BOARD OF COUNTY COMMISSIONERS
Grant County, Washington

RESOLUTION IN THE MATTER OF THE HORSE HEAVEN WIND AND SOLAR PROJECT

RESOLUTION No. 23- 113 **-CC**

WHEREAS, the Scout Clean Energy LLC, applied for site certification with the Washington State Energy Facility Site Evaluation Council (Council) for the Horse Heaven Wind Farm Project on June 8, 2021; and

WHEREAS, the Horse Heaven Wind Farm Project is a wind and solar energy generation facility proposed to be located in unincorporated Benton County; and

WHEREAS, the Horse Heaven Wind Farm Project is situated in an area with unique geological features, comprised of naturally vegetated steep slopes, native habitat, commercially significant agricultural land, and visual resources; and

WHEREAS, during the Council's public comment periods for the land use consistency and the draft environmental impact statement, the Board of County Commissioners emphasized the County's concerns and opposition to the Horse Heaven Wind Farm Project; and

WHEREAS, pursuant to WAC 463-30-050 and WAC 463-30-0660 (2), Benton County was deemed to be a party in the adjudicative proceeding for the Horse Heaven Wind Farm Project; and

WHEREAS, Benton County participated in the adjudicative proceeding to determine whether the Horse Heaven Wind Farm Project satisfies Benton County's conditional use permit criteria by submitting briefing and providing pre-filed and live testimony; and

WHEREAS, the Horse Heaven Wind Farm Project will negatively impact and conflict with the Horse Heaven Hills viewshed, critical areas, agricultural lands of long-term commercial significance, and cultural resources while increasing the risks associated with fire and wildlife; and

WHEREAS, the Horse Heaven Wind Farm Project's industrial use, project size, and location makes the project inconsistent and incompatible with the required outright permitted uses in the Growth Management Act Agricultural Zoning District (BCC 11.17.040), the Washington State designation of long-term commercially agricultural lands, and the required conditional use permit criteria (BCC.11.50.040); and

WHEREAS, the Grant County Board of County Commissioners is gravely concerned of the precedent being set by EFSEC for siting such facilities in areas of cultural significance, long-term commercially significant agricultural lands, and areas of high-fire-risk and impact to the health of local residents despite the clear request for denial by local elected officials, local Nation tribes and the public.

NOW, THEREFORE, BE IT RESOLVED that the Board of Grant County Commissioners hereby opposes the Horse Heaven Wind Farm Project.

DATED this 17 day of October, 2023.

	Yea	Nay	Abstain	**BOARD OF COUNTY COMMISSIONERS GRANT COUNTY, WASHINGTON**
	☑	☐	☐	Rob Jones, Chair
ATTEST:	☐	☐	☑	ABSTAIN Cindy Carter, Vice-Chair
Barbara J. Vasquez Clerk of the Board	☑	☐	☐	Danny E. Stone, Member

From:	Paul Krupin
To:	EFSEC mi Comments; EFSEC (EFSEC)
Subject:	Horse Heaven Wind Farm - Stricken Testimony on Aerial Firefighting David Wardall
Date:	Saturday, October 21, 2023 7:23:02 AM
Attachments:	Wardall EXH-5908_S.pdf WARDALL EXH-5906_S.pdf

External Email

We are submitting the Supplemental Testimony provided by David Wardall on aerial firefighting as public comments.

This Supplemental Testimony was submitted by Tri-Cities CARES on September 5, 2023 and was stricken from the Horse Heaven Hills Adjudication by Judge Torem on September 22, 2023.

Tri-Cities CARES filed a Motion for Reconsideration.

Three attachments

EXH-5906_S Testimony Statement

EXH-907_S – Resume of David Wardall

EXH-5908_S – Report on Aerial Firefighting

Appreciatively,

Paul J. Krupin, BA, MS, JD
Board Member on behalf of TRI-CITIES C.A.R.E.S
Visit: http://www.TriCitiesCARES.org
509-531-8390 cell 509-582-5174 landline Paul@Presari.com

April 10, 2023

Leonidas Payne, Project Manager
California Energy Commission
Environmental Office, 715 P Street, MS-15
Sacramento, CA 95814
Leonidas.Payne@energy.ca.gov

Re: Fountain Wind Project (23-OPT-01)

Dear Mr. Payne,

This letter is respectfully submitted by three pilots involved in aerial firefighting, including the recent Chairman of the National Associated Aerial Firefighters, the former CDF Deputy Chief in charge of air operations for 30 years, and a current retardant pilot who has flown DC-10's to fight wildfires from the air in three different countries on two continents, including some fires in wind farms and including many of California's most recent large fires. A fire and forestry expert also joined us.

We want to alert the California Energy Commission (CEC) to the serious impediments to aerial firefighting in Eastern Shasta County that would be posed if the Fountain Wind Project is built. We hope you and your staff will carefully read this and each of our comments in the four Exhibits that follow. For example, as stated by Dave Wardall, a consulting aircraft structures engineer to the NTSB and retired CDF Deputy Chief of air tanker operations for 34 years: "We have examined the proposed project and determined it is an accident looking for a place to happen." (See full Statement, attached as **Exhibit. A.**) All of the signatories to this letter testified before the Shasta County Planning Commission

and/or Shasta County Board of Supervisors in connection with the permit application for this same project that was denied by Shasta County. The testimony of the aerial firefighters and other fire experts that supported the denial of the Fountain Wind permit application, also later supported, for many of the same reasons, the later zoning amendment that effected a ban by Shasta County on all such future projects in the unincorporated areas of Shasta County.

Our preliminary review of the CEC's February 10, 2023 Deficiency Letter leads us to believe that the CEC is unaware of the serious impediments to aerial firefighting posed by the existence of such a wind turbine project in Shasta county on the proposed site. As described herein, such a project would make it impossible to fight a wildfire, regardless of the cause of the fire, with air tankers (as well as rotor aircraft) anywhere in or near the project site and surrounding areas. The very existence of the wind turbines, which we understand may each exceed 700 feet in height (each therefore roughly twice as tall as the Statue of Liberty, and taller than Shasta Dam), would effectively create a "no fly" zone that would greatly increase the risk that any wildfire that either began in the project site or spread into the project site from any surrounding area, could not be quickly contained, and would likely grow beyond the project area to out-of-control proportions. Such a fire could easily then become an out-of-control wildfire covering tens of thousands, if not hundreds of thousands of acres, such as the Delta, Hirz, Carr, Camp, and Dixie fires of recent years. Such a fire, if not able to be contained from the air, because the turbine field is in the way, would not only burn the project itself, causing a toxic mess and obviating any benefits of having the project there, but would probably also burn through the surrounding communities of Montgomery Creek, Round Mountain, Oak Run and Moose Camp. And, if the fire spread beyond the immediate intermountain area, because it could not be quickly contained from the air,

such a fire could spread to even larger communities, such as Burney to the East, or Shingletown, Palo Cedro and Redding to the West, resulting in massive property damage and potentially even greater loss of life.

Shasta County has suffered several catastrophic wildfires in recent years, including the Carr, Zogg, Hirz, Fawn, Dixie and Delta fires, all of which occurred since this project was first proposed. Indeed, this very project site has burned once before in 1992, in the Fountain Fire, which burned over 60,000 acres of timberland (over 100 square miles), as well as hundreds of homes and businesses in the nearby towns of Montgomery Creek and Round Mountain, causing $225 million in losses and suppression costs (in 2021 dollars), at the time the most expensive fire to contain in California history. As far as we know, the "Fountain Wind" project is the only wind turbine project to ever be named after a catastrophic wildfire (the "Fountain Fire") that burned the very site on which it is proposed to be built. The site burned once before and will no doubt burn again and again.

Now, after the replanting of a timber plantation following the Fountain Fire, the project site is of even higher fire danger than before. Indeed, this project site carries the highest fire danger level in the entire State of California. The site is mostly covered now with a tree plantation covering tens of thousands of acres, composed of densely packed, highly flammable pine trees that have grown in the last 30 years to be about 40-50 feet tall, surrounded by mixed forest for miles in every direction of pine, fir, and oak woodlands.

To understand the magnitude of the impediments to aerial firefighting posed by the proposed Fountain Wind project, and described in this letter, you must begin by picturing two Statue of Liberties stacked one on top of the other (the Statue of Liberty is approximately 300 feet tall, the

proposed turbines may exceed 700 feet tall). Near the top of each turbine tower will be a nacelle, which will contain flammable fossil fuels (grease and oil) that can catch on fire (like a torch, to extend the Statue of Liberty analogy), on top of a superstructure rising out of the forest like a giant lightning rod (and turbine towers do attract lightning).

As stated by Mark Baird who has flown DC10's to fight fires on two continents and who has experience fighting wildfires near wind turbine projects: "The turbines themselves are potential ignition sources, which would compound the existing danger. Fires like the Dixie burned so hot the turbines themselves may combust and then sling burning debris as much as a quarter mile away. We wait until the fires, which are usually started by the turbines, burn well outside the perimeter of the project before we attempt suppression efforts." (**Exhibit B.**)

Most wildfires in Shasta County are caused by either lightning or human negligence/accidents. But even two Statue of Liberties stacked on top of each other does not convey the magnitude of these impediments to aerial firefighting, or the full extent of the problem, as even the Statue of Liberty does not have blades spinning around, nearly two football fields in diameter, and traveling at hundreds of miles an hour at the blade tips as they sweep a huge circle reaching even higher in the air than the nacelle. Now imagine such structures, essentially 70 story buildings, with their spinning blades, wholly or partially obscured by smoke in the midst of a wildfire sweeping through the tens of thousands of trees on the ground between and among the turbines. The turbines, of course, will have been placed intentionally on high points of the landscape, where there are frequently high winds which also typically accompany wildfires in Shasta County. And then picture 48 of these 700 foot plus tall turbines spread over several thousands of acres of densely packed pine trees (each of the 48 a massive skyscraper in its own right, each taller than anything north of downtown San Francisco).

It is not clear that any turbines this tall have ever been built before in California.

No mitigation of the problems posed by the existence of such extremely tall turbines in heavily forested, high fire danger areas is possible. Coloring the turbine blades, putting lights on them, and telling Cal Fire the GPS locations of where they are, is just rearranging deck chairs on the Titanic. What you need to understand is that the very existence of the turbines will mean that air tankers—essential weapons that Cal Fire and other agencies have to contain wildfires in California—simply will not be able to fly anywhere near that area at all, greatly increasing the risk that a fire in Eastern Shasta County, anywhere in or near the project site, will likely be unable to be fought from the air at all, and will necessarily likely grow to become a catastrophic fire.

This project and projects like it simply have no place in heavily forested, severe high fire danger areas such as the proposed project site, which is one of the main reasons why Shasta County has banned all such projects in the unincorporated areas of Shasta County (nearly all of Shasta County is forested and rated as being located in high or very high fire danger zones). Denying the present permit application, as both the Shasta Planning Commission and Board of Supervisors did before you, will likely save lives. We have lost over 100 lives in Northern California wildfires in recent years, including many women and children who were literally burned alive. To add the impairment to aerial firefighting of dozens of 700 foot tall wind turbines scattered through the forest to the already difficult task of containing catastrophic wildfires in high fire danger areas is beyond irresponsible. To do so would invite even greater tragedy by unnecessarily increasing the potential for additional loss of life that could occur as a result of wildfires in heavily forested Shasta County that could not be effectively contained by the use of air tankers and rotor aircraft.

1. **Aerial firefighing with fixed wing aircraft is the most effective way to contain wildfires quickly, support ground forces, and keep wildfires from growing to out-of-control proportions.**

The most effective way to quickly contain wildfires in California is with the use of fixed wing aircraft that drop fire retardant. Cal Fire and all other agencies depend heavily on aerial firefighting to contain fires, create fire lines, and otherwise protect lives, homes, businesses, and in many cases entire communities. As stated in the Proponent's own "experts" report, "it has been noted that in the vicinity of turbines, there will be a reduction of available airspace for fixed-wing aircraft...."

In Shasta County, such fixed wing air tankers use the Redding air tanker base to rapidly fight fires as and when needed. Such fixed wing air tankers have been used to fight all the major wildfires in Shasta County in recent years, including the Carr, Zogg, Hirz, Delta and Dixie fires, and many others. Most recently, fixed wing air tankers were used to contain the Fawn fire near Lake Shasta, and keep it from burning into the City of Redding. Had there been a wind turbine development in the way, such that fixed wing air tankers could not have been used to quickly contain the Fawn fire, that fire would have easily burned into Shasta Lake City and Redding and would have likely burned thousands of additional homes and businesses to the ground. As it was, there are no wind turbines there or near there, and air tankers were used to lay down retardant to create fire lines and fire breaks, and to save hundreds if not thousands of homes (and likely many lives too).

2. **Air Tankers Need to Drop Retardant From Only 100 to 200 Feet Above the Ground.**

As stated by the Chief: "Most effective drop height is 150' above the ground and lower crossing ridge tops not over 700'. I urge you to consider that flying heavily laden aircraft (fixed and rotor wing) with poor

visibility from smoke and very tall obstructions with whirling, immense blades is a **prescription for a fatal accident** both in the air and on the ground. No consideration for huge vortexes produced downwind from the turbines was taken." (**Exhibit A, emphasis in original.**) So, in addition, for fires nearby, an air tanker must have some running room to drop to that low of an altitude before releasing retardant, and some additional running room to return to a higher altitude before returning to the airport to reload. Thus, if there were to be several thousands of acres sprinkled with 700 foot tall wind turbines in or near to any flightpath that an air tanker would otherwise take to attack a wildfire, the impediment to aerial firefighting would extend far beyond the project site itself and would not be limited to the footprint of the wind turbine project itself.

As mentioned above, if an air tanker were compelled to fly a safe distance above the top of the turbine blades, the drop height would be around 900 feet from the ground. Drops at this height are ineffective and simply disperse in the wind. Worse, wind turbines are often located on top of ridges or other high points. This means that a fire burning in a lower area--canyon bottom or on the slope--within or near the turbine project, along a flight approach line, could be well over 1000 to 2000 feet or more below the height of the safe flight path. Drops at this height would have no effect on fire on the ground whatsoever.

3. **The Project Area and Surrounding Area Would Likely Be Deemed a "No Fly" Zone for Aerial Firefighting in the Event of A Wildfire In or Near The Project.**

A former interagency Type 1 (large fire) Plans Chief, Fire Behavior Analyst, and fifteen year National Fire Instructor, has concluded: "I would never recommend assignment of fixed wing aerial attack to this project area and would greatly restrict the use of rotor aircraft." (**Exhibit C.**)

Thus, the likely impact of a project such as the proposed Fountain Wind Project would be to create a "No Fly" zone for aerial firefighting in Eastern Shasta County beyond the project because of flight path issues mentioned above. The effect would be, in a wildfire situation, to exclude air tankers from that general area of Shasta County entirely.

We expect a similar result would also apply to helicopters. When considering helicopters, it is important to note at the outset that the capacity of an initial attack Cal Fire helicopter to hold water or retardant is a fraction of the capacity of an air tanker. So if use of air tankers is completely eliminated by the existence of a turbine field, it might be possible for limited use of helicopters outside the boundaries of the turbine field, some safe distance away. The existence of the wind turbine project in the area has still, nonetheless, greatly diminished the effectiveness of any potential air attack on the fire while greatly increasing the likely outcome that the fire is not contained and grows out-of-control to become a catastrophic fire.

Even the potential limited use of helicopters around the fringes of the project site is problematic when such large obstructions are in the area. Such large turbines with massive turbine blades could easily be hidden or partially hidden by smoke, and the area between the turbines will also be subject to great turbulence. Helicopters are often grounded on very smoky days, or when there is an inversion layer present. Helicopters would be grounded more days or more often if the fire was in an area sprinkled with 700-foot-tall wind turbines. When you add the likely additional factor of not only some smoky conditions, but also very high winds, and/or swirling winds (created by weather, by the fire itself, and turbine vortexes or all three), the use of helicopters, even outside of the turbine field in surrounding areas might also be precluded or greatly diminished.

4. **With Such Large Turbines In the Way, Helicopter Rescues of Trapped or Injured Citizens and Firefighters on the Ground May Also Be Precluded.**

Proponent's own "experts" wrote that there would be "a reduction of airspace for rotor-wing aircraft used to deliver water/foam/gel/retardants, supplies and firefighters to wildfires." While one might suppose that without any air support, a wildfire in the project area or surrounding area could nonetheless be fought by fire trucks and crews on the ground, even this becomes more problematic due to the existence of the turbines. In wildfires in forested areas, citizens who live on ranches or in houses outside of heavily populated areas, or even citizens in towns (like Paradise, CA where over 80 lives were lost) that are in forested areas, can become trapped, injured, or otherwise in need of rescue or evacuation during a wildfire. Such rescues can sometimes be done by fire crews on the ground, but often need to be done by helicopter. In or near a huge wind turbine project, this may not be possible, further endangering the lives of firefighters and citizens on the ground, who may not be able to be rescued from the air if injured, further increasing the potential for loss of life.

5. **The Impediments to Aerial Firefighting Posed by the Turbines will likely mean that the Communities of Montgomery Creek, Round Mountain, Moose Camp, and Oak Run, at A Minimum, Will Burn in a Wildfire In or Near The Project Site, And Access To And Egress From These Communities Could Also Be Blocked By Fire Causing Substantial Loss of Life.**

As noted, the existence of 48 turbines in the project area will likely create a "No Fly" zone in Eastern Shasta County. This means that without the ability to contain a fire from the air using air tankers and possibly helicopters, any fire in that area will likely spread to burn the nearby

communities of Montgomery Creek, Round Mountain, Moose Camp, and Oak Run. The project is also close to Highway 299 and other rural roads that go from residential areas out to Highway 299. Without the ability to lay down retardant from the air, such a fire may also potentially block Highway 299, which is the only way in or out of the area for these rural communities, causing even further loss of life and property.

6. **No Satisfactory Mitigation Is Possible With The Extreme Fire Danger Posed By The Fuel and Terrain In And Around The Project Site.**

The problem is the existence of the turbines. Coloring the blades, putting lights on them, and informing Cal Fire of their GPS locations does not solve or mitigate the problem. Air tankers won't be able to fly there at all, so the problem is not identification of the turbines so they can be avoided by planes and helicopters. The problem is their very existence, their great height, turbulence and the insanity of placing them in a high fire danger, heavily forested area, where they don't belong.

Listen to the immediate past Chairman of the Associated Aerial Firefighters with 30 years of experience of fighting fires in this area, as well as fires in and around wind farms, as he warns:

> "This appears to be a very unsafe proposal to adjacent communities and aerial firefighters.... The strategy was to not use fixed wing aircraft in the turbine fields at all. In Altamont and Tehachapi most of the turbine field was contained within light flashy fuels such as vast stands of grass lands. The proposed Fountain Project would be located in an area containing large stands of Pyrophytic fuels such as chaparral, manzanita, digger pines, and mixed conifers. The heat generated by such a fire, especially if it

is wind driven would be significantly greater than the heat produced by the fast-moving grass fire. This would pose a greater risk to ground firefighters because of the lack of ability to provide them effective air support and the adjacent homesteads surrounding the communities of Round Mountain, Montgomery Creek and Hillcrest. The threat of fatal damage to the tower structures is also worthy of consideration. Not only because of material losses but as an additional hazard that could endanger firefighters on the ground." (**Exhibit D**.)

For all of the foregoing reasons, we respectfully request the following. First, if the application is not withdrawn or dropped by the applicant in its entirety, as it should be, we ask that the CEC review every wildfire in California in the last 5 years in which air tankers were used to contain or slow the growth of the fire, and estimate the additional fire spread that would have occurred if air tankers were unable to be used to fight and contain each such fire, including potential additional lives lost and millions of dollars of additional property damage that would or could have been suffered if air tankers could not have been used. Second, we ask that all of the issues addressed in this letter be fully addressed by the CEC in the CEQA process, including in any EIR that might be prepared in connection with the proposed Fountain Wind Project. And third and finally, we respectfully request that the CEC deny the application for a permit for the Fountain Wind Project and any similar project that may be proposed to be located in heavily forested Shasta County.

The Shasta County Planning Commission and Board of Supervisors denied a permit for this project for many of the foregoing reasons, and others, and later enacted a zoning ordinance banning all such industrial wind turbine projects in heavily forested Shasta County. They expressly took such actions to protect the health, safety and welfare of the citizens of Shasta County, and made specific findings of fact, supported by

the evidence and testimony of experts and citizens alike, that the Fountain Wind Project would be detrimental to the health, safety and welfare of the citizens of Shasta County. We believe that the Shasta County Planning Commission and Board of Supervisors acted responsibly and correctly. We hope that you will concur and deny the requested permit.

Sincerely,

/s/ Dave Wardall
Dave Wardall
Cal Fire Air Ops., Retired
Current Chair Associated
Aerial Firefighters

/s/ Stephen Fitch
Stephen Fitch
Forest Supervisor, Retired

/s/Mark Baird
Mark Baird
Air Attack Pilot

/s/ Jim Barnes
Jim Barnes
Former Pilot and Chair
Associated Aerial Firefighters

EXHIBIT A

Statement of David Wardall

-Chairman-Associated Aerial Firefighters
-Former Deputy Chief CDF air tanker operations for 34 years.
-Consulting engineer to the NTSB on aerial firefighting accidents.
-Involved in around 200 fatal and serious injury aircraft incident/accidents investigations.
-FAA Airline Transport pilot..

The Associated Aerial Firefighters with approximately 100 members represents pilots from across the country and provide a forum to advocate for safety, effectiveness, and efficiency in wildland aerial firefighting. I have examined the proposed Fountain Wind Project and determine it is an accident looking for a place to happen and testified in person at the Planning Commission Hearing where it was unanimously rejected.

The planning and analysis gone into this project is **seriously** flawed—Let me explain:

1. Real world dispatch and safety issues created by these huge turbines at over 600-ft AGL are many.
2. No consideration for huge vortexes produced downwind from the turbines was taken.
3. The movement of the turbine blades will produce sunlight reflections that will impair visual see and avoid for maneuvering among turbines.
4. Most effective drop height is 150' above the ground and lower crossing ridge tops **not** 600 to 750 feet.

I urge you to consider that flying heavily laden aircraft (fixed and rotor wing) with poor visibility from smoke and very tall obstructions with whirling, immense blades is a **prescription for a fatal accident** both in the air and on the ground.

AND understand how important Air Attack has been over the years. Recently Air Attack was key in saving numerous communities from Tulare to Redding.

Finally, consider the threat you would be imposing on the 3 communities immediately adjacent to this proposal by eliminating the possibility of fixed wing air attack.

Don't just take my word for it listen closely to Jim Barnes, former Chairman of the Board of Associated Aerial Firefighters. He has flown out of the Redding Air Tanker Base **AND f**lown Wind Farm Fires.

/s/ Dave Wardall
4/1/23
davidwardall@gmail.com

EXHIBT B

Statement of Mark Baird

-I have 23,000 hours with type ratings in the DC-10, MD-11 and B744 (747) supertanker
-Was an instructor in both the DC-10 and 747 supertankers
-Have spent the last 7 years flying the DC-10 (Very Large Air Tanker).
-Have flown fires all over the United States, Australia and Chile.
-Have flown the DC-10 on several large fires in the Shasta County area including the Dixie-largest fire in recent California history

As I testified to the Shasta Board of Supervisors, in my humble opinion the area adjacent to the ridge lines, spur ridges, and approaches to or escape routes away from heavy fuel fire would be rendered useless by the turbines. (Fountain Wind Project)

The communities near the development would be indefensible by air assets, particularly Large Air Tankers, or Very Large Air Tankers. Further, the turbines themselves are potential ignition sources, which would compound the existing danger. Fires like the Dixie burned so hot the turbines themselves may combust and then sling burning debris as much as a quarter mile away.

These projects built in flashy fuels are indefensible by air. We wait until the fires, which are usually started by the turbines, burn well outside the perimeter of the project before we attempt suppression efforts. Remember air tankers are prohibited from dropping anywhere near power lines or associated infrastructures unless we are given specific permission and the subject infrastructures have been de-energized. Retardant weighs nine pounds per gallon and might be traveling as fast as 150 mph when it hits a structure. Retardant dropped directly on a structure will crush it.

All said and done the proposed project is a dangerous and unproductive risk to the environment, communities and their citizens.

/s/ Mark Baird
4/1/23
mcbair@me.com

EXHIBIT C

Statement of Stephen Fitch

-Former Forest Supervisor and District Ranger of the adjacent Shasta Trinity National Forest
-Formerly responsible for 7 National Forests and 10 million acres in 3 states
-Past type 1 (large fire) Planning Section Chief & Fire Behavior officer on fires across US
-Served 15yrs on Advanced Fire & Resource Mgt. training Cadre training US, Canadian, Mexican forest managers.
-Congressional Fellow and adviser to U.S. Senate Energy & Natural Resource Committee Chairman on fire and resource matters 100th Congress.
-On the team that developed and tested the Incident Command System used on all fires today.
-Was responsible for the largest Air Tanker base in California at Ontario International Airport

Why am I concerned with this project?—As the former Forest Supervisor and District Ranger of the National Forest located adjacent to this project on two sides, I consider this project a threat to the area I spent 11yrs of my life protecting. I have been responsible for reviewing and approving or denying similar projects that threaten or enhance 7 National Forests in 3 states. A fire escaping from within or near this project would immediately threaten the Shasta Trinity National Forest.

Foremost I'm concerned about the effect on wildfire suppression and protection of the adjacent communities. These concerns emanate from having served In the positions listed above.

As you review this proposal please consider that no matter how many **experts** the **proponents** bring in to justify this project they will **never** be able to explain how to make up for the loss of what has become a key to keeping fires small and saving communities, homes and **lives** from big fires. **Air Tankers**

This Project is an absolute **design for disaster** for at least 3 communities a major power distribution system and the many homes scattered adjacent to the project.

This Project sits in a dense stand of young conifers forming continuous horizontal and vertical (ladder) fuels. It is bordered on the West and North by Highway 299 with high potential for fire starts from vehicular accidents. Homes and many other ignitions sources surround the project and within-the turbines themselves and support systems.

The most devastating fires in this area come from the North East during strong gradient winds. **Our Forests fuels have changed** and under these conditions we've learned fires jump with ease roads and forest openings. The devastating Carr fire jumped the Sacramento River in two places.

This means **ALL** the fire fighting tools must be present for us to be successful.

This proposal sets up a condition that cannot be mitigated. 700 foot towers and blades scattered over thousands of acres combined with power lines **virtually eliminates** the option for using fixed wing aerial attack over a broad area making the adjacent communities and homes **indefensible** from fast moving large wildfires.
As a former Planning Section Chief I would never recommend assignment of fixed wing aerial attack to this project area and would greatly restrict the use of rotor aircraft.

It couldn't have been made more clear recently how absolutely critical it is to have **bombers** help save lives and communities. The condition of our Forests has changed so that **backing off and burning out and protecting structures has become routine. All with much much greater dependency on aircraft.**

This County has recently experienced 2 deadly and costly fires, the Carr and the Zogg. There was a recent headline article in the Record Searchlight about **Shasta County** filing suit against PG&E to recover costs incurred from the Zogg Fire. As you consider the benefits this project might bring to the State, I hope you will also **weigh** the costs. Recent Carr, Zogg, Camp, Fawn, Hirz and Dixie fires in this area have cost the State dearly. What are the potential costs, liability and **LOSS OF LIVES** that could result from **your** decision on this **DESIGN FOR DISASTER?**

Finally

Remember Shasta County's General Plan sets "preserving quality of life, especially in rural areas and "safety of citizens and communities" as its paramount precepts. Therefore, the Commission must reject the proposed project already carefully reviewed and denied by Shasta County. The untenable alternative would be to ask the County to remove "Safety" as its plan precept.

/s/ Stephen Fitch
4/1/23
svfitches@yahoo.com

EXHIBIT D

Statement of Jim Barnes

-Past chairman of the Associated Aerial Firefighters
-Have been a Forestry Air Tanker Pilot for over thirty years.
-Have flown air attack on California wind farms.
-Have flown Air Attack from the Redding Air Attack Base protecting the vicinity of the current turbine proposal
-Have testified in Shasta County concerning the Fountain Wind Project before the Planning Commission and Board of Supervisors

I am Jim Barnes the immediate past chairman of the Associated Aerial Firefighters. The Associated Aerial Firefighters with over 100 members represents pilots from across the country and provide a forum to advocate for safety, effectiveness, and efficiency in wildland aerial firefighting. As an air tanker pilot myself for over 30ys. I have flown fires all over California including on **wind farm fires** and frequently flew out of the Redding Air Attack base as initial attack on fires all over Shasta County.

We in the Association have become aware of the recent Fountain Wind Project proposal, carefully reviewed it, and hope the Commission will consider out comments as they directly affect the safety of our pilots, several communities and the forests in Shasta County, This appears to be a very unsafe proposal to adjacent communities and aerial firefighters. Let me explain:

Aerial Firefighting in and around turbines presents a set of unique challenges that are problematic to say the least. I have worked fires at Altamont pass and in Tehachapi pass. The strategy employed in both cases was to not use fixed wing air tankers in the turbine fields at all except around the borders. At Altamont we almost always stopped the fire af-

ter it burned completely through the field usually at highway I-5. Except for one occasion when it spotted across the highway exposing about a mile of parked cars on the road to a burn over.

At Altamont and Tehachapi most of the turbine field was contained within light flashy fuels such as vast stands of grass lands. The proposed Fountain Project would be located in an area containing large stands of pyrophytic fuels such as chaparral, manzanita, digger pines and mixed conifers. The heat generated by such a fire, especially if it is wind driven, would be significantly greater than the heat produced by a fast-moving grass fire. This would pose a greater risk to ground Firefighters because of the lack of ability to provide them effective air support and the adjacent homesteads surrounding the communities of Round Mountain, Montgomery Creek and Hill crest. The Threat of fatal damage to the tower structures is also worthy of consideration, Not only because of material losses but as an additional hazard that could endanger firefighters on the ground.

High towers and high winds are a situation that shouts watch out when it comes to **aerial firefighting.** At some point, winds above 30 knots, air tankers operations would be suspended but even winds below that flowing through the high towers would generate eddy currents that would contribute greatly to the danger for aircraft trying to conduct retardant or water drops above the turbine field. To be effective typical drop altitudes are 150ft above ground and a bit lower crossing a ridge top. Dropping retardant above these 700ft. towers with height and wind dispersal will have little to no effect on the fire. A state investigator and current chairma of our organization who has been involved with over 200 fatal and serious injury aircraft accident investigations advises that these structures over 700' scattered over thousands of acres and poor visibility from smoke would be a "prescription for a fatal accident". From an air tanker pilot's point of view fighting such a fire would be a no-win situation.

Please consider our thoughts as you review this proposal.

/s/Jim Barnes
Recent Past Chairman
Associated Aerial Fighters
4/1/23
aapilots@sonic.net

TCC
Supplemental Testimony
DAVID WARDALL
EXH-5906_S

BEFORE THE STATE OF WASHINGTON
ENERGY FACILITY SITING EVALUATION COUNCIL

In the Matter of the Application of: Scout Clean Energy, LLC, for Horse Heaven Wind Farm, LLC, Applicant.	DOCKET NO. EF-210011 SUPPLEMENTAL TESTIMONY OF TCC WITNESS DAVID WARDALL

Q: Please state your name and address.

A: W. David Wardall, 17069 Lambert Road, Ione, CA 95640.

Q Please briefly describe your business, experience and qualifications.

A. I am the Chairman of the Associated Aerial Firefighters, Former Deputy Chief CDF air tanker operations for 34 years, and consulting engineer to the NTSB on aerial firefighting accidents. I have been involved in around 200 fatal and serious injury aircraft incident/accidents investigations, and hold an FAA Airline Transport pilot certificate.

The Associated Aerial Firefighters is a non-profit organization with approximately 100 members represents pilots from across the country. We provide a forum to advocate for safety, effectiveness, and efficiency in wildland aerial firefighting.

My resume is EXH-5907_S.

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J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
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I have examined the proposed Horse Heaven Hills Project Wind and Solar Project and reviewed information regarding fire history and maps.

Q: Have you prepared testimony containing your comments and observations about your concerns about this project, particularly about the proposed location of the wind turbines and the risks to aerial firefighting operations?

A: My testimony is in the form of a copy of a letter and report submitted to the California Energy Commission in April 2021 containing our analysis and recommendations about a wind farm project proposed in Shasta County, California.

This letter and report are provided in EXH-5908_S.

Q: Please describe any opinion you have regarding the ability to conduct aerial firefighting operations if the proposed project is approved as it is presently described.
A: I have the same concerns about the Horse Heaven Hills Project as I do about other wind farm projects. Wind turbines present severe impediments to aerial firefighting operations. The existence of the wind turbines effectively creates a “no fly” zone which greatly increases the risk that any wildfire that either began in or near the project site or spread into it from any surrounding area, could not be quickly contained, and would grow. I believe there is a threat to the adjacent communities from this proposal by eliminating the possibility of fixed wing air attacks that needs to be acknowledged.

I reviewed the turbine layout and the fire history maps of the area.

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J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
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Q: Is there a difference between steep slope range fires and mountain range forest fires?

A: Yes, fuel loading in tons per acre. Slope on range fires will accelerate movement a bit.

The Fountain project in Shasta County was 48 turbines on 4,500 acres, 205 MW.

By comparison, the Horse Heaven Hills Wind Farm Project is huge – 25 miles and four to six miles wide – over 60,000 acres with up to 850 MW from up to 244 turbines, each one 500 foot to 671 foot high in up to 6 rows along the ridgeline. This is a huge major obstruction to responding firefighting efforts. The size of this proposed project will make a huge "No Fly" zone for civil aircraft, medivac helicopters and of course firefighting aircraft.

The extraordinary length of the project creates a 25-mile barrier to fixed wing tanker aircraft. The wind turbines produce a lot of air rotating vortices type turbulence that will interfere with safe aerial firefighting operations.

Depending on the winds and the terrain, in order to make effective air drops, the minimum obstruction setback distance should be three to four miles along any flight paths needed to conduct aerial operations, and two to three miles perpendicular to the flight paths to reduce the risks posed by the turbulence downwind of the wind turbines.

Also, brush and grass are "flash" fuels easily ignited up to two miles ahead of the fire front from blown embers during wind events at 15 mph or greater.

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J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
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This is a leapfrog-type fast-moving fire which fills in between the fire front and the new ember hot spots. The fire essentially explodes.

Little time to evacuate.

This project would require lots of pre-fire planning and vegetation removal and maintenance along roadway escape routes and wide fire breaks around the entire project and down-wind structures.

Q: Why are you submitting testimony?

A: I am here to share my concerns about the Horse Heaven Hills Wind and Solar Project at the request of Tri-Cities CARES. I acknowledge that I may be cross-examined during the adjudication hearings.

I declare under the penalty of perjury under the laws of the State of Washington that my testimony is true and correct to the best of my knowledge and belief.

Signed this __ 3rd _ day of September, 2023, in _Ione, CA.

__WESLEY DAVID WARDALL _____ _____/s/ _____

Printed Name Signature

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J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
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From:	Paul Krupin
To:	EFSEC mi Comments; EFSEC (EFSEC)
Subject:	Horse Heaven Wind Farm - Stricken Testimony on Aerial Firefighting Mark Baird
Date:	Saturday, October 21, 2023 7:27:32 AM
Attachments:	Mark Baird resume EXH-5913_S.pdf BAIRD EXH-5910_S Supplemental Testimony with maps.pdf

External Email

We are submitting the Supplemental Testimony provided by Mark Baird on aerial firefighting as public comments.

This Supplemental Testimony was submitted by Tri-Cities CARES on September 5, 2023 and was stricken from the Horse Heaven Hills Adjudication by Judge Torem on September 22, 2023.

Tri-Cities CARES filed a Motion for Reconsideration.

Three attachments

EXH-5910_S Testimony Statement

EXH-5913_S – Resume of Mark Baird

Appreciatively,

Paul J. Krupin, BA, MS, JD
Board Member on behalf of TRI-CITIES C.A.R.E.S
Visit: http://www.TriCitiesCARES.org
509-531-8390 cell 509-582-5174 landline Paul@Presari.com

TCC
Supplemental Testimony
Mark Baird
EXH-5913_S

Resume of:

Mark A Baird P.O. Box 842 Fort Jones CA 96032

Employment History 1970-1972 United States Army Helicopter Door Gunner, Republic of Vietnam 1700 hours, low level helicopter Aircraft maintenance

1972-1975 Airframe and Power Plant Mechanic World Airways Maintaining DC-10, DC-8, B747-200, B707, L188

1975- 1989 Charter Pilot for Executive Air Charter; California Air Charter On Demand Charter Service 6000 hours+/- 400 series Cessna, Piper Cheyenne, Navajo, Aztec,

April 1989- April 2014, World Airways. (Company ceased operations).

747-400 Check Airman, 2009-2014 DC-10 Check Airman 1995-2008 Line Capt. 1991-1995 First Officer 1989-1991 Total Time 23,000 + hours DOB 5/31/1952

Airline Transport Pilot, Multi-engine land, Commercial Pilot Single Engine Land, Airframe and Power plant Mechanic, Advanced Ground Instructor ratings, Instrument instructor ratings. Type Rated for B747-400, MD-11, DC-10 Qualified for CAT I/ II/IIIb, Lower than Standard CAT II, GPS approach qualified, VOR, NDB, LOC, Vnav/Lnav approach qualified. Qualified for Polar Ops Qualified NAT, Mid Atlantic, South Atlantic Qualified North Pacific, Mid Pacific, South Pacific I have also conducted South American route Qualifications as well as Africa, Asia,
Central and Eastern Europe, CIS States, China, and Middle East including Afghanistan and Iraq. I have been a Check Airman, Simulator Instructor and Line Captain on Two Heavy Airplane Types, with one of the largest Military Contract Airlines. I am very comfortable at high altitude airports (747-400 in and out of Quito, Ecuador, high temperatures, high gross weight (875,000lbs), and short runways (DC-10-30, in and out of 5,700 foot runway in Punta Arenas, Chile). We operated under some of the worst weather conditions in the world. Prior to World Airways I had approximately 6ooo hours of light multiengine and turbine experience in Piper Cheyenne, Cessna 400 series, Beech 18, and various other types of light aircraft both single and multi-engine.

2017-present, air tanker pilot for 10Tanker Air Carrier. VLAT air tanker operator primarily contracted to USFS but we have operated for the New South Wales Fire Service in Australia and in Chile engaged in initial attack aerial firefighting.

2012- 2019 : Reserve Deputy Sheriff, Siskiyou County

Personal History

I live with my wife, on our ranch in Siskiyou County California. We raise horses and Buffalo. My interests are civil war history with emphasis on Cavalry. I also enjoy astronomy.

Contact Information Mark A Baird mcbair@icloud.com 530-2276729 cell 530-468-5967 home P.O. Box 842 Fort Jones, CA 96032

TCC
Supplemental Testimony
Mark Baird
EXH-5910-S

BEFORE THE STATE OF WASHINGTON
ENERGY FACILITY SITING EVALUATION COUNCIL

In the Matter of the Application of: Scout Clean Energy, LLC, for Horse Heaven Wind Farm, LLC, Applicant.	DOCKET NO. EF-210011 SUPPLEMENTAL TESTIMONY OF TCC WITNESS MARK BAIRD

Q: Please state your name and address.

A: Mark Baird, P.O. Box 842, 4716 Mill Creek Rd, Fort Jones CA 96032.

Q: Please briefly state your work experience and qualifications.

A: I have over 23,000 hours of flight experience, 17,500 in the DC-10.

I hold the following airman certificates: ATP multi engine land with type ratings in B-744, DC-10, MD11. I hold an Airframe and Power plant mechanic certificate, and an advanced ground instructor rating. I have 15 years experience as an instructor pilot in the DC-10, and 7 years experience as a pilot engaged in aerial firefighting using the DC-10 fire tanker.

Q: Did you review information about the Horse Heaven Hills project location and terrain?

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J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
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A: Yes, in preparing for my testimony, TCC member and witness Paul Krupin utilized CalTopo to assist in familiarizing me with the fire history and topography of the area. These materials included the following maps and photographs:

Page 6 is the Fire map created by the South East Washington Interagency Team for the Hansen Road – Rupert Road Fire that occurred on June 16, 2023. The map shows the location and the extent of the fire perimeter. The area is located south of Interstate 82 south of Benton City, WA. The Hansen Road fire is approximately 12 miles in length east to west and one to two miles wide north to south.

Page 7 is an aerial photo taken out the window of one of the DC-10's dropping fire retardant on the Hansen Road – Rupert Road fire, on June 16, 2023, showing the extent of the fire and the fire perimeter.

Page 8 is a CalTopo digital Geographic Information System map (www.Caltopo.com) showing the fire history data layer on the lands to the north of the Horse Heaven Hills project area. The fire history in this area covers events from the year 2002 to present roughly 20 years). The black dots show the proposed Horse Heaven Hill project wind turbine locations. The orange and red zones are the individual fire events with their name and the date they occurred. The fire perimeters in red show the extent to which the fire burned. This map depicts an area south of Interstate 82 south of Benton City and Kennewick in Washington State.

Page 9 is a CalTopo digital Geographic Information System map (www.Caltopo.com) showing the slope angle shading data layer using 40-foot contour lines to visually enhance the steep slope terrain in and north of the Horse Heaven Hills project area.

Page 10 is a CalTopo digital Geographic Information System map (www.Caltopo.com) showing the road map data layer to visually enhance the

LAW OFFICES OF
J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
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identification of known vehicular access roads in the area and terrain in and north of the Horse Heaven Hills project area.

Pages 11 and 12 are CalTopo digital Geographic Information System maps (www.Caltopo.com) showing the USGS Topographic Map data layer showing the detailed contour lines to aid in the interpretation of rugged and steep terrain in the area of the fire and in and north of the Horse Heaven Hills project area. Page 11 is the western section and page 12 is the eastern section of the burned area north of the Horse Heaven Hills Project area.

Page 13 is a CalTopo digital Geographic Information System map (www.Caltopo.com) switched from a topographic map to an aerial photo layer (NAIP from the USDA Farm Service) showing the 40-foot contours on top of the ground surface. This map can be used to visually enhance the identification of known ground surface features including irrigation, wineries, residences, roads, and highways and much more. This figure covers the area in and north of the Horse Heaven Hills project area.

Page 14 is a CalTopo digital Geographic Information System map (www.Caltopo.com) showing the slope shading contours and the fire history data layers simultaneously. Four-mile radial circles were drawn around six selected fire perimeter locations, and a polygon was then drawn around the external perimeter of these circles. The polygon identifies a potential restricted airspace zone needed to ensure the safety of aerial firefighters.

Page 15 is a CalTopo digital Geographic Information System map (www.Caltopo.com) showing the slope shading contours and the fire history data layers simultaneously. Two-mile radial circles were drawn around six selected fire perimeter locations, and a polygon was then drawn around the external perimeter of

LAW OFFICES OF
J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
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these circles. The polygon identifies a smaller potential restricted airspace zone needed to ensure the safety of aerial firefighters.

Q: Please describe your observations and comments on the Horse Heaven Hills Wind Farm and how it relates to aerial firefighting operations.

A: The Horse Heaven Wind project as mapped and described in the information I received would, for all intents and purposes, be indefensible by air. The communities and structures adjacent to, or nearby, the project would also be indefensible using fixed wing aircraft. Aerial firefighting efforts would either be impossible or rendered totally ineffective due to the height and spacing of the turbines in addition to their placement on the higher ground, which negates the ability to prevent fire from running uphill or "backing behavior," which is typical in terrain described and illustrated in the project maps.

Aerial assets are also prohibited from dropping retardant on electrical infrastructure and any watercourses in the fire area, further reducing the capability of the aircraft to assist in building effective fire lines. Fire retardant weighs nine pounds per gallon. Dropping at between 150 and 160 knots at low altitude would cause catastrophic damage to any of the proposed infrastructure were it to be hit during routine fire fighting activity.

Q: Please describe your opinion on how close the turbines can be located if airspace must be restricted to ensure that aerial firefighting operations can be conducted safely.

A: Turbine location, blade turbulence, tip vortex, quantities and spacing of turbines, and proximity to water courses, communities and other structures impact aerial

LAW OFFICES OF
J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
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firefighting capability and effectiveness of aerial tankers, particularly LATS (Large Air Tankers) and VLATS (Very Large Air Tankers). Blade turbulence and tip vortex also impact helicopter operations.

Between three and four nautical miles spacing would at least make aerial firefighting possible in order to save lives and property. FAA TERPS, and ICAO Pan Ops dictate maneuvering minimum radius of turn for large aircraft as well as minimum climb rates to avoid known obstacles in approach and departure corridors where obstructions are known and accurately mapped; 2.7 nautical miles is the minimum radius of turn for category E aircraft with maneuvering speeds of 168 plus knots. A climb of 200 feet per nautical mile is the minimum for most departure procedures. If the ridge top is 2000 feet msl and it has a 500-foot tower on top of it, climb capability would be exceeded quickly.

Based upon the above information it is my opinion that turbines would require spacing of three to four nautical miles to provide aircraft with the ability to safely and effectively fight fire.

Q: Are you providing photographs?

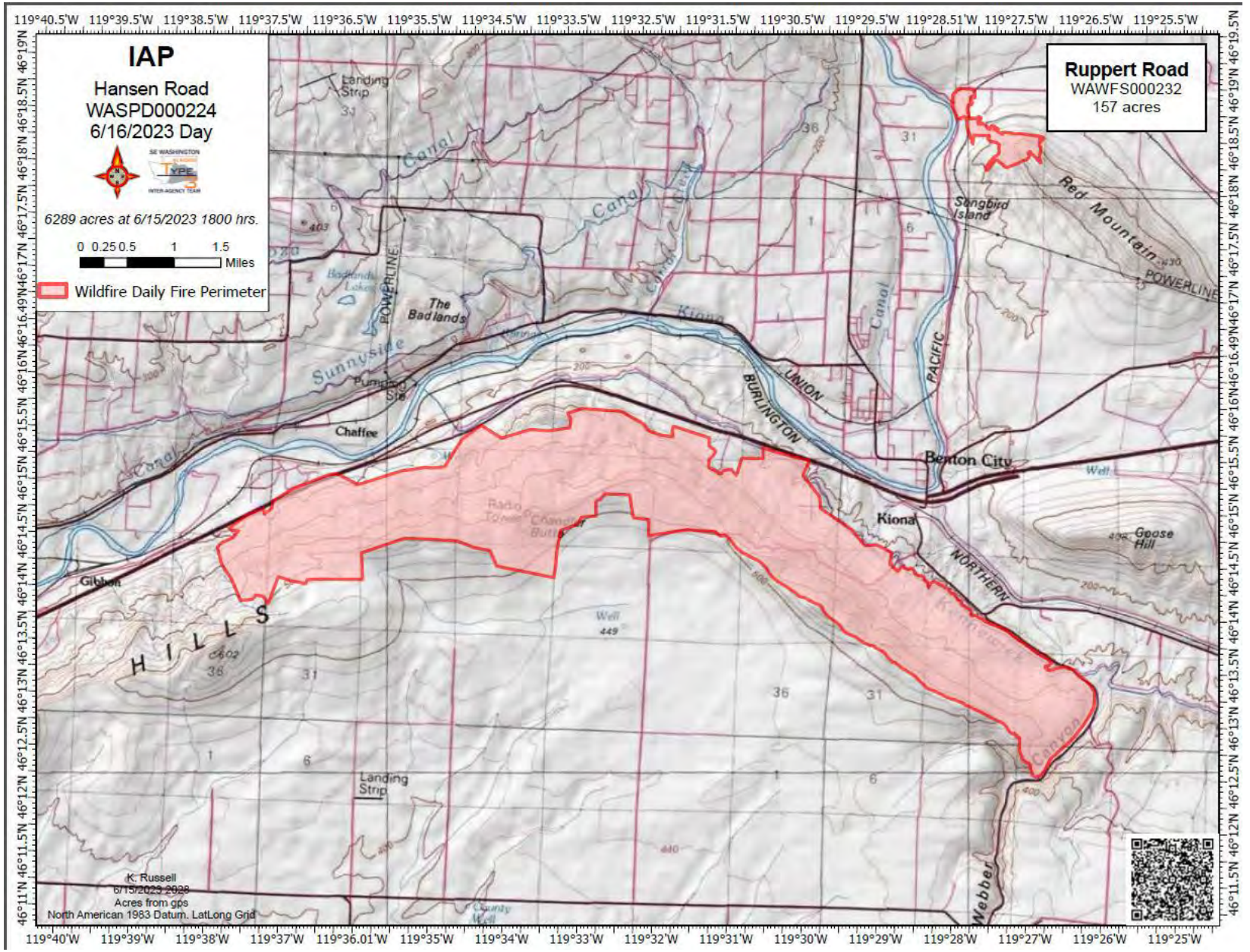
A: Yes, attached.

I declare under penalty of perjury under the laws of the State of Washington that my testimony and reports are true and correct to the best of my knowledge and belief.

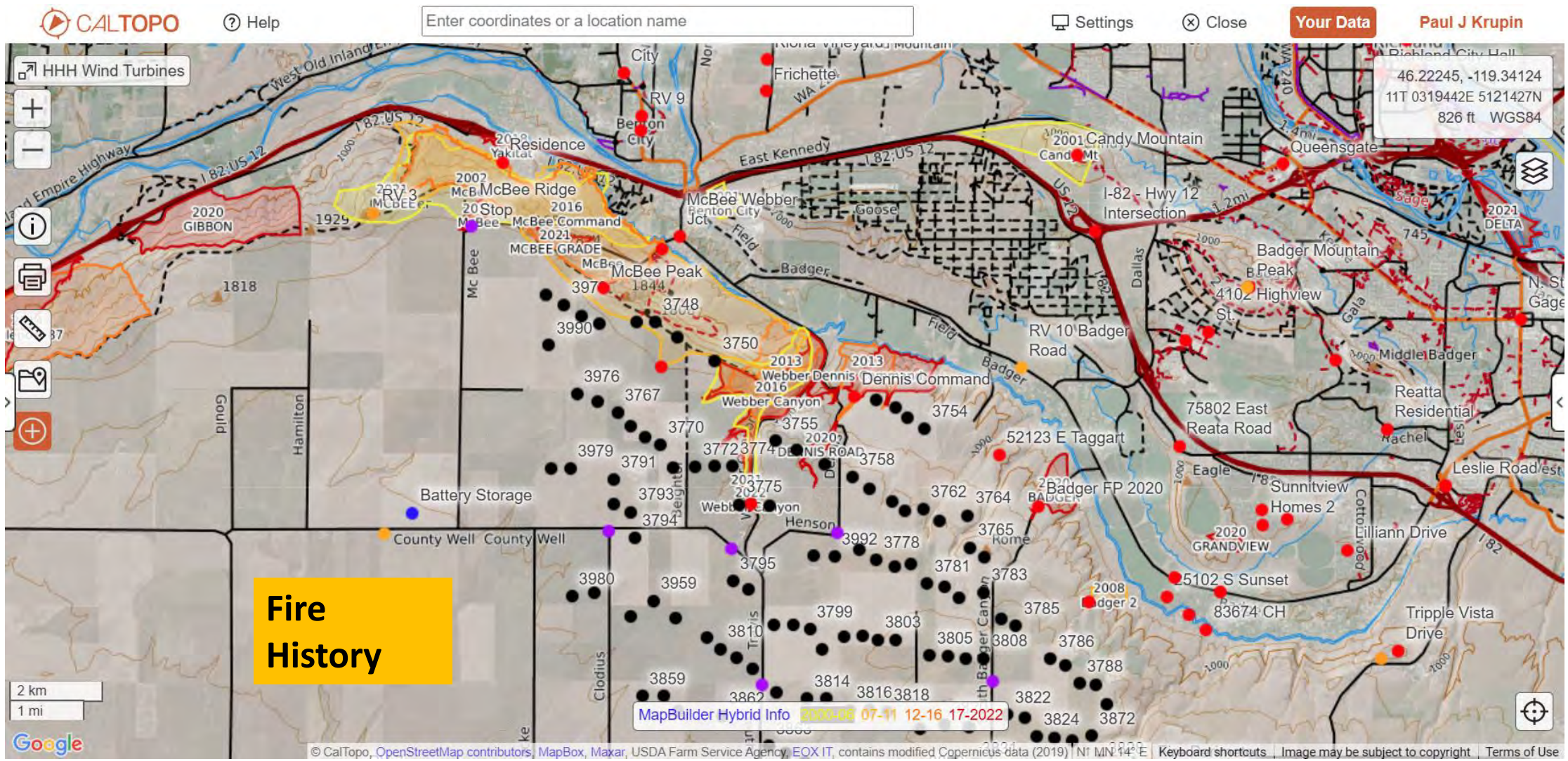
Signed this 3rd day of September 2023 in Fort Jones California

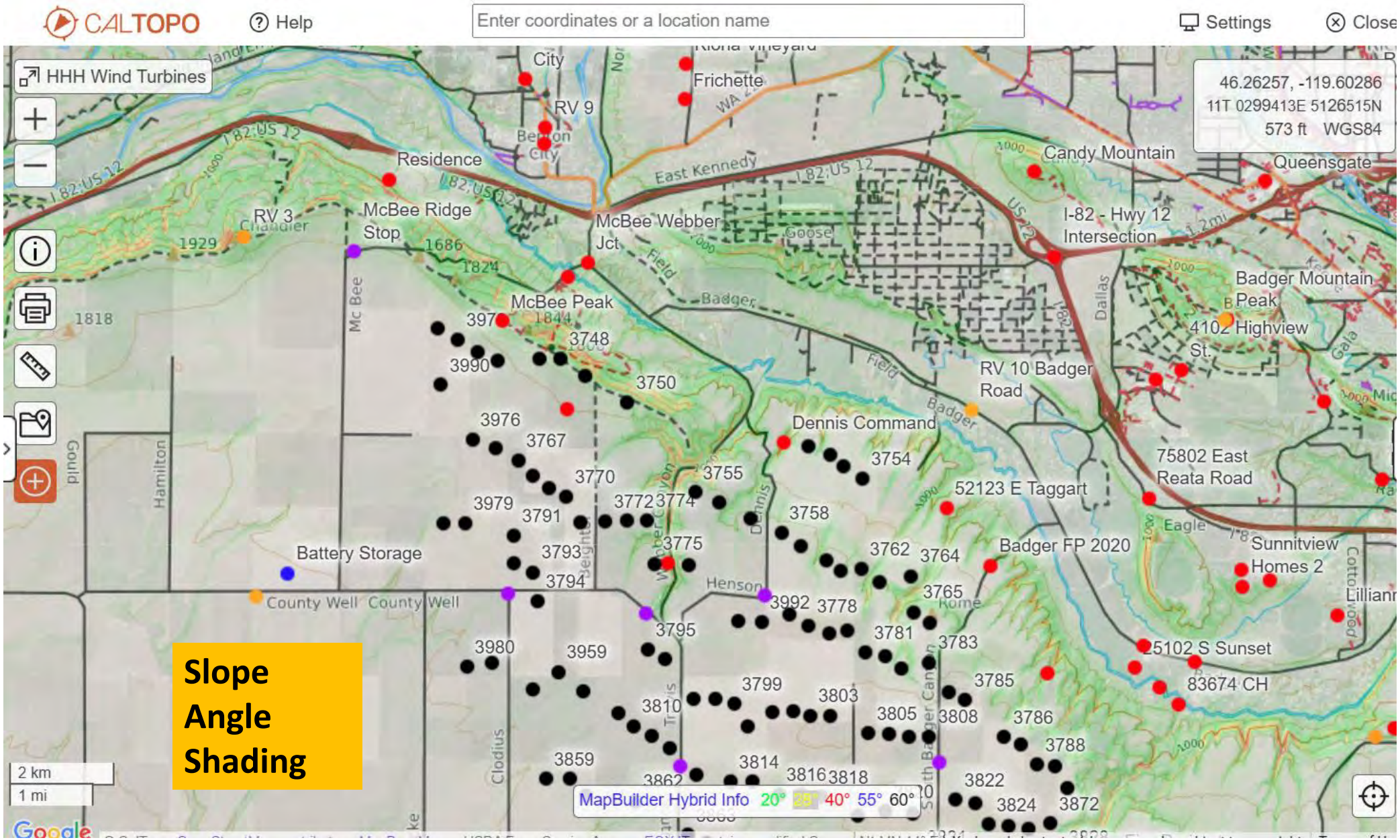
Mark Baird___/s/_____

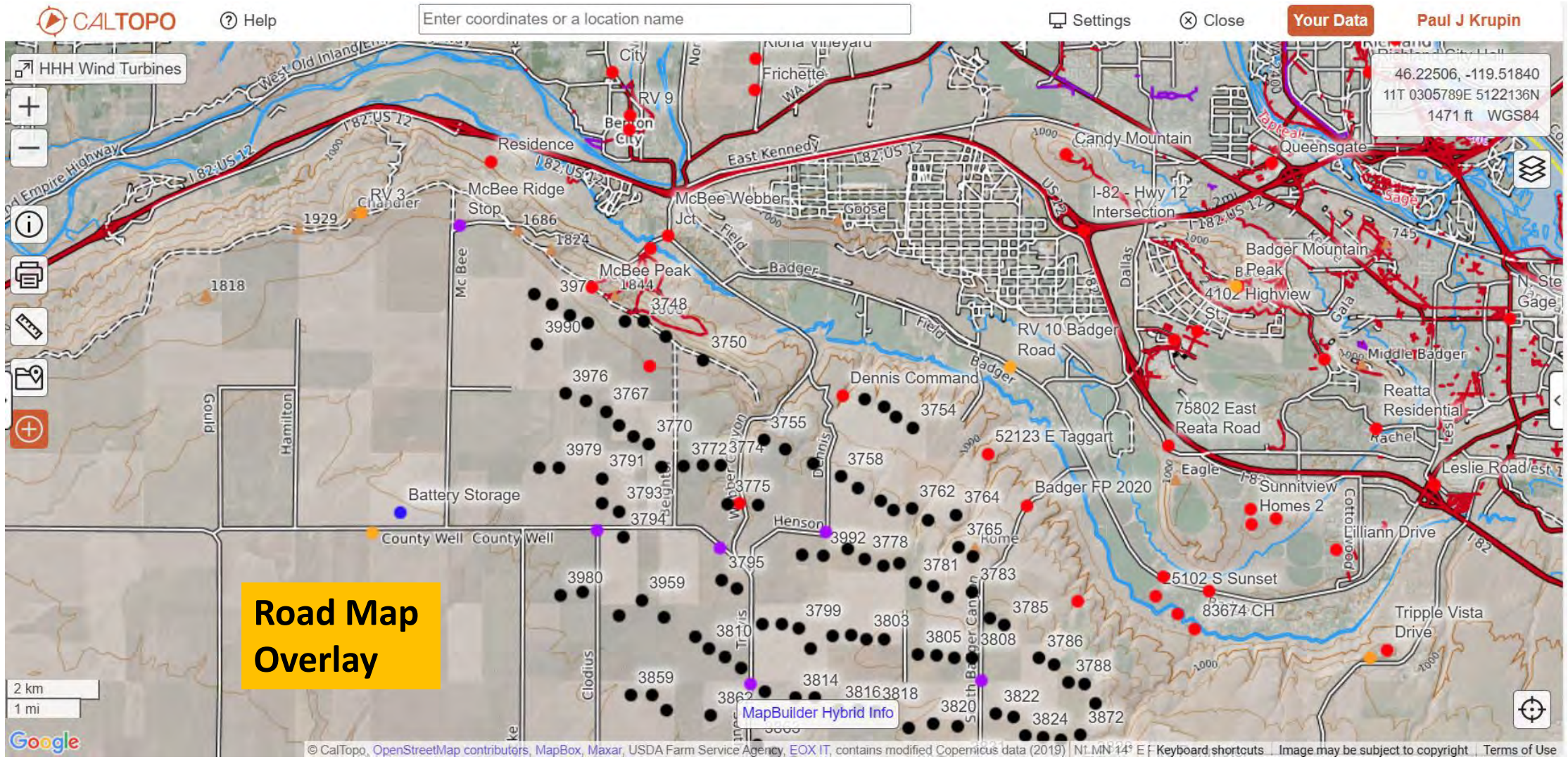
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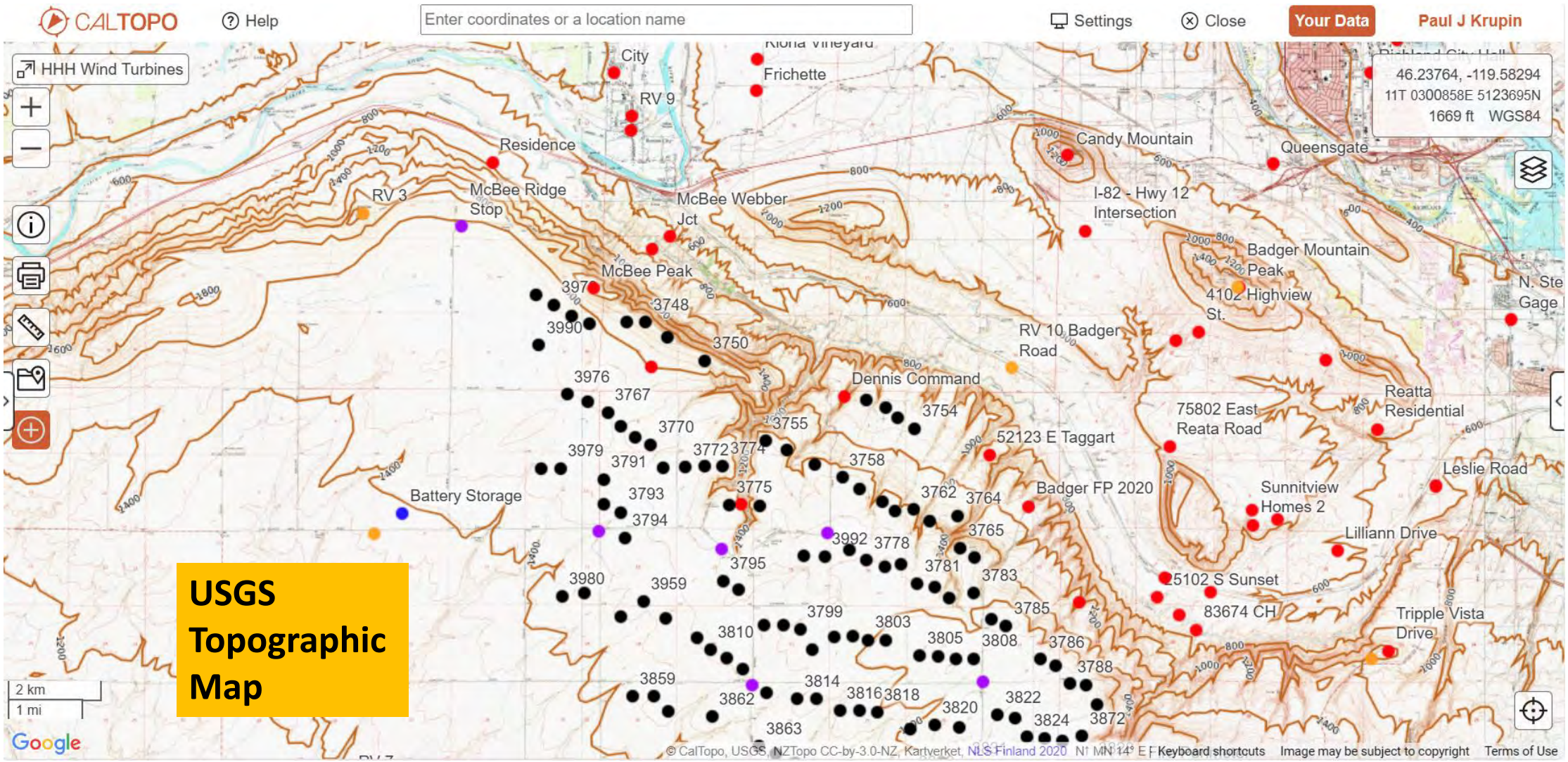

IAP
Hansen Road
WASPD000224
6/16/2023 Day
6289 acres at 6/15/2023 1800 hrs.
0 0.25 0.5 1 1.5
Miles
Wildfire Daily Fire Perimeter
Ruppert Road
WAWFS000232
157 acres
K. Russell
6/15/2023 2028
Acres from gps
North American 1983 Datum. LatLong Grid
Kiona
Benton City
Chaffee
Gibbon
The Badlands
Songbird Island
Red Mountain
Goose Hill
HILLS
POWERLINE
BURLINGTON
UNION
PACIFIC
NORTHERN
Sunnyside Canal
Landing Strip
Webber Canyon

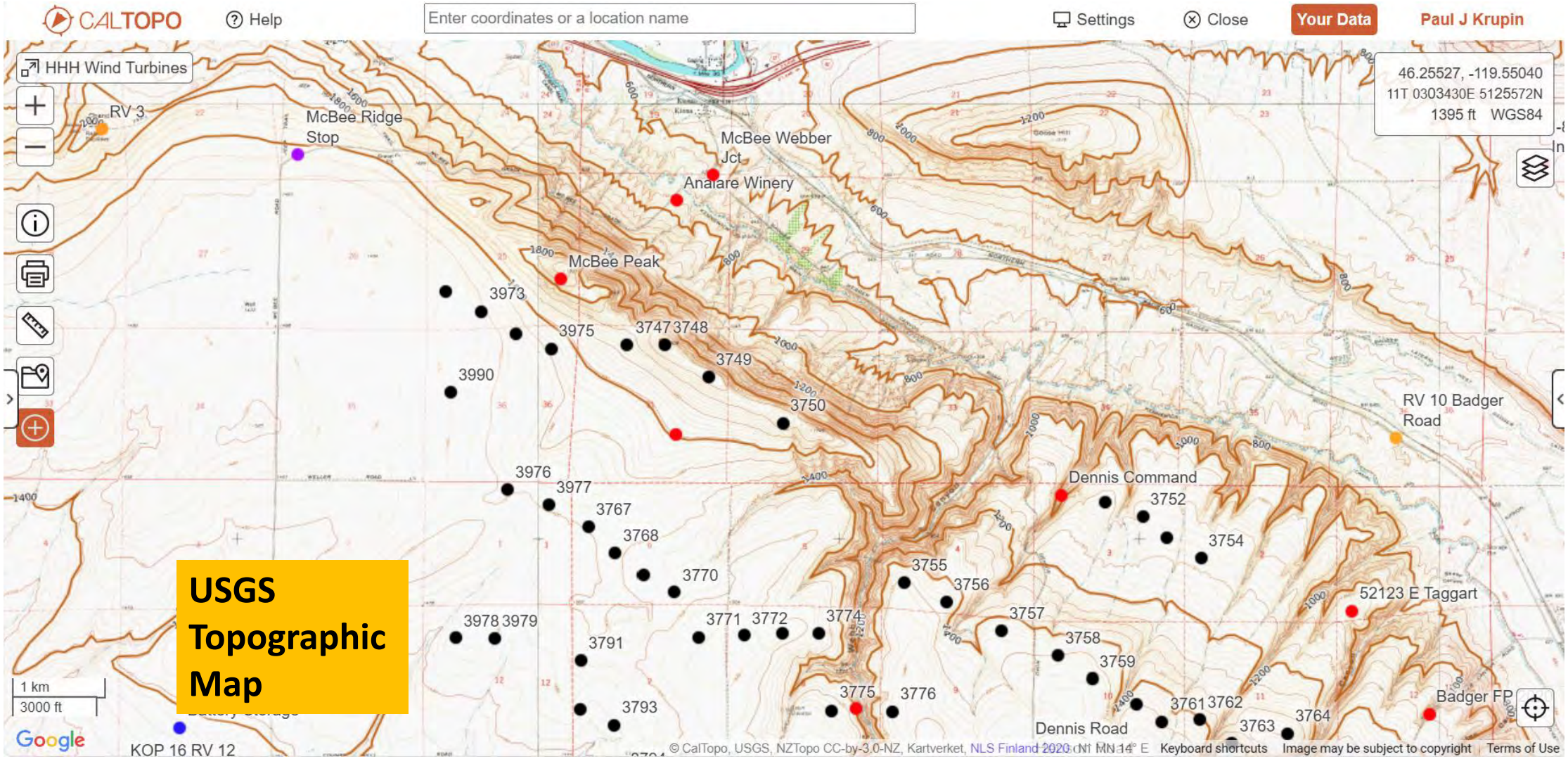



CALTOPO
Help
Enter coordinates or a location name
Settings
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Your Data
Paul J Krupin
HHH Wind Turbines
46.22245, -119.34124
11T 0319442E 5121427N
826 ft WGS84
Fire History
2 km
1 mi
Google
MapBuilder Hybrid Info
© CalTopo, OpenStreetMap contributors, MapBox, Maxar, USDA Farm Service Agency, EOX IT, contains modified Copernicus data (2019)
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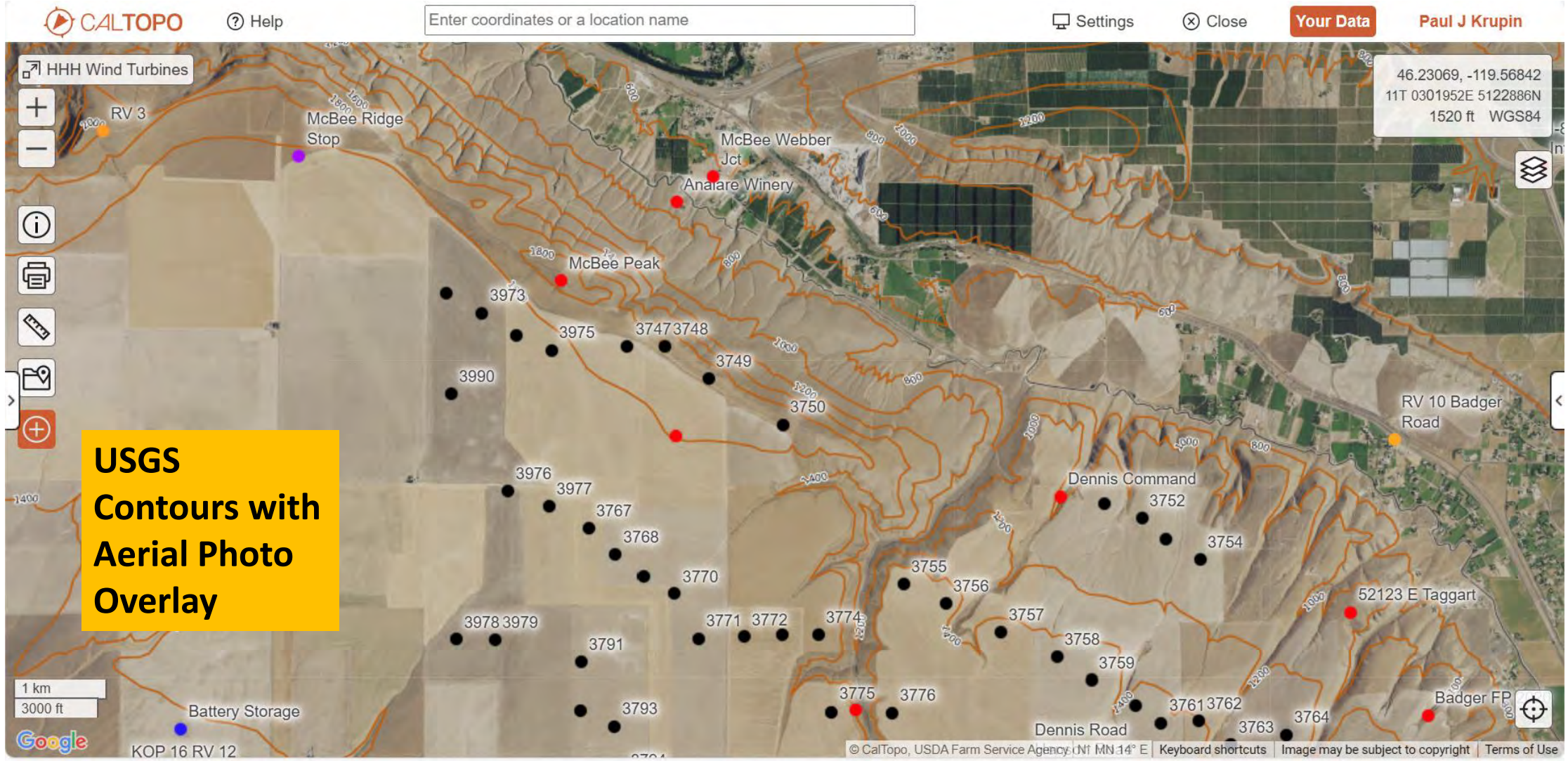

CALTOPO
Help
Enter coordinates or a location name
Settings
Close
HHH Wind Turbines
46.26257, -119.60286
11T 0299413E 5126515N
573 ft WGS84
Slope
Angle
Shading
2 km
1 mi
MapBuilder Hybrid Info 20° 28° 40° 55° 60°
Google

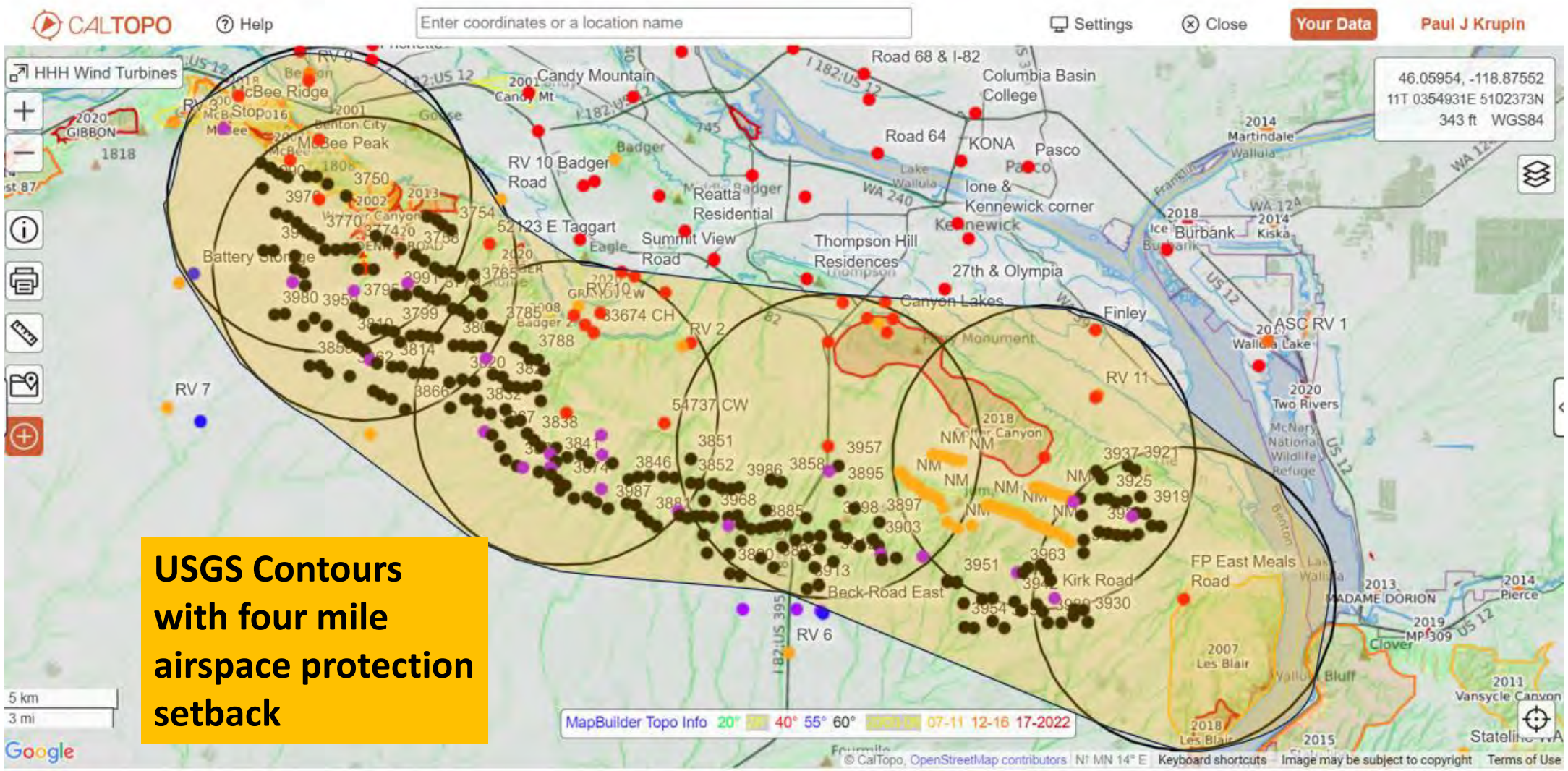

CALTOPO
Help
Enter coordinates or a location name
Settings
Close
Your Data
Paul J Krupin
HHH Wind Turbines
46.22506, -119.51840
11T 0305789E 5122136N
1471 ft WGS84
Road Map Overlay
MapBuilder Hybrid Info
2 km
1 mi
Google
© CalTopo, OpenStreetMap contributors, MapBox, Maxar, USDA Farm Service Agency, EOX IT, contains modified Copernicus data (2019) | NT MN 14° E | Keyboard shortcuts | Image may be subject to copyright | Terms of Use


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Help
Enter coordinates or a location name
Settings
Close
Your Data
Paul J Krupin
HHH Wind Turbines
46.23764, -119.58294
11T 0300858E 5123695N
1669 ft WGS84
City
Frichette
RV 9
Residence
RV 3
McBee Ridge Stop
McBee Webber Jct
McBee Peak
Candy Mountain
Queensgate
I-82 - Hwy 12 Intersection
Badger Mountain Peak
4102 Highview St.
RV 10 Badger Road
Dennis Command
75802 East Reata Road
Reatta Residential
52123 E Taggart
Badger FP 2020
Sunnitview Homes 2
Leslie Road
Lilliann Drive
25102 S Sunset
83674 CH
Tripple Vista Drive
Battery Storage
3970
3748
3990
3750
3976
3767
3770
3755
3754
3979
3791
3772
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3810
3805
3808
3786
3788
3859
3862
3814
3816
3818
3820
3822
3824
3872
3863
2 km
1 mi
Google
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USGS Topographic Map

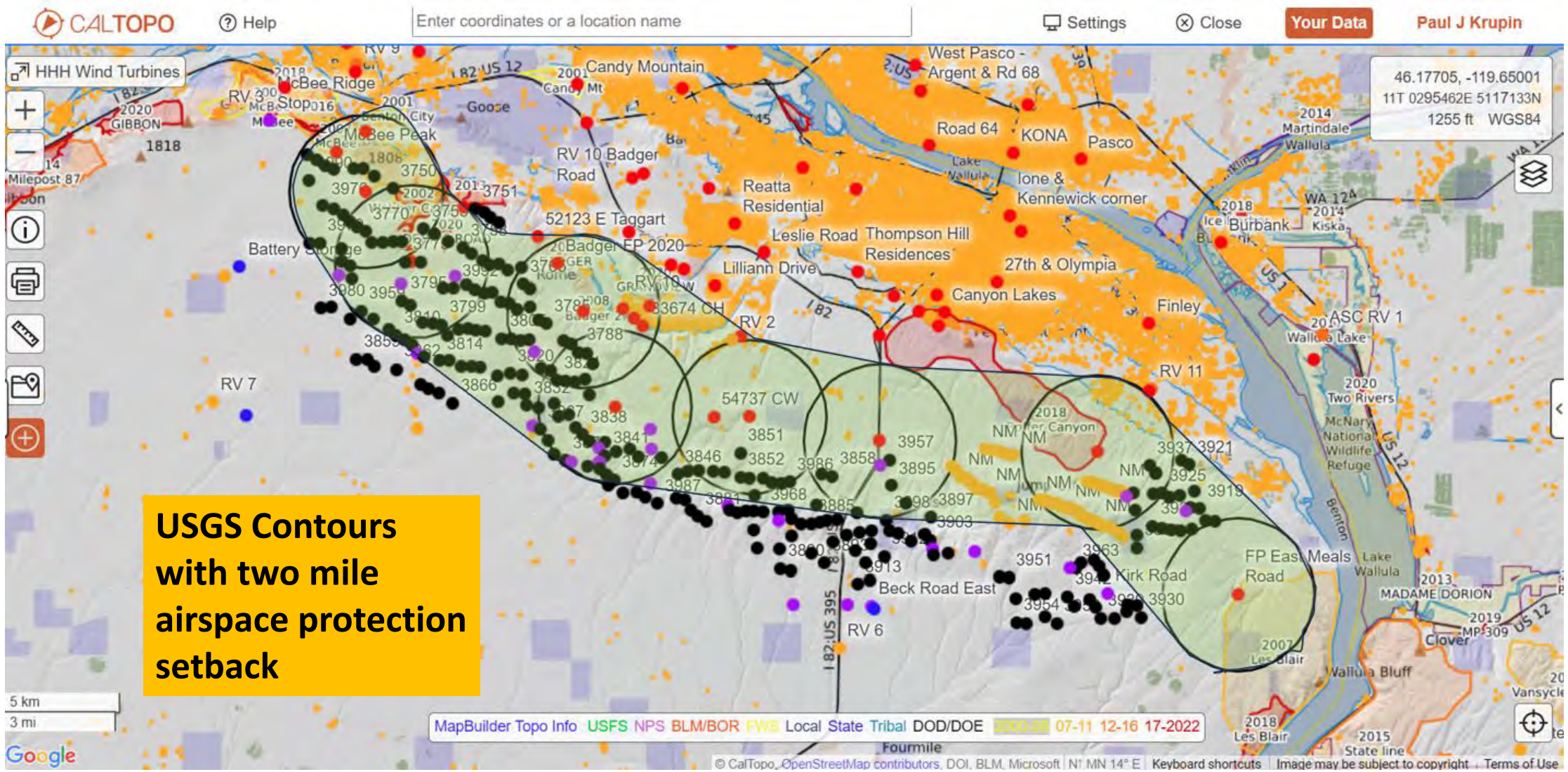


USGS Topographic Map


CALTOPO
Help
Enter coordinates or a location name
Settings
Close
Your Data
Paul J Krupin
HHH Wind Turbines
46.23069, -119.56842
11T 0301952E 5122886N
1520 ft WGS84
RV 3
McBee Ridge Stop
McBee Webber Jct
Anaiare Winery
McBee Peak
3973
3975
3747 3748
3749
3990
3750
RV 10 Badger Road
3976
3977
3767
3768
3770
Dennis Command
3752
3754
3755
3756
3757
3758
3759
52123 E Taggart
3978 3979
3791
3771 3772
3774
3775
3776
3761 3762
3763
3764
Badger FP
3793
Battery Storage
KOP 16 RV 12
Dennis Road
1 km
3000 ft
Google
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USGS Contours with Aerial Photo Overlay



USGS Contours with four mile airspace protection setback


CALTOPO
Help
Enter coordinates or a location name
Settings
Close
Your Data
Paul J Krupin
HHH Wind Turbines
46.17705, -119.65001
11T 0295462E 5117133N
1255 ft WGS84
USGS Contours with two mile airspace protection setback
McBee Ridge
McBee Peak
Candy Mountain
West Pasco - Argent & Rd 68
Road 64
KONA
Pasco
RV 10 Badger Road
Reatta Residential
Ione & Kennewick corner
52123 E Taggart
Leslie Road
Thompson Hill Residences
Lilliann Drive
27th & Olympia
Canyon Lakes
Finley
Burbank
ASC RV 1
RV 11
RV 2
RV 7
RV 6
54737 CW
53674 CH
Beck Road East
Kirk Road
FP East
Meals
Two Rivers
McNary National Wildlife Refuge
MADAME DORION
Clover
Wallula Bluff
Fourmile
5 km
3 mi
MapBuilder Topo Info USFS NPS BLM/BOR FWS Local State Tribal DOD/DOE 07-11 12-16 17-2022
Google
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From:	Paul Krupin
To:	EFSEC mi Comments; EFSEC (EFSEC)
Subject:	Horse Heaven Wind Farm - Stricken Testimony on Air Quality Fugitive Dust Impacts Paul Krupin
Date:	Saturday, October 21, 2023 9:03:03 AM
Attachments:	Paul Krupin EXH-5915_S (revised) Supplemental Testimony.pdf

External Email

We are submitting the Supplemental Testimony provided by Air Quality Fugitive Dust Impacts as public comments.

This Supplemental Testimony was submitted by Tri-Cities CARES on September 5, 2023 and was stricken from the Horse Heaven Hills Adjudication by Judge Torem on September 22, 2023.

Tri-Cities CARES filed a Motion for Reconsideration.

Attachment

EXH-5915_S Supplemental Testimony Statement

Appreciatively,

Paul J. Krupin, BA, MS, JD
Board Member on behalf of TRI-CITIES C.A.R.E.S
Visit: http://www.TriCitiesCARES.org
509-531-8390 cell 509-582-5174 landline Paul@Presari.com

TCC
Supplemental Testimony
Paul Krupin
EXH-5915_S

BEFORE THE STATE OF WASHINGTON
ENERGY FACILITY SITING EVALUATION COUNCIL

In the Matter of the Application of: Scout Clean Energy, LLC, for Horse Heaven Wind Farm, LLC, Applicant.	DOCKET NO. EF-210011 SUPPLEMENTAL TESTIMONY OF TCC WITNESS PAUL KRUPIN

Q: Please state your name and address.

A: Paul Krupin, 2404 South Lyle St., Kennewick WA 99337.

Q: Please briefly describe your work experience and qualifications.

A: My education and resume were provided in EXH-5301_T and in EXH-5305_S.

Q: Please describe what you are providing in this submittal.

A: I am providing supplemental testimony regarding the fugitive dust impacts that will be caused by the proposed wind farm project and in response to questions that were raised by Council members in the adjudication hearing on August 23, 2023.

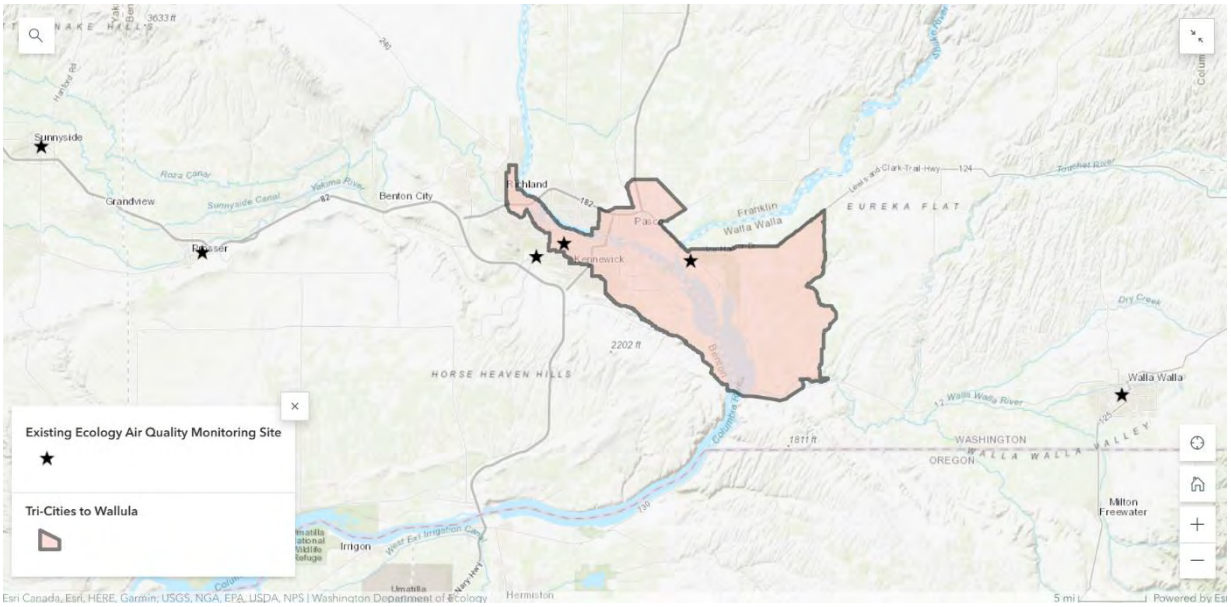
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J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
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Kennewick WA is designated as an overburdened community highly impacted by air pollution.[1]

RCW 70A.65.010 (54) defines "Overburdened Communities" as:

> *"a geographic area where vulnerable populations face combined, multiple environmental harms and health impacts or risks due to exposure to environmental pollutants or contaminants through multiple pathways, which may result in significant disparate adverse health outcomes or effects."*

The following map identifies overburdened communities in Washington State:

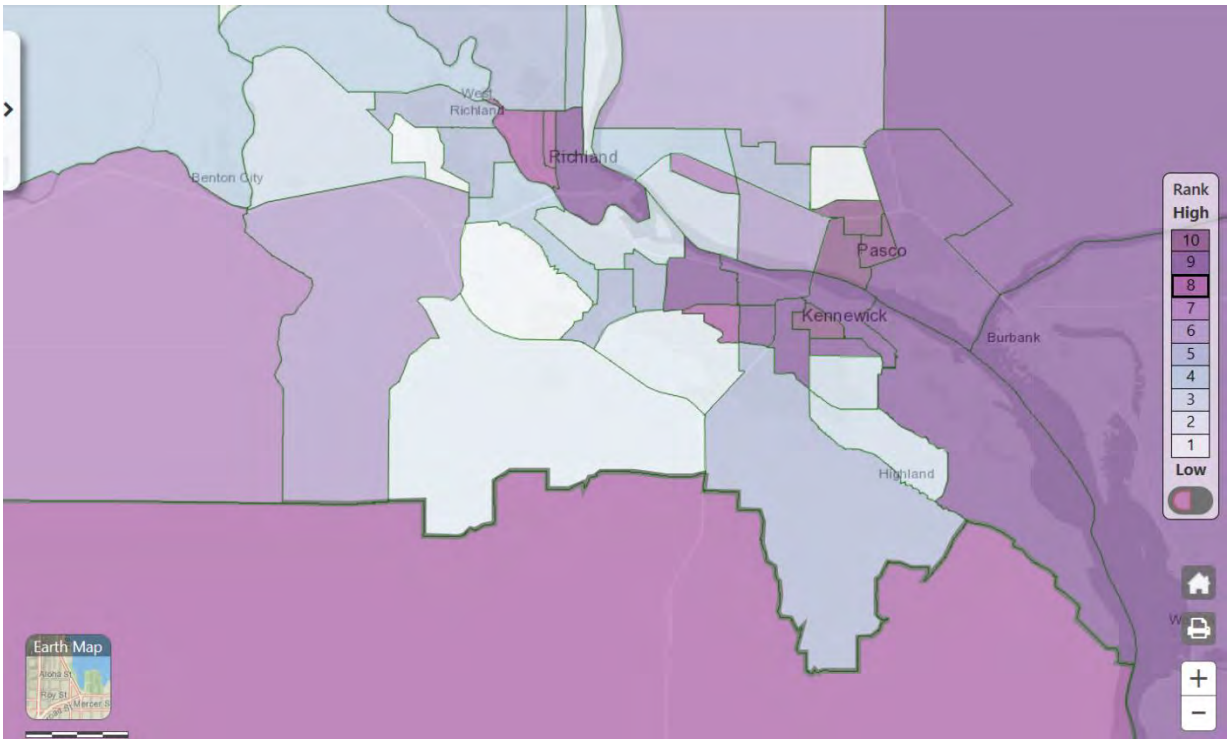


The map shows the location of the existing air quality monitoring stations.

The Washington State Department of Health publishes an Environmental Health Disparities Map that states that the Tri-Cities are identified as among the worst

[1] Reference: Overburdened Communities Highly Impacted by Air Pollution (arcgis.com) https://storymaps.arcgis.com/stories/c10bdbfc69984a9d85346be1a23f6338

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J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
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overburdened communities exposed to poor air quality with associated health impacts.[2]

The area is already impacted severely by air pollution from fugitive dust. It is classified in the highest categories for environmental health disparities compared to the rest of the state of Washington. The Ecology report describes this area in pertinent part as follows:

> "At approximately 173 square miles, this is the largest overburdened community highly impacted by air pollution by area that has been identified so far. However, the pollutants of concern are primarily regional in scale. Ozone forms in the atmosphere on hot summer days when two forms of air pollution – nitrogen oxides (NOx) and volatile organic compounds (VOCs) – react with sunlight. NOx and VOCs come from many sources, but cars and trucks are the largest contributors. Conditions in the Tri-Cities area, including prevailing winds, push ground-level ozone up against the Horse Heaven Hills, where it can become concentrated in the basin over more populated areas. PM 10 and PM 2.5 also collect in the basin, and come from sources like windblown dust from construction, agriculture, or open lands, outdoor and agricultural burning,

[2] Washington Environmental Health Disparities Map https://doh.wa.gov/data-and-statistical-reports/washington-tracking-network-wtn/washington-environmental-health-disparities-map

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J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
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residential wood burning, wildfires, mobile sources like cars and trucks, and industrial sources."

