STAFF REPORT FOR PLANNING COMMISSION MEETING JANUARY 26, 2011

FILE NO: SUP-10-114 **AGENDA ITEM: H-3**

STAFF AUTHORS: Jennifer Pruitt, Principal Planner
Kathe Green, Assistant Planner

REQUEST: A Special Use Permit to allow the installation of a 160 foot wind turbine including variations of height, setback and noise standards pursuant to 18.05.080, on property zoned Single Family 6000 (SF6), located at 7300 Schulz Dr., APN 010-671-02.

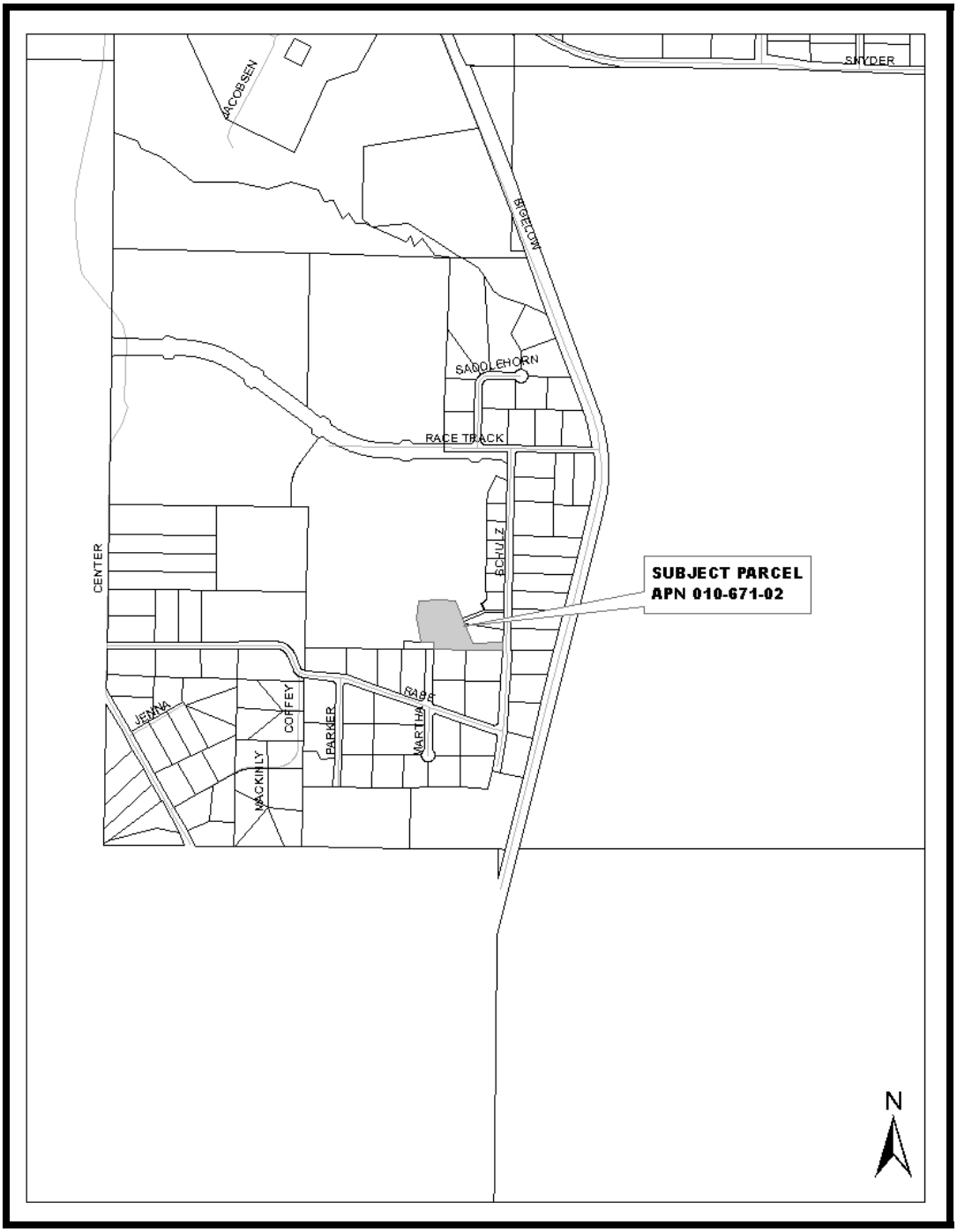
APPLICANT/OWNER: Rainbow Conservation Corps/Joseph Goni

LOCATION: 7300 Schulz Drive

APN: 010-671-02

RECOMMENDED MOTION FOR APPROVAL: "I move to approve SUP-10-114, a Special Use Permit application from Rainbow Conservation Corps (property owner Joseph Goni), to allow the installation of a 160 foot wind turbine, on property zoned Single Family 6,000, located at 7300 Schulz Drive, Assessor's Parcel Number 010-671-02, based on seven findings and subject to the recommended conditions of approval contained in the staff report."

