10 project portfolio – Independent Review of Energy Assessment and Wind Turbine Site Suitability, 2,000 MW

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

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

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

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

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

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

***Sigma Energy Solutions & GE Energy Financial, Kumeyaayl*** – Independent Review of Energy Assessment and Wind Turbine Site Suitability, 50 MW

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

## **EXPERT TESTIMONY**

***Orion Renewable Energy, Knox County Wind Farm, LLC*** – Shadow Flicker Study, Conditional Use Permit, Knox County Zoning Board of Appeals, Galesburg, IL

***NextEra, Crowned Ridge II Wind Farm, LLC*** – Noise and Shadow Flicker Studies, Energy Facility Permit, SD Public Utilities Commission, Pierre, SD

***NextEra, Crowned Ridge I Wind Farm, LLC*** – Noise and Shadow Flicker Studies, Energy Facility Permit, SD Public Utilities Commission, Pierre, SD

***NextEra, Crowned Ridge II Wind Farm, LLC*** – Noise and Shadow Flicker Studies, Conditional Use Permit, Deuel County Planning and Zoning Board, Clear Lake, SD

***NextEra, Crowned Ridge II Wind Farm, LLC*** – Noise and Shadow Flicker Studies, Conditional Use Permit, Grant County Board of Adjustment, Milbank, SD

***NextEra, Crowned Ridge II Wind Farm, LLC*** – Noise and Shadow Flicker Studies, Conditional Use Permit, Codington County Board of Adjustment, Watertown, SD

***NextEra, Crowned Ridge I Wind Farm, LLC*** – Noise and Shadow Flicker Studies, Conditional Use Permit, Deuel County Planning and Zoning Board, Clear Lake, SD

***NextEra, Crowned Ridge I Wind Farm, LLC*** – Noise and Shadow Flicker Studies, NextEra, Conditional Use Permit, Grant County Board of Adjustment, Milbank, SD

***NextEra, Crowned Ridge I Wind Farm, LLC*** – Noise and Shadow Flicker Studies, Conditional Use Permit, Codington County Board of Adjustment, Watertown, SD

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

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

***Sage Law Partners, Sand Canyon*** – Noise & Shadow Flicker Expert Testimony, Tehachapi, CA

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

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

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

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

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

***Peak Wind*** – General Wind Expert Testimony, Opposing Next Era’s Ashtabula Wind Farm Conditional Use Permit, Barnes County Commissioner’s Permit Hearing, Valley City, ND

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

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

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

***Acciona Conditional Use Permit, Velva Wind Farm*** – General Wind Expert Testimony, McHenry County Commissioner’s Permit Hearing, Towner, ND

## **ADDITIONAL EXPERIENCE**

**Course Instructor** – WindPRO Basic and Advanced Course, Wind Energy Workshop, and WindPRO In-House Training

### **Education**

University of North Dakota – Grand Forks, BS Mechanical Engineering

### **Chronology**

Westwood Professional Services, 2020 – Present

EAPC, Mechanical Engineer/Partner, 2000 – 2020

EAPC, Mechanical Engineer, 1998 – 2000

Energy & Environmental Research Center, 1989 – 1998

Ideal Aerosmith, Inc., 1985 – 1989