This area also is subject to occasional "exceptional events" for air quality like windblown dust storms, which can lead to temporary exceedances of the national ambient air quality standards for particulate matter and unhealthy air quality.

I am concerned that the project application fails to identify and adequately characterize the air quality impacts. I believe that they are underestimating the the amount of fugitive dust that will be created during construction of the wind farm project. [3]

The Horse Heaven Hills Wind Turbine Project proposes over 100 miles (200 acres) of gravel and dirt road to the area immediately adjacent to and upwind from the Tri-Cities They do not present any alternatives at all to reduce and eliminate access roads and reduce the potential for dust generation.

The application underestimates the dust that will be generated in the highly erodible fine grained glacial soils – the loess that covers the agricultural land the project is located on. The blowing dust created by the 100 miles of proposed roads will be well beyond anything identified by the project in the Application.

I am concerned that they will not be able to control the dust with water due to the evapotranspiration rates, over 50 inches per year, found in this area. Their declaration that a Dust Control Plan will satisfy requirements is not rational and the statement they

[3] Updated ASC at page 3-59 and 3-60. Table 3.2-2 Emissions Totals by Project Phase.

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J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
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will mitigate the dust is without scientific foundation. They fail to recognize a well-documented fact. That the water applied to the roads to attempt to achieve dust control simply and quickly evaporates into the air.

There are several scientific studies that indicate that fugitive dust emissions from construction activities will be greater than that identified by the project.

Major dust storms may occur several times a year. Exceedances of the US Federal Air Quality Standard for PM10 occurred 20 times between 2000 and 2010 in the city of Kennewick, WA, which is located immediately downwind of the HHH. [4]

The highest daily PM10 concentration measured in Kennewick during this time period was nearly ten times the concentration allowed by law. All of these PM10 exceedances were attributed to windblown dust.[5]

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[4] Sharratt, B.S., and G. Feng. 2009. Windblown Dust Influenced by Conventional and Undercutter Tillage within the Columbia Plateau, USA. Earth Surface Processes Landforms 34: 1223–1332.

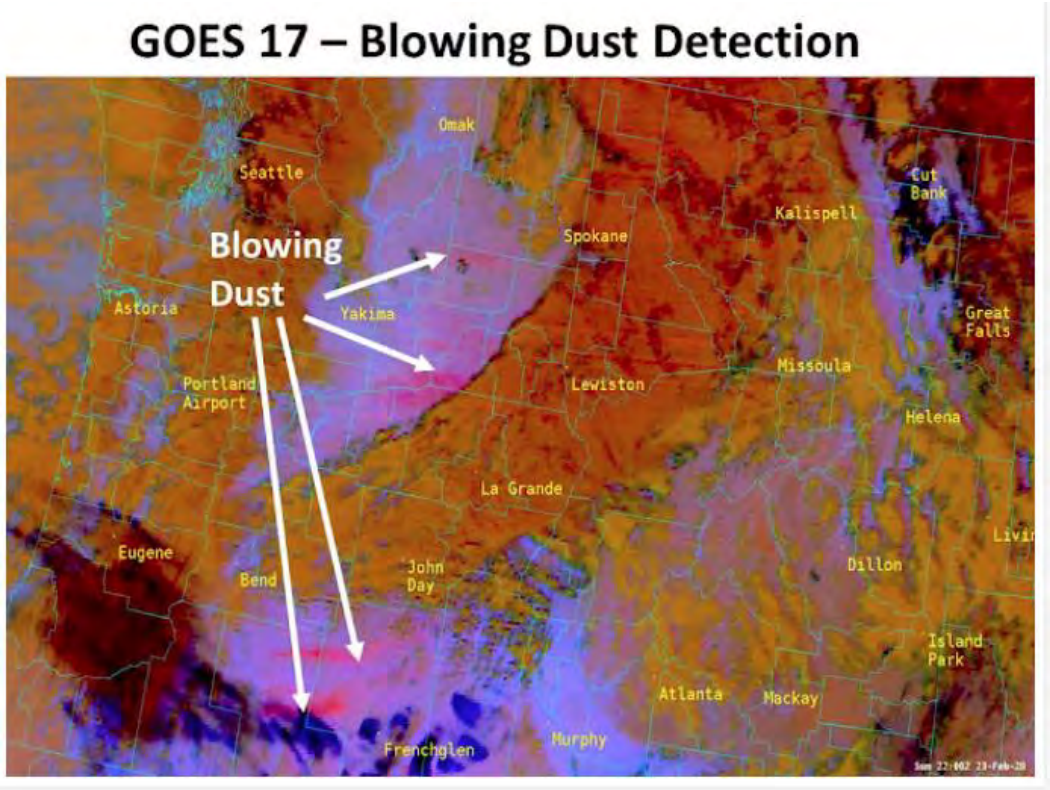
Sharratt, B., G. Feng, and L. Wendling. 2007. Loss of soil and PM10 from agricultural fields associated with high winds on the Columbia Plateau. Earth Surface Processes Landforms 32: 621–630

Sharratt, B.S., and R. Edgar. 2011. Implications of Changing PM10 Air Quality Standards on Pacific Northwest, Communities Affected by Windblown Dust. Atmospheric Environment 45: 4626–4630.

[5] Best management practices for summer fallow in the world's driest rainfed wheat region - Washington State University (wsu.edu), Page 2. https://rex.libraries.wsu.edu/esploro/outputs/9990050285420184 2?skipUsageReporting=true&recordUsage=false&institution=01ALLIANCE_WSU#file-0

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SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
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This GOES 17 weather satellite image highlights the dust on a windy dusty day in February 2020. [6]



This same article by Dr. Mass also contains a satellite photo showing the project area impacted by the dust and discussing car crashes that sent some people to the hospital and closed Interstate 82 for several hours.

[6] : Cliff Mass Weather Blog: Post Feb 20, 2020 Dust Storm Season Begins in Eastern Washington and Oregon

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J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
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I am concerned that the dirt and gravel roads constructed for the Horse Heaven Hills Wind Farm project will dramatically increase the sources and quantities of dust in the air that will blow and be deposited in the Tri-Cities.

Without an adequate source of water for dust control, there is no practical effective way to mitigate this impact. The project will make a very bad situation much worse.

The dust blowing into the Tri-Cities and the effects of PM10 and PM2.5 particles on our communities need to be adequately identified, fully and properly evaluated and reliably mitigated to prevent significant impacts to people in the Tri-Cities.

LAW OFFICES OF
J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
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This photo taken in the Spring of 2023 shows the dust from the HHH plateau blowing into Badger Valley during a dust storm event from the Summit View area in south Kennewick.



The applicant fails to identify and evaluate specifically that 100 miles of micrositing corridors on powdery thick soils that will be the sources of the dust that will cause significant impacts to fugitive dust emissions. The applicant fails to propose or even contemplate any remedy if it entails turbine elimination or relocation.

The Washington Department of Ecology's Comprehensive 2014 County Emission Inventory shows that emissions from agricultural activities are the largest source of PM10 in both the maintenance area and the HHH. The report states:
"For Benton County, emissions from agriculture were second only to construction dust as shown in Table 2. (Ecology, 2018)." [7]

[7] Reference: Publication 19-02-005 11 April 2019 High Wind Fugitive Dust Mitigation Plan (wa.gov) https://apps.ecology.wa.gov/publications/documents/1902005.pdf

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J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
aramburulaw.com

Table 2: Maintenance Area 2014 PM_{10} by source type in each county portion, pounds and percer pounds per season day.

Source Type	Category	Benton, lbs. per season day	Benton, % lbs. per season day	Walla Walla, lbs. per season day	Walla Walla, % lbs. per season day	*Maintenance Area Total*
Point	≥ 70 Tons PTE	0	0%	2,485	35%	*35%*
Point	< 70 Tons PTE	66	1%	140	2%	*3%*
Nonpoint	Ag. Burning	0	0%	0	0%	*0%*
Nonpoint	Ag. Tilling Dust	247	4%	2,133	30%	*34%*
Nonpoint	Ag. Harvesting Dust	114	2%	211	3%	*5%*
Nonpoint	Construction Dust	393	6%	307	4%	*10%*
Nonpoint	Paved Road Dust	68	1%	344	5%	*6%*
Nonpoint	Unpaved Road Dust	343	5%	104	1%	*6%*
Onroad	Mobile	7	0%	50	1%	*1%*
All Sources Total		*1,238*	*19%*	*5,774*	*81%*	*100%*

The applicant does not provide for adequate air monitoring and does not identify and commit to any increased monitoring of PM 10 and PM 2.5. There is no existing baseline on the smallest and most dangerous dust particles (PM2.5). The closest air monitoring station for PM 2.5 is in Toppenish 40 miles north and west of the project. I am concerned about the lack of monitoring of the air quality impacts that will result from the project. The project has not proposed any new air quality monitoring at all. Additional monitoring of the air quality impacts caused by the project is needed to protect the health and safety of the public.

LAW OFFICES OF
J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
aramburulaw.com

I declare under the penalty of perjury under the laws of the State of Washington that my testimony and reports are true and correct to the best of my knowledge and belief.

Signed this ___3__ day of September, 2023, in ___Kennewick WA _____.

_____PAUL KRUPIN_____ _____/s/_____

Printed Name

LAW OFFICES OF
J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
aramburulaw.com

From:	Paul Krupin
To:	EFSEC mi Comments; EFSEC (EFSEC)
Subject:	Horse Heaven Wind Farm - Stricken Testimony on Visual Aesthetics Analysis and Impacts Dean Apostol
Date:	Saturday, October 21, 2023 8:51:28 AM
Attachments:	EXH-5105_S Dean Apostol.pdf EXH-5106_S Dean Apostol maps graphics.pdf

External Email

We are submitting the Supplemental Testimony provided by Dean Apostol on Visual Aesthetics Analysis and Impacts as public comments.

This Supplemental Testimony was submitted by Tri-Cities CARES on September 5, 2023 and was stricken from the Horse Heaven Hills Adjudication by Judge Torem on September 22, 2023.

Tri-Cities CARES filed a Motion for Reconsideration.

Three attachments

EXH-5105_S Testimony Statement

EXH-5106_S – Dean Apostol Maps & Graphics

Appreciatively,

Paul J. Krupin, BA, MS, JD
Board Member on behalf of TRI-CITIES C.A.R.E.S
Visit: http://www.TriCitiesCARES.org
509-531-8390 cell 509-582-5174 landline Paul@Presari.com

TCC
Supplemental Testimony
Dean Apostol
EXH-5105_S

BEFORE THE STATE OF WASHINGTON
ENERGY FACILITY SITING EVALUATION COUNCIL

In the Matter of the Application of: Scout Clean Energy, LLC, for Horse Heaven Wind Farm, LLC, Applicant.	DOCKET NO. EF-210011 SUPPLEMENTAL TESTIMONY OF TCC WITNESS DEAN APOSTOL

Supplemental Testimony

Revised 9/1/2023

Dean Apostol

The following includes additional information that responds to issues raised at the adjudication session on August 24. Questions came up from the EFSEC Advisory Panel covering three areas:

1. What is the value of scenery to people?
2. What are appropriate public outreach approaches to determine community scenic values, including BIPOC communities?
3. What are possible mitigation or impact reduction/avoidance strategies that could lessen visual impacts of the HHH project?

Value of scenery

Much research has been done on the many values of scenic landscapes to people. Numerous research studies have documented positive reactions in people viewing scenic landscapes, or while out in nature. While it may be obvious that people value scenic views, it may not be obvious why. But a reasonable summary is that it makes people feel better physically and

LAW OFFICES OF
J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
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mentally. It relaxes them, lowers blood pressure, lowers stress, improves vitality, and even helps in healing.

People make significant efforts, and go to great expense, to visit scenic landscapes. Grand Canyon, Yosemite, the Rockies, Yellowstone, Mt Rainier, Mt Hood, the San Juan Islands, the Columbia Gorge, and the Oregon Coast are some examples. These are our most outstanding landscapes, and they are often protected by federal or state governments. They usually exhibit some combination of complex land form, water, natural vegetation, seasonal colors, harmonious cultural features, and often afford panoramic large scale views. People take photos and share them with friends, though the photos rarely can capture the scale and grandeur.

Other landscapes are attractive, containing some, but fewer of the elements listed above. They are important close to home views for many people. Some regional examples include; Forest Park in Portland, the Blue Mountains, (Southwest Washington), parts of the Willamette Valley, the Sierra foothills, and Southern Puget Sound. These are locally or regionally important, but often times are unprotected, or only partially protected. The Horse Heaven Hills fits into this category. They are an important part of local identity. People enjoy these areas day to day, but might not travel far to experience them.

A third tier of landscapes are sometimes called “ordinary”, or common. Usually they have low lying or level terrain, lack large water bodies, and may be more agricultural than natural. They often have some scenic value based mainly on their undeveloped condition, but because there are a lot of similar landscapes, little effort is made to protect them. They are taken for granted. Local people may object to development or change, but may have difficulty gaining allies unless there are other values, such as wildlife, wetlands, or archeological sites.

Because the Horse Heaven Hills are locally important for scenic values, proposals to develop them with renewable energy should respect them and make an effort to avoid, minimize, or

LAW OFFICES OF
J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
aramburulaw.com

mitigate visual impacts. If this is not done, an important source of well being will be lost or compromised, with hidden costs that may not be readily apparent or easy to calculate.

Sample References on the Value of Scenery

Lothian, Andrew. 2017. "*The Science of Scenery*." Available Through Amazon Books.

This book includes a comprehensive account of scenery, and scenic beauty. It takes a scientific approach, meaning an objective way of understanding scenery and scenic values. It includes chapters on how humans view scenic beauty, including as art, as travelers, as economic value, for its health benefits. Chapter 13 is "*The Doctor's Eye: Restorative and Health Benefits of Landscape*." This chapter cites and describes hundreds of studies that show that views of nature or natural areas have multiple health benefits to people: reduced stress, reduced blood pressure, greater sense of relaxation, tranquility, happiness, vitality, more rapid restoration from mental fatigue, faster recovery from illness, lower levels of aggression, fewer stress related illnesses, better overall health.

Dr Lothian maintains a web site with valuable information, references, and links on this topic. https://scenicsolutions.world/

Kaplan, Stephen. September 1995. *The Restorative Benefits of Nature. Journal of Environmental Psychology*. Volume 15, Issue 3. Pages 169-182.

Kaplan's theory is that viewing natural scenes improves health due to "Attention Restoration Theory." People spend our days focused on completing tasks, which leads to mental exhaustion, which can be remedied by spending time observing or being in a natural setting. Aesthetically pleasing environments are restorative. They engage us and hold our attention effortlessly. The Horse Heaven Hills, because they are so visible from such a large part of the Tri Cities area, probably does this for many people, at little or no cost.

Hyunju Jo, Chorong Song, and Yoshifumi Miyazaki. 2019. Physiological Benefits of Viewing Nature: A Systematic Review of Indoor Experiments. International Journal of Environmental

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J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
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Research and Public Health. On line publication.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6926748/

This paper is a review of the results of 37 articles that present evidence of positive physiological effects of viewing nature and natural scenes. Accumulation of scientific evidence of the physiological relaxation associated with viewing elements of nature are useful for preventive medicine by providing nature therapy.

Kate E. Lee, Kathryn JH Williams, Leisa D Sargent, Nicholas SG Williams, Katherine A Johnson. 2015. 40 *Second Green Roof Views Sustain Attention.* Journal of Environmental Psychology, Vol 42, June 2015, pp 182-189.

This study found that micro breaks (a few minutes) viewing a flowering green ecoroof boosts sustained attention, results in fewer cognitive errors, improves response to tasks.

Seresinhe, Canuki Illushka, Tobias Preis, & Helen Susannah Moat. 2015. *Quantifying the Impact of Scenic Environments on Health*. In Scientific Reports.

www.nature.com/scientificreports

This study used data from "*Scenic or Not,"* a British website that crowd-sources ratings of "scenicness" for geotagged photographs across Great Britain, and combined this with reported health from the Census for England and Wales. The results provide evidence that the aesthetics of the environment may have quantifiable consequences for well being.

White, Mathew P., et al. 2019. *Spending at least 120 Minutes a Week in Nature is Associated with Good Health and Well Being.* Scientific Reports. PDF. June 2019.

Ulrich, Roger S. 1979. *Visual Landscapes and psychological well-being*. Landscape Research. Volume 4, 1979.

Dr Ulrich did pioneering research in the health benefits of natural scenery. He showed how individuals feel significantly better after visual exposure to natural scenes compared to those dominated by urban elements. Views of nature increased "positive affect," reduced fear

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J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
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arousal, and production of pleasurable feelings. In other research Ulrich showed how viewing nature aided in healing. Ulrich says people "feel" positive emotions about natural scenes before we rationalize them. His work influenced the development of "healing gardens" in the health care industry.

Community Outreach

A second question that came up during my oral testimony was about what can or should be done to improve community outreach on the Horse Heaven Hills project, in particular to the BIPOC community of the Tri Cities area. I had made the observation in written testimony that Scout Energy did not appear to have done much with respect to asking the community to help identify key viewing areas. Additionally, they do not appear to have asked people what they value about the Horse Heaven Hills, or how they feel about how the project impacts them, except through standard input channels required by EFSEC.

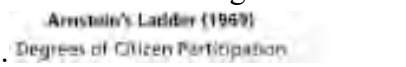
In my book, *The Renewable Energy Landscape* (Routledge Press 2016) Chapter 10 (Richard Smardon and James Palmer) addresses the question of engaging communities in siting and designing renewable energy projects. They argue that participatory processes are essential components in the success of siting renewable projects. Key factors include; participation in planning, trust and confidence in the developers **and decision makers**, equity of impacts, and economic benefits. Various participatory processes are explained and applied. While most people in the USA and elsewhere generally support renewable energy, including wind, there are widespread concerns about landscape impacts. In some countries, like Great Britain, new land based wind projects have all but been abandoned in favor of offshore. And regarding offshore, the public is telling developers and the government to get projects as far offshore as possible. If possible get projects over the horizon.

In Australia, a comprehensive study was done by Andrew Lothian to try and determine where to site wind projects to reduce visual impacts. This study asked people what landscapes they

LAW OFFICES OF
J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
aramburulaw.com

most valued, and showed images of them with wind development. It showed that people care most about landscapes (and seascapes) they consider to be scenic. The loss of scenic quality after wind was added was significant. There was much less concern about developing wind on less scenic, mostly agricultural lands, with little or no loss of scenic value after adding wind. People and communities get very frustrated when public involvement is or is perceived to be "token." That is, if the community is given no genuine opportunity to say what is of value to them, or to affect the siting or design of the project, then people become dissatisfied, as should be expected.

In 1969, in the days before public involvement was a legal requirement for many large projects, the social scientist Sherry Arnstiein described a "ladder of public participation, which looks like the image below:



Number one and two, at the bottom, are called "manipulation" and "therapy." A plan is presented. It is said by its proponents to be great. A public relations campaign tries to sell the project. There is no meaningful opportunity for input, though there may be some pretense of input. "Informing," a bit higher up, is when a community is told about a project, but as a one way flow of information. This project is coming to you, like it or not. Nothing you can do about it, but we thought you might want to know. Consultation and Placation are the next levels up. A larger effort may be made to solicit input. But any input that actually challenges the project, or tries to substantively alter it are rejected out of hand. People are consulted, but what they have to say is not important to the outcome. The level of "Partnership" occurs only if and when there is genuine negotiation. Power over the decision is shared, not held entirely by the project proponent or agency that administers the approval process. Community input meaningfully matters at this level and above.

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J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
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To be meaningful, there needs to be genuine outreach, and the community needs to have a chance to express its values and make its case. The design of the turbine layout needs to reflect these values. Up until now it has not. It is simply an optimal capture of wind energy by placing as many turbines as possible within the perimeter of the project area, leaving a few gaps where there are resources that have higher levels of protection than aesthetics (cultural sites, some sensitive habitats, flight paths). . A Washington Supreme Court case put it well: "The right to be heard implies the reasonable hope of being needed. *Smith v. Skagit County, 75 Wn.2d 715, 741 (1969)*

As for how to engage people, the best approach I have seen is to ask them how they want to be engaged, then design outreach around that. Some people will prefer field trips, others face to face meetings, and some will be fine with on line opportunities. The key to success is to listen to what people have to say, and if there is a community consensus around what level of visual protection the Hills should have, then the project should be redesigned to meet that objective.

A Path Towards Effective Mitigation

Questions were raised at the hearing on August 24 regarding visual impact reduction and/or mitigation. It appears the project as designed takes up every, or nearly every possible turbine space available, given other facilities like solar, transmission lines, battery storage, and substations. With the 13 turbine removals Scout proposed in the Moon memo, there remain 231 proposed turbines, arrayed east to west spanning some 25 miles, and north to south in bands that take up about 4 miles.

Both visual assessments; the ASC and the Draft EIS, using different methodologies, conclude that visual impacts will be high from most key viewpoints. Since these viewpoints are presented as "representative," EFSEC should presume that this means high impacts will be widespread, well beyond the viewpoints analyzed. It is important to note that in both cases "high" is the top of the scale, because neither method included a "very high" or "unreasonably

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J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
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high" category, which are used by other methods, including the one recently developed by Bureau of Energy Management to assess impacts from offshore development beyond three miles distance. My opinion is that "high" understates the visual impacts**. The project as proposed, with maximum or near maximum turbine development, should be considered to have unreasonably high visual impacts.**

The reasons are not hard to understand, but can be summed up as follows:

- There are **tens of thousands of high sensitivity viewers** who will view the project from countless viewpoints across the Tri Cities region every day, or nearly every day.
- The Horse Heaven Hills are a **high quality, high visibility, and highly valued** landscape feature.
- The **distance from the viewers to the turbines is close**. The term "Middleground" significantly understates the problem. Robert Sullivan at the Argonne National Lab demonstrated that **wind turbines are visually dominant at 10 miles distance**. Sometimes more.
- Height of turbines is a problem. Breadth of the layout compounds the problem. **Because the turbines stretch across the entire ridge east to west they leave virtually no "gaps".** Everywhere, from virtually any vantage point with a view of the hills, people will see turbines.
- **Visual density is also a problem**. From elevated viewpoints, particularly Badger Mountain (VP 5), a popular hiking area, one will see all or most of the layers of turbines, front to back. This introduces a "busyness" to the view, creating **a cluttered landscape that completely loses its natural qualities**.
- The impacts are somewhat less at the east and west ends of the project, and **highest when viewing from and towards the center.** The reason is there are many more turbines in view from more central locations.
- It is important to reemphasize that **the simulations presented to EFSEC and the public understate the impacts.** They will often be viewed at too small of a scale, they lack panoramas, that take in the full view, they lack blade movement (a limitation of relying on still photos), lack lighting, lack visible ground disturbance (pad grading, roads, vegetation removal), and many have poor lighting or haze that reduces visual contrast below what it will be in the field.

The book I co-authored, "The Renewable Energy Landscape (Routledge Press 2016) includes a chapter, "Improving the Fit of Renewable Energy Projects." It was written to help decision

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J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
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makers like EFSEC better understand ways large, commercial wind projects can be improved visually, particularly where visual impact concerns are high.

From the answers to questions at the hearing by Scout's visual impact expert, **it is clear that Scout Energy never asked its visual impact team to produce any alternatives or mitigation strategies for this project**. In our book we state:

"*Where conservation of visual resources is desired, energy facilities should be designed to fit within the land or seascape as much as possible, avoiding wholesale changes that obliterate or overwhelm desired attributes*."

We go on to recommend a set of "Best Practices" that should be applied to all renewable energy projects, as follows:

- **Identify and avoid areas of high aesthetic value**, including in some cases entire viewsheds. Avoidance means placing a higher value on the landscape **aesthetic benefits of some areas** over their renewable energy benefits. (i.e. no one would accept wind turbines on the rim of the Grand Canyon).
- **Analyze landscape character before designing the project**. While Scout Energy's visual impact team did a landscape character analysis, it does not appear that any part of that analysis was used to help design the project or mitigate impacts. It appears likely that the analysis was only done after the project was designed. Design decisions were made, as Mr Poulos testified, based on the parameters of meteorology and engineering, not in response to landscape character.
- **Site facilities away from most prominent land features**. The character analysis should have identified the most important visual features, where these are located, and how they are viewed. The project should have avoided impacting them. For example, the Horse Heaven Hills ridgeline has high and low points, complex and simple terrain. It is irregular, not uniform. The turbines could have been arranged to maintain the best, most interesting areas by leaving sufficient visual gaps around them.
- **Site new facilities in already disturbed landscapes**. The Horse Heaven Hills project includes both cultivated agricultural land and undisturbed sagebrush steppe and grasslands. Visually and ecologically the latter have far higher value. The project could have avoided steppe habitats, which would have the added benefit of avoiding disturbance of archeological sites, wildlife, and recreation areas.
- **Increase distance to reduce visual dominance**. Distance is a critical factor in the visual impact of wind turbines. In nearly all cases, the farther away, the lower the impact. Large turbines can be visually dominant at 10 miles distance or more. The

LAW OFFICES OF
J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
aramburulaw.com

location of this project, adjacent to a large urban area, does not allow for the amount of distance we would normally want. However, there is an opportunity to limit turbines to the greatest distance the site permits, which may reduce impacts at least modestly.

- **Locate facilities in less prominent locations and away from focal points**. This is similar to what was stated above. It requires that the visual team work hand in hand with the meteorologists and engineers to call out the most visually prominent features and areas and build those into the design.
- **Use site specific features to reduce visibility.** In some cases turbines can be partially or fully "hidden" from view behind small hills or higher points of the ridgeline. You can see this in the Horse Heaven project by noting that few turbines are visible from Benton City thanks to a high point in the ridgeline and the viewing angle, which hides many turbines that lie behind the ridge. Additional places could be identified that provide topographic screening.
- **Provide visual order and avoid chaos, clutter, and disarray.** Turbines are inherently dominant visual features. Some can be hidden, but many cannot be. This means that the way turbines are seen from key viewing areas is important. If the pattern of turbines appears chaotic, or cluttered, this adds to the visual impact. And as the (imperfect) simulations from Badger Mountain illustrate, there is a lot of chaos and clutter in the view. Reducing this is crucial to lowering impacts. If turbines can't be moved to less impactful locations, some may need to be removed to reduce this effect.
- **Break long lines of turbines with open, undeveloped spaces.** The current (take it or leave it) design of 231 turbines creates a visual wall along the ridgeline, east to west, running nearly parallel with the community to the north, with no substantial visual breaks anywhere. Some turbines should be removed from the center part of the project area to open one or more large visual gaps that provide relief from the monotony of turbine after turbine lining up for 25 miles.
- **Have turbines off to one side rather than in the center of the view.** Clearly, the existing design does the opposite. Most of the turbines are right smack in the center of the view. It would be far better to have a group of turbines to the east, and one to the west, with a large opening in the center.

The above list shows that there are ways to reduce the visual impacts of this project. The horse Heaven Hills are clearly an important visual feature, and EFSEC should require the applicant to go back to the drawing board. The best approach would be to set a goal that the project can have only "moderate" visual impacts from most viewpoints to the north, in the Tri Cities area. Various alternatives could then be explored. All would most likely involve removing turbines,

LAW OFFICES OF
J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
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either from the front (northernmost) to back (south), or by creating sufficient visual gaps, and taking turbines off of visually prominent features. A number of iterations are possible. These can be quickly tested using computer visualization technology.

We offer EXH-5106_S as an illustration of a redesign that follows the principles listed above. This uses the map from the Moon Memo and includes views from the Badger Mountain area. Turbines are removed from the central part of the project area, leaving two large clusters, one to the northwest, and one to the southeast. Because the ridge is highest in the northwest, many of the turbines in this area will be hidden from view, as illustrated in the cross sections provided in EXH-5106_S at pages 3-7. The turbines in the southeast would lie behind the existing Nine Canyon project, adding to turbine visual density in that area, but avoiding less developed areas. All or most of the turbines we leave (approximately 61) will be on already disturbed, cultivated land, thus minimizing habitat and perhaps, cultural resource impacts. There may be other alternatives. There may be ways to allow more turbines, or more solar arrays, in this design. The way to find out is to see what it looks like from representative viewpoints, and analyze the results. My opinion, without further analysis, is that an alternative like this would significantly reduce visual impacts, particularly from the Tri Cities region. Localized impacts, those nearest the remaining turbines, might remain high.

Ultimately it is best for the community to be the judge of the visual impact. By that I mean they should be able to say whether a given alternative sufficiently reduces or mitigates the impact they will have to live with. Failing that, an independent panel of visual resource experts, beholden to EFSEC, not Scout Energy, could be appointed to view alternatives and recommend one or more.

I can't emphasize enough how important it is to get this project right visually (and otherwise).

As far as I am aware, this is the first large scale wind project in the United States that lies

LAW OFFICES OF
J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
aramburulaw.com

adjacent to a major metropolitan area.[1] If it is done badly it can set the wind industry back by years, as it will be used as an example of what goes wrong when a developer and regulators fail to take account of visual impacts to an important landscape. It could be a black eye that follows wind energy around the country, delaying or stopping projects in many places, at a time when the climate cannot afford this.

Conversely **there is an opportunity to demonstrate how to respond to visual concerns and use design and technology to create a plan that is widely accepted**. People in the Tri Cities can feel they were heard, and that this project, while it will no doubt have some impacts, may be an acceptable compromise. This is doable. Yes, some turbines will need to be removed to make it work. But a project of this scale will still produce significant amounts of renewable energy. EFSEC should seek a balanced solution and give this proposal a chance.

Some additional thoughts (optional)

From the Science of Scenery:

"Regarding community acceptance of wind power schemes, the visual evaluation of the impact of wind power on the values of the landscape is by far the most dominant factor in explaining opposition or support. Type of landscape fully overshadows other attitudinal attributes, as well as other visual and scenic factors such as the design of wind turbines and wind farms, and the number and size of turbines."

There are considerable uncertainties regarding the planning of wind farms but (Ian) Bishop concluded the following:

---

[1] The visual analysis prepared by EFSEC for the Kittitas Valley wind project in the FEIS: (https://www.efsec.wa.gov/sites/default/files/180298/00021/20070201_3_9_Visual.pdf) recognized the difference between a dense urban community and rural community at page 3.9-1:

> **3.9.1 Study Methodology**
>
> **Visual Sensitivity Assessment**
>
> Each of us views the outdoor environment differently based on who we are as individuals. Although visual impacts are challenging to gauge quantitatively, there are some common qualitative characteristics of beautiful (and not-so-beautiful) scenery on which most people can agree.
>
> Assessing visual sensitivity involves predicting a general impact on the quality of views from a given viewpoint. A combination of three factors determines how sensitive a landscape scene is: • The number and type of viewers;
>
> • The viewing conditions; and
>
> • The quality of the view.
>
> For example, a dense residential area with unobstructed views of a regionally important and memorable scene would be very sensitive to objects or structures that would impede views. Conversely, a view from a seldom-traveled rural road where motorists have only distant, oblique views of wind turbines in an unremarkable setting would likely qualify as an area of low sensitivity.

LAW OFFICES OF
J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
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- Aesthetic impacts are less the further the viewer is from the turbines (although we have no clear idea of the shape of the distance-impact curve);
- Contrast with the surroundings and background should be **low**;
- **Wind farms should not be located in highly valued landscapes**;
- The distribution and design of the turbines should have regard for aesthetic factors such as complexity and continuity;
- Protected sites should be avoided;
- **Less dissent arises through involvement of the local population in the siting procedure, transparent planning processes, and a high information level;**
- Familiarity with existing small-scale projects is likely to increase later acceptance of further projects.

Hindmarsh (2010) analyzed the extent of community engagement in wind farm planning in Australia and, not surprisingly, found it inadequate. He suggested:

- *"A more promising approach is the collaborative approach, which can also facilitate social mapping of local community qualifications and boundaries about wind farm location alongside technical mapping of wind resources. This is needed to identify the most socially, economically and technically viable locations to locate wind farms to ensure effective renewable energy transitions."*
- The prevailing paradox of visual impacts of wind farms is that their benefits accrue to the wider community but the local community bears their dis-benefits.
- The crucial issue for wind farm location is their acceptability to the community. What is the threshold level when a wind farm shifts from being acceptable to unacceptable? In a hand book on visual impacts, Buchan (2002) noted:
- *"Ultimately, significant is whatever individuals, people, organizations, institutions, society and/or policy say is significant – it is a human evaluative and subjective judgement on which there may or may not be consensus. It is therefore important that two separate but critical characteristics of all effects – magnitude and significance – are clearly distinguished."*

In applying such criteria, the level of landscape quality prior to the development needs to be considered. **The visual impact of a development in a landscape of 4 or 5 rating will be far less objectionable than a development in a landscape of 6, 7 or especially 8 rating** as we saw in the South Australian inland example above. The thresholds in landscapes of high quality will be considerably less than the thresholds for landscapes of low quality**. A reduction from 8 to 7 will be far more objectionable than a reduction from 5 to 4**. Thus two factors need to be considered in establishing visual thresholds, firstly the rating of the

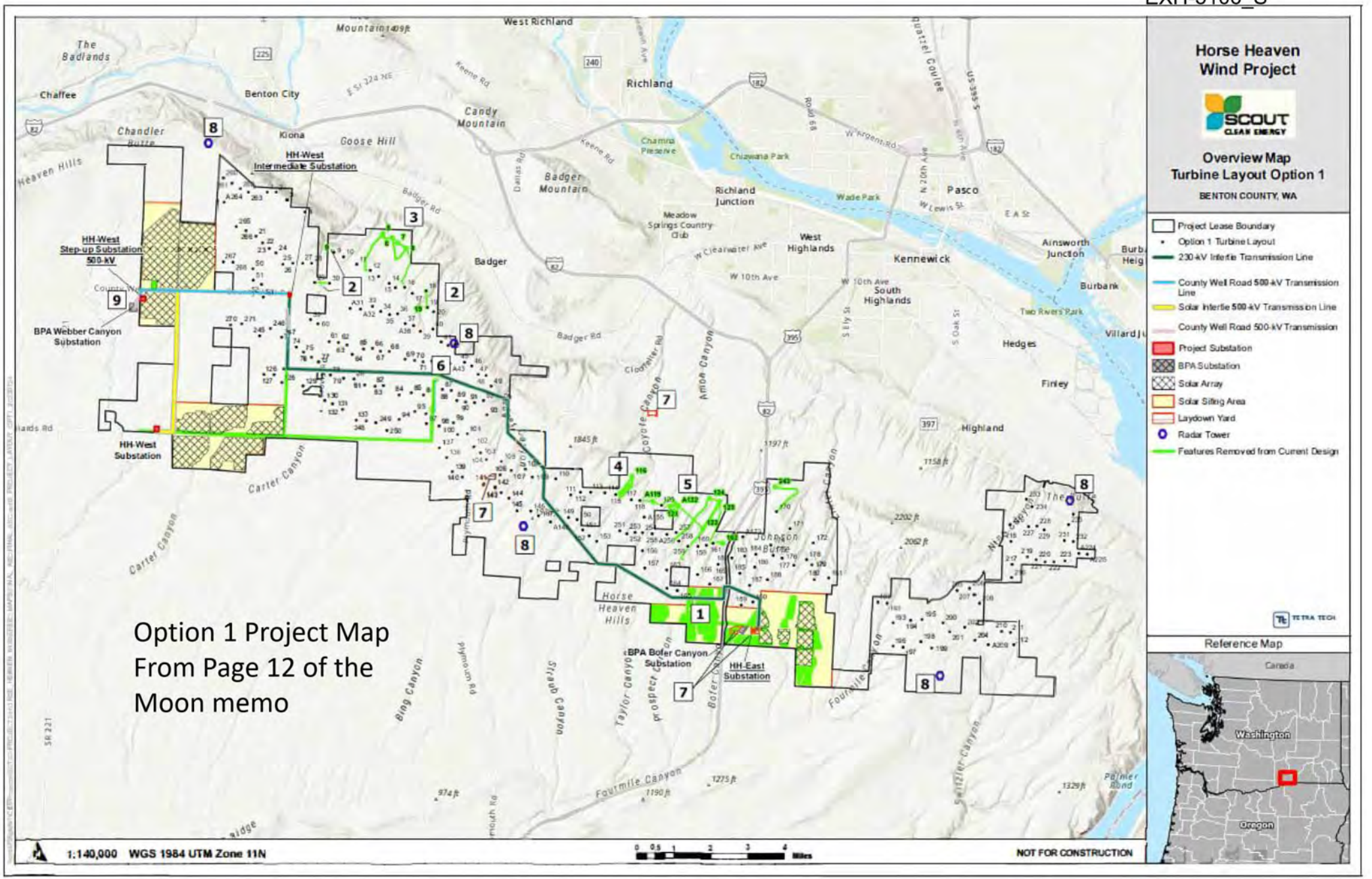
LAW OFFICES OF
J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
aramburulaw.com

subject landscape, and secondly, the reduction in landscape quality that results from the development.

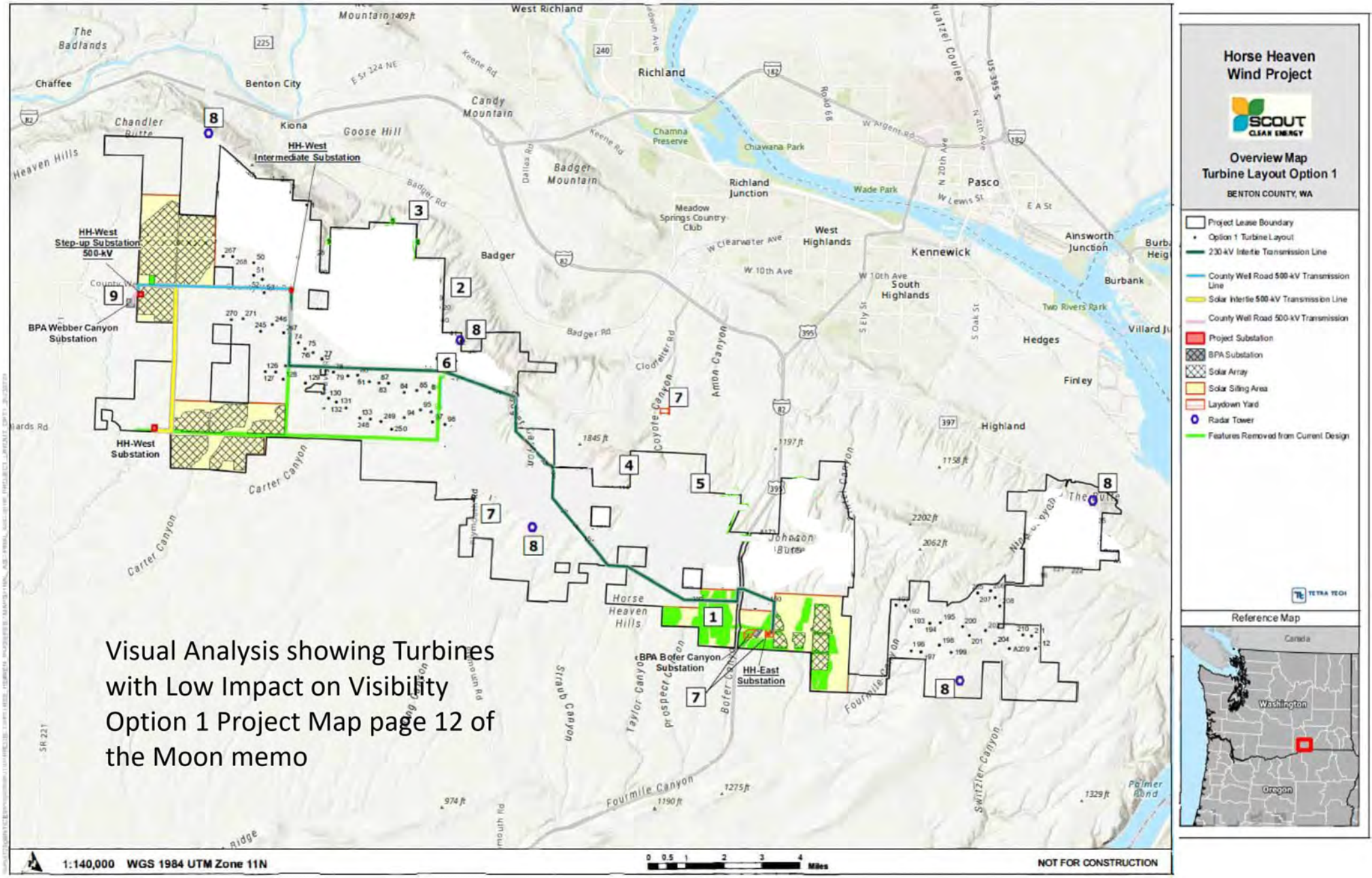
*Note: I don't believe the analysis by TetraTech or SWCA rated the Horse Heaven Hills landscape before the developer placed the turbines. I believe that, on a 10 scale, HHH would rate 7-8 for most people. Which means a lowering of visual quality will be objectionable.

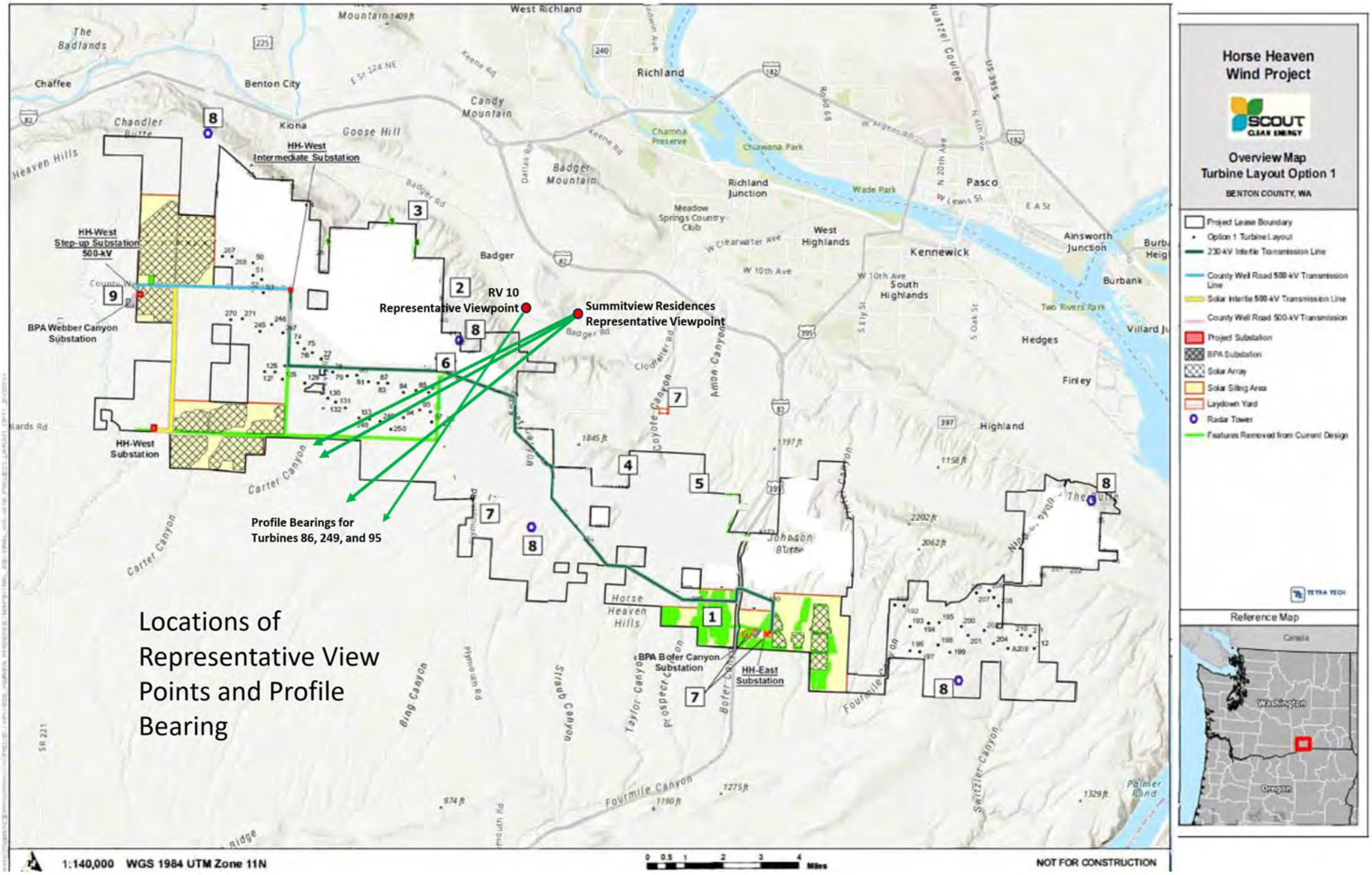
LAW OFFICES OF
J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
aramburulaw.com

TCC
Supplemental Testimony
Dean Apostol
EXH-5106_S



Option 1 Project Map
From Page 12 of the
Moon memo


Horse Heaven Wind Project
SCOUT CLEAN ENERGY
Overview Map
Turbine Layout Option 1
BENTON COUNTY, WA
Project Lease Boundary
Option 1 Turbine Layout
230-kV Intertie Transmission Line
County Well Road 500-kV Transmission Line
Solar Intertie 500-kV Transmission Line
County Well Road 500-kV Transmission
Project Substation
BPA Substation
Solar Array
Solar Siting Area
Laydown Yard
Radar Tower
Features Removed from Current Design
TETRA TECH
Reference Map
Canada
Washington
Oregon
HH-West Intermediate Substation
HH-West Step-up Substation 500-kV
BPA Webber Canyon Substation
HH-West Substation
BPA Bofer Canyon Substation
HH-East Substation
Visual Analysis showing Turbines with Low Impact on Visibility Option 1 Project Map page 12 of the Moon memo
1:140,000 WGS 1984 UTM Zone 11N
0 0.5 1 2 3 4 Miles
NOT FOR CONSTRUCTION


Horse Heaven Wind Project
SCOUT CLEAN ENERGY
Overview Map
Turbine Layout Option 1
BENTON COUNTY, WA
Project Lease Boundary
Option 1 Turbine Layout
230-kV Intertie Transmission Line
County Well Road 500-kV Transmission Line
Solar Intertie 500-kV Transmission Line
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Features Removed from Current Design
TETRA TECH
Reference Map
Canada
Washington
Oregon
HH-West Intermediate Substation
HH-West Step-up Substation 500-kV
BPA Webber Canyon Substation
HH-West Substation
RV 10 Representative Viewpoint
Summitview Residences Representative Viewpoint
Profile Bearings for Turbines 86, 249, and 95
BPA Bofer Canyon Substation
HH-East Substation
Locations of Representative View Points and Profile Bearing
1:140,000 WGS 1984 UTM Zone 11N
0 0.5 1 2 3 4 Miles
NOT FOR CONSTRUCTION

Horse Heaven Project Proposed Mitigation-61 Turbines

Turbine Numbers-Moon Memo Data Request 9

West Phase 2
Modified Project Turbines-By #
267
268
50
51
52
53
270
271
245
247
74
75
76
77
78
79
80
81
82
83
84
85
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126
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248
249
250
94
95
96
97
98

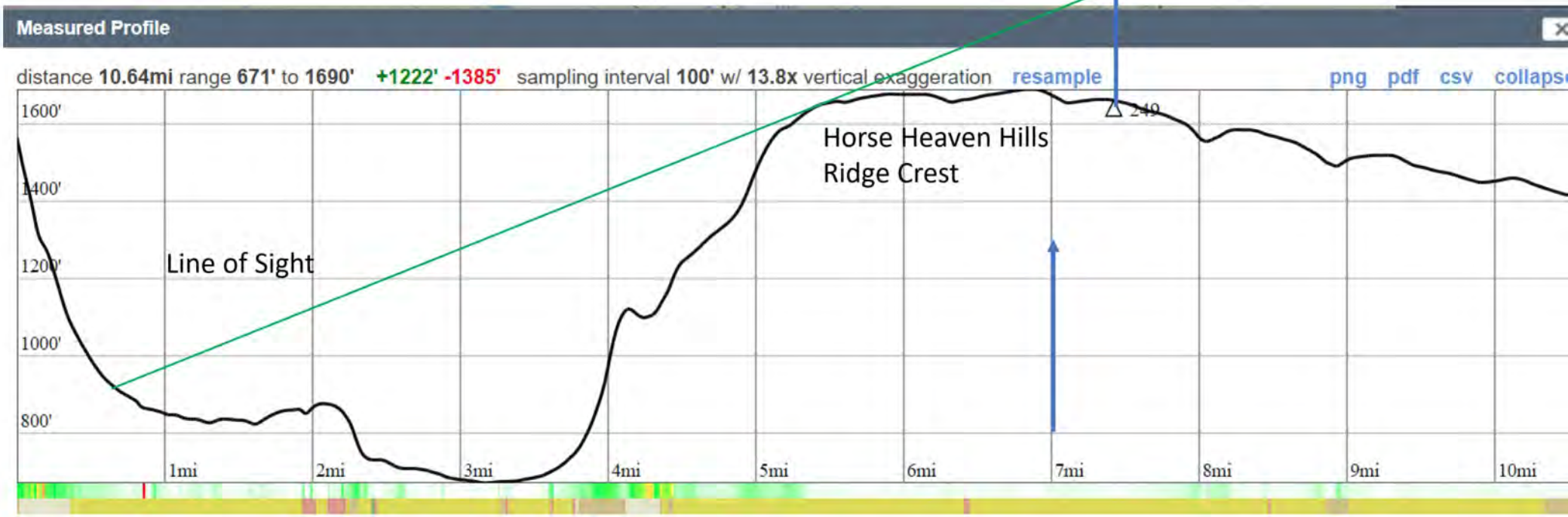
39
Count

East Phase 1
Modified Project Turbines-By #
191
192
193
194
195
196
197
198
199
200
201
202
204
205
206
207
208
A209
210
211
212 & 216

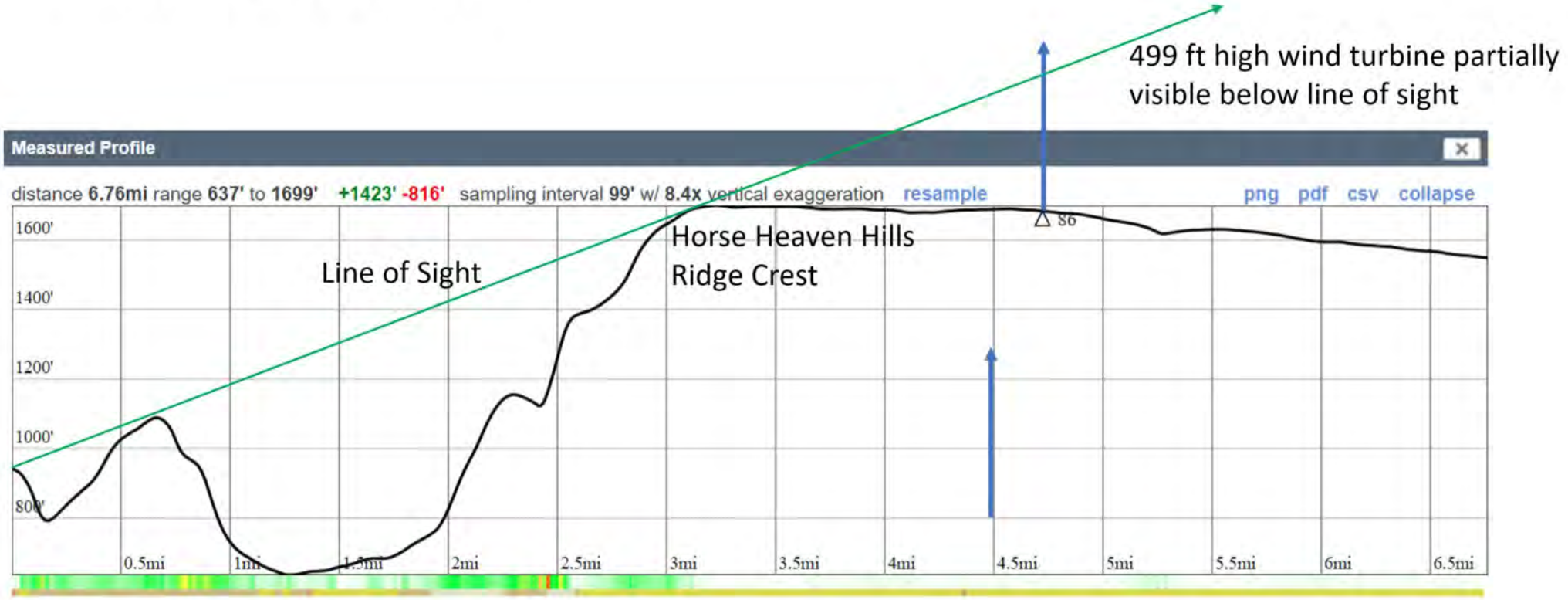
22
Count

Summitview Residential Community
Representative View Point
Profile Bearing SW to Turbine 249

499 ft high wind turbine partially visible below line of sight

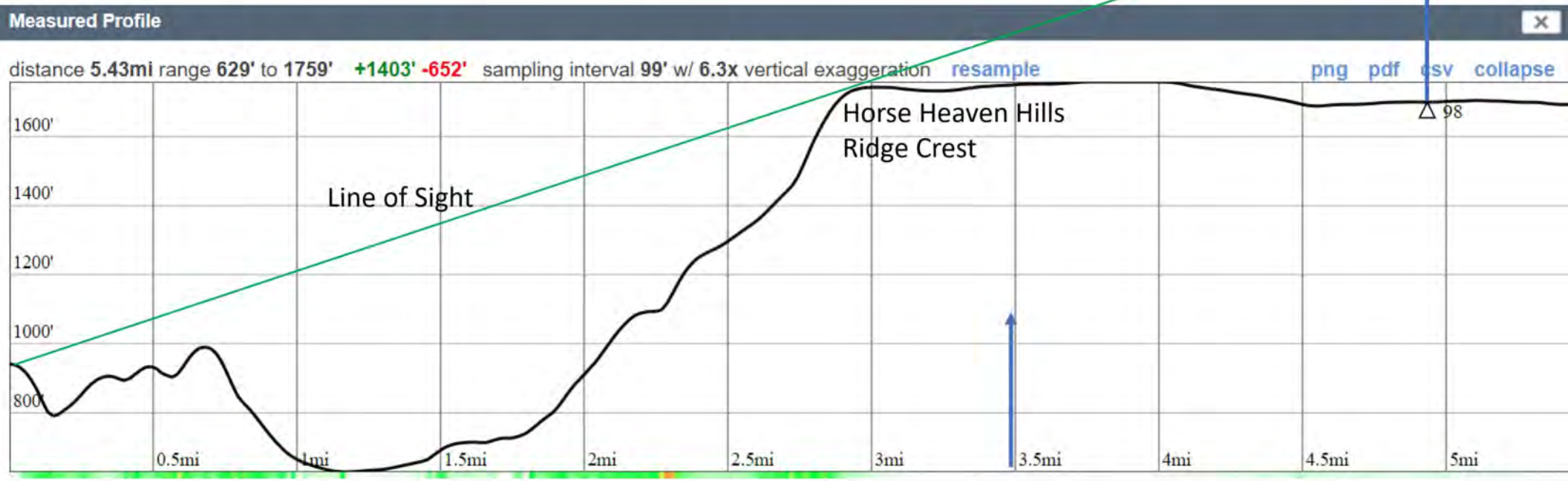


Summitview Residential Community
Representative View Point
Profile Bearing SW to Turbine 86

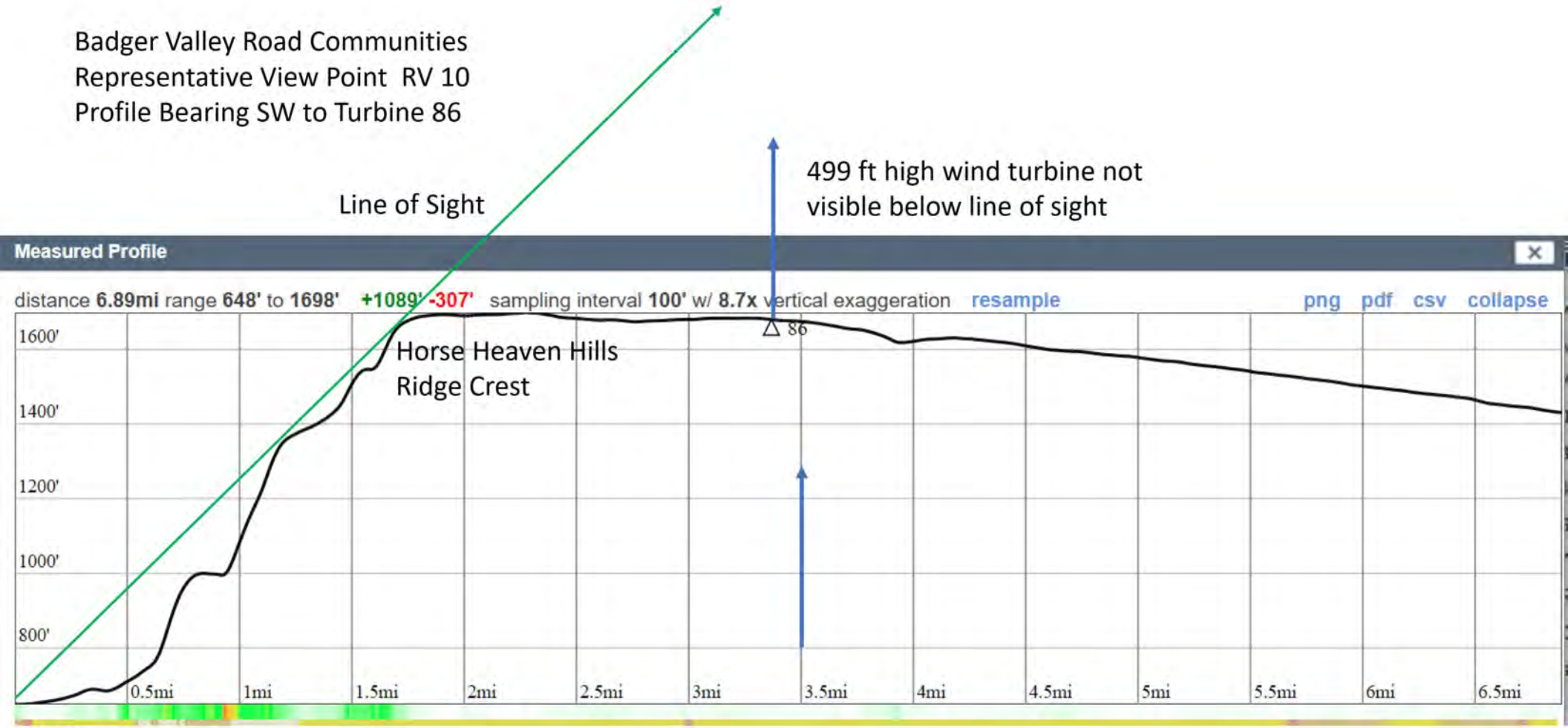


Summitview Residential Community
Representative View Point
Profile Bearing SW to Turbine 98

499 ft high wind turbine not visible below line of sight



Badger Valley Road Communities
Representative View Point RV 10
Profile Bearing SW to Turbine 86



RV 10

To: efsec@efsec.wa.gov;Comments@efsec.wa.gov
From: davesharp.pe@gmail.com
Received: 2023-10-24T22:41:23+00:00
Subject: Turbines #'s 60, 61, and 62 Marked for Removal in FEIS Presentation
Has attachment? False

External Email

Follow-upto October EFSEC Meeting FEIS presentation.

I am writing this as a private citizen and resident impacted by the project.
David Sharp
89417 Summit View Drive
Kennewick, WA 99338

Are we to the point of "Theater of the Absurd" to mitigate turbines that are not impactful and leave those that are? Was it just a mistake, or is the Applicant proposing this mitigation?

The FEIS presentation, Page 6, shows a group of three turbines identified for removal. The picture was taken from KOP #3, Chandler Butte, and are assumed to be turbines 60, 61, and 62 as identified on the Moon memo marked up project map. The reasoning given in the presentation was that they were visually prominent and too close to the KOP, and they were objectionable for a number of other reasons to multiple parties(if I remember correctly). To my knowledge, there has not been one specific objection to those threeturbines;**NONE**.

These turbines are approximately 2.6 miles from Chandler Butte KOP. That KOP is lightly used. More accurately, no one can access the Chandler Butte viewpoint without breaking the law. It is behind a locked gate.

The most objectionable ridge turbines are #''s 1-4, which are built next to a ridge trail that overlooks Benton City and the Yakima Valley. These ridge turbines are shown in KOP 9. of Appendix Q in the Revised ASC. Notice how much more prominent theKOP 9turbines are toBenton City and the Valley population than the KOP 3 turbines in the photo. The ridge turbines rise vertically about 2000' above Benton City, and are much closer to foraging raptors, population, businesses, wineries, highway traffic, and recreators than the Chandler Butte KOP. These KOP 9 ridge turbines are viewed by more people in one hour than the turbines from Chandler Butte in 5 years.

These turbines were the subject ofmore specific diverse public comments than any other turbines in the project. The objections are not just view related. Some of the topics of comment:

- Degradation of the existing BLM managed Class 2 View area. Leaving the ridge turbines would change it to Class 4 (the lowest rating).
- Concerns about increased fire risk for Benton County residents at the base of the escarpment magnified by the loss of aerial firefighting methods.
- Visual impact to public areas 1 mile away, and Benton City limits in general 1-4 miles distant.***Note 1**
- Benton City Mayor and Council Impact on BC retail area development at the Intestate exit.

- A winery owner about 1 mile distant with a public view area, viewsheds to wineries on Red Mountain.
- Introduction of danger to the public while a public facility. *Note 2
- Restriction of recreation opportunities and experiences. *Note 3
- Birds of prey forage all along and above the ridgeline.
- Kiona Ridge Trail will be essentially lost for a 2-milestretch. See project maps 1 and 4 in the presentation. From the width of the micrositing corridor it appears the ridge will be leveled for the turbine installation. This trail has been there for millennia, well before European settlers arrived and should be preserved. It is visually obvious to anyone looking at the drawing how close the turbines are to the trail. These turbines will be built largely over habitat, and not on land used for agriculture.
- Loss of an iconic landmark viewed widely from Benton City, the Yakima Valley and the Tri-Cities.

*Note 1: The public record shows numerous public comments about lack of appropriate visual representations of turbines impacting local communities. As a result EFSEC requested unobstructed panoramic vistas, one of which was the Benton City area that became KOP #9. The record also shows that the Applicant provided a handpicked photo to use that did not provide the unobstructed views and panorama that was requested by EFSEC. For whatever reason, EFSEC accepted that photo. The photo is now KOP 9 and is being used as the foundation of a house of cards portraying Kiona Ridge as a common (nothing special) resource, and only moderately impacted by the project. As a result of where the photo location was chosen this KOP received the lowest visual impact overall rating despite having high viewer sensitivity, and including residential, commercial, and travel impacts. The public pointed out this discrepancy and even provided examples of views from the Benton City area that had unobstructed views. The record also shows that EFSEC requested additional locations for KOP's for the Benton County area in Data request #8 over 7 months ago, with no record of response.

Note 2: Recreators can actually be "under the rotor swept area" while on the established trail. This presents a danger to the general public in the event of ice throw or mechanical malfunction. This will affect all users, not just paragliders. It fits within the definition of "significant" impact, having"a severe adverse impact to environmental quality, even if its chance of occurrence is not great." (WAC 197-11-794).

Note 3: In the proposed configuration, the Applicant will likely, after receiving a Site Certification, restrict public access. More than paragliders will be affected. That will have the effectof putting restrictions to the public while accessing an existing Federal recreation resource. There has been no EFSEC precedent to my knowledge where a project has physically restricted use of an existing recreation resource. Imagine being a hiker stopping to enjoy the ridge views with rotating blade tips 35 feet overhead. However, it will be a unique experience, like none other in the US.

My understanding is that EFSEC is the Lead Agency responsible for accuracy of the FEIS and it should represent a true and accurate picture of the relative environmental impacts. If the three-turbine removal was initiated by the Applicant, it may be noble, but what are the relative benefits vs the impacts along Kiona Ridge. There have been substantial and significant changes to the project made since the public comment period ended for the Draft EIS. If EFSEC does not have the staff to objectively review the final EIS for accuracy, extra review and development time should be allowed, or it should be opened back up to the public for comment.

The voting Council deserves better.

EFSEC is urged to review the genesis of how this juxtaposition happened. The right thing to do is to stipulate that turbines #'s 1-4 be mitigated based upon public comment and environmental impact.

Point of information! An 1150mw nameplate project operating at 30% average capacity factor can generate for the owner nearly $850 million in Federal production tax credits over 10 years. That figure will be adjusted upward for inflation and does not include State tax incentives.

Attachments:

[]

To: Comments@efsec.wa.gov
From: davesharp.pe@gmail.com
Received: 2023-10-26T17:05:21+00:00
Subject: Ferruginous Hawk Nests and Distance from Turbines
Has attachment? False

External Email

Followup to October Meeting FEIS presentation.

I am writing this as a private citizen and resident impacted by the project.
David Sharp
89417 Summit View Drive
Kennewick,WA 99338

This is being written without having seen the FEIS, but portions of discussions in the FEIS presentation to the Council were troublesome.The FEIS should inform the Council how many turbines are impactedby the two-mileexclusion zone from Ferruginous Hawk nests discussed in the presentation. Every turbine within that buffer should be clearly identified. The FEIS presentation relies on the Moon memo which does not do that.

For example,the Moon memo item Section 1.5 that has wording that needs to be read carefully:
"*Including Turbine 116, removal of Turbines 119, 121, 122, 123, 124, 125 would reduce approximately 30% of Turbines located within the 3.2 km* [2 mi]*core area of the Coyote Canyon ferruginous hawk territory*".

> This statement is saying **only 30% of turbines within 2 miles have been removed**. Another way of saying this is there are ~24 turbines within 2 miles and only 7 have had mitigated by removal. If the remaining 70% are within 2 miles, why has the developer not marked them as removed? The assumption is made that this is an active nest.

From Section 1.7:
"1.7 Add/modify construction laydown areas Planned modification: Add locations for Phase 1 and Phase 2 construction laydown; add interim Turbine component laydown area (see area '7' on attached overview map)".

> Incredibly, the Applicant appears to be proposing a staging/laydown/batch plant area that isin the vicinity of the same Ferruginous Hawk nest discussed above. That will most likely be the most active, noisiest and dustiest place on the project. EFSEC staff needs to validate the exact location coordinates with the nest coordinates to determine the exact location and distances. If this area is within 2 miles of the nest, or an appropriate distance, based upon the activity, noise, etc. the construction laydown area should be relocated.

The information presented does not give the Council complete and accurate information. It is estimated that many more turbines will be within a two-mile zone than what is shown in the

Moon memo and subsequent information provided. An updated map showing every turbine within the project that is within 2 miles of either an active or inactive nest should be included in the FEIS; proposed for removal or not. Anything less would be a disservice to the voting members of the Council. The Council members need to understand the basis of their vote decision.

Wildlife-Wildlife and Habitat is a key issue for this EIS. Is EFSEC going to punt the football on this? Key rewrite topics in the EIS were identified as:

- *Expansion of Wild-1 mitigation regarding the TAC, monitoring plans, and adaptive management.*
- *Spec-5 now creates a 2-mile avoidance buffer around all ferruginous hawk nests with active habitat.*

Wildlife and Habitat is a key SEPA issue for this project and not appropriate for a Technical Advisory Committee. Just the word "Advisory" is problematic. What entity does the Committee advise: EFSEC, or the Applicant? What is the makeup of the committee(s)? Are they volunteers, or paid? Who pays them? Are any of them employees of the Applicant, or consultants hired by the Applicant? What is the definition of "active habitat"? Or more appropriate, what is the definition of "inactive habitat"?
A TAC approach should not be utilized for key environmentalissues, especially controversial decisions associated with the Ferruginous hawk. Those go to the heart of SEPA issues on this project. And there is no bigger environmental issue for this project than preserving an endangered species. The TAC approach can be defined with one word:"Advisory". The TAC would not be a neutral committee. This was the topic of several public comments during the DEIS period.

Point of Information.

Wilbur and Orville Wright made the first powered flight in 1903. Chuck Yeager broke the sound barrier in 1947, only 43 years later. Man first set foot on the moon in 1969 only 22 years later, and only 66 years after man's first flight. Imagine the leaps of technology that made those feats possible.

Attachments:

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To: Comments@efsec.wa.gov
From: efsec@efsec.wa.gov
Received: 2023-11-01T15:27:32+00:00
Subject: FW: Docket Number EF-210011
Has attachment? False

From: Penelope Loucas Sent: Wednesday, November 1, 2023 2:40 AM To: EFSEC (EFSEC) Subject: Docket Number EF-210011 External Email I am writing to express my support for the Horse Heaven Clean Energy Center and the role it will play in helping Washington achieve the ambitious decarbonization goals we set for ourselves with the passage of the Clean Energy Transformation Act (CETA) in 2019. I believe strongly in impact mitigation and value EFSEC's process, but know that Washington's ability to realize a carbon-free future will depend on permitting large-scale clean energy projects in a timely manner just like the Horse Heaven Clean Energy Center. This is a good project with appropriately identified mitigation measures, and backed by an experienced team that will produce up to 1,150 MW of renewable energy through a combination of wind, solar, and battery storage technology. With the passage of CETA, Washington established itself as a leader in the fight to curb global emissions. The state now has a responsibility to ensure the clean energy transition can be achieved in the necessary timeframe to facilitate fossil plant retirement, and in doing we can set an example for the rest of the nation to follow. Thank you for your consideration. Sent from my iPhone

Attachments:

[]

BOARD OF COUNTY COMMISSIONERS
DOUGLAS COUNTY, WASHINGTON

IN THE MATTER OF	)	**RESOLUTION CE 23-40**
THE HORSE HEAVEN WIND	)	
AND SOLAR PROJECT	)	

WHEREAS, the Scout Clean Energy LLC, applied for site certification with the Washington State Energy Facility Site Evaluation Council (Council) for the Horse Heaven Wind Farm Project on June 8, 2021; and

WHEREAS, the Horse Heaven Wind Farm Project is a wind and solar energy generation facility proposed to be located in unincorporated Benton County; and

WHEREAS, the Horse Heaven Wind Farm Project is situated in an area with unique geological features, comprised of naturally vegetated steep slopes, native habitat, commercially significant agricultural land, and visual resources; and

WHEREAS, during the Council's public comment periods for the land use consistency and the draft environmental impact statement, the Board of County Commissioners emphasized the County's concerns and opposition to the Horse Heaven Wind Farm Project; and

WHEREAS, pursuant to WAC 463-30-050 and WAC 463-30-0660 (2), Benton County was deemed to be a party in the adjudicative proceeding for the Horse Heaven Wind Farm Project; and

WHEREAS, Benton County participated in the adjudicative proceeding to determine whether the Horse Heaven Wind Farm Project satisfies Benton County's conditional use permit criteria by submitting briefing and providing pre-filed and live testimony; and

WHEREAS, the Horse Heaven Wind Farm Project will negatively impact and conflict with the Horse Heaven Hills viewshed, critical areas, agricultural lands of long-term commercial significance, and cultural resources while increasing the risks associated with fire and wildlife; and

WHEREAS, the Horse Heaven Wind Farm Project's industrial use, project size, and location makes the project inconsistent and incompatible with the required outright permitted uses in the Growth Management Act Agricultural Zoning District (BCC 11.17.040), the Washington State designation of long-term commercially agricultural lands, and the required conditional use permit criteria (BCC.11.50.040); and

WHEREAS, the Douglas County Board of County Commissioners is gravely concerned of the precedent being set by EFSEC for siting such facilities in areas of cultural significance, long-term commercially significant agricultural lands, and areas of high-fire-risk and impact to the health of local residents despite the clear request for denial by local elected officials, local Nation tribes and the public;

NOW, THEREFORE BE IT RESOLVED that the Board of Douglas County Commissioners hereby opposes the Horse Heaven Wind Farm Project.

Dated this 31st day of October 2023.

DOUGLAS COUNTY, WASHINGTON
BOARD OF COUNTY COMMISSIONERS

Dan Sutton, Chair

Kyle Steinburg, Vice-Chair

Marc Straub, Member

ATTEST:

Carlye Baity, Clerk of the Board

To: Comments@efsec.wa.gov
From: efsec@efsec.wa.gov
Received: 2023-11-02T15:15:51+00:00
Subject: FW: Wind turbines on Horse Heaven Hills.
Has attachment? False

From: Ira Johnson <johnsonira967@gmail.com>
Sent: Wednesday, November 1, 2023 10:45 PM
To: EFSEC (EFSEC) <efsec@efsec.wa.gov>
Subject: Wind turbines on Horse Heaven Hills.

External Email

I have pointed out to you that I'm against this project. That you are getting ready to make a decision.
I wanted to point out to you that states like Hawaii, New Jersey, and other states that have them are abandoning them. Electric transportation buses are catching fire, electric cars are catching fire or when the batteries get wet they have to be replaced. This going all green is crashing around us.
WA. The state needs to be smart and not join the bad choices that CA., NJ and Hawaii have made.
Sincerely
Ira Johnson

Attachments:

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To: Comments@efsec.wa.gov
From: efsec@efsec.wa.gov
Received: 2023-11-06T19:33:22+00:00
Subject: FW: Wind Turbines in Horse Heaven Hills
Has attachment? False

From: Ira Johnson <johnsonira967@gmail.com>
Sent: Monday, November 6, 2023 11:28 AM
To: EFSEC (EFSEC) <efsec@efsec.wa.gov>
Subject: Wind Turbines in Horse Heaven Hills

External Email

There is an interesting article on the internet today about US Offshore Wind is Holed and Sinking. by David Blackmon. I encourage you to read the article. Shows why we should not install anymore Wind Turbines period.
Sincerely
Ira Johnson

Attachments:

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To: Comments@efsec.wa.gov
From: efsec@efsec.wa.gov
Received: 2023-11-13T16:09:24+00:00
Subject: FW: EFSEC review of Horse Heaven Hills Wind Farms Project - Feedback from West Richland - Obviating a Disaster
Has attachment? False

From: pixelate@mathsavers.com <pixelate@mathsavers.com>
Sent: Saturday, November 11, 2023 8:09 AM
To: EFSEC (EFSEC) <efsec@efsec.wa.gov>
Subject: EFSEC review of Horse Heaven Hills Wind Farms Project - Feedback from West Richland - Obviating a Disaster

External Email

Greetings EFSEC Administrators, Trustees and Associates –
I am writing with respect to the proposed Horse Heaven Hills Wind Farm and Solar Project to be located to the southwest of the TriCities in Eastern Washington State. This project must not be constructed for many reasons, specifically:

- Solar and wind power are neither renewable nor economically viable -- they are both first order derivatives of hydrocarbon fuels.
- The sunlight and wind are renewable; the machines used to “harvest” the sun and wind are not. These so-called green energy solutions break down and require continued maintenance and ultimately, they must be taken down and be replaced.
- The total energy necessary for the mining, refining, manufacturing, transportation, installation, maintenance and decommissioning of a wind turbine far exceeds the energy generated over its service life.
- This project will crater property values in the area. Nobody wants to live next to or see a power plant in close proximity to their home or business. This power operation will extend over 25 miles and be visible to much of the 250,000 people living and working in the TriCities.
- This project is a disastrous misallocation of resources and will destroy the landscape and beauty of the Horse Heaven Hills.
- Washington State already receives over 70% of its electricity from efficient hydroelectric power. The plan to tear down existing dams on the Snake River while constructing an economically and environmentally damaging power station is beyond absurd.

Construction of the HHH Wind “Farm” would be a disaster for the environment, citizens of the TriCities and anyone that enjoins to relocate to the area.
Thank you for taking the time to read and understand my position.
Regards,
Patrick D. Grengs II / Farmer in West Richland (owner of 40 acres)

Attachments:

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To: Comments@efsec.wa.gov
From: efsec@efsec.wa.gov
Received: 2023-11-13T16:09:13+00:00
Subject: FW: HHH Windfarm
Has attachment? False

From: d <jantkids@aol.com>
Sent: Friday, November 10, 2023 4:28 PM
To: EFSEC (EFSEC) <efsec@efsec.wa.gov>
Subject: HHH Windfarm

External Email

The Community, municipalities, Benton County, BPUD, Wildfire strike teams, the Yakama Nation have all expressed that this is not in anyone's best interest for wild life, quality of life or tribal treaties. The simple fact that this committee may go against what the majority of everyone this will effect, is extremely scary to me. The concept of constituents having a say is not mere lip service, this committee is bound to take into consideration the needs, wants and livelihood of those this windfarm will impact, not our Governor that sits in his house on the West side of our state, and his misguided political ideas, or you the members of the committee that have no stake in this. Windfarms are NOT green, the amount of fossil fuels, oil, gas and cement, making of the steel, transporting it and the water needed for this project make this worse than a coal fired plant! This windfarm is not needed for our part of the state, our dams and Hanford are more than ample suppliers for our needs here. We are not to be subjected to something so someone else can brag they created a green project that is just dishonest and disingenuous.
The best use of this land is left for what our urban growth is.
Please do not approve or suggest that our governor approves this, you have received ample testimony that this project is in NO ONES best interest except Scout and that is not who you are representing!
This project should not be approved.
Janice Taylor
720 Shockley Rd
Richland, WA 99352

Attachments:

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To: Comments@efsec.wa.gov
From: lisa.masengale@efsec.wa.gov
Received: 2023-11-13T20:55:56+00:00
Subject: FW: Horse Heaven Final ASC Appendices
Has attachment? False

Forwarding public comment, below.
Lisa Masengale *(she/her)*
Forms and Records Analyst Supervisor
Energy Facility Site Evaluation Council
Phone number: (360) 485-1591
EFSEC phone number: (360) 664-1345
www.efsec.wa.gov

From: kmbrun@gmail.com <kmbrun@gmail.com>
Sent: Monday, November 13, 2023 12:55 PM
To: Masengale, Lisa (EFSEC) <lisa.masengale@efsec.wa.gov>
Subject: RE: Horse Heaven Final ASC Appendices

External Email

If those sites are that sensitive, perhaps Scout should not be building turbines on them.
Karen

From: Masengale, Lisa (EFSEC)
Sent: Monday, November 13, 2023 12:29 PM
To: kmbrun@gmail.com

Subject: RE: Horse Heaven Final ASC Appendices
Good Afternoon,
I am still reviewing and redacting the ASC appendices. They will be posted online one-by-one as I finish reviewing them. Please note, Appendix R – Cultural Resource Reports, will not be posted online. The cultural reports are of great sensitivity, especially to the Tribes, and we therefore respect the wishes of the Tribes by not posting them online, even in redacted form.
As always, you are also welcome to request the ASC appendices via public records request. The most expeditious way to process a request is to create an account and submit a public records request through our Public Records Portal. If you would like to submit a request but prefer not to submit via the Public Records Portal, just let me know and I will open your request manually in the portal. Please note, submitting a public records request still requires me to review and redact all sensitive (confidential) information, which I am doing as expeditiously as possible.
Thank you,
Lisa Masengale *(she/her)*
Forms and Records Analyst Supervisor
Energy Facility Site Evaluation Council
Phone number: (360) 485-1591
EFSEC phone number: (360) 664-1345
www.efsec.wa.gov

From: kmbrun@gmail.com <kmbrun@gmail.com>
Sent: Friday, November 10, 2023 7:42 AM
To: Masengale, Lisa (EFSEC) <lisa.masengale@efsec.wa.gov>
Subject: Horse Heaven Final ASC Appendices

External Email

Lisa, I do not see any appendices along with the Final ASC in your postings. Why not? Does this mean that the 12/1/23 updated appendices were used for the FEIS? The appendices that were changed from or added to the original ASC are the following:
Appendix G – Shadow Flicker Analysis Memo (Revised)

Appendix I – Wetlands and Other Waters Delineation Report (Revised)
Appendix K – Biological Reports (Revised)
Appendix L – Draft Wildlife and Habitat Mitigation Plan (New)
Appendix O – Acoustic Reports (Revised)
Appendix Q – Visual Simulations (Revised)
Appendix R – Cultural Resource Reports (redacted) (Revised)
Karen Brun
Kennewick, WA

Attachments:

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To:
press@updates.gov.wa.gov;outbound@iq.governor.wa.gov;Chris.Corry@leg.wa.gov;curtis.king@leg.wa.gov;GOVOu
From: cease2020@aol.com
Received: 2023-11-14T00:14:01+00:00
Subject: C.E.A.S.E
Has attachment? False

External Email

Latest Update on Horse Heaven Hills Windfarm Project (pnwag.net)

EFSEC will ignore all the true facts and negative impacts and send it to Inslee who will do the same. This project would not happen in the Seattle area. It's time for EFSEC employees and Inslee to share in the clean energy plan. Time to put turbines in Puget Sound and solar sites on Bainbridge Island. Those hypocrites will never allow that to happen. Greg Wagner C.E.A.S.E.

Attachments:

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To:
Comments@efsec.wa.gov;elev461@ECY.WA.GOV;Michael.Livingston@dfw.wa.gov;LEONARD.YOUNG@dnr.wa.gov;s
From: dave@tricitiescares.org
Received: 2023-11-16T17:40:40+00:00
Subject: Fwd: Horse Heaven Project-Fugitive Dust
Has attachment? False

External Email

David Sharp
Vice President, Tri-Cities CARES
Email: dave@tricitiescares.org
Webpage: www.tricitiescares.org

---------- Forwarded message ---------
From: **Dave Sharp** <dave@tricitiescares.org>
Date: Wed, Nov 15, 2023 at 7:54 PM
Subject: Horse Heaven Project-Fugitive Dust
To: <efsec@efsec.wa.gov>

To the EFSEC Staff and Council, is it not coincidental that part of the topic today was fugitive dust? In the following screen shot, Kennewick is singled out on the Dept of Ecology website as the most problematic airquality site in the state. The PM 10 level highlighted is barely below the National Ambient Air Quality Standard of 150. The Applicants Final ASC, Table 3.2-1, shows the three-yearaverage (2019-2021) at 240. Any uptick will make an already bad situation worse and may make the area subject to mandatory implementation plans to regain compliance.

The Metalinesite shown is downwind of the Horse Heaven Project, and the parched dryland area of the HHH is most likely the major contributor. To get an idea of how bad this problem is currently, please review the Adjudication Supplemental Testimony of HHH farmer Chris Wiley and his description of the talcumpowder-like fine dust.

The Final ASC states that post construction, the annual PM10 emissions will be 19 pounds of dust per year. That incredibly low number with over100 miles of unpaved roads is simply not believable.

Does the Applicant even take into account the downdraft and updraft wake turbulence of the wind turbine rotor span with blade tips within 40' from the ground? The Applicant's data request response to a paragliding question certainly shows that turbulence.

Some recommendations:

1.Staff should review the Applicants calculations and methodology to check the validity of the PM-10 emissions during the operations phase. EPA's AP42 Chapter 13.2.2 is the industry standard for unpaved roads. The method used by the Applicant is unclear.

2. Ensure that a detailed dust control plan is in place including speed limits of no more than 5 mph as per EPA Best practices.

3. The project should not move forward without a water supply proven and secured with quantity necessary to control dust.
4. Construction curtailment should be required when wind speeds are high enough to entrain dust into the air during earthmoving activities.
5. Follow Best management dust control practices of the US EPA. Fugitive Dust Control Measures and Best Practices (epa.gov)

David Sharp
Tri-Cities CARES
Email: dave@tricitiescares.org

Webpage: www.tricitiescares.org

Attachments:

[{"@odata.type":"#microsoft.graph.fileAttachment","id":"AAMkADU1OGRmNDUyLWNhZDAtNGQ3Mi05N2YwLTkwM
BwASg50NvGhiT597AeISAVy7AAAAAAEMAAASg50NvGhiT597AeISAVy7AAD_HQTFAAABEgAQAB61PChvM35ChCB
11-
16T17:40:40+00:00","name":"image.png","contentType":"image/png","size":869934,"isInline":true,"contentId":"ii_lp0

To: Comments@efsec.wa.gov
From: efsec@efsec.wa.gov
Received: 2023-11-17T23:37:49+00:00
Subject: FW: HHH Wind Farm
Has attachment? False

From: Neal Farenbaugh <nfarenbaugh@hotmail.com>
Sent: Friday, November 17, 2023 3:37 PM
To: EFSEC (EFSEC) <efsec@efsec.wa.gov>
Subject: HHH Wind Farm

External Email

I live nearby and absolutely object to this project! We don't want to have these wind turbines obstructing our views of the surrounding area. If you think it's necessary to have these wind turbines then move them south a couple of miles so we don'thave to see them.

Attachments:

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To: Comments@efsec.wa.gov
From: efsec@efsec.wa.gov
Received: 2023-11-28T00:17:30+00:00
Subject: FW: Horse Heaven Energy Center FEIS Questions & Comments
Has attachment? False

From: kmbrun@gmail.com <kmbrun@gmail.com>
Sent: Monday, November 27, 2023 4:17:18 PM (UTC-08:00) Pacific Time (US & Canada)
To: Moon, Amy (EFSEC) <amy.moon@efsec.wa.gov>; Drew, Kathleen (EFSEC) <kathleen.drew@efsec.wa.gov>; Bumpus, Sonia (EFSEC) <sonia.bumpus@efsec.wa.gov>; Grantham, Andrea (EFSEC) <andrea.grantham@efsec.wa.gov>; ami.hafkemeyer@efsec.wa. <ami.hafkemeyer@efsec.wa.>; EFSEC (EFSEC) <efsec@efsec.wa.gov>; Brewster, Stacey (UTC) <stacey.brewster@utc.wa.gov>; Levitt, Eli (ECY) <elev461@ECY.WA.GOV>; Livingston, Michael F (DFW) <Michael.Livingston@dfw.wa.gov>; Osborne, Elizabeth (COM) <elizabeth.osborne@commerce.wa.gov>
Subject: Horse Heaven Energy Center FEIS Questions & Comments

External Email

After spending many hours reviewing this huge document, I have many questions and comments. This is the largest wind and solar project every proposed for Washington State and one that has not received the arduous review and scrutiny that a project of its size and scale requires. The entire process has a rubber-stamped check-the-boxes feel…let's get this thing off the ground and the Tri-Cities be damned. I realize that the goal is to reduce Washington's carbon footprint but given that this power is, in all likelihood, going to be sent out of state, it will have zero impact on Washington's carbon goals.

1. **Chapter 3 – Affected Environment**
   Where are the visual simulations for Representative Viewpoints 17-23?
2. **Section 3.13.2.1**states that the Lease Boundary primarily falls within the jurisdiction of Fire Districts #1 and #5.**That is not entirely true**.Fire District #2serves Benton City and the rural areas surrounding Benton City including the area involved in the June 18th wildfire. Refer to the Office of Fire Managementmapsfor Benton County. Who didn't do their homework?
3. **Section 4.10, Visual Aspects, Light and Glare**
   According to the referenced**Appendix 3.10-2 Updated SWCA Visual Study – Final EIS, Section 4.2.4.1**,**the Applicant committed**to "**Clustering or grouping turbines**to break up long lines of turbines". Neither the FASC nor the FEIS provide evidence that this has been done. Why not? If they committed to it, then they should do it.
   Section 4.10.1.1, Visual Aspects Methodology
   The analysis of the Project's visual impacts focuses on three elements: landscape character, viewing locations, and compliance with state and county visual management guidance. The analysis uses the methods developed by the Clean Energy States Alliance (CESA), which suggest three evaluation criteria as they relate to determining whether impacts rise to the magnitude of "undue" or "unreasonable" (CESA 2011):
   - Does the project violate a clear written aesthetic standard intended to protect the scenic values or aesthetics of the area or a particular scenic resource?
   - Does the project dominate views from highly sensitive viewing areas or within the region as a whole?
   - Has the developer**failed to take reasonable measures to mitigate**the significant or avoidable impacts of the project?

   From our perspective, the answer to every one of these questions is a resounding "YES". Even SWCA states in:
   Section 4.2.2.6 Combined Impacts of Components

•The combined impacts of the different Project components would result in a landscape character dominated by large-scale energy infrastructure,…

•…the scale of the Project and prominence of the proposed turbines would result in high, long-term impacts to the existing landscape.

•Views from these locations (KOPs 3, 6, 12, 13 and 15) would be dominated by energy infrastructure as a result of the additive effects from each Project component, resulting in high, long-term impacts on these views. Since these impacts occur on viewpoints beyond the neighboring receptors, these effects would be regional in extent. In summary, activities during operation of all components of the Project would result in high, long-term,**unavoidable**, regional impacts on visual resources.

•The Horse Heaven Hills and northern ridgeline would, however, become dominated by energy infrastructure, with potential long duration views from areas within the communities between Benton City and Kennewick. These impacts on views would be most intense where unobstructed views of a large number of turbines occur." Which, as those of us who live here, would impact the residences who are at or near the same elevation as HHH-West, not those who are in Badger Canyon within .5 miles of the Project.
Given the restricted grid injection capacity of 850 MW, why are the most onerous turbines not being removed or relocated? Doing so would significantly reduce the multiple impacts of those turbines currently located in the migration corridor, on cultural resource sites, in heavily used recreation areas, within the aerial firefighting corridor, and within proximity to populated residential areas. The "Significant Unavoidable Adverse Impacts" only exist because the Applicant refuses to consider any meaningful compromises on turbine location or quantity. It's all about the money!

4. **In the FEIS, Public Health and Safety**

PHS-126: Fire Suppression Aircraft Access: In the event of a major wildfire occurring in an area where fire suppression aircraft may need access near the Project, whether related to the Project or resulting from another cause, the Applicant would shut down turbines temporarily.
Rationale: This mitigation measure would allow access for fire suppression aircraft carrying water and fire suppression chemicals, as needed.
Had Judge Torem not denied testimony from two aerial firefighters with a combined experience of 84 years, you would know that the proposed mitigation is unacceptable for protecting the lives and property of those who live near the steeply sloped areas prone to wildfires. These professionals require a 4-mile buffer zone in which to descend, drop the retardant or water, and lift out again. FAA restricts any obstruction 499' tall within 20,000 feet from a runway. Commercial and passenger planes take off and land at the same height and speed as an aerial firefighting plane. Why would you think that having a 499' tower with no spinning blade would be different from a 499' building? The same restriction should apply. It makes no difference to an aerial firefighter whether the blades are spinning or not. It's the presence of the 499' tall turbines and the fact that they are inside the 4-mile buffer zone that matter.

5. **InSection 4.12.2.5**, the FEIS "describes measures to reduce or compensate for impacts related to recreation…".
R-2: The Certificate Holder would provide a minimum of five informational boards approved by DNR and EFSEC at viewpoints within the Lease Boundary and/or in the surrounding communities associated with scenic areas of interest. The construction of the informational boards would be completed within five years of the beginning of construction.

Rationale: To mitigate the loss of uninterrupted views of scenic viewpoints and provide information to the public regarding the Project, the Project's expected years of operation and the reclamation of the Project. Additionally, photographs of the viewshed prior to the construction of the Project should be displayed, in color, on the informational boards. Why would you think that posting informational boards on the operational Project and what it used to look like is going to mitigate the loss of uninterrupted views of scenic viewpoints? Just ludicrous.

6. In the FEIS,**Table 4.12-5b**:**Summary of Potential Impacts on Recreation during Operations**, the following appears:

Turbines would limit recreational activities (i.e., paragliding) that occur on public land near area of operation" with a Low magnitude of impact. Have you asked the paragliders if they agree with this rating? Your mitigation is to push them off to other areas but they selected this area for their recreational activity because it meets their criteria. If other areas were capable of doing so, they would've picked another place from which to paraglide.

7. **Table 4.12-5c**wherein EFSEC has determined that significant unavoidable adverse impacts would occur during the operation stage.

   Are these really unavoidable or have they been designated as such because neither the Applicant nor EFSEC is willing to scale this project back to a reasonable and much less impactful state? Why do the turbines have to sit on the Horse Heaven Hills ridgeline when, by sacrificing a small amount of generation, they could be pushed farther south and southwest? The Applicant and EFSEC are asking the Tri-Cities to make a huge sacrifice with very little being offered to balance that out.