ALTERNATIVE MOTION FOR DENIAL: "I move to DENY SUP-10-114, a Special Use Permit request from Rainbow Conservation Corps (property owner Joseph Goni) for the installation of a 160 foot wind turbine, on property zoned Single Family 6,000, located at 7300 Schulz Drive, Assessor's Parcel Number 010-671-02, based, based on the inability to make the required findings for approval as identified in the staff report."


JACOBSEN
SNYDER
BIGELOW
SADDLEHORN
RACE TRACK
SCHULZ
CENTER
SUBJECT PARCEL
APN 010-671-02
JENNA
COFFEY
PARKER
RABE
MARTHA
MACKINLY
N

If a motion for approval is made, these are the required conditions of approval:

The following shall be completed prior to commencement of the use:

1. The applicant must sign and return the Notice of Decision/Conditions of Approval within 10 days of receipt of notification. If the Notice of Decision is not signed and returned within 10 days, the item will be rescheduled for the next Planning Commission meeting for further consideration.

2. The applicant shall meet all the conditions of approval and commence the use (obtain and maintain a valid building permit) for which this permit is granted within twelve months of the date of final approval. A single, one-year extension of time may be granted if requested in writing to the Planning Division thirty days prior to the one-year expiration date. Should this permit not be initiated within one year and no extension granted, the permit shall become null and void.

Conditions required to be incorporated into the proposed development plan:

3. All development shall be substantially in accordance with the development plans approved with this application, except as otherwise modified by the conditions of approval herein.

4. All improvements shall conform to City standards and requirements.

The following shall be submitted or included as part of a building permit application:

5. The applicant shall obtain a building permit from the Carson City Building and Safety Division for the proposed construction.

6. The plan submittal for the wind turbines shall comply with the prescriptive requirements outlined within the Carson City Building Division handout titled PLAN SUBMITTAL REQUIREMENTS: Wind Electrical Systems.

7. 2006 IBC Section 1803.1 requires excavations for any purpose shall not remove lateral support from any footing or foundation without first underpinning or protecting the footing or foundation against settlement or lateral translation. The proposed footing is located very close to the existing dwelling footing.

8. The electrical system shall be designed by a Nevada registered electrical engineer in order to show code compliance for tying in of the multiple electrical generating systems located on the subject property.

9. The applicant shall submit a copy of the Notice of Decision/Conditions of Approval, signed by the applicant and owner.

10. Dust control measures must be employed during the construction period.

11. Guy wire anchors may not extend closer than 10 feet to/from any property line.

12. The tower shall be designed and installed so that there shall be no exterior step bolts or a ladder on the tower readily accessible to the public for a minimum height of 12 feet above the ground. For lattice or guyed towers, sheets of metal or wood or other barrier shall be fastened to the bottom tower section such that it cannot readily be climbed.

13. All ground-mounted electrical and control equipment shall be labeled or secured to prevent unauthorized access.

14. All wind machines shall comply with applicable FAA regulations, including any necessary approvals for installations.

15. Evidence shall be submitted with a building permit application that the wind machine has been constructed in accordance with accepted industry standards and certified safe.

16. The potential ice throw or ice shedding from the proposed wind machine shall not cross the property lines of the site.

17. The only advertising sign allowed on the wind machine shall be a manufacturer's label, not exceeding one square foot in size, located on the generator housing.

18. Wind machines, unless subject to any applicable standards of the FAA, shall be a non-reflective, non-obtrusive color such as tan, sand, gray, black or similar colors. Galvanized steel or metal is acceptable for the support structures. Any painting or coating shall be kept in good repair for the life of the wind machine.

19. The wind machine shall be equipped with both manual and automatic controls to limit the rotational speed of the blade within the design limits of the rotor. An external, manual shut-off switch shall be included with the installation. The minimum distance between the ground and any protruding blades utilized on a private wind machine shall be 10 feet as measured at the lowest point of the arc of the blades.

20. The wind machine shall not create noise that exceeds a maximum of 50 decibels (dBA) at any property line.

21. Any wind machine found to be unsafe by an official of the Carson City Building Division shall immediately cease operation upon notification by Carson City and shall be repaired by the owner to meet federal, state, and local safety standards or be removed within six months.

22. Wind machines that are not operated for a continuous period of 12 months shall be removed by the owner of the wind machine.