8. **Section 4.13 Public Health and Safety.**Under**Applicant Commitments**list of applicable federal, state, and local health and safety standards in on**Page 4-503**, there is a noticeable absence of anything remotely related to aerial firefighting. Why is that? Did they not consider aerial firefighting to be an area of concern for public health and safety? We sure do.
   On**Page 4-506**, the FEIS states: "Fire may result from turbine construction under Turbine Option 1 due to existing site conditions and the nature of construction activities. However, potential impacts related to fire could be meaningful, as**wildfire risk in the area is considered high**(Section 3.13.2.1). Impacts of a fire would be medium, temporary, feasible, and**limited in spatial extent**." So the Applicant and EFSEC acknowledge the risk of wildfire but yet hamstring firefighting ability by not providing a 4-mile buffer for aerial firefighting. Why is that? And what is meant by "limited in spatial extent"? Are you expecting a wildfire to stay in one place?
9. **Table 5-2: Cumulative Impacts with Proposed Action**

   •**Air Quality**: Fugitive Dust ($PM_{2.5}$and PM_{10}) – Conclusion: The Proposed Action does not meaningfully contribute to the overall cumulative impact on air quality within the spatial and temporal setting. Where is the data that supports this conclusion? Just stating something doesn't make it so.

   •**Vegetation**- Conclusion: The Proposed Action would meaningfully contribute to cumulative impacts on Priority Habitat and special status plant species.

   •**Wildlife and Habitat**- Conclusion: The Proposed Action would meaningfully contribute to cumulative impacts on Priority Habitat and special status plant species.

   •**Historic and Cultural Resources**- Conclusion: Due to changes in the nature and use of the landscape, the Proposed Action would meaningfully contribute to a cumulative impact on historic and cultural resources.

•Visual Aspects, Light and Glare- Conclusion: The Proposed Action meaningfully contributes to a cumulative impact on visual aspects within the spatial setting.

•Noise and Vibration- Conclusion: The Proposed Action meaningfully contributes to a cumulative impact on the local noise environment in the spatial setting.

•Recreation- Conclusion: The Proposed Action meaningfully contributes to a cumulative impact on recreational resources due to changes in the use, quality of the experience, and the health and safety of recreationists.

•Transportation– Conclusion: Depending on the construction timing of RFDs, the Proposed Action has the potential to meaningfully contribute to impacts on transportation within the spatial and temporal setting.

Of the 14 Resources listed in this table, 7 meaningfully contribute to a cumulative impact and 1 has the potential to do so. Another, Public Health and Safety, was not thought to have a meaningful impact from fire, smoke and haze, or hazardous materials release. That designation should be reconsidered since wildfires, whether caused by lightning, human irresponsibility, or a turbine, solar, panel, or BESS malfunction, have significant potential for harm to the public. Given that more than half of these resources are significantly impacted, why is neither the Applicant nor EFSEC taking a step back and seriously considering what else should be done to change this? Relocating the turbines currently sited within the migration and historic/cultural resources corridors and recreational areas would also reduce the impacts on vegetation and people (i.e., visual, light, glare, noise and vibration).

10. Section 5.2.2 – Identification of Meaningful Contributions to Cumulative Impacts and Determination of Significant from the Proposed Action

•Vegetation- The potential exists for a final design that lessens the residual impact and reduces the Proposed Action's contribution to cumulative impacts on priority habitats and native plant species.

•Wildlife and Habitat– The potential exists for a final design that lessens the residual impact and reduces the Proposed Action's contribution to cumulative impacts on special status wildlife species and priority habitats.

•Historic and Cultural Resources- Cumulative impacts from ground disturbance, viewshed alteration, and restricted access to Traditional Cultural Properties are likely to alter the nature and use of the landscape. Cumulative impacts from past and present actions and RFDs may affect the location, setting, feeling, and/or association of historic and cultural resources, resulting in a potential loss of the integrity of these resources.

•Visual Aspects- Mitigation measures have been identified for these impacts that, when implemented, are expected to reduce the magnitude of effect. These effects include dominating the area's landscape character through the introduction of large-scale energy infrastructure, as well as dominating views from viewing locations where the setting would appear heavily modified.

•Noise- Impacts from long-term noise sources could add to the present developments and RFDs in the local settings.

•Recreation- Cumulative loss of the use for recreation resources occurs when lands, frequently used for recreation activities, are taken out of use during the construction and operation of non-recreation projects or recreation activities are indirectly impacted by

projects (e.g., visual, noise, etc.).

•**Transportation**- Cumulative impacts from past and present actions and RFDs have the potential to affect the level of service of traffic routes, cause loss of access to public resources, and decrease roadway safety if constructed or decommissioned contemporaneously.

Why were Light and Glare not addressed in Section 5.2.2?

11. **Table 5-3: Cumulative Impact Analysis Summary**
    Of the 17 topics listed in this table, all but one (vibration during construction and decommissioning) acknowledge that the proposed action meaningfully contributions to a cumulative impact. It appears to any intelligent person that you all should back to the drawing board. This project is not ready for prime-time. What rationale do you have for proceeding with this project when there are so many negative impacts – many of which could be resolved with compromise on the part of the Applicant and EFSEC? EFSEC should not be in the business of making sure that the Applicant gets what they want and disregarding everyone else.
12. According to**WAC 463-60-085(2) Fair treatment**.The application shall describe how the proposal's design and mitigation measures ensure that no group of people, including any racial, ethnic, or socioeconomic group, bear a disproportionate share of the environmental or socioeconomic impacts resulting from the construction and operation of the proposed facility.
    Statistics provided by TCC during the adjudication shows that this project will impact 20 times more people than all the rest of the wind and solar projects in the entire state. That definitely shows that the residents of the Tri-Cities will bear a disproportionate share of the environmental impacts. How can that be justified?

Karen Brun
Kennewick, WA
509-392-1156

Attachments:

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To: Comments@efsec.wa.gov
From: efsec@efsec.wa.gov
Received: 2023-11-28T00:01:14+00:00
Subject: FW: Horse Heaven FEIS Questions/Comments
Has attachment? False

From: kmbrun@gmail.com <kmbrun@gmail.com>
Sent: Monday, November 27, 2023 4:00 PM
To: Moon, Amy (EFSEC) <amy.moon@efsec.wa.gov>; EFSEC (EFSEC) <efsec@efsec.wa.gov>; EFSEC (EFSEC) <efsec@efsec.wa.gov>; efsec@doe.wa.gov; efsec@wdfw.wa.gov; efsec@dnr.wa.gov; Grantham, Andrea (EFSEC) <andrea.grantham@efsec.wa.gov>; Brewster, Stacey (UTC) <stacey.brewster@utc.wa.gov>; Drew, Kathleen (EFSEC) <kathleen.drew@efsec.wa.gov>; Levitt, Eli (ECY) <elev461@ECY.WA.GOV>; Livingston, Michael F (DFW) <Michael.Livingston@dfw.wa.gov>; Brewster, Stacey (UTC) <stacey.brewster@utc.wa.gov>; Osborne, Elizabeth (COM) <elizabeth.osborne@commerce.wa.gov>; Bumpus, Sonia (EFSEC) <sonia.bumpus@efsec.wa.gov>
Subject: Horse Heaven FEIS Questions/Comments

External Email

All, after spending many hours reviewing the HH FEIS, I have many questions and comments. This project is the largest ever proposed for Washington State and has not received the amount of scrutiny commensurate with its size and scale. The process so far appears to be a rubber stamp rather than the thorough vetting that the Legislature intended. Additionally, the power produced will, in all likelihood, be distributed out of state and, therefore, have zero impact on Governor Inslee's carbon goals.

1. **Chapter 3 – Affected Environment**
   Where are the visual simulations for Representative Viewpoints 17-23?
2. **Section 3.13.2.1**states that the Lease Boundary primarily falls within the jurisdiction of Fire Districts #1 and #5.**That is not entirely true**.Fire District #2serves Benton City and the rural areas surrounding Benton City including the area involved in the June 18th wildfire. Refer to the Office of Fire Managementmapsfor Benton County. Who didn't do their homework?
3. **Section 4.10, Visual Aspects, Light and Glare**
   According to the referenced**Appendix 3.10-2 Updated SWCA Visual Study – Final EIS, Section 4.2.4.1**,**the Applicant committed**to "**Clustering or grouping turbines**to break up long lines of turbines". Neither the FASC nor the FEIS provide evidence that this has been done. Why not? If they committed to it, then they should do it.
   Section 4.10.1.1, Visual Aspects Methodology
   The analysis of the Project's visual impacts focuses on three elements: landscape character, viewing locations, and compliance with state and county visual management guidance. The analysis uses the methods developed by the Clean Energy States Alliance (CESA), which suggest three evaluation criteria as they relate to determining whether impacts rise to the magnitude of "undue" or "unreasonable" (CESA 2011):
   - Does the project violate a clear written aesthetic standard intended to protect the scenic values or aesthetics of the area or a particular scenic resource?
   - Does the project dominate views from highly sensitive viewing areas or within the region as a whole?
   - Has the developer**failed to take reasonable measures to mitigate**the significant or avoidable impacts of the project?

   From our perspective, the answer to every one of these questions is a resounding "YES". Even SWCA states in:
   Section 4.2.2.6 Combined Impacts of Components

   - The combined impacts of the different Project components would result in a landscape character dominated by large-scale energy infrastructure,…

•…the scale of the Project and prominence of the proposed turbines would result in high, long-term impacts to the existing landscape.

•Views from these locations (KOPs 3, 6, 12, 13 and 15) would be dominated by energy infrastructure as a result of the additive effects from each Project component, resulting in high, long-term impacts on these views. Since these impacts occur on viewpoints beyond the neighboring receptors, these effects would be regional in extent. In summary, activities during operation of all components of the Project would result in high, long-term,**unavoidable**, regional impacts on visual resources.

•The Horse Heaven Hills and northern ridgeline would, however, become dominated by energy infrastructure, with potential long duration views from areas within the communities between Benton City and Kennewick. These impacts on views would be most intense where unobstructed views of a large number of turbines occur." Which, as those of us who live here, would impact the residences who are at or near the same elevation as HHH-West, not those who are in Badger Canyon within .5 miles of the Project.

Given the restricted grid injection capacity of 850 MW, why are not the most onerous turbines being removed or relocated? Doing so would significantly reduce the multiple impacts of those turbines currently located in the migration corridor, on cultural resource sites, in heavily used recreation areas, within the aerial firefighting corridor, and within proximity to populated residential areas. The "Significant Unavoidable Adverse Impacts" only exist because the Applicant refuses to consider any meaningful compromises on turbine location or quantity. It's all about the money!

4. **In the FEIS, Public Health and Safety**

PHS-126: Fire Suppression Aircraft Access: In the event of a major wildfire occurring in an area where fire suppression aircraft may need access near the Project, whether related to the Project or resulting from another cause, the Applicant would shut down turbines temporarily.
Rationale: This mitigation measure would allow access for fire suppression aircraft carrying water and fire suppression chemicals, as needed.
Had Judge Torem not denied testimony from David Wardell, Chairman of the Associated Aerial Firefighters and air tanker operator for 34 years, and David Baird, an experienced aerial firefighter, you would know that the proposed mitigation is unacceptable for protecting the lives and property of those who live near the steeply sloped areas prone to wildfires. These professionals require a 4-mile buffer zone in which to descend, drop the retardant or water, and lift out again. FAA restricts any obstruction 499' tall within 20,000 feet from a runway. Commercial and passenger planes take off and land at the same height and speed as an aerial firefighting plane. Why would you think that having a 499' tower with no spinning blade would be different from a 499' building? The same restriction should apply. It makes no difference to an aerial firefighter whether the blades are spinning or not. It's the presence of the 499' tall turbines and the fact that they are inside the 4-mile buffer zone that matter.

5. **InSection 4.12.2.5**, the FEIS "describes measures to reduce or compensate for impacts related to recreation…".

R-2: The Certificate Holder would provide a minimum of five informational boards approved by DNR and EFSEC at viewpoints within the Lease Boundary and/or in the surrounding communities associated with scenic areas of interest. The construction of the informational boards would be completed within five years of the beginning of construction.
Rationale: To mitigate the loss of uninterrupted views of scenic viewpoints and provide information to the public regarding the Project, the Project's expected years of operation and the reclamation of the Project. Additionally, photographs of the viewshed prior to the construction of the Project should be displayed, in color, on the informational boards.
Why would you think that posting informational boards on the operational Project and what it used to look like is going to mitigate the loss of uninterrupted views of scenic viewpoints?

Just ludicrous.

6. In the FEIS, **Table 4.12-5b**: **Summary of Potential Impacts on Recreation during Operations**, the following appears:

Turbines would limit recreational activities (i.e., paragliding) that occur on public land near area of operation" with a Low magnitude of impact. Have you asked the paragliders if they agree with this rating? Your mitigation is to push them off to other areas but they selected this area for their recreational activity because it meets their criteria. If other areas were capable of doing so, they would've picked another place from which to paraglide.

7. **Table 4.12-5c** wherein EFSEC has determined that significant unavoidable adverse impacts would occur during the operation stage.

Are these really unavoidable or have they been designated as such because neither the Applicant nor EFSEC is willing to scale this project back to a reasonable and much less impactful state? Why do the turbines have to sit on the Horse Heaven Hills ridgeline when, by sacrificing a small amount of generation, they could be pushed farther south and southwest? The Applicant and EFSEC are asking the Tri-Cities to make a huge sacrifice with very little being offered to balance that out.

8. **Section 4.13 Public Health and Safety.** Under **Applicant Commitments** list of applicable federal, state, and local health and safety standards in on **Page 4-503**, there is a noticeable absence of anything remotely related to aerial firefighting. Why is that? Did they not consider aerial firefighting to be an area of concern for public health and safety? We sure do.

On **Page 4-506**, the FEIS states: "Fire may result from turbine construction under Turbine Option 1 due to existing site conditions and the nature of construction activities. However, potential impacts related to fire could be meaningful, as **wildfire risk in the area is considered high** (Section 3.13.2.1). Impacts of a fire would be medium, temporary, feasible, and **limited in spatial extent**." So the Applicant and EFSEC acknowledge the risk of wildfire but yet hamstring firefighting ability by not providing a 4-mile buffer for aerial firefighting. Why is that? And what is meant by "limited in spatial extent"? Are you expecting a wildfire to stay in one place?

9. **Table 5-2: Cumulative Impacts with Proposed Action**

- **Air Quality**: Fugitive Dust ($PM_{2.5}$ and PM_{10}) – Conclusion: The Proposed Action does not meaningfully contribute to the overall cumulative impact on air quality within the spatial and temporal setting. Where is the data that supports this conclusion? Just stating something doesn't make it so.

- **Vegetation**- Conclusion: The Proposed Action would meaningfully contribute to cumulative impacts on Priority Habitat and special status plant species.

- **Wildlife and Habitat**- Conclusion: The Proposed Action would meaningfully contribute to cumulative impacts on Priority Habitat and special status plant species.

- **Historic and Cultural Resources**- Conclusion: Due to changes in the nature and use of the landscape, the Proposed Action would meaningfully contribute to a cumulative impact on historic and cultural resources.

- **Visual Aspects, Light and Glare**- Conclusion: The Proposed Action meaningfully contributes to a cumulative impact on visual aspects within the spatial setting.

- **Noise and Vibration**- Conclusion: The Proposed Action meaningfully contributes to a cumulative impact on the local noise environment in the spatial setting.

•**Recreation**- Conclusion: The Proposed Action meaningfully contributes to a cumulative impact on recreational resources due to changes in the use, quality of the experience, and the health and safety of recreationists.

•**Transportation**– Conclusion: Depending on the construction timing of RFDs, the Proposed Action has the potential to meaningfully contribute to impacts on transportation within the spatial and temporal setting.

Of the 14 Resources listed in this table, 7 meaningfully contribute to a cumulative impact and 1 has the potential to do so. Another, Public Health and Safety, was not thought to have a meaningful impact from fire, smoke and haze, or hazardous materials release. That designation should be reconsidered since wildfires, whether caused by lightning, human irresponsibility, or a turbine, solar, panel, or BESS malfunction, have significant potential for harm to the public. Given that more than half of these resources are significantly impacted, why is neither the Applicant nor EFSEC taking a step back and seriously considering what else should be done to change this? Relocating the turbines currently sited within the migration and historic/cultural resources corridors and recreational areas would also reduce the impacts on vegetation and people (i.e., visual, light, glare, noise and vibration).

10. Section 5.2.2 – Identification of Meaningful Contributions to Cumulative Impacts and Determination of Significant from the Proposed Action

•**Vegetation**- The potential exists for a final design that lessens the residual impact and reduces the Proposed Action's contribution to cumulative impacts on priority habitats and native plant species.

•**Wildlife and Habitat**– The potential exists for a final design that lessens the residual impact and reduces the Proposed Action's contribution to cumulative impacts on special status wildlife species and priority habitats.

•**Historic and Cultural Resources**- Cumulative impacts from ground disturbance, viewshed alteration, and restricted access to Traditional Cultural Properties are likely to alter the nature and use of the landscape. Cumulative impacts from past and present actions and RFDs may affect the location, setting, feeling, and/or association of historic and cultural resources, resulting in a potential loss of the integrity of these resources.

•**Visual Aspects**- Mitigation measures have been identified for these impacts that, when implemented, are expected to reduce the magnitude of effect. These effects include dominating the area's landscape character through the introduction of large-scale energy infrastructure, as well as dominating views from viewing locations where the setting would appear heavily modified.

•**Noise**- Impacts from long-term noise sources could add to the present developments and RFDs in the local settings.

•**Recreation**- Cumulative loss of the use for recreation resources occurs when lands, frequently used for recreation activities, are taken out of use during the construction and operation of non-recreation projects or recreation activities are indirectly impacted by projects (e.g., visual, noise, etc.).

•**Transportation**- Cumulative impacts from past and present actions and RFDs have the potential to affect the level of service of traffic routes, cause loss of access to public resources, and decrease roadway safety if constructed or decommissioned contemporaneously.

Why were Light and Glare not addressed in Section 5.2.2?

11. **Table 5-3: Cumulative Impact Analysis Summary**
    Of the 17 topics listed in this table, all but one (vibration during construction and decommissioning) acknowledge that the proposed action meaningfully contributions to a cumulative impact. It appears to any intelligent person that you all should back to the drawing board. This project is not ready for prime-time. What rationale do you have for proceeding with this project when there are so many negative impacts – many of which could be resolved with compromise on the part of the Applicant and EFSEC? EFSEC should not be in the business of making sure that the Applicant gets what they want and disregarding everyone else.
12. According to **WAC 463-60-085(2) Fair treatment**. The application shall describe how the proposal's design and mitigation measures ensure that no group of people, including any racial, ethnic, or socioeconomic group, bear a disproportionate share of the environmental or socioeconomic impacts resulting from the construction and operation of the proposed facility.

    Statistics provided by TCC during the adjudication shows that this project will impact 20 times more people than all the rest of the wind and solar projects in the entire state. That definitely shows that the residents of the Tri-Cities will bear a disproportionate share of the environmental impacts. How can that be justified?

Attachments:

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To:
efsec@efsec.wa.gov;Comments@efsec.wa.gov;kathleen.drew@efsec.wa.gov;Michael.Livingston@dfw.wa.gov;LEONA
From: dave@tricitiescares.org
Received: 2023-11-29T17:01:53+00:00
Subject: Fugitive Dust -Calculations and Modeling Incomplete
Has attachment? False

External Email

In an earlier comment it was pointed out that the PM10 emissions for O&M portion of the project were unbelievably low at 19 pounds for PM10. I stand by the comment.

Ongoing O&M Activities-**The FEIS calculation for PM omits fugitive dust sources. It appears incomplete, and incorrectly understates the actual emissions.**

The calculation only includes PM from vehicle exhausts, brake pads and brake liners. Fugitive dust emissions will be orders of magnitude higher than the method used. The two largest fugitivedust sources; windblown open areas, and vehicle wheel contact with unpaved road surfaces are not included. The FEIS does not require any active dust control mitigation post construction for unpaved roads, and the emissions would be considered uncontrolled. A comprehensive PM calculation that includes fugitive dust should be performed, as should dispersion modeling.

AP-42Section 13.2.2.2 Emissions Calculation and Correction Parametersoffers an appropriate calculation. Local AP factors, i. e., silt, moisture, and particlesize fractions, should be used instead of general factors as AP42 recommends.

The project will add approximately 100 miles of unpaved roads, and potentially 36 miles of crane paths. The projectincreases unpaved roads in the entire county by nearly 50%, and ~400% within 10 miles of the metro areas and communities. The only reason for these roads to exist is to support operations and maintenance of the HHH project.

Since PM 10 is a criteria pollutant identified by the National Ambient Air Quality Standard (NAAQS) the FEIS needs to be comprehensive and correct. This uncontrolled source existsonly to support the project and will add an ongoing increment to the area's already high PM levels.

Dispersion Modeling was not Performed for Construction Activities

Constructionemissions dwarf the batch plant emissions by a factor of about 400 times. Dispersion modeling should be performed, and Fugitive emissions should be included as in the Tetra Tech model. The emissions calculations should be revised to utilize local data for AP factors as discussed above. The FEIS should demonstrate that the calculation shortcut taken to use only bulldozer and grader emissions is theworst case scenario. By not including backhoe and excavator activity, some emissionactivity from that equipment has also been excluded.

The Tetra Tec dispersion modeling in Appendix 4.3-2(batch plant activities and diesel engines) showed the PM10 and PM2.5 uncomfortably bumping up to the NAAQS standard exceedance level. The batch plant emissions are intertwined with the construction activities and across the same area. The only difference is that construction activities will be 400 times greater. The construction activity should get the same modeling and integrated with the batch plant modeling, if possible..

This is a major health issue that will affect many people. Without a comprehensive calculation, the council will not be adequately informed.

We know the following: 1. Benton County has ongoing fugitive dust issues; enough to justify an agency specifically devoted to air quality. 2. Benton County has high background PM10 and PM2.5 (Reference Tetra-Tech modeling report), 3. The County has been in non-attainment status for PM-10 several times, and the downwind Burbank located PM2.5 monitor in Franklin County is on the NAAQS watch status. 4. We know from descriptive testimony how dry and dusty the Horse Heaven Hills are; Chris Wiley, supplemental testimony, 5. There are ~300,000 people within 10 miles of the project, and 6. Many people work outdoors, particularly those in the Agriculture industry or construction industries. That category of people would see even more increased exposure to dust levels.

The FEIS as now presented is deficient for this key topic, and the Council should have necessary data in front of them before proceeding.

The Tetra Tech model first appeared at the end of October, 2023, with no public or adjudication review possible.

Note that both the DEIS and FEIS opening page of Appendix 4.3-1 Emissions Calculation Table, Page 1 of 15,*Horse Heaven Wind Farm-Construction Emissions-Emission Summary by Phase and Year* **misrepresent emissions by not including fugitive dust** and implying that the *Summary* page, by virtue of the word summary, was inclusive of all emissions.

If I were a council membe**r my**assumption would be just what it says,*Emission Summary by Phase and Year*. It is not. Yes, the fugitive dust emissions are included toward the end of all the tables and other information, but even that table presents it as "*Fugitive Dust Emissions Summary Construction* ***Scenario".*** Why was it not included on the summary page? It is an emission, and it is covered under federal law. Would the council member have time to flush out that detail? A council member is in an executive role and dependent upon others to inform and educate. A council member does not have the time to dig into details.

David Sharp
Tri-Cities CARES
Email: dave@tricitiescares.org
Webpage: www.tricitiescares.org

Attachments:

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To: Comments@efsec.wa.gov
From: efsec@efsec.wa.gov
Received: 2023-11-30T00:31:59+00:00
Subject: FW: FEIS Aerial Firefighting SME
Has attachment? False

From: kmbrun@gmail.com <kmbrun@gmail.com>
Sent: Wednesday, November 29, 2023 4:28 PM
To: EFSEC (EFSEC) <efsec@efsec.wa.gov>
Subject: FEIS Aerial Firefighting SME

External Email

During your 11/29/23 special meeting presentation, your firefighting subject matter expert was way off the mark on his description of the type of fires we have here. We have to use planes and helicopters every year to fight fires on the slope area near Benton City. They are contracted by the local fire districts. When called to task, he back pedaled big time. Actually asking the local fire districts about how they fight slope fires is the right call.
Karen Brun
Kennewick, WA

Attachments:

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From:	Paul Krupin
To:	EFSEC (EFSEC); EFSEC mi Comments; COM Communications; cpl@dnt.gov; stacy.brewster@utc.wa.gov; UTC DL Commissioners; Brewster, Stacey (UTC); Drew, Kathleen (EFSEC); Levitt, Eli (ECY); Livingston, Michael F (DFW); Osborne, Elizabeth (COM); YOUNG, LENNY (DNR)
Cc:	Moon, Amy (EFSEC); Hafkemeyer, Ami (EFSEC); Grantham, Andrea (EFSEC); Owens, Joan (EFSEC)
Subject:	HHH Special Presentation Nov 29 - aerial firefighting issue
Date:	Thursday, November 30, 2023 8:55:25 AM
Attachments:	Linda Lehman Testimony PJK final 070523 1000 AM.pdf Mark Baird resume EXH-5913_S.pdf BAIRD EXH-5910_S Supplemental Testimony with maps.pdf WARDALL EXH-5906_S.pdf Wardall EXH-5908_S.pdf EXH 5907 Resume - Dave Wardall.pdf

External Email

At the very end of the Nov 29, 2023 special meeting, the topic of aerial firefighting was raised when discussing the public safety element of the presentation on the Horse Heaven Hills (HHH) FEIS Mitigation.

The question was asked what type of aircraft was used in the recent fires in the Horse Heaven Hills. Lenny Young, DNR asked how close to the turbines the aircraft used can fly. The Scout technical expert who responded at the request of EFSEC staff did not provide accurate information.

The following information is in the public comments and adjudication record submitted to EFSEC for the Horse Heaven Hills Project.

Testimony was submitted in the DEIS public comments and the HHH adjudication record addressing aerial firefighting requirements along with photos of the actual aircraft and fire maps and fire perimeters of the fire.

The aircraft used on June 13-14, 2023 in the Hanson Fire that swept the northern slope adjacent to the Horse Heaven Hills Project was a DC-10.

Paul Krupin submitted fire history maps (EXH-5307-R) that were admitted into testimony on August 8, 2023. The maps are on the EFSEC website at the following link: https://www.efsec.wa.gov/sites/default/files/210011/admitted/EXH-5307_R.pdf The maps include mileage rings from fire perimeters that can be

used to identify the turbines in zones too close to the areas where aerial firefighting aircraft are utilized.

L**onnie Click, Fire Chief, gave regular and supplemental testimony (EXH-5631_R and EXH-5912_R)** that was admitted into testimony on August 22, 2023.

Dennis Bates, Fire Chief gave supplemental testimony (EXH-5911_S) that was admitted into testimony on September 14, 2023.

Linda Lehman, Mayor of Benton City gave testimony to the adjudication that states in pertinent part:

> "Comment #3 – The Application and the DEIS do not address the safety of fire suppression aircraft over ridgelines in the Horse Heaven Hills, northern areas of the project, or in Webber and Badger Canyon….[]… Aerial firefighting will be seriously hindered if there are 499-foot wind turbines in close proximity to the flight paths of the aircraft and helicopters.

Mark Baird, aerial firefighter pilot gave supplemental testimony (EXH-5913_S Testimony and EXH-5910_S Resume) that was stricken from the adjudication record by Judge Torem on September 22, 2023.

Page 5 line 5 to 13 of the testimony states in pertinent part:

> "Between three and four nautical miles spacing would at least make aerial
> firefighting possible in order to save lives and property. FAA TERPS, and ICAO Pan
> Ops dictate maneuvering minimum radius of turn for large aircraft as well as minimum
> climb rates to avoid known obstacles in approach and departure corridors where
> obstructions are known and accurately mapped; 2.7 nautical miles is the

minimum
radius of turn for category E aircraft with maneuvering speeds of 168 plus knots. A
climb of 200 feet per nautical mile is the minimum for most departure procedures. If
the ridge top is 2000 feet msl and it has a 500-foot tower on top of it, climb capability
would be exceeded quickly."

David Wardall, Chairman of the National Aerial Firefighters Association gave testimony (EXH-5096_S and EXH-5908_S) that was stricken from the adjudication record by Judge Torem on September 22, 2023 states in pertinent part:

Page 2 lines 17 to 22, state in pertinent part,

"Wind turbines present severe impediments to aerial firefighting operations.
The existence of the wind turbines effectively creates a "no fly" zone which
greatly increases the risk that any wildfire that either began in or near the project site
or spread into it from any surrounding area, could not be quickly contained, and would
grow. I believe there is a threat to the adjacent communities from this proposal by
eliminating the possibility of fixed wing air attacks that needs to be acknowledged."

Page 3 lines 8 to 26 state in pertinent part:

"… the Horse Heaven Hills Wind Farm Project is huge – 25 miles and four to six miles wide – over 60,000 acres with up to 850 MW from up to 244 turbines,
each one 500 foot to 671 foot high in up to 6 rows along the ridgeline.

This is a huge
major obstruction to responding firefighting efforts. The size of this proposed project
will make a huge “No Fly” zone for civil aircraft, medivac helicopters and of course
firefighting aircraft.”

“The extraordinary length of the project creates a 25-mile barrier to fixed wing tanker
aircraft. The wind turbines produce a lot of air rotating vortices type turbulence that
will interfere with safe aerial firefighting operations.

Depending on the winds and the terrain, in order to make effective air drops, the
minimum obstruction setback distance should be three to four miles along any flight
paths needed to conduct aerial operations, and two to three miles perpendicular to the
flight paths to reduce the risks posed by the turbulence downwind of the wind turbines.

Also, brush and grass are “flash” fuels easily ignited up to two miles ahead of the fire
front from blown embers during wind events at 15 mph or greater.”

Page 4 lines 1 to 6 state:

“This is a leapfrog-type fast-moving fire which fills in between the fire front and the new
ember hot spots. The fire essentially explodes. Little time to evacuate.

This project would require lots of pre-fire planning and vegetation removal and
maintenance along roadway escape routes and wide fire breaks around

the entire
project and down-wind structures."

All this is available information in original and redlined strikeout versions at the EFSEC website.

The fire history can be validated on the DNR website in the Washington DNR Large Fires Dataset:

https://geo.wa.gov/datasets/6f31b076628d4f8ca5a964cbefd2cccc/explore

Hope this helps. Appreciatively,

Paul Krupin, BA MS JD
509-531-8390 cell 509-582-5174 landline Paul@Presari.com

Appreciatively,

Paul J. Krupin, BA, MS, JD
Board Member on behalf of TRI-CITIES C.A.R.E.S
Visit: http://www.TriCitiesCARES.org
509-531-8390 cell 509-582-5174 landline Paul@Presari.com

EXH-6102_T

Testimony from Linda Lehman

Benton City has reviewed the Application for Site Certification and is submitting comments to the EFSEC based on its review of these documents. The points we make on the Application for Site Certification closely follow the comments and issues we identified in our comments on the DEIS for the SEPA process. The ASC and the DEIS utilize the same set of reports and documentation.

Benton City supports the use of green energy alternatives over carbon-based sources. The City has been proactive in developing solar energy to off-set costs of operating its Wastewater Treatment Plant Laboratory and Sewer Lift Stations. The solar array was installed by the City in 2017.

Benton City is not to be considered a NIMBY complainant; rather, the City is submitting comments that point to areas that affect safety, economic and socioeconomic factors that have not been considered in the Application.

Benton City has a right to expect a fair and unbiased Adjudication and SEPA process; however, the City finds that there are equity issues. The City is identifying places in the ASC where elements have not been identified analyzed, do not provide adequate information, and do not offer reasonable alternatives.

We believe the proposed action options in the ASC are IN conflict with city development goals, are inconsistent, and will hinder or impede city planned development.

Comment #1 - The Application does not consider economic effects to Benton City regarding the planned I-82 development adjacent to the Horse Heaven Hills Wind Turbine Project.

We strongly disagree with the Applicant's conclusion statement that the project will not materially endanger the health, safety, and welfare of the surrounding community to an extent greater than that associated with any other permitted uses in the applicable zoning district.

Project Description

For the past 15 years, Benton City has been engaged in efforts to annex and/or sell City-owned property on the south side of I-82. This area is comprised of 212 acres and is needed by Benton City to provide additional light industrial acreage, a hotel, and additional mixed residential housing. The initial development entailed creation of a force main and additional lift stations to bring water and sewer across the Yakima River to support the development. This action was contracted in 2008 at a cost of $787,542.39. This work allowed sewage that had been previously truncated on the south side of the Yakima River during flooding, to be piped directly to the Wastewater Treatment Plant on the north side of the river.

The current phase of the I-82 Development Project has been underway since approximately 2018. It is a joint project with the Department of Natural Resources (DNR) and the City of Benton City on State Trust Lands that were annexed into Benton City. Recently, the port of kennewick has

offered funding to the city to complete its zoning map and to complete training for staff in implementing new design standards. A Subarea Plan has been completed by AHBL, Inc., is based on feasibility studies by Eco Northwest, and incorporates City designs by world-famous designers, Michael Mahaffey and Laurence Quamar. The Subarea Plan has been reviewed by the DNR and will be incorporated into the Benton City Comprehensive Plan in early 2023.

The Subarea Plan contains preliminary designs to accommodate additional residences, allow for more light industrial space (Benton City's current Industrial Park is full), and provide a high-end lodging/dining experience with outstanding views that cover 180 degrees from west to east. These views currently include the Horse Heaven Hills near Anelare Winery to the West, Red Mountain to the north, and eastward down the valley toward Goose Ridge. Currently, design standards are under development preceding DNR's release of the property for sale and/or ground lease. The Subarea Plan is intended to attract more visitors to the Red Mountain AVA, provide upscale lodging, and provide services to local wineries, such as bottle or cork distribution centers, and manufacturing of pumps and valves as well as other wineries or tasting rooms.

To encourage light industrial tenants to the development, the City chose to run sewer and water along Jacobs and Field Roads where the light industrial development is planned. This work is slated to start in 2023 at an additional cost of approximately $360,000.00.

This development has moved forward at a significant cost to the City, and the City obviously wants to protect its investments and need for expansion. The City does not want to compromise its standards to do so. Horse Heaven Hills views will have several very prominent Wind Turbines that would impede the natural beauty that is planned to be emphasized in the development. Several large Wind Turbines are located less than a mile distance, as shown in the Application, and would no doubt impede views and devalue the City's investments if surrounded by hundreds of Wind Turbines.

Conclusion: Wind Turbines within a mile of the planned development will materially endanger the health, safety, and welfare of the surrounding community to an extent greater than that associated with any other permitted uses within the applicable zoning district. Further, it is inconsistent with Benton County Conditional Use Permit Requirements.

Recommendations:

1. Complete financial studies that would consider the development and postulated losses to the taxpayers of Benton City due to current Application for Site Certification.
2. Remove the four (4) (or more, based on Options), Wind Turbines from the northern edge of Horse Heaven Hills from the ASC;
3. Consider expanding the solar array to balance power losses from removal of wind turbines.

Comment #2 - The Union Pacific Railroad Bridge and Trail Hub Project loss of recreation and financial impacts of this project have not been addressed in the Application.

Requirements:

The ASC references Benton County Conditional Use Permit Requirements and Project Analysis

> *Item (b) Will not materially endanger the health, safety, and welfare of the surrounding community to an extent greater than that associated with any other permitted uses in the applicable zoning district.*

Under the Washington State Environmental Policy Act, the Adjudication will feed fact and legal conclusions into the SEPA process and facilitate a recommendation to the Governor that weighs the likelihood of occurrence with the severity of an impact (Washington Administrative Code [WAC] 197-11-794) and considers several factors when determining the significance of identified potential impacts (WAC 197-11-330 and WAC 197-11-794).

These impacts were qualitatively assessed based on the method of analysis described in Appendix S Economic Impact Assessment in the Updated ASC as well as in the DEIS Section 4.12.1., Appendix 4-16-1 Technical Review of Horse Heaven Hills Wind Farm, LLCs Economic Impact Analysis.

The City disagrees with the Applicants conclusion statements that the project would not hinder or discourage the development of permitted uses on neighboring properties in the applicable zoning district as a result of the location, size or height of the buildings, structures, walls, required fences or screening vegetation to a greater extent than other permitted uses in the applicable zoning district.

We find flaws and have issues with the identification, discussion and analysis of Project Impacts on Land Use in the Application and the DEIS Section 4.8.

The adjudication process for the Project would allow interested parties, including neighbors, to participate in the project's review and conditions may be placed upon the Project's construction and operations that address issues involving development of permitted uses on neighboring properties.

Project Description

Since 2017, the City has sought to purchase the historic Union Pacific Railroad Bridge, which has been abandoned for nearly a century. The purpose of the Project is to link Benton City to more wide-ranging trail systems, such as Friends of Badger Mountain Trail system, Tapteal Greenway Overland Trail systems, Benton County proposed trail through Badger Canyon and other envisioned trail systems located along ridgelines of Horse Heaven Hills.

Negotiations have been ongoing for several years with the Union Pacific Railroad and cost estimates have been prepared for inspections for environmental effects, and structural integrity of the bridge. The City has proactively purchased eleven (11) acres of park land leading up to and adjacent to the bridge. In doing so, cultural surveys were performed, and several land swaps and boundary line adjustments were made. Recently, there has been increased interest in acquiring the bridge from several bike clubs and hiking enthusiasts, as well as from Benton County. This increased interest has led Congressman Newhouse to select the project for inclusion in the recent Omnibus bill, which has now passed. The City should receive Federal appropriation of $2 million dollars toward the purchase and development of the Railroad Bridge.

The abandoned Union Pacific Railroad Bridge that crosses the Yakima River on the eastern side of Benton City was closed in the 1950s and has been abandoned ever since. Utilizing the bridge as a Rails-to-Trails connector was envisioned approximately seven (7) years ago, as its full potential became apparent. Vision for the project includes a City Park at the west end of the bridge with connection to the Red Mountain Winery Trail to the east. The Red Mountain Winery Trail will be the most westerly leg of a Trail System of approximately 15 miles that comprise the current and planned Badger Mountain Trail System. The Trail System provides access to local cities such as Richland and Kennewick.

Quality of Life and Safety – Quality of Life in the greater Benton City area and within the County is enhanced by providing access to miles of walking and cycling trails, and the bridge provides connectivity to existing trails to the east Western Benton County cycling route(s) access will also be enhanced via a safer route for cyclists traveling from the east. Currently, cyclists must ride on a two-lane State Road with no bike lanes, enter a round-about and then cross a vehicular bridge with very little distance (approximately two feet) between the traffic lane and guard rail, which is dangerous.

Tourism, Education, and Economic Development – The Railroad Bridge connection will allow Benton City to enjoy increased tourism which will support businesses, especially restaurants and retail establishments. It will also encourage family outings along the bike path for discovery of Benton City's unique offerings. These offerings include scientific kiosks such as the Uranus Orbital Marker (part of the Hanford Reach Solar System SILAS Education Project) and wildlife information about natural species that inhabit this area of the Yakima River, in cooperation with the Washington Department of Fish & Wildlife. Historical information is being developed with regard to history of agriculture located at the first irrigation paddlewheel.

Providing a healthy walking and cycling experience also supports Red Mountain wineries by providing various family experience that encourage visitors to stay longer and explore other activities along the river such as swimming, fishing, kayaking and paddle-boarding at the start of the Tapteal Greenway River Trail.

Project goals are to create a significant community impact in terms of quality-of-life, improved tourism, education, safety, and economic development. These goals are measurable by increased tourism via records from Benton City Chamber of Commerce Tourism Office and records regarding social media's number of contacts. Other measurable items are property tax increases, housing starts, numbers of created jobs, and overall increase in Business Licenses.

Conclusion

The Benton City Railroad Bridge and Regional Trail Development, in terms of economics, or loss of recreation, has not been considered or studied in either the Application or the DEIS.

Loss of trails through Badger Mountain, McBee Grade and other areas of Horse Heaven Hills will diminish the City's return on investment from fewer hikers due to positioning of Wind Turbines, loss of natural beauty, loss of habitat and bird mortality.

Recommended Stipulations:

1. Complete an economic study that analyzes the loss of hiking trails up Badger Canyon and along other ridgelines that can affect the number of hikers and quality of their experiences.

These impacts will effect both economic and recreational investments that have been made by the City of Benton City.

2. Remove the four (4) (or more, based on Options) Wind Turbines from the northern edge of Horse Heaven Hills; or
3. Expand the solar array to accommodate the loss in output.

Comment #3 – The Application and the DEIS do not address the safety of fire suppression aircraft over ridgelines in the Horse Heaven Hills, northern areas of the project, or in Webber and Badger Canyon.

Aerial firefighting will be seriously hindered if there are 499-foot wind turbines in close proximity to the flight paths of the aircraft and helicopters.

Regulation:

11.17.070(q)(7). All Wind Turbine(s) must comply with the Federal Aviation Regulations Part 77, Objects Affecting Navigable Airspace, as currently in effect or as hereafter amended, including but not limited to, providing such notices to the FAA as required thereunder and compliance with all requirements or prohibitions imposed by the FAA on the applicant's proposal.

Description

Horse Heaven Hills are subject to numerous wildfires that may or may not influence the Wind Turbines. However, neglected in the Application and the DEIS is the huge safety risk that these Wind Turbines pose on fire suppression aircraft, especially near ridgelines. Fire District 2 often utilizes two types of aircraft during fire suppression work: fixed wing (Air Tankers) and helicopters. The Fire District coordinates with Washington State Fish and Wildlife and with the US Bureau of Land Management (BLM) through specific operating procedures. Representatives of either agency would call the Fire District to inform what type of aircraft is needed. It is not an uncommon occurrence in Horse Heaven Hills.

Attached is a photograph of a recent fire which almost engulfed Anelare Winery on McBee Grade, the location of one of the proposed Wind Turbines. As you can see from the photograph, there is considerable smoke produced by this fire. Firefighters focused on the ground and in drenching hot areas. Wind Turbines may be obscured to low altitude planes. Maneuverability is critical and should not be hampered by trying to maneuver their way through the numerous proposed Wind Turbines at this very ridgeline and also through the steep slopes of Weber Canyon.

An additional concern is aircraft being forced to fly over urbanized areas and major roadways, as this practice discouraged for safety reasons. If Wind Turbines are located on the ridgeline, aircraft will be forced to fly over more populated areas and along I-82 or Weber Canyon Road. Firefighters expressed concern that some things or items may fall into those areas or that the aircraft would be a major distraction to those driving on highways at higher speeds.

A commonly used aircraft is called a SEAT. A single engine airtanker, or SEAT, is the smallest airtanker. These aircraft can deliver up to 800 gallons of fire retardant or water to wildland firefighters on the ground and are ideal for wildfires in lighter fuels, like grasses and light brush.



A "Type 2" aircraft is the fire suppression helicopter. It is commonly known as a "UH-1H Huey". This type of aircraft is designed to carry up to nine firefighters plus the crew and the bucket that is utilized for water drops carries between 300 and 600 gallons of water.



Further, red flashing lights may be confused with emergency vehicles or hot spots and could prove to be a distraction to pilots.

Working Wind Turbines could cause embers to spread down gradient areas, such as Benton City or residences in Badger Canyon.

The Updated Application Appendix P Emergency Response Plan and Table 3.8-1A in the DEIS states do not adequately address fire prevention. Both call for the preparation of a Fire Prevention Plan.

At the present time, Applicant's documentation does not appear to satisfy or be consistent with Benton County LU G 6 Policy 14. LU Goal 6.

> *Policy 14: Support and encourage the use of and application of Firewise principles and other fire risk reduction measures consistent with the Benton County Natural Hazard Mitigation Plan and Community Wildfire Protection Plan to reduce fire risk for urban development, urban subdivisions, rural subdivisions and large rural developments susceptible to wildfires. Encourage the implementation of the Firewise principles, or similar best management measures.*

At the present time, Applicant's documentation does not appear to satisfy or be consistent with Benton County LU Goal 2

> *Policy 1: Limit developments in areas with higher risk for natural disaster or geologic hazard unless it can be demonstrated by the Project proponent that the development is sited, designed, and engineered for long term structural integrity and that life and property on- and off-site are not subject to increased risk as a result of the development.*



This is a photo of the DC-10 flying over my house in Benton City on June 13, 2023.



This is a photo looking at the across Interstate 84 towards the ridgeline of the Horse Heaven Hills (on the project) from my house in Benton City on June 13, 2023.



This is a photo looking at the across Interstate 84 towards the ridgeline of the Horse Heaven Hills (on the project) from my house in Benton City on June 13, 2023.

Conclusions:

The Application fails to recognize and adequately address the significant and increased risk of harm faced by Benton City residents from the proposed HHH Wind Turbine Project, especially from fire hazards.

The turbines will affect the ability of firefighting aircraft to perform effectively, and further endanger the pilots of these aircraft. The Draft Hazard Mitigation Plan is silent with respect to air defenses when it comes to fire fighting. Rather it concentrates on protecting or evacuating their facilities and clearing some roads between the turbines for firefighting vehicles.

Recommended Stipulations:

1. Discuss maneuverability requirements with the State and/or Federal fire pilots regarding their procedures and common practices for suppression activities.
2. At a minimum, move Wind Turbines back from ridgelines and existing housing so that pilots do not face additional risks of working around Wind Turbines.

References:

Excerpt and Photos from Tri-City Herald, July 15, 2016, follow.

Fire Threatens Washington Winery, Vineyard Near Red Mountain

July 15, 2016 by Great Northwest Wine 1 Comment



Skyfall Vineyard, owned by Precept Wine in Seattle, sits just below the aftermath of a 4,000-acre wildfire. The blaze threatened the vineyard before it was brought under control. (Photo by Niranjana Perdue/Great Northwest Wine)

KIONA, Wash. – A 4,000-acre wildfire near Red Mountain threatened one winery and smoked a handful of Chardonnay vines before being brought under control early this morning.

Fifteen agencies battled the blaze, according to the Tri-City Herald. It came within about 100 yards of Anelare Winery in the unincorporated community of Kiona, which sits across the freeway from famed Red Mountain. The fire started about 5 p.m. Thursday near Yakitat Road in the Yakima Valley and was brought under control about 4:30 a.m. today.

Kim Gravenslund, general manager of Anelare, said she did not know the cause of the fire, which came within a few hundred feet of the winery.

“It was moving fast,” she told Great Northwest Wine. “It was a pretty intense fire.”

Gravenslund drove to the winery about 11 p.m., and the entire southern side of Interstate 82 was lit up by flames. Anelare opened its Kiona tasting room two summers ago.

Across the road from Anelare and north of an irrigation canal is Skyfall Vineyard, owned by Precept Wine in Seattle. David Minick, director of vineyards for Precept, said the 125-acre vineyard was threatened by the flames and a handful of Chardonnay vines were singed by the blaze, which came within fewer than 100 feet of the southern edge of the vineyard.

A Benton County firefighter was walking along the canal Friday afternoon, looking for hot spots amid torched sagebrush.

Gravenslund said the fire didn't seem to be hurting business. In fact, she said the tasting room traffic has been brisk.

Winemakers Watch Blaze From Across River



Firefighters drop retardant on flames that threaten Anelare Winery and Skyfall Vineyard along the northern flanks of the Horse Heaven Hills in the lower Yakima Valley near Benton City, Wash., on Thursday, July 14. (Photo courtesy of Larry Oates)
Larry Oates of Sleeping Dog Wines in Benton City monitored the fire from his winery across the Yakima River.

“It was charging to the west, and somewhere around nightfall the dynamics changed,” Oates said. “The wind came from the west and pushed the first to the east like a racehorse.”

Oates said he was impressed by the courage of firefighters who were touching off the backfires above Anelare.

“They were running almost vertically up the hill with their cans of kerosene, with the fire line maybe 30 feet away from them,” Oates said.

Oates said he couldn’t help but remember the evacuation of the entire town of Benton City in the face of the massive fire of June 2000 that scorched 163,000 acres on the Hanford Reach National Monument and burned 25 homes in Benton County.

“This never crossed the freeway, and it looked closer that what it was,” Oates said. “And we had about 1,000 acres of nicely irrigated alfalfa between us and this fire.”

Filed Under: News Tagged With: featured, ticker

Comment #4 – The Viewpoint Analysis in the Updated Application Aesthetics Section 4.2.3 and Appendix Q Visual Simulations and the DEIS Section 4 and Table 4.10-1 do not accurately identify, describe, evaluate and score Benton City, and the only KOP viewpoint selected is on the main street in town and partially or completely obscures some of the Wind Turbines. The Applicant fails to identify even on Key Observation point at higher elevation areas with higher residential populations and also fails to identify any Key Observation points along Sunset Road, in the heart of the Red Mountain AVA.

Regulations: Washington State Environmental Policy Act. EFSEC weighs the likelihood of occurrence with the severity of an impact (Washington Administrative Code [WAC] 197-11-794) and considers several factors when determining the significance of identified potential impacts (WAC 197-11-330 and WAC 197-11-794. The impact rating is summarized in Table 4.10-1.

Description:
The viewpoint selected for Benton City was not representative of the City nor the bulk of residences located within the City. The location selected was in the middle of the main highway SR 225 with two of the closest proposed primary turbines obscured from view. The location should have been selected with an unobstructed view. Many residences in the City sit at higher elevations and would be viewing many more Wind Turbines than the one shown.

The Application and the DEIS Table 4.10-9 provides an overview of impacts from each KOP/viewpoint and includes the viewer position, extent of the horizontal view occupied by the Project, level of contrast, and magnitude of impact.

Benton City is given as Key Viewpoint 9 and indicates that the Level of Visual Contrast is moderate, and the Magnitude of Impact is medium.

The City does not agree with the impact description which are as follows:

> *The proposed Wind Turbines would be intermittently screened by development within Benton City, with partial screening of the Project features occurring where the Horse Heaven Hills would partially obstruct views to the south. Where visible, there would be a limited number of turbines in view, as depicted in the visual simulation.(a) The presence and motion of the turbines would attract attention but would appear codominant with other commercial and residential developments. Other areas within the city may have more expansive, unobstructed views of the proposed Wind Turbines, similar to KOPs 2 and 10. The Project would expand the extent of view occupied by moving Wind Turbines and would be prominent from this inferior viewing angle, resulting in medium, long term impacts on views.*

Conclusion:

The City concludes that the Ratings in the Application and the DEIS are not appropriate or accurate due to the obscured viewpoint utilized, and descriptive assumptions that are not representative of Benton City.

Recommendations:

1. Repeat the visual analysis with several more additional representative viewpoints and including residential areas in Benton City and along Sunset Road as well as the I-82 Project location (which is located within one (1) mile of the Wind Turbines).
2. Remove the Wind Turbines on the north side of the Horse Heaven Hills and substitute their power with the solar array.

Comment #5 – Proximity to population - The highest number of Wind Turbines in the lowest economic groups, which raise Environmental Equity Questions

Requirements:

Title VI of the Civil Rights Act prohibits recipients of Federal Financial Assistance from discrimination based on race, color, or national origin in any program or activity.

Executive Order 12898, directs Federal agencies to identify and address, as appropriate, disproportionally high adverse human health and environmental effects of their programs, policies, and activities on minority populations and low-income populations**.**

Description:

Demographics:

- Benton County has over 80,000 people within six (6) miles of the proposed Wind Turbines, more than all other Wind Farms in the state combined.
- Wind Turbines are closer to Benton City limits than any other community in the region.
- I-82 South Development at the Benton City exit will have Wind Turbine views of at least four (4) Wind Turbines, including flashing lights within a mile.
- Of all the municipalities and communities along the project length, Benton City is the smallest.
- Of all the municipalities and communities along the project length, Benton City has the lowest per capita income.
- Of all the municipalities and communities along the project length, Benton City has the largest percentage of Hispanic residents. Upward of 35% of the students in KIBE School District are not fluent in the English language.
- Of all the municipalities and communities along the project length, Benton City is most underprivileged and under-served.

Conclusion:

Benton City deserves to be treated fairly and should have the ability to negotiate an outcome that will enhance the City's investments and support a higher quality of life without endangering its citizens. The City of Benton City consists of a very small staff that do not have the ability to evaluate many of the impacts created by this project. The City does not want to have its goals and plan marginalized because of the effort needed to adequately review of the project.

Recommended Stipulations:

1. Remove and relocate Wind Turbines along the ridgeline back further south and implement options with more solar array.

2. Carefully identify, describe and evaluate economic damages that will be caused by this project to the City of Benton City.

Comment #6 – Clarification of number of bird fatalities over the lifecycle of the project.

Description:

The City is concerned that a clarification is required to enable the general population to understand the total number of fatalities that will occur to birds and bats because of this project.

The Application Appendices pertaining to Wildlife and the DEIS Appendix 4.6-1 2022 Wind Turbine Wildlife Collision Risk Assessment state "The literature review suggests that the effect of turbine height and rotor swept area on bird collision mortalities remains uncertain (AWWI 2021). Some studies did not find a relationship between bird mortality rates and turbine height (Everaert 2014; Barclay et al. 2007; Krijgsveld et al. 2009). Other studies report higher bird mortality rates at taller turbines on a per turbine basis (Loss et al. 2013; De Lucas et al. 2008, Thelander et al. 2003 but lower mortality rates per unit of energy generation (Thaxter et al, 2017), although this is not unequivocal (Huso et al. 2021)".

"Collision with turbines is considered one of the greatest threats to bats in North America (O'Shea et al.2016). Three species of migratory tree-roosting bats (i.e., eastern red bat, silver-haired bat and hoary bat) make up most bat mortalities resulting from turbine collision, raising concerns about population-level impacts as the number of wind farms increases (Barclay et al 2007; Zimmerling and Francis 2016; Hein and Schirmacher 2016).

However, there is limited and conflicting information about the effect of turbine height on bat collision mortalities. Some studies report that bat mortality rates increase with turbine size (Baerwald and Barclay 2009), including on a per megawatt (MW) basis (Barclay et al. 2007), while others report no effect (Huso et al 2021), the opposite effect (Fielder et al 2007), or that mortality rates increase on either side of an optimum intermediate turbine size (Thaxter et al 2017)."

"Bird and bat collision risk associated with the two general turbine options was evaluated based on site-specific information collected during baseline studies conducted for the Project and presented in the Application for Site Certification (ASC) to the Washington Energy Facility Site Evaluation Council in 2021, in combination with a review of published scientific literature pertaining to bird and bat interactions with Wind Turbines."

"The DEIS document addresses studies based on the exposure indices that represent relative collision risk but are not directly translatable to the number of bird mortalities due to factors such as species-specific collision avoidance."

This type of information (exposure index) is not helpful to public understanding of bird and bat mortality rates.

To find meaningful numbers, the Application of Site Certification (ASC) was searched and a document entitled Bird and Bat Conservation Strategy, Horse Heaven Wind Farm, Benton County, Washington was found as Appendix M to the ASC. Chapter 6.0 Assessment of Risks to Birds and Bats, calculates risks from direct impacts such as collisions with turbines, power line interactions and indirect impacts.

In Section 6.1.1.1 Collisions for All Birds was compiled from publicly available data from 482 studies across 221 wind energy facilities in the US that reported 336 bird species as fatalities (WEST 2019). Of the studies between 2015 and 2018, fatality estimates at these facilities ranged from zero to nine birds/MW/year. The historic maximum as 12.1 birds/MW/year in California in 2014 (WEST 2019).

American Wildlife Institute (AWWI) also compiled publicly available data from 193 studies across 130 wind energy facilities in the US that reported 281 species of birds as fatalities during survey and an additional 13 species as incidental observation (AWWI 2019). Of the studies between 2002 and 2017, fatality estimates at the facilities ranged from approximately zero to 12 birds/MW/year with a median value of 1.8 birds/MW/year.

Among facilities in the USFWS Pacific Region, fatality estimates ranged from less than 0.4 to 8.4 birds/MW/year (median of 2.4 birds/MW/year) based on the 22 wind facilities (30 technical reports; WEST 2019). Of the more than 500 Avian species occurring in the Pacific Region, 114 have been recorded as fatalities.

While this still is not readily apparent as to just how many birds are being discussed, it can be calculated.

For example:

1 bird fatality per year per MW times the number of years in the life cycle for a 1150 MW design of the HHH Wind Farm would yield:

1 bird x 1150 MW x 35 years = 40,250 birds

1.8 birds x 1150 MW x 35 years = 72,450 birds

2.8 birds x 1150 MW x 35 years = 112,700 birds

9 birds x 1150 MW x 35 years = 362,250 birds

12 birds x 1150 MW x35 years = 483,000 birds

Bats have not been studied as extensively in this respect. Appendix M states that AWWI (2018b) has compiled publicly available data from wind energy facilities in the US, and the median adjusted fatality estimate was 2.6 bats/MW/year with a range of 1 to 50 bats /MW/year. In Washington, fatality estimates from 13 facilities had a median adjusted fatality rate of 1.4 bats /MW/year at Nine Mile Canyon approximated the national median estimate and consisted entirely of hoary bats and silver-haired bats during the spring and fall (Erickson et al. 2003a, WEST 2019).

1 bat x 1150 MW x35 years = 40, 250 bats

2.6 bats x 1150 MW x 35 years = 104,650 bats

50 bats x 1150 x35 years = 2,012, 500 bats

A new study found that farmers around the world are turning to birds and bats for help reducing pesticide use, environmental impact, and increasing yields. By eating insects, bats save U.S. agriculture billions of dollars per year in pest control. Some studies have estimated that service to be worth over 3.7 billion dollars per year, and possibly as much as 53 billion dollars per year.

This value does not, however, consider the volume of insects eaten by bats in forest ecosystems and the degree to which that benefits industries like lumber. It also doesn't consider the critical importance of bats as plant and crop pollinators. So the actual monetary worth of bats is far greater than 3.7 billion dollars per year.

Conclusions:

The simplest way to keep birds and bats away from wind turbines is to not build wind turbines where lots of birds and bats are known to fly. It's not always that simple, though, since many of the open, treeless expanses that attract birds and bats are also prime locations for harvesting wind.

Wind turbines may pose less danger to raptors if they're sited away from cliffs and hills where the birds of prey seek updrafts.

Already-altered habitats like food farms make good turbine sites from a wildlife perspective, according to the American Bird Conservancy, but the main thing to avoid is any habitat deemed an "Important Bird Area."

These include places where birds congregate for feeding and breeding, like wetlands and ridge edges, as well as migratory bottlenecks and flight paths used by endangered or declining species.

Recommendations.

- Eliminate turbines in any habitat areas deemed to be an important bird or bat area.
- Lower the MW capacity with fewer Wind Turbines and find ways to mitigate these losses.
- Site Turbines away from ridgelines and other areas where birds and bats are known to fly.
- Consider ultrasonic deterrent devices, aka boom boxes which are inaudible to humans, but can be used to repel bats from wind turbines.
- Most wind turbines are painted white or gray, an attempt to make them as visually inconspicuous as possible. But white paint can indirectly lure birds and bats, researchers found in a 2010 study, by attracting the winged insects they hunt. White and gray turbines were second only to yellow ones in attracting insects, according to the study, including flies, moths, butterflies and beetles.

  Purple turned out to be the least attractive color to these insects, raising the possibility that painting wind turbines purple might alleviate some bird and bat fatalities. The researchers stopped short of advocating that, however, noting that other factors — such as heat given off by turbines — could also be encouraging wildlife to fly near the spinning blades.

  Even if purple paint isn't practical, another line of research is investigating the use of ultraviolet light to deter birds and bats from turbines. While UV light is invisible to humans, many other species can see it — including bats, which aren't as blind as you might have heard. Still, given the limitations of long-distance vision at night, some researchers think migrating bats don't always see the spinning blades, and mistake the poles of wind turbines for trees. Rather than trying to deter bats at short range, a team of researchers

with the U.S. Geological Survey and the University of Hawaii are studying how dim UV lights on turbines can warn bats about the danger from afar.

- Beyond new paint, lights, and sound, tweaking the design of wind turbines could greatly reduce the risk they pose to birds and bats. Engineers have come up with a wide array of wildlife-friendly designs in recent years, ranging from slight modifications to overhauls that barely resemble a traditional wind turbine. A concept known as Windstalk, for example, doesn't even use spinning blades. Developed by New York design firm Atelier DNA, it's meant to harness wind energy with giant, cattail-like poles that mimic "the wind sways a field of wheat, or reeds in a marsh." In Texas, some coastal wind farms have used radar for years to protect migrating birds. And there are products available like the MERLIN Avian Radar System, made by Florida-based DeTect, which scans the skies for 3 to 8 miles around wind-energy sites, both for "pre-construction mortality risk projections and for operational mitigation." Bats also typically prefer to fly in weak winds, so leaving turbines dormant at lower wind speeds — known as raising the "cut-in speed" at which they begin generating power — can save lives, too. In one study, published in the journal BioOne Complete, researchers found that leaving turbines idle until winds reach 5.5 meters per second curbed bat deaths by 60%.

Comment #7 - Reserve the right to provide additional comments due to the very short review period. These documents are so large that they require more time to be fully examined by the public.

Recommendations:

1. **Hold a public hearing at the end of the adjudication.**
2. **Hold a public comment period on the Final EIS.**

TCC
Supplemental Testimony
Mark Baird
EXH-5913_S

Resume of:

Mark A Baird P.O. Box 842 Fort Jones CA 96032

Employment History 1970-1972 United States Army Helicopter Door Gunner, Republic of Vietnam 1700 hours, low level helicopter Aircraft maintenance

1972-1975 Airframe and Power Plant Mechanic World Airways Maintaining DC-10, DC-8, B747-200, B707, L188

1975- 1989 Charter Pilot for Executive Air Charter; California Air Charter On Demand Charter Service 6000 hours+/- 400 series Cessna, Piper Cheyenne, Navajo, Aztec,

April 1989- April 2014, World Airways. (Company ceased operations).

747-400 Check Airman, 2009-2014 DC-10 Check Airman 1995-2008 Line Capt. 1991-1995 First Officer 1989-1991 Total Time 23,000 + hours DOB 5/31/1952

Airline Transport Pilot, Multi-engine land, Commercial Pilot Single Engine Land, Airframe and Power plant Mechanic, Advanced Ground Instructor ratings, Instrument instructor ratings. Type Rated for B747-400, MD-11, DC-10 Qualified for CAT I/ II/IIIb, Lower than Standard CAT II, GPS approach qualified, VOR, NDB, LOC, Vnav/Lnav approach qualified. Qualified for Polar Ops Qualified NAT, Mid Atlantic, South Atlantic Qualified North Pacific, Mid Pacific, South Pacific I have also conducted South American route Qualifications as well as Africa, Asia,
Central and Eastern Europe, CIS States, China, and Middle East including Afghanistan and Iraq. I have been a Check Airman, Simulator Instructor and Line Captain on Two Heavy Airplane Types, with one of the largest Military Contract Airlines. I am very comfortable at high altitude airports (747-400 in and out of Quito, Ecuador, high temperatures, high gross weight (875,000lbs), and short runways (DC-10-30, in and out of 5,700 foot runway in Punta Arenas, Chile). We operated under some of the worst weather conditions in the world. Prior to World Airways I had approximately 6ooo hours of light multiengine and turbine experience in Piper Cheyenne, Cessna 400 series, Beech 18, and various other types of light aircraft both single and multi-engine.

2017-present, air tanker pilot for 10Tanker Air Carrier. VLAT air tanker operator primarily contracted to USFS but we have operated for the New South Wales Fire Service in Australia and in Chile engaged in initial attack aerial firefighting.

2012- 2019 : Reserve Deputy Sheriff, Siskiyou County

Personal History

I live with my wife, on our ranch in Siskiyou County California. We raise horses and Buffalo. My interests are civil war history with emphasis on Cavalry. I also enjoy astronomy.

Contact Information Mark A Baird mcbair@icloud.com 530-2276729 cell 530-468-5967 home P.O. Box 842 Fort Jones, CA 96032

TCC
Supplemental Testimony
Mark Baird
EXH-5910-S

BEFORE THE STATE OF WASHINGTON
ENERGY FACILITY SITING EVALUATION COUNCIL

In the Matter of the Application of: Scout Clean Energy, LLC, for Horse Heaven Wind Farm, LLC, Applicant.	DOCKET NO. EF-210011 SUPPLEMENTAL TESTIMONY OF TCC WITNESS MARK BAIRD

Q: Please state your name and address.

A: Mark Baird, P.O. Box 842, 4716 Mill Creek Rd, Fort Jones CA 96032.

Q: Please briefly state your work experience and qualifications.

A: I have over 23,000 hours of flight experience, 17,500 in the DC-10.

I hold the following airman certificates: ATP multi engine land with type ratings in B-744, DC-10, MD11. I hold an Airframe and Power plant mechanic certificate, and an advanced ground instructor rating. I have 15 years experience as an instructor pilot in the DC-10, and 7 years experience as a pilot engaged in aerial firefighting using the DC-10 fire tanker.

Q: Did you review information about the Horse Heaven Hills project location and terrain?

LAW OFFICES OF
J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
aramburulaw.com

A: Yes, in preparing for my testimony, TCC member and witness Paul Krupin utilized CalTopo to assist in familiarizing me with the fire history and topography of the area. These materials included the following maps and photographs:

Page 6 is the Fire map created by the South East Washington Interagency Team for the Hansen Road – Rupert Road Fire that occurred on June 16, 2023. The map shows the location and the extent of the fire perimeter. The area is located south of Interstate 82 south of Benton City, WA. The Hansen Road fire is approximately 12 miles in length east to west and one to two miles wide north to south.

Page 7 is an aerial photo taken out the window of one of the DC-10's dropping fire retardant on the Hansen Road – Rupert Road fire, on June 16, 2023, showing the extent of the fire and the fire perimeter.

Page 8 is a CalTopo digital Geographic Information System map (www.Caltopo.com) showing the fire history data layer on the lands to the north of the Horse Heaven Hills project area. The fire history in this area covers events from the year 2002 to present roughly 20 years). The black dots show the proposed Horse Heaven Hill project wind turbine locations. The orange and red zones are the individual fire events with their name and the date they occurred. The fire perimeters in red show the extent to which the fire burned. This map depicts an area south of Interstate 82 south of Benton City and Kennewick in Washington State.

Page 9 is a CalTopo digital Geographic Information System map (www.Caltopo.com) showing the slope angle shading data layer using 40-foot contour lines to visually enhance the steep slope terrain in and north of the Horse Heaven Hills project area.

Page 10 is a CalTopo digital Geographic Information System map (www.Caltopo.com) showing the road map data layer to visually enhance the

LAW OFFICES OF
J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
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identification of known vehicular access roads in the area and terrain in and north of the Horse Heaven Hills project area.

Pages 11 and 12 are CalTopo digital Geographic Information System maps (www.Caltopo.com) showing the USGS Topographic Map data layer showing the detailed contour lines to aid in the interpretation of rugged and steep terrain in the area of the fire and in and north of the Horse Heaven Hills project area. Page 11 is the western section and page 12 is the eastern section of the burned area north of the Horse Heaven Hills Project area.

Page 13 is a CalTopo digital Geographic Information System map (www.Caltopo.com) switched from a topographic map to an aerial photo layer (NAIP from the USDA Farm Service) showing the 40-foot contours on top of the ground surface. This map can be used to visually enhance the identification of known ground surface features including irrigation, wineries, residences, roads, and highways and much more. This figure covers the area in and north of the Horse Heaven Hills project area.

Page 14 is a CalTopo digital Geographic Information System map (www.Caltopo.com) showing the slope shading contours and the fire history data layers simultaneously. Four-mile radial circles were drawn around six selected fire perimeter locations, and a polygon was then drawn around the external perimeter of these circles. The polygon identifies a potential restricted airspace zone needed to ensure the safety of aerial firefighters.

Page 15 is a CalTopo digital Geographic Information System map (www.Caltopo.com) showing the slope shading contours and the fire history data layers simultaneously. Two-mile radial circles were drawn around six selected fire perimeter locations, and a polygon was then drawn around the external perimeter of

LAW OFFICES OF
J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
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these circles. The polygon identifies a smaller potential restricted airspace zone needed to ensure the safety of aerial firefighters.

Q: Please describe your observations and comments on the Horse Heaven Hills Wind Farm and how it relates to aerial firefighting operations.

A: The Horse Heaven Wind project as mapped and described in the information I received would, for all intents and purposes, be indefensible by air. The communities and structures adjacent to, or nearby, the project would also be indefensible using fixed wing aircraft. Aerial firefighting efforts would either be impossible or rendered totally ineffective due to the height and spacing of the turbines in addition to their placement on the higher ground, which negates the ability to prevent fire from running uphill or "backing behavior," which is typical in terrain described and illustrated in the project maps.

Aerial assets are also prohibited from dropping retardant on electrical infrastructure and any watercourses in the fire area, further reducing the capability of the aircraft to assist in building effective fire lines. Fire retardant weighs nine pounds per gallon. Dropping at between 150 and 160 knots at low altitude would cause catastrophic damage to any of the proposed infrastructure were it to be hit during routine fire fighting activity.

Q: Please describe your opinion on how close the turbines can be located if airspace must be restricted to ensure that aerial firefighting operations can be conducted safely.

A: Turbine location, blade turbulence, tip vortex, quantities and spacing of turbines, and proximity to water courses, communities and other structures impact aerial

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J. RICHARD ARAMBURU, PLLC
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SEATTLE 98104
Telephone (206) 625-9515
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firefighting capability and effectiveness of aerial tankers, particularly LATS (Large Air Tankers) and VLATS (Very Large Air Tankers). Blade turbulence and tip vortex also impact helicopter operations.

Between three and four nautical miles spacing would at least make aerial firefighting possible in order to save lives and property. FAA TERPS, and ICAO Pan Ops dictate maneuvering minimum radius of turn for large aircraft as well as minimum climb rates to avoid known obstacles in approach and departure corridors where obstructions are known and accurately mapped; 2.7 nautical miles is the minimum radius of turn for category E aircraft with maneuvering speeds of 168 plus knots. A climb of 200 feet per nautical mile is the minimum for most departure procedures. If the ridge top is 2000 feet msl and it has a 500-foot tower on top of it, climb capability would be exceeded quickly.

Based upon the above information it is my opinion that turbines would require spacing of three to four nautical miles to provide aircraft with the ability to safely and effectively fight fire.

Q: Are you providing photographs?

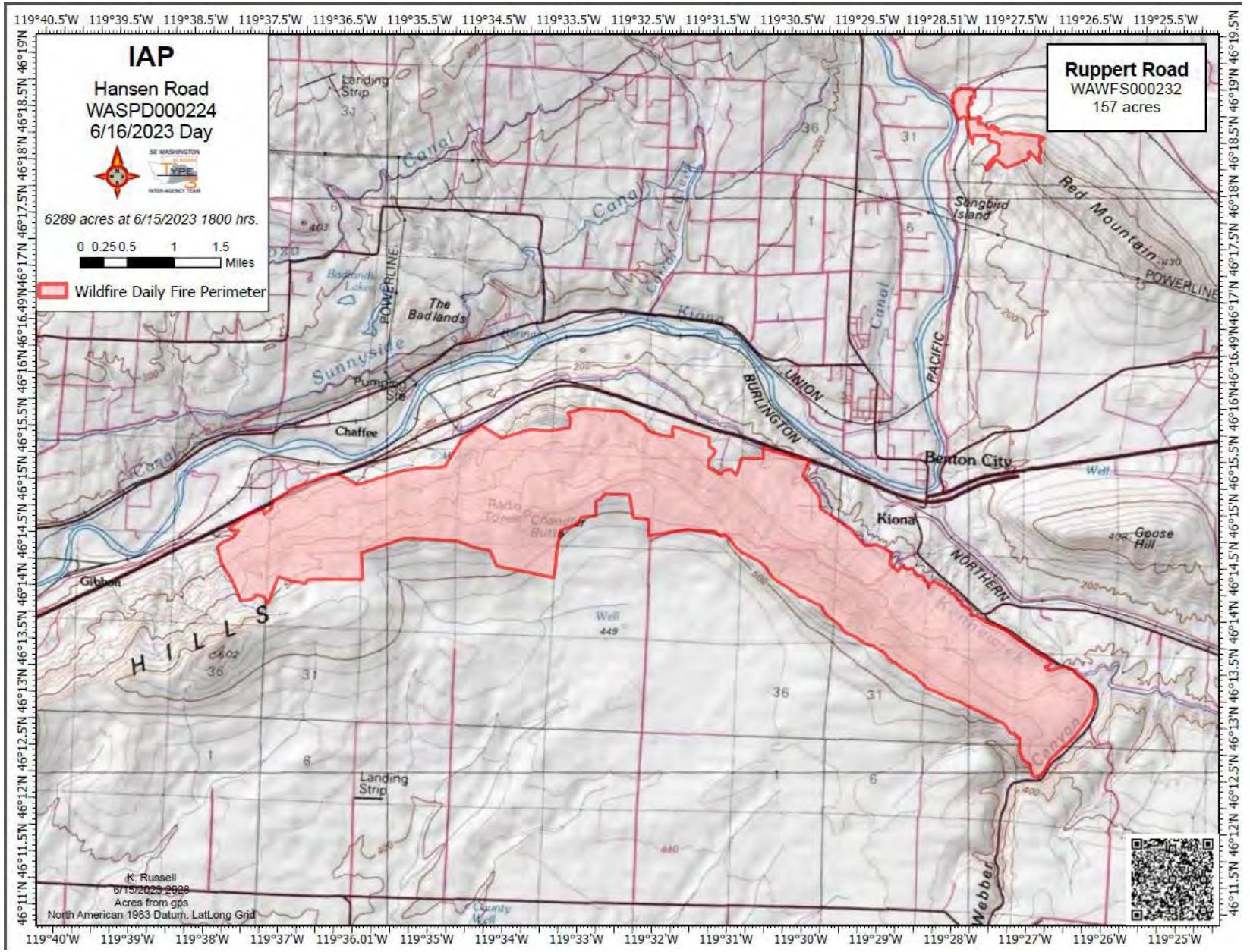
A: Yes, attached.

I declare under penalty of perjury under the laws of the State of Washington that my testimony and reports are true and correct to the best of my knowledge and belief.

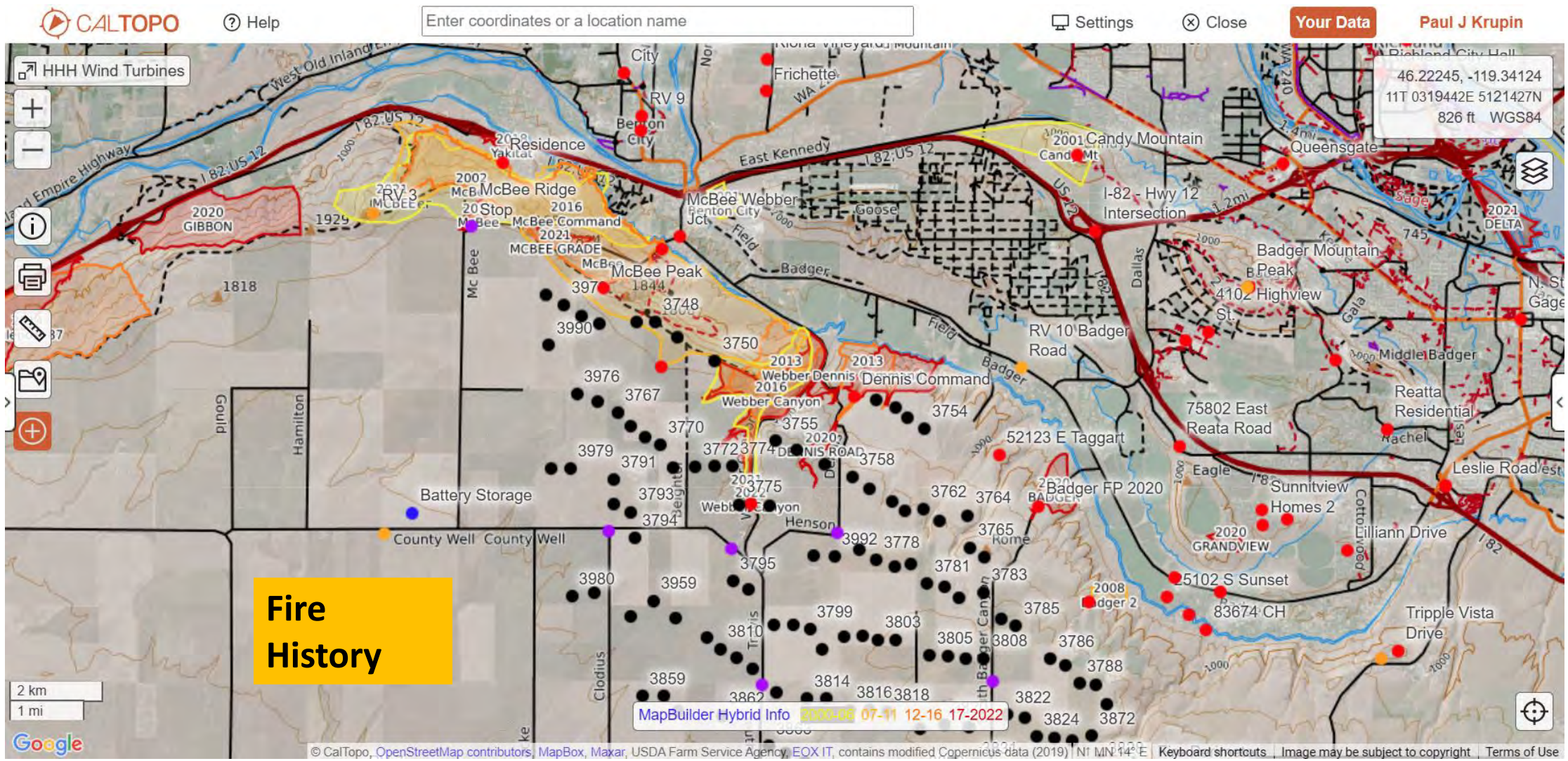
Signed this 3rd day of September 2023 in Fort Jones California

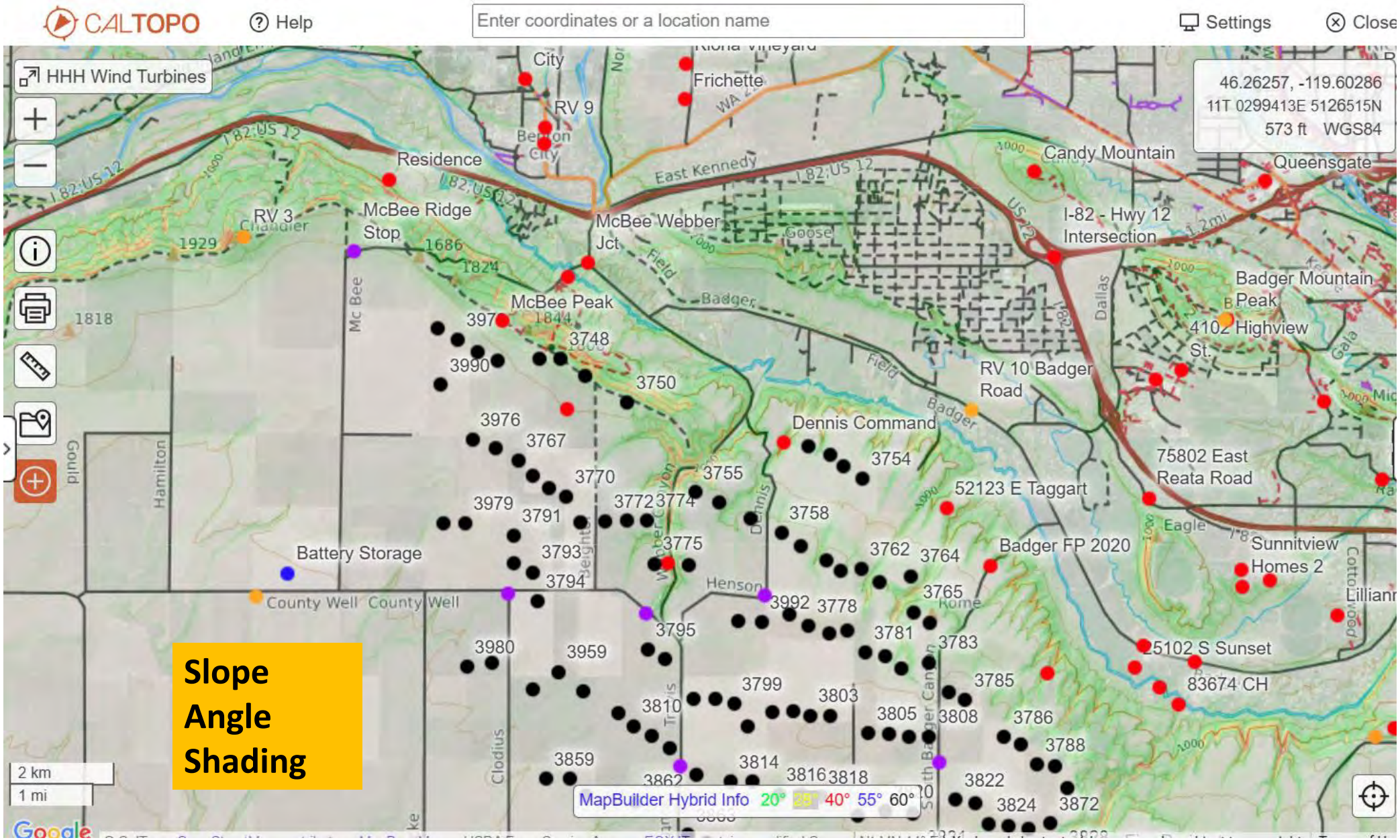
Mark Baird___/s/_____

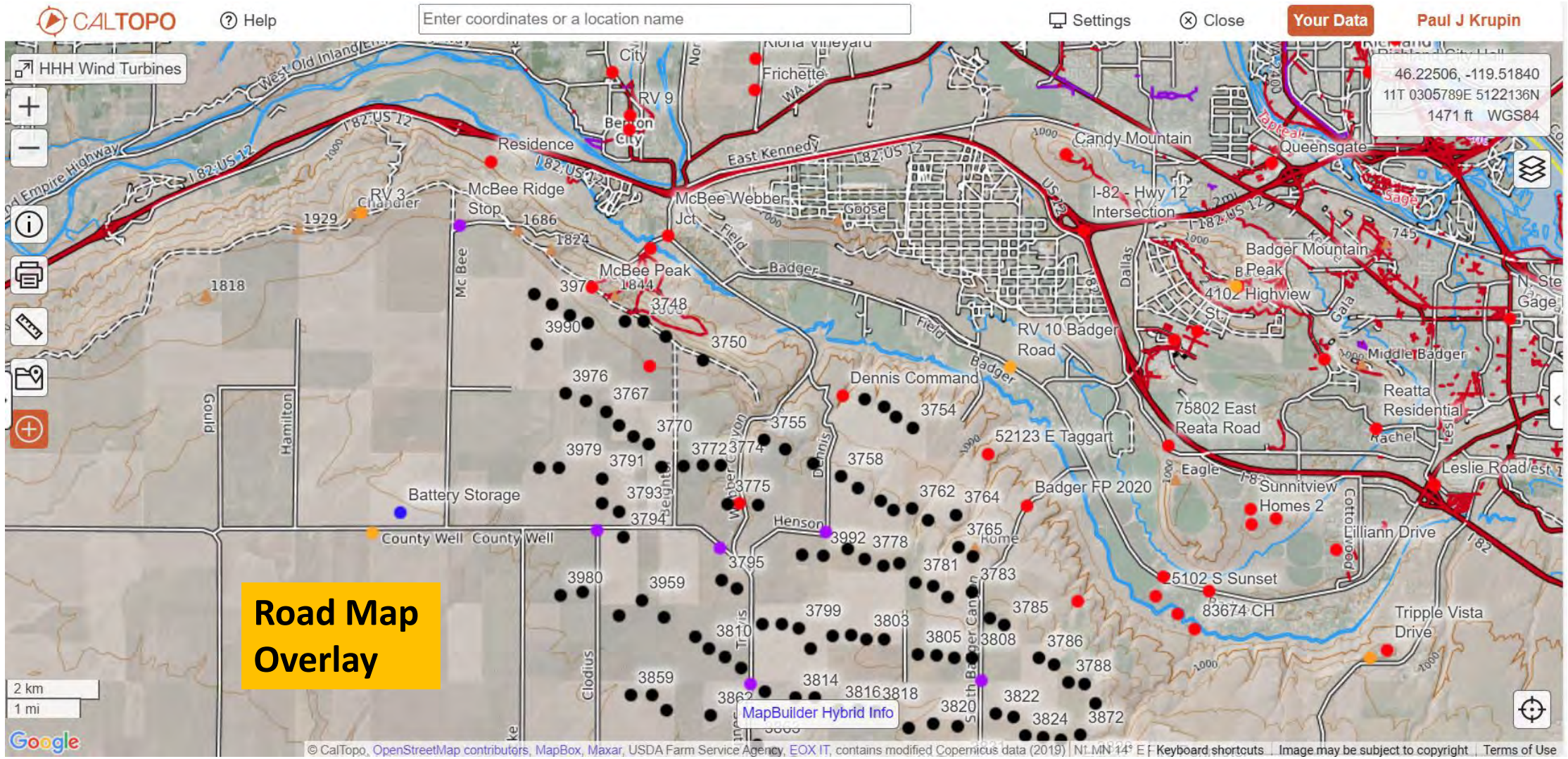
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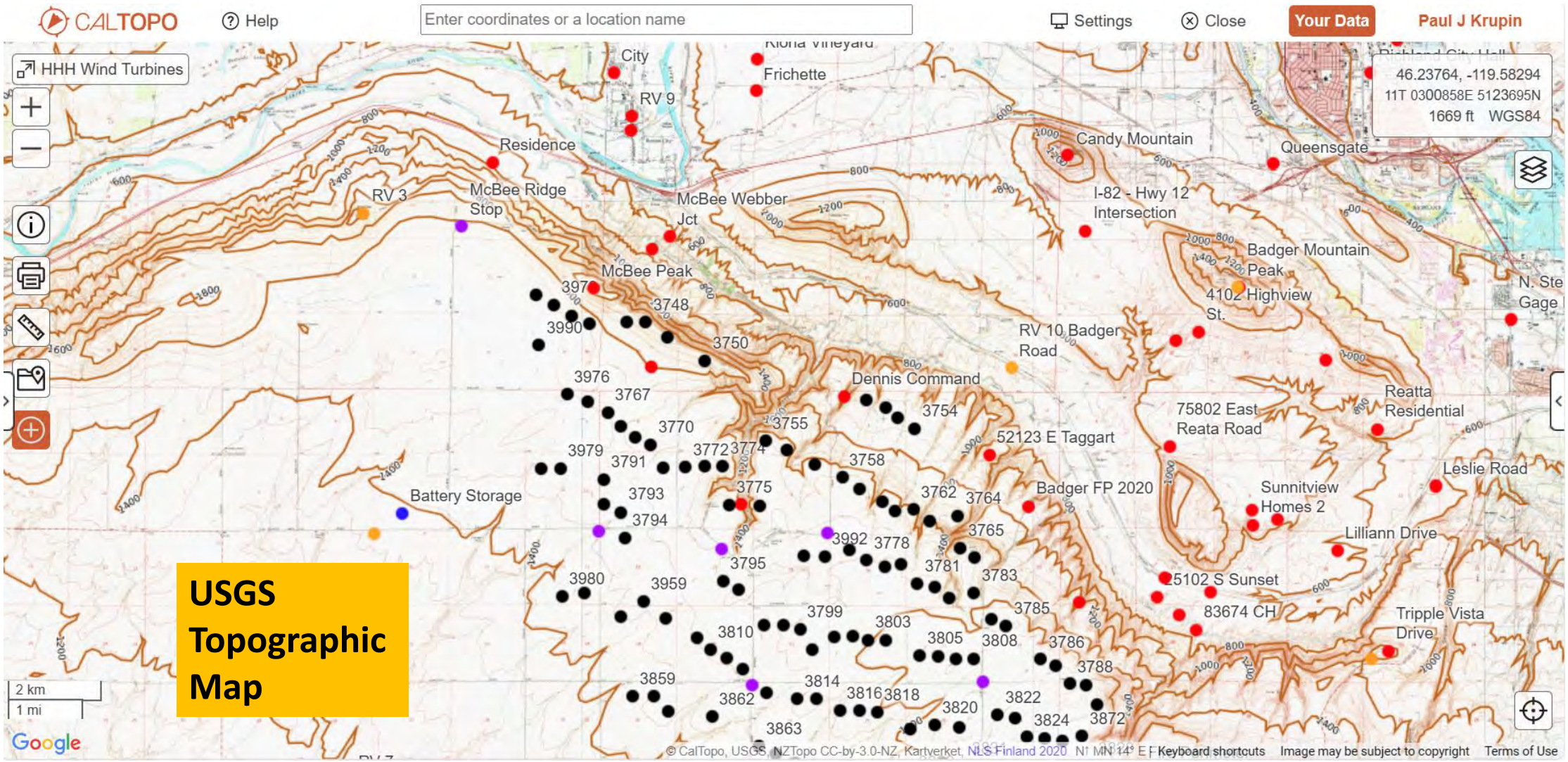

IAP
Hansen Road
WASPD000224
6/16/2023 Day
6289 acres at 6/15/2023 1800 hrs.
0 0.25 0.5 1 1.5
Miles
Wildfire Daily Fire Perimeter
Ruppert Road
WAWFS000232
157 acres
K. Russell
6/15/2023 2028
Acres from gps
North American 1983 Datum. LatLong Grid
Kiona
Benton City
Chaffee
Gibbon
The Badlands
Songbird Island
Red Mountain
Goose Hill
HILLS
POWERLINE
BURLINGTON
UNION
PACIFIC
NORTHERN
Sunnyside Canal
Landing Strip
Webber Canyon

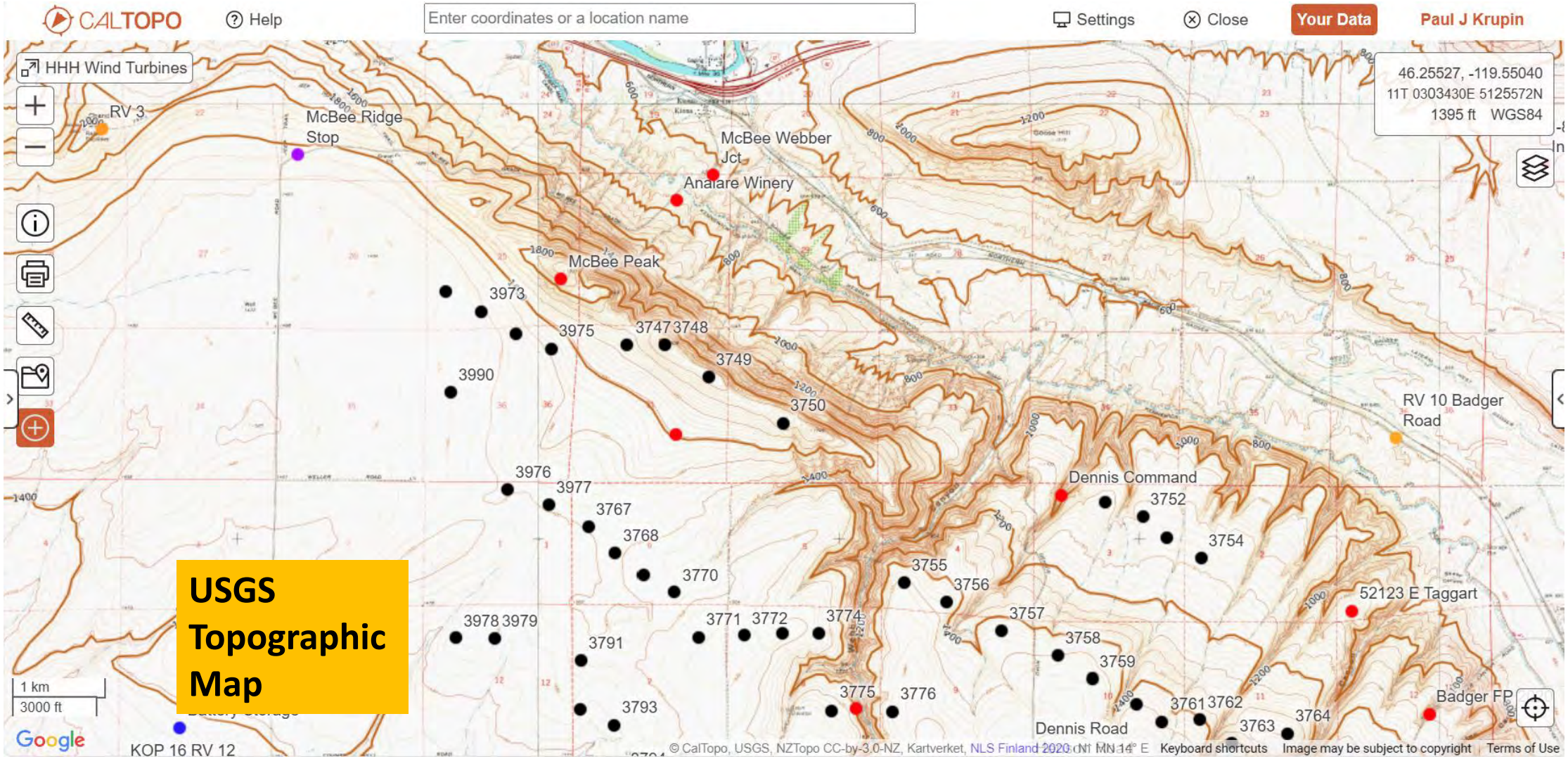



CALTOPO
Help
Enter coordinates or a location name
Settings
Close
Your Data
Paul J Krupin
HHH Wind Turbines
46.22245, -119.34124
11T 0319442E 5121427N
826 ft WGS84
Fire History
2 km
1 mi
Google
MapBuilder Hybrid Info
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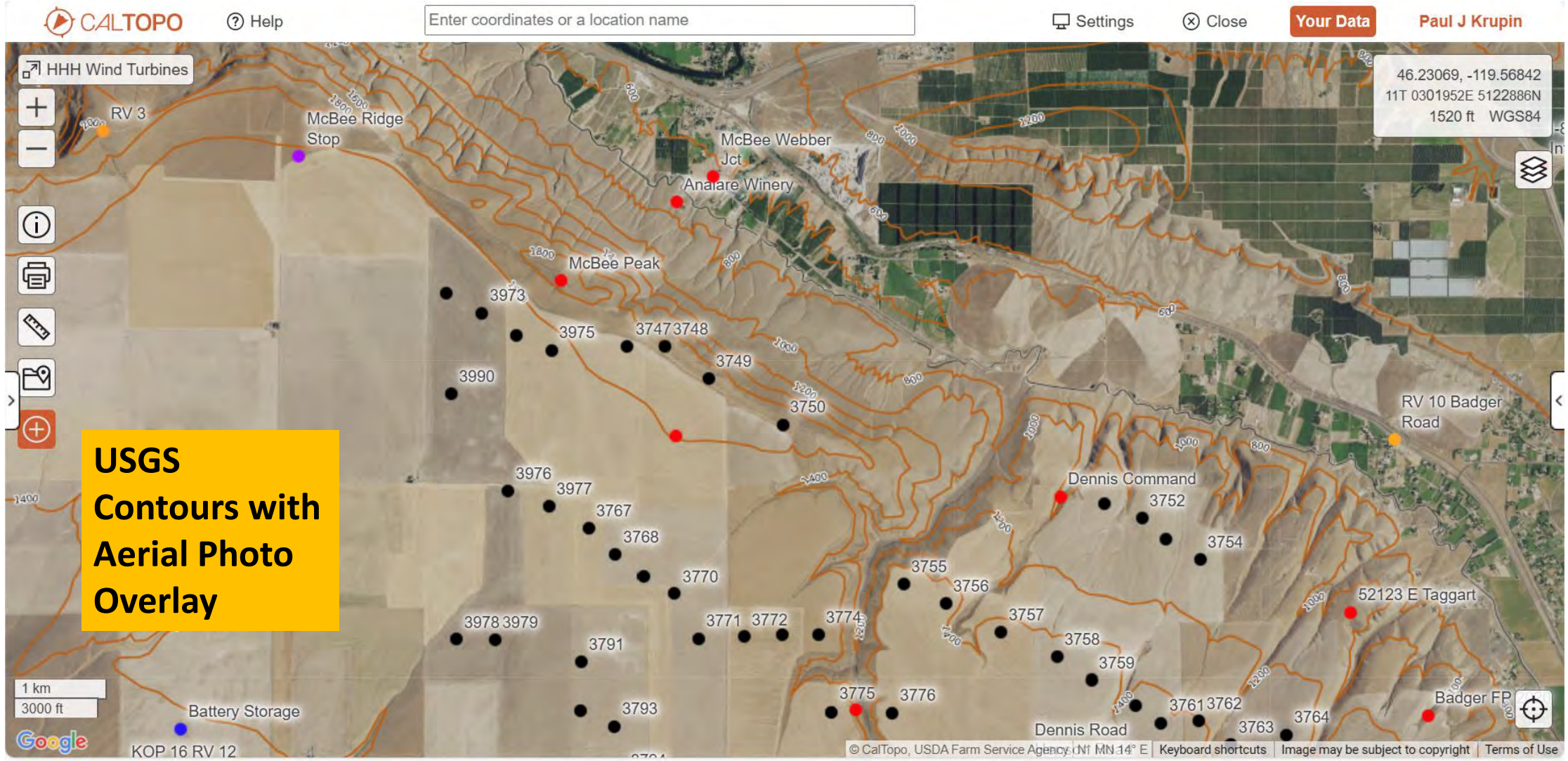

CALTOPO
Help
Enter coordinates or a location name
Settings
Close
HHH Wind Turbines
46.26257, -119.60286
11T 0299413E 5126515N
573 ft WGS84
Slope
Angle
Shading
2 km
1 mi
MapBuilder Hybrid Info 20° 28° 40° 55° 60°
Google

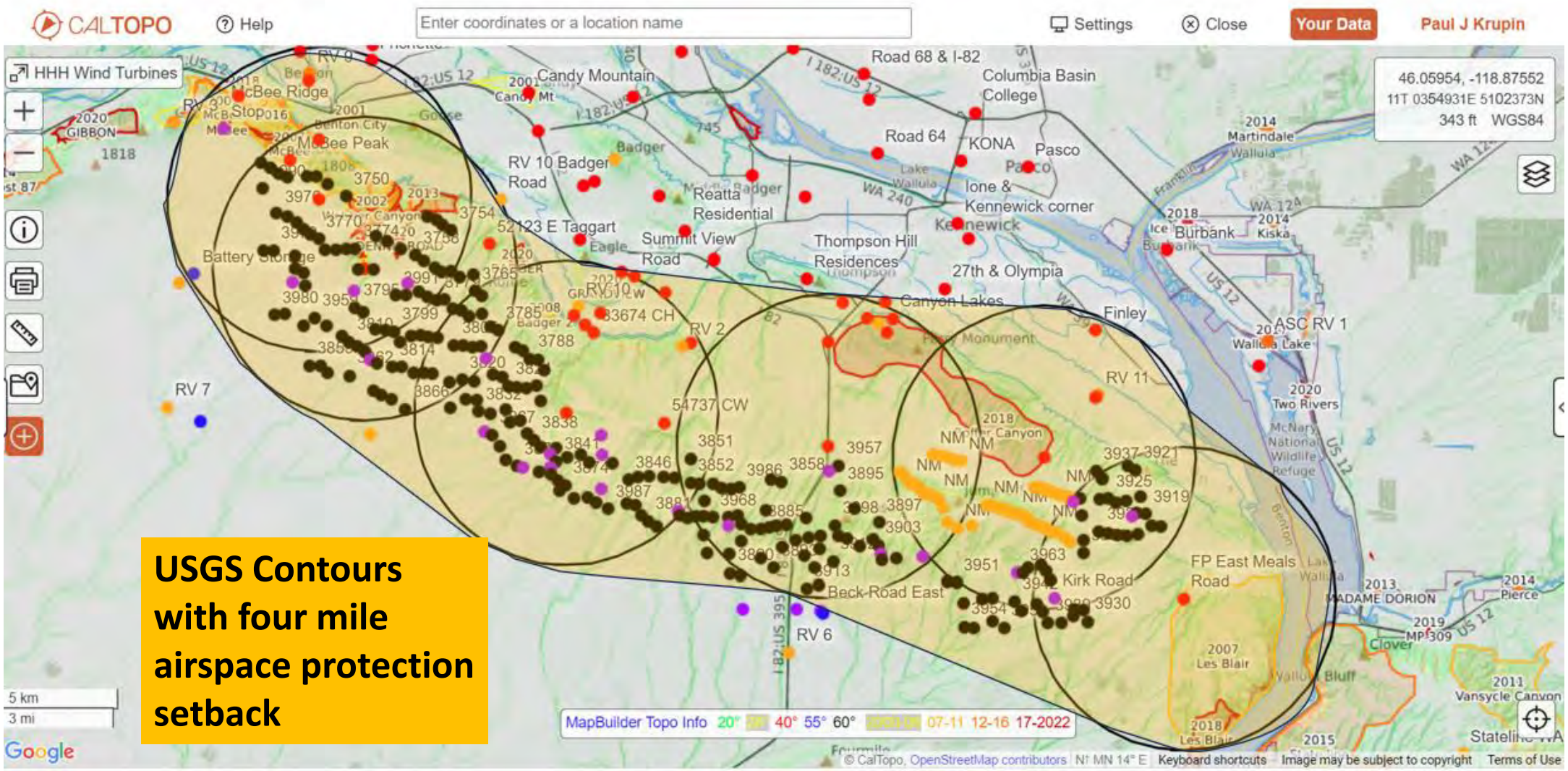

CALTOPO
Help
Enter coordinates or a location name
Settings
Close
Your Data
Paul J Krupin
HHH Wind Turbines
46.22506, -119.51840
11T 0305789E 5122136N
1471 ft WGS84
Road Map Overlay
MapBuilder Hybrid Info
2 km
1 mi
Google
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Help
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Your Data
Paul J Krupin
HHH Wind Turbines
46.23764, -119.58294
11T 0300858E 5123695N
1669 ft WGS84
City
Frichette
RV 9
Residence
RV 3
McBee Ridge Stop
McBee Webber Jct
McBee Peak
Candy Mountain
Queensgate
I-82 - Hwy 12 Intersection
Badger Mountain Peak
4102 Highview St.
RV 10 Badger Road
Dennis Command
75802 East Reata Road
Reatta Residential
52123 E Taggart
Badger FP 2020
Sunnitview Homes 2
Leslie Road
Lilliann Drive
25102 S Sunset
83674 CH
Tripple Vista Drive
Battery Storage
3970
3748
3990
3750
3976
3767
3770
3755
3754
3979
3791
3772
3774
3758
3775
3793
3794
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3795
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3980
3959
3799
3785
3803
3810
3805
3808
3786
3788
3859
3862
3814
3816
3818
3820
3822
3824
3872
3863
2 km
1 mi
Google
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USGS Topographic Map

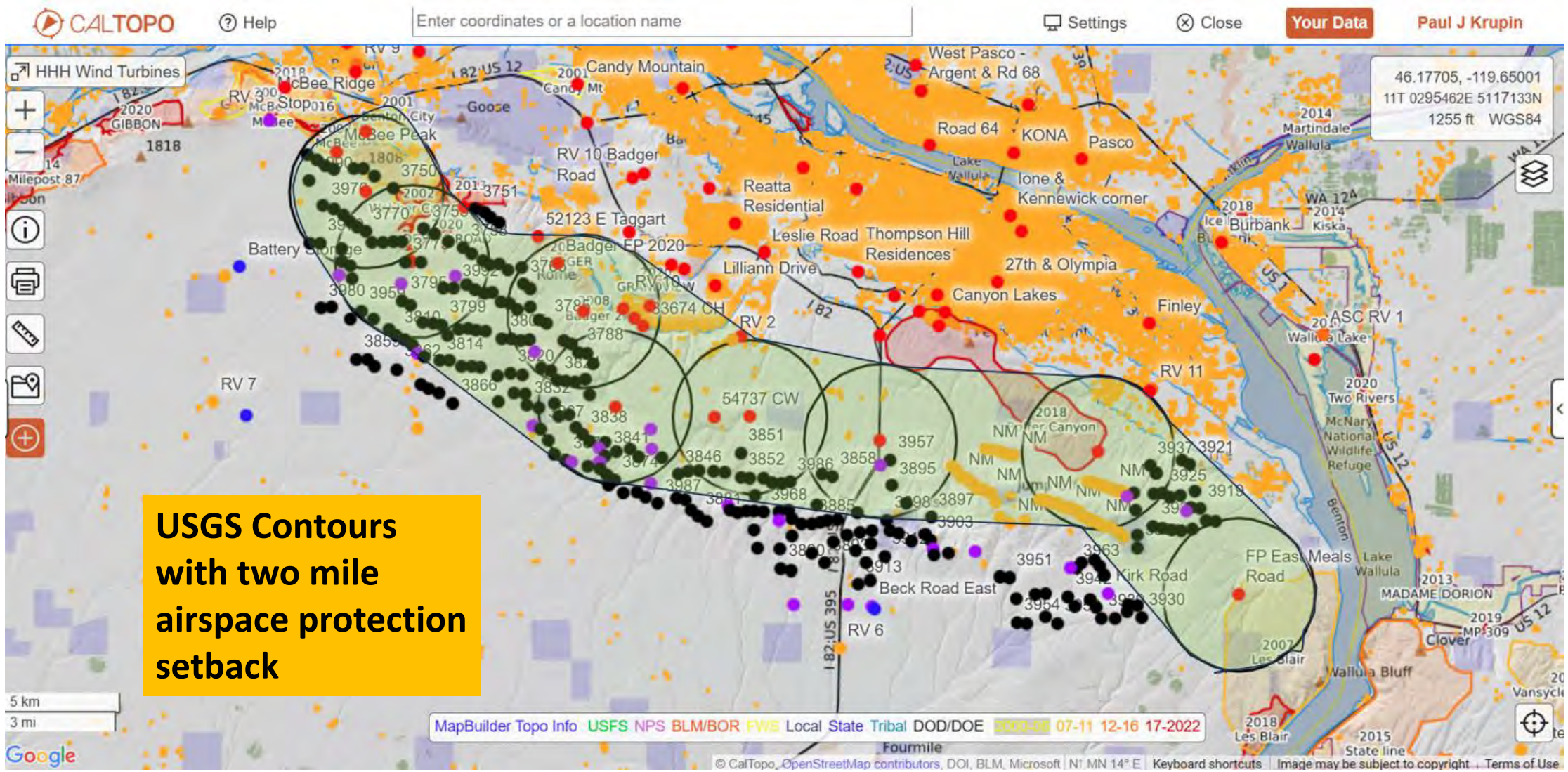


USGS Topographic Map


CALTOPO
Help
Enter coordinates or a location name
Settings
Close
Your Data
Paul J Krupin
HHH Wind Turbines
46.23069, -119.56842
11T 0301952E 5122886N
1520 ft WGS84
RV 3
McBee Ridge Stop
McBee Webber Jct
Anaiare Winery
McBee Peak
3973
3975
3747 3748
3749
3990
3750
RV 10 Badger Road
3976
3977
3767
3768
3770
Dennis Command
3752
3754
3755
3756
3757
3758
3759
52123 E Taggart
3978 3979
3791
3771 3772
3774
3775
3776
3761 3762
3763
3764
Badger FP
3793
Battery Storage
KOP 16 RV 12
Dennis Road
1 km
3000 ft
Google
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USGS Contours with Aerial Photo Overlay



USGS Contours with four mile airspace protection setback


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Your Data
Paul J Krupin
HHH Wind Turbines
46.17705, -119.65001
11T 0295462E 5117133N
1255 ft WGS84
USGS Contours with two mile airspace protection setback
McBee Ridge
McBee Peak
Candy Mountain
West Pasco - Argent & Rd 68
Road 64
KONA
Pasco
RV 10 Badger Road
Reatta Residential
Ione & Kennewick corner
52123 E Taggart
Leslie Road
Thompson Hill Residences
Lilliann Drive
27th & Olympia
Canyon Lakes
Finley
Burbank
ASC RV 1
RV 11
RV 2
RV 7
RV 6
54737 CW
33674 CH
Beck Road East
Kirk Road
FP East
Meals
Two Rivers
McNary National Wildlife Refuge
MADAME DORION
Clover
Wallula Bluff
Fourmile
5 km
3 mi
MapBuilder Topo Info USFS NPS BLM/BOR FWS Local State Tribal DOD/DOE 07-11 12-16 17-2022
Google
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TCC
Supplemental Testimony
DAVID WARDALL
EXH-5906_S

BEFORE THE STATE OF WASHINGTON
ENERGY FACILITY SITING EVALUATION COUNCIL

In the Matter of the Application of: Scout Clean Energy, LLC, for Horse Heaven Wind Farm, LLC, Applicant.	DOCKET NO. EF-210011 SUPPLEMENTAL TESTIMONY OF TCC WITNESS DAVID WARDALL

Q: Please state your name and address.

A: W. David Wardall, 17069 Lambert Road, Ione, CA 95640.

Q Please briefly describe your business, experience and qualifications.

A. I am the Chairman of the Associated Aerial Firefighters, Former Deputy Chief CDF air tanker operations for 34 years, and consulting engineer to the NTSB on aerial firefighting accidents. I have been involved in around 200 fatal and serious injury aircraft incident/accidents investigations, and hold an FAA Airline Transport pilot certificate.

The Associated Aerial Firefighters is a non-profit organization with approximately 100 members represents pilots from across the country. We provide a forum to advocate for safety, effectiveness, and efficiency in wildland aerial firefighting.

My resume is EXH-5907_S.

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705 2ND AVE., SUITE 1300
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Telephone (206) 625-9515
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I have examined the proposed Horse Heaven Hills Project Wind and Solar Project and reviewed information regarding fire history and maps.

Q: Have you prepared testimony containing your comments and observations about your concerns about this project, particularly about the proposed location of the wind turbines and the risks to aerial firefighting operations?

A: My testimony is in the form of a copy of a letter and report submitted to the California Energy Commission in April 2021 containing our analysis and recommendations about a wind farm project proposed in Shasta County, California.

This letter and report are provided in EXH-5908_S.

Q: Please describe any opinion you have regarding the ability to conduct aerial firefighting operations if the proposed project is approved as it is presently described.
A: I have the same concerns about the Horse Heaven Hills Project as I do about other wind farm projects. Wind turbines present severe impediments to aerial firefighting operations. The existence of the wind turbines effectively creates a “no fly” zone which greatly increases the risk that any wildfire that either began in or near the project site or spread into it from any surrounding area, could not be quickly contained, and would grow. I believe there is a threat to the adjacent communities from this proposal by eliminating the possibility of fixed wing air attacks that needs to be acknowledged.

I reviewed the turbine layout and the fire history maps of the area.

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J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
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Q: Is there a difference between steep slope range fires and mountain range forest fires?

A: Yes, fuel loading in tons per acre. Slope on range fires will accelerate movement a bit.

The Fountain project in Shasta County was 48 turbines on 4,500 acres, 205 MW.

By comparison, the Horse Heaven Hills Wind Farm Project is huge – 25 miles and four to six miles wide – over 60,000 acres with up to 850 MW from up to 244 turbines, each one 500 foot to 671 foot high in up to 6 rows along the ridgeline. This is a huge major obstruction to responding firefighting efforts. The size of this proposed project will make a huge "No Fly" zone for civil aircraft, medivac helicopters and of course firefighting aircraft.

The extraordinary length of the project creates a 25-mile barrier to fixed wing tanker aircraft. The wind turbines produce a lot of air rotating vortices type turbulence that will interfere with safe aerial firefighting operations.

Depending on the winds and the terrain, in order to make effective air drops, the minimum obstruction setback distance should be three to four miles along any flight paths needed to conduct aerial operations, and two to three miles perpendicular to the flight paths to reduce the risks posed by the turbulence downwind of the wind turbines.

Also, brush and grass are "flash" fuels easily ignited up to two miles ahead of the fire front from blown embers during wind events at 15 mph or greater.

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705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
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This is a leapfrog-type fast-moving fire which fills in between the fire front and the new ember hot spots. The fire essentially explodes.

Little time to evacuate.

This project would require lots of pre-fire planning and vegetation removal and maintenance along roadway escape routes and wide fire breaks around the entire project and down-wind structures.

Q: Why are you submitting testimony?

A: I am here to share my concerns about the Horse Heaven Hills Wind and Solar Project at the request of Tri-Cities CARES. I acknowledge that I may be cross-examined during the adjudication hearings.

I declare under the penalty of perjury under the laws of the State of Washington that my testimony is true and correct to the best of my knowledge and belief.

Signed this __ 3rd _ day of September, 2023, in _Ione, CA.

__WESLEY DAVID WARDALL _____ _____/s/ _____

Printed Name Signature

LAW OFFICES OF
J. RICHARD ARAMBURU, PLLC
705 2ND AVE., SUITE 1300
SEATTLE 98104
Telephone (206) 625-9515
FAX (206) 682-1376
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April 10, 2023

Leonidas Payne, Project Manager
California Energy Commission
Environmental Office, 715 P Street, MS-15
Sacramento, CA 95814
Leonidas.Payne@energy.ca.gov

Re: Fountain Wind Project (23-OPT-01)

Dear Mr. Payne,

This letter is respectfully submitted by three pilots involved in aerial firefighting, including the recent Chairman of the National Associated Aerial Firefighters, the former CDF Deputy Chief in charge of air operations for 30 years, and a current retardant pilot who has flown DC-10's to fight wildfires from the air in three different countries on two continents, including some fires in wind farms and including many of California's most recent large fires. A fire and forestry expert also joined us.

We want to alert the California Energy Commission (CEC) to the serious impediments to aerial firefighting in Eastern Shasta County that would be posed if the Fountain Wind Project is built. We hope you and your staff will carefully read this and each of our comments in the four Exhibits that follow. For example, as stated by Dave Wardall, a consulting aircraft structures engineer to the NTSB and retired CDF Deputy Chief of air tanker operations for 34 years: "We have examined the proposed project and determined it is an accident looking for a place to happen." (See full Statement, attached as **Exhibit. A.**) All of the signatories to this letter testified before the Shasta County Planning Commission

and/or Shasta County Board of Supervisors in connection with the permit application for this same project that was denied by Shasta County. The testimony of the aerial firefighters and other fire experts that supported the denial of the Fountain Wind permit application, also later supported, for many of the same reasons, the later zoning amendment that effected a ban by Shasta County on all such future projects in the unincorporated areas of Shasta County.

Our preliminary review of the CEC's February 10, 2023 Deficiency Letter leads us to believe that the CEC is unaware of the serious impediments to aerial firefighting posed by the existence of such a wind turbine project in Shasta county on the proposed site. As described herein, such a project would make it impossible to fight a wildfire, regardless of the cause of the fire, with air tankers (as well as rotor aircraft) anywhere in or near the project site and surrounding areas. The very existence of the wind turbines, which we understand may each exceed 700 feet in height (each therefore roughly twice as tall as the Statue of Liberty, and taller than Shasta Dam), would effectively create a "no fly" zone that would greatly increase the risk that any wildfire that either began in the project site or spread into the project site from any surrounding area, could not be quickly contained, and would likely grow beyond the project area to out-of-control proportions. Such a fire could easily then become an out-of-control wildfire covering tens of thousands, if not hundreds of thousands of acres, such as the Delta, Hirz, Carr, Camp, and Dixie fires of recent years. Such a fire, if not able to be contained from the air, because the turbine field is in the way, would not only burn the project itself, causing a toxic mess and obviating any benefits of having the project there, but would probably also burn through the surrounding communities of Montgomery Creek, Round Mountain, Oak Run and Moose Camp. And, if the fire spread beyond the immediate intermountain area, because it could not be quickly contained from the air,

such a fire could spread to even larger communities, such as Burney to the East, or Shingletown, Palo Cedro and Redding to the West, resulting in massive property damage and potentially even greater loss of life.

Shasta County has suffered several catastrophic wildfires in recent years, including the Carr, Zogg, Hirz, Fawn, Dixie and Delta fires, all of which occurred since this project was first proposed. Indeed, this very project site has burned once before in 1992, in the Fountain Fire, which burned over 60,000 acres of timberland (over 100 square miles), as well as hundreds of homes and businesses in the nearby towns of Montgomery Creek and Round Mountain, causing $225 million in losses and suppression costs (in 2021 dollars), at the time the most expensive fire to contain in California history. As far as we know, the "Fountain Wind" project is the only wind turbine project to ever be named after a catastrophic wildfire (the "Fountain Fire") that burned the very site on which it is proposed to be built. The site burned once before and will no doubt burn again and again.

Now, after the replanting of a timber plantation following the Fountain Fire, the project site is of even higher fire danger than before. Indeed, this project site carries the highest fire danger level in the entire State of California. The site is mostly covered now with a tree plantation covering tens of thousands of acres, composed of densely packed, highly flammable pine trees that have grown in the last 30 years to be about 40-50 feet tall, surrounded by mixed forest for miles in every direction of pine, fir, and oak woodlands.

To understand the magnitude of the impediments to aerial firefighting posed by the proposed Fountain Wind project, and described in this letter, you must begin by picturing two Statue of Liberties stacked one on top of the other (the Statue of Liberty is approximately 300 feet tall, the

proposed turbines may exceed 700 feet tall). Near the top of each turbine tower will be a nacelle, which will contain flammable fossil fuels (grease and oil) that can catch on fire (like a torch, to extend the Statue of Liberty analogy), on top of a superstructure rising out of the forest like a giant lightning rod (and turbine towers do attract lightning).

As stated by Mark Baird who has flown DC10's to fight fires on two continents and who has experience fighting wildfires near wind turbine projects: "The turbines themselves are potential ignition sources, which would compound the existing danger. Fires like the Dixie burned so hot the turbines themselves may combust and then sling burning debris as much as a quarter mile away. We wait until the fires, which are usually started by the turbines, burn well outside the perimeter of the project before we attempt suppression efforts." (**Exhibit B.**)

Most wildfires in Shasta County are caused by either lightning or human negligence/accidents. But even two Statue of Liberties stacked on top of each other does not convey the magnitude of these impediments to aerial firefighting, or the full extent of the problem, as even the Statue of Liberty does not have blades spinning around, nearly two football fields in diameter, and traveling at hundreds of miles an hour at the blade tips as they sweep a huge circle reaching even higher in the air than the nacelle. Now imagine such structures, essentially 70 story buildings, with their spinning blades, wholly or partially obscured by smoke in the midst of a wildfire sweeping through the tens of thousands of trees on the ground between and among the turbines. The turbines, of course, will have been placed intentionally on high points of the landscape, where there are frequently high winds which also typically accompany wildfires in Shasta County. And then picture 48 of these 700 foot plus tall turbines spread over several thousands of acres of densely packed pine trees (each of the 48 a massive skyscraper in its own right, each taller than anything north of downtown San Francisco).

It is not clear that any turbines this tall have ever been built before in California.

No mitigation of the problems posed by the existence of such extremely tall turbines in heavily forested, high fire danger areas is possible. Coloring the turbine blades, putting lights on them, and telling Cal Fire the GPS locations of where they are, is just rearranging deck chairs on the Titanic. What you need to understand is that the very existence of the turbines will mean that air tankers—essential weapons that Cal Fire and other agencies have to contain wildfires in California—simply will not be able to fly anywhere near that area at all, greatly increasing the risk that a fire in Eastern Shasta County, anywhere in or near the project site, will likely be unable to be fought from the air at all, and will necessarily likely grow to become a catastrophic fire.

This project and projects like it simply have no place in heavily forested, severe high fire danger areas such as the proposed project site, which is one of the main reasons why Shasta County has banned all such projects in the unincorporated areas of Shasta County (nearly all of Shasta County is forested and rated as being located in high or very high fire danger zones). Denying the present permit application, as both the Shasta Planning Commission and Board of Supervisors did before you, will likely save lives. We have lost over 100 lives in Northern California wildfires in recent years, including many women and children who were literally burned alive. To add the impairment to aerial firefighting of dozens of 700 foot tall wind turbines scattered through the forest to the already difficult task of containing catastrophic wildfires in high fire danger areas is beyond irresponsible. To do so would invite even greater tragedy by unnecessarily increasing the potential for additional loss of life that could occur as a result of wildfires in heavily forested Shasta County that could not be effectively contained by the use of air tankers and rotor aircraft.

1. **Aerial firefighing with fixed wing aircraft is the most effective way to contain wildfires quickly, support ground forces, and keep wildfires from growing to out-of-control proportions.**

The most effective way to quickly contain wildfires in California is with the use of fixed wing aircraft that drop fire retardant. Cal Fire and all other agencies depend heavily on aerial firefighting to contain fires, create fire lines, and otherwise protect lives, homes, businesses, and in many cases entire communities. As stated in the Proponent's own "experts" report, "it has been noted that in the vicinity of turbines, there will be a reduction of available airspace for fixed-wing aircraft...."

In Shasta County, such fixed wing air tankers use the Redding air tanker base to rapidly fight fires as and when needed. Such fixed wing air tankers have been used to fight all the major wildfires in Shasta County in recent years, including the Carr, Zogg, Hirz, Delta and Dixie fires, and many others. Most recently, fixed wing air tankers were used to contain the Fawn fire near Lake Shasta, and keep it from burning into the City of Redding. Had there been a wind turbine development in the way, such that fixed wing air tankers could not have been used to quickly contain the Fawn fire, that fire would have easily burned into Shasta Lake City and Redding and would have likely burned thousands of additional homes and businesses to the ground. As it was, there are no wind turbines there or near there, and air tankers were used to lay down retardant to create fire lines and fire breaks, and to save hundreds if not thousands of homes (and likely many lives too).

2. **Air Tankers Need to Drop Retardant From Only 100 to 200 Feet Above the Ground.**

As stated by the Chief: "Most effective drop height is 150' above the ground and lower crossing ridge tops not over 700'. I urge you to consider that flying heavily laden aircraft (fixed and rotor wing) with poor

visibility from smoke and very tall obstructions with whirling, immense blades is a **prescription for a fatal accident** both in the air and on the ground. No consideration for huge vortexes produced downwind from the turbines was taken." (**Exhibit A, emphasis in original.**) So, in addition, for fires nearby, an air tanker must have some running room to drop to that low of an altitude before releasing retardant, and some additional running room to return to a higher altitude before returning to the airport to reload. Thus, if there were to be several thousands of acres sprinkled with 700 foot tall wind turbines in or near to any flightpath that an air tanker would otherwise take to attack a wildfire, the impediment to aerial firefighting would extend far beyond the project site itself and would not be limited to the footprint of the wind turbine project itself.

As mentioned above, if an air tanker were compelled to fly a safe distance above the top of the turbine blades, the drop height would be around 900 feet from the ground. Drops at this height are ineffective and simply disperse in the wind. Worse, wind turbines are often located on top of ridges or other high points. This means that a fire burning in a lower area--canyon bottom or on the slope--within or near the turbine project, along a flight approach line, could be well over 1000 to 2000 feet or more below the height of the safe flight path. Drops at this height would have no effect on fire on the ground whatsoever.

3. **The Project Area and Surrounding Area Would Likely Be Deemed a "No Fly" Zone for Aerial Firefighting in the Event of A Wildfire In or Near The Project.**

A former interagency Type 1 (large fire) Plans Chief, Fire Behavior Analyst, and fifteen year National Fire Instructor, has concluded: "I would never recommend assignment of fixed wing aerial attack to this project area and would greatly restrict the use of rotor aircraft." (**Exhibit C.**)

Thus, the likely impact of a project such as the proposed Fountain Wind Project would be to create a "No Fly" zone for aerial firefighting in Eastern Shasta County beyond the project because of flight path issues mentioned above. The effect would be, in a wildfire situation, to exclude air tankers from that general area of Shasta County entirely.

We expect a similar result would also apply to helicopters. When considering helicopters, it is important to note at the outset that the capacity of an initial attack Cal Fire helicopter to hold water or retardant is a fraction of the capacity of an air tanker. So if use of air tankers is completely eliminated by the existence of a turbine field, it might be possible for limited use of helicopters outside the boundaries of the turbine field, some safe distance away. The existence of the wind turbine project in the area has still, nonetheless, greatly diminished the effectiveness of any potential air attack on the fire while greatly increasing the likely outcome that the fire is not contained and grows out-of-control to become a catastrophic fire.

Even the potential limited use of helicopters around the fringes of the project site is problematic when such large obstructions are in the area. Such large turbines with massive turbine blades could easily be hidden or partially hidden by smoke, and the area between the turbines will also be subject to great turbulence. Helicopters are often grounded on very smoky days, or when there is an inversion layer present. Helicopters would be grounded more days or more often if the fire was in an area sprinkled with 700-foot-tall wind turbines. When you add the likely additional factor of not only some smoky conditions, but also very high winds, and/or swirling winds (created by weather, by the fire itself, and turbine vortexes or all three), the use of helicopters, even outside of the turbine field in surrounding areas might also be precluded or greatly diminished.

4. **With Such Large Turbines In the Way, Helicopter Rescues of Trapped or Injured Citizens and Firefighters on the Ground May Also Be Precluded.**

Proponent's own "experts" wrote that there would be "a reduction of airspace for rotor-wing aircraft used to deliver water/foam/gel/retardants, supplies and firefighters to wildfires." While one might suppose that without any air support, a wildfire in the project area or surrounding area could nonetheless be fought by fire trucks and crews on the ground, even this becomes more problematic due to the existence of the turbines. In wildfires in forested areas, citizens who live on ranches or in houses outside of heavily populated areas, or even citizens in towns (like Paradise, CA where over 80 lives were lost) that are in forested areas, can become trapped, injured, or otherwise in need of rescue or evacuation during a wildfire. Such rescues can sometimes be done by fire crews on the ground, but often need to be done by helicopter. In or near a huge wind turbine project, this may not be possible, further endangering the lives of firefighters and citizens on the ground, who may not be able to be rescued from the air if injured, further increasing the potential for loss of life.

5. **The Impediments to Aerial Firefighting Posed by the Turbines will likely mean that the Communities of Montgomery Creek, Round Mountain, Moose Camp, and Oak Run, at A Minimum, Will Burn in a Wildfire In or Near The Project Site, And Access To And Egress From These Communities Could Also Be Blocked By Fire Causing Substantial Loss of Life.**

As noted, the existence of 48 turbines in the project area will likely create a "No Fly" zone in Eastern Shasta County. This means that without the ability to contain a fire from the air using air tankers and possibly helicopters, any fire in that area will likely spread to burn the nearby

communities of Montgomery Creek, Round Mountain, Moose Camp, and Oak Run. The project is also close to Highway 299 and other rural roads that go from residential areas out to Highway 299. Without the ability to lay down retardant from the air, such a fire may also potentially block Highway 299, which is the only way in or out of the area for these rural communities, causing even further loss of life and property.

6. **No Satisfactory Mitigation Is Possible With The Extreme Fire Danger Posed By The Fuel and Terrain In And Around The Project Site.**

The problem is the existence of the turbines. Coloring the blades, putting lights on them, and informing Cal Fire of their GPS locations does not solve or mitigate the problem. Air tankers won't be able to fly there at all, so the problem is not identification of the turbines so they can be avoided by planes and helicopters. The problem is their very existence, their great height, turbulence and the insanity of placing them in a high fire danger, heavily forested area, where they don't belong.

Listen to the immediate past Chairman of the Associated Aerial Firefighters with 30 years of experience of fighting fires in this area, as well as fires in and around wind farms, as he warns:

> "This appears to be a very unsafe proposal to adjacent communities and aerial firefighters.... The strategy was to not use fixed wing aircraft in the turbine fields at all. In Altamont and Tehachapi most of the turbine field was contained within light flashy fuels such as vast stands of grass lands. The proposed Fountain Project would be located in an area containing large stands of Pyrophytic fuels such as chaparral, manzanita, digger pines, and mixed conifers. The heat generated by such a fire, especially if it

is wind driven would be significantly greater than the heat produced by the fast-moving grass fire. This would pose a greater risk to ground firefighters because of the lack of ability to provide them effective air support and the adjacent homesteads surrounding the communities of Round Mountain, Montgomery Creek and Hillcrest. The threat of fatal damage to the tower structures is also worthy of consideration. Not only because of material losses but as an additional hazard that could endanger firefighters on the ground." (**Exhibit D**.)

For all of the foregoing reasons, we respectfully request the following. First, if the application is not withdrawn or dropped by the applicant in its entirety, as it should be, we ask that the CEC review every wildfire in California in the last 5 years in which air tankers were used to contain or slow the growth of the fire, and estimate the additional fire spread that would have occurred if air tankers were unable to be used to fight and contain each such fire, including potential additional lives lost and millions of dollars of additional property damage that would or could have been suffered if air tankers could not have been used. Second, we ask that all of the issues addressed in this letter be fully addressed by the CEC in the CEQA process, including in any EIR that might be prepared in connection with the proposed Fountain Wind Project. And third and finally, we respectfully request that the CEC deny the application for a permit for the Fountain Wind Project and any similar project that may be proposed to be located in heavily forested Shasta County.

The Shasta County Planning Commission and Board of Supervisors denied a permit for this project for many of the foregoing reasons, and others, and later enacted a zoning ordinance banning all such industrial wind turbine projects in heavily forested Shasta County. They expressly took such actions to protect the health, safety and welfare of the citizens of Shasta County, and made specific findings of fact, supported by

the evidence and testimony of experts and citizens alike, that the Fountain Wind Project would be detrimental to the health, safety and welfare of the citizens of Shasta County. We believe that the Shasta County Planning Commission and Board of Supervisors acted responsibly and correctly. We hope that you will concur and deny the requested permit.

Sincerely,

/s/ Dave Wardall
Dave Wardall
Cal Fire Air Ops., Retired
Current Chair Associated
Aerial Firefighters

/s/ Stephen Fitch
Stephen Fitch
Forest Supervisor, Retired

/s/Mark Baird
Mark Baird
Air Attack Pilot

/s/ Jim Barnes
Jim Barnes
Former Pilot and Chair
Associated Aerial Firefighters

EXHIBIT A

Statement of David Wardall

-Chairman-Associated Aerial Firefighters
-Former Deputy Chief CDF air tanker operations for 34 years.
-Consulting engineer to the NTSB on aerial firefighting accidents.
-Involved in around 200 fatal and serious injury aircraft incident/accidents investigations.
-FAA Airline Transport pilot..

The Associated Aerial Firefighters with approximately 100 members represents pilots from across the country and provide a forum to advocate for safety, effectiveness, and efficiency in wildland aerial firefighting. I have examined the proposed Fountain Wind Project and determine it is an accident looking for a place to happen and testified in person at the Planning Commission Hearing where it was unanimously rejected.

The planning and analysis gone into this project is **seriously** flawed—Let me explain:

1. Real world dispatch and safety issues created by these huge turbines at over 600-ft AGL are many.
2. No consideration for huge vortexes produced downwind from the turbines was taken.
3. The movement of the turbine blades will produce sunlight reflections that will impair visual see and avoid for maneuvering among turbines.
4. Most effective drop height is 150' above the ground and lower crossing ridge tops **not** 600 to 750 feet.

I urge you to consider that flying heavily laden aircraft (fixed and rotor wing) with poor visibility from smoke and very tall obstructions with whirling, immense blades is a **prescription for a fatal accident** both in the air and on the ground.

AND understand how important Air Attack has been over the years. Recently Air Attack was key in saving numerous communities from Tulare to Redding.

Finally, consider the threat you would be imposing on the 3 communities immediately adjacent to this proposal by eliminating the possibility of fixed wing air attack.

Don't just take my word for it listen closely to Jim Barnes, former Chairman of the Board of Associated Aerial Firefighters. He has flown out of the Redding Air Tanker Base **AND f**lown Wind Farm Fires.

/s/ Dave Wardall
4/1/23
davidwardall@gmail.com

EXHIBT B

Statement of Mark Baird

-I have 23,000 hours with type ratings in the DC-10, MD-11 and B744 (747) supertanker
-Was an instructor in both the DC-10 and 747 supertankers
-Have spent the last 7 years flying the DC-10 (Very Large Air Tanker).
-Have flown fires all over the United States, Australia and Chile.
-Have flown the DC-10 on several large fires in the Shasta County area including the Dixie-largest fire in recent California history

As I testified to the Shasta Board of Supervisors, in my humble opinion the area adjacent to the ridge lines, spur ridges, and approaches to or escape routes away from heavy fuel fire would be rendered useless by the turbines. (Fountain Wind Project)

The communities near the development would be indefensible by air assets, particularly Large Air Tankers, or Very Large Air Tankers. Further, the turbines themselves are potential ignition sources, which would compound the existing danger. Fires like the Dixie burned so hot the turbines themselves may combust and then sling burning debris as much as a quarter mile away.

These projects built in flashy fuels are indefensible by air. We wait until the fires, which are usually started by the turbines, burn well outside the perimeter of the project before we attempt suppression efforts. Remember air tankers are prohibited from dropping anywhere near power lines or associated infrastructures unless we are given specific permission and the subject infrastructures have been de-energized. Retardant weighs nine pounds per gallon and might be traveling as fast as 150 mph when it hits a structure. Retardant dropped directly on a structure will crush it.

All said and done the proposed project is a dangerous and unproductive risk to the environment, communities and their citizens.

/s/ Mark Baird
4/1/23
mcbair@me.com

EXHIBIT C

Statement of Stephen Fitch

-Former Forest Supervisor and District Ranger of the adjacent Shasta Trinity National Forest
-Formerly responsible for 7 National Forests and 10 million acres in 3 states
-Past type 1 (large fire) Planning Section Chief & Fire Behavior officer on fires across US
-Served 15yrs on Advanced Fire & Resource Mgt. training Cadre training US, Canadian, Mexican forest managers.
-Congressional Fellow and adviser to U.S. Senate Energy & Natural Resource Committee Chairman on fire and resource matters 100th Congress.
-On the team that developed and tested the Incident Command System used on all fires today.
-Was responsible for the largest Air Tanker base in California at Ontario International Airport

Why am I concerned with this project?—As the former Forest Supervisor and District Ranger of the National Forest located adjacent to this project on two sides, I consider this project a threat to the area I spent 11yrs of my life protecting. I have been responsible for reviewing and approving or denying similar projects that threaten or enhance 7 National Forests in 3 states. A fire escaping from within or near this project would immediately threaten the Shasta Trinity National Forest.

Foremost I'm concerned about the effect on wildfire suppression and protection of the adjacent communities. These concerns emanate from having served In the positions listed above.

As you review this proposal please consider that no matter how many **experts** the **proponents** bring in to justify this project they will **never** be able to explain how to make up for the loss of what has become a key to keeping fires small and saving communities, homes and **lives** from big fires. **Air Tankers**

This Project is an absolute **design for disaster** for at least 3 communities a major power distribution system and the many homes scattered adjacent to the project.

This Project sits in a dense stand of young conifers forming continuous horizontal and vertical (ladder) fuels. It is bordered on the West and North by Highway 299 with high potential for fire starts from vehicular accidents. Homes and many other ignitions sources surround the project and within-the turbines themselves and support systems.

The most devastating fires in this area come from the North East during strong gradient winds. **Our Forests fuels have changed** and under these conditions we've learned fires jump with ease roads and forest openings. The devastating Carr fire jumped the Sacramento River in two places.

This means **ALL** the fire fighting tools must be present for us to be successful.

This proposal sets up a condition that cannot be mitigated. 700 foot towers and blades scattered over thousands of acres combined with power lines **virtually eliminates** the option for using fixed wing aerial attack over a broad area making the adjacent communities and homes **indefensible** from fast moving large wildfires.
As a former Planning Section Chief I would never recommend assignment of fixed wing aerial attack to this project area and would greatly restrict the use of rotor aircraft.

It couldn't have been made more clear recently how absolutely critical it is to have **bombers** help save lives and communities. The condition of our Forests has changed so that **backing off and burning out and protecting structures has become routine. All with much much greater dependency on aircraft.**

This County has recently experienced 2 deadly and costly fires, the Carr and the Zogg. There was a recent headline article in the Record Searchlight about **Shasta County** filing suit against PG&E to recover costs incurred from the Zogg Fire. As you consider the benefits this project might bring to the State, I hope you will also **weigh** the costs. Recent Carr, Zogg, Camp, Fawn, Hirz and Dixie fires in this area have cost the State dearly. What are the potential costs, liability and **LOSS OF LIVES** that could result from **your** decision on this **DESIGN FOR DISASTER?**

Finally

Remember Shasta County's General Plan sets "preserving quality of life, especially in rural areas and "safety of citizens and communities" as its paramount precepts. Therefore, the Commission must reject the proposed project already carefully reviewed and denied by Shasta County. The untenable alternative would be to ask the County to remove "Safety" as its plan precept.

/s/ Stephen Fitch
4/1/23
svfitches@yahoo.com

EXHIBIT D

Statement of Jim Barnes

-Past chairman of the Associated Aerial Firefighters
-Have been a Forestry Air Tanker Pilot for over thirty years.
-Have flown air attack on California wind farms.
-Have flown Air Attack from the Redding Air Attack Base protecting the vicinity of the current turbine proposal
-Have testified in Shasta County concerning the Fountain Wind Project before the Planning Commission and Board of Supervisors

I am Jim Barnes the immediate past chairman of the Associated Aerial Firefighters. The Associated Aerial Firefighters with over 100 members represents pilots from across the country and provide a forum to advocate for safety, effectiveness, and efficiency in wildland aerial firefighting. As an air tanker pilot myself for over 30ys. I have flown fires all over California including on **wind farm fires** and frequently flew out of the Redding Air Attack base as initial attack on fires all over Shasta County.

We in the Association have become aware of the recent Fountain Wind Project proposal, carefully reviewed it, and hope the Commission will consider out comments as they directly affect the safety of our pilots, several communities and the forests in Shasta County, This appears to be a very unsafe proposal to adjacent communities and aerial firefighters. Let me explain:

Aerial Firefighting in and around turbines presents a set of unique challenges that are problematic to say the least. I have worked fires at Altamont pass and in Tehachapi pass. The strategy employed in both cases was to not use fixed wing air tankers in the turbine fields at all except around the borders. At Altamont we almost always stopped the fire af-

ter it burned completely through the field usually at highway I-5. Except for one occasion when it spotted across the highway exposing about a mile of parked cars on the road to a burn over.

At Altamont and Tehachapi most of the turbine field was contained within light flashy fuels such as vast stands of grass lands. The proposed Fountain Project would be located in an area containing large stands of pyrophytic fuels such as chaparral, manzanita, digger pines and mixed conifers. The heat generated by such a fire, especially if it is wind driven, would be significantly greater than the heat produced by a fast-moving grass fire. This would pose a greater risk to ground Firefighters because of the lack of ability to provide them effective air support and the adjacent homesteads surrounding the communities of Round Mountain, Montgomery Creek and Hill crest. The Threat of fatal damage to the tower structures is also worthy of consideration, Not only because of material losses but as an additional hazard that could endanger firefighters on the ground.

High towers and high winds are a situation that shouts watch out when it comes to **aerial firefighting.** At some point, winds above 30 knots, air tankers operations would be suspended but even winds below that flowing through the high towers would generate eddy currents that would contribute greatly to the danger for aircraft trying to conduct retardant or water drops above the turbine field. To be effective typical drop altitudes are 150ft above ground and a bit lower crossing a ridge top. Dropping retardant above these 700ft. towers with height and wind dispersal will have little to no effect on the fire. A state investigator and current chairma of our organization who has been involved with over 200 fatal and serious injury aircraft accident investigations advises that these structures over 700' scattered over thousands of acres and poor visibility from smoke would be a "prescription for a fatal accident". From an air tanker pilot's point of view fighting such a fire would be a no-win situation.

Please consider our thoughts as you review this proposal.

/s/Jim Barnes
Recent Past Chairman
Associated Aerial Fighters
4/1/23
aapilots@sonic.net

W. DAVID WARDALL
17069 Lambert Road
Ione, CA 95640
209-274-9160

Retired, Consulting Aerospace Engineer 2009-2023
Clients include: NASA, DynCorp International, USFS, States of California and New York, UC Davis, Comerica Bank, Overseas Aircraft Support, US Technical, Cessna, City of LA, TTE International, Impact International, Global Supertanker, various FBO's

Chief, Aircraft Maintenance and Engineering 1996- 2008
California Department of Forestry and Fire Protection (CAL FIRE)

Plan, organize and direct the aircraft Maintenance and Engineering Program for CAL FIRE. Responsible 24/7 for 55 fire fighting aircraft. Hold FAA Director of Maintenance position for fleet of aircraft.

- Directly administer $20 million budget for aircraft maintenance and engineering
- Supervise management staff of four aircraft maintenance managers
- Supervise depot level and field assigned maintenance work force of 80 technicians
- Manage FAA Repair Station Certificate with several class ratings
- As an FAA DER, design and approve major modifications and major repairs
- Hold and maintain three FAA type certificates for fire fighting aircraft
- In-house manufacture a wide variety of aerospace parts and components
- Act as pilot-in-command for VIP flights for Governor and cabinet staff
- Perform maintenance test flights on transport class airtankers

Deputy Chief, Research and Development 1995-1996
California Department of Forestry and Fire Protection (CDF)

Plan, organize and direct the Research and Development program. Plan and submit Federal Grant funding request to obtain, at no cost to State, a high altitude, high performance turbine powered aircraft. Retrofit and install an infrared real time fire mapping system.

- Develop real time live down-link fire mapping program with several map overlays
- Manage all field and depot level maintenance through specialized service contracts
- Design and approve as an FAA DER structures engineer, infrared sensor installation
- Design and approve as an FAA DER, integrated cabin equipment and consoles
- Oversee and manage all aircraft engineering major modifications and repairs
- Fly aircraft as fire mapping airplane and for VIP transport of Governor and staff
- Fly transport class airtankers for maintenance evaluation test flights

Deputy Chief, Airplane Program 1990-1995
California Department of Forestry and Fire Protection (CDF)

Plan, organize and direct CDF Airplane Program. Responsible 24/7 for 23 airtankers, 15 observation aircraft and 5 support aircraft deployed to 13 airtanker bases and a major depot level maintenance facility.

- Directly administer $6 million budget for airplane program
- Supervise management staff of two aircraft maintenance managers
- Supervise two chief pilots, airtankers and observation airplanes
- Supervise 50 line airtanker and observation aircraft pilots

- Supervise depot level and field assigned maintenance work force of 65 technicians
- As an FAA DER, design and approve major modifications and major repairs
- Act as pilot-in-command for VIP flights for Governor and cabinet staff
- Perform maintenance and test flights on Transport class airtankers

Manager, Aircraft Maintenance and Engineering 1977-1990
California Department of Forestry and Fire Protection (CDF)

Supervise the contracted maintenance of 51 Department aircraft. Responsible 24/7 for the maintenance of 19 airtankers, 16 observation aircraft, 12 helicopters and four support airplanes.

- Directly administer $10 million budget for aircraft maintenance and engineering
- Supervise management staff of three aircraft maintenance managers
- Supervise depot level and field assigned maintenance work force of 60 technicians
- As an FAA DER, design and approve major modifications and major repairs
- Hold and maintain two FAA type certificates for fire fighting aircraft
- Act as pilot-in-command for VIP flights for Governor and cabinet staff
- Perform maintenance and test flights on Transport class airtankers

Aviation Consultant and Airport Inspector 1974-1977
California Department of Aeronautics

Manage the contracted maintenance of Department aircraft. Inspect airports for permit issuance and airport safety considerations.

- Inspect Department aircraft for airworthiness
- Prepare maintenance bid specifications; bid, award and monitor contracts
- Inspect airports and heliports for license and construction standards
- Evaluate and award State and FAA grants for airport construction
- Fly Department aircraft as pilot-in-command

Airframe Systems Engineer 1973-1974
Lockheed Aircraft Corporation

Employed in the Field Service Department. Assist and advise airline customer personnel in the inspection, maintenance and operation of the L-1011 jet transport.

- Develop customer relations to improve maintenance and operation of the L-1011
- Maintain a close liaison with factory engineering on operations of the plane
- Investigate and report on accidents, incidents and service problems
- Inspect unserviceable removed parts to determine cause of failure and warranty

Associate Production Engineer 1971-1972
Lockheed Aircraft Corporation

Design modifications and repairs to the L-1011 jet transport resulting from manufacturing damage and blue print errors.

- Respond to production line floor and design repairs to shop errors and damage
- Investigate drawing errors and design revisions to drawings
- Inspect aircraft in final assembly and flight line for conformity to engineering drawings

CERTIFICATES/ RATINGS/ LICENSES

FAA Airline Transport Pilot, several type ratings
FAA Flight Engineer, Turbo Jet, L-1011
FAA Flight Instructor, Airplane Single & Multi-Engine Land
FAA Flight Instructor, Instruments
FAA Designated Engineering Representative, (DER), Structures, Parts 23, 25, 27, 29 & 33
FAA Designated Engineering Representative, (DER), Powerplants, Part 33
FAA Airframe and Powerplant Technician with Inspection Authorization (IA)
Holder of Three FAA Aircraft Type Certificates
Holder of FAA Part 145 Repair Station Certificate

PROFESSIONAL EDUCATION AND TRAINING

Academic:	BS Aeronautical Maintenance, San Jose State University, 1971 MS Aviation Safety, USC, several classes completed
Professional:	Aviation Safety Officer, USC, Los Angeles, CA, 1979 Gas Turbine Accident Investigation, USC, Los Angeles, CA, 1995 Senior Level Aviation Management, US Forest Service, 1985 Techniques of Supervision “A” & “B”, State of California, 1989 Type Ratings and recurrent training, Flight Safety International Factory schools: Bendix, Bell Helicopter, Allison, Lockheed, Garrett, etc. FAA DER annual re-current technical training for last 35+ years

ACHIEVEMENTS

Dean’s Scholar, School of Engineering, Dept. of Aeronautics, San Jose State University, 1971
Dean’s List Every Semester, San Jose State University 1970 and 1971
National Aerospace Education Award
Scholarship Achievement Award
Airport Owner / Operator / Manager

Clients

DynCorp International
NASA, Houston Space Center
US Navy
US Air Force
Minden Air Corp
Comerica Bank
State of New York, State Police Aviation Unit
CAL FIRE Aviation Unit
US Technical, Aerospace Engineering
AAR Corporation
Seacor Holdings
Loree Air
Global Supertanker

Aero Vonics
GARD Specialists Co., Inc.
Global Supertanker
Cessna Aircraft Co.

From:	Dave Sharp
To:	EFSEC (EFSEC); EFSEC mi Comments
Subject:	Fwd: Wake Turbulence and Aerial Firefighting
Date:	Thursday, December 7, 2023 5:39:36 PM
Attachments:	Wake Turbulance Impacts Light Aviation-Excerpt.pdf

External Email

Amy Moon and Sean Green, the Applicant Response to the Recreation 1 topic in Data Request 7 is another indicator that the North line of turbines are too close to Kiona Ridge and historical burn areas. Turbulence to light aircraft. Request was about paragliding, but applicant submitted documentation cautioning light aircraft.

The council should be aware of this impediment to aerial firefighting and the danger that turbines in close proximity pose to pilots and aircraft.

---------- Forwarded message ---------
From: **Dave Sharp** <dave@tricitiescares.org>
Date: Sun, Dec 3, 2023, 2:09 PM
Subject: Wake Turbulence and Aerial Firefighting
To: Paul Krupin <Paul@presari.com>
Cc: Karen Brun <karen@tricitiescares.org>, Pam Minelli <pam@tricitiescares.org>

Buried at the very end of the Applicant response to Data Request 7 for the Revised ASC, under topic REC-1 is the following quote for light aviation: "*.....exercise caution if the flight path is within 10 rotor diameters*." The applicant calculated a 3000' downwind turbulence caution zone that represents 10 rotor diameters. The 3000' distance apparently was calculated based upon the smallest diameter rotor offered rather than the worst-case diameter option in the ASC.

1. The Applicant response significantly understates the cautionary downwind far wake zone by using an incorrect rotor diameter in the calculation. The correct distance is 5,510' (1.1 mile) based upon worst case rotor diameter (551') in the RASC, not 3,000'. Their error understates the actual safe distance by 50%.

2. The response based upon the Data Recreation-1 response, yet light aircraft technical papers were referenced, but is should also be included as a danger to firefighters. This is an important issue with respect to use of small and large aircraft for firefighting.

Attached is the Response 7 that had the writeup about Wake Turbulence.

This is further evidence that the turbines are located too close to Kiona ridge and will impact aerial firefighting.

How do we ensure that since this type of information gets to the voting council members.

Attached are the last 4 pages of the data response.
David Sharp
Vice President, Tri-Cities CARES
Email: dave@tricitiescares.org
Webpage: www.tricitiescares.org

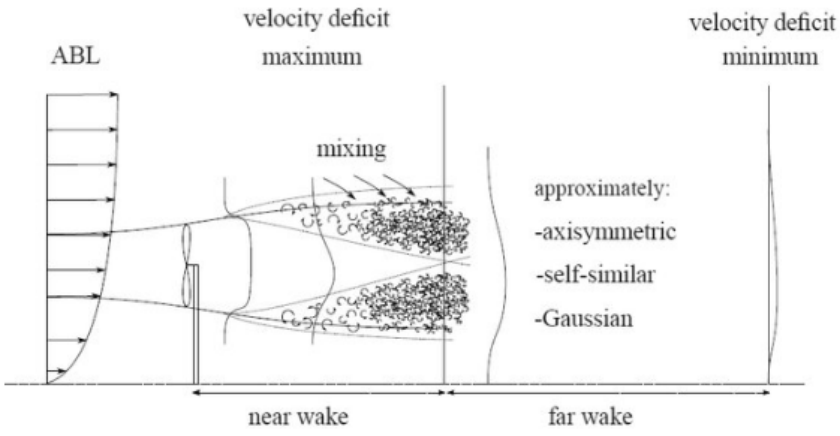
Attachment FEIS-Recreation-1

WIND TURBINE WAKE EFFECT

In any wind farm, operating wind turbine generators convert the kinetic energy of the free-stream wind flow into electricity through the rotation of blades over a large swept area that turns an internal generator in the nacelle of each unit. In the process of extracting kinetic energy from the incoming free-stream wind flow, every wind turbine will leave a 'wake' downwind of the turbine rotor swept area. This 'wake effect' can be described as a trail of reduced wind speeds and enhanced turbulence inside the 'wake zone'. The length and width of the wake zone behind each wind turbine is highly variable and will vary by specific atmospheric conditions including temperature profiles above the surface, wind speed intensity, barometric pressure, relative humidity and the resulting air density at any given moment.

Generally, wakes are characterized and described in two zones:

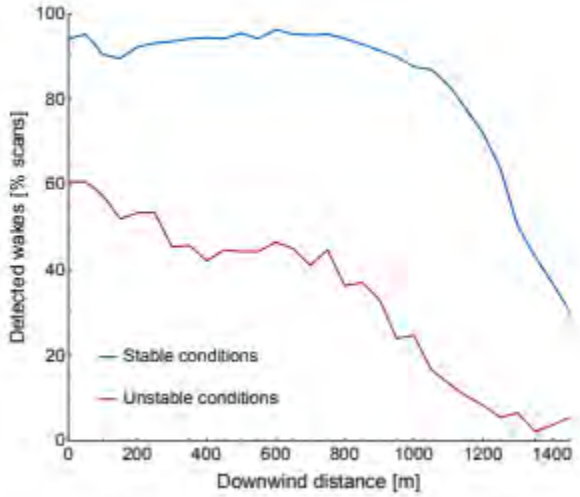
- The first is called the 'Near Wake' zone where the air flow immediately behind an operating wind turbine has the highest wind deficit (lowest wind speeds) as a large portion of kinetic energy has just been extracted and the highest turbulent kinetic energy (or turbulence). Typically, the Near Wake zone begins immediately behind the operating wind turbine and extends to approximately 3 to 5 rotor diameter lengths. For example, a 127-meter rotor diameter would typically see Near Wake zones extend as far as 380 to 635 meters (~ 1,250 to 2,000 feet downwind).
- The second area is called the 'Far Wake' zone which is the area where there is a transition between the highly turbulent airflow behind the wind turbine rotor to an area where the surrounding air flow from the lateral sides and above the wake begin the recover the wind flow. Typically, the Far Wake zone begins immediately behind the Near Wake (at ~ 3 to 5 rotor diameters) and could extend as far as 8 to 10 rotor diameters behind the operating wind turbine. A wind turbine with a 127 meter rotor diameter would typically see far wake effects extend out to 1000-1270 meters (~ 3280 – 4150 feet downwind). The Far Wake zone is characterized as an area of lower wind speeds than the free-stream wind flow, lower wind shear with height up to the blade-tip height of the rotor (~ 500 feet AGL), and air not as turbulent than the Near Wake zone. After the Far Wake zone, winds mostly recover into the free stream at distances > 10 rotor diameters. These distances can vary somewhat based on the atmospheric conditions and stability at specific times.



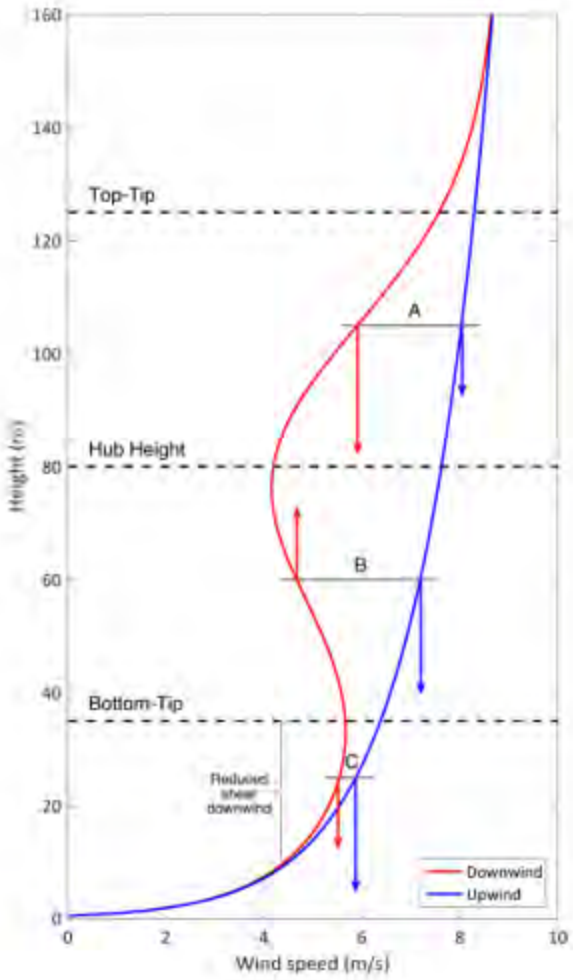
Many detailed research studies have been completed throughout the years investigating the effects of wind turbine wakes individually and as a group. These studies utilized instrumentation such as on-site met towers and remotes sensing devices such as LIDARs (Light Detection and Ranging) and SODARs (Sound Detection and Ranging).

Overall, the general findings can be characterized by the following:

- The strongest wakes are those with the highest wind speed loss in the flow behind the wind turbine and longest downwind distance. The strongest wakes occur during nighttime stable atmospheric conditions.
- The weakest and shortest downwind wakes are typically in the daytime hours when heating of the surface and low-level atmospheric mixing is at its highest (during unstable atmospheric conditions).



- The wind speed velocity reduction decreases with distance from the wind turbine within the wake. In other words, the lowest winds and highest turbulence are immediately behind the turbine and then slowly recover over distance within the wake.
- The width of the wakes increases with downwind distance much like a cone shape in typical daytime atmospheric conditions.
- Wind turbine wakes can evolve over time and distance as wind speeds and temperatures are constantly changing over time. Wakes have been observed to exhibit different kinds of motions, even from inside the same wind farm. Motions such as meandering (snake-like back and forth motion behind the wind turbine), looping, and wave-like motion are possible.
- Above the surface, the wind speeds exhibit a wake like vertical profile where there is lower wind shear with height and in some cases, negative shear (wind speeds decreases with height) inside the wake zone.



Several studies have probed the physical structures of the Wake zones and the impact on light aviation. A summary of reports directly related to Wind Turbine wakes are listed below as References.

The implications for light aviation traffic in the vicinity of a wind farm are as follows:

- At wind speeds above cut in speed (approx. 3 mph), exercise caution if the flight path is within 10 rotor diameters (approx. 3,000 feet) downwind of the wind turbines. *Note: the nose of a wind turbine always faces up-wind and the rotor has a clock-wise rotation.*
- Atmospheric conditions can vary quickly causing changes in wind speed and direction, ofttimes causing unpredictable hazard.

References: Large turbine rotor diameter 551', danger mode within 5,551'
Small turbine rotor diameter 459', danger zone 4,590'

Barthelmie, R.J., S.T. Frandsen, O. Rathmann, K. Hansen, E.S. Politis, J.M. Prospathopoulos, J.G. Schepers, K. Rados, D. Cabezon, W. Schlez, A. Neubert, and M. Heath. 2011. Flow and Wakes in Large Wind Farms: Final Report for UpWind WP8. Risø DTU National Laboratory for Sustainable Energy. Report number Risø-R-1765(EN). February.

Applicant gives incorrect information. Should be worst case rotor diameter.

Bodini, N., D. Zardi, and J.K. Lundquist. 2017. Three-dimensional structure of wind turbine wakes as measured by scanning lidar. *Atmospheric Measurement Techniques* 10:2881-2896.

Tomaszewski, J.M., J.K. Lundquist, M.J. Churchfield, and P.J. Moriarty. 2018. Do wind turbines pose roll hazards to light aircraft? *Wind Energy Science* 3:833-843.

Wu, Sichent. 2011. *Effects of Wind Turbine Wakes on Microclimate Properties near the Ground*. Dissertation. University of Delaware.

To: Comments@efsec.wa.gov
From: kmbrun@gmail.com
Received: 2023-12-09T21:14:49+00:00
Subject: FW: Horse Heaven Energy Center FEIS Questions & Comments
Has attachment? False

External Email

After spending many hours reviewing this huge document, I have many questions and comments. This is the largest wind and solar project every proposed for Washington State and one that has not received the arduous review and scrutiny that a project of its size and scale requires. The entire process has a rubber-stamped check-the-boxes feel…let's get this thing off the ground and the Tri-Cities be damned. I realize that the goal is to reduce Washington's carbon footprint but given that this power is, in all likelihood, going to be sent out of state, it will have zero impact on Washington's carbon goals.

1. **Chapter 3 – Affected Environment**
   Where are the visual simulations for Representative Viewpoints 17-23?
2. **Section 3.13.2.1**states that the Lease Boundary primarily falls within the jurisdiction of Fire Districts #1 and #5.**That is not entirely true**.Fire District #2serves Benton City and the rural areas surrounding Benton City including the area involved in the June 18th wildfire. Refer to the Office of Fire Managementmapsfor Benton County. Who didn't do their homework?
3. **Section 4.10, Visual Aspects, Light and Glare**
   According to the referenced**Appendix 3.10-2 Updated SWCA Visual Study – Final EIS, Section 4.2.4.1**,**the Applicant committed**to "**Clustering or grouping turbines**to break up long lines of turbines". Neither the FASC nor the FEIS provide evidence that this has been done. Why not? If they committed to it, then they should do it.

   Section 4.10.1.1, Visual Aspects Methodology

   The analysis of the Project's visual impacts focuses on three elements: landscape character, viewing locations, and compliance with state and county visual management guidance. The analysis uses the methods developed by the Clean Energy States Alliance (CESA), which suggest three evaluation criteria as they relate to determining whether impacts rise to the magnitude of "undue" or "unreasonable" (CESA 2011):

   - Does the project violate a clear written aesthetic standard intended to protect the scenic values or aesthetics of the area or a particular scenic resource?
   - Does the project dominate views from highly sensitive viewing areas or within the region as a whole?
   - Has the developer**failed to take reasonable measures to mitigate**the significant or avoidable impacts of the project?

   From our perspective, the answer to every one of these questions is a resounding "YES". Even SWCA states in:

   Section 4.2.2.6 Combined Impacts of Components

   •The combined impacts of the different Project components would result in a landscape character dominated by large-scale energy infrastructure,…

   •…the scale of the Project and prominence of the proposed turbines would result in high, long-term impacts to the existing landscape.

   •Views from these locations (KOPs 3, 6, 12, 13 and 15) would be dominated by energy infrastructure as a result of the additive effects from each Project component, resulting in high, long-term impacts on these views. Since these impacts occur on viewpoints beyond the neighboring receptors, these effects would be regional in extent. In summary, activities during operation of all components of the Project would

result in high, long-term,**unavoidable**, regional impacts on visual resources.

•The Horse Heaven Hills and northern ridgeline would, however, become dominated by energy infrastructure, with potential long duration views from areas within the communities between Benton City and Kennewick. These impacts on views would be most intense where unobstructed views of a large number of turbines occur." Which, as those of us who live here, would impact the residences who are at or near the same elevation as HHH-West, not those who are in Badger Canyon within .5 miles of the Project.

Given the restricted grid injection capacity of 850 MW, why are the most onerous turbines not being removed or relocated? Doing so would significantly reduce the multiple impacts of those turbines currently located in the migration corridor, on cultural resource sites, in heavily used recreation areas, within the aerial firefighting corridor, and within proximity to populated residential areas. The "Significant Unavoidable Adverse Impacts" only exist because the Applicant refuses to consider any meaningful compromises on turbine location or quantity. It's all about the money!

4. **In the FEIS, Public Health and Safety**

PHS-126: Fire Suppression Aircraft Access: In the event of a major wildfire occurring in an area where fire suppression aircraft may need access near the Project, whether related to the Project or resulting from another cause, the Applicant would shut down turbines temporarily.

Rationale: This mitigation measure would allow access for fire suppression aircraft carrying water and fire suppression chemicals, as needed.

Had Judge Torem not denied testimony from two aerial firefighters with a combined experience of 84 years, you would know that the proposed mitigation is unacceptable for protecting the lives and property of those who live near the steeply sloped areas prone to wildfires. These professionals require a 4-mile buffer zone in which to descend, drop the retardant or water, and lift out again. FAA restricts any obstruction 499' tall within 20,000 feet from a runway. Commercial and passenger planes take off and land at the same height and speed as an aerial firefighting plane. Why would you think that having a 499' tower with no spinning blade would be different from a 499' building? The same restriction should apply. It makes no difference to an aerial firefighter whether the blades are spinning or not. It's the presence of the 499' tall turbines and the fact that they are inside the 4-mile buffer zone that matter.

5. **InSection 4.12.2.5**, the FEIS "describes measures to reduce or compensate for impacts related to recreation…".

R-2: The Certificate Holder would provide a minimum of five informational boards approved by DNR and EFSEC at viewpoints within the Lease Boundary and/or in the surrounding communities associated with scenic areas of interest. The construction of the informational boards would be completed within five years of the beginning of construction.

Rationale: To mitigate the loss of uninterrupted views of scenic viewpoints and provide information to the public regarding the Project, the Project's expected years of operation and the reclamation of the Project. Additionally, photographs of the viewshed prior to the construction of the Project should be displayed, in color, on the informational boards.

Why would you think that posting informational boards on the operational Project and what it used to look like is going to mitigate the loss of uninterrupted views of scenic viewpoints? Just ludicrous.

6. In the FEIS,**Table 4.12-5b**:**Summary of Potential Impacts on Recreation during Operations**, the following appears:

Turbines would limit recreational activities (i.e., paragliding) that occur on public land near area of operation" with a Low magnitude of impact. Have you asked the paragliders if they agree with this rating? Your mitigation is to push them off to other areas but they selected this area for their recreational activity because it meets their criteria. If other areas were capable of doing so, they would've picked another place from which to paraglide.

7. **Table 4.12-5c** wherein EFSEC has determined that significant unavoidable adverse impacts would occur during the operation stage.

   Are these really unavoidable or have they been designated as such because neither the Applicant nor EFSEC is willing to scale this project back to a reasonable and much less impactful state? Why do the turbines have to sit on the Horse Heaven Hills ridgeline when, by sacrificing a small amount of generation, they could be pushed farther south and southwest? The Applicant and EFSEC are asking the Tri-Cities to make a huge sacrifice with very little being offered to balance that out.

8. **Section 4.13 Public Health and Safety.** Under **Applicant Commitments** list of applicable federal, state, and local health and safety standards in on **Page 4-503**, there is a noticeable absence of anything remotely related to aerial firefighting. Why is that? Did they not consider aerial firefighting to be an area of concern for public health and safety? We sure do. On **Page 4-506**, the FEIS states: "Fire may result from turbine construction under Turbine Option 1 due to existing site conditions and the nature of construction activities. However, potential impacts related to fire could be meaningful, as **wildfire risk in the area is considered high** (Section 3.13.2.1). Impacts of a fire would be medium, temporary, feasible, and **limited in spatial extent**." So the Applicant and EFSEC acknowledge the risk of wildfire but yet hamstring firefighting ability by not providing a 4-mile buffer for aerial firefighting. Why is that? And what is meant by "limited in spatial extent"? Are you expecting a wildfire to stay in one place?
9. **Table 5-2: Cumulative Impacts with Proposed Action**

   •**Air Quality**: Fugitive Dust ($PM_{2.5}$ and PM_{10}) – Conclusion: The Proposed Action does not meaningfully contribute to the overall cumulative impact on air quality within the spatial and temporal setting. Where is the data that supports this conclusion? Just stating something doesn't make it so.

   •**Vegetation**- Conclusion: The Proposed Action would meaningfully contribute to cumulative impacts on Priority Habitat and special status plant species.

   •**Wildlife and Habitat**- Conclusion: The Proposed Action would meaningfully contribute to cumulative impacts on Priority Habitat and special status plant species.

   •**Historic and Cultural Resources**- Conclusion: Due to changes in the nature and use of the landscape, the Proposed Action would meaningfully contribute to a cumulative impact on historic and cultural resources.

   •**Visual Aspects, Light and Glare**- Conclusion: The Proposed Action meaningfully contributes to a cumulative impact on visual aspects within the spatial setting.

   •**Noise and Vibration**- Conclusion: The Proposed Action meaningfully contributes to a cumulative impact on the local noise environment in the spatial setting.

   •**Recreation**- Conclusion: The Proposed Action meaningfully contributes to a cumulative impact on recreational resources due to changes in the use, quality of the experience, and the health and safety of recreationists.

   •**Transportation**– Conclusion: Depending on the construction timing of RFDs, the Proposed Action has the potential to meaningfully contribute to impacts on transportation within the spatial and temporal setting.

   Of the 14 Resources listed in this table, 7 meaningfully contribute to a cumulative impact and

1 has the potential to do so. Another, Public Health and Safety, was not thought to have a meaningful impact from fire, smoke and haze, or hazardous materials release. That designation should be reconsidered since wildfires, whether caused by lightning, human irresponsibility, or a turbine, solar, panel, or BESS malfunction, have significant potential for harm to the public. Given that more than half of these resources are significantly impacted, why is neither the Applicant nor EFSEC taking a step back and seriously considering what else should be done to change this? Relocating the turbines currently sited within the migration and historic/cultural resources corridors and recreational areas would also reduce the impacts on vegetation and people (i.e., visual, light, glare, noise and vibration).

10. Section 5.2.2 – Identification of Meaningful Contributions to Cumulative Impacts and Determination of Significant from the Proposed Action

    •**Vegetation**- The potential exists for a final design that lessens the residual impact and reduces the Proposed Action's contribution to cumulative impacts on priority habitats and native plant species.

    •**Wildlife and Habitat**– The potential exists for a final design that lessens the residual impact and reduces the Proposed Action's contribution to cumulative impacts on special status wildlife species and priority habitats.

    •**Historic and Cultural Resources**- Cumulative impacts from ground disturbance, viewshed alteration, and restricted access to Traditional Cultural Properties are likely to alter the nature and use of the landscape. Cumulative impacts from past and present actions and RFDs may affect the location, setting, feeling, and/or association of historic and cultural resources, resulting in a potential loss of the integrity of these resources.

    •**Visual Aspects**- Mitigation measures have been identified for these impacts that, when implemented, are expected to reduce the magnitude of effect. These effects include dominating the area's landscape character through the introduction of large-scale energy infrastructure, as well as dominating views from viewing locations where the setting would appear heavily modified.

    •**Noise**- Impacts from long-term noise sources could add to the present developments and RFDs in the local settings.

    •**Recreation**- Cumulative loss of the use for recreation resources occurs when lands, frequently used for recreation activities, are taken out of use during the construction and operation of non-recreation projects or recreation activities are indirectly impacted by projects (e.g., visual, noise, etc.).

    •**Transportation**- Cumulative impacts from past and present actions and RFDs have the potential to affect the level of service of traffic routes, cause loss of access to public resources, and decrease roadway safety if constructed or decommissioned contemporaneously.

    Why were Light and Glare not addressed in Section 5.2.2?

11. **Table 5-3: Cumulative Impact Analysis Summary**
    Of the 17 topics listed in this table, all but one (vibration during construction and decommissioning) acknowledge that the proposed action meaningfully contributions to a cumulative impact. It appears to any intelligent person that you all should back to the drawing board. This project is not ready for prime-time. What rationale do you have for proceeding with this project when there are so many negative impacts – many of which could be resolved with compromise on the part of the Applicant and EFSEC? EFSEC should not be in the business of making sure that the Applicant gets what they want and disregarding everyone else.
12. According to**WAC 463-60-085(2) Fair treatment**.The application shall describe how the

proposal’s design and mitigation measures ensure that no group of people, including any racial, ethnic, or socioeconomic group, bear a disproportionate share of the environmental or socioeconomic impacts resulting from the construction and operation of the proposed facility. Statistics provided by TCC during the adjudication shows that this project will impact 20 times more people than all the rest of the wind and solar projects in the entire state. That definitely shows that the residents of the Tri-Cities will bear a disproportionate share of the environmental impacts. How can that be justified?

Karen Brun
Kennewick, WA
509-392-1156

Attachments:

[]

From:	EFSEC (EFSEC)
To:	EFSEC mi Comments
Subject:	FW: Tricities CARES-Fugitive Dust Comment-
Date:	Wednesday, December 13, 2023 1:11:51 PM
Attachments:	Fugitive Dust Emissions Analysis-Comment EFSEC.pdf

From: Dave Sharp <dave@tricitiescares.org>
Sent: Wednesday, December 13, 2023 1:09:30 PM (UTC-08:00) Pacific Time (US & Canada)
To: EFSEC (EFSEC) <efsec@efsec.wa.gov>; EFSEC mi Comments <Comments@efsec.wa.gov>; Bumpus, Sonia (EFSEC) <sonia.bumpus@efsec.wa.gov>
Subject: Tricities CARES-Fugitive Dust Comment-

External Email

Sonia, the Council needs to review this email and attachment.

Tri-Cities CARES offers comments to FEIS Appendix 3.2-1-Emissions Calculations, and Appendix 3.2-2-Tetra Tech Dispersion Modeling Emissions Calculations. A more detailed discussion is included in the attachment to this email. We question the calculations and methodologies used to tabulate and model the particulate emissions.

Our greater concern is chronic and excessive PM10 and PM25 and impact to public health. Department of Ecology Website:
"Particulate pollution affects the airways and lungs and can cause problems in other parts of the human body. It's especially bad for those with chronic heart and lung disease (like asthma, bronchitis, and emphysema), children, and the elderly. It worsens these diseases, which can lead to hospitalization or even early death".

Environmental Rule #1. The solution to pollution is not dilution!

Construction Phase

Yet, this is what has been done here. The project dispersion modeling excludes the construction activities phase. That phase generates 99.5% of PM10 emissions. By excluding the major source of emissions, the modeling results were diluted. This is a very large and widespread project with a massive amount of emissions. These emissions have not been included in modeling of an area that has been over the National Ambient Air Quality Standard (NAAQS) for both PM10 and PM 2.5 numerous times. As a result of the exclusion of construction emissions, the EIS

modeling result appears to be understated, and we believe, flawed.

Without an area wide model, the EIS will not be able to accurately determine whether the project meets the NAAQS, State, or Benton Clean Air standard during the construction phase.

O&M-Ongoing Operations

The calculation for ongoing operations did not include windblown dust from exposed areas resulting from the project, and vehicle traffic (wheel contact with roads) on paved and unpaved roads. Those will be the major sources of fugitive dust. The only reason the new unpaved roads exist is to support the project and should have been included. The calculation only used vehicle exhaust emissions, brake wear and tire wear. Without the complete calculation, ongoing emissions from the new source are diluted and understated. The calculation needs to be expanded to include all PM sources.

The solution to pollution is not dilution!

David Sharp
Tri-Cities CARES
Email: dave@tricitiescares.org
Webpage: www.tricitiescares.org

Horse Heaven Hills Wind Project
FEIS-Comments and Analysis Fugitive Dust
Dave Sharp-Tricities CARES

Executive Summary, Final Environmental Impact Statement-Fugitive Dust- A post FEIS comment is appropriate for fugitive dust. The first and only dispersion model was not provided until late October 2023. The FEIS contains incorrect calculations and conclusions.

The Horse Heaven Hills Wind Project has the potential to create routine "dust bowl" type conditions, with associated adverse health impacts, for the communities North of the project and the greater metropolitan area of the Tri-Cities. Benton County historically has been in non-attainment status with the National Ambient Air Quality Standard (NAAQS) indicating systemic fugitive dust problems. The following bullet points a summary of major issues identified.

- Horse Heaven project fugitive dust emissions from construction activities have not been modeled. **This represents 99.5% of the total project PM10 emissions.**
- The HH project emissions will add an increment over background emissions, which are already high. Impacts to the adjacent communities are not known.
- The Project should be treated as a single source that include construction activity, and the Batch Plant, and Diesel Engines [Batch Plant].
- Emissions calculated for Ongoing Operations [O&M] are incorrect and understated. The FEIS then concluded emissions were de minimis based upon that incorrect calculation.
- Emissions calculations did not utilize factors representative of the local area's fine silty soil and low moisture.
- A water source has not been secured. Without ample water for control, fugitive dust emissions will increase significantly.
- The FEIS has not provided data to assess the significance of the fugitive dust impact, and should not be used as basis for a Determination of Non-Significance [DNS].
- How can a Final Environmental Impact Statement be issued if the final Impact has not been calculated, quantified, or is not known?
- Downwind NAAQs monitors should be installed for PM10 and PM2.5 in the Badger Valley.
- The FEIS should be reopened for this Human Health topic.

<u>Discussion-Project Location</u>

The project consists of over 100 square miles of land in a swath 25 miles long located just South of the Tri-Cities and communities.

The project developer chose a location that is contrary to customary and general wind industry practice, in close proximity to a high population urban area. The Tri-Cities is the third largest and fastest growing metropolitan area in the State with over 300,000 people. Benton City and Finley are a scant 1 mile from the project, with Kennewick and Richland municipal boundaries are approximately 2.5 miles distant.

There were numerous public comments, photographs, air quality monitoring data, technical papers and testimony that **fugitive dust is already a problem** in the Tri-Cities area. The project would add to those emissions. Nearly 100 miles of unpaved roads and crane paths will be constructed solely to support construction and ongoing operations. Prevailing wind direction brings the dust emissions into the Badger Valley and beyond. The majority of dust emanates from the dryland wheat areas where the project will be located generally upwind of population, cities, and communities.

Fugitive Dust-General

Fugitive dust is a criteria pollutant regulated nationwide by the EPA through the National Ambient Air Quality Standards (NAAQS). PM-10, and PM-2.5 are of particular concern because their small size allows inhalation to the lungs. In Washington, Department of Ecology is responsible for PM monitoring and compliance.

From Dept of Ecology Website: "*Particulate pollution affects the airways and lungs, and can cause problems in other parts of the human body. It's especially bad for those with chronic heart and lung disease (like asthma, bronchitis, and emphysema), children, and the elderly. It worsens these diseases, which can lead to hospitalization or even early death*".

Final Environmental Impact Statement-Supplemental Emissions calculations and modeling results that were seen for the first time in the FEIS raise questions about the increment of fugitive dust that will be added from the entire project. The calculations and dispersion model for the Batch Plant Engine Sources [Batch Plant] in FEIS Appendix 3.2-2 was not in the Draft EIS, and was only seen by the public at the end of October 2023. The largest emission source by far, construction activity emissions has not been modeled.

<u>Emissions Calculations Review Findings (Summary)</u>

Construction Activity-

1. Construction Emissions-1,100 Tons-The major source of particulate emissions by far come from construction activities (FEIS Appendix 3.2-1); approximately 1,100 tons/year for PM10 for Project Phase 1 alone; Another 1,000 tons for Phase 2. **No area modeling was performed to include construction activities which account for 99.5% of project emissions**.
2. Batch Plant Emissions-5.5 Tons-The Batch Plant emits approximately 5.5 tons/year. Area modeling was performed. Batch plant modeling barely stayed within NAAQS exceedance limits when modeling potential to emit emissions scenarios. That raises serious questions about the modeling that **was not performed** with a factor 200 times the Batch Plant emissions.

3. Whole project dispersion modeling needs to be performed for Phase 1 and Phase 2. Turbine locations crowd the Northern Lease boundary and are much closer to communities than the Batch Plant.
4. Emissions calculations must use local conditions of soil and meteorological data rather than general AP-42 factors discussed below under Tri-Cities Cares review.

Post Construction Ongoing O&M Activities [O&M]

1. Appendix 3.2-1 incorrectly calculated O&M fugitive dust emissions. The FEIS declared the fugitive dust from O&M to be de minimis based upon the incorrect calculation.
2. The fugitive dust calculation needs correction, O&M details need to be added, and a project area dispersion model should be performed for O&M.
3. AP-42 factors- Same as item #4 above.

Overall-The project should be considered a single new source, emissions calculated and dispersion modeled accordingly.

Tri-Cities CARES review of FEIS Emissions Calculations-Details

References: 1. Final FEIS-Horse Heaven Wind Project, 2. Appendix 4.3-1 Emissions Calculations, 3. Appendix 4.3-2 Tetra Tech Air Quality Dispersion Modeling Evaluation, and 4. USEPA AP-42 Compilation of Air Emissions Factors-Chapter 13

1. The project has not secured a source of water for the project. Throughout the construction phases the calculations show that dust control by use of water is 70 to 75% depending upon the calculation. What metric will be used to determine whether dust control methods are not controlled properly? Will the standard be visible fugitive dust (20% opacity)? The project should not proceed any further without a water supply.
2. The FEIS language indicates that water is to be used for dust control, but the window is open for the contractor to use other means in place of water such as compressed schedules, staging, "alternative methods", etc., to use less or perhaps even no water. Without adequate water, emissions could be up to 3-4 times higher. The Applicant should perform alternate calculations with less of control efficiency if their intent is to economize water use, or not use water for dust control.
3. The major source of particulate emissions is from construction activities; approximately 1,100 tons/year for PM10 phase 1, and 1,000 in phase 2. **Emissions from construction activities are roughly 200 times that of the Batch Plant emissions.** The FEIS did not model these emissions. The limited modeling performed is not adequate to assess the overall project area emissions and impact to downwind population. A "whole site" model should be used.
4. The emissions calculation for ongoing operation is incorrect and understates emissions. The calculation needs to be redone and dispersion modeling should be performed for O&M activities post construction. The calculation should include:
    a. Windblown dust from new permanently disturbed areas.

b. Vehicle wheel contact to paved and unpaved roads. Road travel miles should include all vehicle traffic including employees, and contracted employees of the wind turbine supplier, other support contractors, substation access, and estimates of crane travel, Solar panel washing and vehicle support.
c. Provide the dust control measures that will be utilized post construction, if any.

5. Local soil and meteorology data should be utilized in the AP42 calculations rather than the general AP factors, as recommended by AP42: AP42, Section 13.2.2 Unpaved Roads - Updated November 2006 (epa.gov) Reference Quote, page 2: *"Therefore, the use of data from this table can potentially introduce considerable error. Use of this data is strongly discouraged when it is feasible to obtain locally gathered data."*
   a. The project lease is located in one of the dustiest and driest areas in the State with soil characterized as Ritzville Silt Loam (FEIS Chapter Figure 3.2-3 Lease Boundary Soil Data). Silt Loam is characterized as having very fine particulates. All AP-42 based emissions calculations containing a silt should utilize local values. From AP42, Chapter 13.2.2.2-Emissions Calculation and Correction Parameters *"It should be noted that* ***the ranges of silt content vary over two orders of magnitude****.* ***Therefore, the use of data from this table can potentially introduce considerable error. Use of this data is strongly discouraged when it is feasible to obtain locally gathered data."*** Reference testimony by Chris Wiley from the adjudication hearing describing the fine dust in the Horse Heave Hills flowing like powder.
   b. Wind speed-Meteorological data for ground level windspeed should be from the representative area. Wind speed was data from the Tri-Cities airport. That data understates actual windspeed compared to data on the HHH. A significant calculation factor for windblow dust is wind speed.
   c. Moisture-Any AP-42 emissions calculation should utilize moisture values expected in this local area, in particular on roads traffic used post construction that are more likely categorized as public roads with light duty vehicle traffic that use no water or dust control mitigation.

Conclusion

The FEIS does not account for and analyze fugitive dust emissions impact to residents of Benton County. The issues identified warrant EFSEC reexamine the FEIS emissions calculations and modeling methodology. If the DNS is equivalent to a federal PSD review for a new source, it was not performed for the Horse Heaven project and the FEIS is incomplete.

Discounting visual and aesthetic issues is one thing; discounting human health and safety are another.

David Sharp, PE (retired)-Before retirement I was involved with new emissions source projects with fugitive dust emissions. I have had experience with AP-42 calculations.

From:	Dave Sharp
To:	EFSEC (EFSEC); EFSEC mi Comments; Bumpus, Sonia (EFSEC)
Subject:	Tricities CARES-Fugitive Dust Comment-
Date:	Wednesday, December 13, 2023 1:11:45 PM
Attachments:	Fugitive Dust Emissions Analysis-Comment EFSEC.pdf

External Email

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Without an area wide model, the EIS will not be able to accurately determine whether the project meets the NAAQS, State, or Benton Clean Air standard during the construction phase.

O&M-Ongoing Operations

The calculation for ongoing operations did not include windblown dust from exposed areas resulting from the project, and vehicle traffic (wheel contact with roads) on paved and unpaved roads. Those will be the major sources of fugitive dust. The only reason the new unpaved roads exist is to support the project and should have been included. The calculation only used vehicle exhaust emissions, brake wear and tire wear. Without the complete calculation, ongoing emissions from the new source are diluted and understated. The calculation needs to be expanded to include all PM sources.

The solution to pollution is not dilution!

David Sharp
Tri-Cities CARES
Email: dave@tricitiescares.org
Webpage: www.tricitiescares.org

Horse Heaven Hills Wind Project
FEIS-Comments and Analysis Fugitive Dust
Dave Sharp-Tricities CARES

Executive Summary, Final Environmental Impact Statement-Fugitive Dust- A post FEIS comment is appropriate for fugitive dust. The first and only dispersion model was not provided until late October 2023. The FEIS contains incorrect calculations and conclusions.

The Horse Heaven Hills Wind Project has the potential to create routine "dust bowl" type conditions, with associated adverse health impacts, for the communities North of the project and the greater metropolitan area of the Tri-Cities. Benton County historically has been in non-attainment status with the National Ambient Air Quality Standard (NAAQS) indicating systemic fugitive dust problems. The following bullet points a summary of major issues identified.

- Horse Heaven project fugitive dust emissions from construction activities have not been modeled. **This represents 99.5% of the total project PM10 emissions.**
- The HH project emissions will add an increment over background emissions, which are already high. Impacts to the adjacent communities are not known.
- The Project should be treated as a single source that include construction activity, and the Batch Plant, and Diesel Engines [Batch Plant].
- Emissions calculated for Ongoing Operations [O&M] are incorrect and understated. The FEIS then concluded emissions were de minimis based upon that incorrect calculation.
- Emissions calculations did not utilize factors representative of the local area's fine silty soil and low moisture.
- A water source has not been secured. Without ample water for control, fugitive dust emissions will increase significantly.
- The FEIS has not provided data to assess the significance of the fugitive dust impact, and should not be used as basis for a Determination of Non-Significance [DNS].
- How can a Final Environmental Impact Statement be issued if the final Impact has not been calculated, quantified, or is not known?
- Downwind NAAQs monitors should be installed for PM10 and PM2.5 in the Badger Valley.
- The FEIS should be reopened for this Human Health topic.

<u>Discussion-Project Location</u>

The project consists of over 100 square miles of land in a swath 25 miles long located just South of the Tri-Cities and communities.

The project developer chose a location that is contrary to customary and general wind industry practice, in close proximity to a high population urban area. The Tri-Cities is the third largest and fastest growing metropolitan area in the State with over 300,000 people. Benton City and Finley are a scant 1 mile from the project, with Kennewick and Richland municipal boundaries are approximately 2.5 miles distant.

There were numerous public comments, photographs, air quality monitoring data, technical papers and testimony that **fugitive dust is already a problem** in the Tri-Cities area. The project would add to those emissions. Nearly 100 miles of unpaved roads and crane paths will be constructed solely to support construction and ongoing operations. Prevailing wind direction brings the dust emissions into the Badger Valley and beyond. The majority of dust emanates from the dryland wheat areas where the project will be located generally upwind of population, cities, and communities.

Fugitive Dust-General

Fugitive dust is a criteria pollutant regulated nationwide by the EPA through the National Ambient Air Quality Standards (NAAQS). PM-10, and PM-2.5 are of particular concern because their small size allows inhalation to the lungs. In Washington, Department of Ecology is responsible for PM monitoring and compliance.

From Dept of Ecology Website: "*Particulate pollution affects the airways and lungs, and can cause problems in other parts of the human body. It's especially bad for those with chronic heart and lung disease (like asthma, bronchitis, and emphysema), children, and the elderly. It worsens these diseases, which can lead to hospitalization or even early death*".

Final Environmental Impact Statement-Supplemental Emissions calculations and modeling results that were seen for the first time in the FEIS raise questions about the increment of fugitive dust that will be added from the entire project. The calculations and dispersion model for the Batch Plant Engine Sources [Batch Plant] in FEIS Appendix 3.2-2 was not in the Draft EIS, and was only seen by the public at the end of October 2023. The largest emission source by far, construction activity emissions has not been modeled.

<u>Emissions Calculations Review Findings (Summary)</u>

Construction Activity-

1. Construction Emissions-1,100 Tons-The major source of particulate emissions by far come from construction activities (FEIS Appendix 3.2-1); approximately 1,100 tons/year for PM10 for Project Phase 1 alone; Another 1,000 tons for Phase 2. **No area modeling was performed to include construction activities which account for 99.5% of project emissions**.
2. Batch Plant Emissions-5.5 Tons-The Batch Plant emits approximately 5.5 tons/year. Area modeling was performed. Batch plant modeling barely stayed within NAAQS exceedance limits when modeling potential to emit emissions scenarios. That raises serious questions about the modeling that **was not performed** with a factor 200 times the Batch Plant emissions.

3. Whole project dispersion modeling needs to be performed for Phase 1 and Phase 2. Turbine locations crowd the Northern Lease boundary and are much closer to communities than the Batch Plant.
4. Emissions calculations must use local conditions of soil and meteorological data rather than general AP-42 factors discussed below under Tri-Cities Cares review.

Post Construction Ongoing O&M Activities [O&M]

1. Appendix 3.2-1 incorrectly calculated O&M fugitive dust emissions. The FEIS declared the fugitive dust from O&M to be de minimis based upon the incorrect calculation.
2. The fugitive dust calculation needs correction, O&M details need to be added, and a project area dispersion model should be performed for O&M.
3. AP-42 factors- Same as item #4 above.

Overall-The project should be considered a single new source, emissions calculated and dispersion modeled accordingly.

Tri-Cities CARES review of FEIS Emissions Calculations-Details

References: 1. Final FEIS-Horse Heaven Wind Project, 2. Appendix 4.3-1 Emissions Calculations, 3. Appendix 4.3-2 Tetra Tech Air Quality Dispersion Modeling Evaluation, and 4. USEPA AP-42 Compilation of Air Emissions Factors-Chapter 13

1. The project has not secured a source of water for the project. Throughout the construction phases the calculations show that dust control by use of water is 70 to 75% depending upon the calculation. What metric will be used to determine whether dust control methods are not controlled properly? Will the standard be visible fugitive dust (20% opacity)? The project should not proceed any further without a water supply.
2. The FEIS language indicates that water is to be used for dust control, but the window is open for the contractor to use other means in place of water such as compressed schedules, staging, "alternative methods", etc., to use less or perhaps even no water. Without adequate water, emissions could be up to 3-4 times higher. The Applicant should perform alternate calculations with less of control efficiency if their intent is to economize water use, or not use water for dust control.
3. The major source of particulate emissions is from construction activities; approximately 1,100 tons/year for PM10 phase 1, and 1,000 in phase 2. **Emissions from construction activities are roughly 200 times that of the Batch Plant emissions.** The FEIS did not model these emissions. The limited modeling performed is not adequate to assess the overall project area emissions and impact to downwind population. A "whole site" model should be used.
4. The emissions calculation for ongoing operation is incorrect and understates emissions. The calculation needs to be redone and dispersion modeling should be performed for O&M activities post construction. The calculation should include:
    a. Windblown dust from new permanently disturbed areas.

b. Vehicle wheel contact to paved and unpaved roads. Road travel miles should include all vehicle traffic including employees, and contracted employees of the wind turbine supplier, other support contractors, substation access, and estimates of crane travel, Solar panel washing and vehicle support.
c. Provide the dust control measures that will be utilized post construction, if any.

5. Local soil and meteorology data should be utilized in the AP42 calculations rather than the general AP factors, as recommended by AP42: AP42, Section 13.2.2 Unpaved Roads - Updated November 2006 (epa.gov) Reference Quote, page 2: *"Therefore, the use of data from this table can potentially introduce considerable error. Use of this data is strongly discouraged when it is feasible to obtain locally gathered data."*
   a. The project lease is located in one of the dustiest and driest areas in the State with soil characterized as Ritzville Silt Loam (FEIS Chapter Figure 3.2-3 Lease Boundary Soil Data). Silt Loam is characterized as having very fine particulates. All AP-42 based emissions calculations containing a silt should utilize local values. From AP42, Chapter 13.2.2.2-Emissions Calculation and Correction Parameters *"It should be noted that* ***the ranges of silt content vary over two orders of magnitude****.* ***Therefore, the use of data from this table can potentially introduce considerable error. Use of this data is strongly discouraged when it is feasible to obtain locally gathered data."*** Reference testimony by Chris Wiley from the adjudication hearing describing the fine dust in the Horse Heave Hills flowing like powder.
   b. Wind speed-Meteorological data for ground level windspeed should be from the representative area. Wind speed was data from the Tri-Cities airport. That data understates actual windspeed compared to data on the HHH. A significant calculation factor for windblow dust is wind speed.
   c. Moisture-Any AP-42 emissions calculation should utilize moisture values expected in this local area, in particular on roads traffic used post construction that are more likely categorized as public roads with light duty vehicle traffic that use no water or dust control mitigation.

Conclusion

The FEIS does not account for and analyze fugitive dust emissions impact to residents of Benton County. The issues identified warrant EFSEC reexamine the FEIS emissions calculations and modeling methodology. If the DNS is equivalent to a federal PSD review for a new source, it was not performed for the Horse Heaven project and the FEIS is incomplete.

Discounting visual and aesthetic issues is one thing; discounting human health and safety are another.

David Sharp, PE (retired)-Before retirement I was involved with new emissions source projects with fugitive dust emissions. I have had experience with AP-42 calculations.

To: Comments@efsec.wa.gov
From: efsec@efsec.wa.gov
Received: 2023-12-18T17:11:53+00:00
Subject: FW: Horse heaven Hills Wind Farm
Has attachment? False

From: Geneva Carroll <genevacarroll@yahoo.com>
Sent: Sunday, December 17, 2023 11:37 AM
To: EFSEC (EFSEC) <efsec@efsec.wa.gov>
Subject: Horse heaven Hills Wind Farm

External Email

The proposed HHH Wind Farm is dangerous and ugly.
The power it is supposed to generate goes to Western Washington. Let them have the wind farms.
Do not allow our Horse Heaven Hills to be used for this purpose!
Thank you,
Geneva Carroll

Attachments:

[]

To: Comments@efsec.wa.gov
From: efsec@efsec.wa.gov
Received: 2023-12-18T17:12:12+00:00
Subject: FW: Horse heaven wind project
Has attachment? False

From: Brent Strecker <brentstrecker@gmail.com>
Sent: Sunday, December 17, 2023 12:35 PM
To: EFSEC (EFSEC) <efsec@efsec.wa.gov>
Subject: Horse heaven wind project

External Email

Please do not recommend the sensless Horse Heavan Wind project at the expense of ruining our home that we have worked so hard for.
Brent and Karen Strecker
35401 S. Valley Vista
Kennewick WA 99338

Attachments:

[]

To: Comments@efsec.wa.gov
From: efsec@efsec.wa.gov
Received: 2023-12-18T19:44:58+00:00
Subject: FW: Please Reduce the Size of Horse Heaven Hills Wind Farm Project
Has attachment? False

From: Miguel Orr <miguel.ziz192@gmail.com>
Sent: Monday, December 18, 2023 10:01 AM
To: EFSEC (EFSEC) <efsec@efsec.wa.gov>
Subject: Please Reduce the Size of Horse Heaven Hills Wind Farm Project

External Email

Dear Washington Energy Facility Site Evaluation Council,
I am calling on you to restrict the construction of turbines in the Horse Heaven Hills Wind Farm that will be sited on relatively undisturbed shrub steppe land and within a 2-mile radius of ferruginous hawk nesting sites. I grew up in Prosser, Washington, am a Washington resident, and am very passionate about the region I grew up in. Constructing energy infrastructure on relatively undisturbed shrub steppe land harms an already endangered ecosystem and the precious animals that call it home and limits the Yakama Nation's access to key cultural sites and treaty-protected rights to hunt and gather. Green energy is important for our future, but cannot come at the cost of our already endangered ecosystems and the rights of our region's Indigenous peoples. Please do your job to protect the environment and peoples of our region and do not allow the construction of turbines within 2 miles of ferruginous hawk nesting sites and on relatively undisturbed shrub steppe habitat.
Best,
Miguel Symonds Orr

Attachments:

[]

To: Comments@efsec.wa.gov
From: efsec@efsec.wa.gov
Received: 2023-12-18T06:54:40+00:00
Subject: FW: Public Safey Comment and other Areas of Concern-Kiona Ridge Trail
Has attachment? False

From: Dave Sharp <dave@tricitiescares.org>
Sent: Sunday, December 17, 2023 10:54:15 PM (UTC-08:00) Pacific Time (US & Canada)
To: EFSEC (EFSEC) <efsec@efsec.wa.gov>; EFSEC mi Comments <Comments@efsec.wa.gov>
Subject: Public Safey Comment and other Areas of Concern-Kiona Ridge Trail

External Email

Although I provided testimony on this subject, there were no cross examination questions, and I want to ensure that the Council is aware of, and understands this issue.

Hiking on the Public BLM Resource area post project will expose the general public to unacceptable risk that is completely avoidable. The area described below has a number of critical impact issues that can be avoided with common sense mitigation.

The following is from the Updated ASC: *"**Section 2.19 Security Concerns**-The Project is located in an area that contains a low population density (see Section 4.4), and the construction and operation of the Project is anticipated to have **minimal impacts on the security and safety of the local population.** The following safety measures would be taken to reduce the risk of property damage (though sabotage, terrorism, or vandalism) at the facility as well as **protect the public from personal injury:The Turbine towers would be sited away from existing roadways and residences per the applicable setback requirements** described in Section 2.23."*

The setback that the Applicant uses from tower to adjacent property is 500'. Thousands of hikers per year use this facility and will be that close, or even closer if they stay on the existing hiking trail. How about 20-50 feet? That is the distance from towers to the trail in some places.

There was testimony in the adjudicative process regarding the proximity of the northernmost row of turbines (#'s 1, 2, 3 and 4) to the BLM Resource area and the highly used Kiona Ridge trail at the West end of Phase 2, and the danger that large rotating equipment poses.The risks can be described as catastrophic consequences from a common operating issue such as a mechanical malfunction, or in cold weather areas such as ours, "ice throw" from turbine blades.

The testimony referenced a procedure to mitigate ice throw. The turbine manufacturer(GE) provided a distance recommendation and a procedureto minimize the problem.Ice throw is a well known issue, and at least one State mandates mitigation to address ice throw. No such mention was made in the FEIS. The question should be, who will be liable if there is an accident that was entirely predictable? The turbine manufacturer disclosed the problem and offered mitigation. The Applicant remains silent on the issue as hasEFSEC.The adjudicative decision is not public, but we hope that Mr. Torem recognizes that two of the biggest concerns, public safety and cultural property issues should not trump profit.

It also should be noted that the Applicant chose to remove 3 turbines just to the South of the Kiona Ridge and very close to the turbines being discussed. We have not seen the rationale, but an EFSEC staff member,Mr. Green, mentioned visual reasons in the FEIS preview in October. What rationale can explain removing unobjectionable turbines for visual and aesthetic reasons when they are 2 1/2 miles from a key observationpoint that the public cannot access, and at the sae time ignoring the four turbines mentioned above?

There needs to be special consideration by EFSEC to either remove these objectionable turbines, or move them back to a distance to where they are not a public safety issue. The lease boundary adjoins a BLM Resource area, but the Applicant has provided an "adjoining property" setback equivalent to 1 turbine height setback The adjoining land is designated by the County as GMAAG, but will never be used as such. Nothing can be grown on these windswept rocky ridges and steep slopes that descend to the Yakima River Basin. It is BLM land and a public resource. We hope it will stay that way. The setback used is simply disproportionate to the situation and consequences that could occur.

This is a special setback case and one that the county rules did not anticipate would ever happen. The setback distance should be at least the equivalent of what they would be from a residence; 2500 feet, 4 times rotor span, which is a previous EFSEC precedent from residences.

However, there is more to this story. The area needs to be protected and conserved for safe public use, but to protect cultural resources as described below. Tthe Project trespasses on a critical area of cultural concern to the Yakama Nation. The Kiona Ridge Trail follows that ridge, on which the Applicant has chosen to place 4 turbines. This trail, in use by Native Americans for millennia, will be gone forever as significant earthmoving would flatten the ridge and alter the very landscape of the trail, meaning that after the project is gone, the resource cannot be restored.

EFSEC is urged to recognizethat this particular area has multiple areas of concern, and the Kiona Ridge areas should be protected from development. These turbines should be removed for multiple significant avoidable issues that can be easily mitigated.

The Tri-City area has a local conservation organization that has raised over a million dollars of privatefunds and withthousands of hours of volunteer work, have developed and conserved two hiking trails to elevatedviewpoints. Their mission is to preserve ridges for hiking and recreation purposes.

This is a healthy dose of irony with one group raising money to develop recreation opportunities while the project Applicant, incentivized by taxpayer subsidies, is degrading and limiting activity in another.

David Sharp
Tri-Cities CARES
Email: dave@tricitiescares.org
Webpage: www.tricitiescares.org

Attachments:

[]

To: efsec@efsec.wa.gov;Comments@efsec.wa.gov
From: dave@tricitiescares.org
Received: 2023-12-18T06:54:29+00:00
Subject: Public Safey Comment and other Areas of Concern-Kiona Ridge Trail
Has attachment? False

External Email

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David Sharp
Tri-Cities CARES
Email: dave@tricitiescares.org
Webpage: www.tricitiescares.org

Attachments:

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To: Comments@efsec.wa.gov
From: efsec@efsec.wa.gov
Received: 2023-12-20T17:39:28+00:00
Subject: FW: Horse Heaven Hills Wind & Solar Comments Dec 20th
Has attachment? False

From: David McDonald <macclan47@gmail.com>
Sent: Tuesday, December 19, 2023 8:42 PM
To: EFSEC (EFSEC) <efsec@efsec.wa.gov>
Subject: Horse Heaven Hills Wind & Solar Comments Dec 20th

External Email

December 19, 2023
WashingtonEnergy Facility Site EvaluationCouncil
621 Woodland Square Loop SE
PO Box 43172
Olympia, WA 98503-3172 Re: Horse Heaven Wind Farm Proposal

Dear Council Members:

I am concerned the Horse Heaven Hills wind and solar farm FEIS is still lacking in a number of areas.

There are far better ways to address our needs for generating electricity that do not require the destruction of large swathes of habitat like the proposed project does. You cannot support President Biden's "America the Beautiful" initiative to preserve wildlife habitat by covering up some of the last remaining habitat areas in Benton County with industrial scale solar panels and massive wind turbines. The cumulative impact on Eastern Washington's unspoiled habitat caused by multiple industrial sized wind and solar projects operating or proposed needs to be considered. The cumulative impact of new transmission towers, power lines criss crossing Eastern Washington along with security fencing and dirt service roads needs to be considered also.

Large urban areas are responsible for creating an urban heat island effect that is skewing global temperatures up. Yet industrial scale solar and wind farms are never located near these urban areas where the power is needed. It is small communities like the Tri- Cities that bear the environmental and social costs of these projects. Where is the environmental and social justice in forcing this large project on an area with less population, with lower median incomes and a greater ethnic population than the Puget Sound area where the power is needed most. Why does the Tri- Cities have to bear this burden for the benefit of Western Washington. There are plenty of windy areas in Western Washington.

With the burden of this project comes the visual blight that it will create for the Tri- Cities. The residents of the Tri- Cities will be required to endure this visual blight, not the people that most need the power. The FEIS lacks any comprehensive discussion on the impact the visual blight will have on the home owners and property owners nearest the wind turbines and solar panels. There is a high probability that the value of the properties within close proximity to the solar panels and turbines will be diminished. These property owners will then bear the burden of lower values for the benefit of the power users in Western Washington. With approval of this project the EFSEC will be taking part of nearby properties without compensation which is counter to one of the goals of the Growth Management Act. These impacts need to be studied more and proper mitigation should be provided. There are other ways of providing dispatchable electricity that do not create an eyesore for so many people.

Construction projects in Eastern Washington require significant dust control measures to protect air quality and public health. Most of the dust control measures require the use of large quantities of water. Does this industrial power project have a source of construction water? Water rights for industrial/commercial use may not be the same as water rights used for farming. Farm wells may

not legally be available for construction dust control. Does the project have the proper water permitting? Can it even get the proper water permitting?

Water is a necessary component of controlling fugitive dust caused by construction activity. Fugitive dust creates major health concerns for residents of the Tri- Cities. Vacant lots, construction sites and dirt or gravel roadways all contribute to this health problem. Adding more non- hard surfaced roads near the Tri- Cities will only contribute to additional fugitive dust and health problems. Increased fugitive dust in the air increases health risks for residents of the Tri-Cities, not for the people in Western Washington that need the power. The FEIS does not consider the fugitive dust problem created by over 100 miles of non- hard surfaced service roads. There are alternate ways of creating firm electrical power that do not require the construction of 105 miles of roads or the occupation over hundreds of square miles land needed for habitat or farming.

There is also still a significant concern about the harm this project will do to the Ferruginous Hawks that frequent the proposed industrial power site. A recent commentary likened wind turbines to "Cuisinarts in the sky" because of the undeniable fact of the harm massive wind turbines do to birds of prey. Birds of prey are being killed all over the world by wind turbine farms. The Ferruginous Hawks in Benton County need to be protected from the wind turbines.

The last item of major concern related to this industrial power project in an area that is not zoned for industrial purposes is the problem of yearly wildfires. The hot dry weather in Eastern Washington during the summer creates just the right conditions for wildfires. Every summer there is a wildfire in, near or around the Tri- Cities. The size and scale of this wind turbine project is very concerning when thinking about our wildfire potential each summer.

Eastern Washington wildfires often need to be fought and suppressed by the use of aerial water bombers. People and property can be best protected from wildfires by the rapid response of aerial water bombers. However, because of its size and location this wind turbine project will impede or drastically limit the use of water bombers along the southern reaches of the Tri- Cities where they may be needed the most during a wildfire event. Local residents and their property need to be protected from wildfires. The government has a responsibility to ensure the safety, welfare and benefit of the general public. Permitting a large number of very tall wind turbines within close proximity to homes, schools and other buildings does not ensure the safety and welfare of the public as it relates to wildfires. The turbines will make it more difficult to protect people and property during wildfires. The wind turbines in the proposed project potentially could make wildfires south of the Tri-Cities more dangerous and damaging for life and property.

Please consider the above comments in your deliberations.

Thank You

David McDonald
10312 W. Argent Rd
Pasco, Washington

Attachments:

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To: Comments@efsec.wa.gov
From: efsec@efsec.wa.gov
Received: 2023-12-21T19:34:35+00:00
Subject: FW: Fugitive Dust on Roads
Has attachment? False

From: Hafkemeyer, Ami (EFSEC) <ami.hafkemeyer@efsec.wa.gov>
Sent: Thursday, December 21, 2023 11:34:28 AM (UTC-08:00) Pacific Time (US & Canada)
To: EFSEC (EFSEC) <efsec@efsec.wa.gov>; Greene, Sean (EFSEC) <sean.greene@efsec.wa.gov>
Subject: RE: Fugitive Dust on Roads

Put it in comments for now. I believe the use of water suppression would be covered in the construction dust plan, or plan to that effect.
Best wishes,
Amí Hafkemeyer
Director of Siting and Compliance
ami.hafkemeyer@efsec.wa.gov
Office 360.664.1305
Cell 360.972.5833

From: EFSEC (EFSEC) <efsec@efsec.wa.gov>
Sent: Thursday, December 21, 2023 8:17 AM
To: Hafkemeyer, Ami (EFSEC) <ami.hafkemeyer@efsec.wa.gov>; Greene, Sean (EFSEC) <sean.greene@efsec.wa.gov>
Subject: FW: Fugitive Dust on Roads
Unsure if you're wanting to answer this or just put it to comments.
Thanks,
Andrea Grantham
(she/her)
Energy Facility Site Evaluation Council
Administrative Assistant 3
Email: andrea.grantham@efsec.wa.gov
EFSEC Email: efsec@efsec.wa.gov
EFSEC phone number: (360) 664-1345
Address: 621 Woodland Square Loop SE, Lacey WA 98503-3172
Mailstop/P.O. Box: 43172
www.efsec.wa.gov

From: Dave Sharp <dave@tricitiescares.org>
Sent: Wednesday, December 20, 2023 1:19 PM
To: EFSEC (EFSEC) <efsec@efsec.wa.gov>
Subject: Fugitive Dust on Roads

External Email

This question is directed to Mr. Greens.
Fugitive dust will be a big issue. Does the EIS require the contractor to use water on roads to control the dust? The emissions calculations in the EIS use 70 and 75% control factors that are what would be obtained using water. However, I see no stipulation that water must be used. If the do not use water, the emissionswill rise by a factor of 4, all other variables remaining the same. Thank You.
David Sharp
Vice President, Tri-Cities CARES
Email: dave@tricitiescares.org
Webpage: www.tricitiescares.org

Attachments:

[]

To: Comments@efsec.wa.gov
From: efsec@efsec.wa.gov
Received: 2023-12-29T16:50:14+00:00
Subject: FW: Additional Wind Farm
Has attachment? False

From: Gary Dukelow <duffer1a@gmail.com>
Sent: Friday, December 29, 2023 8:27 AM
To: EFSEC (EFSEC) <efsec@efsec.wa.gov>
Subject: Additional Wind Farm

External Email

I am opposed to the proposed 150-250 wind turbines south of the Tri-Cities. They will produce maximum power in only the strongest winds. At only 10 years of life, blades and gearboxes are needing to be replaced. The cost to teardown a single turbine is $200,000, not including any payback from selling or recycling valuable materials, which is heavily labor intensive and not always cost effective. Instead of decommissioning, more often the site will be 'repowered' which means replacing the turbines with newer technology.
We need to move to construct more nuclear powered facilities. This wind farm just postpones the nuclear option.
Gary Dukelow

Attachments:

[]

To: Comments@efsec.wa.gov
From: kmbrun@gmail.com
Received: 2024-01-09T21:06:53+00:00
Subject: Horse Heaven Hills Wind/Solar Project
Has attachment? False

External Email

It is my understanding that EFSEC will be reviewing and making a decision on January 24th about the final recommendation to be sent to Governor Inslee on the HHH Wind/Solar Project. It is also my understanding that the public is supposed to be able to comment. That said, I do not find any indication that the proposed recommendation will be made available to the public prior to the January 24th meeting. It will be impossible to comment with any specificity on a document we have not seen.
I urge you to make that document available with sufficient time for the public to review it and make specific comments on its contents. Not doing so shows a definite indifference to the public and puts a black mark on EFSEC's report card.
Karen Brun
Kennewick, WA

Attachments:

[]

To: Comments@efsec.wa.gov
From: lditte@icloud.com
Received: 2024-01-16T22:40:48+00:00
Subject: Horse Heaven Wind farm
Has attachment? False

External Email Solar panels are at best about 20% efficient. They convert almost 0% of the UV light that hits them. None of the visible spectrum and only some of the IR spectrum. At the same time as they are absorbing light they are absorbing heat from the sun. This absorbed heat is radiated into the adjacent atmosphere. It should be obvious what happens next. When air is warmed it rises. Even small differences in ordinary land surfaces are capable of creating powerful forces of weather like thunderstorms and tornadoes. These weather phenomena are initiated and reinforced by land features as they are blown downwind. It is all too obvious to me what will happen with the heat generated by an entire solar farm. Solar farms will become thunderstorm and tornado incubators and magnets. Solar panels are dark and and they emit energy to the space above them when they are not being radiated. This is known as black-body radiation. Satellites flying in space use this phenomenon to cool internal components. If they didn't do this they would fry themselves. So solar farms not only produce more heat in summer than the original land that they were installed on, but they also produce more cooling in winter, thus exacerbating weather extremes. So I conclude with this. There is nothing green about green energy except the dirty money flowing into corrupt pockets. There is no such thing as green energy. The science doesn't exist. The technology doesn't exist. The engineering doesn't exist. We are being pushed to save the planet with solutions that are worse than the problems.

Attachments:

[]

Audubon | WASHINGTON

5902 Lake Washington Blvd. S.
Seattle, WA 98118

206.652.2444
wa.audubon.org

January 17, 2024

Sonia Bumpus
EFSEC Director

Kathleen Drew
Chair, Energy Facility Site Evaluation Council

Amy Moon
Siting and Compliance Lead

621 Woodland Square Loop SE
PO Box 43172
Olympia, WA 98503-3172
Delivery Via Email: sonia.bumpus@efsec.wa.gov; kathleen.drew@efsec.wa.gov; amy.moon@efsec.wa.gov

Re: Request for January 24 Action Item Documents for Horse Heaven Wind Project

Dear Ms. Bumpus, Chair Drew, and Ms. Moon:

We received the January 4, 2024 email notice that EFSEC has scheduled the next Monthly Council Meeting for January 24, 2024. We also received two email notices on January 12th about the agenda and the upcoming action item, specifying a public comment period of three days prior to the January 24th meeting. It appears that the Council will be discussing and possibly voting on its final recommendation to the Governor regarding the project.

We are requesting that you make the final draft report and decision documents available publicly prior to public comment period and allow the public adequate time to review and provide meaningful comments to the Council before a final action is taken, even if this means delaying a final decision and recommendation. Transparency and meaningful opportunities for public comment are essential to legitimizing the EFSEC process, which is important both for this project and for setting precedent for future large-scale clean energy projects.

Thank you for your time and attention.

Sincerely,

Trina Bayard, PhD
Interim Executive Director
Director of Bird Conservation

Legislative Building
Olympia, WA 98504-0482

Washington State Senate

Phone: (360) 786-7550
FAX: (360) 786-1999

January 19, 2024

Sonia Bumpus
Energy Facility Site Evaluation Director
621 Woodland Square Loop SE
PO Box 43172
Olympia, WA 98503-3172

Kathleen Drew
Chair, Energy Facility Site Evaluation Council
621 Woodland Square Loop SE
PO Box 43172
Olympia, WA 98503-3172

RE: Horse Heaven Hills Wind Farm and Solar Project

Dear Ms. Bumpus and Chair Drew:

We received the January 4, 2024, email notice that EFSEC has scheduled the next Monthly Council Meeting for January 24, 2024.

Although, it is expected that the Council will be discussing and possibly voting on its final recommendation to the Governor regarding the Horse Heaven Hills Wind Farm project, we are requesting that you make the final draft report and decision-making documents available publicly and allow the public adequate time to review and provide meaningful comment to the EFSEC before the Council takes a final action.

Sincerely,

Matt Boehnke, 8th LD
WA State Senate

Stephanie Barnard, 8th LD
WA State Representative

April Connors, 8th LD
WA State Representative



Bryan Sandlin, 15th LD
WA State Senate



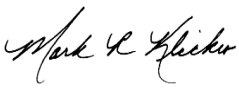
Mary Dye, 9th LD
WA State Representative



Perry Dozier, 16th LD
WA State Senate



Chris Corry, 14th LD
WA State Representative



Mark Klicker, 16th LD
WA State Representative



Joe Schmick, 9th LD
WA State Representative



Nikki Torres, 15th LD
WA State Senate

To: cease2020@aol.com
From: cease2020@aol.com
Received: 2024-01-24T02:55:13+00:00
Subject: C.E.A.S.E. Inslee at it again destroying lives
Has attachment? False

External Email

Bill to ban natural gas revived, passes in Washington House - MyNorthwest.com Greg Wagner C.E.A.S.E.

Attachments:

[]

To: Comments@efsec.wa.gov
From: efsec@efsec.wa.gov
Received: 2024-02-09T16:07:18+00:00
Subject: FW: Scout Clean Energy
Has attachment? False

From: Virginia Fitzpatrick <virginiaf51@yahoo.com>
Sent: Thursday, February 8, 2024 9:11 PM
To: EFSEC (EFSEC) <efsec@efsec.wa.gov>
Subject: Scout Clean Energy

External Email

Dear Energy Commissioners,
First I would like to commend your actions with Scout CleanEnergy in your December meeting. As leaders of our state I expect you to do your due diligence, and not just accept the information that Scout Clean Energy provides.
I have many concerns about this green energy rush. My research showed all these BIG Megawatt promises end up producing about 30% of what they tout. You have to dig for any information about actual results of all these "green farms". If such a great amount of alternative energy is produced - why not advertise it?
Our "Governor recently bannedeight chemicals and/or chemical classes will be bannedon Jan. 1, 2025when intentionally added to the product.

- ortho-phthalates
-

- perfluoroalkyl and polyfluoroalkyl substances
- formaldehyde and chemicals determined by Ecology to release formaldehyde
- methylene glycol
- mercury and mercury compounds
- triclosan
- m-phenylenediamine and its salts
- o-phenylenediamine and its salts

Lead and lead compounds are also restricted when intentionally added or meet a certain threshold.”

One of my concerns is allowing so many components from countries that do not share our concerns for safety.

What countries are producing these solar panels that Scout Clean Energy intends to use?

What about the solar panels debris? (and there will be) Is there a comprehensive plan for clean up?

Will these companies put millions in trust for clean up?

We’ve all seen and heard about the discarded windmills?

A lot of rural people oppose destroying the areas

where we choose to live. The visual and potential toxic pollution coming from these “green farms” is anything but green.
Has anyone considered using Hanford??? Seems like a perfect place to me, basically already a wasteland.
The feds would probably lease it cheaply,
Thank you for your attention to my concerns.
Please respond to my questions.
Sincerely,
Virginia Fitzpatrick
Goldendale WA
Sent from my iPad

Attachments:

[]

From:	Dave Sharp
To:	EFSEC (EFSEC); EFSEC mi Comments
Subject:	Turbine #"s 162 and 243-Applicant Removal Commitment
Date:	Saturday, February 17, 2024 3:26:21 PM
Attachments:	Public Comment Turbines 162 and 243-Final.pdf 20240109 Horse Heaven FEIS Council Exclusion Considerations X01-1-Final Markup.pdf

External Email

Shawn and Amy,
Attached is a comment regarding turbine #'s162 and 243. The Applicant committed to removing several turbines including those mentioned after considering all comments. See Chapter 2 Proposed Action and Alternatives, Section 2.2.3.

Attached is the formal comment, and the Map Option X01-1 with turbines identified.

David Sharp
Vice President, Tri-Cities CARES
Email: dave@tricitiescares.org
Webpage: www.tricitiescares.org

Public Comment-Horse Heaven Hills Project

Dave Sharp

Tri-Cities CARES

Subject: Scout Post-Adjudication Commitments, Turbines #162, and #243.

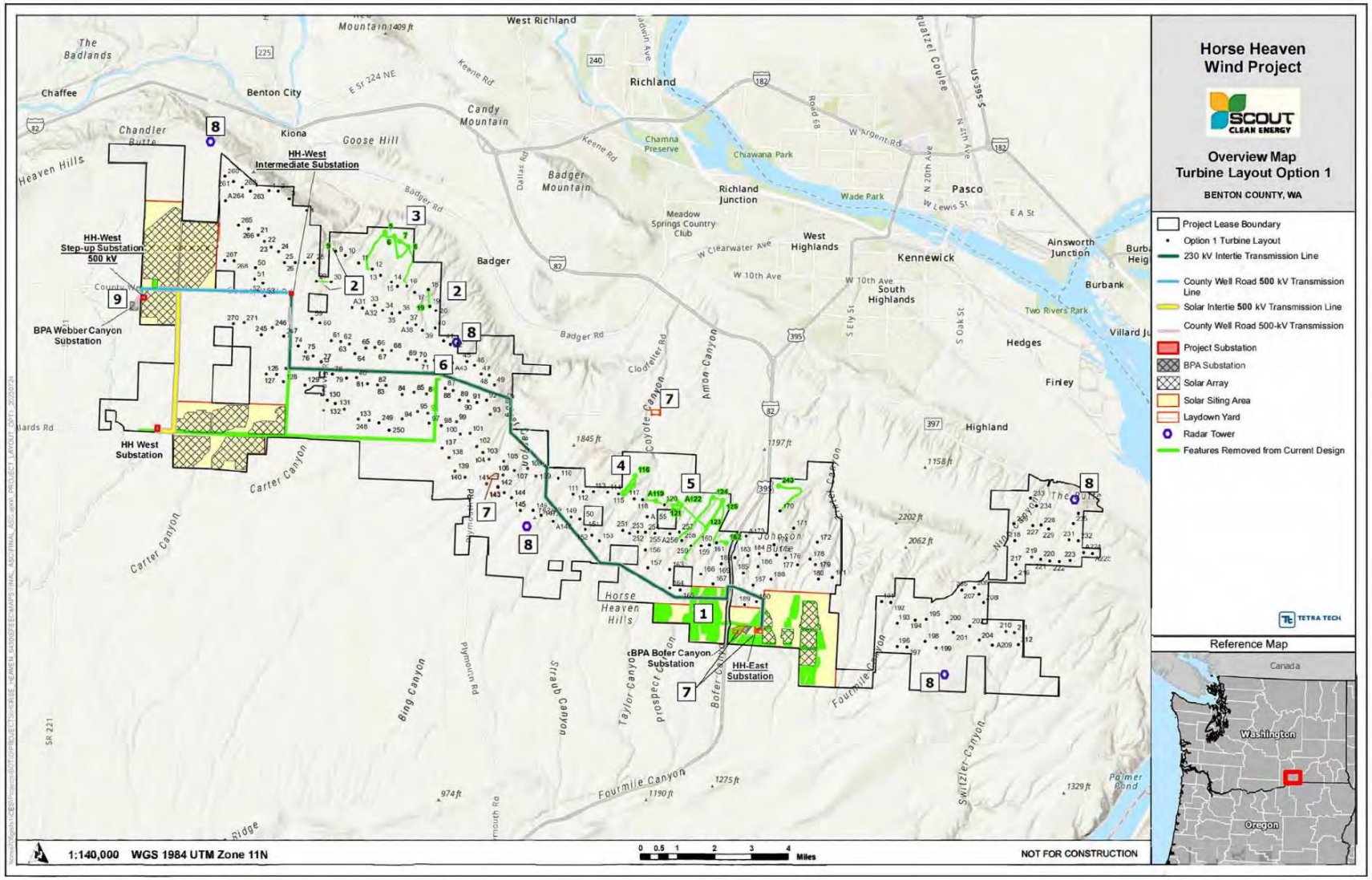
EIS Chapter 2 **Proposed Action and Alternatives** Section 2.2.3 page removed 9 turbines from option 1, and 3 turbines from Option 2. The Applicant provided changes in the Final ASC following comments and input from regulatory agencies, changes to applicable regulations, testimony from adjudicative hearings, and information received from the BPA. Additional Applicant commitments were identified and finalized in the Applicant's Final ASC. Turbine 162 and 243 were removed as well as 7 others from Phase 1.

The Council Deliberation maps prepared by Staff and shared with the Council brought two of the turbines back. Like all of the other turbines that have been voluntarily removed those turbines should be removed because of Applicant the commitments.

There Applicant provided their rationale which included visual impacts. There are others reasons:

- There have been numerous public comments about the proximity and prominence of the towers to Kennewick, homeowners' property and recreation areas. Turbine #243 stands out as the most Northerly turbine and closest to the Kennewick City limits. The location will likely restrict access to the Johnson Butte Trailhead, and the trail itself.
- Turbine #162 appears to be the closest turbine to Highway 395, appearing to be only ~550' West of the highway. There is an existing power line running between the turbine and the highway approximately 250-300' from the centerline of the tower. Considering the different size turbines and blade lengths proposed, the horizontal clearance would be only ~50-100 feet.
- The issue of aerial firefighting has not been totally resolved. However, an appropriate use of aerial firefighting would be to protect public roadways, and to prevent wildfires from spreading over a natural barrier provided by the highway right of way. Note that a horizontal setback of 550' will only effectively be ~300' because of the turbine blade length protruding into the setback space.

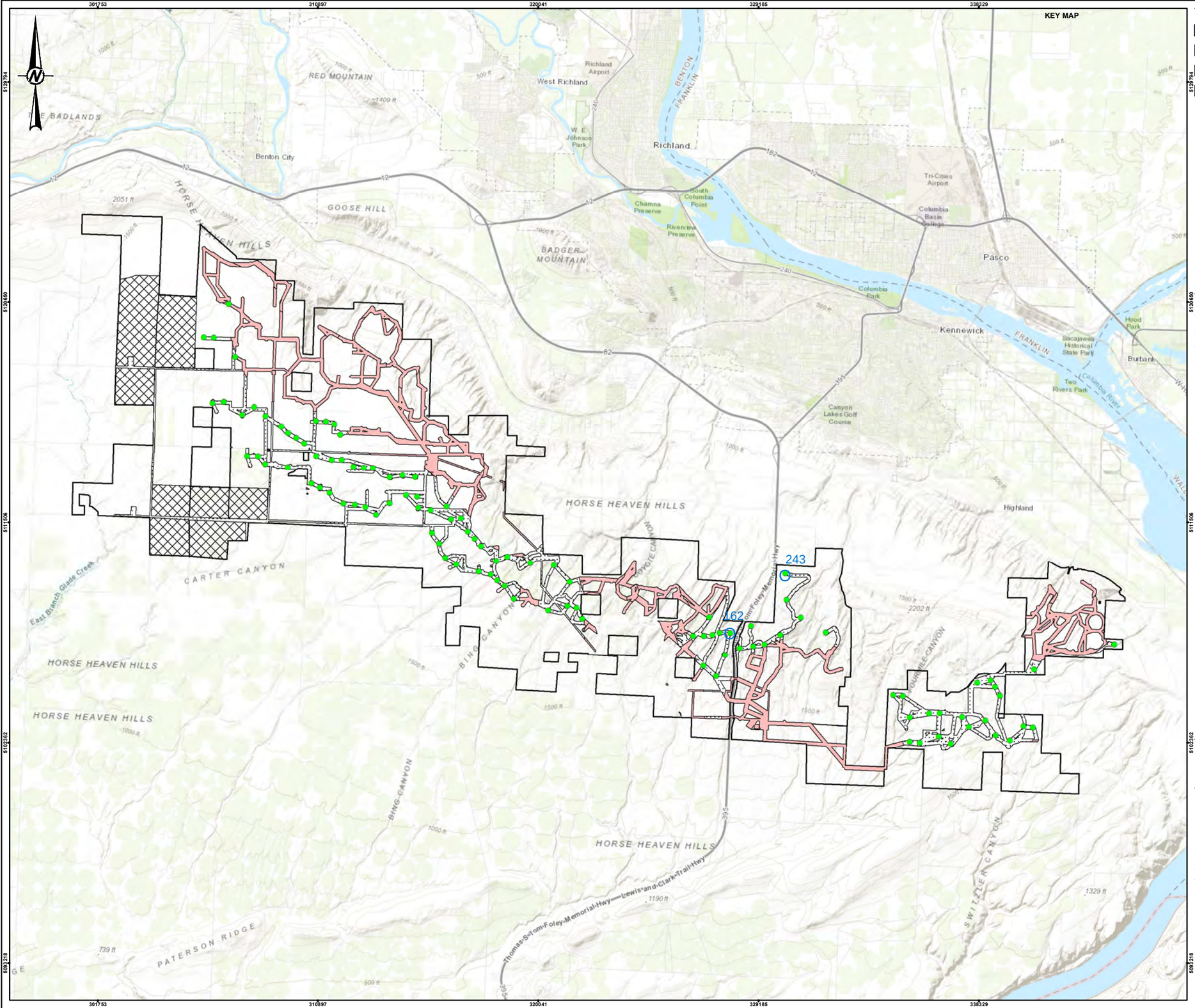
Tri-City CARES respectfully requests that EFSEC staff remove them from Option X01-1 maps provided.


Horse Heaven Wind Project
SCOUT CLEAN ENERGY
Overview Map
Turbine Layout Option 1
BENTON COUNTY, WA
Project Lease Boundary
Option 1 Turbine Layout
230 kV Intertie Transmission Line
County Well Road 500 kV Transmission Line
Solar Intertie 500 kV Transmission Line
County Well Road 500-kV Transmission
Project Substation
BPA Substation
Solar Array
Solar Siting Area
Laydown Yard
Radar Tower
Features Removed from Current Design
TETRA TECH
Reference Map
Canada
Washington
Oregon
HH-West Intermediate Substation
HH-West Step-up Substation 500 kV
BPA Webber Canyon Substation
HH West Substation
BPA Bofer Canyon Substation
HH-East Substation
Horse Heaven Hills
Carter Canyon
Badger Mountain
Candy Mountain
Goose Hill
Chandler Butte
Richland
West Richland
Kennewick
Pasco
Benton City
Kiona
Badger
Finley
Highland
Hedges
Ainsworth Junction
Burbank
Two Rivers Park
Wade Park
Chamna Preserve
Chiawana Park
Meadow Springs Country Club
Richland Junction
West Highlands
South Highlands
Amon Canyon
Coyote Canyon
Clodfelter Rd
Badger Rd
Keene Rd
Dallas Rd
Plymouth Rd
Bing Canyon
Straub Canyon
Taylor Canyon
Prospect Canyon
Bofer Canyon
Fourmile Canyon
Switzler Canyon
Palmer Pond
1:140,000 WGS 1984 UTM Zone 11N
0 0.5 1 2 3 4 Miles
NOT FOR CONSTRUCTION

301753 310897 320041 329185 338329

5129784 5120850 5111506 5102362 5093218

KEY MAP



LEGEND

- Project Lease Boundary
- Solar Siting Area
- Micrositing Corridor - No Turbines
- Micrositing Corridor - Turbines
- Proposed Turbine - Option 1

0 2.5 5

1 " = 2.5 mi MILES

NOTE(S)

1. ALL INFRASTRUCTURE REMOVED:
   - WITHIN HIGH OR ABOVE WILDLIFE MOVEMENT CORRIDORS
2. PROJECT COMPONENTS (TURBINES, SOLAR ARRAYS, AND BESS) REMOVED:
   - WITHIN MEDIUM OR ABOVE WILDLIFE MOVEMENT CORRIDORS
   - WITHIN THE 2MI FEHA NEST BUFFER

REFERENCE(S)

1. COORDINATE SYSTEM: WGS 1984 UTM ZONE 11N
2. MOVEMENT CORRIDORS: WDFW 2021 (HTTPS://WACONNECTED.ORG/CP_ADDENDUMANALYSES/)

CLIENT
STATE OF WASHINGTON ENERGY FACILITY SITE EVALUATION COUNCIL

PROJECT
HORSE HEAVEN WIND FARM

TITLE
TURBINE LAYOUT OPTION 1
REMOVAL OF TURBINES - FOR COUNCIL REVIEW CONSIDERATION NO. 1

CONSULTANT

YYYY-MM-DD	2024-01-08
DESIGNED	MK
PREPARED	SCH
REVIEWED	JP
APPROVED	AH/SG/AM

PROJECT NO.	CONTROL	REV.	FIGURE
31405435.000	01	0	X0.1-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

1 in

0

To: Comments@efsec.wa.gov
From: johnsonira967@gmail.com
Received: 2024-02-19T18:29:16+00:00
Subject: HHH wind turbines
Has attachment? False

External Email

I want you to know I'm against the wind turbines for several reasons:

1) Let's pretend they were being put in your neighborhood.
a) None of the energy they produce would go to you.
b) They require a tremendous amount of work to install.
c) They require routine maintenance.
d) They have to be replaced on average 10 years.
e) They can catch fire. Now planes can't come in and fight them because of the houses.
f) They are noisy.
g) They kill all the birds that visit your neighborhood.
h) Your property value will go down.
i) Now when they are no longer of any value or the company goes bankrupt, who is going to remove them?

2) Only people who benefit from them:
a) Only the people who's land they will be put on because they will be paid rent.
b) The company that puts them in makes big bucks but has no cost. Why?? because they are subsidized.

3) The company that wants to install them is already threatening to not put them in if you restrict them. Sounds like a threat to me.

4) I guarantee you if you reject this you will catch all kinds of backlash from our governor.

So please use some common sense and if you believe in God pray about this important decision you are about to make.

Sincerely
Ira Johnson
509-987-3013

Attachments:

[]

To: efsec@efsec.wa.gov;Comments@efsec.wa.gov
From: dave@tricitiescares.org
Received: 2024-02-19T03:55:42+00:00
Subject: Public Comment-Horse Heaven Hills Project-Turbine Height
Has attachment? False

External Email

This is a supplementalinformation to the letter that Scout Clean Energy sent to EFSEC January 19, 2023. The specific topic is turbine height.

David Sharp
Vice President, Tri-Cities CARES
Email: dave@tricitiescares.org
Webpage: www.tricitiescares.org

Attachments:

[]

From:	Dave Sharp
To:	EFSEC (EFSEC); EFSEC mi Comments
Subject:	Wildlife Corridors and Transmission Infrastructure
Date:	Monday, February 19, 2024 7:30:00 AM
Attachments:	Transmission Line Suggested Reroute.pdf Wildlife Corridor- Mitigation Exclusion Slide Page 8.pdf

External Email

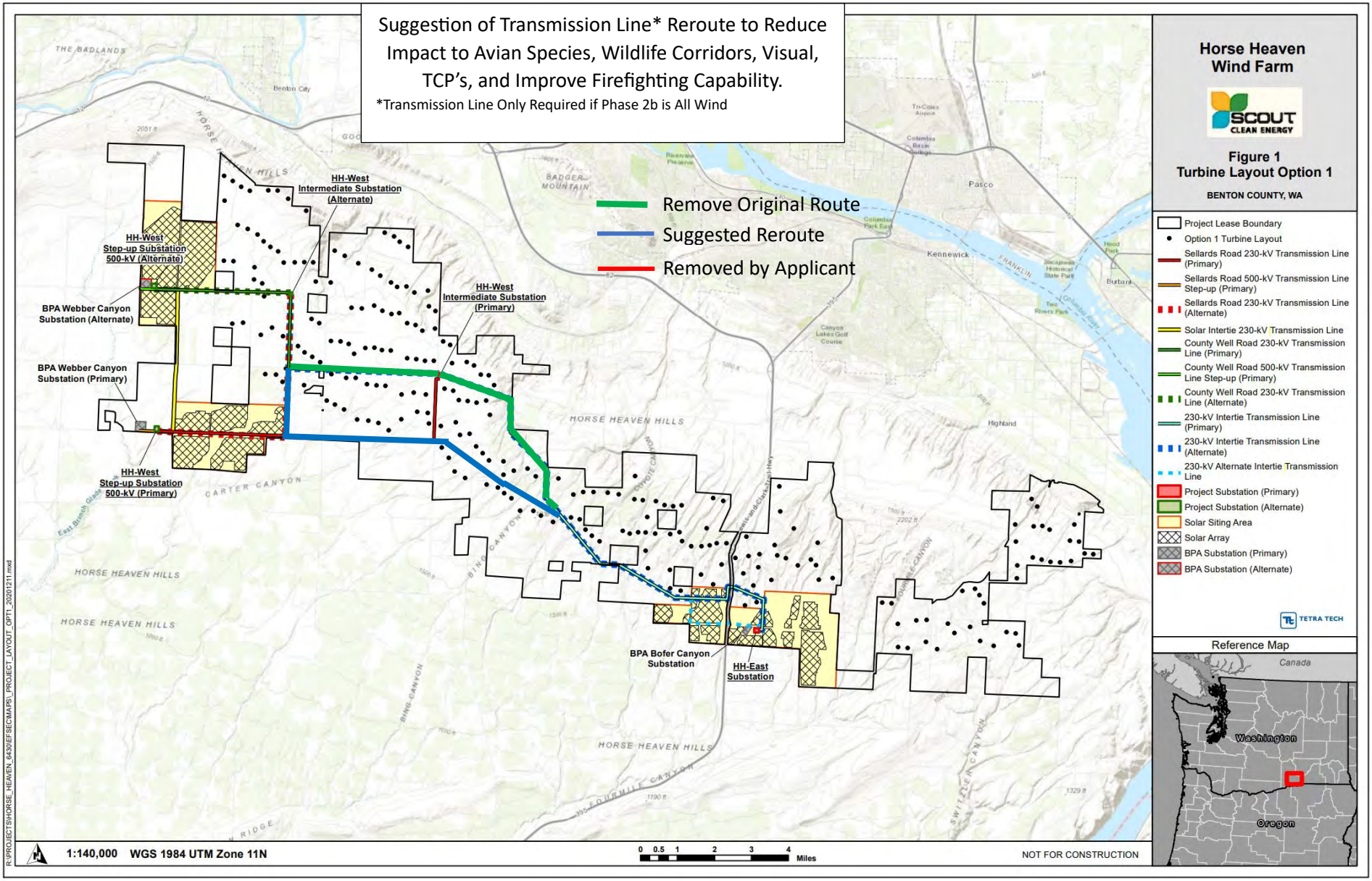
This is for Sean Greene and Amy Moon's attention:

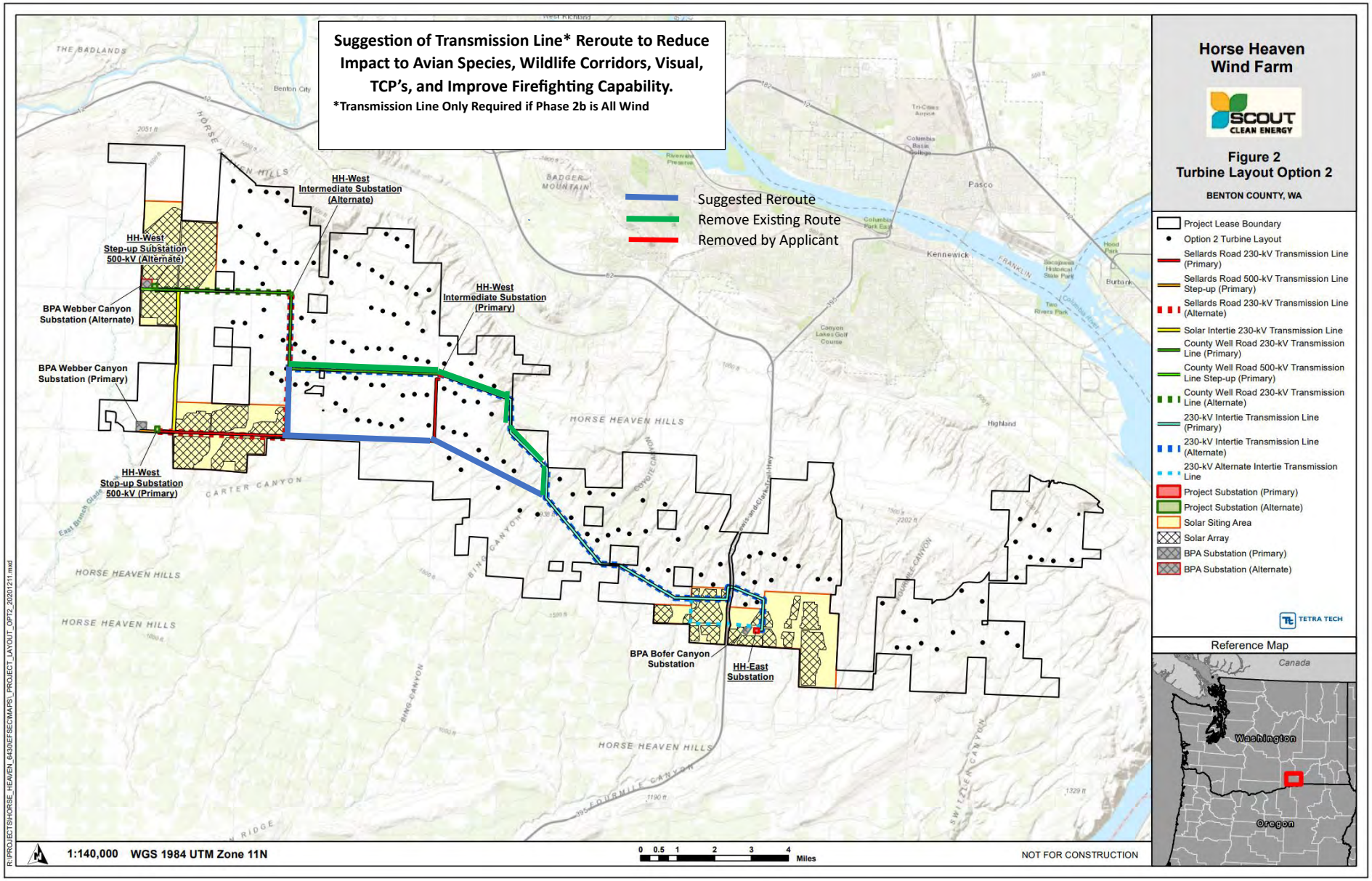
Deliberation discussions continue regarding project Infrastructure wildlife corridors and ferruginous Hawk nesting and range. This comment is to perhaps provide clarification regarding transmission lines.

1, Transmission Lines-Collector lines for wind turbine strings are underground.
2. The Applicant has in the Application, and the EIS includes a 230kv transmission line. The line is approximately 20 miles long and crosses key wildlife corridors, including sensitive areas just West of I-82, and along and spanning the Badger Canyon drainage.
3. The ASC and EIS clearly state that the transmission line is **only** required if Phase 2 is developed as **All Wind**. This is highly unlikely given the solar resources in the West Solar areas and the Applicants stated intention for a Hybrid project. Therefore, the transmission line very likely will not be needed or constructed.
4. However, in the event the line is required, it should be rerouted to avoid the majority of sensitive wildlife issues and reduce impact in other areas. An example is attached for each turbine option.
5. Also attached is a copy of the Wildlife Corridor Map in the Exclusion Mitigation Presentation marked up to show the Transmission Line high impact areas.

Two recommendations for EFSEC to consider:

1. Stipulate that this transmission line be removed from project drawings and not be part of the SCA. If they are unwilling to do so because of a "possibility" of an All Wind facility, EFSEC should require the line be rerouted on the drawings.
2. Coordinate locations should be provided for all project components including locations of wind turbines to be built, Meteorology Towers, and footprint locations for solar areas. Standard practice is then to allow the Applicant to move them up to 50'. If more than that, EFSEC must review the circumstances. Coordinate locations have already been provided to the FAA


Suggestion of Transmission Line* Reroute to Reduce Impact to Avian Species, Wildlife Corridors, Visual, TCP's, and Improve Firefighting Capability.
*Transmission Line Only Required if Phase 2b is All Wind
Remove Original Route
Suggested Reroute
Removed by Applicant
HH-West Intermediate Substation (Alternate)
HH-West Step-up Substation 500-kV (Alternate)
BPA Webber Canyon Substation (Alternate)
HH-West Intermediate Substation (Primary)
BPA Webber Canyon Substation (Primary)
HH-West Step-up Substation 500-kV (Primary)
BPA Bofer Canyon Substation
HH-East Substation
HORSE HEAVEN HILLS
CARTER CANYON
BADGER MOUNTAIN
Benton City
Kennewick
Pasco
Highland
Horse Heaven Wind Farm
SCOUT CLEAN ENERGY
Figure 1
Turbine Layout Option 1
BENTON COUNTY, WA
Project Lease Boundary
Option 1 Turbine Layout
Sellards Road 230-kV Transmission Line (Primary)
Sellards Road 500-kV Transmission Line Step-up (Primary)
Sellards Road 230-kV Transmission Line (Alternate)
Solar Intertie 230-kV Transmission Line
County Well Road 230-kV Transmission Line (Primary)
County Well Road 500-kV Transmission Line Step-up (Primary)
County Well Road 230-kV Transmission Line (Alternate)
230-kV Intertie Transmission Line (Primary)
230-kV Intertie Transmission Line (Alternate)
230-kV Alternate Intertie Transmission Line
Project Substation (Primary)
Project Substation (Alternate)
Solar Siting Area
Solar Array
BPA Substation (Primary)
BPA Substation (Alternate)
TETRA TECH
Reference Map
Canada
Washington
Oregon
1:140,000 WGS 1984 UTM Zone 11N
0 0.5 1 2 3 4 Miles
NOT FOR CONSTRUCTION
R:\PROJECTS\HORSE_HEAVEN_6430\EFSEC\MAPS_PROJECT_LAYOUT_OPT1_20201211.mxd



Horse Heaven Wind Farm

SCOUT CLEAN ENERGY

Figure 2
Turbine Layout Option 2

BENTON COUNTY, WA

- Project Lease Boundary
- Option 2 Turbine Layout
- Sellards Road 230-kV Transmission Line (Primary)
- Sellards Road 500-kV Transmission Line Step-up (Primary)
- Sellards Road 230-kV Transmission Line (Alternate)
- Solar Intertie 230-kV Transmission Line
- County Well Road 230-kV Transmission Line (Primary)
- County Well Road 500-kV Transmission Line Step-up (Primary)
- County Well Road 230-kV Transmission Line (Alternate)
- 230-kV Intertie Transmission Line (Primary)
- 230-kV Intertie Transmission Line (Alternate)
- 230-kV Alternate Intertie Transmission Line
- Project Substation (Primary)
- Project Substation (Alternate)
- Solar Siting Area
- Solar Array
- BPA Substation (Primary)
- BPA Substation (Alternate)

TETRA TECH

Reference Map

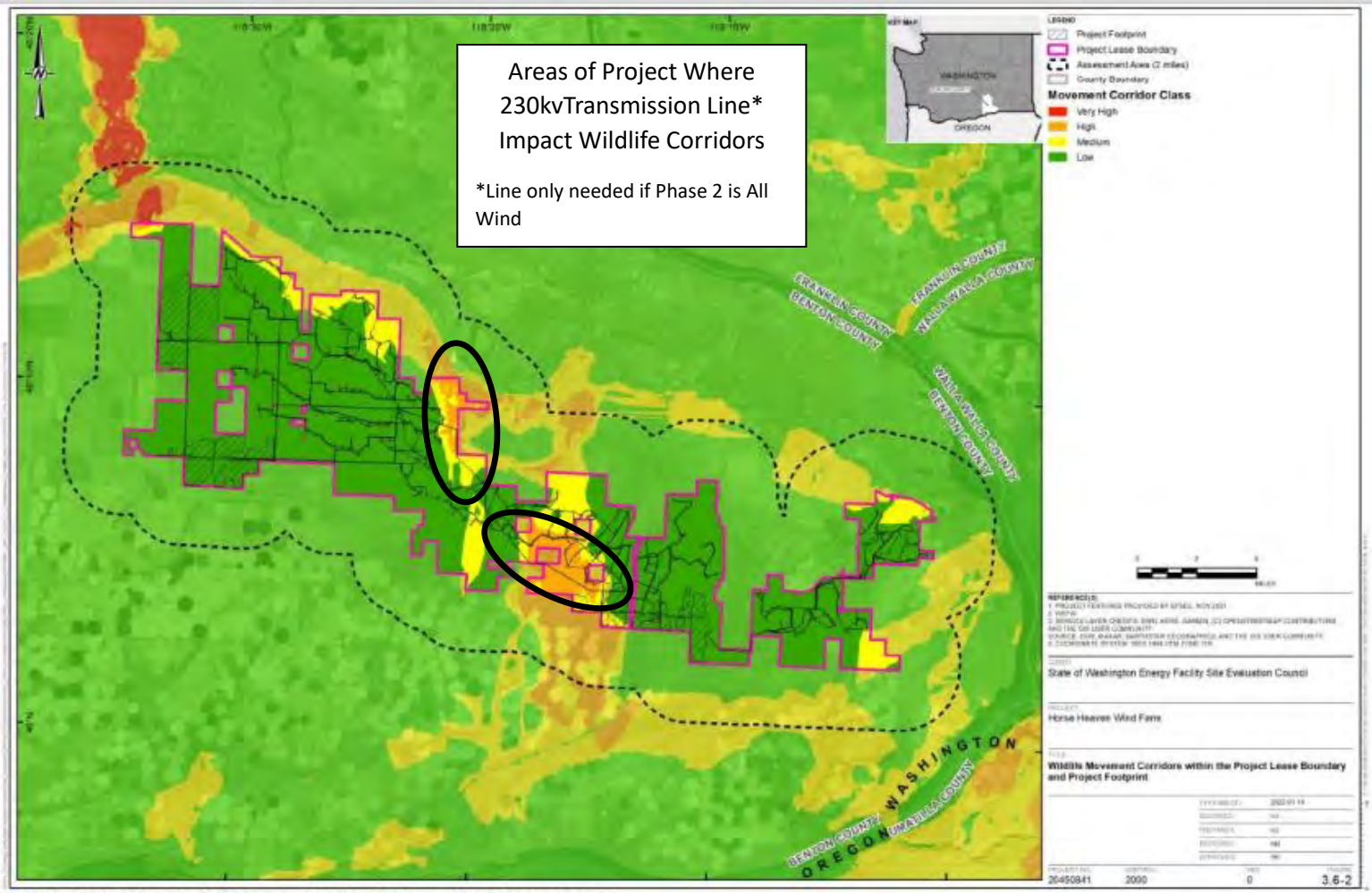


Figure 3.6-2: Wildlife Movement Corridors within the Project Lease Boundary and Project Footprint

To: Comments@efsec.wa.gov
From: efsec@efsec.wa.gov
Received: 2024-02-20T15:22:45+00:00
Subject: FW: Wildlife Corridors and Transmission Infrastructure
Has attachment? False

From: Pam Minelli <pam@tricitiescares.org>
Sent: Tuesday, February 20, 2024 7:22:27 AM (UTC-08:00) Pacific Time (US & Canada)
To: Dave Sharp <davesharp.pe@gmail.com>
Cc: EFSEC (EFSEC) <efsec@efsec.wa.gov>; EFSEC mi Comments <Comments@efsec.wa.gov>
Subject: Re: Wildlife Corridors and Transmission Infrastructure

External Email

Dave,

Appreciate the time you took to bring this to EFSEC's attention! Getting that ugly transmission line removed would be a victory. Having it relocated further south and away from the hawk nests and wildlife corridors would be an improvement, too.

Thank you!

Pam

On Mon, Feb 19, 2024 at 7:29 AM Dave Sharp <davesharp.pe@gmail.com> wrote:

> This is for Sean Greene and Amy Moon's attention:
>
> Deliberation discussions continue regarding project Infrastructure wildlife corridors and ferruginous Hawk nesting and range. This comment is to perhaps provide clarification regarding transmission lines.
>
> 1, Transmission Lines-Collector lines for wind turbine strings are underground.
> 2. The Applicant has in the Application, and the EIS includes a 230kv transmission line. The line is approximately 20 miles long and crosses key wildlife corridors, including sensitive areas just West of I-82, and along and spanning the Badger Canyon drainage.
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>
> Two recommendations for EFSEC to consider:
>
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> practice is then to allow the Applicant to move them up to 50'. If more than that, EFSEC must review the circumstances. Coordinate locations have already been provided to the FAA

--

Secretary, TRI-CITIES C.A.R.E.S.
Phone: 509-539-6788
Email: pam@tricitiescares.org

TRI-CITIES C.A.R.E.S
Community |**A**ction for |**R**esponsible |**E**nvironmental |**S**tewardship
Visit:www.TriCitiesCARES.org

Attachments:

[]

To: davesharp.pe@gmail.com
From: pam@tricitiescares.org
Received: 2024-02-20T15:22:43+00:00
Subject: Re: Wildlife Corridors and Transmission Infrastructure
Has attachment? False

External Email

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--

Secretary, TRI-CITIES C.A.R.E.S.

Phone: 509-539-6788
Email: pam@tricitiescares.org

TRI-CITIES C.A.R.E.S
Community |Action for |Responsible |Environmental |Stewardship
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Attachments:

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From: Dave Sharp
To: EFSEC (EFSEC); EFSEC mi Comments
Subject: Fwd: Wildlife Corridors and Transmission Infrastructure
Date: Wednesday, February 21, 2024 9:58:59 AM
Attachments: Transmission Line Suggested Reroute.pdf
Wildlife Corridor- Mitigation Exclusion Slide Page 8.pdf
Unnecessary Transmission Lines.pdf

External Email

This is related to the 19.4 mile 230kv transmission line the is proposed by the Applicant. This is the second email on this subject. I have added a third attachment entitled unnecessary turbines.

---------- Forwarded message ---------
From: **Dave Sharp** <davesharp.pe@gmail.com>
Date: Tue, Feb 20, 2024 at 10:20 PM
Subject: Fwd: Wildlife Corridors and Transmission Infrastructure
To: Drew, Kathleen (EFSEC) <kathleen.drew@efsec.wa.gov>

Kathleen,

You need to be aware that the majority of transmission infrastructure proposed in the final ASC and carried through to the FEIS is unnecessary. The story is more complicated and sinister than that, but I need to ensure you have read this email as you are deliberating very important issues associated with wildlife corridors and interface with Ferruginous Hawk nesting and habitat. I am hopeful you will forward this to the Council. I will forward this to the EFSEC comment line tomorrow morning.

Attached is a transmission map that I have marked up to highlight what is **not** required. The title is Unnecessary Transmission Lines and was not included in the original comment email.

Putting forth an entirely new unneeded transmission corridor through sensitive areas is not just high impact to wildlife but has high visual impact to the community, and further complicates firefighting. Cannot comment regarding TCP.

The Applicant's proposed line is contrary to the Benton County Comprehensive Plan, **Utility Element, Goal 3-Policy 3** "Facilitate maintenance and rehabilitation of existing utility systems and facilities and encourage the use of existing transmission/distribution corridors". **Applicant Analysis**, "*The Project is consistent with UE Goal 3 Policy 3 as the transmission line connecting the Project's substations within the Project Lease Boundary would traverse parcels to optimize the most direct route between substations while minimizing potential environmental and agricultural impacts on surrounding lands. The eastern Project substation has been located adjacent to BPA's proposed Bofer Canyon substation, thereby eliminating the need for new transmission lines at this location. Proposed transmission lines would be located adjacent and parallel to existing public road right-of-way where possible*".

The above was extracted from Table 3.8-1a from the Final Environmental Impact Statement.

Not only does the transmission line carve out an entirely new corridor; it is not needed for the project.

---------- Forwarded message ---------
From: **Dave Sharp** <davesharp.pe@gmail.com>
Date: Mon, Feb 19, 2024 at 7:28 AM
Subject: Wildlife Corridors and Transmission Infrastructure
To: EFSEC (EFSEC) <efsec@efsec.wa.gov>, <comments@efsec.wa.gov>

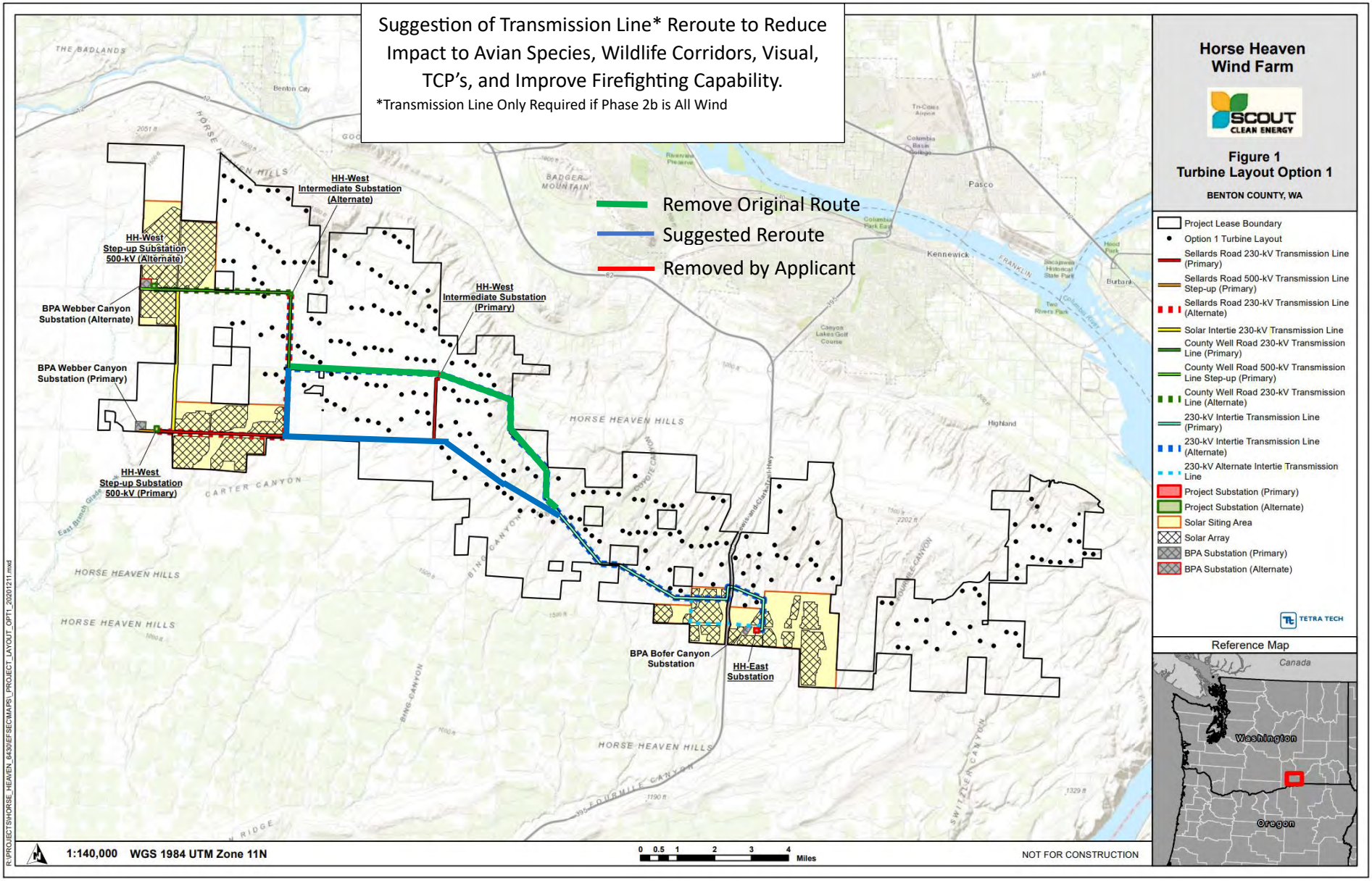
This is for Sean Greene and Amy Moon's attention:

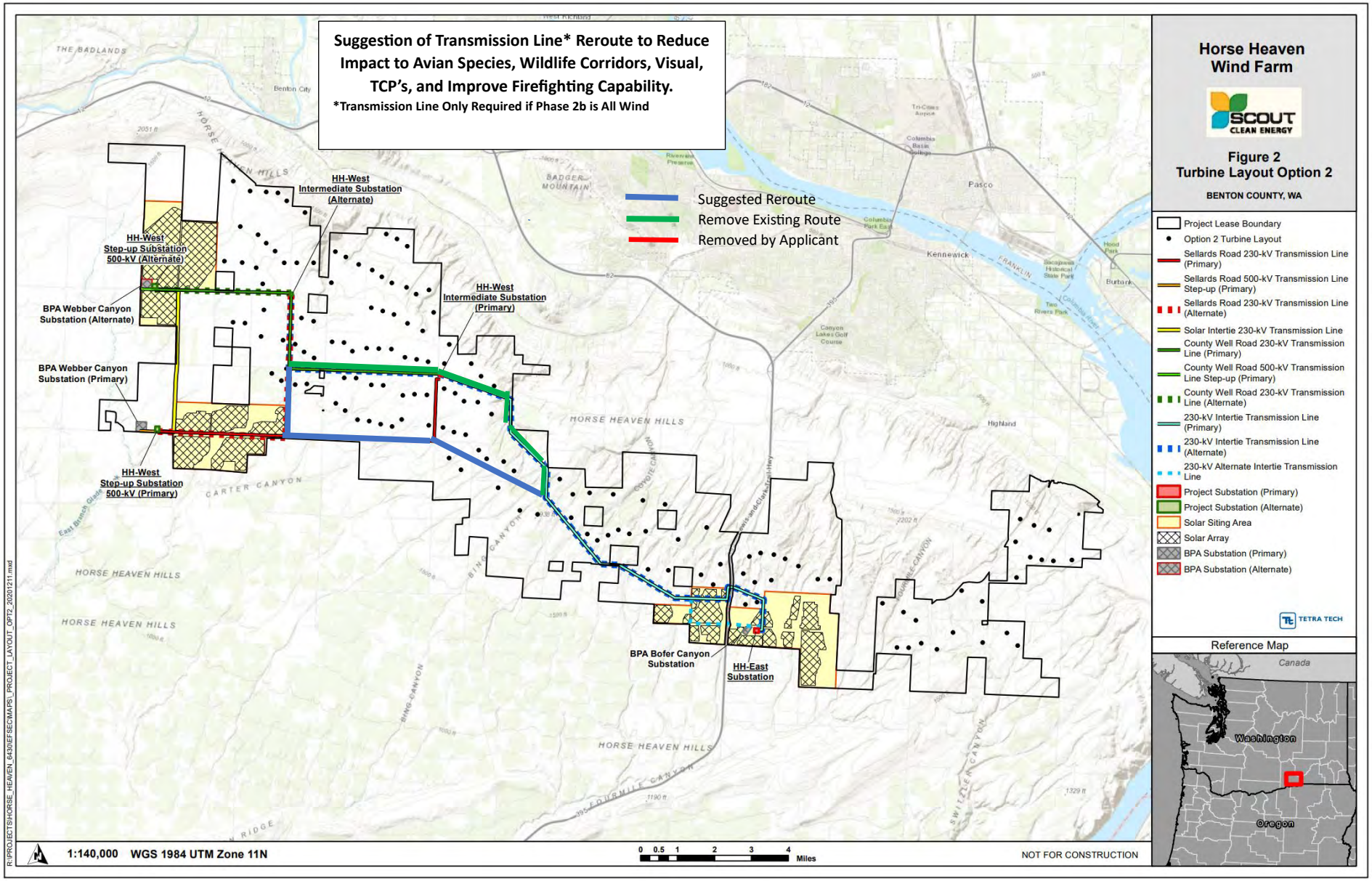
Deliberation discussions continue regarding project Infrastructure wildlife corridors and ferruginous Hawk nesting and range. This comment is to perhaps provide clarification regarding transmission lines.

1, Transmission Lines-Collector lines for wind turbine strings are underground.
2. The Applicant has in the Application, and the EIS includes a 230kv transmission line. The line is approximately 20 miles long and crosses key wildlife corridors, including sensitive areas just West of I-82, and along and spanning the Badger Canyon drainage.
3. The ASC and EIS clearly state that the transmission line is **only** required if Phase 2 is developed as **All Wind**. This is highly unlikely given the solar resources in the West Solar areas and the Applicants stated intention for a Hybrid project. Therefore, the transmission line very likely will not be needed or constructed.
4. However, in the event the line is required, it should be rerouted to avoid the majority of sensitive wildlife issues and reduce impact in other areas. An example is attached for each turbine option.
5. Also attached is a copy of the Wildlife Corridor Map in the Exclusion Mitigation Presentation marked up to show the Transmission Line high impact areas.

Two recommendations for EFSEC to consider:

1. Stipulate that this transmission line be removed from project drawings and not be part of the SCA. If they are unwilling to do so because of a "possibility" of an All Wind facility, EFSEC should require the line be rerouted on the drawings.
2. Coordinate locations should be provided for all project components including locations of wind turbines to be built, Meteorology Towers, and footprint locations for solar areas. Standard practice is then to allow the Applicant to move them up to 50'. If more than that, EFSEC must review the circumstances. Coordinate locations have already been provided to the FAA


Suggestion of Transmission Line* Reroute to Reduce Impact to Avian Species, Wildlife Corridors, Visual, TCP's, and Improve Firefighting Capability.
*Transmission Line Only Required if Phase 2b is All Wind
Remove Original Route
Suggested Reroute
Removed by Applicant
HH-West Intermediate Substation (Alternate)
HH-West Step-up Substation 500-kV (Alternate)
BPA Webber Canyon Substation (Alternate)
HH-West Intermediate Substation (Primary)
BPA Webber Canyon Substation (Primary)
HH-West Step-up Substation 500-kV (Primary)
BPA Bofer Canyon Substation
HH-East Substation
HORSE HEAVEN HILLS
CARTER CANYON
BADGER MOUNTAIN
Benton City
Kennewick
Pasco
Highland
Horse Heaven Wind Farm
SCOUT CLEAN ENERGY
Figure 1
Turbine Layout Option 1
BENTON COUNTY, WA
Project Lease Boundary
Option 1 Turbine Layout
Sellards Road 230-kV Transmission Line (Primary)
Sellards Road 500-kV Transmission Line Step-up (Primary)
Sellards Road 230-kV Transmission Line (Alternate)
Solar Intertie 230-kV Transmission Line
County Well Road 230-kV Transmission Line (Primary)
County Well Road 500-kV Transmission Line Step-up (Primary)
County Well Road 230-kV Transmission Line (Alternate)
230-kV Intertie Transmission Line (Primary)
230-kV Intertie Transmission Line (Alternate)
230-kV Alternate Intertie Transmission Line
Project Substation (Primary)
Project Substation (Alternate)
Solar Siting Area
Solar Array
BPA Substation (Primary)
BPA Substation (Alternate)
TETRA TECH
Reference Map
Canada
Washington
Oregon
1:140,000 WGS 1984 UTM Zone 11N
0 0.5 1 2 3 4 Miles
NOT FOR CONSTRUCTION
R:\PROJECTS\HORSE_HEAVEN_6430\EFSEC\MAPS_PROJECT_LAYOUT_OPT1_20201211.mxd



Horse Heaven Wind Farm

SCOUT CLEAN ENERGY

Figure 2
Turbine Layout Option 2

BENTON COUNTY, WA

- Project Lease Boundary
- Option 2 Turbine Layout
- Sellards Road 230-kV Transmission Line (Primary)
- Sellards Road 500-kV Transmission Line Step-up (Primary)
- Sellards Road 230-kV Transmission Line (Alternate)
- Solar Intertie 230-kV Transmission Line
- County Well Road 230-kV Transmission Line (Primary)
- County Well Road 500-kV Transmission Line Step-up (Primary)
- County Well Road 230-kV Transmission Line (Alternate)
- 230-kV Intertie Transmission Line (Primary)
- 230-kV Intertie Transmission Line (Alternate)
- 230-kV Alternate Intertie Transmission Line
- Project Substation (Primary)
- Project Substation (Alternate)
- Solar Siting Area
- Solar Array
- BPA Substation (Primary)
- BPA Substation (Alternate)

TETRA TECH

Reference Map

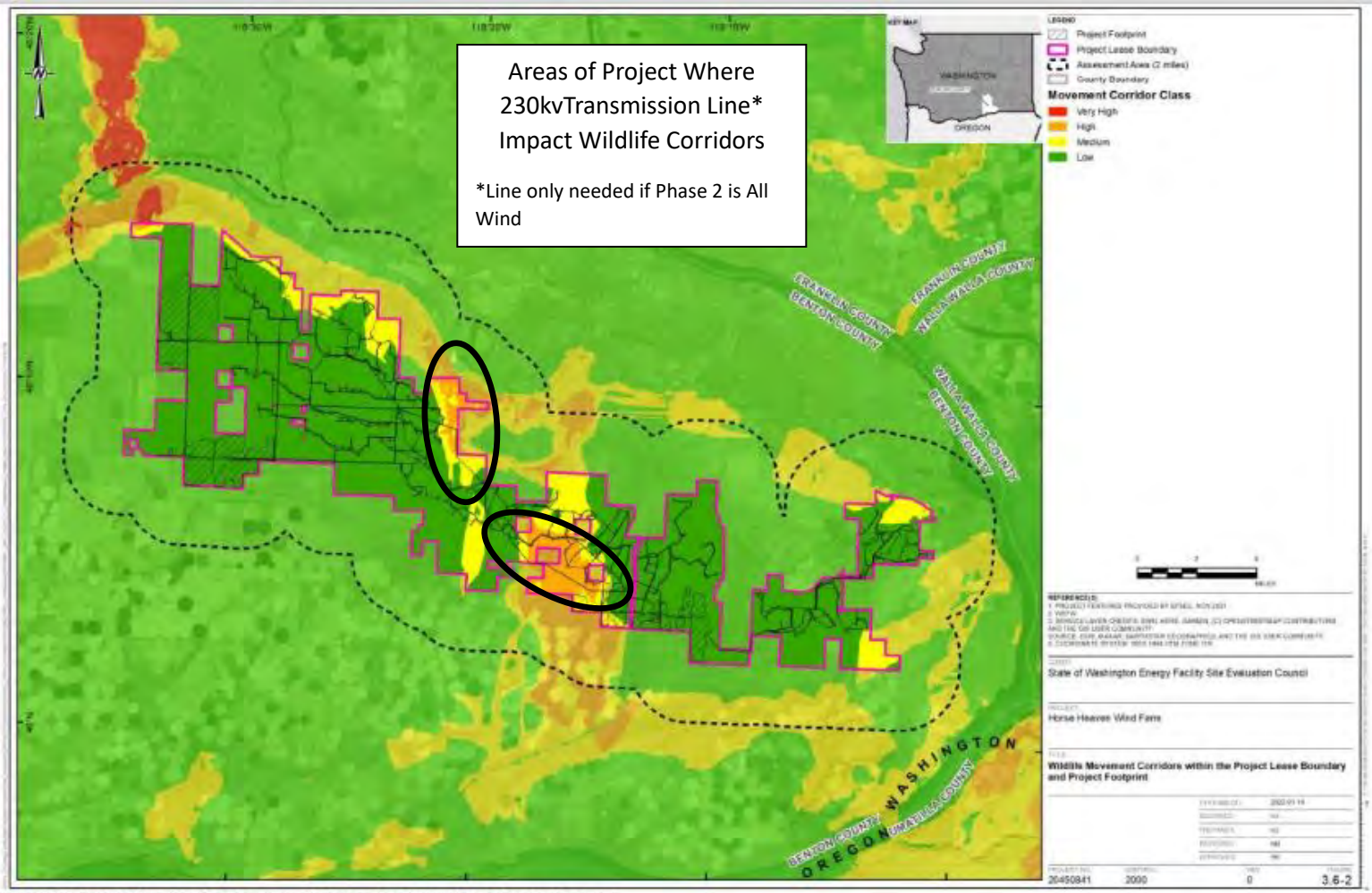
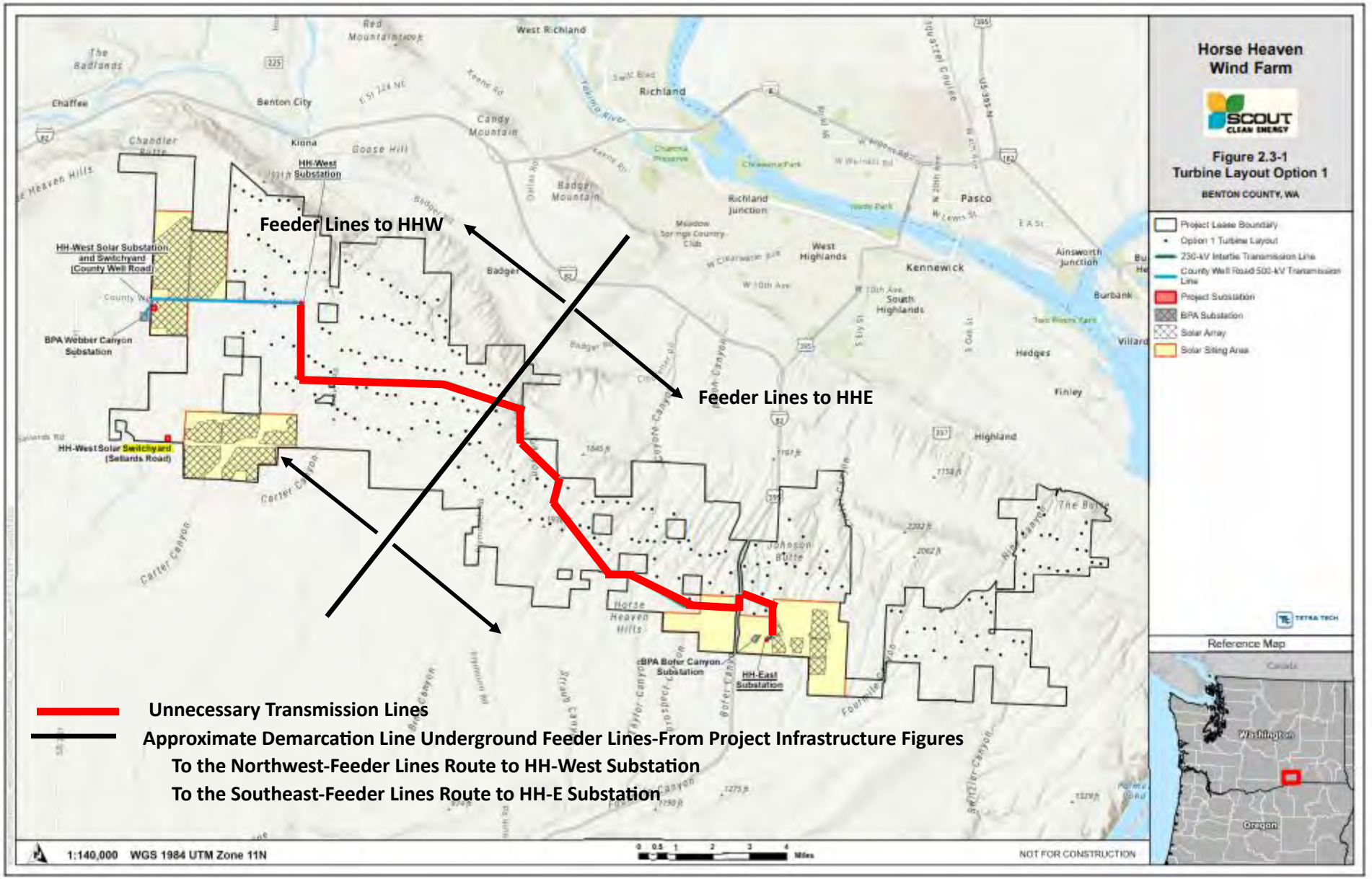


Figure 3.6-2: Wildlife Movement Corridors within the Project Lease Boundary and Project Footprint


Horse Heaven Wind Farm
SCOUT CLEAN ENERGY
Figure 2.3-1
Turbine Layout Option 1
BENTON COUNTY, WA
Project Lease Boundary
Option 1 Turbine Layout
230-kV Interlie Transmission Line
County Well Road 500-kV Transmission Line
Project Substation
BPA Substation
Solar Array
Solar Siting Area
TETRA TECH
Reference Map
Canada
Washington
Oregon
Feeder Lines to HHW
Feeder Lines to HHE
HH-West Substation
HH-West Solar Substation and Switchyard (County Well Road)
BPA Webber Canyon Substation
HH-West Solar Switchyard (Sellards Road)
BPA Bofer Canyon Substation
HH-East Substation
Unnecessary Transmission Lines
Approximate Demarcation Line Underground Feeder Lines-From Project Infrastructure Figures
To the Northwest-Feeder Lines Route to HH-West Substation
To the Southeast-Feeder Lines Route to HH-E Substation
1:140,000 WGS 1984 UTM Zone 11N
0 0.5 1 2 3 4 Miles
NOT FOR CONSTRUCTION

To: Comments@efsec.wa.gov
From: Paul@Presari.com
Received: 2024-02-21T20:17:13+00:00
Subject: Seattle Times article Horse Heaven Hills Wind Project
Has attachment? False

External Email

It appears that the Scout gave the Seattle Times a map showing the locations of Ferruginous Hawk nests that has been considered confidential during the HHH adjudication to the Conrad Swanson and it was published this morning.
https://www.seattletimes.com/seattle-news/climate-lab/how-an-endangered-hawk-could-topple-plans-for-was-largest-wind-farm/
PDF file of the article is also attached.
Paul J. Krupin, BA, MS, JD
Board Member on behalf of TRI-CITIES C.A.R.E.S
Visit: http://www.TriCitiesCARES.org
509-531-8390 cell 509-582-5174 landline Paul@Presari.com

Attachments:

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To: Comments@efsec.wa.gov
From: greggwilbanks@gmail.com
Received: 2024-02-22T02:43:46+00:00
Subject: Horse heaven wind
Has attachment? False

External Email

Approve this Horse Heaven Wind Project. Narrow focused special interests are keeping our society mired in old school fossilfuels. We need a mind set shift to get us into a healthier form of energy production. Otherwise, we'll wait too long and by then building wind power will too little, too late. If that's not already the case.

Attachments:

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From:	Dave Sharp
To:	EFSEC (EFSEC); EFSEC mi Comments; Krupin, Paul (WaTech Guest); Karen Brun; Pam Minelli; Bumpus, Sonia (EFSEC)
Subject:	230kv Transmission Line-Environmental Issues
Date:	Thursday, March 14, 2024 5:09:41 PM
Attachments:	Final Public Comment-Transmission LIne Reroute with Figures.pdf

External Email

Comment from Tri-Cities CARES-Horse Heaven Wind Project.

This is directed to Ami, Amy, and Sean. This supplements an earlier comment regarding the **optiona**l 230kv transmission lines. Our position remains that the project can be fully functional as proposed without the line. The line is still optional.

We are aware that the Council will be deliberating above ground transmission infrastructure that was preliminarily excluded earlier.
TCC takes no position on the Easternmost section of the transmission line in vicinity of I-82, but strongly believe that the section built in, and across Badger, Canyon would be an unneeded environmental blunder and an alternate route should be considered.

A cursory look at project documentation shows that a reroute may be feasible. The line would be shorter and would be almost entirely on previously developed or on previously surveyed land for the alternative transmission line that was removed.

Our formal comment outlines the environmental issues and is attached in PDF format.

David Sharp
Vice President, Tri-Cities CARES
Email: dave@tricitiescares.org
Webpage: www.tricitiescares.org

March 14 29, 2024
Public Comment-Horse Heaven Hills Project- Optional 230kv Transmission Route
Update to Previous Public Comment February 20, 2024
Suggested Reroute to avoid multiple issues

Dave Sharp-Tri-Cities CARES

This is directed to the attention of Amy Moon, Sean Greene, Ami Hafkemeyer. The TCC public previous comment highlighted that the transmission line as presented in the ASC is optional. This comment highlights the environmental impacts of the line, and proposes a reroute.

This reinforces to Staff and Council the significant and multiple environmental issues as a result of the route of this transmission line and suggests either a design reroute, or Not Build alternative. This comment is directed to the portion of the line routed through and across Badger Canyon drainage. We have not studied the route further to the East toward I-82. Leaving this portion of the transmission line to be built as designed would be a terrible environmental blunder.

Included in this comment are several Figures from the various FEIS chapters and Appendices that show the variety of issues. We do not include Ferruginous Hawk issues, but previous exclusion maps that show removal of Turbines 45-49, 92 and 92 imply a Ferruginous hawk nest within 2 miles. The area also provides habitat for the Townsend Ground Squirrel, and there have been sightings of the Loggerhead Shrike in the vicinity of the wetland.

The following is from Appendix L Bird and Bat Conservatory, Avoidance and Mitigation Measures 7.1.4-Collector and Transmission Lines, The Applicant states the *"…up to 19 mile transmission line will be located, where possible, where previous disturbance has occurred"*. As can be seen, the route chosen follows over 3 miles of undisturbed land with numerous environmental impacts. If the Applicant will not reroute the line, then they should not build it. Their own ASC stated the line as optional and no benefit has been stated. And since EFSEC balances benefit with cost, a simple answer would be to not allow the line to be built.

The reroute significantly reduces loss of shrub steppe and other critical habitat, and likely avoids the need for a dedicated road to service the line. It also utilizes existing utilities corridors more efficiently. The Intertie line reroute provides an additional buffer for aerial firefighting. Other benefits include a less lengthy route and more efficient use of DNR property already impacted from a project component (temporary laydown yard).

Figure2.3-1 Turbine Layout Option 1
Figure 4.6-1 Indirect habitat Loss
Figure 3.4-2 Delineated Wetland
Figure 3.4-6 FEIS Arid Lands Initiative
Figure 3.6-4 Townsend Ground Squirrel HCA
Figure 3 Large Fire Data from DNR
Figure 3.6-2 Wildlife Corridor Movements
Figure 3.2-4 Geologically Hazardous Areas.
Figure 3.6-3 WFWD Occurrance-Loggerhead Shrike

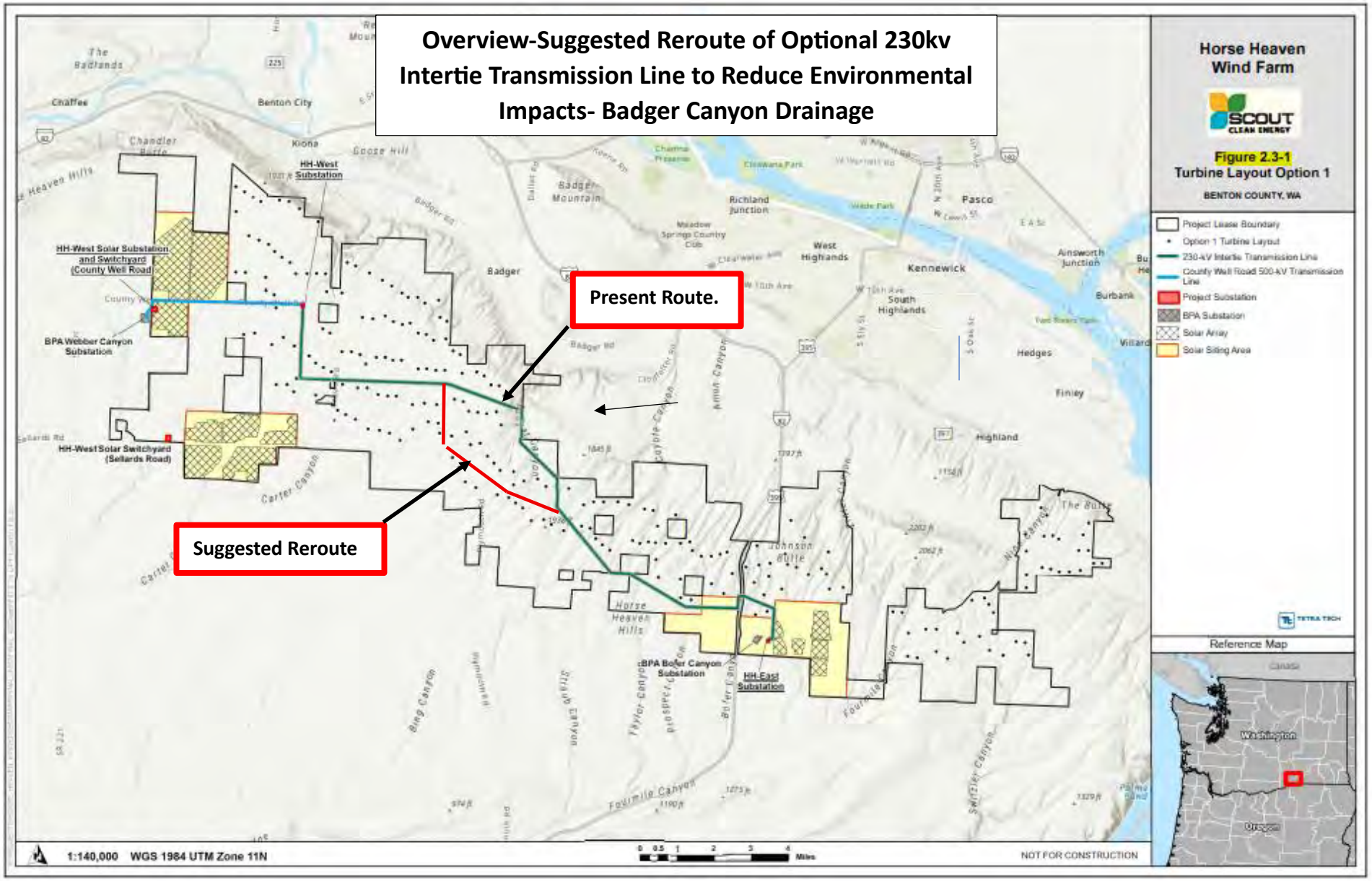

Overview-Suggested Reroute of Optional 230kv Intertie Transmission Line to Reduce Environmental Impacts- Badger Canyon Drainage
Present Route.
Suggested Reroute
Horse Heaven Wind Farm
SCOUT CLEAN ENERGY
Figure 2.3-1
Turbine Layout Option 1
BENTON COUNTY, WA
Project Lease Boundary
Option 1 Turbine Layout
230-kV Intertie Transmission Line
County Well Road 500-kV Transmission Line
Project Substation
BPA Substation
Solar Array
Solar Siting Area
TETRA TECH
Reference Map
HH-West Substation
HH-West Solar Substation and Switchyard (County Well Road)
BPA Webber Canyon Substation
HH-West Solar Switchyard (Sellards Road)
BPA Boiler Canyon Substation
HH-East Substation
Badger
Kiona
Benton City
Chaffee
Richland Junction
West Highlands
Kennewick
Pasco
Ainsworth Junction
Burbank
South Highlands
Hedges
Finley
Highland
Horse Heaven Hills
Badger Mountain
Goose Hill
Chandler Butte
Carter Canyon
Johnson Butte
Foxmile Canyon
Bing Canyon
Taylor Canyon
Switzler Canyon
1:140,000 WGS 1984 UTM Zone 11N
0 0.5 1 2 3 4 Miles
NOT FOR CONSTRUCTION

Figure 3.2-4 Geologically Hazardous Areas.

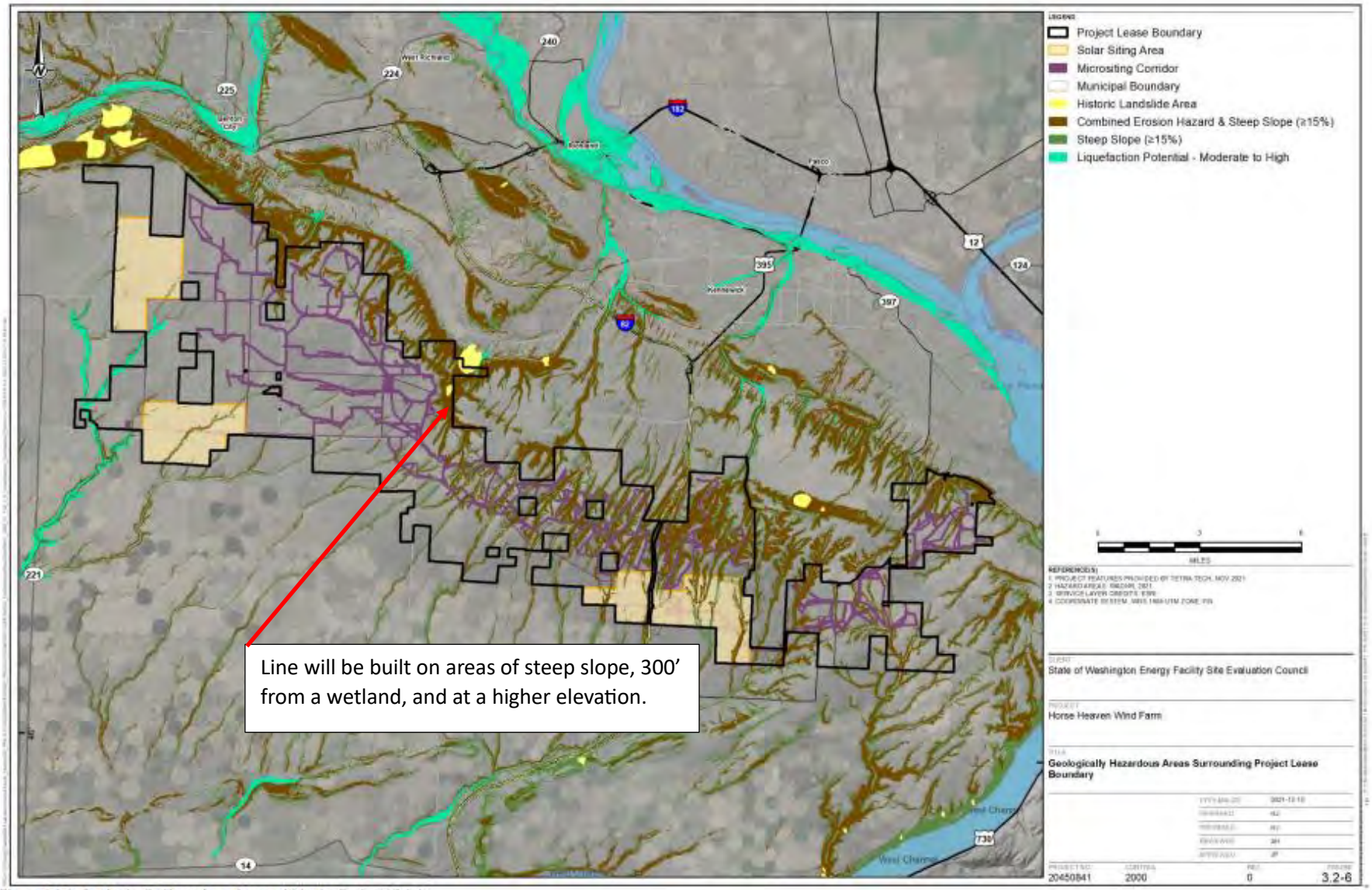


Figure 3.2-6: Geologically Hazardous Areas within the Project Vicinity

Figure 3.6-2 FEIS Wildlife Movement Corridors

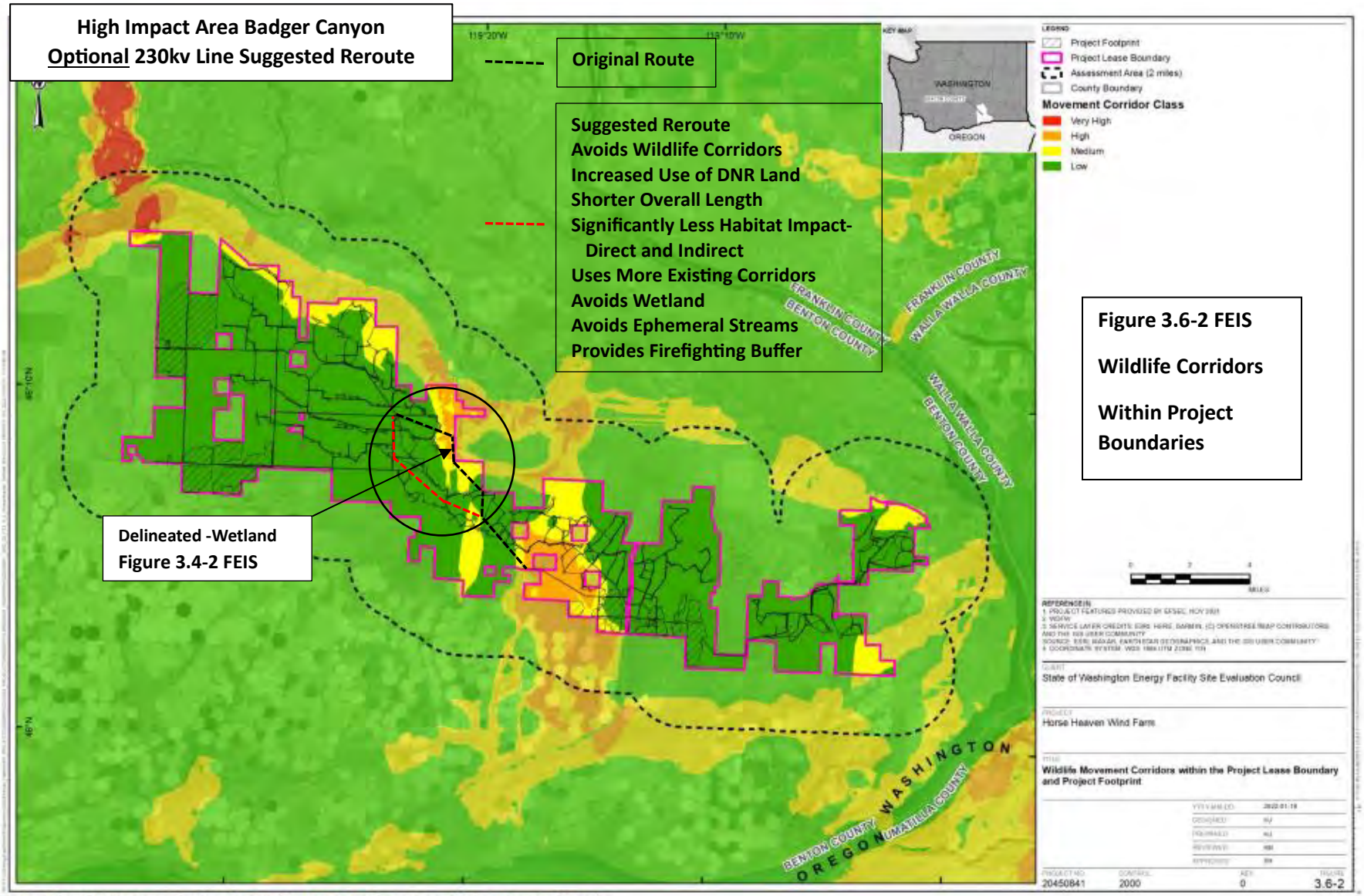
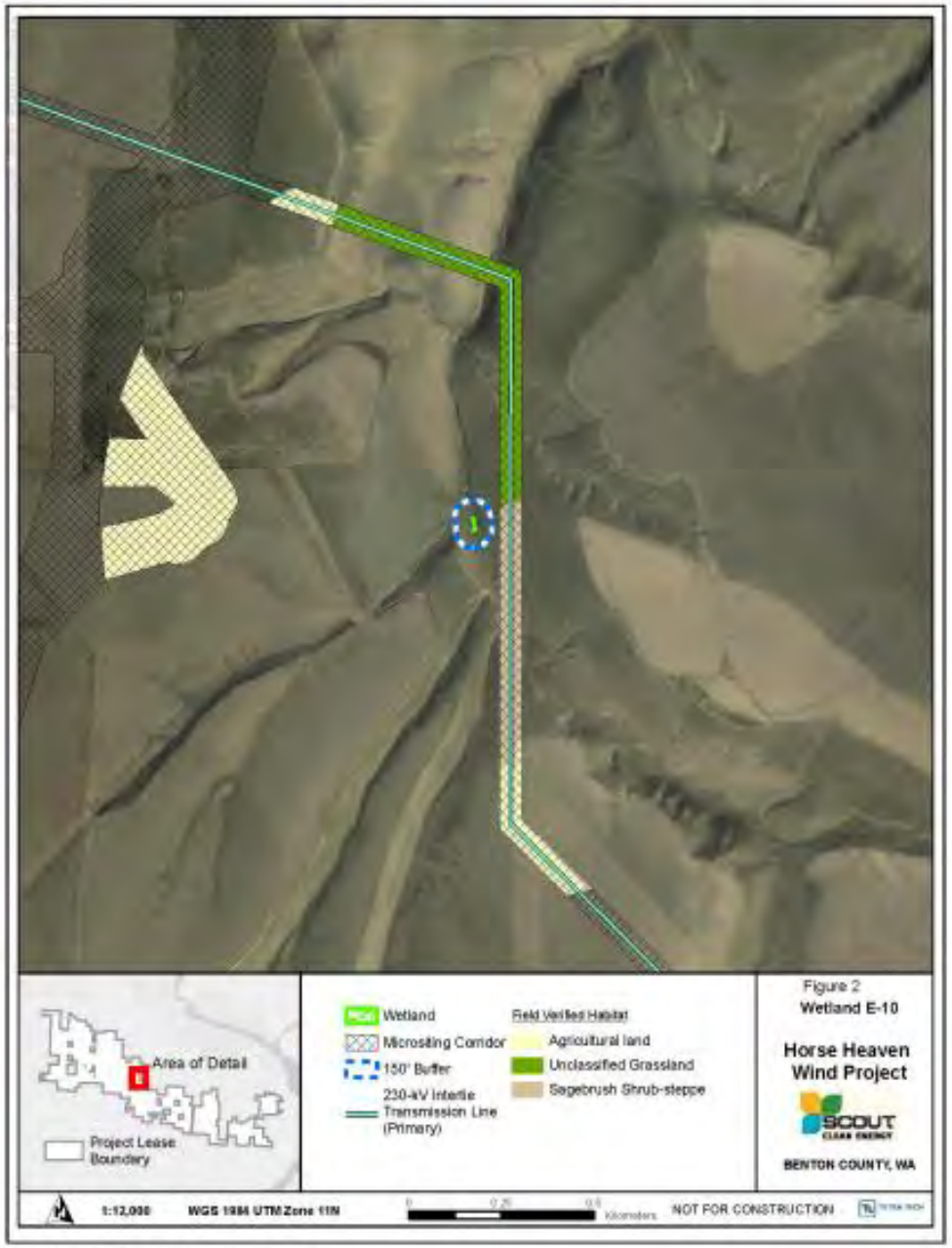


Figure 3.6-2: Wildlife Movement Corridors within the Project Lease Boundary and Project Footprint

Figure 3.4-2 FEISDelineated Wetland Figure 3.4-2



Source: Appendix I, Horse Heaven Wind Farm, LLC 2022
Figure 3.4-2: Wetland Delineated in the Lease Boundary during May 2020 Field Surveys by the Applicant

This satellite view provides the viewer perspective of the sheer size of Badger Canyon. Based on the scale embedded in this Figure, this image represents approximately 13 square miles or over 10% of the lease area.

Note the Intertie corridor includes land cover color of Unclassified grassland-green, Shrub Steppe-Brown, and Agriculture Land-Light Tan and leaves the majority of the land cover as unidentified.

Other Project Maps show two springs in the vicinity of the wetland.

Figure 4.6-1 Indirect Habitat Loss-Two Items to note: The figure only delineates indirect habitat loss inside project boundary. Should include habitat loss outside of the lease boundary if within zone of influence of 0.5 miles. This understates indirect loss of habitat.

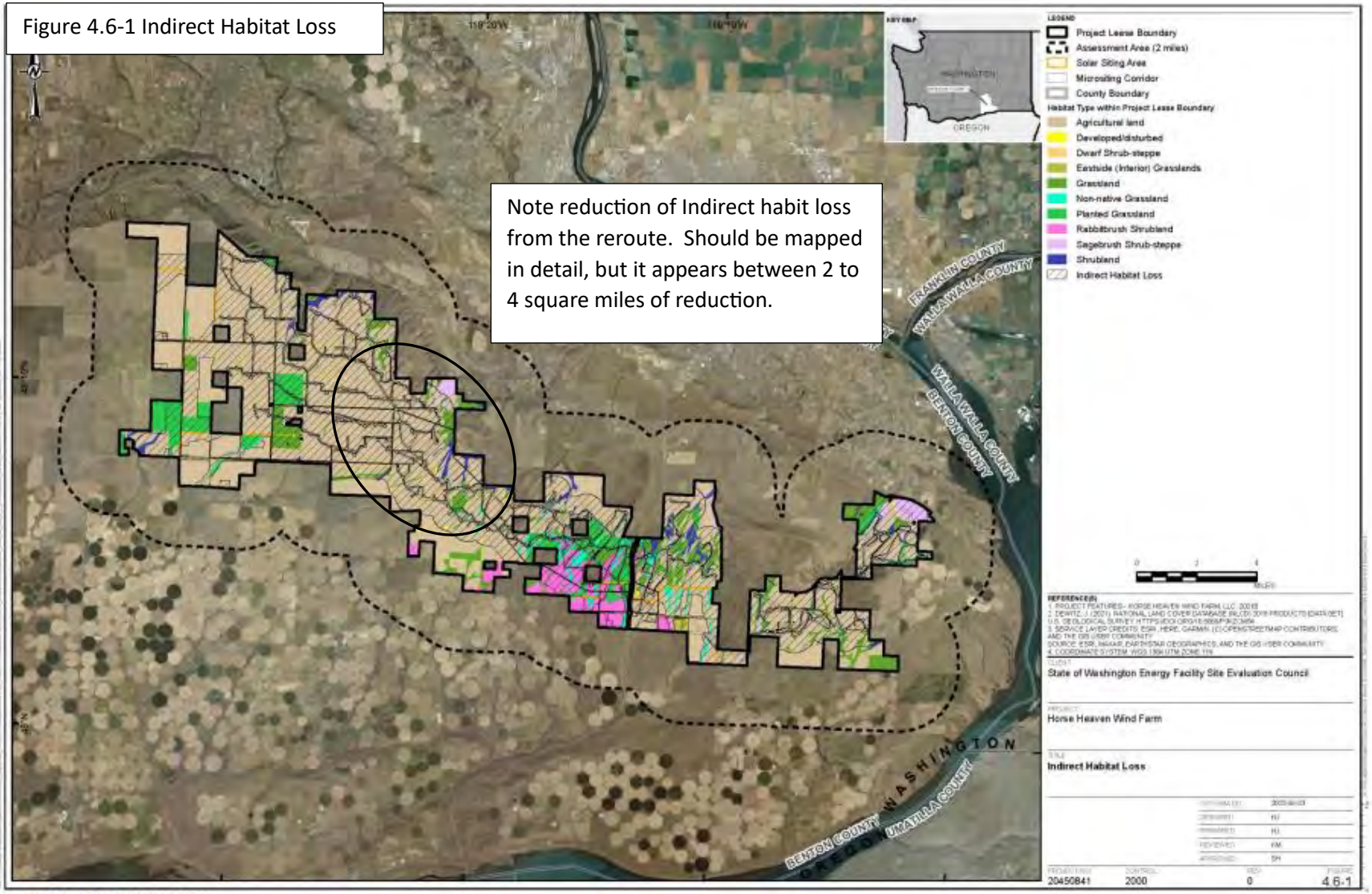


Figure 4.6-1: Indirect Habitat Loss

Figure 3.4-6 FEIS Arid Lands Initiative

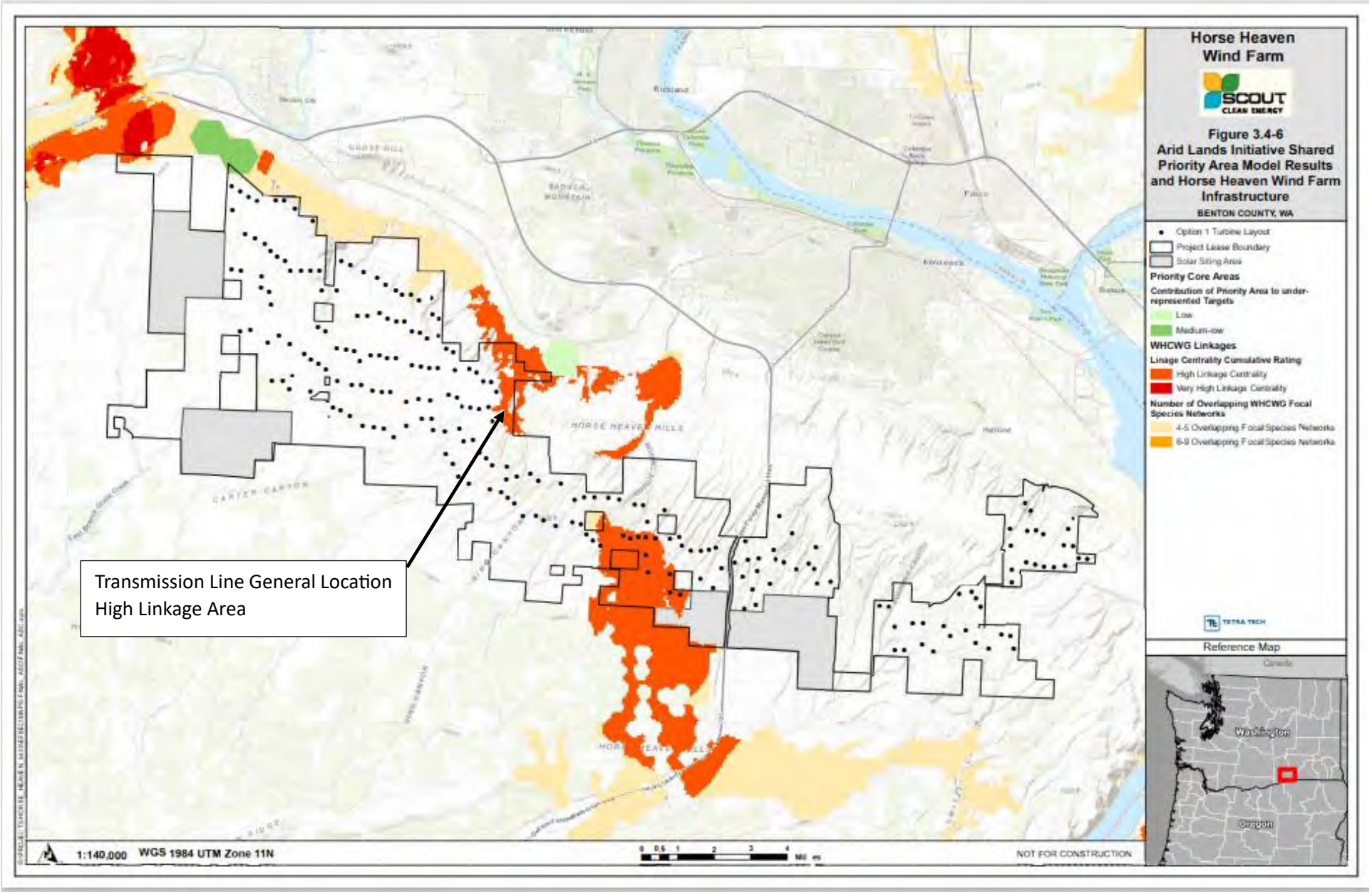


Figure 3.6-4 Townsend Ground Squirrel Habitat Conservation Area- High HCA

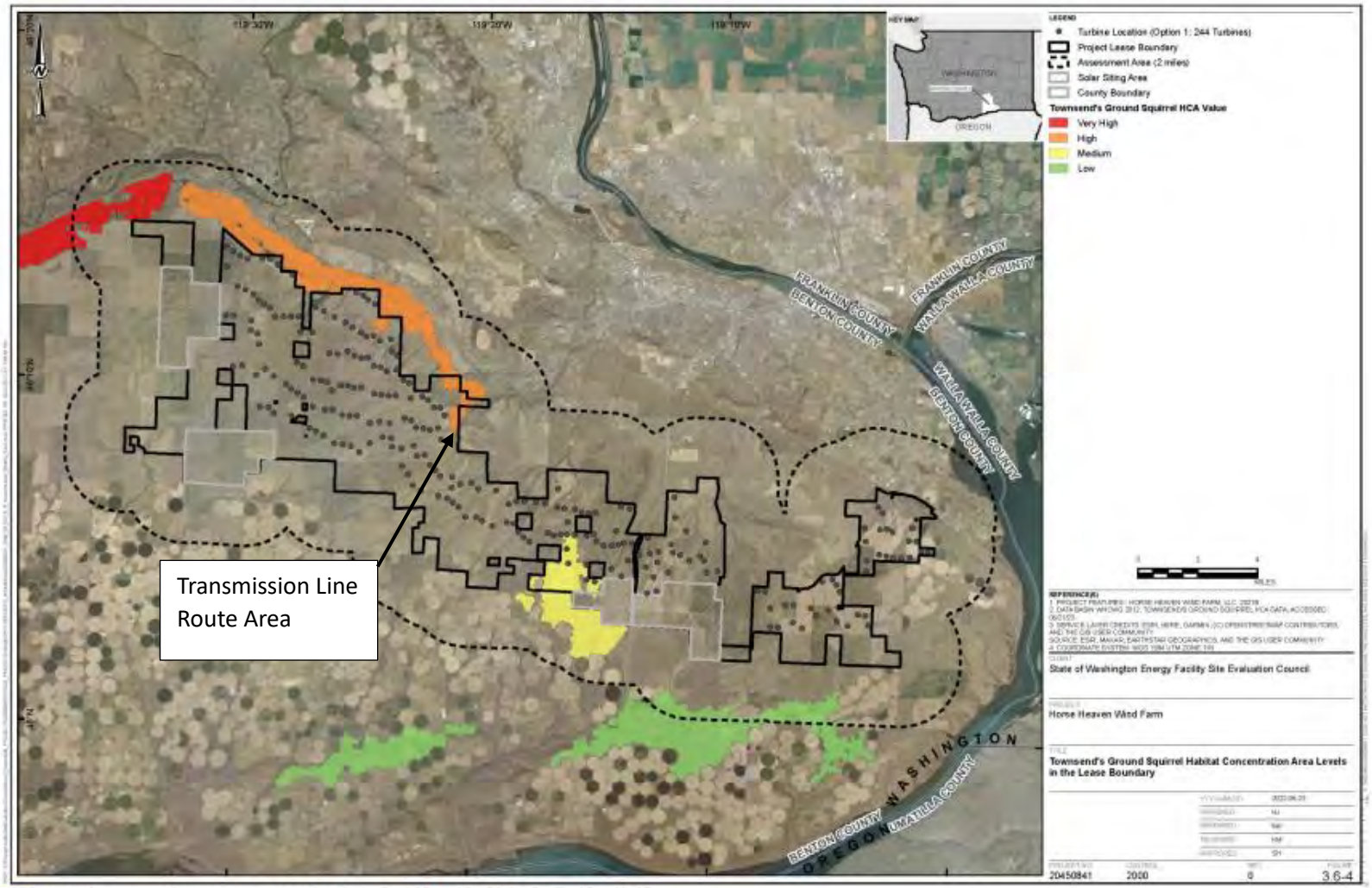


Figure 3.6-4: Townsend's Ground Squirrel Habitat Concentration Area Levels in the Lease Boundary

Figure 3.6-3 WDFW Occurrence Location-Loggerhead Shrike

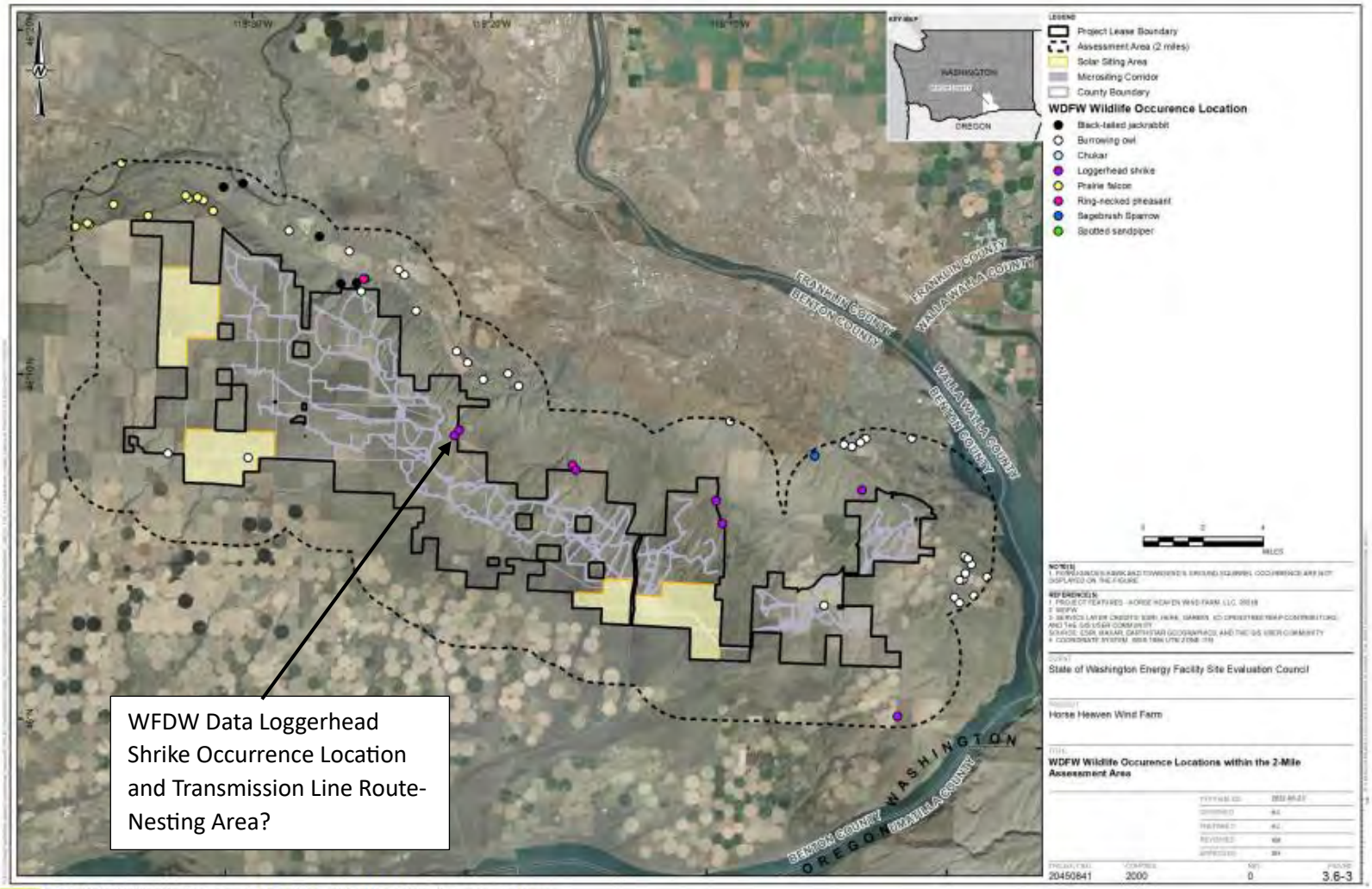
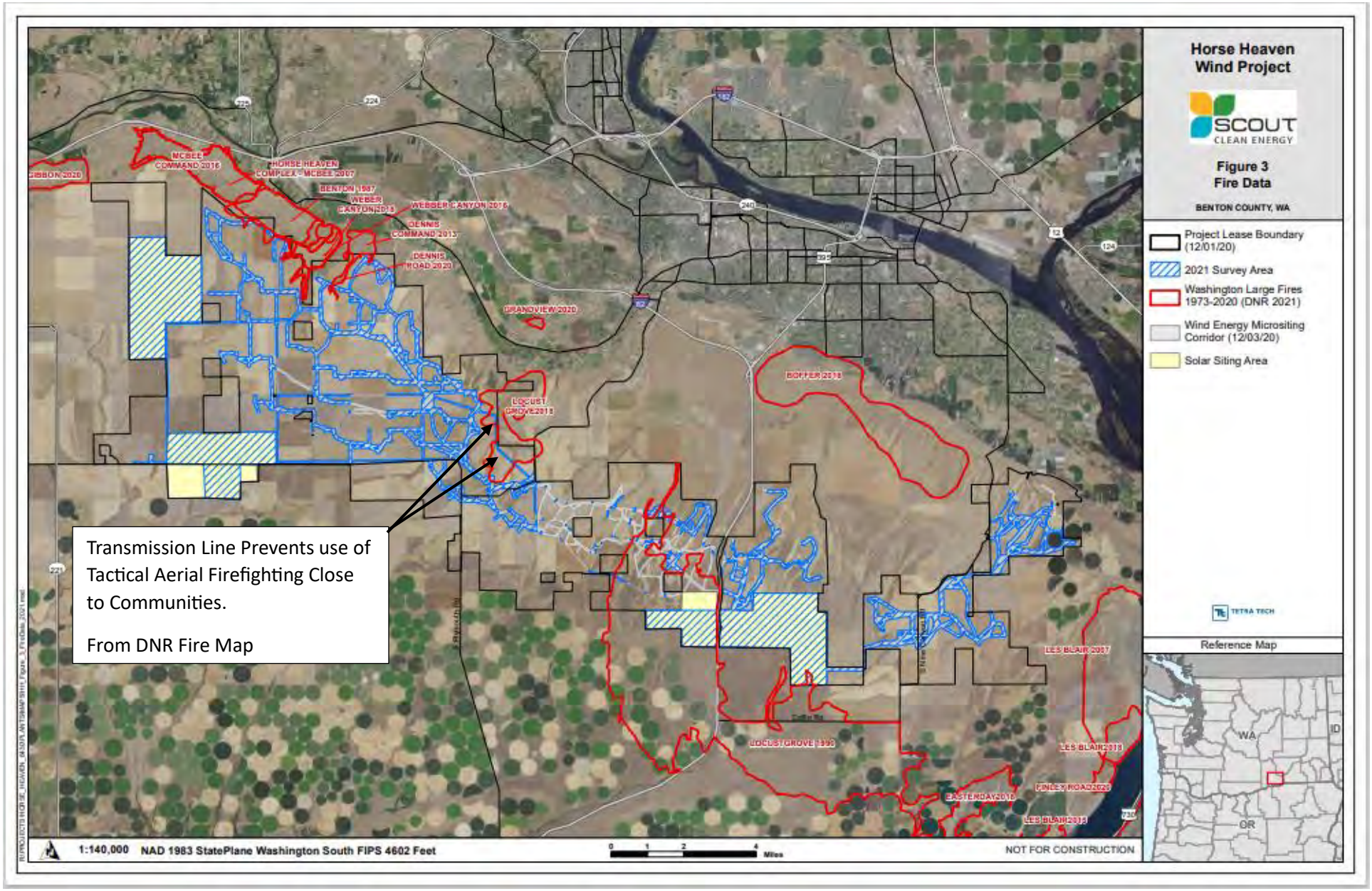


Figure 3.6-3: WDFW Wildlife Occurrence Locations within the 2-Mile Assessment Area

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Large Fires ASC Supplemental Botany and Habitat Report- Figure 3 Fire Map



Date: March 14, 2024
Public Comment
Comments and rebuttal to Letter from Scout (Applicant) Clean Energy Dated January 19, 2024.

Horse Heaven Hills Project
From: Tri-Cities CARES- Dave Sharp, Karen Brun, Paul Krupin, Pam Minelli

The intent of Applicant's letter dated 1/19/2024 can only be to pressure, or otherwise influence EFSEC to change direction in the deliberation process. Much of their letter focuses on turbine exclusion and the 2-mile exclusion zone around historical nests. The problem with that position is that the Ferruginous Hawk impact is only one of many that this project brings. The exclusion recommendation presented by EFSEC staff judged the turbine as high impact, based not on a single issue, but on several, turbine by turbine.

EFSEC is charged with the responsibility of balancing the benefits of the project with the impacts to the environment. The Applicant has had over 3 years to present their case. It is past the time for the Applicant to let EFSEC perform their jobs without putting their finger on the scale. TCC will rebut the Applicant letter by numbered topic/issue.

1. **General Site Capacity and the Application for Site Certification**-Page 1 of Letter.

TCC Comment-The HHH site will not support the applied for nameplate generation, proposed micrositing corridors, and infrastructure specified without significant impact to the environment. Applicant's approach appears to be to obscure and minimize the impacts of the project. This was especially apparent with the visual aspects of the project. The ASC stated that BLM visual assessment methodology was used, but we saw no attempt to engage local stakeholders in finding appropriate Key Observation Points. There was no testimonial record of a stakeholder assessment team or rating sheets: a requirement of the BLM methodology. Our review of the data request/response record suggests that Applicant may have hand-picked the KOP locations and "suggested" to EFSEC the use of others. To this day, there are still deficiencies in the visual record, and residents that do not know what the impact will be. TCC had to expend scarce funds to independently develop our own visual representations to show unsuspecting residents what was being planned.

The project site chosen is bordered by Military Training Flight Route restrictions to the South and West, and bumps against a metropolitan area with a population over 300,000 to the North. The NE corner hugs the Nine Canyon Wind Project, and the SE corner is restricted by wildlife impact. In between are other sensitive areas associated with wildlife and wildlife corridors, State endangered and threatened species, a wetland, loss of habitat, visual impacts, likely loss of use of a public multi-use recreation area, to say nothing of the issues around traditional cultural property, and loss of ability to effectively fight wildfires common in this area.

2. **"Likely forcing procurement of a taller wind turbine model."** Page 3 of the letter.

TCC Comment: Tri-cities Cares has already commented on the Applicant's assertion that turbines taller than those presented in the ASC likely may be required for reasons of turbine unavailability, and citing a "notification" they received that the under 500' turbines may not be available. **Do not accept that premise, which we would opine as a "red herring"**. The sub-500 ft turbine is the workhorse of the GE fleet. We find the statement that the Applicant made as misleading and fear mongering. Substituting turbines with specifications over the envelope criteria in the ASC will be a significant and challengeable event. Indeed, one of the smaller turbines in Option 1 already poses significant issues to listed avian species.

3. **Project Hybrid Design**-Mr. Rucker stated in the letter that "*The Horse Heaven Clean Energy Center Project is a multi-technology, hybrid facility* ***designed from the outset*** *(emphasis TCC) as an integrated renewable project.*"

TCC Comment-We beg to differ with Mr. Rucker's characterization of the project designed as a hybrid facility from the outset. The Applicant was in the area for approximately 4 years before there was any public indication that the project would be hybrid technology. The Applicant's application with Bonneville Power did not show any hybrid interconnection requests until December 2020, less than 2 months before the Application submittal.

4. **Project Generation Capacity**-Mr. Rucker also states; *"In total, the Council's proposed changes would gut the Project's renewable energy generation capacity, reducing it from 1,150 MW to around a mere 236 MW of wind generation and at most 500MWac solar generation from the western solar array".*

TCC Comment-The HHH project would not be able to **generate** 1150mw. The BPA transmission systems limits maximum generation to 850mw. Even the Final ASC Transmission Section contains the caveat of "up to 350mw" from the East Substation and "up to 500mw" from the West Substation.

In our review of this project, we failed to understand why an Applicant would propose such a large overbuild, with no stated benefit, that would proportionately add costs, but only incrementally increase benefits, if any. There are a number of potential reasons:

- From the FEIS ES 2.2 Alternatives to the Proposed Action: "*Several alternatives were considered for analysis but were eliminated from detailed evaluation in the EIS because they* ***would not generate the designed nameplate generating capacity required by the Applicant.*****"** (Emphasis TCC) This puts Applicant in a position to dictate the mitigation. We could find no other instance in the EFSEC record that a major project did not offer Alternative build option(s).
- Speculative overbuild to preserve capability to add more nameplate at a later date if the BPA transmission infrastructure could then accept higher generation.
- Use the project in a way not discussed in the ASC, or the FEIS.

Reference Mr. Rucker's comment regarding EFSEC "gutting" the project. Our analysis shows the project could install 950mw nameplate: still exceeding the BPA limitation. Our estimate is based upon Council deliberation in the January EFSEC meeting

For perspective, the largest wind project in the State is Lower Snake River at 342.7mw, and the largest solar project is Lund Hill Solar at 150mw. Stated another way: the project would still be nearly 3 times the nameplate generation of the current largest renewable energy project in the State. In our opinion, that is hardly gutting the project.

This community was introduced to CEO Michael Rucker in a March 20, 2020 guest opinion piece in the local newspaper. We think it appropriate to review his words.

5. **Transparency**-In the opening paragraph Mr. Rucker's message was clear: "*That's why transparency with the local community about our wind energy projects is important to everyone here at our company and most especially to me*". In the next paragraph Mr. Rucker stated the project: *"……. could bring up to 600 megawatts (MW) of wind energy to the region and the state of Washington.*

TCC Comment-Mr. Rucker mentioned transparency to the local community. At the time of the Opinion piece, the project was "up to 600mw". By the end of August 2020, the project grew from 600mw of wind to 850mw wind and solar with batteries (first mention of a hybrid concept).

Late in 2020, with no notice to the community officials, the Applicant changed the permitting venue from Benton County to EFSEC. February 2021, they made the first Application for Site Certification (ASC) to EFSEC. The ASC grew the project another 300mw to 1150mw. This blindsided the county and affected residents, including many with no idea of the scope growth the project.

6. Mr. Rucker praised a Washington renewable project *"----development such as the Skookumchuck Wind Project currently in construction in Lewis County near Centralia".*

TCC Comment*:* There are major differences between the Skookumchuck (SP) and the HHH project;

- The SP is a 136mw facility with 38 turbines. As part of the permitting process with Lewis and Thurston counties, their Applicant voluntarily reduced the project from 100 turbines, a reduction of 62%, to reduce environmental impact to wildlife. When the EFSEC Council deliberates reducing the HHH project by a much smaller percentage the Applicant responds in a non-professional manner that should not be tolerated or accepted.
- SP is sited on remote timber land. The nearest incorporated City appears to be Tenino with a population of 1,950 located 15 miles distant. Compare that to the Tri-Cities situation within 300,000 population within 10 miles.
- Skookumchuck renewable energy is going to Northwest utility customers. The HHH Project Applicant has made no commitment for direcet renewable energy benefits to Washington customers.

7. Another quote from Mr. Rucker's opinion piece: *"In fact, the Audubon Society strongly supports properly sited wind energy facilities that reduce the threat to birds posed by a warming climate."*

TCC Comment- The Applicant has vigorously opposed mitigation associated with wildlife. We remind EFSEC of the Head of Washington Audubon's DEIS public comment #578 and the public comment video August 23, 2023 as part of the Adjudication. The comments are consistent and very clear. The HHH project is not sited in a manner that Audubon can support. Their comment strongly opposed siting of many of the turbines for the project and reaffirmed the 2-mile buffer for the Ferruginous Hawk nests, and for wildlife corridor preservation. One of the first public comments came from a WDFW specialist that effectively communicated the same. Later public comment from avian experts on the Ferruginous hawk reaffirmed the two-mile buffer.

8. Mr. Rucker also stated in the public opinion piece: *"Scout Clean Energy takes potential impacts to the local ecology very seriously. We share the public's concerns about bird and bat mortality,* ***which is why we site our projects carefully to minimize impacts****"* (emphasis TCC)"

TCC Comment- A comparison to Mr. Rucker's current letter speaks volumes. Many of the turbines have 3 to 5 high impact categories, whether it be wildlife, wildlife corridors, habitat, loss of recreation opportunity, traditional cultural property, visual impacts, etc. The project is sited so poorly that multiple high impact unavoidable impacts were identified.

9. **Reference Applicant Letter Section III.-Wildlife Corridors.** **Wildlife Corridors**-

The Applicant states in Section III, page 7-8: "*The council's reliance on that map is particularly egregious given that on-the-ground field review has been conducted in the area. Applicant and its biologist experts conducted extensive multi-year site-specific surveys as documented in the application materials. Those data verified that the mapped linkage areas in question are majority disturbed developed and agricultural lands that no longer present viable linkages or habitat qualities as suggested in the 2013 map."*

The context of the comment in the Applicant letter is to allow construction of an optional 230kv transmission line through wildlife corridors.

TCC Comment-The proposed "optional" 230kv transmission brings multiple environmental impacts to environmentally sensitive areas.

There is ample information in the FEIS to characterize the environmental impacts. There is no way to disguise the huge swath in the center of the project that has a combination of wildlife corridors, proximity to endangered avian species and habitat. EFSEC Staff is showing portions of the line removed from the high impact maps is being used for deliberation purposes. TCC believes that a reroute out of from Badger Canyon is a reasonable mitigation action that could be accomplished.

If the line is truly an option, then the Applicant should not be opposed to a rerouted design change. A separate comment will be provided.

Conclusion-TCC's position is that the project is too large and unsuitable for the site and carries unacceptable environmental impact. We asserted that the benefits would be moderate at best, and renewable energy would most likely not go to Washington electricity customers. After over 3 years of studying the Project, we reaffirm those positions.

In their letter to EFSEC, the Applicant disparages the Council deliberation and EFSEC process for most of the letter, and then in the last page "respectfully" requests that the Council effectively abandon the deliberations and use Staff provided direction.

The EFSEC process is dependent upon close cooperation, and Full Disclosure by the Applicant to help make the process both efficient and transparent. The multiple changes made, including successively ballooning the size of the project, making a late venue change on short notice, and multiple revisions to the ASC documents has made this a difficult project for all parties. In the letter's Conclusion the Applicant complains about the EFSEC process not providing a "stream-lined" process. The Applicant needs to look in the mirror to find the party responsible!

In 2018 a "Strategic and Policy Review" for the EFSEC process was written by Chair Drew, and endorsed by the Governor. Legislation was later promulgated to streamline the EFSEC process. As on-point the strategic review, and as well intentioned the legislation, it takes two party cooperation, transparency, realistic expectations, and a willingness to compromise to achieve a mutually desirable outcome. In the case of the HHH project, that appears not to have happened.

Tri-Cities CARES asks that EFSEC Council continue deliberations that would balance the benefits of the project with impacts to the environment. That would include mitigation of above ground infrastructure, in particular the route of the optional 230kv Intertie Transmission line crossing critical wildlife corridors, and maintain the EFSEC position of a 2-mile distance buffer to Ferruginous Hawk nests.

Sincerely,

Tri-City CARES, Karen Brun, Paul Krupin, Pam Minelli, and Dave Sharp

From:	CEASE2020
To:	EFSEC mi Comments; EFSEC (EFSEC); EFSEC (EFSEC); Bumpus, Sonia (EFSEC); Drew, Kathleen (EFSEC); Snarski, Joanne (EFSEC); Hafkemeyer, Ami (EFSEC); Owens, Joan (EFSEC); Grantham, Andrea (EFSEC); Moon, Amy (EFSEC); Randolph, Sara (EFSEC); Shiley, Alex (EFSEC); Greene, Sean (EFSEC); patricia.betts@efsec.wa.gov; osta.davis@efsec.wa.gov
Cc:	GOVOutBound; Office of Governor Inslee
Subject:	C.E.A.S.E. CITIZENS EDUCATED ABOUT SOLAR ENERGY HHH PROJECT COMMENTS FOR THE RECORD
Date:	Wednesday, March 27, 2024 8:44:35 AM
Attachments:	02152024_hawk-2_140058.webp

External Email

EFSEC Chair Drew, these are my comments as the founding member of C.E.A.S.E. Citizens Educated About Solar Clean Energy opposing the Horse Heaven Hills wind and solar project. Please place them on the record. This project will do more harm than good and is a detriment to Benton County. It is a danger to the safety, health and welfare of all the Benton County citizens. The known fire risk in and of itself should stop this project. In the summer of 2023 adjoining Klickitat County experienced the Newell Road fire which consumed 62,000 acres. The aerial firefighting efforts were greatly reduced by the wind turbines obstructing their flight path of the planes not allowing them to drop the fire retardant. This obstruction allowed the fire to burn out of control for weeks. The fire burned up 10s of 1000s of acres of farmland and many structures. It was devasting and this will happen at the HHH project. The lack of a firefighting water source in this remote area contributed to this uncontrolled fire. The HHH project is in a remote area without a water source and will experience the same problem. Do not certify this project. EFSEC think of the citizens you are placing in harms way. Would you place your loved ones in harms way? C.E.A.S.E. supports the 2-mile buffer from the endangered Ferruginous Hawk nesting sites. These hawks must be protected into the future and must not become collateral damage for the profits of the greedy foreign corporation like Scout Clean Energy. Brookfield owner of Scout Clean Energy is a South American foreign corporation and does not care about these hawks. Scout Clean Energy based out of Colorado can build their wind turbine sites in the Colorado Rocky Mountains near their homes, but they won't and don't want them near their homes. Keep the 2-mile Ferruginous hawk buffer in place. Keep all the sub-stations, transformers, inverters, transmission lines, and other energized equipment out of wildlife corridors. Do not allow 8-foot-high chain-link fencing and barbed wired which will impede wildlife migration. Do not accept mitigation money which will never offset the damage done by this destructive HHH project. Protect all the wildlife as they are an important part of the eco-system now and into the future. Additional wildlife and avian studies must be done by independent qualified experts in these fields. Do not allow Tetra Tech to perform and submit any studies as they have a history of falsifying studies. Hunter Point navy base is one example. Native American culture and resources must be protected, and further studies are needed to ensure this protection occurs. Where will the water source for dust control, the manufacture of concrete and to clean solar panels come from. Are there wells present in the proposed area. Has the Washington Department of Ecology issued well permits for drilling and consuming water. Will the 5000 gallon per day limit be adhered to by

Scout Clean Energy. How will the usage be monitored. Will penalties be applied when the limit is violated. If this project is allowed how will decommissioning happen. How will the toxic solar panels, inverters, lithium-ion batteries, transformers, wind turbines, toxic wind turbine blades, and associated harmful fluids be disposed of. Who will be responsible and pay for the cleanup. Scout Clean Energy, I doubt it as they will be long gone with profits in their pockets. When a fire occurs at BESS, in a wind turbine, sub-station, inverter or in the solar site will Scout Clean Energy fight the fire with their onsite personnel. No. With no water source available how will fire suppression be accomplished. If local firefighters must respond will Scout Clean Energy train the first responders, supply all the needed firefighting equipment and pay for services rendered. Will Scout Clean Energy pay for the loss of life of a first responder. Or will that death just be collateral damage. This project will be devasting to the citizens of Benton County directly and indirectly to all citizens of Washington state. The only thing green about this project is the green going Brookfield/Scout Clean Energy's pocket. They are all about money. Chair Drew and EFSEC employees do not allow this project to be built. EFSEC you are jeopardizing everyone's future and that includes you and your families. Stop supporting useless so-called clean energy corporations from foreign countries such as Brookfield/Scout Clean Energy. Wind and solar are not clean and green at all. They are unreliable, non-dispatchable, expensive and can never supply the baseload electricity needed to support America and keep America a great nation. Wind and solar will never replace the existing energy sources. We cannot live without fossil fuels. CO2 is the building block of life and not the dreaded danger climate activists claim it to be. We cannot exist without it and need more. EFSEC wake up and realize the disastrous future you helping to create and do not allow this project to be built. Greg Wagner C.E.A.S.E. Citizens Educated About Solar Energy
Brookfield to invest up to $2 billion in Scout Clean Energy and Standard Solar



Brookfield to invest up to $2 billion in Scout Clean Energy and Standard...

Brookfield to invest up to $2 billion in Scout Clean Energy and Standard Solar. Read full press release here.

wdfw02210 (1).pdf

Public Comment-Avian Use Surveys and Collision Calculations. March 18, 2024

Horse Heaven Wind Project
FEIS Response to Council for the Environment Comment #1117655
Appendix M, Bird and Bat Conservation Strategy,
Appendix 4.6-1 Wind Turbine Wildlife Collision Risk

Dave Sharp
Tri Cities CARES

EFSEC is flying blind with respect to Avian Mortality for this project. The ONLY number that has been presented is the Applicant stating the fatality rate will be about the rate of Nine Canyon at 2.6 birds/mw/year. We have found no basis for that opinion.

In the FEIS the applicant did not provide the avian fatality estimates information requested by the Council for the Environment in comment 1117655.

The Applicant will not voluntarily offer to perform collision risk calculations. That direction must come from FSEC.

TCC believes the avian fatality rate likely will be higher than the Nine Canyon Project. Collision calculations are required to provide the answers. The calculations should be performed for all turbine models for certain species of concern for the following reasons:

1. At this late point in the process EFSEC is in the dark with respect to avian fatalities other than an opinion by the Applicant.
2. The Exposure Index[1] described in Appendix M does not predict collisions or provide a rate. It is not intended for that use. However, the large number of observations including 14 species of concern along with irregularities[2] in the survey process require collision calculations be performed for species listed below.
3. All of the four models of turbines reflect latest trends in wind turbine design that impose the largest rotor possible for the height; the most pronounced and prominent will be a squatty looking design with minimal ground clearance. These models will be more impactful to avian species for two reasons:
    a. A larger rotor diameter increases the turbine hazard zone by a square function, logarithmically increasing collision risk, (Example: increasing rotor diameter of the rotor by 10% will increase the hazard zone of 21%) and,
    b. As a result of the increased rotor diameter, there is a lower cut-in wind speed resulting in higher operating hours and higher proportional risk. Operating hours are a key component of the calculation.

The Applicant has successfully cloaked the performance of the wind project based upon business confidentiality and maintaining competitive advantage. However, without operating hours collision risk calculation to avian species will not be complete.

Skookumchuck used operating hours in their collision for that project.

Avian Use Surveys and Collisions-The AUS's should be the basis to establish whether more specific avian collision models should be performed, and if, so used to further exclude turbines that are statistically more impactful to species of concern. The survey performed showed significant and diverse avian population. Based upon that, TCC believes collision modeling should be performed.

It is unfortunate that the Applicant continues to take the position that they, and they alone can determine mitigation by turbine exclusion. EFSEC has final say as the Lead Agency.

Appendix 4.6-1 conflates and misuses the exposure index with collision risk models and further makes statement about relative avian fatality rates that are not supported. The Appendix report provided a literature search that concludes that larger turbines will have less fatalities/mw/year. We could not find that their literature search was conclusive. This may have been an attempt to respond to the CFE comment in the DEIS discussed above.

This is likely the most impactful site ever permitted in Washington. There are 14 species of concern, and the focus has only been one of those: the ferruginous Hawk. It would be astounding if EFSE does not require a more comprehensive look at avian fatalities.

Tri-Cities CARES believes that as a minimum, collision calculations should be performed for the following species of concern: American White Pelican, Ferruginous Hawk, Sandhill Crane, Bald Eagle, Golden Eagle, and migratory birds in general. Rationale follows:

- Eagle are covered by the Bald and Golden Eagles Endangered Species Act. Current guidelines are to follow USFWS methodology for collision models.
- American White Pelican had the highest Exposure Index (EI) of all Species of concern for the smaller turbines and second high for large turbines. More importantly, the vast majority of AWP observations are concentrated in the East portion of the project. A major AWP breeding ground is Badger Island in the Columbia River 2 miles distant from the project lease boundary.
- Sandhill Cranes, a second State endangered Species, had the most observations of any special concern species. The EI was highest of the species of concern for the taller turbines and second for the smaller turbines. Removal of over half of the SHC observations as being over rotor swept height is also not persuasive. The surveys for Horse Heaven West were completed before the Applicant decided to include a taller turbine.
- Ferruginous Hawks have been discussed in detail.
- Snow Geese, Canadian Geese, and birds subject to the Migratory Bird Treaty Act (Sandhill Cranes discussed above). These had by far the highest mean use Index and EI of all species, and at both turbine option heights. There is current uncertainty around rulemaking associated with the Migratory Bird Treaty Act regarding penalties. The shear number of observations of migratory birds could result in an inordinate number of avia fatalities.

It should be noted that the Skookumchuck had only 3 species of concern, and collision modeling was performed for all of them.

Disclaimer in Final ASC

[1]*Calculation of the exposure index does not consider the geometry of the facility (i.e., the "layout" or how Turbines are organized on the landscape). The interaction described in the hypothetical scenario would be dependent on species-specific avoidance behavior, inter or intra species-specific behaviors, foraging behavior, weather, among many other factors (Barrios and Rodrigues 2004, USFWS 2013, among others). Spacing between Turbines along a string is approximately 0.25 mile from the tower base and the perpendicular distance between strings are much greater (approximately 0.5 to 1 mile), which would allow corrective flight and avoidance behavior. As discussed in the BBCS (Appendix M), the exposure calculation is not a rate nor a likelihood; instead, it is a unitless index that does not account for other possible collision risk factors. In-flight avoidance behavior and habituation are key aspects in a collision risk scenario that are that not included in the exposure risk index calculation. Bird avoidance rates are typically high (>98 percent; Luzenski et al. 2016, Bowgen and Cook 2018) and habituation to structures occur over time which reduces the potential for bird collisions (Watson et al. 2018).*

Survey Irregularities[2] **-**Meant to Mean Not Normal

Appendix M not attributed to an expert on the subject

Surveys were performed for 3 separate project and then aggregated

Major project changes were happening during the survey periods.

Taller turbines options were added after two of the three survey area had been completed. It is unclear how observations were assigned to the larger turbines to obtain Exposure Index.

To: Comments@efsec.wa.gov
From: efsec@efsec.wa.gov
Received: 2024-03-19T16:22:25+00:00
Subject: FW: Urgent Request Regarding Renewable Energy Projects
Has attachment? False

From: Keith Watts <tango_zulu@hotmail.com>
Sent: Tuesday, March 19, 2024 6:45 AM
To: EFSEC (EFSEC) <efsec@efsec.wa.gov>
Subject: Urgent Request Regarding Renewable Energy Projects

External Email

Dear Chair Drew and EFSEC members,
I am writing to express my deep concern about the pace of new renewable energy projects in our state. As we face the impending negative impacts of climate change, it is crucial that we accelerate our transition to cleaner energy sources. Unfortunately, the Energy Facility Site Evaluation Council (EFSEC) seems to be moving at an alarmingly slow pace.
The recent decision to downsize the Horse Heaven project was, in my opinion, a significant mistake. It is not just hawks that will suffer; our entire ecosystem and future generations stand to lose if we fail to invest in robust renewable energy infrastructure. As Norm Dicks aptly pointed out in his Seattle Times editorial, EFSEC's choices could jeopardize project viability and set a dangerous precedent for other clean energy initiatives.
Chair Drew, I implore you to reconsider this decision. Our children's future depends on bold action to combat climate change. Please restore the Horse Heaven project to its original size and prioritize the development of renewable energy sources.
Thank you for your attention to this critical matter.
Sincerely,
Keith H. Watts
5635 178thAve SE
Bellevue, WA 98006

Attachments:

[]

To: Comments@efsec.wa.gov
From: gs_hanson@yahoo.com
Received: 2024-03-19T18:21:45+00:00
Subject: Horse Heaven Hills
Has attachment? False

External Email

Dear EFSEC,

Please tell me the status of Horse Heaven Hills Project. Has EFSEC sent its recommendation to Gov. Inslee?

If not, is there still time to comment? What is the deadline for comments?

Thank you,

Gwen Hanson, MD
Citizens Climate Lobby, Bellevue
Join usto create the political will for a stable climate and empower individuals to have breakthroughs in exercising their personal and political power.

425-401-8374 (home)

425-830-9402 (cell)

Attachments:

[]

To: Comments@efsec.wa.gov
From: khweir@hotmail.com
Received: 2024-03-19T18:05:46+00:00
Subject: Status of Horse Heaven Hills Project
Has attachment? False
External Email Dear EFSEC, I am anxious to know the status of Horse Heaven Hills Project. Has EFSEC sent its recommendation to Gov. Inslee? If not, is there still time to comment? What is the deadline for comment? \ Thank you, Kristi Weir Bellevue WA
Attachments:

[]

Public Comment-Horse Heaven Hills Project March 23, 2024

Dave Sharp
Tri-Cities CARES

Subject: Geological Hazards-Badger Canyon Drainage Area-FEIS Chapter 3, Section 3.2.1.3 Landslides.

This comment is to call to the attention of EFSEC Staff and the Council of "**the inherent risk of adding large rotating equipment with low frequency vibration and deep foundations built in an area with known geological hazards"**; historic landslides (slow-moving ground movement) or liquefaction (fast moving), and the Horse Heaven has added yet another potential issue of concern. We believe the project presents unacceptable geological risk to residents at the base of the Horse Heaven Uplift.

It is almost exactly 10 years from the date of the Oso, Washington mudslide disaster. Forty-three people were killed and 49 homes and other structures destroyed. The landslide has been described as one of, if not the most, deadly landslide in American history. TCC will point out that the OSO site did not have a forcing factor such as **highlighted** above that would increase the risk for residents adjacent to the HHH project.

The area on the North rim of the Horse Heaven Hills have had several areas of landslides as shown in **FEIS Figure 3.2.6 Geologically Hazardous Areas Surrounding Project Lease Boundary.** Attached to this is a screenshot of that Figure with one area highlighted. In this area within the project, we believe there is an enhanced risk of ground movement. The FEIS Chapter 3 Geology points out: *"Benton County experienced only one major landslide between 1984 and 2014. The Prosser landslide occurred in 1986 and **1987 during the construction of Interstate 82 when interstate construction remobilized several very large, prehistoric landslide complexes (DNR 2015)".*** [Emphasis TCC]. We are shocked that, knowing this, the Developer elected to built as near as possible to steep slopes or on cornices, knolls, and ridges that are above population. This is a step beyond being irresponsible. There is population living all along the bottom of the Horse Heaven Uplift, and we believe that more than just one community could be at risk.

The figure shows a historic landslide area within a half mile of a developed community of about 100 homes. Attached to this comment is GIS Map from the Benton County Map Department. The map enlarges potentially affected area. Note the Image shows several lots not built or under construction. Since the image date, those lots have been built out. One portion of the Figure also shows an area subject to liquefaction in close proximity (yards) from residences.

We have also attached a copy of the map depicting **Turbine Option 1, Areas of High Impact.** We have added a 3-mile radius range ring to provide scale. The Council has already indicated that many of the turbines marked as high impact and potentially will be removed. Many of those potentially removed turbines appear to be within a mile of the hazard.

We have also attached a satellite view a current of a county GIS map that shows the community and residences within ½ mile from the landslide areas. The community is called Country Meadow Estates. This is the closest community and adjacent to the project lease boundary. There is one other potential problem area.

We believe that a geologic hazard should be considered a significant impact for this area and add to the other high impacts identified. We cannot comment to what would be an appropriate build setback would be but recommend that the Council use utmost caution. The consequences are profound.

FIGURES FOLLOW IN THIS DOCUMENT

The project will inject a physical forcing element to a currently stable, but historically hazardous, geological environment. If an adverse event occurs, there must be a trail of liability. A party is building a project that, although not expected, can adversely affect others, and in a profound physical way. This project will most likely be sold several times over its life. If the project is sold to a third party the potential liability needs to be disclosed and remain attached to the Purchaser. We want the record to show that the Developer chose to develop next to this area.

First, we request that EFSEC Council fully weigh the consequences that the build could cause. The FEIS discusses "Significant Unavoidable Impacts". The impact of this particular issue is avoidable; build further away, and out of the Badger Canyon drainage. The turbines already proposed for exclusion should not be reinstated, perhaps more should be excluded, and further infrastructure installed on geological hazardous slopes should not be allowed. The optional 230kv transmission line falls within this category.

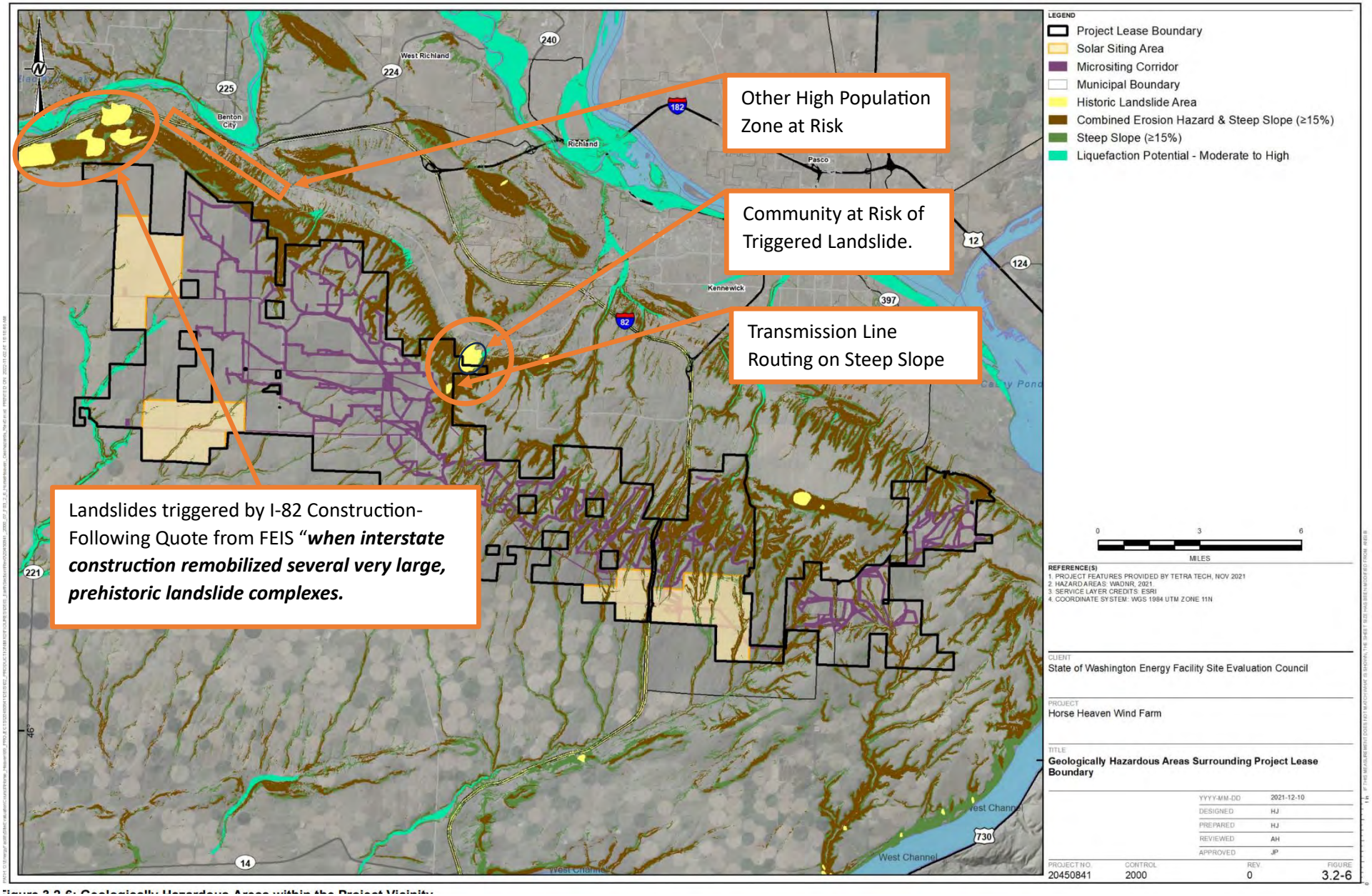
The following is an actual event that transpired over a period of time 30 years ago. In 1976, in the coal mining community of Gillette, Wyoming, housing was short for workers. A 53-home rural community called Rawhide Village was built by a developer. This was not a trailer park. These were permanent stick-built homes. The project was built within about a mile of an existing coal mine property. Several years after construction, problems began. As the mine advanced the coal seam dewatered. That dewatering liberated methane from the coal: not just from the coal being mined, but from the seam under the homes a good distance away. Methane accumulated in basement areas to significant concentrations. Long story short, the area became unlivable from risk of explosion and health impacts. Houses were abandoned, moved, foreclosed, or given back to the banks. People lost everything because they unknowingly built in an area that had an unrecognized hazard. They received no help except expenses for limited hotel expenses. The only party that was liable was the developer who declared bankruptcy early on in the process.

This was an unintended consequence. No one knew the phenomena would take place. I lived in that community at the time. Several of our employees lost their homes. See attached link: Methane memories | Local News | gillettenewsrecord.com The article is a 30 year lookback with history of what happened.

There are parallels between the HH Project and this example. The difference, however, is that the potential hazards are known. The FEIS tells us so. In the above example, no one foresaw the problem that unfolded. The Applicant knows, and is willing to proceed anyway.

Someone, some company, or some entity must be responsible and accountable if an incident comes to pass. What happens if slow ground movement starts after the project begins operation. Is it natural, or is it as a result of the project? Who would be responsible? Who has liability? Who pays? Insurance typically does not pay for events that are not "sudden". If the answer is the Homeowner, there should be a range ring exclusion zone that cannot be disputed, at least the 3-mile ring depicted. We are not implying this would be a disaster type of situation such as Oso, but slow-moving ground movement would be more likely.

Historic Landslide Area- FEIS Figure 3.2-6 Highlighted Landslide Zone



Turbine Layout Option 1-Areas of High Impact Residential Area Highlighted-3-Mile Range Ring Added

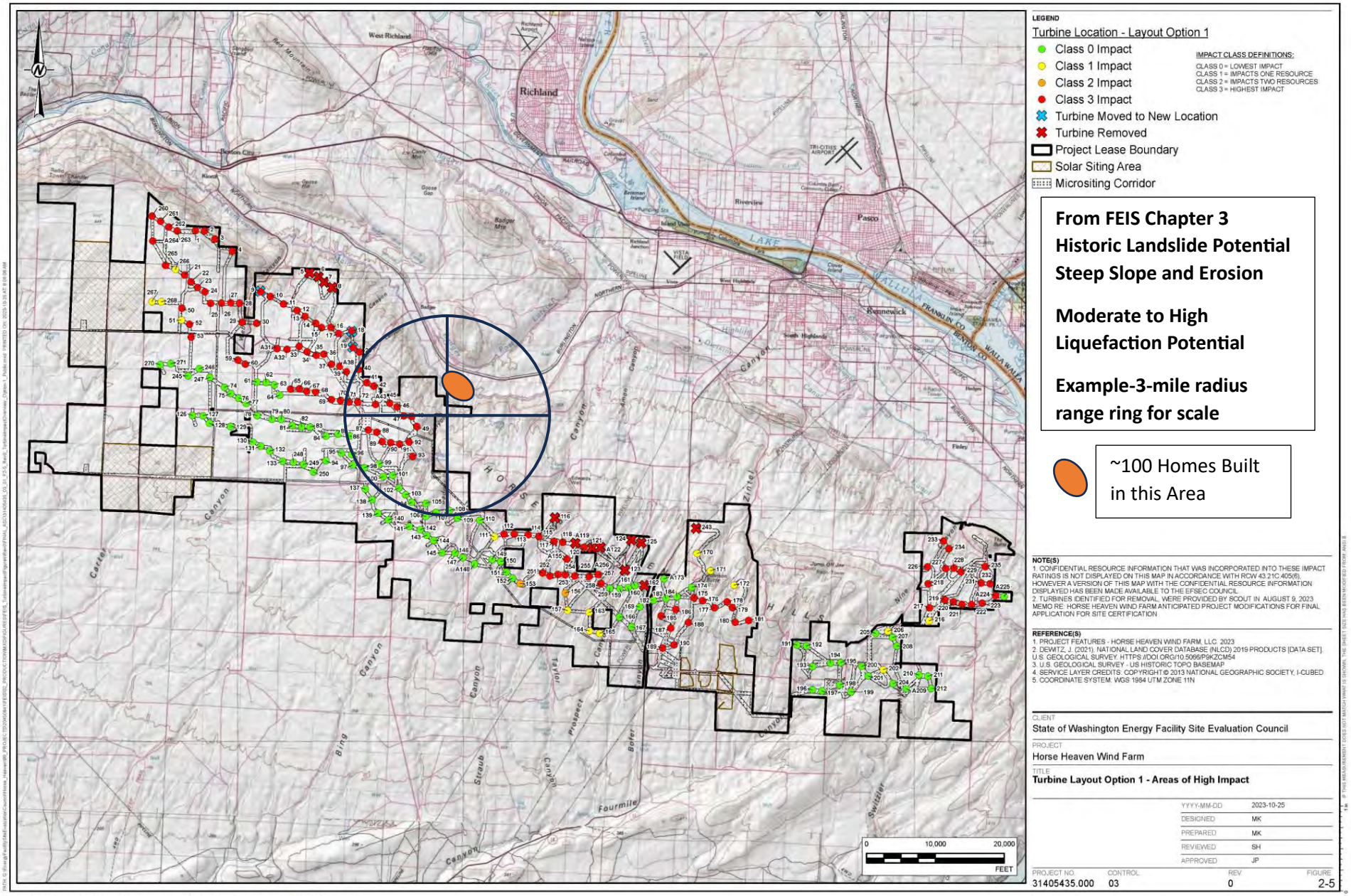
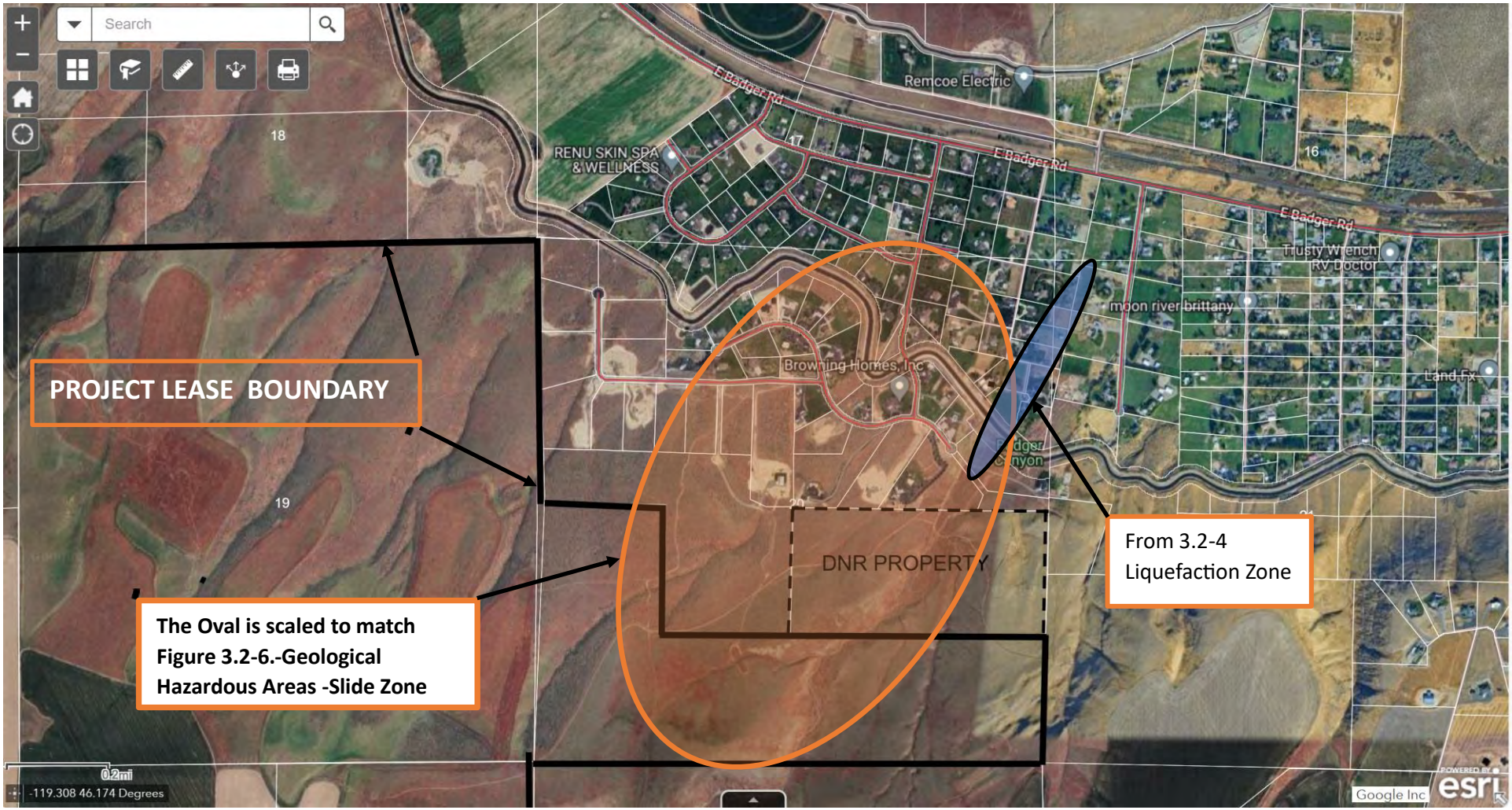


Figure 2-5: Turbine Layout Option 1 - Areas of High Impact

County GIS Mapping-Satellite View, Country Meadows Estates Community



From:	EFSEC (EFSEC)
To:	EFSEC mi Comments
Subject:	FW: COMMENTS ON THE PROPOSED HORSE HEAVEN HILLS WINDMILL PROJECT
Date:	Wednesday, March 27, 2024 10:46:05 AM
Attachments:	WINDMILLS AND FIRES A MAJOR CONCERN MARCH 2024.docx WINDMILLS AND FIRES A MAJOR CONCERN MARCH 2024.docx

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From: Anthony Umek <akueconsult@gmail.com>
Sent: Tuesday, March 26, 2024 9:28 PM
To: EFSEC (EFSEC) <efsec@efsec.wa.gov>
Subject: COMMENTS ON THE PROPOSED HORSE HEAVEN HILLS WINDMILL PROJECT

External Email

I am a Tri City resident who enjoys our lifestyle, and I also support developing energy sources that reduce our carbon footprint. But I have 2 major concerns with the proposed HH Windmill Project. Neither of these have been adequately addressed from my perspective, and they should be. Project planning must adequately assess the costs, benefits,risks and the safety of operations and maintenance of proposed projects. This must include attention to detail and a robust failure modes and effects analysis (FMEA) that addresses risks and their unintended consequences. Recent issues with Boeing aircraft have reminded us that inadequate attention to detail and inadequate FMEA can result in serious consequences.

My two major issues are:

1. **Capacity Factor**: wind turbines have at best ~ 30% capacity factor (worldwide data supports this fact), because they are dependent on the uncertainty of weather. Solar panels have a similar issue. To maintain a civil society and our way of life and to move away from fossil fuels we need energy sources with high "capacity factors". Having adequate, high-capacity electrical generation is critical to a range of key services including hospitals, airports, Fire Depts, Emergency Centers; as well as 24x7 charging of Electric vehicles. Only hydro and nuclear power can provide adequate, non-fossil fueled high-capacity factors. Energy Northwest's Nuclear station capacity factor has consistently exceeded 95%. Hydro is currently limited because of the requirement to "load follow" wind and solar. This results in undue cycling of components that can cause wear and tear. Unfettered hydro is needed.
2. **Turbine fires and impacts on firefighters and equipment. Although not a problem with hydro and small modular reactors, there are real fire related risks associated with wind turbines, especially those with very large blades.** Please see the attached Word File for supporting information.

Thank you for the opportunity to comment.

Tony Umek
2972 Clark Court
West Richland, WA 99353
509-438-6700

FIRES AND WINDMILLS – A MAJOR CONCERN – INFORMATION SOURCES LISTED BELOW – MARCH 2024

SOURCE: FIRETRACE INTERNATIONAL WEBSITE – MARCH 2024

Research conducted by Caithness Windfarm Information Forum (CWIF) found that over the last five years, the average number of wind turbines fires was 25.4. Other researchers feel the number of cases of turbine fires is significantly underestimated based on the fact that there is no required reporting for turbine fires. Also, in the case of official reports, the reports can be incomplete, biased, or contain non-publicly available data. In a previous report, the Telegraph and Renewables UK both have estimated that 91 percent of wind turbine fires go unreported. With the average cost of a wind turbine fire at $4.5M, the annual financial impact could be anywhere from $114.3M to $1.35B.

Caithness Windfarm Information Forum (CWIF), an anti-windfarm campaign group, recorded **1,328 accidents involving wind turbines** between 1995 and 2012. Out of these, **200 incidents** were related to fire. Remarkably, there were **no recorded fatalities** and only **four recorded injuries** from wind turbine fires during this period[1].
On average, this translates to approximately **11.7 fires per year**, or nearly one fire every month. However, considering that there were **225,000 wind turbines installed globally in 2012**, the overall incidence rate is relatively low. On average, you could expect **one fire per year for every 19,230 turbines operating worldwide**[1].

Based on research conducted by CWIF, since 2000 there have been 385 documented wind turbine fires. A number of these fires where not only a total loss of the turbine but had devastating consequences. In June 2012, the View Fire, which burned 367 acres in Riverside County, California, was caused by a wind turbine fire. Nearby residences were evacuated, and over 100 firefighters fought the wildfire to get it contained. A little over a year later, a tragedy that the wind industry had not yet experienced occurred. In October 2013, two young mechanics became trapped on top of a burning wind turbine and died as a result at the Piet de Wit Wind Farm. Because of the height of turbines, a specialized team of firefighters was called to battle the fire and recover the victims.

More recently, in the US, two wildfires were sparked from wind turbine fires. In July 2019, melted debris falling from a turbine fire caught the surrounding grass and brush on fire to cause the Juniper Fire wildfire, which put 39 structures in danger. It took almost 200 fire crew members to contain the 250-acre fire over three days. A turbine fire on August 26, 2019, is blamed for the Rhodes Ranch 3 Fire outside of Abilene, Texas. Record-setting temperatures and rough terrain increased the challenges for firefighters. Fire crews on the ground watched over the containment lines while aircrews spread fire retardant and water on hot spots. Luckily, in both cases, there were no reports of injury or structural damage. Wind turbine fires are not something you want to face in your business because it can harm your assets, your staff, and the surrounding environment.

SOURCE: By Courtney Flatt (Northwest News Network); Feb. 5, 2024 2:45 p.m.

The height of the turbines would likely prevent some aerial firefighting, including the use of drones and helicopters, Washington State Department of Natural Resources leaders told the council.

While the turbines could reach up to 657 feet, most aerial firefighting happens below 500 feet, according to Russ Lane, manager of the DNR Wildland Fire Management Division. Aerial firefighting could be unsafe in the middle of the proposed project.

"The density and spacing of the towers would essentially create a no-fly zone over the entire project area. We would apply an additional 'safety buffer' of one-to-two tower-heights around the project to ensure safe separation for aircraft operations," Lane wrote. If a water or flame bucket got tangled in a turbine blade, the results could be "catastrophic," he said.

During the meeting, Amy Moon, EFSEC siting and compliance lead, reported Lane's thoughts to the council. Fighting fires from the air by dropping water or flame retardant could do more damage to wind projects than the fire, she said.

"These drops come down with the force of gravity and many thousands of pounds of water or retardant that could easily snap off blades and could do other damage to towers," Moon said.

In addition, Lonnie Click, Benton County Fire District No. 1 Chief, told the council the fire district's responses would be "nearly exact" to DNR's responses.

Young raised the concern that fire plans for fighting from the ground should be really well thought out – making up for a lack of ability to fight fires from the air. It's a problem for all wind projects, he said.

To:
efsec@efsec.wa.gov;Comments@efsec.wa.gov;kathleen.drew@efsec.wa.gov;sonia.bumpus@efsec.wa.gov;joanne.sn
From: cease2020@aol.com
Received: 2024-03-28T03:30:29+00:00
Subject: C.E.A.S.E. CITIZENS EDUCATED ABOUT SOLAR ENERGY
Has attachment? False

External Email

EFSEC, place my comments on the record opposing Scout Clean Energy HHH project proposed in Benton County. I oppose this project because it threatens the endangered and protected Ferruginous Hawk. The wind turbines will kill these hawks and reduce their population possibly making them extinct. Wind turbines are killers of bird, bats and other airborne creatures these populations are dwindling across the world. This indiscriminate killing must stop. Wind turbines will prevent aerial firefighting effort which will allow a fire to spread rapidly across the land endangering wildlife and citizens. Wind turbines prevented effective aerial firefighting efforts during the 63,000 acres Newell Road fire in Klickitat County in the summer of 2023. To allow this project will be negligence on EFSEC's part and endanger many east side citizens. Land based firefighting effort will be ineffective because there are no sources of water, and this will enable the fire to spread. Fencing surrounding the solar sites will negatively impact the wildlife migration and habitat. The disturbance to the land by grading, towers, substations, building, roads and other related equipment will destroy existing wildlife habitat. Scout Clean Energy is owned by a foreign corporation from South America. The do not care how they destroy Benton County and America. We do not want them controlling our electricity. We do not want them in our state. EFSEC say NO to this project. Tell Inslee this is not good for the citizens of Benton County, Washington and America. Time for this madness to STOP. It's up to you to what's best for Benton County, Washington and America. Deb Wagner C.E.A.S.E. CITIZENS EDUCATED ABOUT SOLAR ENERGY

Attachments:

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To: Comments@efsec.wa.gov
From: efsec@efsec.wa.gov
Received: 2024-03-28T23:31:41+00:00
Subject: FW: HHH Wind Farm
Has attachment? False

From: DJ Crager <djcrager@outlook.com>
Sent: Thursday, March 28, 2024 1:29 PM
To: EFSEC (EFSEC) <efsec@efsec.wa.gov>
Subject: HHH Wind Farm

External Email

Please do not locate the monstrous Horse Heaven Hills windfarm project near the Tri-Cities Washington. The negative impacts certainly outweigh any perceived wins that would result from developing a windfarm in the Horse Heaven Hills that stretches for miles and miles. No other windfarm in Washington State is located so close to an urban population (Tri-Cities has over 300,000 people). Only a few long-term jobs will be created for those who think that is reason enough.

Wind turbines would generate minimal energy in comparison with our hydropower resources in this area. Here, hydropower should be supported and dam breaching prevented as it is an important and efficient green energy resource. And just in general, Washington State is a poor wind resource (per Western Resource Adequacy Program, Washington has the lowest wind resource rating in the Pacific Northwest).
We are so very concerned too about the risks to our wildlife from the turbine blades. Birds especially will be at risk. How will they know to go around the whirling blades? So many will be killed.
Lastly, this great wall of gigantic turbines along the hills will prevent any expansion of our community to the south.Who would build amongst this wind farm? It seems that the high-maintenance wind turbines are a low-tech energy solution. Sadly, we may be stuck with these metallic monuments of an antiquated technology because it would cost too much to take them down when better solutions come along. This wind farm will forever change this area for the worse. Please reconsider locating the windfarm here.

Attachments:

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Confederated Tribes and Bands
of the Yakama Nation

Established by the
Treaty of June 9, 1855

April 10, 2024

Sent via Electronic Mail

ENERGY FACILITY SITE EVALUATION COUNCIL
efsec@efsec.wa.gov

Re: Horse Heaven Hills Wind & Solar Project
Draft Recommendation to Governor Inslee and Site Certification Agreement

Dear Energy Facility Site Evaluation Council,

I write on behalf of the Confederated Tribes and Bands of the Yakama Nation ("Yakama Nation") regarding the recently-published draft Recommendation to the Governor ("Recommendation") and Site Certification Agreement ("SCA") for the Horse Heaven Hills Wind & Solar Project ("Project"). Yakama Nation's position remains unchanged from our arguments and concerns articulated throughout the course of the adjudication.

The only way to truly reduce impacts to Traditional Cultural Properties ("TCPs") is to significantly reduce the size of the Project, which nearly half of this Council has recognized in supporting Councilmember Young's motion to remove the Project components east of Straub Canyon that impact numerous TCPs. At EFSEC's request, Yakama Nation provided a confidential map of project impacts to TCPs that shows "levels" of impact in a similar way that the Figures 2-5 and 2-6 of the Final Environmental Impact Statement ("FEIS") show levels of impact to known ferruginous hawk areas of use. It is true that many of the class-3 turbines recommended for removal from the Project will decrease the Project's impacts to Yakama Nation TCPs. However, the Recommendation still leaves in place numerous turbines that have the same "level" of TCP impact as the turbines now being removed. Yakama Nation cannot agree that such a proposal correctly balances the statutory objectives discussed in the Recommendation or ". . . conforms to the legislative intent expressed in RCW 80.50.010."

While Yakama Nation has multiple concerns with the FEIS that could not be shared due to a lack of comment period, it is necessary to address one section relied upon by the Recommendation.[1] Specifically, the Recommendation quotes a mitigation measure from the

[1] Yakama Nation greatly appreciated the technical engagement between our staff and EFSEC staff regarding the SEPA review process that occurred separate from the adjudication process. Not all of Yakama Nation's technical feedback was incorporated into the FEIS, which we were unable to articulate due to the lack of FEIS comment period.

FEIS that ". . . requires that the Applicant and EFSEC continue engagement with affected tribes throughout the life of the Project to identify any measures that could effectively reduce impacts to TCPs." However, as Yakama Nation well knows and the Recommendation later states, ". . . the Council learned that constructing the Horse Heaven Wind Farm would result in unavoidable negative impacts to Yakama Nation (TCPs)." This mitigation measure in the FEIS is incompatible with the information provided by Yakama Nation throughout the Project's application review process.

We ask, again, that this Council protect Yakama Nation TCPs with the same care and consideration that it is giving to other resources such as wildlife and recreational values. The Council should go further than the currently-proposed Project modifications in order to address TCP impacts.

Respectfully,

Gerald Lewis

Gerald Lewis, Chairman
YAKAMA NATION TRIBAL COUNCIL

cc: Jonathan Thompson, Attorney General for EFSEC
Sonia Bumpus, EFSEC Director
Amí Hafkemeyer, EFSEC Director of Siting and Compliance
Amy Moon, EFSEC Siting and Compliance Lead

To: Comments@efsec.wa.gov
From: katie.hertfelder@everyactioncustom.com
Received: 2024-04-11T22:40:05+00:00
Subject: Thank you for your commitment to balancing renewable energy development with preservation
Has attachment? False
External Email Dear EFSEC Comments, As an avid birder and member of Audubon in Washington, I am writing to express my strong support for the recent EFSEC recommendation and draft Site Certification Agreement for the Horse Heaven Wind Project. Specifically, I support the Council’s recommendations to augment the mitigation measures identified in the Final Environmental Impact Statement as follows: 1. Restrict the siting of wind turbines within 2 miles of documented Ferruginous Hawk nests and siting of primary project components with 0.5 miles of documented nest sites. 2. Restrict the construction of project components in priority linkage zones for wildlife connectivity, 3. Avoid siting solar arrays in rabbitbrush shrubland habitat or other WDFW-designated Priority Habitats, and 4. Conduct surveys for Burrowing Owls and develop a Burrowing Owl Management Plan if active burrows are found. Protecting birds and their habitats from habitat loss and climate change is a cause that is deeply personal to me, and I am grateful for EFSEC's responsiveness to the concerns of the conservation community, especially regarding the state endangered Ferruginous Hawk and wildlife connectivity. I am encouraged by EFSEC's commitment to balancing renewable energy development with the preservation of these vital habitats and species. Renewable energy is crucial for reaching our state’s ambitious climate goals, but we must proceed in a way that is compatible with our species and habitat recovery goals. Thank you for your dedication to preserving the beauty and wonder of Washington's precious landscapes. Sincerely, Kt Hertfelder 411 Scottfield Ter Ballwin, MO 63011-4323 katie.hertfelder@yahoo.com
Attachments:

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To: Comments@efsec.wa.gov
From: cheri.olney@everyactioncustom.com
Received: 2024-04-13T22:58:20+00:00
Subject: Thank you for your commitment to balancing renewable energy development with preservation
Has attachment? False
External Email Dear EFSEC Comments, As an avid birder and member of Audubon in Washington, I am writing to express my strong support for the recent EFSEC recommendation and draft Site Certification Agreement for the Horse Heaven Wind Project. Specifically, I support the Council’s recommendations to augment the mitigation measures identified in the Final Environmental Impact Statement as follows: 1. Restrict the siting of wind turbines within 2 miles of documented Ferruginous Hawk nests and siting of primary project components with 0.5 miles of documented nest sites. 2. Restrict the construction of project components in priority linkage zones for wildlife connectivity, 3. Avoid siting solar arrays in rabbitbrush shrubland habitat or other WDFW-designated Priority Habitats, and 4. Conduct surveys for Burrowing Owls and develop a Burrowing Owl Management Plan if active burrows are found. Protecting birds and their habitats from habitat loss and climate change is a cause that is deeply personal to me, and I am grateful for EFSEC's responsiveness to the concerns of the conservation community, especially regarding the state endangered Ferruginous Hawk and wildlife connectivity. I am encouraged by EFSEC's commitment to balancing renewable energy development with the preservation of these vital habitats and species. Renewable energy is crucial for reaching our state’s ambitious climate goals, but we must proceed in a way that is compatible with our species and habitat recovery goals. Thank you for your dedication to preserving the beauty and wonder of Washington's precious landscapes. Sincerely, Cheri Olney 1268 Dines Point Rd Greenbank, WA 98253-9735 cheri.olney@whidbey.com
Attachments:

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To: Comments@efsec.wa.gov
From: grayad@everyactioncustom.com
Received: 2024-04-14T01:21:53+00:00
Subject: Thank you for your commitment to balancing renewable energy development with preservation
Has attachment? False

External Email Dear EFSEC Comments, As an avid birder and member of Audubon in Washington, I am writing to express my strong support for the recent EFSEC recommendation and draft Site Certification Agreement for the Horse Heaven Wind Project. Specifically, I support the Council’s recommendations to augment the mitigation measures identified in the Final Environmental Impact Statement as follows: 1. Restrict the siting of wind turbines within 2 miles of documented Ferruginous Hawk nests and siting of primary project components with 0.5 miles of documented nest sites. 2. Restrict the construction of project components in priority linkage zones for wildlife connectivity, 3. Avoid siting solar arrays in rabbitbrush shrubland habitat or other WDFW-designated Priority Habitats, and 4. Conduct surveys for Burrowing Owls and develop a Burrowing Owl Management Plan if active burrows are found. Protecting birds and their habitats from habitat loss and climate change is a cause that is deeply personal to me, and I am grateful for EFSEC's responsiveness to the concerns of the conservation community, especially regarding the state endangered Ferruginous Hawk and wildlife connectivity. I am encouraged by EFSEC's commitment to balancing renewable energy development with the preservation of these vital habitats and species. Renewable energy is crucial for reaching our state’s ambitious climate goals, but we must proceed in a way that is compatible with our species and habitat recovery goals. Thank you for your dedication to preserving the beauty and wonder of Washington's precious landscapes. Sincerely, Alice D Gray PO Box 2206 Port Orchard, WA 98366-0797 grayad@icloud.com

Attachments:

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To: Comments@efsec.wa.gov
From: dennisbahr@everyactioncustom.com
Received: 2024-04-14T14:38:13+00:00
Subject: Thank you for your commitment to balancing renewable energy development with preservation
Has attachment? False
External Email Dear EFSEC Comments, As an avid birder and member of Audubon in Washington, I am writing to express my strong support for the recent EFSEC recommendation and draft Site Certification Agreement for the Horse Heaven Wind Project. Specifically, I support the Council’s recommendations to augment the mitigation measures identified in the Final Environmental Impact Statement as follows: 1. Restrict the siting of wind turbines within 2 miles of documented Ferruginous Hawk nests and siting of primary project components with 0.5 miles of documented nest sites. 2. Restrict the construction of project components in priority linkage zones for wildlife connectivity, 3. Avoid siting solar arrays in rabbitbrush shrubland habitat or other WDFW-designated Priority Habitats, and 4. Conduct surveys for Burrowing Owls and develop a Burrowing Owl Management Plan if active burrows are found. Protecting birds and their habitats from habitat loss and climate change is a cause that is deeply personal to me, and I am grateful for EFSEC's responsiveness to the concerns of the conservation community, especially regarding the state endangered Ferruginous Hawk and wildlife connectivity. I am encouraged by EFSEC's commitment to balancing renewable energy development with the preservation of these vital habitats and species. Renewable energy is crucial for reaching our state’s ambitious climate goals, but we must proceed in a way that is compatible with our species and habitat recovery goals. Thank you for your dedication to preserving the beauty and wonder of Washington's precious landscapes. Sincerely, Dennis Bahr 7425 152nd St SE Snohomish, WA 98296-8436 dennisbahr@yahoo.com
Attachments:

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To: Comments@efsec.wa.gov
From: jbann64@gmail.com
Received: 2024-04-15T04:58:56+00:00
Subject: Horse Heaven Hills EFSEC Recommendation
Has attachment? False

External Email

Hello,
My name is Jeff Banning and my quality of life will be directly impacted by the Horse Heaven Hills Wind Farm. My home is on the north rim of Badger Canyon and the initially proposed turbine locations would have drastically changed the landscape I see every day. I am firmly opposed to these kinds of low energy density projects anywhere near population areas. But, practically speaking, I understand that a significant portion of WA citizens and state government seem to feel a great need to install wind turbines and solar panels. I feel that the EFSEC proposal to remove the turbines with a visual impact to residents of the southern Tri-Cities is a reasonable compromise.

Thank you,
Jeff Banning
86715 E Haven View PRSE
Kennewick,WA 99338
509 551-6147

Attachments:

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To: Comments@efsec.wa.gov
From: kelleycoleman77@everyactioncustom.com
Received: 2024-04-15T19:33:38+00:00
Subject: Thank you for your commitment to balancing renewable energy development with preservation
Has attachment? False
External Email Dear EFSEC Comments, As an avid birder and member of Audubon in Washington, I am writing to express my strong support for the recent EFSEC recommendation and draft Site Certification Agreement for the Horse Heaven Wind Project. Specifically, I support the Council’s recommendations to augment the mitigation measures identified in the Final Environmental Impact Statement as follows: 1. Restrict the siting of wind turbines within 2 miles of documented Ferruginous Hawk nests and siting of primary project components with 0.5 miles of documented nest sites. 2. Restrict the construction of project components in priority linkage zones for wildlife connectivity, 3. Avoid siting solar arrays in rabbitbrush shrubland habitat or other WDFW-designated Priority Habitats, and 4. Conduct surveys for Burrowing Owls and develop a Burrowing Owl Management Plan if active burrows are found. Protecting birds and their habitats from habitat loss and climate change is a cause that is deeply personal to me, and I am grateful for EFSEC's responsiveness to the concerns of the conservation community, especially regarding the state endangered Ferruginous Hawk and wildlife connectivity. I am encouraged by EFSEC's commitment to balancing renewable energy development with the preservation of these vital habitats and species. Renewable energy is crucial for reaching our state’s ambitious climate goals, but we must proceed in a way that is compatible with our species and habitat recovery goals. Thank you for your dedication to preserving the beauty and wonder of Washington's precious landscapes. Sincerely, Kelley Slack 1811 34th St Bellingham, WA 98229-3246 kelleycoleman77@gmail.com
Attachments:

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To: Comments@efsec.wa.gov
From: efsec@efsec.wa.gov
Received: 2024-04-16T00:33:18+00:00
Subject: FW: Horse Haven Hills wind project
Has attachment? False

From: Chuck & Karen <crbatish@pocketinet.com>
Sent: Monday, April 15, 2024 5:11 PM
To: EFSEC (EFSEC) <efsec@efsec.wa.gov>
Subject: Horse Haven Hills wind project

External Email

I have looked over you "Site Certification Agreement between "Horse Heaven Wind Farm, LLC" and Scout Clean Energy LLC."

I believe The "Commissions plans" appear to be be completely bogus and lacking the call for responsibility for both the Wind Farm and Scout Energy. **For Example:**

*The "Restoration Plan" that starts on page 38 goes on for ten pages or so completely ignores one word about what will be restored. There is no definition for what "restored" might mean. Certainly, as soon as the machines turn on the Hills will be lacking all their bat populations. The construction will drive out the wild animals and probably the migrating flocks.Not to mention that no solar or wind farm has yet to actually restore the land before or after use. Scout should be able to prove it has reserves set aside for clean up as well as for maintenance, but no business that that much money to preserve.

*Wind Farms have gone bankrupt because the Federal Government only gives them enough to start building, None are actually cost effective over their life time because they have already used up more energy to construct than they will ever put back into the electrical grid. EVERY wind tower has a higher "energy cost" to build than it will ever replace during it's lifetime. Wind Farms are largely avoided by investors since they understand wind-

power's risky history, again and again. Further, they cost the consumer a double electrical fee because of the gigantic cost of building them and their comparatively short life span for pay off. Plus the payback for expense is slower to accumulate in this case due to the fact that, according to the Department of Energy, usable winds for driving a wind turbine exist less than one third of the time over the Hills. This fact alone should make it plain that this project, at such a great expense, does not merit consideration on this site.

Section G says that mitigation of the storm water and soil erosion will not even begin until operation begins, by then the area will be devoid of any wildlife. Nor does it mention construction caused erosion. Furthermore it does not mention that the need to prevent contaminated soil from becoming airborne during construction. I don't believe the Commissioners have a good understanding of the geological facts of the Horse Haven Hills.

Section I is a hand-wave over a black box signifying that "Dangerous, hazardous and general waste" will never be required to be properly removed. Indeed they cannot be cleaned up and remain where they are left.

Please, reconsider more carefully what a dangerous and expensive environmental experiment this project presents.

Thank you for your consideration. . . . Karen Batishko

Virus-free.www.avast.com

Attachments:

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To: Comments@efsec.wa.gov
From: efsec@efsec.wa.gov
Received: 2024-04-16T19:42:44+00:00
Subject: FW: Horse Heaven Wind/Solar Farm Draft SCA, Citizen Comments
Has attachment? False

From: John Endres <jmmendres@tds.net>
Sent: Tuesday, April 16, 2024 12:42:35 PM (UTC-08:00) Pacific Time (US & Canada)
To: EFSEC (EFSEC) <efsec@efsec.wa.gov>
Subject: Horse Heaven Wind/Solar Farm Draft SCA, Citizen Comments

External Email

Hello:
Will the citizen comments for the recent comment period regarding the Horse Heaven Wind and Solar project be available for citizens to read?
Thank you,
John M. Endres
jmmendres@tds.net

Attachments:

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To: Comments@efsec.wa.gov
From: bettyyakima@everyactioncustom.com
Received: 2024-04-16T04:17:41+00:00
Subject: Thank you for your commitment to balancing renewable energy development with preservation
Has attachment? False

External Email Dear EFSEC Comments, As an avid birder and member of Audubon in Washington, I am writing to express my strong support for the recent EFSEC recommendation and draft Site Certification Agreement for the Horse Heaven Wind Project. Specifically, I support the Council's recommendations to augment the mitigation measures identified in the Final Environmental Impact Statement as follows: 1. Restrict the siting of wind turbines within 2 miles of documented Ferruginous Hawk nests and siting of primary project components with 0.5 miles of documented nest sites. 2. Restrict the construction of project components in priority linkage zones for wildlife connectivity, 3. Avoid siting solar arrays in rabbitbrush shrubland habitat or other WDFW-designated Priority Habitats, and 4. Conduct surveys for Burrowing Owls and develop a Burrowing Owl Management Plan if active burrows are found. Protecting birds and their habitats from habitat loss and climate change is a cause that is deeply personal to me, and I am grateful for EFSEC's responsiveness to the concerns of the conservation community, especially regarding the state endangered Ferruginous Hawk and wildlife connectivity. I am encouraged by EFSEC's commitment to balancing renewable energy development with the preservation of these vital habitats and species. Renewable energy is crucial for reaching our state's ambitious climate goals, but we must proceed in a way that is compatible with our species and habitat recovery goals. Thank you for your dedication to preserving the beauty and wonder of Washington's precious landscapes. Sincerely, Amanda Dickinson 1322 S 18th Ave Yakima, WA 98902-5264 bettyyakima@aol.com

Attachments:

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To: Comments@efsec.wa.gov
From: amy.moon@efsec.wa.gov
Received: 2024-04-17T21:48:05+00:00
Subject: FW: Horse Heaven Energy Center
Has attachment? False

From: Karen Brun <karen@tricitiescares.org>
Sent: Wednesday, April 17, 2024 2:41 PM
To: Moon, Amy (EFSEC) <amy.moon@efsec.wa.gov>; Greene, Sean (EFSEC) <sean.greene@efsec.wa.gov>
Subject: Horse Heaven Energy Center

External Email

Just listened to your synopsis of changes to the Site Certification Agreement based on public comments and letters. Thank you for not succumbing to pressure from Scout Clean Energy.
One thing I didn't hear was a clarification on the amount of generating capacity for wind and solar. The agreement states 1150MW for wind and 800 MW for solar which is incorrect. It should be 1150 total.
Karen Brun
Tri-Cities CARES

Attachments:

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To: Comments@efsec.wa.gov
From: weberet3@gmail.com
Received: 2024-04-17T18:38:48+00:00
Subject: Horse Heaven Wind Farm
Has attachment? False

External Email This is a brief comment which is submitted for the record of public comments on the subject project. For the record, I am in support of all comments advocating restrictions to this project as previously submitted or referenced to these source: >Washington Audubon Society >Lower Columbia Audubon Society >Save-Our-Ridges Organization (the citizens group located in the Tribal-Cities WA who have previously submitted detailed comments regarding impacts to the local area and citizens and recommendations for restrictions.) >Benton County PUD I believe that this proposed wind farm is not in the best interests of the citizens of Washington state. Low power density, renewable electric power sources are a useful part of future electricity sources. However, such sources require huge land areas and offer relatively short useful/design unit life spans (about 20-30 years) and experience numerous maintenance/repair outages. I advocate for more highly distributed sources (i.e. - solar panels on buildings, wind turbines in remote areas, if cited with appropriate attention to protecting natural ecosystems (including potential for restoration of degraded areas). I also am concerned for electric grid reliability resulting from generation sources that can be interrupted by weather systems, which can last for days to weeks, well beyond makeup by current/economical battery storage units proposed by solar an wind developers. My comment on meeting the future power needs of Washington state is that our interests are best served building new nuclear power reactors, especially the new modular small reactor (SMR) designs, and more of the proven, highly reliable larger (i.e. 1000mgW range) plants. Studies by MIT have shown that nuclear power represents the least environmental impacts, land use impacts and longest usable lifespan for materials resources of any currently available electrical generating technologies. E. Thomas Weber 6622 W. Victoria Ave. Kennewick, WA 99336

Attachments:

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To: Comments@efsec.wa.gov
From: efsec@efsec.wa.gov
Received: 2024-04-19T01:36:11+00:00
Subject: FW: Questions on HHH Project
Has attachment? False

From: Judy <goosie1515@aol.com>
Sent: Thursday, April 18, 2024 6:36:02 PM (UTC-08:00) Pacific Time (US & Canada)
To: Drew, Kathleen (EFSEC) <kathleen.drew@efsec.wa.gov>; Hafkemeyer, Ami (EFSEC) <ami.hafkemeyer@efsec.wa.gov>; Moon, Amy (EFSEC) <amy.moon@efsec.wa.gov>; Grantham, Andrea (EFSEC) <andrea.grantham@efsec.wa.gov>; EFSEC (EFSEC) <efsec@efsec.wa.gov>
Subject: Questions on HHH Project

External Email

Would you please explain what this paragraph means in layman's terms? Thank you.
Administrative relief may be available through a petition for reconsideration, filed within 20 days of the service of the Orders within the Recommendation Package to the Governor. If any such petition for reconsideration is filed, the deadline for answers is 14 days after the date of service of each such petition, see RCW 80.50.100.

1. When will Gov. Inslee receive EFSEC's recommendation for the HHH Project?
2. After Gov. Inslee receives EFSEC's recommendation for the HHH Project, will there be a time period for public comment to him?
3. If there will be a time period for public comment to the governor, when will this happen?
4.How will the people know when to comment? Will there be a public announcement?
5. In the above paragraph in blue, are you saying that EFSEC can renege on their original recommendation to the governor?

Thank You,

Judy

Attachments:

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To: Comments@efsec.wa.gov
From: efsec@efsec.wa.gov
Received: 2024-04-19T20:01:37+00:00
Subject: FW: Sean Greene Clarification- # Turbines in Option #2.
Has attachment? False

From: Dave Sharp <dave@tricitiescares.org>
Sent: Friday, April 19, 2024 12:42 PM
To: EFSEC (EFSEC) <efsec@efsec.wa.gov>; Greene, Sean (EFSEC) <sean.greene@efsec.wa.gov>; Moon, Amy (EFSEC) <amy.moon@efsec.wa.gov>; Hafkemeyer, Ami (EFSEC) <ami.hafkemeyer@efsec.wa.gov>; Bumpus, Sonia (EFSEC) <sonia.bumpus@efsec.wa.gov>
Subject: Sean Greene Clarification- # Turbines in Option #2.

External Email

Follow-up to the Wednesday EFSEC meeting and your presentation. Regarding your #2 that posed maximum height and maximum number of turbines but excluded a maximum for Option #2. In the final ASC the Applicant clearly limits the number of the Option #2 turbines to 147. No less than nine places in the FASC have they said so. That number should appear in the SCA. Likewise, the SCA shouldalso list the maximum height for option #1 turbines as 499'. That has also clearly been in all of the ASC's.

We recognize that the Applicant's comment and letter of April 10 stated they were reconsidering their previous exclusionof turbines. By having the SCA silent on the maximums, it allows a passive change in the Application: by omission. First, it is not appropriate, and second, it gives the appearance of the lead agency favoring the Applicant. Ask yourself this, would the Applicant take advantage of that omission?

A last thought. If the Applicant intends to regain excluded turbines by crowding them closer together, or using a turbine model outside of the ASC height limits it opens up other SEPA issues. If EFSEC has been led to believe that option #1 turbines are not available within the ASC limits, consider it bad information.

David Sharp
Tri-Cities CARES
Email: dave@tricitiescares.org
Webpage: www.tricitiescares.org

Attachments:

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From:	EFSEC (EFSEC)
To:	EFSEC mi Comments
Cc:	Hafkemeyer, Ami (EFSEC); Moon, Amy (EFSEC); Greene, Sean (EFSEC)
Subject:	FW: Horse Heaven Comments and Questions
Date:	Tuesday, April 23, 2024 1:41:50 PM
Attachments:	Horse Heaven Draft SCA Comments_jme_20240410.docx

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From: John Endres <jmmendres@tds.net>
Sent: Tuesday, April 23, 2024 12:19 PM
To: EFSEC (EFSEC) <efsec@efsec.wa.gov>
Subject: Horse Heaven Comments and Questions

External Email

re: Horse Heaven Wind and Solar Project: Unanswered Questions

Hello:
I did not receive answers to my questions in my Comment Letter regarding the Horse Heaven Wind and Solar Project. My comments were submitted and received on April 10, 2024 at 2:25 pm.
In my comments regarding the Horse Heaven Wind and solar Project I requested the following information (Questions are in Bold). My questions are copied into this document from my original letter (which I am also attaching).
If possible, can you please provide answers to my questions?

1. A preliminary Carbon Footprint (CFP) and Life Cycle Inventory/Assessment (LCI/LCA) of the Horse Heaven Wind and Solar project has not be done.
A preliminary Carbon Footprint (CFP) and Life Cycle Inventory/Life Cycle Assessment (LCI/LCA) analysis must be done before any further action on this project can proceed.
Q1: How will we know if this project will actually save more Greenhouse Gases (GHG) than it produces throughout its life cycle?

2. Solar Arrays, Modules, Panels
Q2: Please provide the total estimated number of Crystal Silicon Solar Panels, Silicon Solar Panel dimensions, and Silicon Solar Panel mass values; and the total estimated number Cadmium-Telluride Solar Panels, dimensions, and mass values.

Q3: Where will the Quartzite for Silicon Solar Panels be Sourced (mined) from?
Q4: Will explosives be used for Quartzite mining?
Q5: How much fossil fuel will be used for mining equipment and transport of Quartzite to the silicon smelter?

2.3 Which Silicon Smelting Facilities will provide the Metallurgical-Grade Silicon (MgSi)?
Q6: How much Coal will be mined and used in the Silicon Smelting process, and where are the coal mines located?

Q7: Which smelter(s) will be used? How much Charcoal will be used, and how many Trees will be harvested for Woodchips for the smelting process, and where will they be sourced from?

Q8: What will be the total mass (tons) of coal, charcoal, and wood that will used in the smelting process?
Q9: How will these items be transported to the smelter, and what type of fuel will be used?
Q 10: How much electric energy will be used, and what will be the energy source for the smelting process?
Q 11: How many tons of Greenhouse Gases will be emitted from the silicon smelting process while obtaining the metallurgical grade silicon (MgSi) for the silicon solar panels to be used in this

project?

Q 12: 2.4 Where will the MgSi be further processed into monocrystalline or polycrystalline panels?

A	***Q 13: How much energy will be used and what mass of GHGs will be emitted for processing the MgSi into mono-crystalline and/or poly-crystalline silicon solar panels?*** ***Q 14: What will be the total number of Silicon Solar Panels for this project?***

2.5 Balance of Systems (BOS) for Silicon Solar Panels

A	***Q15: How much Steel, Copper, Aluminum and other metals will be used for Solar Panel framing, mounting, and electrical connections***? ***Q16: Where will the metals be mined, smelted, and processed?*** ***Q17: How will the supplies be transported to the Horse heaven site? Please provide quantities in mass values.***
B	***Q 18: Where will Inverters and other electrical components be sourced from, and how will they be transported?***

2.6 Cadmium Telluride (CadTe) Solar Panels

A	***Q 19:* Cadmium*. What ores will provide the source of Cadmium-- Zinc, Copper, Lead?*** ***Q 20: Where will the ores be mined, and where will they be processed for the extraction and smelting to obtain the Cadmium?*** ***Q 21: What will be the estimated total amount of Cadmium obtained for use in Solar Panels?*** ***Q 22: What will be the emissions from the extraction process. Please provide the quantity and mass of Cadmium that will be used.*** ***Q 23: Cadmium is very toxic, what precautions will be taken to ensure Cadmium is not leaked into the environment?***
B	**Q 24: Tellurium.** ***What ores will be the source of Tellurium—Copper mining, or other metal mining?*** ***Q 25: Where will the ores be mined and where will they be processed for extraction to obtain the Tellurium? What will be the emissions from the extraction process***. ***Q 26: Will the source of Tellurium be in the USA, or a foreign country?*** ***Q 27: Please provide the quantity and mass of Tellurium that will be used***. ***Q 28: Tellurium is a toxic substance, what precautions will be taken to ensure Tellurium is not leaked into the environment?***

2.7 Balance of Systems (BOS) for CadTe Solar Panels

A	***Q 29: See 2.5 A above***
B	***Q 30: See 2.5 B above***

2.8 Solar Arrays, Battery Energy Storage Systems (BESS), Inverters, Transformers, and Substations

A	***Q 31: Where will the Lithium be mined for the storage batteries?*** ***Q 32: Please provide the mass quantity of Lithium that will be mined, and the quantity of fossil fuels that will be used for mining and transport. Also provide the mass quantity of silicon that will be used in the Lithium batteries.***
B	Inverters, Transformers, and Substations can generate man-made electromagnetic fields (emfs). ***Q 33: What will be the radius of intensity of the emfs?*** Man-made emfs can be detrimental to all life forms. Man-made emfs are "polarized" and are different than the earth's natural "non-polarized" emfs [2]. ***Q 34: What measurements of the man-made emfs will be taken, and what are the potential negative impacts on flora and fauna?***
C	***Q 35: Tracking System: How much steel will be used for the solar array racking system and steel post foundations? Please provide the total mass of steel to be used, and the source of the steel***.
D	***Q 36: The Solar Arrays will obscure much of the soil surface and natural habit from: sunlight, natural precipitation, wind and air movement, etc.*** ***What impacts will this have on soil micro-flora and fauna, insects, native plants, reptiles,***

	mammals, birds, etc.?

3. Wind Turbines

3.1 Wind Turbine Towers

A	It is assumed that the Wind Towers will of the Tubular Steel type. ***Q 37: How much steel (tons) will comprise each of the Towers, and what/where is the source of the steel?***

3.2 Wind Turbine Main Shaft

A	***Q 38: What will the Main shaft be made of: Steel, Aluminum, or Fiberglass? Please specify the material, and the source of the material: e.g., Steel smelter, Aluminum smelter, or Fiberglass manufacturing facility.*** ***Q 39: Please provide the mass (tons) of the metal or fiberglass Main Shaft for the various Wind Turbines that will be part of this project.***

3.3 Wind Turbine Blades

A	Do the blades consist of the standard "Fiberglass Reinforced Polyester (or Epoxy) plus Kevlar or Carbon Fiber" type, or of some other composition? ***Q 40: Please provide the source of the Blade materials and the mass per Blade.***

3.4 Wind Turbine Concrete Foundations

A	***Q41: Please Provide the total amount of Concrete (tons) that will be used for Wind Turbine Foundations.***

3.5 Wind Turbine Nacelle

A	***Q 42: What is the Nacelle box or casing made of? Steel, Aluminum, or Fiberglass?***
B	Internal components of the Nacelle: Gearbox assembly, Aerodynamic braking system, Mechanical braking system, Turbine generator, Electrical power transmission systems. ***Q 43: Please provide the amount (mass) of metals: Steel, Aluminum, Copper, Iron, etc. Please provide the source of these components.*** ***Q 44: Specifically, please address the special Rare-Earth mineral Magnets used in the Generator. See item C***

C	**Rare Earth Minerals**. From the Institute for Energy Research (IER): "Big Wind's Dirty Little Secret: Toxic Lakes and Radioactive Waste", 2023 [3] "The specialized magnets used in the Generator consist of the Rare Earth Minerals Neodymium and Dysprosium, and are sourced from China" "According to the Bulletin of Atomic Sciences, a 2 megawatt (MW) wind turbine contains about 800 pounds of neodymium and 130 pounds of dysprosium. The MIT study cited above estimates that a 2 MW wind turbine contains about 752 pounds of rare earth minerals. "To quantify this in terms of environmental damages, consider that mining one ton of rare earth minerals produces about one ton of radioactive waste, according to the Institute for the Analysis of Global Security. In 2012, the U.S. added a record 13,131 MW of wind generating capacity. That means that between 4.9 million pounds (using MIT's estimate) and 6.1 million pounds (using the Bulletin of Atomic Science's estimate) of rare earths were used in wind turbines installed in 2012. It also means that between 4.9 million and 6.1 million pounds of radioactive waste were created to make these wind turbines." ***Q 45: Please provide the total mass of the Rare Earth Minerals "NEODYMIUM" and "DYSPROSIUM" that will be used in the Wind Turbines, and the total amount of RADIOACTIVE WASTE that will be generated. Also please provide the Source of the Rare Earth Minerals, how they will be transported, and where the Radioactive waste will be stored/disposed.***

Thank you,
John M. Endres
jmmendres@tds.net

Horse Heaven Draft SCA Comments, John M. Endres, April 10, 2024

1. A preliminary Carbon Footprint (CFP) and Life Cycle Inventory/Assessment (LCI/LCA) of the Horse Heaven Wind and Solar project has not be done.

A preliminary Carbon Footprint (CFP) and Life Cycle Inventory/Life Cycle Assessment (LCI/LCA) analysis must be done before any further action on this project can proceed. How will we know if this project will actually save more Greenhouse Gases (GHG) than it produces throughout its life cycle?

2. Solar Arrays, Modules, Panels

Please provide the total estimated number of Crystal Silicon Solar Panels, Silicon Solar Panel dimensions, and Silicon Solar Panel mass values; and the total estimated number Cadmium-Telluride Solar Panels, dimensions, and mass values. Please note: Published Carbon Footprint values of Silicon Solar Panels are significantly flawed, as described below:

2.1 Silicon Solar Panels

In 2017 – 2022, the proposed HiTest/PacWest Silicon Smelter in Newport, WA prompted an investigation into: "The Impact of Silicon Smelting on Crystal Silicon Solar Panel Carbon Footprints" [1]. This study revealed several critical flaws with published Silicon Solar Panel Carbon Footprint determinations, which are listed below:

- **A** Reported carbon footprint values of silicon solar panels found in reviewed literature do NOT include the silicon smelting process, which is perplexing since silicon is the critical component of silicon solar panels.
- **B** Carbon footprint calculations use a process known as Life Cycle Assessment and Life Cycle Inventory. These methods are highly subjective, yield inconsistent and noncomparable results, are not governed by a standard unifying method, and are typically performed by industry instead of independent bodies.
- **C** According to the Intergovernmental Panel on Climate Change (IPCC), greenhouse gas emissions from biomass sources (trees, woodchips, charcoal, etc.) are NOT accounted for at the point of combustion in energy and industrial sectors, including smelting. But we all know that burning wood and charcoal emits carbon dioxide and other gases into the atmosphere. A number of reviewed papers challenge the IPCC's "non-accounting" of biomass emissions at the point of combustion.
- **D** The carbon dioxide sink loss due to the harvest of trees for wood chips and charcoal used in the smelting process is NOT included in silicon solar panel carbon footprints. It can take decades to more than 100 years to replace the carbon dioxide sink loss due to tree harvest.
- **E** A clear and quantifiable definition of "green" does not exist, and "greenwashing" is a persistent problem.
- **F** Using the provided raw material and emissions quantities for the proposed smelter, the impact of silicon smelting on silicon solar panel carbon footprints was estimated and suggests that silicon solar panels account for more atmospheric carbon dioxide than they save over a presumed lifetime of 30 years.

2.2 Where will the Quartzite for Silicon Solar Panels be Sourced (mined) from?

- **A** Will explosives be used for Quartzite mining? How much fossil fuel will be used for mining equipment and transport of Quartzite to the silicon smelter?

2.3 Which Silicon Smelting Facilities will provide the Metallurgical-Grade Silicon (MgSi)?

- **A** How much Coal will be mined and used in the Silicon Smelting process, and where are the coal mines located? Which smelter(s) will be used? How much Charcoal will be used, and how many Trees will be harvested for Woodchips for the smelting process, and where will they be sourced from? What will be the total mass (tons) of coal, charcoal, and wood that will used in the smelting process? How will these items be transported to the smelter, and what type of fuel will be used? How much electric energy will be used, and what will be the energy source for the smelting process? How many tons of

Greenhouse Gases will be emitted from the silicon smelting process while obtaining the metallurgical grade silicon (MgSi) for the silicon solar panels to be used in this project?

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A How much energy will be used and what mass of GHGs will be emitted for processing the MgSi into mono-crystalline and/or poly-crystalline silicon solar panels? What will be the total number Silicon Solar Panels for this project?

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A How much Steel, Copper, Aluminum and other metals will be used for Solar Panel framing, mounting, and electrical connections? Where will the metals be mined, smelted, and processed? How will the supplies be transported to the Horse heaven site? Please provide quantities in mass values.

B Where will Inverters and other electrical components be sourced from, and how will they be transported?

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A See 2.5 A above

B See 2.5 B above

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A Where will the Lithium be mined for the storage batteries? Please provide the mass quantity of Lithium that will be mined, and the quantity of fossil fuels that will be used for mining and transport. Also provide the mass quantity of silicon that will be used in the Lithium batteries.

B Inverters, Transformers, and Substations can generate man-made electromagnetic fields (emfs). What will be the radius of intensity of the emfs? Man-made emfs can be detrimental to all life forms. Man-made emfs are “polarized” and are different than the earth’s natural “non-polarized” emfs [2]. What measurements of the man-made emfs will be taken, and what are the potential negative impacts on flora and fauna?

C Tracking System: How much steel will be used for the solar array racking system and steel post foundations? Please provide the total mass of steel to be used, and the source of the steel.

D The Solar Arrays will obscure much of the soil surface and natural habit from: sunlight, natural precipitation, wind and air movement, etc. What impacts will this have on soil micro-flora and fauna, insects, native plants, reptiles, mammals, birds, etc.?

3. Wind Turbines

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A What will the Main shaft be made of: Steel, Aluminum, or Fiberglass? Please specify the material, and the source of the material: e.g., Steel smelter, Aluminum smelter, or Fiberglass manufacturing facility. Please provide the mass (tons) of the metal or fiberglass Main Shaft for the various Wind Turbines that will be part of this project.

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C **Rare Earth Minerals**. From the Institute for Energy Research (IER): "Big Wind's Dirty Little Secret: Toxic Lakes and Radioactive Waste", 2023 [3]

"The specialized magnets used in the Generator consist of the Rare Earth Minerals Neodymium and Dysprosium, and are sourced from China"

"According to the Bulletin of Atomic Sciences, a 2 megawatt (MW) wind turbine contains about 800 pounds of neodymium and 130 pounds of dysprosium. The MIT study cited above estimates that a 2 MW wind turbine contains about 752 pounds of rare earth minerals.

"To quantify this in terms of environmental damages, consider that mining one ton of rare earth minerals produces about one ton of radioactive waste, according to the Institute for the Analysis of Global Security. In 2012, the U.S. added a record 13,131 MW of wind generating capacity. That means that between 4.9 million pounds (using MIT's estimate) and 6.1 million pounds (using the Bulletin of Atomic Science's estimate) of rare earths were used in wind turbines installed in 2012. It also means that between 4.9 million and 6.1 million pounds of radioactive waste were created to make these wind turbines."

3.6 Other Environmental Concerns of Wind Turbines/Wind Farms

A Noise Pollution and Wind Turbines: Seeking Silent Solutions in Urban Settings BLOG / By Windcycle Energy [4]

"Noise pollution, including that generated by wind turbines, can have various adverse effects on both physical and mental well-being. Physiologically, excessive noise can disrupt sleep patterns, increase stress levels, and contribute to cardiovascular issues. Psychologically, continuous exposure to noise can lead to annoyance, reduced concentration, and decreased productivity."

B "Vibrational noise from wind energy-turbines negatively impacts earthworm abundance" [5]

"Human-induced sensory pollutants can directly affect organisms through an impact on their perception, physiology and behavior (Brumm and Slabbekoorn 2005, Barber et al. 2010, Kight and Swaddle 2011, Naguib 2013, Velilla and Halfwerk 2019). It is possible that wind turbine-induced vibrational noise masks the vibrational cues of approaching foraging moles, making earthworms in noisy areas more prone to predation (Dominoni et al. 2020). Vibratory noise could also be misleading to earthworms (Dominoni et al. 2020), who may not be able to distinguish between vibratory cues coming from an approaching predator such as a mole, and the subterranean waves from the turbines."

"We found that, on average, the number of earthworms decreased by 40% at the point furthest away from the turbines compared to the closest point to the turbines where we measured (128 m versus 8 m). Our results confirm that earthworm abundance decreased substantially as the amplitude of vibrational noise increased. The maximum amplitude difference over the range at which we surveyed earthworms was on average 13 dB. We therefore predict the impact of vibratory noise to be even bigger when measured over the whole transect, as vibrational noise levels near the base of the turbine are up to 30 dB higher than at our furthest sites (> 200 m from the turbine)."

C **Birds and Bats**. Please consult the book: "Bright Green Lies" by Derrick Jensen, Lierre Keith, and Max Wilbert, 2021 [6] for a discussion regarding the numbers of Bird and Bat mortalities. Actually, please consult this well-researched, well-referenced book for the most comprehensive discussion regarding alternative energy issues that is available.

Summary

I oppose the Horse Heaven Wind Solar Farm.

This massive project will significantly damage the entire habitat of this area of Washington State in a multitude of ways, and will do more harm than good with regard to Climate Change. We have not been provided with necessary and complete information to completely assess this project. Concerned citizens should have access of complete information to assess the carbon footprint and environmental footprint of this project. For a project of this magnitude, more time should have been allowed for citizen comment. Instead of pushing for more electrical energy, we should start reducing our seemingly constant demands for more energy and more "things". We are doing significant damage to our planet in our industrial pursuits for more and more energy, and this is only exacerbating climate change. We should start reducing our energy demands. We should stop allowing unnecessary energy demands for projects like "crypto currency", enormous Electronic Server Farms for digital corporations, etc., etc., etc.

References

[1] "The Impact of Silicon Smelting on Crystal Silicon Solar Panel Carbon Footprints", John M. Endres, 2022, Pre-Print paper, ResearchGate

[2] "Polarization: A Key Difference between Man-made and Natural Electromagnetic Fields, in regard to Biological Activity" Dimitris J. Panagopoulos, Olle Johansson & George L. Carlo. Oct 12, 2015. www.nature.com/scientificreports

[3] "Big Wind's Dirty Little Secret: Toxic Waste and Radioactive Waste". October 13, 2023. IER, Institute for Energy Research. https://www.instituteforenergyresearch.org/renewable/wind/big-winds-dirty-little-secret-rare-earth-minerals/

[4] "Noise Pollution and Wind Turbines: Seeking Silent Solutions in Urban Settings". Blog, by Windcycle Energy. https://windcycle.energy/noise-pollution-and-wind-turbines/

[5] "Vibrational noise from wind energy-turbines negatively impacts earthworm abundance". 2021. Estefania Velilla, Eleanor Collinson, Laura Bellato, Matty P. Berg and Wouter Halfwerk. www.oikosjournal.org. https://nsojournals.onlinelibrary.wiley.com/doi/full/10.1111/oik.08166

[6] "Bright Green Lies: How the Environmental Movement Lost Its Way and What We Can Do About It". Derrick Jensen, Lierre Keith, Max Wilbert. 2021

To: Comments@efsec.wa.gov
From: joan.owens@efsec.wa.gov
Received: 2024-04-23T15:14:17+00:00
Subject: FW: HORSEHEAVAN HILLS APPROVAL.
Has attachment? False

Thanks,
~Joan Owens

NOTE: EFSEC email addresses have changed to @efsec.wa.gov! Please update your EFSEC contacts.

Energy Facility Site Evaluation Council
Executive Assistant
Email: joan.owens@efsec.wa.gov
Phone number: (360) 664-1920
EFSEC Email: efsec@efsec.wa.gov
EFSEC phone number: (360) 664-1345
Address: 621 Woodland Square Loop SE, Lacey WA 98503-3172
Mailstop/P.O. Box: 43172
www.efsec.wa.gov

From: Holappa, Karl (EFSEC) <karl.holappa@efsec.wa.gov>
Sent: Monday, April 22, 2024 6:55 AM
To: Owens, Joan (EFSEC) <joan.owens@efsec.wa.gov>
Subject: FW: HORSEHEAVAN HILLS APPROVAL.

Good morning, Joan,

I received this email this morning. I figured you'd be the best person to help me get it to where it needs to be. Thank you!

Best,

Karl Holappa
Public Information Officer
karl.holappa@efsec.wa.gov
Phone: (360) 515-2012

Energy Facility Site Evaluation Council (EFSEC)
www.efsec.wa.gov

From: Richard Yrjanson <dyrjanson@hotmail.com>
Sent: Sunday, April 21, 2024 10:10 PM
To: Holappa, Karl (EFSEC) <karl.holappa@efsec.wa.gov>
Subject: HORSEHEAVAN HILLS APPROVAL.

External Email

This project should not be approved because it is not needed and wind and solar will only increase our costs to the consumer. Over the last 10 years we have wasted money building solar and wind which will not provide reliable power sources and only compete with the hydrogen bub in centralia wa and will require all the power to produce hydrogen production including river water. They are looking at removing the dams and on the Snake

River and I see no effort to coordinate our electrical grid. I followed the present governor's 8 years of spending our tax dollars and look forward to getting a new governor which will not follow present governor's record of providing healthcare, electricity, and relationship with unions, retirement plans, etc, etc. It is good to see him go before gas gets to 5.90 a gallon. The state better start looking into the Biden's hydrogen hub which is going to start electrical costs to soar^. I'm 83 years and lived in this beautiful state for 53 years and seen the first 3 wind generators built by Boeing on the hill overlooking the Columbia River near Goldendale WA they are gone now but our lovely state is nothing more than Wind and Solar eyesores. I am tired of the waste, and unplanned cost that was given to corporations building solar and wind equipment and receiving tax breaks and speaking up with the majority of citizens who are suffering from the highest electrical cost in the country, and the efforts to do away of greenhouse gas. I joined thousands of other people suffering the results of this administration and look forward now to saying enough and will no longer keep on trying to try to understand how this state and present admininistration operate and will no longer even attempt to understand of what a good state government is. So I will quit and enjoy the rest of my time in enjoying my travels out of state as much as possible.

Richard Yrjanson
212 EB Browning Drive
Centralia Wa 98531

509-783-2994

Attachments:
[]

To: Comments@efsec.wa.gov
From: amy.moon@efsec.wa.gov
Received: 2024-04-23T22:31:09+00:00
Subject: FW: Sean Greene Clarification- # Turbines in Option #2.
Has attachment? False

From: Dave Sharp <dave@tricitiescares.org>
Sent: Friday, April 19, 2024 12:42 PM
To: EFSEC (EFSEC) <efsec@efsec.wa.gov>; Greene, Sean (EFSEC) <sean.greene@efsec.wa.gov>; Moon, Amy (EFSEC) <amy.moon@efsec.wa.gov>; Hafkemeyer, Ami (EFSEC) <ami.hafkemeyer@efsec.wa.gov>; Bumpus, Sonia (EFSEC) <sonia.bumpus@efsec.wa.gov>
Subject: Sean Greene Clarification- # Turbines in Option #2.

External Email

Follow-up to the Wednesday EFSEC meeting and your presentation. Regarding your #2 that posed maximum height and maximum number of turbines but excluded a maximum for Option #2. In the final ASC the Applicant clearly limits the number of the Option #2 turbines to 147. No less than nine places in the FASC have they said so. That number should appear in the SCA. Likewise, the SCA should also list the maximum height for option #1 turbines as 499'. That has also clearly been in all of the ASC's.

We recognize that the Applicant's comment and letter of April 10 stated they were reconsidering their previous exclusion of turbines. By having the SCA silent on the maximums, it allows a passive change in the Application: by omission. First, it is not appropriate, and second, it gives the appearance of the lead agency favoring the Applicant.

Ask yourself this, would the Applicant take advantage of that omission?

A last thought. If the Applicant intends to regain excluded turbines by crowding them closer together, or using a turbine model outside of the ASC height limits it opens up other SEPA issues. If EFSEC has been led to believe that option #1 turbines are not available within the ASC limits, consider it bad information.

David Sharp
Tri-Cities CARES
Email: dave@tricitiescares.org
Webpage: www.tricitiescares.org

Attachments:
[]

To: Comments@efsec.wa.gov
From: donnachrispowers@gmail.com
Received: 2024-04-27T16:19:35+00:00
Subject: HH Wind/solar
Has attachment? False

External Email

Once again the government manages to obscure the facts of a project in order to allow "wiggle" room to override the concerns of the local population. Let the wind in Western WA be the basis for your next project.

Attachments:
[]

To: Comments@efsec.wa.gov
From: djcrager@outlook.com
Received: 2024-04-28T13:26:43+00:00
Subject: EFSEC's failure to release the Adjudication Order for Public Review (HH Windfarm Project in Tri-Cities)
Has attachment? False

External Email

I object to the EFSEC not releasing the Adjudication Order for public review before voting on the HH Project. Since there are considerable changes to this project, there should be a supplemental SEPA review at the very least, as this project is being thrust on this area even though arguments against it have been solid. It seems our state government is going to make this happen no matter the negative impact on our community and its wildlife. Sadly, the benefit of some energy output here is outweighed by the everlasting negative impacts it will cause here.

Did EFSEC even read the public comments? Or was the decision made to just go through the bureaucratic hoops, and force it through for the governor's signature as he would be most pleased. As a resident of Kennewick Washington I consider this a devasting project for the Tri-Cities; for its intrusion of turbines that will stop Kennewick's ability to grow any further to the south, unsightly turbines to spoil our hills, killing of our wildlife, especially the hawks, the fire danger that will be imposed; and in the end these turbines won't generate nearly as much electricity as our clean energy hydropower does [FYI - our dams should not be breached]. Solar and hydropower are what makes sense here, not wind power.

Just because wind farm companies are welcomed by our state and no doubt will receive subsidized support to do so, does not mean that it makes sense to operate in this state. Studies show wind farms don't generate much energy in this state. Focus on hydropower or solar please.

Sincerely,

Joan Crager

Attachments:
[]

To: Comments@efsec.wa.gov
From: gramason1@gmail.com
Received: 2024-04-28T06:08:20+00:00
Subject: HHWF
Has attachment? False

External Email

Hello
To whom this may concern:
I'm a Tri-Cities resident opposed to said proposed Wind project at Horse Heaven Hills.
There is no reason why this wind farm needs to proceed at this particular area other than to spite those that oppose.
There is plenty of lands that would be ideal away from the public eye.
This battle has become a power ggrabbed over reach to suffice the Biden agenda and defy the will of the people of those that reside in the area.
Listen to us!!
Shame on those determined to destroy Horse Heaven Hills serenity.
This beautiful area needs to stay clear and pristine for the future of our animals and Indigenous significance of this heritage territory.
We say no
No more pushing us around.
We don't want a wind farm here we have enough.
How would you like some unknown to come take your view without your permission??

Thanks for your understanding and doing the right thing.

Sonia Ayala

Attachments:
[]

To: Comments@efsec.wa.gov
From: dwshepherd49@yahoo.com
Received: 2024-04-28T15:30:30+00:00
Subject: Horse Heaven Hills Wind Farm Project
Has attachment? False

External Email

We, the residents, homeowners, business owners, and visitors of the Tri-Cities and vicinity (stakeholders) oppose the Horse Heaven Hills Wind Farm Project.

This industrial-scale wind farm is presented as green, clean, and beneficial. However, there is ample evidence that this is not true.

This huge and poorly cited project will have significant negative impacts on wildlife, cultural resources, real estate and property values, tourism, air quality, public safety, and the growth and development of local and regional economies.

We ask that the responsible parties deny the Site Certification.

Attachments:
[]

To: Comments@efsec.wa.gov
From: akueconsult@gmail.com
Received: 2024-04-28T03:47:19+00:00
Subject: Horse Heaven Hills Wind Project
Has attachment? False
External Email I understand EFSEC has reviewed comments by various parties and has forwarded a recommendation to Jay Inslee, WA State Governor on thie HH Wind Project. I appreciate the time and hard work EFSEC has put forward. With all due respect, in addition to concerns of local citizens, the WA State DNR and Tribes, I still have a concern that all reasonable alternatives to the wind & solar energy sources were not evaluated. Particularly since we need reliable energy sources with high capacity factors to transition from fossil fuels while maintaining the lifestyle that supports a civil society. Low capacity factor electrical sources are prone to inadequate supply leading to brownouts and blackouts. Lack of adequate energy will endanger health, safety, security and can disrupt a civil society. It is not clear why inherently safe, proven technology, small modular reactors such as NuScale and High Temperature Gas were not considered. Especially since the USDOE Hanford Site is a viable site with existing access to electrical transmission capacity. I look forward to a response. Thank you in advance. Anthony M Umek CEO AKU Enterprises West Richland, WA 509-438-6700 Sent from my iPhone
Attachments:
[]

To: Comments@efsec.wa.gov
From: lburton@ci.benton-city.wa.us
Received: 2024-04-29T13:09:22+00:00
Subject: Eagles
Has attachment? False

External Email

We now have bald eagles residing and nesting on the Yakima River by Benton City. Last Saturday they were flying between the river and Horse Heaven hills. This is a new development that we have not seen before. Any windmills on or near the hills could be devasting on these raptors.

Len Burton
Mayor Benton City, WA
lburton@ci.benton-city.wa.us
Cell 509-554-4746
Work 509-588-3322

Attachments:
[]

To: Comments@efsec.wa.gov
From: isaacstanfield@gmail.com
Received: 2024-04-29T00:02:36+00:00
Subject: Horse Heaven Hills turbine project
Has attachment? False

External Email

I am disappointed that the EFSEC council chose to approve the Horse Heaven Hills turbine project without releasing information on the adjudication order. The public will expect there to be a supplemental SEPA review if there are substantial changes to the project.
Isaac Stanfield

Attachments:
[]

To: Comments@efsec.wa.gov
From: cswakw@frontier.com
Received: 2024-04-29T23:07:52+00:00
Subject: Horse heaven Windfarm issue
Has attachment? False
External Email As a question, could EFSEC point to another wind project that was sent to the governor with the turbine size and location undefined, and no determined water supply? Thanks Chris Wright Sent from my iPhone
Attachments:
[]

Tri-Cities CARES
Response to Draft ASC, based upon EFSEC Council Meeting April 17, 2024
Date: April 31, 2024
Dave Sharp

The Draft SCA opens more questions and confusion about the project than it answers. After the 3-year process of public comment, the SEPA process, the adjudication process and Council deliberation, the lack of specificity in the draft SCA threatens the SEPA process. Leaving specifics out of the SCA has left loopholes for the Applicant's advantage. It does not put guardrails in place that protects the arduous work that has already been done in the SEPA Process.

We heard for the first time in the EFSEC meeting of April 17 the term "Exclusion by Area" rather than by Turbine. This gives give the appearance of EFSEC changing horses, not in mid-stream, but after crossing the river. This is an abrupt change from discussions in the deliberation process. What are the implications of this change? Can the Applicant simply respace turbines, or survey in new micrositing corridors just outside of exclusion areas? The fact that the draft SCA does not reference the turbines excluded to date, and allows up to 222 Turbines in the Draft SCA leaves the door open for the Applicant to relocate or space turbines closer together. This would have the effect of by-passing the SEPA process.

The Council is to be commended for recognizing that a significant number of turbines caused multiple high and unavoidable impact, whether it be further endangering an endangered avian species, or having impact on wildlife corridors, visual, recreation, noise, dust, firefighting techniques, and Native American Traditional Cultural Property.

The Council, as part of their deliberations, voted to exclude 116 turbines from Option #1, leaving 115 turbines, and to exclude 75 turbines from Option #2, leaving 72 turbines. Reference FEIS Chapter 2, Figure 2-5, Areas of High Impact. Those excluded turbines included those most impactful to the environment in at least 3 categories.

Guardrails Need to be Included in the SCA-

- The Draft SCA should include by ID # the non-excluded turbines from the two options listed above.
- EFSEC should pair these turbines with location coordinates. If the coordinates have not been provided by the Applicant, EFSEC should require their submittal for documentation to support the SCA.
- Any changes in location, or additional turbines that had been previously excluded should be subject to Council approval. Doing so will provide a baseline for the SCA, and ensure that any changes do not simply move a high impact turbine to another high impact location, or create a high impact turbine where it did not previously exist.

These are reasonable guardrails that the Council should put in place.

In the Draft SCA, pages 14-15, the Council recommends modifying Hab-1, and putting restrictions on both primary and secondary components that cross high and medium impact wildlife corridors. Those restrictions may result in exclusion or relocation of primary components not included in the deliberations decision numbers referenced, as well as relocation or elimination of some secondary

components. Before finalizing the SCA, those turbines need to be identified by ID #, and if areas of exclusion are to be utilized the areas need to be specifically identified by survey or coordinate locations.

Future Environmental Issues-In the course of time from SCA to start of construction, if other environmental impacts are identified for existing turbines, EFSEC should maintain the right to exclude additional turbines if the impacts rise to the level of the original excluded turbines.

Significant Turbine Exclusions are the Norm in the Permitting Process-The exclusions identified by the Council as a result of public comment and the EIS process is far from abnormal. Reference the latest greenfield wind project in Washington: Skookumchuck reduced from 100 to 38 turbines. EFSEC processed projects Desert Claim, Kittitas Wind, and Whistling Ridge all resulted in reductions of turbines as a result of the SEPA process.

Applicant Refusal to Offer Alternative Build Scenarios is Not Normal-The findings uncovered throughout public comment and SEPA Process indicate an Applicant that either did not perform proper due diligence for the site, or knew the sensitivity of the site but chose not disclose the issues.

How Respacing Turbines Will Affect the SEPA Process-

- Visual Representations were location specific and only prepared, presented, and analyzed for the two options. Closer spacing alters visual impact and invalidates conclusions drawn by expert witnesses, technical reports. In effect, respacing turbines require a comprehensive review to ensure that the SEPA process is not compromised.
- The same with noise, and shadow flicker.
- Avian species will see increased collision risk with closer spacing proportional to the decrease in spacing.

Overall-Avian Issues-This portion of the Horse Heaven Hills is unique, and very different from any other project sited in the Northwest. The project is located within peninsula of land bounded by the Big Bend of the Columbia River, where three other Rivers feed into Columbia. The area is rich in both population and diversity of avian species, as well as being on the Pacific Flyway migration path for Sandhill Cranes and other migratory species. The Skookumchuck project mentioned above included three avian species of interest. The HHH project has no less than 14, of which 12 were observed during Avian Mean Use Surveys.

- The vast majority of attention, comment and analysis has been directed toward the Ferruginous Hawk and their nests. There has not been much attention to the bigger pictures of overall avian mean use and other avian species of interest.
    - Avian Mean Use Surveys and Appendix M Issues-TCC has reviewed existing Appendix M and underlying AUS Surveys and have found a number of issues.
        - There is no Environmental Specialty Company attribution for Appendix M-Bird and Bat Conservation Strategy: arguably the most important document needed to analyze, estimate and compare avian fatalities in the HHH and other projects across the Northwest.
        - The Applicant provided no modeling for Avian Fatality projections, or even a scientific basis for estimation. Their only number provided is as an opinion that the Fatality Rate would be in line with the Nine Canyon number of 2.76 fatalities/mw/year.

- Avian Mean Use Surveys indicated a high mean use by diurnal raptors, on par with the highest seen for any wind project in the Northwest.
- The aggregated Avian Use Survey final report does not represent the totality of avian impact of the project to include flight path data and species differentiation that earlier Surveys show.
- Mean Use Survey results of a sensitive survey point were excluded from the final Horse Heaven East Survey, and at the same time, another survey point not within the project boundary was included. The survey point excluded had the highest diurnal and Buteo mean use of any survey point in the project. This had the effect of presenting more favorable data and obscuring a sensitive high use area from the public and Council review.
    - The excluded survey data overlaid Turbine #'s 182-184, and A175 for Turbine Option #1, and 183 and 184 for Option #2. Reference FEIS Figure 2-5 High Impact Areas. These turbines have not been excluded by the Applicant.
- AUS surveys were utilized to estimate collision risk using a "Bird Exposure Index", a unitless number not meant for that purpose. The BEI was then used to discriminate collision risk between turbine models without considering other risk factor components. This is not a standard practice. TCC believes that the only turbine model correctly represented in the Appendix M BEI is the GE-2.82 model. Reference FEIS Appendix 4.6-1

- The Applicant argues that larger, but less turbines will result in less avian fatalities/mw without scientific analysis or modeling. Operating hours, ground clearance, rotational velocity, rotor span, blade pitching correlated with wind speed, and blade dimensional characteristics all impact avian risk. As an example, the larger rotor diameter models such as the GE-3.03mw are meant to operate at lower wind speeds and operate more hours/year. That increases avian risk. Add to that the larger diameter rotor, and low ground clearance which puts both large and small avian species at greater risk. Appendix 4.6-1 identifies the GE-3.03 machine is higher risk to avian species than a GE-2.82 machine. TCC agrees. That itself illustrates that the Applicant's argument is not necessarily true. Larger Nameplate is not always better.
- For these above reasons, TCC believes that any relocation or spacing changes after the SCA is certified should closely examined from an avian risk standpoint as a SEPA issue.

Turbine Model Changes-In addition to turbine spacing, any change in turbine models that increase height, rotor diameter, estimated operating hours, or nameplate generation parameters should be assessed for overall avian risk.

The Applicant argues that larger but fewer turbines reduce overall avian risk. That argument only holds if the Applicant intends to reduce the number of turbines. For example, if a new Option 1 turbine model increases nameplate by 10%, then the Applicant should decrease the number of turbines by 10%.

From:	RICHARD L MCKIE
To:	EFSEC mi Comments
Subject:	Governor Inslee"s New Position on Horse Heaven Hills Wind Farm is Incorrect - for Reasons Unknown to the EFSEC
Date:	Friday, May 24, 2024 1:54:41 PM
Attachments:	EU President responce on ERU Reply_ARES_2024_1236716.pdf 1984 POD MOD Test Results Pg. 1.png 1984 POD MOD Test Results Pg. 2.png US 5,146,395 Richard L. McKie ERU Patent.pdf

External Email

To: Ms. Kathleen Drew / Chairperson / EFSEC
From: Mr. Scott McKie / The POD MOD Project
Subject: The POD MOD -- An Electric Power Supply That Governor Inslee Refuses to Acknowledge / Exists
Dear Ms. Drew,
If you Google "...Scott McKie - POD MOD -- "Over-Unity" power generator..." you will find a Seattle Times newspaper article written by then staff reporter Mr. Terry McDermott / published "center - front-page" - because the Publisher at the time; felt that the content warranted it:
--- on June 23rd. 1993.
To begin: Nikola Tesla discovered / developed / and US Patented the multiphase AC power system the world uses today
Mr. McDermott's article was written about a Nikola Tesla based / US Invented / US developed (laboratory tested by Northwest Laboratories of Seattle WA.(1984) / US Patented (1992) / "over-unity" / electric power supply -- that is going to Europe first - because:
--- all Washington State / City / State / US Federal Government Agencies / US Universities / and US Commercial entities contacted over the life of the Project totally refused to even consider making funding or technical help available.
So -- at the official written request of Europe's EC President Ursula von der Yelen - through a letter received from Mr. Vincent Berrutto / Head of Unit / Directorate-General of Energy / under the management of Professor Antonio Marco Pantaleo / EC - EIC Accelerator Programme Manager of Breakthrough / Disruptive Technologies -- I have an accelerated application for full funding underway -- for Europe -- first.
You need to also know that the viability of the Project was verified by Mr. Nicholas G. "Nick" Butler - BSEE / Graduate of the University of Washington / BPA Senior Electrical Engineer / who oversaw and was responsible for not only:
--- the several Northwest University located research projects associated with; but also:
--- the location of, and initial design for - the first major sized, BPA funded, Wind Turbine Wind Farms in the Northwest:
--- starting with the vertical shaft "egg-beater" test design - located just North of I-90 / and just West of Ellensburg / on Stuart Anderson's old ranch.
Mr. Butler became a "silent partner" to the POD MOD Project - after I demonstrated a "table-top" demonstration to him - of a Tesla based / "over-unity" - "variable load following" design that produced a "120 VAC / 60 Hz / output power" to "120 VAC / 60

Hz (wall-power)" ratio of over 150% "over-unity":
--- that didn't violate any Laws of Physics.
The system didn't violate any "Laws" --because it "worked" the very same way that every "radio station to radio station tuning circuit" found in every AM or FM radio manufactured after Tesla invented and applied for his US Patent for the radio:
--- on Mar. 20th. 1900
--- over 124 years ago.
For reasons only known to them: Washington State Officials running this state - from Governor Inslee on down - have refused (save for State Senator Andy Billig - who ended accomplishing nothing:
--- refused to even acknowledge that they received the information I sent them.
This is what they have refused acknowledging.
The POD MOD is:
--- totally solid-state / no "fuel of any kind or type" required / environmentally clean- it emits nothing / small - 2.5 cu. ft. / lightweight - 30 lb.
--- modular / inexpensive to produce - less than $2000 per unit / "stand-alone - it has it's own on-board "start-up" power source:
--- does not require a connection to any external power source at any time / does not require "recharging" at any time
--- can have multiples of units connected together for larger / higher output power levels -- just like the 7,920 batteries in a TESLA Model S Plaid.
The POD MOD has a "selectable" VDC or VAC / continuous / "over-unity" electric output power levels:
--- 24 VDC; 48 VDC; 72 VDC; 120 VDC; 230 VDC (reduced from 240 VDC); 240 VDC; 260 VDC; 330 VDC (reduced from 380 VDC); 360 VDC (reduced from 380 VDC); 380 VDC; 400 VDC; and 480 VDC.
"Selectable" VDC outputs can be DC / AC (PWM) inverted to the following VAC continuous / "over-unity" / electric power output levels:
--- 120 VAC; 230 VAC; 240 VAC; 260 VAC; 330 VAC; 360 VAC; 380 VAC; 400 VAC; and 480 VAC.
All VAC output levels will have the following:
--- the correct number of output phases / output voltage / output frequency / and output amperage level
--- 400 VDC / 480 Amps, or
--- 3-phase / 400 VAC / variable frequency / 160 Amps per phase (480 Amps total) is available for all moving vehicle power - because:
The POD MOD has been designed to be manufactured and installed - either as a single unit - or in multiples as required either:
a.) "at" any existing or new "stationary" location; i.e., any home; apartment; office-space (in each floor's power room per occupant);
commercial; or industrial-site -- in Washington State / the US / and world-wide, or:
b.) "in" any existing or new "movable" vehicle - be it battery or internal combustion engine (of any kind or type) powered - by retrofitting-repowering each vehicle with either directly connected AC power as required, or with AC power AC motor(s) as required - be that vehicle on land / "in" or "on" the seas / or in the air as a propeller(s) ; rotor(s) of hi-bypass jet powered private or commercial aircraft (can you say Boeing)
--- making available:
b1.) unlimited range of travel and / or movement, and;

b2.) unlimited time of travel and / or movement.
Remember Mr. Butler - who suddenly passed away soon after retiring from his beloved BPA -- way too soon:
While giving me a tour of the Priest Rapid and then Wanapum Dams on the Columbia River - he realized the following: we could use POD MOD power units to retrofit-repower any and all existing Hydro powered dam sites - along with all existing "heat-sourced" (including Atomic) high voltage electric power plants by:
--- installing multiples of "rack-mounted" POD MOD units against the interior walls of each site's Turbine Hall(s):
--- connecting the new / clean / matching output power through the control room(s) to the existing connected power grid(s):
--- allowing for the shutting down / turning off / of "only the polluting power source(s) and revolving generator(s)" - while allowing each site:
--- to continuously produce it's full / maximum output level / 24 - 7 / 365 days a year -- which they can't do now due to reduced winter snowpack levels - which are only going to get worse.
--- and keeping the site - and all of the jobs - going past any "termination date" due to pollution considerations.
Simply stated: -- the POD MOD technology makes everything, including all renewables / used to produce electricity and power vehicles:
--- redundant - full stop.
Finally: "Nick" and I designed the POD MOD specifically to combat something that he had found while researching some Oil and Gas Industry in the early '80s..
What he had stumbled across - was the earlier research done by Oil and Gas Industry scientist / "participants" - where they found that "...there was a chance..." that their product lines could cause something called Climate Change... (paraphrase).
Well guess what happened.
IF you want any reason to tell the out going Governor -- to "rethink his position" which I've cleaned up for possible public viewing -- you've got it -- because of the following:
Irrespective of the fact that the US/DOE-IPO Title 17 specifically "denies" the POD MOD technology from any US Government funding - not because it doesn't work -- but because:
--- it hasn't been "commercialized" i.e., "front-end debt loading" via the standard means of financing presently in vogue / has not been "accepted" as a "standard means" of producing electricity.
All commercial size / remotely located installations" - require connection to our aging / full to capacity / FERC controlled / 5 year back-logged / power grids -- including any Wind Turbines installed at Horse Heaven.
A POD MOD (or multiples as required) - can be installed and connected, by our "not-for-profit" 501(c)(4):
--- to any power utility / power grid / connected "stationary" or "movable / vehicle" location:
--- just as any other "emergency generator" can be installed.
And if there is no "...contract for power..." in place:
--- that "stationary" or "movable/ vehicle" location -- is not legally required to use any of the "available" electricity from either a "connected power utility or power grid.
I won't do this at present - as I believe it is going to "hit the fan" / politically and economically / here in the State of Washington - and across the US:

--- when it becomes known that the electric bill payers and vehicle fuel purchasers in this state (and the US) - have been denied the following:
--- long term (10 -30 year) / extremely low - set rate - with only inflation connected increases /
--- $0.10 "per hour" / $72 per 30 day month per POD MOD / standard billing / without any installation costs for single home locations and negotiated installation costs for commercial and industrial installations / clean electricity.
If the US/DOE-PPA can make this available to single "stationary" location owners (with all installation costs on the site owner) -- we will go better.
Europe is going to get the economic benefits - first - because the State Governor - would not allow himself to be contacted on this.
I'm going to be converting my vehicles and my home s soon as I can -- because I am sick and tired of Politicians that are married to the idea of "Profits first / the good 'ol consumer will pick up the tab".
I'm supplying the following:
1.) EC President von der Yelen's request letter,
2.) Northwest Laboratories of Seattle test affidavit (two pages)
Had the licensed Electrical Engineer doing the testing - followed the specific instructions given him -- as noted on page two of the affidavit:
--- the total "output power" to "input power" ratio, i.e., what is the "over-unity" feature of the POD MOD - would have been well over 400%.
The bottom two entries on page 2, i.e., 120 VAC / 60 Hz / 0.06 A when compared to the 75 VAC / 60 Hz / 0.03 A actually powering the generator's drive motor - creates the "over-unity" / Tesla based / electric condition allowing the POD MOD to "do what it does".
3.) US Patent 5,146,395 -- and "Richard" is my legal first name
4.) a photo of the finalized hand wired and tested design taken on Sept.19th. 2023 - on my work space -- in my basement.
The electronics to the left and middle - are in transition to a single 7 x 8 professionally manufactured pc-board status for up-to full voltage output Beta testing.
The POD MOD exists - and is "very well, thank you".
If any questions come up concerning the information here - please fee free to contact me at your convenience -- as $1.2 Billion dollars - just for the purchase and installation for something that Nick initially located -- shouldn't be put on the shoulders of the rate payer - simply because the State Politicians and Governor didn't listen.
If you make known this information to the public -- there will be a reaction -- because Frank Blethen, the present Publisher / owner of the Seattle Times:
--- is pulling a "Jay Inslee" - "...I don't see anything new' / don't hear anything new / don't speak anything new..." move.
Yours,
Scott McKie / The POD MOD Project
2846 NW 73rd. St.
Seattle, WA 98117-6253
(206) 782-0856
scotsman7@comcast.net

EUROPEAN COMMISSION
DIRECTORATE-GENERAL FOR ENERGY

Directorate B – Just Transition, Consumers, Energy Security, Efficiency and Innovation
B.5 – Digitalisation, Competitiveness, Research, and Innovation

Brussels
ENER.B.5/VB/kke(2024)2024593

Mr Scott McKie
The POD MOD Project
2846 NW 73rd. St.
Seattle, WA. USA 98117- 6253
(206) 782-0856
scotsman7@comcast.net

Dear Mr McKie,

Thank you for your email of 28 January regarding your patent for solid-state electric power supplies. President von der Leyen has asked me to respond on her behalf as Head of the Research, Innovation, Digitalisation and Competitiveness Unit.

The European Union offers strong financial support to research, innovation and deployment of technologies aimed at decarbonising energy systems and strengthening the security of supply. This is done through several funding programmes and instruments that benefit from substantial financial allocations. Two relevant examples are presented below:

Horizon Europe is the EU's key funding programme for research and innovation, helping to mature the technological readiness of innovative solutions. It currently has a budget of over EUR 95 billion, and tackling climate change is one of its primary objectives. More information can be found on the link below. Please refer to the 'Climate, Energy and Mobility' part of the programme, which would hold the most relevance for your areas of interest.

https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe_en.

Additionally, the EU Innovation Fund is one of the world's largest funding programmes for the demonstration of innovative low-carbon technologies, which bring European 'value added' and can significantly reduce GHG emissions. More information is available at:

https://cinea.ec.europa.eu/programmes/innovation-fund_en#:~:text=The%20EU%20Innovation%20Fund%20is,contribute%20to%20greenhouse%20gas%20reduction.

Commission européenne/Europese Commissie, 1049 Bruxelles/Brussel, BELGIQUE/BELGIË - Tel. +32 22991111
Office: DM24 03/138 - Tel. direct line +32 229-68642

Vincent.BERRUTTO@ec.europa.eu

I therefore encourage you to examine those funding opportunities and, if interested, get in direct contact with the management authorities of the programmes for further discussions and details. The web links above contain all the relevant information for helping you to take an informed decision.

Yours sincerely,

Vincent BERRUTTO

Head of Unit

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Report To: Miller Dobbs & Company Date: September 10, 1984

Report On: Electrical Device/Demonstration Lab No: E 31425

On September 5, 1984 a demonstration of a device to improve the electrical efficiency of an electric motor was witnessed at Marelco Distributing, 3901 Leary Way NW, Seattle, Washington.

Exhibit I attached is a rough schematic sketch of the system demonstrated. The purpose of the demonstration was to show an increase in electrical efficiency. The results of Test 3 purport to show this increase (Power feed V2 = 75 volts, A2 = 0.03 amps; power delivered V4 110 volts A4 - 0.06 amps). This shows a power improvement of $\frac{110 \text{ volts} \times 0.06 \text{ amps}}{75 \text{ volts} \times 0.03 \text{ amp}} = \frac{6.6 \text{ watts}}{2.25 \text{ watts}}$ or 293%.

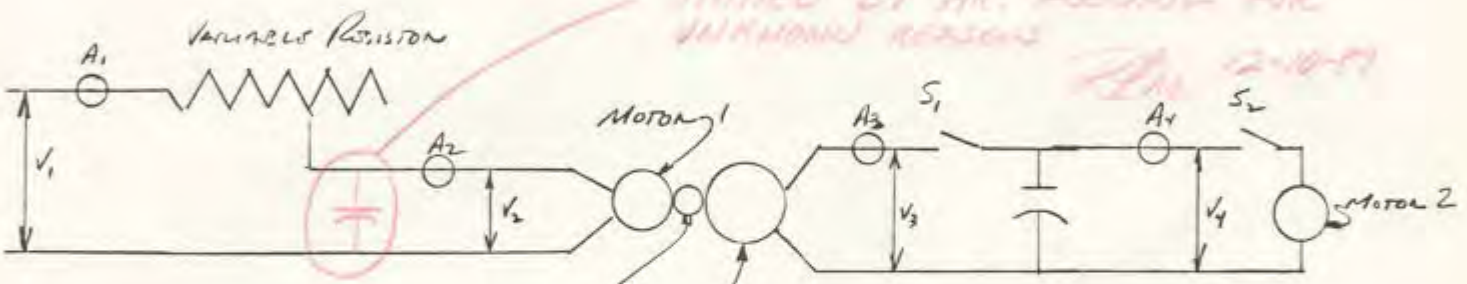
Additional tests at my request showed:

- As a load is applied to Motor #2 the output voltage of the generator (V3) drops.
- When Motor #2 is plugged into a 110V supply it draws 0.03 amps.

SUMMARY AND CONCLUSIONS

- This writer is not qualified to evaluate the electrical circuitry involved on a theoretical basis.
- Under the no-load motor #2 conditions, the device demonstrated shows improved efficiency (V2-75 volts A2 - 0.03 amps) over plugging the motor into City Light supply (110 volts; 0.03 amps) (i.e. the motor is driven with less power ($\frac{75 \times 0.05}{110 \times 0.03} = 68\%$).
- When motor #2 is loaded the circuitry does not function properly. It was reported that the demonstrators knew how to correct the problem but needed additional hardware to demonstrate properly.
- Normally electric motors are designed to operate most efficiently at rated load. Under reduced or no-load conditions the power factor falls and efficiency is reduced. This condition can be partially or wholly corrected by adding capacitors to the circuit. While this writer is not an electrical engineer, it appears that the device demonstrated is basically a capacitator.

V – Voltage
A – Amps
S – Switch



Demonstration Results

	Test 1	Test 2 (Motor)	Test 3 (Generator)
Generator R.P.M	400	400	400
V_1	120	120	120
A_1	—	—	—
V_2	55	85	75
A_2	.02	.03	.03
S_1	Open	Closed	Closed
V_3	105	131	110
A_3	N.A	2.3	~0
S_2	Open	Open	Closed
V_4	N.A	N.A	110
A_4	N.A	N.A	.06

Exhibit I
Electrical
Schematic

US005146395A

United States Patent [19]

McKie

[11] Patent Number: 5,146,395

[45] Date of Patent: Sep. 8, 1992

[54] **POWER SUPPLY INCLUDING TWO TANK CIRCUITS**

[76] Inventor: **Richard L. McKie**, 4618 3rd Ave., N.W., Seattle, Wash. 98107

[21] Appl. No.: **742,761**

[22] Filed: **Aug. 9, 1991**

[51] **Int. Cl.**[5] **H02M 3/07**

[52] **U.S. Cl.** **363/13**; 320/1; 363/16

[58] **Field of Search** 320/1; 363/1, 13, 16, 363/27, 28

[56] **References Cited**

U.S. PATENT DOCUMENTS

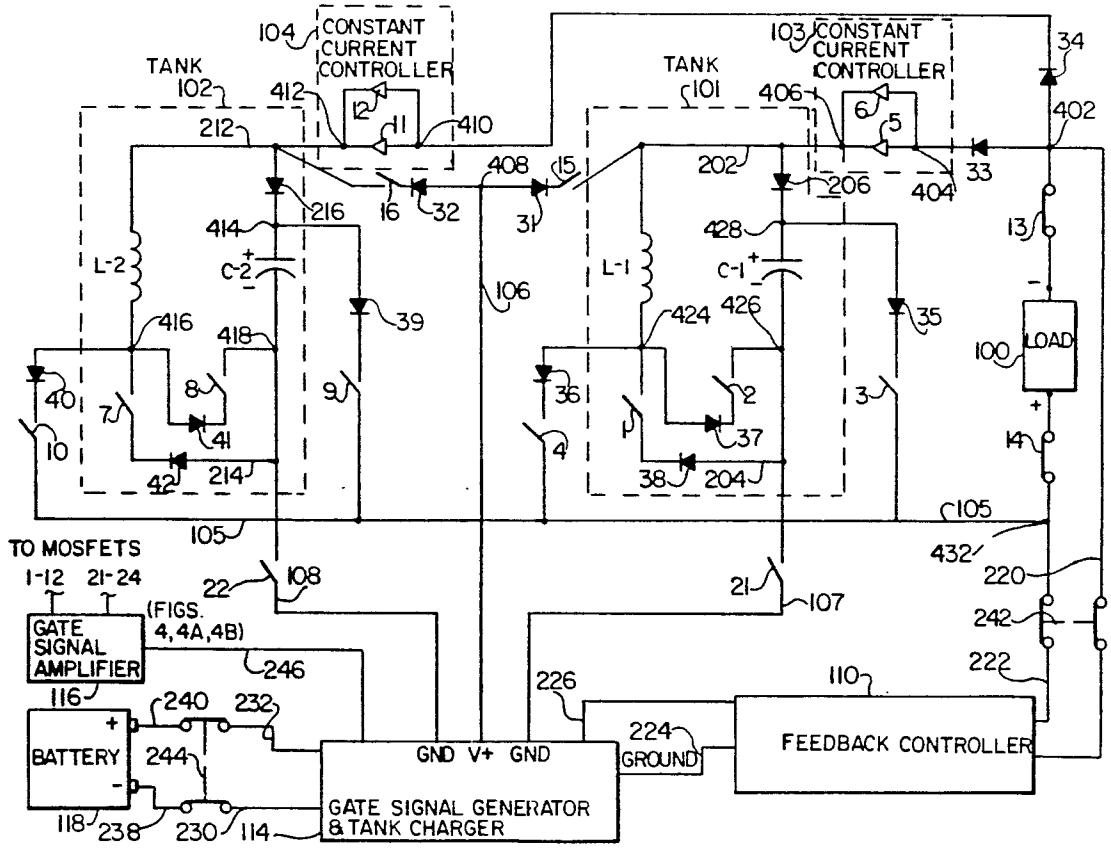
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4,748,311	5/1988	Thomas et al.	363/24

Primary Examiner—William H. Beha, Jr.
Attorney, Agent, or Firm—Mason, Fenwick & Lawrence

[57] **ABSTRACT**

The present invention provides a power supply for supplying electrical power to a load. The power supply includes first and second tank circuits having a common resonant frequency, and functions repetitively in two "major periods." In the first major period, the first tank is disconnected from powering the load and the second tank supplies power to the load while charging the first tank. In the second major period, the second tank is disconnected from powering the load, and the first tank supplies power to the load while charging the second tank. The tank circuits are arranged with constant current controllers and switches to function so that the major periods each include first and second minor "intervals." The first minor interval of the first major period defines a time during which the second tank's capacitor is providing power to the load and is charging the first tank circuit; the second minor interval of the first major period defines a time during which the second tank's inductor is charging the first tank circuit and providing power to the load. During the second major period's two minor intervals, the tank circuits perform functions identical to those performed in the first two minor intervals.

15 Claims, 10 Drawing Sheets



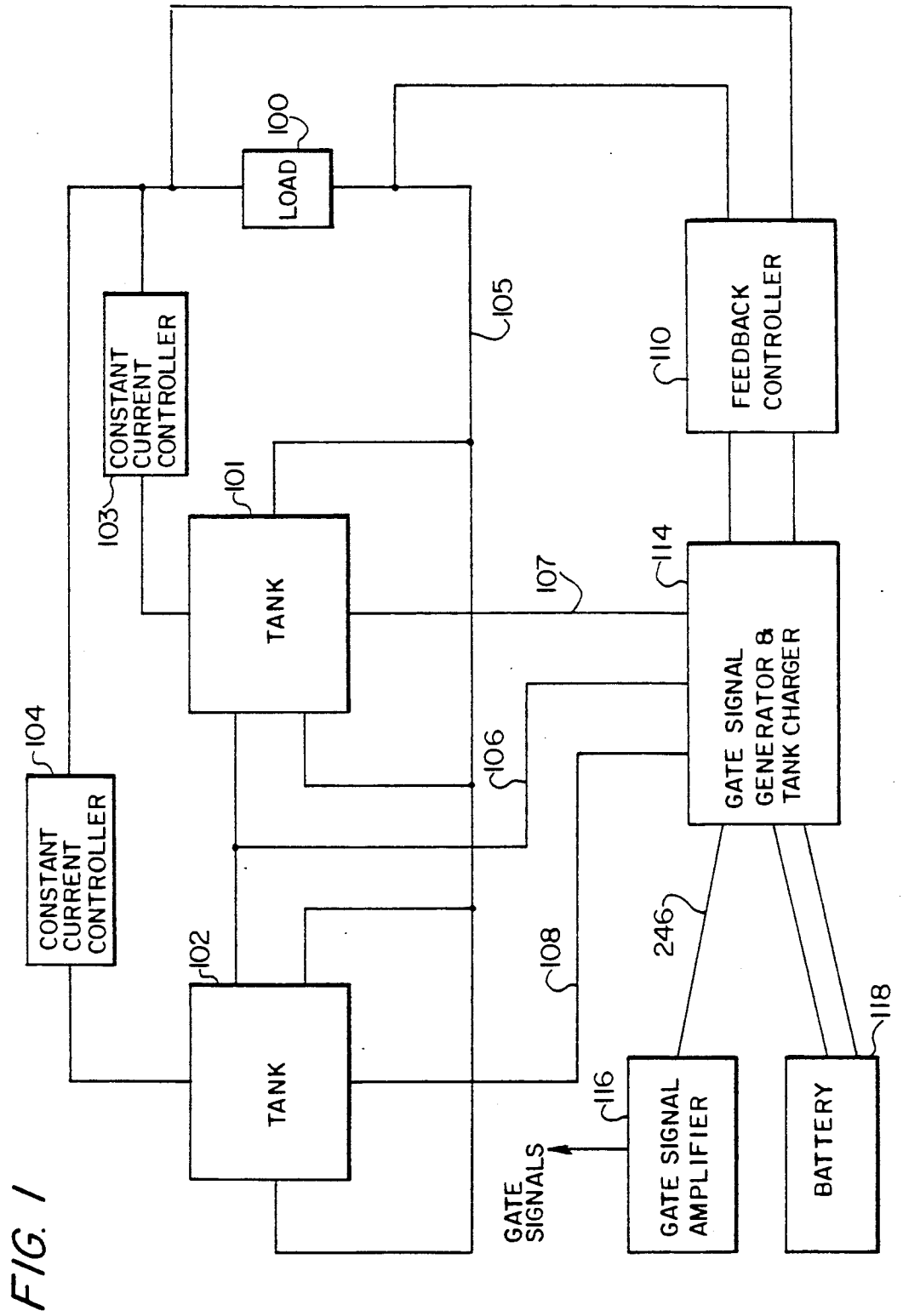

LOAD
100
CONSTANT CURRENT CONTROLLER
103
TANK
101
105
FEEDBACK CONTROLLER
110
GATE SIGNAL GENERATOR & TANK CHARGER
114
107
CONSTANT CURRENT CONTROLLER
104
106
TANK
102
108
246
GATE SIGNALS
GATE SIGNAL AMPLIFIER
116
BATTERY
118

FIG. 1

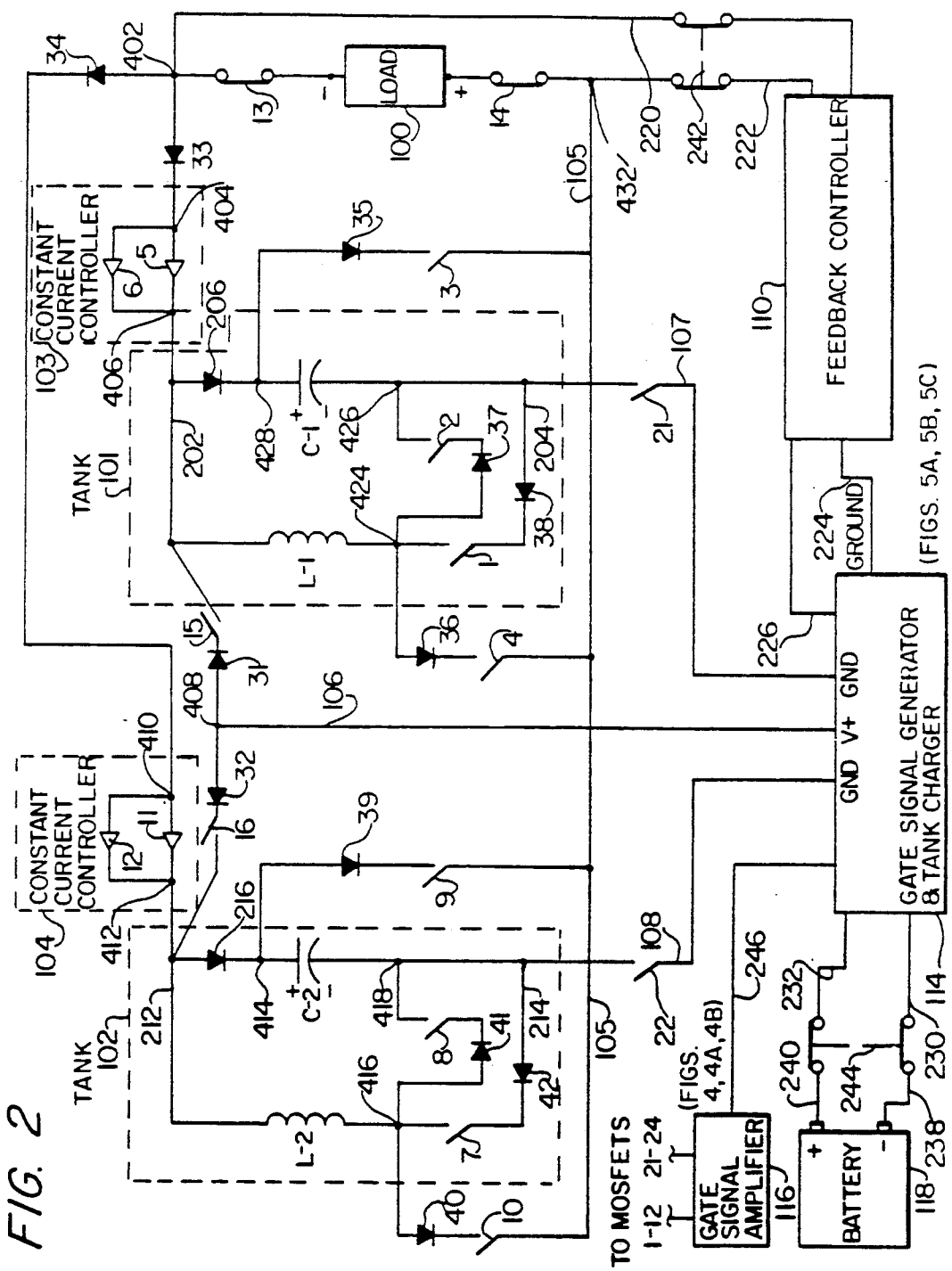

CONSTANT CURRENT CONTROLLER
CONSTANT CURRENT CONTROLLER
TANK
TANK
LOAD
FEEDBACK CONTROLLER
GATE SIGNAL GENERATOR & TANK CHARGER
GND V+ GND
GROUND
GATE SIGNAL AMPLIFIER
BATTERY
TO MOSFETS 1-12 21-24
(FIGS. 4, 4A, 4B)
(FIGS. 5A, 5B, 5C)
C-1
C-2
L-1
L-2

FIG. 2

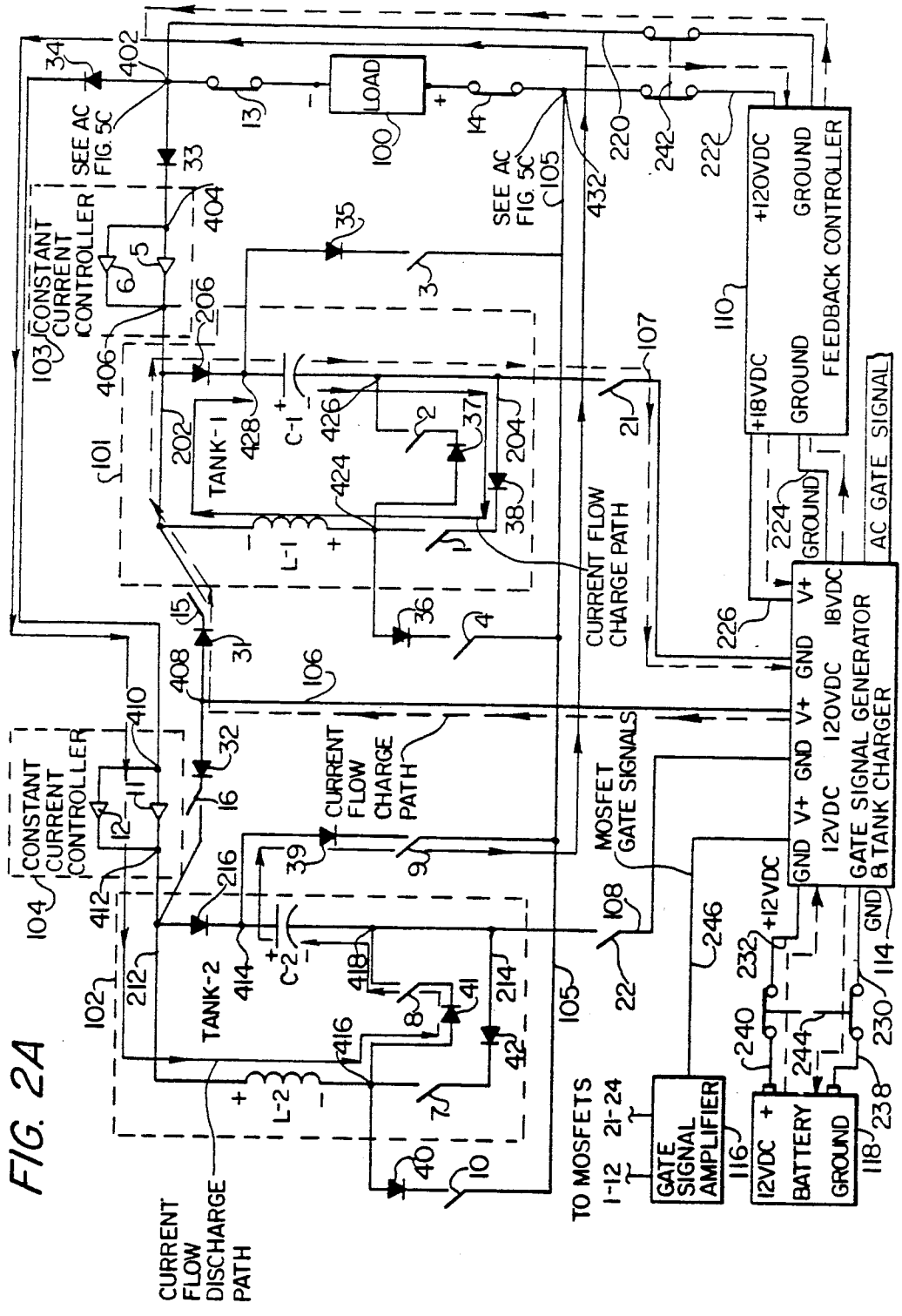

CONSTANT CURRENT CONTROLLER
SEE AC FIG. 5C
LOAD
TANK-1
TANK-2
L-1
L-2
C-1
C-2
CURRENT FLOW CHARGE PATH
CURRENT FLOW DISCHARGE PATH
MOSFET GATE SIGNALS
TO MOSFETS 1-12 21-24
GATE SIGNAL AMPLIFIER
12VDC BATTERY
GROUND
+12VDC
+18VDC
FEEDBACK CONTROLLER
GATE SIGNAL GENERATOR & TANK CHARGER
AC GATE SIGNAL
GND V+ GND V+ GND V+
12VDC 12VDC 18VDC

FIG. 2A

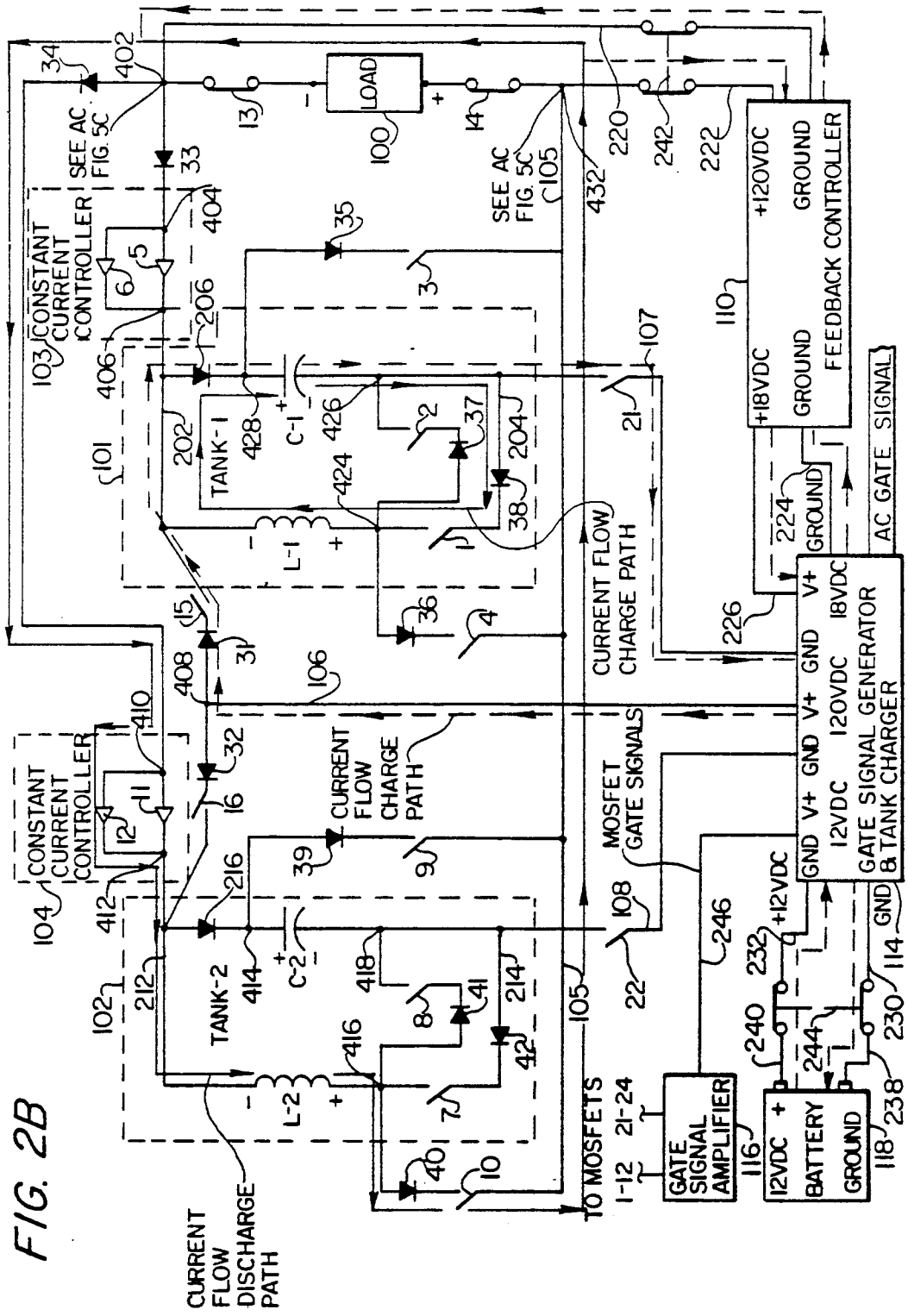

LOAD
100
SEE AC FIG. 5C
CONSTANT CURRENT CONTROLLER
103
TANK-1
C-1
L-1
CURRENT FLOW CHARGE PATH
CONSTANT CURRENT CONTROLLER
104
TANK-2
C-2
L-2
CURRENT FLOW DISCHARGE PATH
MOSFET GATE SIGNALS
TO MOSFETS 1-12 21-24
GATE SIGNAL AMPLIFIER
116
12VDC + BATTERY GROUND
118
+120VDC
GROUND
FEEDBACK CONTROLLER
110
+18VDC
GROUND
GROUND
AC GATE SIGNAL
GATE SIGNAL GENERATOR & TANK CHARGER
GND V+ GND V+
12VDC 120VDC 18VDC
+12VDC
GND
114
220
222
242
224
226
232
240
244
246
230
238
432
105
107
108
106
102
101
202
204
206
212
214
216
402
404
406
408
410
412
414
416
418
424
426
428

FIG. 2B

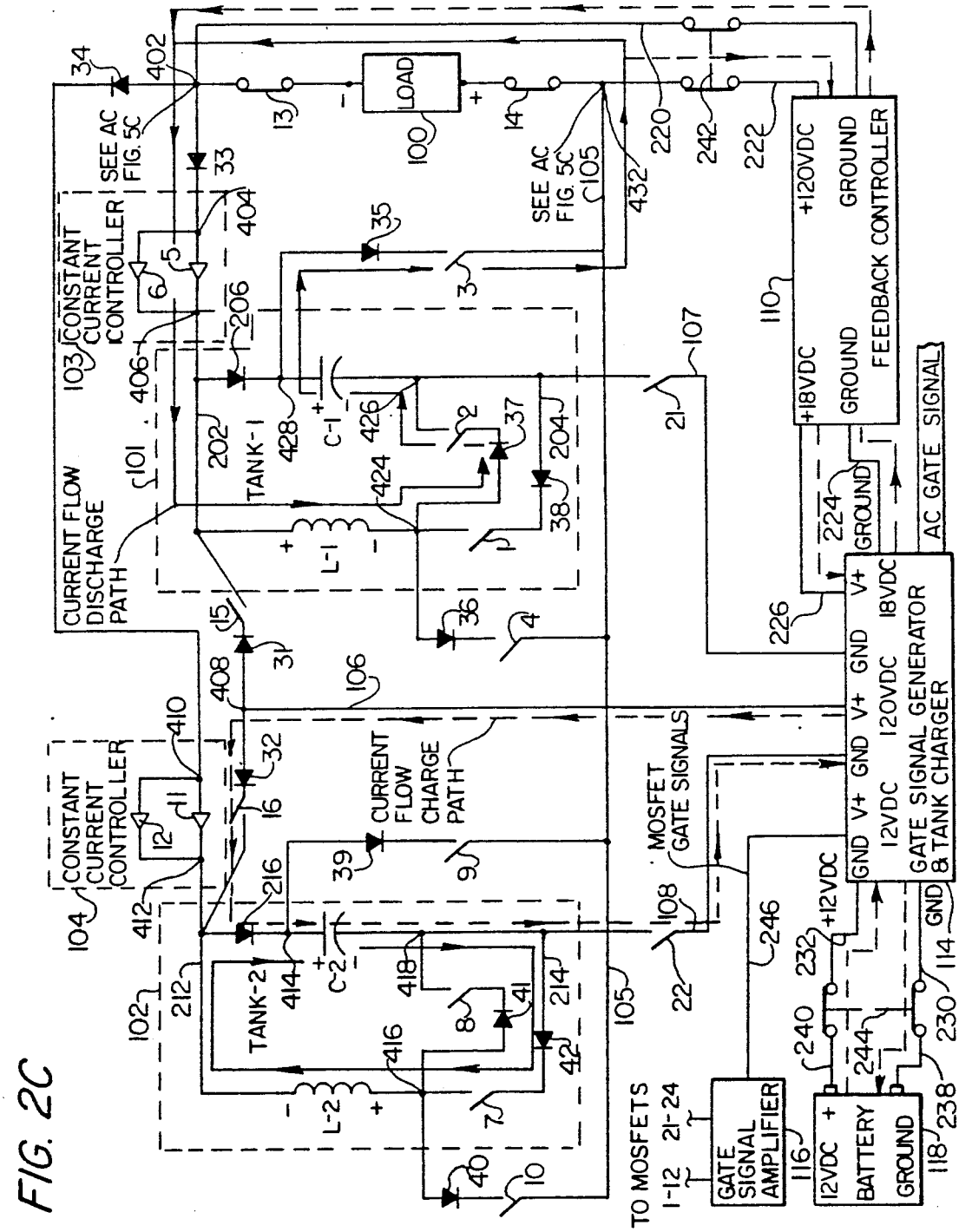

CONSTANT CURRENT CONTROLLER
CONSTANT CURRENT CONTROLLER
CURRENT FLOW DISCHARGE PATH
CURRENT FLOW CHARGE PATH
TANK-1
TANK-2
L-1
L-2
C-1
C-2
LOAD
SEE AC FIG. 5C
MOSFET GATE SIGNALS
TO MOSFETS 1-12 21-24
GATE SIGNAL AMPLIFIER
12VDC BATTERY
GROUND
+12VDC
+18VDC
+120VDC
GROUND
FEEDBACK CONTROLLER
GATE SIGNAL GENERATOR & TANK CHARGER
AC GATE SIGNAL
V+ GND V+ GND V+ GND
12VDC 120VDC 18VDC

FIG. 2C

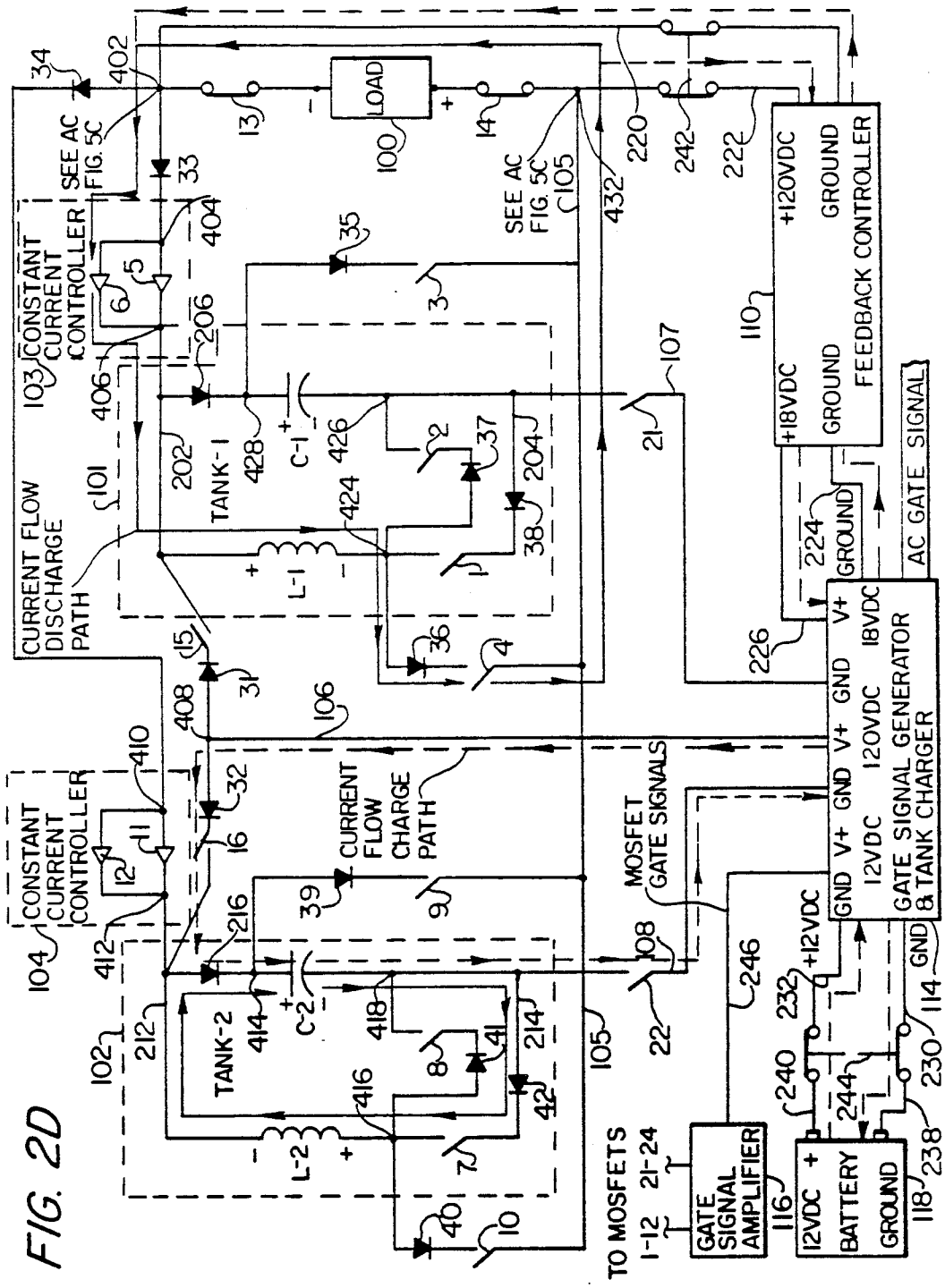

LOAD
100
SEE AC FIG. 5C
105
CONSTANT CURRENT CONTROLLER
103
CURRENT FLOW DISCHARGE PATH
TANK-1
C-1
L-1
CONSTANT CURRENT CONTROLLER
104
CURRENT FLOW CHARGE PATH
TANK-2
C-2
L-2
MOSFET GATE SIGNALS
TO MOSFETS 1-12 21-24
GATE SIGNAL AMPLIFIER
116
12VDC + BATTERY GROUND
118
+120VDC
GROUND
FEEDBACK CONTROLLER
110
+18VDC
GROUND
GND V+ GND V+
12VDC 120VDC 18VDC
GATE SIGNAL GENERATOR & TANK CHARGER
AC GATE SIGNAL
GROUND
+12VDC
GND
114
220
222
242
432
224
226
246
232
240
244
230
238
107
106
108
22
21
102
101
202
204
206
212
214
216
402
404
406
408
410
412
414
416
418
424
426
428

FIG. 2D

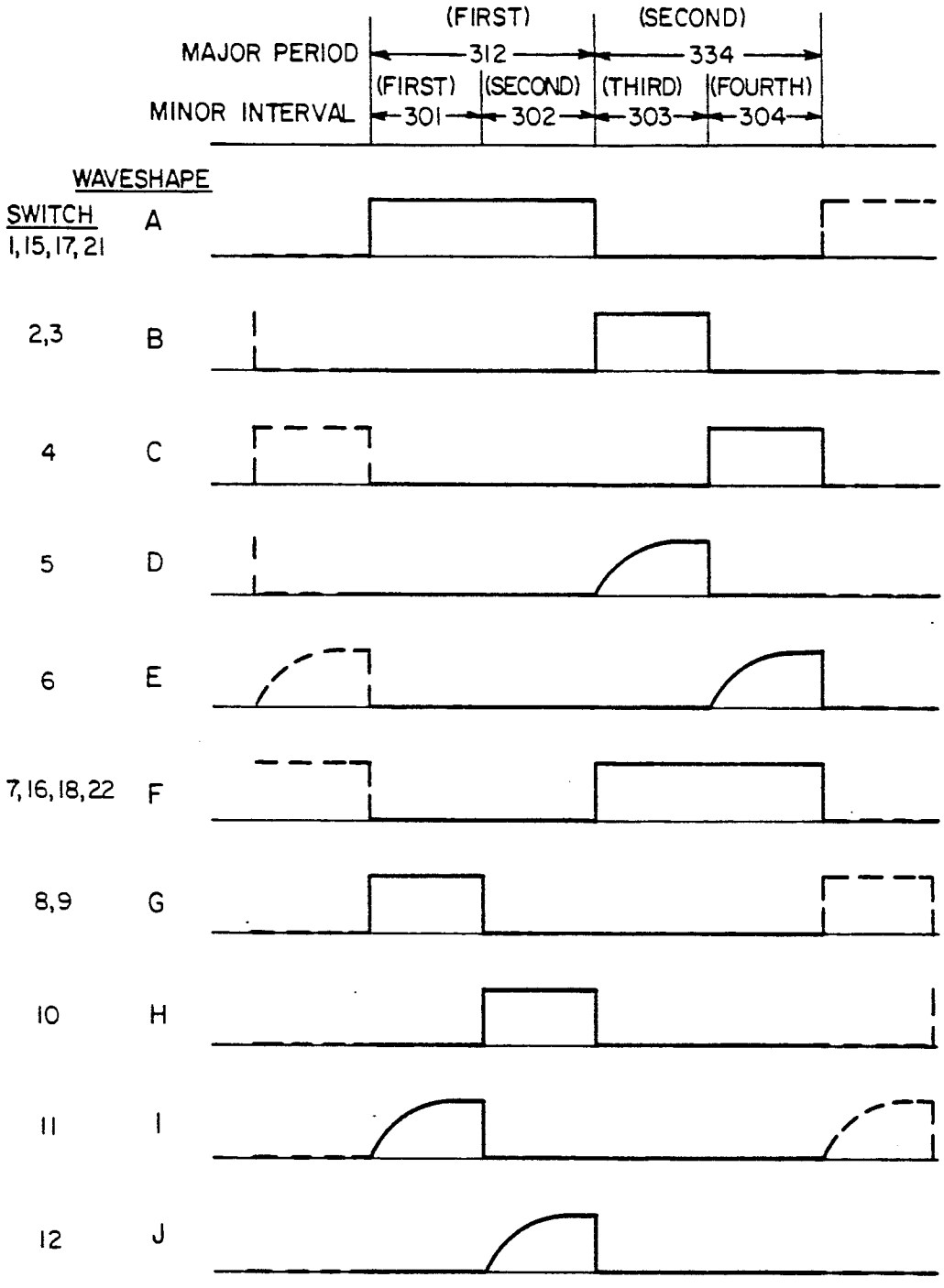

(FIRST)
(SECOND)
MAJOR PERIOD
312
334
(FIRST)
(SECOND)
(THIRD)
(FOURTH)
MINOR INTERVAL
301
302
303
304
WAVESHAPE
SWITCH
1,15,17,21
A
2,3
B
4
C
5
D
6
E
7,16,18,22
F
8,9
G
10
H
11
I
12
J

FIG. 3

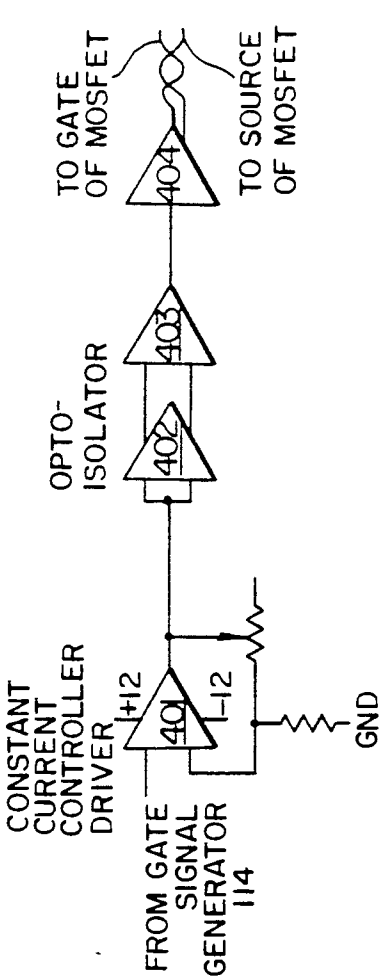


FIG. 4A

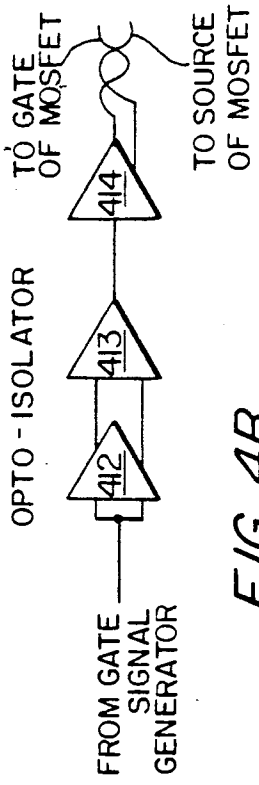


FIG. 4B

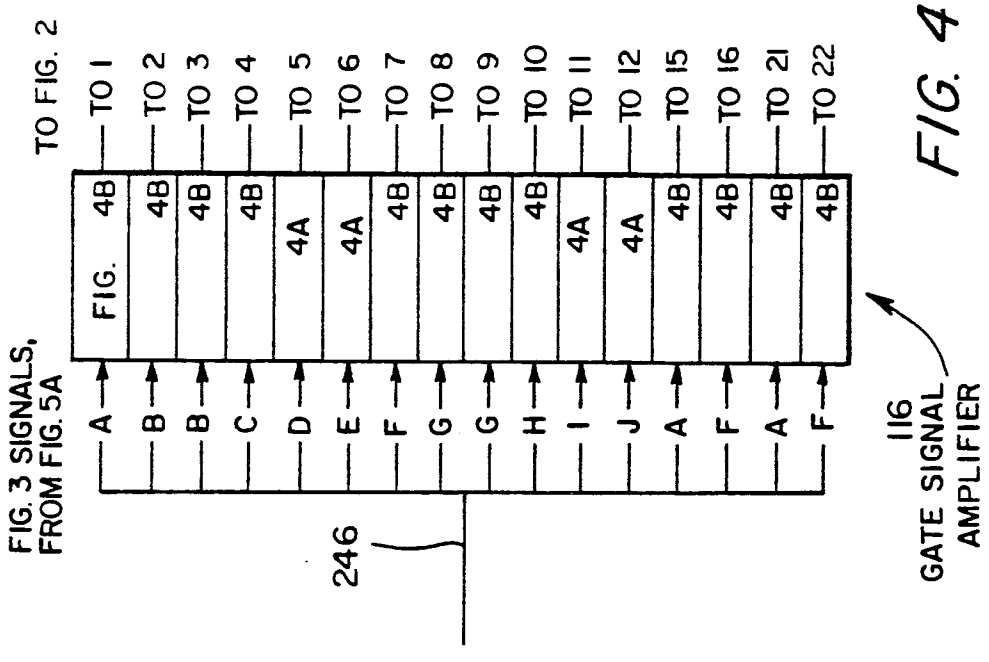


FIG. 4

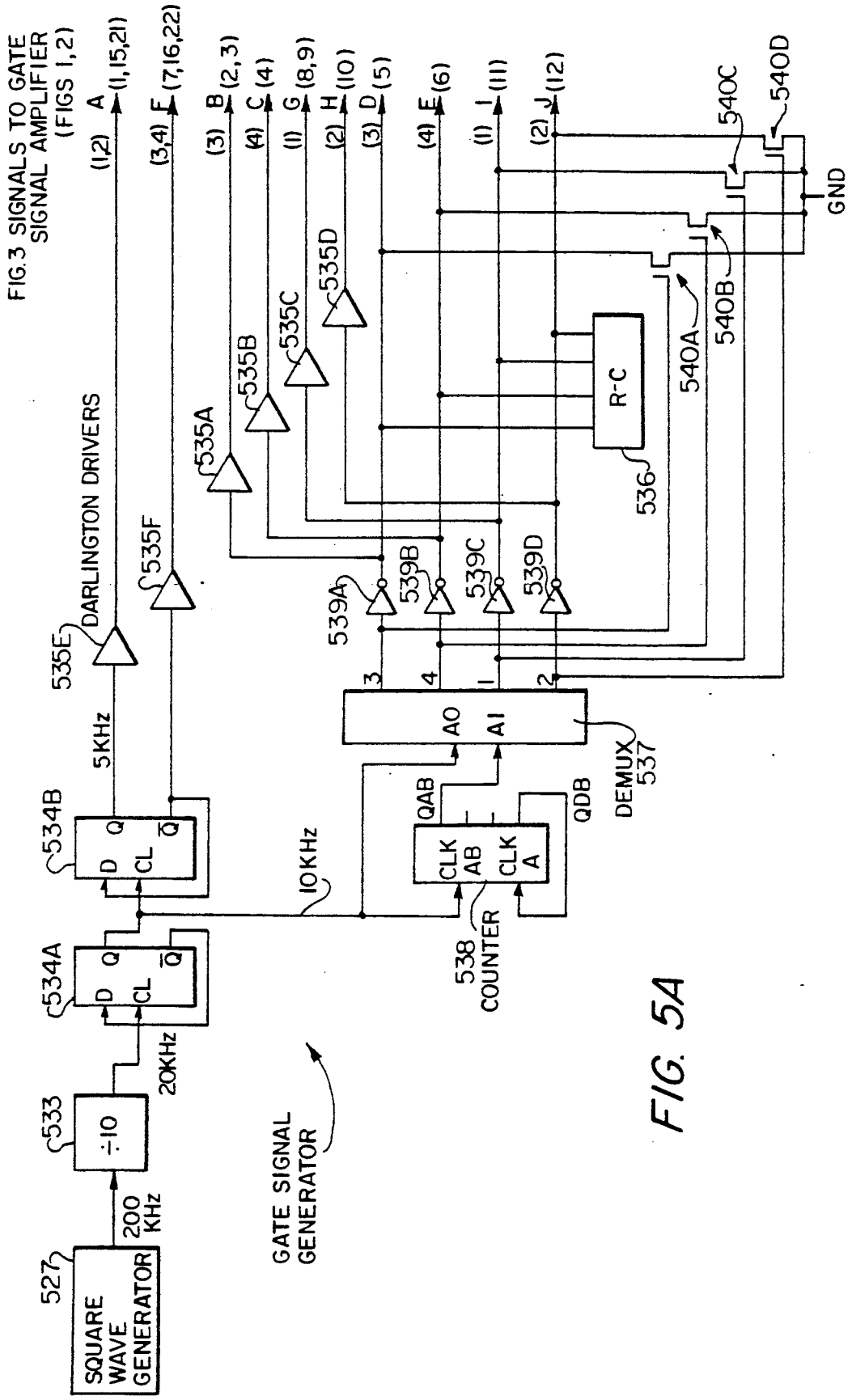

FIG.3 SIGNALS TO GATE SIGNAL AMPLIFIER (FIGS 1,2)
A (1,15,21)
F (7,16,22)
B (2,3)
C (4)
G (8,9)
H (10)
D (5)
E (6)
I (11)
J (12)
(12)
(3,4)
(3)
(4)
(1)
(2)
(3)
(4)
(1)
(2)
DARLINGTON DRIVERS
535E
535F
535A
535B
535C
535D
R-C
536
540A
540B
540C
540D
GND
539A
539B
539C
539D
3
4
1
2
A0
A1
DEMUX
537
5KHz
534B
534A
D
Q
CL
10KHz
20KHz
QAB
QDB
CLK AB
CLK A
538
COUNTER
533
÷10
200 KHz
527
SQUARE WAVE GENERATOR
GATE SIGNAL GENERATOR

FIG. 5A

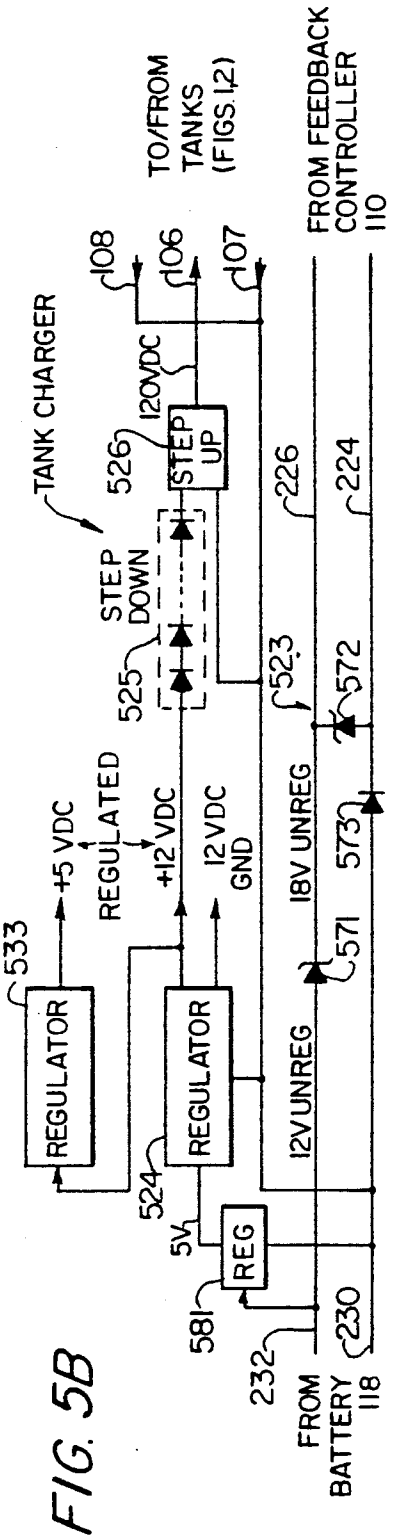

TANK CHARGER
533
REGULATOR
+5 VDC
REGULATED
+12 VDC
12 VDC
GND
REGULATOR
524
5V
REG
581
232
FROM BATTERY 118
12V UNREG
18V UNREG
571
573
572
523
STEP DOWN
525
526
120VDC
STEP UP
108
106
107
TO/FROM TANKS (FIGS. 12)
226
224
FROM FEEDBACK CONTROLLER 110
"DC" TO 60Hz HALF-WAVE
HALF-WAVE TO 60 Hz FULL WAVE
549
550

FIG. 5B

PRE-DRIVERS
+1V
+10V
FIG. 4B
542A
+12V
FIG. 4B
542B
+12V
FIG. 4B
542C
+10V
FIG. 4B
542D
+1V
+12V
SQUARE WAVE GEN.
531
532
SQUARE WAVE GEN.
+1V
+1V
530
X-1
-1V
529A
529B
DUAL HALF-WAVE RECTIFIER 529
+1V
60Hz SIN. OSC.
528
(PART OF 114 - FIGS 1,2) TIMING FOR A.C. LOAD
85V (PEAK)
120 VDC
23
24
17
17A
17B
18
18A
18B
85V
AC LOAD
100A
DC LOAD
100
402 NODE (FIG. 2)
NODE 105/432 (FIG. 2)

FIG. 5C

POWER SUPPLY INCLUDING TWO TANK CIRCUITS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to power supplies for supplying electrical power to a load. More specifically, the invention relates to a high-efficiency power supply including plural tank circuits whose function and interaction are controlled by a set of specially controlled switches and constant current controllers.

2. Related Art

Power supplies including charge storage elements (or, more broadly, energy storage elements), are known in the art.

For example, U.S. Pat. No. 4,628,284 (Bruning) discloses a high-frequency, high-voltage supply involving switching of transistors for, for example, magnetrons of microwave ovens. A "dead time" is provided between the intervals when one or the other of the transistors is off.

U.S. Pat. No. 4,319,315 (Keeney, Jr. et al) discloses a DC-to-DC convertor with oppositely conducting transistor pairs.

U.S. Pat. No. 3,886,429 (Maillard et al) discloses a symmetrical power pack for adapting to different sources. The power pack provides for alternate blocking and saturation of pairs of switching transistors.

U.S. Pat. No. 4,748,311 (Thomas et al) discloses a chopper circuit having a push-pull frequency f_O and parallel tuned circuit at $2xf_O$. A goal of the Thomas et al circuit is to reduce power loss in their switching means.

U.S. Pat. No. 4,542,440 (Chetty et al) discloses a current sensor involving two power switches and two associated snubber circuits which operate 180° with respect to each other.

U.S. Pat. No. 5,513,226 (Josephson) discloses a ballast inverter circuit which comprises two tank circuits. The two tank circuits operate at a common resonant frequency. A pair of transistors are switched in opposition so as to operate in a push-pull manner.

U.S. Pat. No. 4,709,323 (Lien) discloses a parallel resonant converter in which resonant circuitry recovers energy which would otherwise be lost in the circuit's switching operation.

Efficiency of power supplies has been measured in terms of the amount of energy which is consumed internally, within the power supply itself. Of course, it is desirable to minimize the amount of energy which is consumed internally, as energy which is consumed internally cannot be delivered to the load.

There is always a need to provide power supplies having greater efficiency. The present invention fulfills this need.

SUMMARY OF THE INVENTION

The present invention is a power supply for supplying electrical power to a load. The power supply includes first and second tank circuits having a common resonant frequency, and functioning repetitively in two "major periods". In the first major period, the first tank is disconnected from powering the load and the second tank supplies power to the load while charging the first tank. In the second major period, the second tank is disconnected from powering the load, and the first tank supplies power to the load while charging the second tank.

In a particular embodiment, the inventive power supply may include a plurality of constant current controllers, which may be metal oxide semiconductor field effect transistors (MOSFETs), for connecting the tank circuits to the load. The inventive power supply may also include a set of switches for selectively interconnecting the tank circuits, constant current controllers and load.

The tank circuits, constant current controllers and switches are arranged to function in the first and second "major periods", each of which includes first and second "minor intervals". The first tank circuit comprises a first capacitor and inductor, whereas the second tank circuit comprises a second capacitor and inductor. The first minor interval of the first major period defines a time during which the second capacitor is simultaneously providing current flow through the second inductor, providing power to the load, and charging the first tank circuit; the second minor interval of the first major period defines a time during which the second inductor is simultaneously charging the first tank circuit and providing power to the load. The first minor interval of the second major period defines a time during which the first capacitor simultaneously provides current flow through the first inductor, charges the second tank, and provides power to the load; and the second minor interval of the second major period defines a time during which the first inductor charges the second tank and provides power to the load.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is better understood by reading the following Detailed Description of the Preferred Embodiments with reference to the accompanying drawing figures, in which like reference numerals refer to like elements throughout, and in which:

FIG. **1** is a high-level block diagram schematically indicating an embodiment of the power supply according to the present invention.

FIG. **2** illustrates in greater detail the embodiment of FIG. **1**. FIGS. **2A** and **2B** illustrate current flow during the first and second minor intervals associated with the first major period, as shown graphically in FIG. **3**. FIGS. **2C** and **2D** illustrate current flow during the third and fourth minor intervals associated with the second major period, as shown graphically in FIG. **3**.

FIG. **3** is a Waveshape and Timing Diagram of certain voltage signals provided by the Gate Signal Generator to the control terminals (gates) of the switches and Constant Current Controllers of the embodiment shown in FIGS. **1** and **2**

FIG. **4** illustrates a preferred Gate Signal Amplifier shown in FIGS. **1** and **2**, FIGS. **4A** and **4B** showing details thereof.

FIGS. **5A**, **5B** and **5C** respectively illustrate details of a preferred Gate Signal Generator, Tank Charger, and AC Load Timing Circuit, as shown schematically in FIGS. **1** and **2**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

In describing preferred embodiments of the present invention illustrated in the drawings, specific terminology is employed to describe preferred elements and circuits for the sake of clarity. However, the invention is not intended to be limited to the specific terminology

so selected, and it is to be understood that each specific element and circuit includes all technical equivalents which operate in a similar manner to accomplish a similar purpose. It is further understood that "gate signal generator and tank charger," "gate signal amplifier," "feedback controller," and "constant current controller," are used in the Detailed Description to include all associated circuitry, but that the scope of the invention and the interpretation of claims elements should not be so limited. Also, "node", "path", "pathway" are understood to be any suitable means to conduct electrical current from one circuit element or circuit to another and/or serve as a point where two or more such conductors are connected together. The terms "path" and "pathway" to be broadly interpreted, and may include circuit elements other than conductive nodes. According to convention, positive current flow is described; however, it is understood by those skilled in the art that positive current flow, involving flow of negatively charged electrons in the opposite direction, is but a convention to which operation of the invention is not limited.

FIG. **1** is a high-level block diagram of a preferred embodiment of the power supply according to the present invention. The power supply is designed to provide power to a load **100**. FIG. **2** illustrates the power supply embodiment in more detail.

The power supply itself includes first and second tank circuits **101**, **102**, respectively. The tank circuits **101**, **102** are connected to a negative terminal of the load **100** via respective constant current controller circuits **103**, **104** and isolating switch **13** (FIG. **2**).

A common node **105** connects, via isolating switch **14** (FIG. **2**), the positive terminal of the load to both tank circuits **101**, **102**. Tank circuits **101**, **102** are connected via a common node **106** and dedicated paths **107**, **108**, respectively, to gate signal generator & tank charger **114**. The two terminals of the load are connected via respective pathways **220** and **222** to a feedback controller **110** Feedback controller **110** is connected via respective pathways **226**, **224** to gate signal generator & tank charger **114**. Power is provided to the gate signal generator and tank charger **114** by either a feedback controller **110** (which may be a MOSFET gate drive circuit) or a battery **118**. Gate signal generator and tank charger **114** oversees, via gate signal amplifier **116**, the functioning of the constant current controller circuits **103**, **104**, as well as various switches which are not specifically illustrated in FIG. **1**.

Various switches and constant current controller elements (which may be MOSFETs), as well as current direction controllers (preferably Schottky diodes), have been purposely omitted from FIG. **1** for the sake of clarity. Referring now to FIG. **2**, the power supply of FIG. **1** is illustrated in greater detail.

First tank circuit **101** is shown to comprise a variety of elements extending between two nodes **202**, **204**. An inductor L1 is connected in series with a node **424**, a switch **1** and a diode **38** between nodes **202**, **204**. Similarly, a diode **206** is connected in series with a node **428**, capacitor Cl and node **426** between nodes **202**, **204**. A diode **37** and a switch **2** are connected in series between node **424** (between inductor L1 and switch **1**) and node **426** (between capacitor Cl and node **204**).

Second tank circuit **102** is structured in a manner similar to tank circuit **101**. Specifically, nodes **212**, **214** correspond to nodes **202**, **204**. Similarly, second inductor L2 and second capacitor C2 respectively correspond to first inductor L1 and first capacitor Cl. Finally, switches **7** and **8**, and diodes **42**, **41**, and **216** respectively correspond to switches **1** and **2**, and diodes **38**, **37**, and **206**.

Diodes **206**, **216** are oriented so as to allow current to flow from node **202**, through respective nodes **428**, **414**, to respective capacitors Cl, C2. The positive terminals of capacitors Cl and C2 are connected, respectively, through nodes **428**, **414**, to diodes **206** and **216**; the capacitors' negative terminals are connected, respectively, through nodes **426**, **418** to nodes **204**, **214**.

The polarity of inductors L1 and L2 varies with the interval of operation of the circuit. During the first and third minor intervals (described in greater detail below), associated, respectively, with the discharging of tanks **102**, **101** through their capacitors and inductors to load **100**, the terminal of the inductor which is connected to node **212** (first minor interval **301**) or **202** (third minor interval **303**) is the positive terminal; during the second and fourth minor intervals (described in greater detail below), this polarity is reversed.

As briefly introduced in the discussion related to FIG. **1**, the negative terminal of load **100** is connected through isolating switch **13** to respective tank circuits **101**, **102** via respective constant current controller circuits **103**, **104**. FIG. **2** illustrates the connection in more detail than FIG. **1**. Specifically, the negative terminal of load **100** is connected via node **402** to a diode **33** which in turn is connected to the input node **404** of constant current controller circuit **103**. An output node **406** of constant current controller circuit **103** is connected to node **202** (within tank circuit **101**). Diode **33** is oriented to allow current to flow from the negative terminal of load **100** through isolation switch **13** and node **402** to the constant current controller circuit **103**. Constant current controller circuit **103** includes two parallel-connected constant current controller elements **5** and **6** which may be MOSFETs. Regulation of the current passing through constant current controller elements **5** and **6** is separately controlled by the gate signal generator in **114**, described below.

In a manner similar to the connection of isolation switch **13**, node **402**, diode **33**, node **404**, constant current controller elements **5** and **6**, node **406**, and node **202**, the negative terminal of load **100** is connected to the second tank circuit **102** via isolation switch **13**, node **402**, a diode **34**, node **410**, two parallel-connected constant current controller elements **11**, **12** which may be MOSFETs, node **412**, and node **212**.

The positive terminal of load **100** is connected to two points within each of tank circuits **101**, **102**. Specifically, the positive terminal of load **100** is connected via isolation switch **14**, nodes **105**, a switch **3**, and a diode **35** to node **428** between diode **206** and capacitor Cl. Also, the positive terminal of load **100** is connected via a switch **14**, node **105**, a switch **4**, and a diode **36** to node **424** between first inductor L1 and switch **1**.

In an analogous manner, the positive terminal of load 100 is connected via isolating switch **14**, node **105**, a switch **9**, and a diode **39** to node **414** between diode **216** and capacitor C2. Finally, the positive terminal of load **100** is connected via isolating switch **14**, node **105**, a switch **10**, and a diode **40** to node **416** between second inductor L2 and switch **7**.

Node **106**, which was shown schematically in FIG. **1** as commonly connected to tank circuits **101**, **102**, is more specifically illustrated in FIG. **2** to be connected to diodes **31** and **32**. Diodes **31**, **32** are connected

through respective switches **15**, **16** to allow current to flow from node **106** to respective nodes **202**, **212** within respective tank circuits **101**, **102** only when those tanks are being charged. Node **204** (within tank circuit **101**) and node **214** (within tank circuit **102**) are connected to respective switches **21**, **22** on respective pathways **107**, **108**. The opposite terminals of switches **21**, **22** and node **106** are presented to gate signal generator and tank charger **114**. Switches **21** and **22** operate in conjunction such that they are not both simultaneously connected to their respective tank circuits **101**, **102**.

The negative and positive terminals of load **100** are connected via respective paths **220**, **222** and switch **242**, to feedback controller **110**. Feedback controller **110** is connected via paths **224**, **226** to the gate signal generator and tank charger **114**. Path **224** is considered ground whereas path **226** is a DC voltage, typically +18 volts.

Gate signal generator and tank charger **114** receives its power from either feedback controller **110** or a battery **118** (or other equivalent power source). Typically, the positive DC voltage input **232** of the gate signal generator and tank charger **114** is connected to the positive terminal **240** of battery **118**. Similarly, ground input **230** of gate signal generator and tank charger **114** is typically connected to the negative terminal **238** of battery **118**. Switch **244** connects respective battery terminal **238**, **240** to gate signal generator and tank charger **114** inputs **230**, **232**.

In operation, gate signal amplifier **116** performs the function of amplifying the gate signals generated by gate signal generator in **114** and passed to it on paths indicated as **246**. Gate signal amplifier **116** distributes the amplified signals to the gates of respective switches and constant current controllers which control the function of the inventive power supply.

Switches **1–4**, **7–10** and **21–22** may advantageously be implemented using metal oxide semiconductor field effect transistors (MOSFETs). As illustrated in FIG. **2**, switches **3**, **4**, **9**, **10**, **21**, and **22**, may be implemented so that the source of the MOSFET is oriented toward the bottom of FIG. **2**, and the drain of the MOSFET oriented toward the top of FIG. **2**. For switches **1**, **2**, **7**, and **8**, the source of the MOSFET is oriented toward the top o right of FIG. **2** and the drain of the MOSFET is oriented toward the bottom or left. For MOSFET switches **5**, **6**, **11**, and **12**, the source is oriented toward the left and the drain is oriented toward the right of FIG. **2**. The source of MOSFET **16** is oriented to the left, and the source of MOSFET **15** is oriented to the right.

The gates of the MOSFETs are the controlling elements of the switches, and are provided, via the gate signal amplifier **116**, with appropriate voltage signals from gate signal generator in **114**. Isolation switches **13**, **14** may be advantageously implemented using mechanical, vacuum, or solid state devices suitable for connecting load **100** to, and disconnecting it from, the power supply.

Constant current controller circuits **5**, **6**, **11**, and **12** may also be implemented as MOSFETs. However, these MOSFETs are not operated as binary switches. Rather, as indicated by the generic term "constant current controller," these MOSFETs may advantageously be operated in their linear regions, serving as current controllers. As illustrated in FIG. **2**, the source of each constant current controller MOSFET may be connected, via respective nodes **406**, **412**, to the top node **202**, **212** of the tank circuits **101**, **102**. The drain of each MOSFET may be connected, via respective nodes **404**, **410** to the diodes **33**, **34**. The gate of each MOSFET is connected to the gate signal generator & tank charger **114** via gate signal amplifier **116**.

Regenerative feedback controller **110** (FIGS. **1** and **2**) is preferably implemented as a Vicor VI L53 Cy DC-to-DC converter, having 120 volts DC on the tank output (load) side, and a +18 volt DC output between paths **226** and **224**.

FIG. **3** is a waveshape and timing diagram illustrating signals produced by gate signal generator and tank charger **114** which controls the switches and constant current controller elements **1–12** and **21–22**.

As described above, the power supply includes first and second tank circuits. The tank circuits having a common resonant frequency, and function repetitively in two "major periods" **312** and **334** (FIG. **3**). In the first major period **312**, the first tank **101** is disconnected from powering load **100** and the second tank **102** supplies power to load **100** while charging first tank **101**. In the second major period **334**, second tank **102** is disconnected from powering load **100**, and first tank **101** supplies power to load **100** while charging second tank **102**.

The major periods each include first and second "minor intervals." The first minor interval **301** of first major period **312** defines a time during which the second capacitor C2 is simultaneously providing power to load **100**, is maintaining current flow through inductor L2, and is charging first tank circuit **101**; the second minor interval **302** of the first major period **312** defines a time during which the second inductor L2 is charging first tank circuit **101** and providing power to load **100**. The first minor interval **303** of the second major period **334** defines a time during which the first capacitor Cl simultaneously charges second tank **102**, maintains current flow through inductor L1, and provides power to load **100**; and the second minor interval **304** of the second major period **334** defines a time during which the first inductor L1 charges second tank **102** and provides power to load **100**. The timing of the minor intervals and major periods is controlled by the switches in the following manner.

The first and second minor intervals of the first major period are followed immediately by the first and second minor intervals of the second major period. Consequently, they may be referred to as first, second, third, and fourth consecutive minor intervals. The first through fourth minor intervals are illustrated in FIG. **3** as elements **301**, **302**, **303**, and **304**, respectively. It is understood that the waveforms shown in FIG. **3** are repetitive, extending before and after the illustrated time segments. By convention, a high-level signal indicates that a binary switch is "on" (conducting), with a "low" level indicating the binary switch is "off" (nonconducting). The gate signal generator and tank charger **114** generates these waveforms in the illustrated synchrony.

For tank **101**, waveform A is input to switches **1**, **15**, and **21** (FIG. **2**) and **17** (FIG. **5C**). Waveform B is input to switches **2** and **3**. Waveform C is input to switch **4**. Waveform D is input to constant current controller element **5**. Waveform E is input to constant current controller element **6**.

Similarly, for tank **102**, waveform F is input to switches **7**, **16**, **22** (FIG. **2**) and **18** (FIG. **5C**). Waveform G is input to switches **8** and **9**. Waveform H is input to switch **10**. Waveform I is input to constant current

controller element **11**. Finally, waveform J is input to constant current controller element **12**.

In the preferred embodiment, waveforms A and F are consecutively timed, positive-going square waves having a 50/50 duty cycle and a nominal frequency of 20 kHz. Waveforms B, C, G, and H are positive-going square waves having a 25/75 (25%) duty cycle at 20 kHz. Waveforms D, E, I, and J, are positive-going exponential waves having a 25/75 (25%) duty cycle at 20 kHz. The illustrated waveshapes are used with a positive voltage power supply. Not shown are the complementary negative waveshapes which could be used with a complementary negative power supply applying the same principles as the illustrated power supply.

Only one of waveforms B, C, G, and H are active in a minor interval. Waveform G is active during the first minor interval; waveform H, during the second minor interval; waveform B, during the third minor interval; and finally, waveform c is active during the fourth minor interval. Waveforms I, J, D, and E are activated during the first, second, third, and fourth minor intervals, respectively. These waveforms are carefully-controlled analog waveforms, preferably exponential in shape, which regulate the amount of current supplied by respective constant current controller elements **11, 12, 5**, and **6**, so as to control the current ultimately fed to the load **100** by respective tank circuits !02 and **101**. The exponential waveforms may be generated in any suitable fashion, such as using analog networks or digitally implemented waveform generators in a manner known to those skilled in the art.

The flow of current in the circuit of FIG. **2** for start-up operation during the first through fourth minor intervals is now described. The function of the various circuit components is the same as during steady-state operation, described more fully below.

During start-up, switches **13** and **14** are opened, isolating load **100** from the power supply. Switch **244** is closed, providing power from battery **118** (or an equivalent power supply) to the gate signal generator and tank charger !14. Switch **242** is also closed, thus connecting feedback controller **110** to the output of the tanks, which, under steady-state operation, serves load **100** as well as feedback controller **110**. The gate signal generator and tank charger **114** is turned on and, simultaneously, switches **1, 8, 9, 11, 15**, and **21** are turned on and switches **4, 6, 7, 16**, and **22** are turned off. Thus begins the charging of tank **101** during major period **312**, minor interval **301** (FIG. **3**).

Tank **102** has no charge at this time, consequently, it cannot perform its steady state operation which is to provide power to load **100** and charge tank **101**. The switches of tank **102** are, however, connected during startup in the same sequence as they would be during steady-state operation.

Since only tank **101** needs to be charged initially during startup, power only needs to be routed from battery **118** (or equivalent power supply) through gate signal generator and tank charger **114**, tank **101**, and feedback controller **110**, finally returning to the gate signal generator and tank charger **114**.

At the end of minor interval **301**/beginning of minor interval **302**, switches **8, 9**, and **11** are turned off and, simultaneously, switches **10** and **12** are turned on. At the end of minor interval **302**, major period **312**/beginning of minor interval **303**, major period **334**, switches **1, 10, 12, 15**, and **21** are turned off, and, simultaneously, switches **2, 3, 5, 7, 16**, and **22** are turned on, during which tank **101** discharges through feedback controller **110** and gate signal generator & tank charger **114** to begin charging tank **102**. Finally, at the end of minor interval **303**/beginning of minor interval **304**, switches **2, 3**, and **5** are turned off and, simultaneously, switches **4** and **6** are turned on. At the end of major period **334**, both tanks continue in their respective charge/discharge sequence, as indicated in FIG. **3**.

During both major periods and all four minor intervals, gate signal generator and tank charger **114**, through gate signal amplifier **116**, provides the necessary voltage signals to the switches in order to allow them to control the charging and discharging of tanks **101, 102** according to the timing sequence presented in FIG. **3**. At the end of major period **312**, isolation switches **13** and **14** can be closed, providing power to load **100**.

Operation during steady-state conditions will now be described. Special reference is made to FIGS. **2A–2D** which respectively illustrate current flow during the four consecutive minor intervals.

During the first minor interval **301**, capacitor C2 simultaneously maintains current flow through inductor L2, charges tank circuit **101**, and provides power to the load **100**. Current passes from the positive terminal of C2 through node **414**, diode **39**, switch **9**, node **105** and switch **14** to the positive terminal of load **100**. From the negative terminal of load **100**, current passes through node **402**, diode **34**, node **410**, MOSFET **11**, and node **412** to re-enter tank circuit **102**. Current then passes through inductor L2, node **416**, diode **41**, MOSFET **8**, and node **418** to return to the negative terminal of capacitor C2.

It is understood that, within tank circuit **101**, an internal tank current is flowing in a clockwise direction (as viewed in FIG. **2A**).

At the same time, tank circuit **101** is being charged. Current flows from gate signal generator and tank charger **114** through node **106**, diode **31**, switch **15**, node **202**, diode **206**, and node **428** to capacitor Cl. Current continues to flow from the opposite (negative) terminal of C! through node **426**, switch **21**, along path **107** before returning to the gate signal generator & tank charger **114**.

Feedback controller **110** receives some of the current from node **432** through switch **242**, along path **222**, with current passing along path **226** to gate signal generator & tank charger **114**. Current also passes from gate signal generator & tank charger **114** along path **224**, through feedback controller **110**, along path **220**, through switch **242**, node **402** and switch **13** to the negative terminal of load **100**.

In the second minor interval **302**, inductor L2 provides power to load **100** while charging tank circuit **101**. Specifically, current passes from conductor L2 through node **416**, diode **40**, switch **10**, node **105** (**432**), and isolation switch **14** to the positive terminal of load **100**. Current then passes from the negative terminal of load **100** through isolation switch **13**, node **402**, diode **34**, node **410**, constant current controller MOSFET **12**, and node **412** before returning to inductor L2. The description of currents during this second minor interval **302** is otherwise identical to the description of those in the first minor interval **301**.

During the third minor interval **303**, a process occurs which is a repeat of that in the first minor interval **301**, with tank **101** supplying power to load **100**, tank **102**, and associated circuitry. Capacitor Cl within the first

tank circuit **101** now provides power to the load and charges the second tank circuit **102**. Specifically, current flows from the positive terminal of capacitor C1 through node **428**, diode **35**, switch **3**, node **105** (**432**), and isolation switch **14** to the positive terminal of load **100**. Current then flows from the negative terminal of load **100** through isolation switch **13**, node **402**, diode **33**, node **404**, constant current controller MOSFET **5**, nodes **406**, **202**, inductor L1, node **424**, diode **37**, switch **2**, and node **426** before returning to the negative terminal of capacitor C1.

Inside tank circuit **102**, an internal resonant current flows in a clockwise direction, as viewed in FIG. **2C**. Current flows from gate signal generator and tank charger **114** through node **106** (**408**), diode **32**, switch **16**, node **212**, diode **216**, and node **414** to the positive terminal of capacitor C2. Current also flows from the negative terminal of capacitor C2 through node **418**, switch **22**, along path **108** before returning to gate signal generator and tank charger **114**.

Current flows from node **432** and switch **242** along path **222** to feedback controller **110**, and then along path **226** to the gate signal generator and tank charger **114**. Current returns along path **224** through the feedback controller **110** through switch **242** along path **220** to node **402**.

During the fourth minor interval **304**, inductor L1 provides power to the load and charges the second tank circuit **102**. Specifically, current flows from the positive terminal of inductor L1 through node **424**, diode **36**, switch **4**, node **105** (**432**), and isolation switch **14** to the positive terminal of load **100**. Then, current flows through isolation switch **13**, node **402**, diode **33**, node **404**, constant current controller MOSFET **6**, and nodes **406**, **202** to return to the negative terminal of inductor L1. Other current flow in the circuit during the fourth minor interval **304** is identical to that described above, with respect to the third minor interval **303**.

Appropriate gate control signals are sent from the gate signal generator & tank charger **114**, along path **246**, to gate signal amplifier **116**, and then on to the gates of MOSFETs **1–12**, **21**, **22**, according to the timing and waveshape diagram FIG. **3**.

Specific values which have been found advantageous for various components in FIG. **2** are provided in the following Table. However, it is to be understood that substitutions of and variations upon the following components, component values, component types, and parameter ranges may be made by those skilled in the art while still remaining within the spirit and scope of the present invention, as defined by the claims which follow this specification.

TABLE ONE

Element	Implementation
Switches 1–4	IRF350 MOSFETS (400 volt, 60 amp pulsed)
Switches 7–10	IRF350 MOSFETS (400 volt, 60 amp pulsed)
Switches 21–22	IRF641 MOSFETS (150 volts, 72 amps pulsed)
Switches 15–16	IRF350 MOSFETS (See above)
Constant current controllers 5–6	IRF350 MOSFETS (See above)
Constant current controllers 11–12	IRF350 MOSFETs (See above)
Diodes 206, 216	IRF60HFU(R)200 (200 volts, 60 amps-(Super Fast Recovery)
Diodes 31, 32	IRF60HFU(R)200 (200 volts, 60 amps-(Super Fast Recovery)
Diodes 33, 34	IRF60HFU(R)200 (200 volts, 60 amps-(Super Fast Recovery)
Diodes 35-38	IRF60HFU(R)200 (200 volts, 60 amps-(Super Fast Recovery)
Diodes 39-42	IRF60HFU(R)200 (200 volts, 60 amps-(Super Fast Recovery)
Inductors L1, L2	MICROTRAN SL4-23-F (Toroid/21 μH @ 30 amps)
Capacitors C1, C2	COMPONENTS RESEARCH 3.14 uF/600 volts/30 amps @ 200 kHz

(IRF = International Rectifier Co.)

Referring now to FIGS. **4**, **4A**, and **4B**, the gate signal amplifier **116** (FIGS. **1** and **2**) is illustrated in more detail. In particular, gate signal amplifier **116** is shown to be an array of a plurality of drivers and pre-drivers. Various signals which pass along paths **246** from gate signal generator **114** to the gate signal amplifier **116** (FIGS. **1** and **2**) are input to respective drivers/pre-drivers. The details of the generation of the various signals which travel along path **246** are described below, with reference to FIG. **5A**.

Referring to FIG. **4**, the signals which pass on paths **246** to the gate signal amplifier **116** are shown diverging to respective drivers and pre-drivers. The signals entering from the left of FIG. **4** ar those signals A–J which are illustrated in FIG. **3**. Each of the FIG. **3** signals generated in FIG. **5A** is input to one of two circuits, the two circuits being respectively illustrated in FIGS. **4A** and **4B**. The circuits shown in FIGS. **4A** and **4B** are shown in block form in FIG. **4**, for purposes of clarity. Each of the blocks shown in FIG. **4** drives a respective gate of a MOSFET switch or constant current controller shown in FIG. **2**.

Signals D, E, I, and J drive constant current controllers **5**, **6**, **11**, and **12**, and are analog signals. The circuit shown in FIG. **4A** is used for these analog signals. Most of the signals shown exiting to the right of FIG. **4** are binary signals, the binary signals being input to MOSFETs which function as on-off switches. The circuit shown in FIG. **4B** is used for these binary signals.

Referring to FIG. **4A**, four series-connected elements **401**, **402**, **403**, **404** are illustrated. The first element **401** is a constant current controller MOSFET gate input signal driver which is preferably implemented as an International Rectifier **IR2129**. The gain and drive characteristics of the driver **401** are determined by fixed and adjustable resistors which are connected and adjusted in accordance with manufacturer's specifications provided in published data sheets.

Driver **401** drives the input of a MOSFET opto-isolator pre-driver comprising elements **402**, **403**, and **404**. Element **402** is preferably a **CD40107BEX**, and element **403** is preferably an **HCPL-2231**. Elements **402**, **403** effectively provide electrical isolation through use of optical isolation technology. A final MOSFET gate driver **404** is indicated, although it is optional in many embodiments.

It is understood that each of elements **401–404** are provided with regulated power (+12 volts DC and −12 volts DC from FIG. **5B**).

Referring now to FIG. **4B**, series-connected elements **412**, **413**, and **414** are illustrated. These elements correspond respectively to elements **402**, **403**, and **404** (FIG. **4A**). Because the circuit in FIG. **4B** does not drive a constant current controller MOSFET gate, no element corresponding to FIG. **4A** element **401** is required. Otherwise, the function of FIG. **4B** is substantially the same as that of FIG. **4A**.

Referring now to FIG. 5A, the gate signal generator (part of element 114 in FIGS. 1 and 2) is illustrated. A square wave generator 527 produces a 200 kHz square wave output, nominally 1 volt in magnitude and having a 50/50 duty cycle. The square wave generator 527 may be implemented using a Texas Instruments SN74LS624N voltage controlled oscillator.

The output of square wave generator 527 is received by a frequency divider 533, a divide-by-10 element, which produces a 20 kHz square wave. The implementation of divide-by-10 element 533 is preferably a Motorola MC74HC4017 synchronous counter.

The 20 kHz square wave output by divider 533 is input to the clock input of a first D flip-flop 534A. The non-inverting output of flip-flop 534A is input to the clock input of a second D-flip-flop 534B. The inverted outputs of flip-flops 534A, 534B are fed back to their respective D inputs. In this configuration, on the rising edge of each clock input, the respective outputs are toggled to the respective opposite states, as determined by the state of the inverted output during the previous cycle of the clock input. In this manner, each of the flip-flops 534A, 534B functions as a divide-by-2 frequency divider. Thus, the output of flip-flop 534A is a 10 kHz square wave, whereas the output of flip-flop 534B is a 5 kHz square wave.

The non-inverted output of flip-flop 534A is input to the CLK AB input of a counter 538, as well as to the less significant address input bit A0 of a demultiplexer 537. The QAB output of counter 538 is input to the more significant address bit Al of demultiplexer 537. Also, the most significant counter bit QDB of counter 538 is fed back to the CLK A input of the counter.

Flip-flops 534A, 534B may be implemented as an RCA 249CD4013AE Dual D flip-flop chip. Demultiplexer 537 may be implemented as a Motorola 832100 M74LS139T 1-of-4 Decoder/Demultiplexer chip. Finally, counter 538 may be implemented as a Motorola Dual 4-Stage Binary Ripple Counter, with a clock AB input being pin 15, the clock A input being pin 1, and the QAB and QDB outputs being pins 13 and 9, respectively.

Demultiplexer 537 has four outputs. Only one of the four outputs is active at the same time. The signals input to address inputs A0 and Al ensure that, at a suitable frequency to synchronize with the outputs of flip-flop 534B, the demultiplexer signal which is active scans progressively from one output of the demultiplexer to the next. The labels 1, 2, 3, and 4 at the output of demultiplexer 537 indicate the minor interval (as defined with reference to FIG. 3) in which the corresponding output is active. The presence of counter 538 ensures that no "lock-up" occurs and that the scanning of the active pulse is continuous and repetitive.

The outputs of flip-flop 534B as well as the outputs of demultiplexer 537 determine the timing for all of MOSFETs 1-12, 15-16, and 21-22 (shown in FIGS. 1 and 2). These signals are labelled A-J at the right of FIG. 5A, and correspond to similarly labelled signals in FIG. 3. Also, the minor interval (1, 2, 3, or 4) during which each signal is active is also labelled, near the right of FIG. 5A.

The manner in which the outputs of flip-flop 534B and demultiplexer 537 determine these control signals is no described. The four outputs of demultiplexer 537 are input to respective logical inverters 539A, 539B, 539C, and 539D, which may be implemented as part of a Motorola MC74HC04N Hex inverter chip. Modified (exponentially shaped) outputs of inverters 539A, 539B, 539C, 539D provide signals D, E, I, J, respectively, which control the gates of constant current controller MOSFETs 5, 6, 11, 12, respectively.

It is understood from previous discussion that the signals D, E, I, and J are not binary signals, but are preferably exponential signals. To provide this exponential wave shaping, a wave shaping element 536, which may be conceptualized as essentially an R-C wave shaper, is employed. In a preferred embodiment, wave shaper 536 may be an RCA CA324E, connected to the outputs of inverters 539A-539D in a manner readily implemented by those skilled in the art using published data sheets for the CA324E.

To provide additional current boosting for the signals D, E, I, and J, the respective outputs of the demultiplexer 537 are input to the gates of four MOSFETs 540A, 540B, 540C, and 540D. The drain-source pathways of these MOSFETs are connected between respective wave shaped outputs of the inverters and ground. MOSFETs 540A, 540B, 540C, 540D are preferably implemented using Siliconix VN10KM N-Channel MOSFETs, rated at 60 volts and 1 amp (pulsed). Thus, the proper shape and power gate signals D, E, I, and J are provided via gate signal amplifier 116 (FIG. 4) to constant current controller MOSFETs 5, 6, 11, and 12.

Meanwhile, the binary MOSFET gate signals A, F, B, C, G, and H are produced by Darlington drivers 535E, 535F, 535A, 535B, 535C, and 535D, respectively. These Darlington drivers, preferably implemented as a Motorola ULN2003A Darlington Transistor Array, receive respective outputs from the non-inverted and inverted outputs of flip-flop 534B, and the respective outputs of inverters 539A, 539B, 539C, and 539D.

All the signals exiting the right of FIG. 5A are sent to the gate signal amplifier 116 offered in detail in FIGS. 4, 4A, and 4B, before controlling the timing and operation of the MOSFETs which are in the tank circuit shown in FIGS. 1 and 2.

It is understood that the circuit elements illustrated in FIG. 5A are provided with proper power in the form of regulated voltage signals. The regulated voltage signals are generated on FIG. 5B.

Referring now to FIG. 5B, voltage regulators and the tank charger considered a part of element 114 (FIGS. 1 and 2) are illustrated. The bottom of FIG. 5B illustrates the connection between battery 118 (at the left of FIG. 5B) and feedback controller 110 (at the right of FIG. 5B). The difference between the unregulated 18 volts received from feedback controller 110 (FIGS. 1 and 2) and the unregulated 12 volts from the battery 118 (FIGS. 1 and 2) is provided by a Zener diode 571, preferably a 5.1 volt Zener used as a voltage shifter. Similarly, a second Zener diode 572 is provided between the positive and ground lines 226, 224, the Zener diode 572 preferably implemented as a 12.1 voltage Zener used as a voltage regulator. Finally, a third diode allows passage of current from battery 118 on path 230 to path 224 to feedback controller 110. The third diode 573 is preferably implemented as a IN914 functioning as a reverse polarity protector.

Regenerative feedback controller 110 (FIGS. 1 and 2) is preferably implemented as a Vicor DC-to-DC converter, having 120 volts DC on the tank output (load) side, and a +18 volt DC output between paths 226 and 224. The Zener diode 572 ensures a 12 volt DC potential matches that from battery 118.

Regulated power is provided as follows. Referring again to FIG. 5B, a first regulator **524** is connected to ground and to the unregulated 12 volt input from battery **118** on path **232**. through a voltage regulator **581**. Voltage regulator **581** is preferably implemented as a **7805**. Regulator **524**, preferably implemented as a Maxim MAX743 Dual Output Switch Mode Regulator operating with two Maxim LM78L12 Linear Regulators, produces regulated +12 volt DC and −12 volt DC outputs. The +12 volt DC output is input to a second regulator **533**, which is preferably implemented as a **7805** UC8621 **5** volt regulator. Regulators **524** and **533** provide the regulated +12 volt DC, +5 volt DC, and −12 volt DC levels to circuits in FIG. **5A**, **5C**, **4A**, and **4B**, in a manner readily appreciated by those skilled in the art.

The tank charger portion of element **114** (FIGS. **1** and **2**) may be implemented as follows. In FIG. **5B**, the tank charger circuitry which controls paths **106**, **107**, **108** (FIGS. **1** and **2**) is shown to comprise a series-connected step down element **525**, and a step up element **526**. Step down element **525** receives the 12 volt DC regulated power and steps it down through a series of **12** series-connected diodes and an adjustable resistor to provide an output of +5.14 volts DC. Then, step up element **526**, preferably implemented as an E12-12-1.5150 ERG Inc. DC-to-DC voltage converter, produces a regulated **120** volt DC output. The output of step u element **526** provides power through node **106** (also shown in FIGS. **1** and **2**) to both tank elements **101**, **102**. The ground lines leading to the respective tanks via switches **21** and **22** (FIG. **2**) are shown as pathways **107**, **108** (FIGS. **1**, **2**, **5B**).

Referring now to FIG. **5C**, circuitry which provides timing for an AC load **100A** is illustrated. This circuit is in contrast to that providing power to a DC load **100** (shown in FIGS. **1** and **2**). The circuit illustrated in FIG. **5C** provides a 60 Hz, 120 volt RMS signal to the AC load **100A**.

More specifically, a 60 Hz sinusoidal oscillator **528** produces a 1.0 volt 0-to-peak sinusoidal signal. Preferably, the sinusoidal oscillator is implemented as a Micro Linear ML2036 Programmable Sine Wave Generator, programmed to produce the above-mentioned signal applying information in published data sheets accompanying the Micro Linear product. The sinusoidal output of oscillator **528** is input to a dual half-wave rectifier **529**. Half-wave rectifier **529** includes two diodes **529A**, **529B**. The positive portion of the sine wave is passed along a top path to both a square wave generator **531** and a first pre-driver **542A**. Conversely, the negative portion of the sine wave is inverted by a unity-gain invertor before being input to a second square wave generator **532** and a fourth pre-driver **542D**. Square wave generators **531**, **532** are similarly constructed square wave generators which produce +12 volt square waves synchronous with their respective sinusoidal inputs. The outputs of square wave generators **531**, **532** are input to second and third pre-drivers **542B**, **542C**. Pre-drivers **542B**, **542C** produce +12 volt square waves substantially synchronous with their respective inputs.

The unity-gain invertor is preferably implemented as an LM **318** configured for unity gain but opposite polarity. Square wave generators **531**, **532** are readily implemented by those skilled in the art. Finally, pre-drivers **542A**, **542B**, **542C**, and **542D** are constructed in accordance with FIG. **4B**.

The outputs of pre-drivers **542A** and **542D** drive gates of respective MOSFETs **23**, **24**. MOSFETs **23**, **24** comprise the elements of a DC to 60 Hz half-wave convertor **549**. The node between MOSFETs **23** and **24** is the same as node **402** (FIGS. **1** and **2**) which is at the negative side of DC load **100** (illustrated in phantom in FIG. **5C**).

MOSFETs **17** and **18**, with diodes **17A**, **17B**, **18A**, and **18B** collectively comprise a half-wave to full wave converter.

The outputs of pre-drivers **542B** and **542C** drive gates of respective MOSFETs **17** and **18**. The source of MOSFET **17** is connected to the source of MOSFET **24** via series-connected diodes **17A** and **18B**. The node between diodes **17A** and **18B** is connected to a first terminal of the AC load **100A**. Similarly, the source of MOSFET **18** is connected to the drain of MOSFET **23** via series-connected diodes **18A** and **17B**. The node between diodes **18A** and **17B** is connected to a second terminal of the AC load **100A**.

The drain of MOSFET **17** is connected to the drain of MOSFET **18**, their common connection being the node **105** (**432**) which is the node at the positive terminal of the DC load **100** (shown in phantom in FIG. **5C**).

MOSFETs **17**, **18**, **23** and **24** are preferably implemented as IRF350's. Finally, Diodes **17A**, **17B**, **18A**, and **18B** are preferably implemented as 200-volt, **30A** diodes functioning as reverse polarity protectors.

In operation, the half-wave sinusoidal signals entering the gates of MOSFETs **23** and **24** are 180° out of phase with each other, thus allowing power passing from nodes **402** and **105** to pass through the AC load **100A** in oppositely phased time frames. The 85 volt peak voltage half-wave sinusoids provided by each of the MOSFETs **23**, **24** arranged in opposite polarities thus provides a 60 Hz full wave 120 volt RMS output to the AC load **100A**.

The structure and operation of the preferred embodiment of the present invention has been described. For a more conceptual understanding, the following description is provided.

As described above, the preferred embodiment includes two tank circuits that are resonant at the same frequency. In the illustrated embodiment whose components are listed above, the resonant frequency is 20 kHz. The tank circuits have identical associated drive systems, master-time-controlled by signals A and F (FIG. **3**) from gate signal generator and tank charger **114**, operating at 20 kHz. Signals A and F are identical but oppositely phased positive-going, **50/50** duty cycle square waves. Each signal controls the time frame by which all other operations take place by controlling the grounding sequence between the tank circuits and their respective current source through respective grounding MOSFETs **21** and **22**. Thus, alternation of functioning of the tank circuits is achieved.

Regarding operation of tank **101**, at the beginning of the first major period **312**, at the beginning of the first minor interval **301**; at the instant that MOSFET **21** receives a positive going (0 to +12 volts) 50/50 duty cycle square wave gate voltage signal A , MOSFET **22** is receiving a neutral going (+12 volts to 0 volts) 50/50 duty cycle square wave gate voltage signal F. Tank **101** is thus connected to the gate signal generator and tank charger **114** and capacitor Cl is allowed to charge (under resonant conditions) where the inductive reactance equals the capacitive reactance to V+voltage, which in the preferred embodiment is **120** volts. Page

4–134, *Electricity One-Seven,* (Harry Mileaf, the totality of which is incorporated herein by reference) includes an explanation of parallel resonant tank circuit charging as generally understood by those skilled in the art.

At the same time that MOSFET **21** receives its positive going square wave gate signal A, MOSFET **1** of tank **101** receives the same gate signal. This opens a current flow path within tank **101** including only resistances associated with the inductor, MOSFET switch, diodes, capacitor and conductors connecting these components in series. The series resistance includes: the resistance of multi-strand wire, which may be #12 copper wire with having 0.00102 ohms resistance/foot used as conductors connecting the various components in series; the 0.15 Ohm internal drain-to-source resistance of MOSFET **1**; the internal resistances of diodes **206** and **38**; negligible capacitor resistance; and 12–14 inches of copper wire, which may be #12 single strand wire which makes up the coil of tank **101**'s inductor L1.

The magnetic core of the inductor is preferably a ferrite toroid with associated magnetic quadrature tuning circuitry. This circuitry between the positive and negative terminals of Cl makes up the complete current charging path within tank **101**, which is only about 12–18 inches in length. The extremely low value of the total internal tank circuit resistance allows the tank to be operated at a high "Q" or "quality." Adjustment of the "Q" in the preferred embodiment is accomplished by varying the inductive reactance of the inductor L1. This is preferably accomplished by increasing or decreasing a DC current through the windings around a "C" cored electro-magnet physically placed at 90 degrees (at quadrature) to the axis of the toroid inductor L1. The induced magnetic field within the "C" cored electro-magnet controller changes, or "modulates" the inductive reactance of the inductor L1. Other possible means of manual or automatic physical or electronic adjustment of the tank's inductance lie within the ability of those skilled in the art for tuning the inventive power supply, and need not be further described.

Tank **102**'s internal charging path circuitry, associated controlling circuitry and associated current paths are functionally, and as close as possible, physically, exact duplicates of those of tank **101**.

At the beginning of the first major period, tank **102**, having just completed its resonant charging sequence, is at the same instant decoupled from the exterior current source as "grounding" MOSFET **22** receives neutral going (+12 to 0 volt) square wave gate signal F so that it is turned off to a non-conducting state. Also at this same instant, a current flow path is established between the negatively charged terminal of C2, the load **100**, and the positive terminal of C2, because of the 0 to +12 volt, 25/75 duty cycle signal G (applied to the gates of MOSFETs **8** and **9**), and signal I (applied to the gate of MOSFET **11**). MOSFETs **8** and **9** receive the 0 to +12 volt, 25/75 duty cycle gate G signal which turns them on.

MOSFET **11** receives a 0 to +12 volt, 25/75 duty cycle "exponential" gate signal that is specifically designed to utilize the full 25% time period of minor interval **301** in reaching its maximum +12 volt level. It is sequenced to start at the same instant as the gate signal going to MOSFET **8**. In the illustrated embodiment, all trailing, or neutral going +12 to 0 volt edges of the exponential signals are vertical; they do not ramp downward nor do they extend below the zero line.

At the end of this first minor interval, the voltages at the gates of MOSFETs **8**, **9**, and **11** are forced instantaneously to zero volts. This minor interval comprises only half the overall **50** percent duty cycle as determined by the gate signal generator and tank charger **114**'s 20 kHz rate (signals A and F).

At the instant that MOSFETs **8**, **9** and **11** are turned off, MOSFETs **10** and **12** are turned on by receiving 0 to +12 volt 25/75 duty cycle gate voltage signals H and J respectively. MOSFET **10** receives a 0 to +12 volt, 25/75 duty cycle gate voltage like that sent to the gates of MOSFETs **8** and **9**. MOSFET **12** receives a 0 to +12 volt, 25/75 duty cycle "exponential" gate voltage signal identical to that sent earlier to the gate of MOSFET **11**.

This second set of MOSFET controls the discharging path during the second minor interval **302** (and therefore, the timing of th collapse of the magnetic field of L2) which was created by the discharge of capacitor C2. This second minor interval **302** (occupying the second 50 percent of the first major period time frame) takes up the remaining portion of the discharge time frame. This discharge time frame is the first major period allotted to tank **102** by the 20 kHz signals A and F from the gate signal generator and tank charger **114**.

This is the preferred configuration of MOSFETs **8–12** in the discharge current path of tank **102**, and the preferred configuration of MOSFETs **21** and **1** in the current capacitor charge path of tank **101**. As stated above, MOSFETs **1–4**, 7–10, and **21–22** act as "on/off" switches, thus changing the various current flow paths, while other MOSFETs (**5**, **6**, **11**, and **12**) act as constant current controllers. MOSFET **11** controls the current discharge flow rate of tank **102**'s capacitor C2, while MOSFET **12** controls the current flow rate created by the controlled collapse of the magnetic field of tank **102**'s inductor L2. By design, the tank capacitors are not in the current flow discharge path of the tank inductors. When a tank inductor discharges within in the second minor interval, it does not change polarity as in standard tank circuits. Nor do the tank capacitors change in polarity as in standard tank circuits; they charge in one direction only. This action is totally different than that of standard tank circuit.

The advantages of the present invention are many, but include:

1) Each resonant tank is directed to charge its capacitor independent of any exterior load being connected to it, thereby realizing the resonance charging conditions to the fullest.

2) Each tank element is discharged through the load in a uniform manner with a common and unchanging polarity to the load (for DC operation).

A discussion is presented here to amplify the advantages summarized in the previous paragraphs; for it is here that the present invention demonstrates some of its advances in the art.

By first controlling the current flow discharge rate of the resonant tank capacitor, and then controlling the discharge rate of the resonant tank inductor, the following occurs. First, a non-resonant RC circuit, and then a non-resonant LR circuit, powers the load. Powering a load using non-resonant circuits is standard practice today in some power supplies, but any powering circuits are used independently of each other. In contrast, the present embodiment sequentially uses a non-resonant RC circuit and a non-resonant LR circuit. Also, and more important, by discharging the elements of both resonant tank circuits in exactly half the time that

was allotted for resonant charging of the individual tank capacitors, twice the available current (and thus, correspondingly increased power) is made available to the load in comparison to the situation in which each capacitor is discharged at its resonant charging rate. In fact, discharging each capacitor at its resonant charging rate would bring about very disastrous conditions for most loads. This is because series resonant conditions would come into play with its associated condition of reactive voltage increases which would be impressed across the load.

By utilizing the MOSFETs **5**, **6**, **11**, and **12** as variable resistors (functioning as constant current controllers) and decreasing their resistance exponentially from maximum to minimum during the "on" portion of the appropriate minor interval, the following is accomplished: By decreasing the internal resistance to current flow within each tank capacitor's discharge circuit over the full minor interval in a manner that exactly counteracts and yet controls the decreasing voltage of the discharging tank capacitor, the load is presented with controlled, even current. Thus, the load can react evenly, as if fed by a constant voltage, constant current source. Similarly, by decreasing the internal resistance within each tank inductor's discharge circuit over the entire minor interval in a manner that exactly counteracts and yet controls the decreasing voltage associated with the collapsing magnetic field, the load is again presented with controlled current.

This advantage is accomplished by exactly matching the previous negative polarity to positive polarity supplied by the tank capacitor (only now from the tank inductor) during the entire time frame in which inductor magnetic field collapse is experienced. The different voltage potentials (+120V and neutral, or ground) required by the load to operate properly is first supplied by the tank **102** capacitor C2 during minor interval **301**, then by tank **102** inductor L2 during minor interval **302**, then by tank **101** capacitor Cl during minor interval **303**, and finally by tank **101** inductor L1 during minor interval **304**; at which time minor interval **301** begins again and the entire sequence repeats. Again, it is as if a non-changing, constant voltage source is being applied to the load.

Each of the discharge time "minor intervals" is exactly one-half the full tank charge time "major periods". This fulfills the requirement of balancing the charge/-discharge ratio to obtain equilibrium within the circuit As described above, as the tank **102** components C2 and L2 are discharging through the load in a non-resonant manner, tank **101** is charging the capacitor Cl (which is not connected to the load) under parallel resonant conditions. The individual series-connected discharge time rates are one-half the charge time rate, so that the discharge current flow rate is twice as fast, thus affording the load twice the available current compared with a set of operating conditions where each discharge time rate is equal in time to each charge time rate. After the elements of tank **102** have discharged through the load, encountering only series resistive losses due to the conductive paths, the inductor coil, tank diodes, and the load, they are disconnected from the load by MOSFETs **8**, **9**, **10**, **11**, and **12** as they receive neutral going +12 to 0 volt signals G, G, H, I, and J, respectively at their gates. At the same instant, the proper positive going gate voltages are applied to the appropriate tank **101** MOSFETs (tank **101** having just completed resonant charging of its capacitor Cl), and the cycle of powering the load during the second major period **334** during minor intervals **303**, **304**, (from the elements of tank **101**) can begin.

In summary, the described embodiment has the following features:

The ability to use reactive power to completely power a load through the process of controlled current flow from alternately employed series non-resonant LR and RC circuits of which the L and C components, during the charging cycle, form a parallel resonant tank circuit.

The ability to utilize the natural magnification characteristics of a resonant tank circuit to bring about the full charge condition of a capacitor through a circuit path other than only through the current's voltage source (as in a series resonant circuit).

The ability to double the effective available current to a load. This is accomplished by halving the available discharge time per element, from the capacitor and then from the inductor of each tank.

The ability to continuously power a pseudo-series-connected load by using two identical resonant tank circuits. One tank circuit's capacitor under resonant conditions is charged from an external voltage source while being isolated from the load. The other previously charged tank circuit's elements discharge (under controlled series circuit conditions as described above) through the load while being isolated from the external voltage source.

The ability to continuously power a load with an electronic power supply that cannot suffer from the problem of voltage drop (a dropping or decreasing voltage potential experienced by known generators).

The ability to continuously power a load with an electrical power source. The external voltage/current source (battery **118**) supplies the necessary voltage and current to fulfill the power requirements to charge up Cl in tank **101** during the first major period. After the resonant charging of one of the two resonant tanks, the charged tank elements start to discharge through the load.

As can be seen from the above description of circuit operations, the circuitry operates in both "best mode" cases of resonance. First, regarding series resonance, the illustrated embodiment has the ability to deliver maximum available power to a load. Second, regarding parallel resonance, the illustrated embodiment has the ability to charge a capacitor to act as a voltage potential source utilizing the absolute minimum amount of current from an external current source.

Additional circuitry may be added to the illustrated embodiment to utilize the ability of a DC "power" source to be non-discriminatory in its own power requirements under the condition known as DC superposition. In this scenario, the resonant tank circuitry takes its required current and voltage from whatever source such as battery **118** and/or feedback controller **110**, or a combination of both, as long as each has the correct voltage polarity and minimum required current. The system may be specifically designed to utilize feedback controller **110** for the primary (internal) DC voltage and current source, and may use battery **118** as an external DC voltage and current source for the secondary DC source.

The system exhibits maximum impedance to current flow from the point of view of looking out from the resonant tank circuit toward its voltage and current source, as any resonant tank circuit should. At the same

time, it powers the load as a series circuit would, with impedance to current flow coming only from line resistance (determined by the size and other properties of the wire used in the discharge path). The system is not under series resonant conditions in the discharge mode because the discharge frequency is twice that of the charge frequency: 40 kHz versus the 20 kHz resonant frequency of the system.

The dual, yet independent series LR and RC discharge circuits making up tanks **101** and **102** have the ability to fulfill all electrical power requirements: each can supply the necessary voltage and current to each other as the internal system "power source", (feedback controller **110**, gate signal generator and tank charger **114**, gate signal amplifier **116**, and associated circuitry) that is charging the other tank circuit (which is charging under resonant conditions at 20 kHz) as a load in parallel to load **100**. The reason for this condition is that the particular section of the system being charged under resonant conditions is connected (from a load-power-requirements point of view) to the other part of the power supply that is powering load **100** at that instant. Only those resonant tank circuit components that had been previously charged up under resonant conditions, and were previously disconnected from the "internal" power source (the other tank circuit but not feedback controller **110**) during this time frame is powering the total parallel load. In this usage of the term "load", the "internal" tank circuit control circuitry and the other charging tank circuit are a part of the total "load", not just load **100**.

Under conditions of resonance, "tunnel diodes", or "Esaki diodes", can be used in the resonant tank circuit, and all necessary outside current directly fed to the tank circuit itself can be eliminated. The reason is that a tunnel diode creates a condition known as "negative resistance". The effect it can have upon the tank circuit in which it is placed is to reduce the effective pure resistance to an absolute minimum. Therefore, with an effective internal pure resistance at an absolute minimum within the tank itself as described above, an absolute minimum "line current" running through node **106** is necessary.

As shown in FIG. **2**, two circuits are operating at the same time. In the first minor interval **301** (FIG. **3**), tank **101** is being charged, and is disconnected from load **100** and feedback controller **110** as MOSFETs **2**, **3**, **4**, **5**, and **6** are not conducting. Tank **101** is connected to the internal power source (feedback controller **110**; gate signal generator and tank charger **114**; and gate signal amplifier **116**) through its diode on the positive **120V** node **202** through node **106**. MOSFET **21** provides the connection to the ground side.

Tank **102**'s capacitor and then its inductor discharge through the "load" (which, for these purposes, is considered to include tank **101**, the internal power source (feedback controller **110**, gate signal generator and tank charger **114**, gate signal amplifier **116**, and parallel load **100**)). At this time, tank **102** is disconnected from the internal power supply (feedback controller **110**, gate signal generator and tank charger **114**, gate signal amplifier **116**) because diode **216** at the positive terminal of capacitor C2 does not allow the capacitor to discharge directly to it. MOSFET **22**, positioned between tank **102** and the internal power source ground, has also been turned off, thus isolating tank **102** discharge circuitry from the internal and external power source grounds.

In this manner, each discharging tank circuit component forms both its own ground source and current source to load **100** and its parallel load made up of feedback controller **110**, gate signal generator and tank charger **114**, gate signal amplifier **116**, and the other tank circuit. MOSFETs **11** and **12**, each receiving a exponential gate signal, control the amount of current allowed to be delivered to the loads as described earlier for the following reason.

Current should be delivered in a steady, even manner to obtain the desired effect of powering the load evenly. An evenly applied amount of current supplied to a steady and unchanging load will allow the proper, even, designed voltage drop to be developed across the load. The availability of current flow (up to a predetermined maximum amount as determined by the dual tank circuit components and discharge circuitry) applied to a changing load; either resistive, inductive, capacitive, or a combination thereof, can power that load as supplied by the system. Because "current flow" (and not voltage) is the "common denominator" in all four load conditions listed above, the various different voltage drops; and their individual phase relationships at the individual loads can be developed by the various loads as required. The present system utilizes the ability of a power MOSFET to be used as a variable resistor in controlling the current flow rate. The present system controls the current flow rate supplied to the load by decreasing its resistance to current flow in a manner that is an exact correlation to the dropping source voltage being supplied first by tank capacitors and then tank inductors. This arrangement delivers the correct flow of current needed to pass through and as required by the load. As the voltage of, first, the tank capacitor and then the tank inductor, drops, the controlling MOSFETs' internal resistance also must drop.

During the first minor interval **301** (FIG. **3**) the discharging of the tank **102** capacitor C2 supplies the necessary difference of potential between its terminals to cause current flow through the parallel loads, as controlled by MOSFET **11**.

During the second minor interval **302** (FIG. **3**) the collapsing magnetic field of the tank **102** inductor L2 supplies the necessary difference in potential between its poles to cause current flow through the load, as controlled by MOSFET **12**.

During minor intervals **303** and **304** (FIG. **3**), the above described current flow occurs again. Tank **101** powers the "load" (which now includes both tank **102** and the internal power source as described previously). Tank **101** capacitor Cl is disconnected from gate signal generator and tank charger **114** through node **106** by diode **206** at C1's positive terminal, thus not allowing Cl to discharge back into itself, MOSFET **15** being turned off, and by the non-conducting ground controlling MOSFET **21** being turned off. MOSFET controls the discharge time of capacitor Cl, in the same manner as MOSFET **11** controls the discharge time of capacitor C2. MOSFET **6** controls the decay time of the magnetic field of inductor Ll, in the same manner as MOSFET **12** controls the decay time of the magnetic field of inductor L2. MOSFETs **8**, **9**, and **10** are turned off to allow tank **102** to charge capacitor C2 to the applied 120 volts supplied from the gate signal generator and tank charger **114**.

Modifications and variations of the above-described embodiments of the present invention are possible, as appreciated by those skilled in the art in light of the

above descriptions. It is therefore to be understood that, within the scope of the appended claims and their equivalents, the invention may be practiced otherwise than as specifically described.

What is claimed is:

1. A power supply for supplying power to a load, the power supply comprising:

a) a first tank circuit having a resonant frequency; and

b) a second tank circuit having a resonant frequency substantially identical to the resonant frequency of the first tank circuit;

wherein the two tank circuits are constructed and adapted to function repetitively in two major periods,

A) in the first major period, the first tank is disconnected from powering the load and the second tank supplies power to the load and charges the first tank; and

B) in the second major period, the second tank is disconnected from powering the load, and the first tank supplies power to the load and charges the second tank.

2. The power supply of claim 1, further comprising:

c) a plurality of switches for selectively interconnecting the tank circuits and the load; and

d) a gate signal generator for generating gate signals for controlling the switches.

3. The power supply of claim 2, further comprising:

e) a gate signal amplifier, receiving the gate signals from the gate signal generator, for producing amplified gate signals which are connected to the switches.

4. The power supply of claim 2, further comprising:

f) a tank charger for providing power to the first and second tank circuits;

g) a battery for selectively providing power to the gate signal generator and tank charger; and

h) a feedback controller, connected between the load and the tank charger, for selectively providing additional power from the tank circuits to the gate signal generator and tank charger.

5. The power supply of claim 4, further comprising:

at least one regulator circuit, responsive to either the battery or the feedback controller, for producing regulated voltage used by the gate signal generator and the tank charger.

6. The power supply of claim 4, wherein:

the tank charger includes:

1) a step down circuit for converting a regulated voltage from the at least one regulator circuit to a voltage smaller than the regulated voltage; and

2) a step up circuit, responsive to an output of the step down circuit, for producing a tank drive voltage which is larger than the regulated voltage;

wherein the first tank circuit and the second tank circuit are responsive to the tank drive voltage.

7. The power supply of claim 2, wherein the gate signal generator includes:

a circuit for producing a plurality of minor interval signals, only one of which is active at the same time, the one of the minor interval signals which is active scans successively and repetitively among the plurality of minor interval signals, the scanning being completed in a period of time substantially equal to the two major periods.

8. The power supply of claim 7, wherein the circuit for producing the plurality of minor interval signals includes:

a demultiplexer having first, second, third, and fourth minor interval outputs, wherein:

1) the first and second outputs being successively active during respective first and second minor intervals in the first major period; and

2) the third and fourth outputs being successively active during respective third and fourth minor intervals in the second major period.

9. The power supply of claim 2, wherein the gate signal generator includes:

a circuit for producing first and second major period signals, wherein:

1) the first major period signal being active during the first major period and inactive during the second major period; and

2) the second major period signal being active during the second major period and inactive during the first major period.

10. The power supply of claim 1, further comprising a timing circuit for an AC load, the timing circuit for the AC load including:

a sinusoidal generator for generating a first sinusoidal signal of a first magnitude;

a first circuit for converting the first sinusoidal signal into two oppositely phased sinusoidal half-waves;

a second circuit for converting the first sinusoidal signal into two oppositely phased square waves; and

a conversion circuit, responsive to the first circuit and second circuit, that, under control of the square waves, combines the two sinusoidal half-waves into a full wave sinusoid of a second magnitude, the full wave sinusoid being applied to the AC load.

11. The power supply of claim 1, wherein:

each of the first tank circuit and the second tank circuit includes:

1) a first node and a second node;

2) a first pathway between the first node and the second node including a series-connected inductor, a first intermediate node, and first switch;

3) a second pathway between the first node and the second node including a capacitor; and

4) a third pathway, connected between the first intermediate node in the first pathway and the second node, the third pathway including a second switch;

wherein the first and second switches govern current flow within and through the first and second tank circuits.

12. The power supply of claim 11, wherein:

each of the first tank circuit and the second tank circuit further has associated with it:

5) a fourth pathway connecting the first intermediate node with a first terminal of the load via a third switch; and

6) a fifth pathway connecting the first node to the first terminal of the load via a fourth switch.

13. The power supply of claim 11, wherein:

each of the first tank circuit and the second tank circuit has associated with it:

7) a constant current controller connected between a second terminal of the load and the first node.

14. The power supply of claim 13, wherein the constant current controller includes:

two MOSFETs which operate in linear regions so as to control current which enters the first node.

15. A power supply for supplying power to a load, the power supply comprising:

a) a first tank circuit having a resonant frequency, the first tank circuit comprising a first capacitor and a first inductor which substantially determine the resonant frequency of the first tank circuit;

b) a second tank circuit having a resonant frequency substantially identical to the resonant frequency of the first tank circuit, the second tank circuit comprising a second capacitor and a second inductor, which substantially determine the resonant frequency of the second tank circuit;

c) a plurality of constant current controllers for connecting the tank circuits to the load; and

d) a set of switches for selectively interconnecting the tank circuits, constant current controllers and load; wherein the tank circuits, constant current controllers and switches ar constructed and arranged to function in first and second major periods, each of the first and second major periods comprising first and second minor intervals, wherein:

1) the first minor interval of the first major period defines an interval during which the second capacitor is providing power to the load and is charging the first tank circuit;

2) the second minor interval of the first major period defines an interval during which the second inductor is charging the first tank circuit and providing power to the load;

3) the first minor interval of the second major period defines an interval during which the first capacitor charges the second tank and provides power to the load; and

4) the second minor interval of the second major period defines an interval during which the first inductor charges the second tank and provides power to the load;

wherein the switches control the timing of the minor intervals and major periods.

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BK PRECISION
2120B DUAL TRACE OSCILLOSCOPE 30MHz
TIME BASE
TIME/DIV
CH1
CH2
MICRONTA
DIGITAL MULTIMETER
EXTECH LCR Meter 380193
FREQ
ENTER
Panaflo
DC BRUSHLESS
TRACO POWER

To: Comments@efsec.wa.gov
From: kmbrun@gmail.com
Received: 2024-05-24T18:05:52+00:00
Subject: Governor Inslee's Remand Letter
Has attachment? False

External Email

I just want to let you know that I feel Governor Inslee, in sending this directive three days after a Motion for Reconsideration was filed and before any of the other intervenors have responded to it, seems like a violation of several statutes including WAC 463-30-355(3), SEPA, and the Administrative Procedures Act. I'm in the process of writing a response letter to him, with a copy to you, that focuses on the fallacies of this directive.

It's almost like Stoel Rives wrote this letter for him as it directs you to narrowly tailor impacts rather than use cumulative impacts (as required by 10 CFR 1508.7) to justify your decision for exclusion areas. I urge you to do the absolute minimum on his demands and send the draft SCA back with very few changes.

If the Governor can direct you to rescind all the hard work you've done and side with the applicant on its original proposal, then EFSEC might as well be disbanded as it serves no useful purpose.

Karen Brun
Kennewick, WA

Attachments:
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To:
efsec@efsec.wa.gov;Comments@efsec.wa.gov;efsec@efsec.wa.gov;sonia.bumpus@efsec.wa.gov;kathleen.drew@efsec.wa.gov;joanne.snarski@efsec.wa.gov;andrea.grantl
From: cease2020@aol.com
Received: 2024-05-26T23:52:42+00:00
Subject: C.E.A.S.E. HHH PROJECT DECISION
Has attachment? False

External Email

EFSEC, you followed the RCWs and made good decisions on the HHH project. Inslee now wants you to ignore the laws and change your decisions with narrow mitigation. He should just say give Scout Clean Energy what they want or else you're out of a job. WILL you stand by your decisions or cave in to Inslee's demands? I ask that you stand by your decisions for the all the reasons you sited. Follow the laws and protect the east side citizens of Benton County. Respectfully, Greg Wagner C.E.A.S.E. CITIZENS EDUCATED ABOUT SOLAR ENERGY

20240523_HH_GOV_ResponseLetter_0.pdf (wa.gov)

Attachments:
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To: Comments@efsec.wa.gov
From: efsec@efsec.wa.gov
Received: 2024-05-28T15:37:10+00:00
Subject: FW: No Horse Heaven wind farm
Has attachment? False

From: bcmcconnel49 <bcmcconnel49@gmail.com>
Sent: Monday, May 27, 2024 12:19 PM
To: EFSEC (EFSEC) <efsec@efsec.wa.gov>
Subject: No Horse Heaven wind farm

External Email

Wind does 10 times more environmental damage than nuclear.

https://thebreakthrough.org/issues/energy/its-settled-more-nuclear-energy-means-less-mining

Sent from my Verizon, Samsung Galaxy smartphone

Attachments:
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