23. When a wind machine is removed from a site, all associated and ancillary equipment, batteries, devices, structures or support(s) for that system shall also be removed.

24. Once wind machine is permitted, the owner has the option of compliance with the standards or discontinuation of operations. If the operation of the wind

machine(s) does not comply with the provisions of this article, the operator shall promptly take all measures necessary to comply with these regulations, including, but not limited to, discontinued operation of one or more wind machines.

25. The maximum overall height of the proposed wind turbine, including extended length of the blade, will be 160 feet.

LEGAL REQUIREMENTS: CCMC 18.02.050 (Review); 18.02.080 (Special Use Permits); 18.05.080 Wind Energy Conversions Systems

MASTER PLAN DESIGNATION: Medium Density Residential; Schulz Ranch Specific Plan Area

ZONING DISTRICT: Single Family 6,000

KEY ISSUES: Will the proposed 160 foot wind turbine be compatible with adjacent land uses and properties? Is this an appropriate location for the proposed use?

SURROUNDING ZONING AND LAND USE INFORMATION

NORTH: Single Family 6,000, vacant
SOUTH: Public Community/Mobile Home One Acre (MH1A), City property, vacant and residential uses
EAST: Single Family 6,000, vacant
WEST: Single Family 6,000 vacant

SITE HISTORY

- In August 2001 the applicant converted from well to Carson City water with building permit 01-1202.

- On September 26, 2001, Special Use Permit U-01/02-09 was approved by the Planning Commission to allow an accessory structure of 216 square feet on the subject site. At that time the subject site was 19.75 acres and included one modular home of 1,420 square feet, one modular home of 938 square feet, metal storage units of 144 square feet and a barn of 2,400 square feet. The 1,420 square foot modular home and the 216 square foot accessory structure have been removed from site.

- On February 27, 2002 the Planning Commission continued indefinitely MPA-01/02-4, a Master Plan Amendment application to change the Master Plan Land Use designation from Suburban Residential to Medium Density Residential to facilitate the establishment of a Specific Plan Area.

- On April 27, 2005, the Board of Supervisors approved MPA-05-044 to change the Master Plan Land Use designation from Suburban Residential to Medium Density Residential and Mobile Home One Acre to Single Family 6,000 concurrent with the adoption of the Schulz Ranch Specific Plan Area.

- On October 4, 2005 the Planning Commission reviewed and made a recommendation to the Board of Supervisors for approval of a Zoning Map Amendment by ordinance from Single Family One Acre (SF1A) and Mobile Home One Acre (MH1A) to Single Family 6,000 (SF6) on 125.8 acres in the Race Track Road vicinity, Assessor's Parcel Numbers 009-311-03,-08,-09,-10,-14,-15 & -47.

- On October 4, 2005 the Planning Commission approved a Tentative Map for a Common Open Space Development, "Schulz Ranch Development", consisting of 521 single family dwelling units,19% of land as common areas and open space on 125.8 acres in the Race Track Road vicinity, Assessor's Parcel Numbers 009-311-03,-08,-09,-10,-14,-15 & -47.

- On November 3, 2005, the Board of Supervisors approved a Zoning Map Amendment by ordinance from Single Family One Acre (SF1A) and Mobile Home One Acre (MH1A) to Single Family 6,000 (SF6) on 125.8 acres in the Race Track Road vicinity Assessor's Parcel Numbers 009-311-03,-08,-09,-10,-14,-15 & -47.

- On December 19, 2005, Parcel Map, PM-05-257 was approved by the Parcel Map Committee, which divided the 19.75 acres site into four parcels: 2.48 acre, 2.62 acre, .60 acre, and 14.11 acre. The applicant at that time retained ownership of the 2.48 acre parcel and the other parcels were incorporated into the Schulz Ranch Common Open Space Development.

- On November 19, 2008, the Planning Commission approved SUP-08-105, a request to allow an accessory structure exceeding 75% of the primary structure on site. Planning staff had recommended approval.

- In December 2009 the applicant installed a 14 panel ground mounted photovoltaic array on site through building permit 09-1062.

- In November 2010 the applicant installed a multi panel ground mounted photovoltaic array on site through building permit 10-923.

ENVIRONMENTAL INFORMATION

- FLOOD ZONE: Zone X
- SLOPE/DRAINAGE: The site is improved.
- SEISMIC ZONE: Zone II

SITE DEVELOPMENT INFORMATION

1. PARCEL AREA: 2.48 Acres
2. EXISTING LAND USE: Single Family Dwelling Unit
3. PROPOSED WIND TURBINE: 10 KW Bergey
4. MAXIMUM HEIGHT WITHOUT ADDITIONAL REVIEW: 60 Feet
   PROPOSED HEIGHT: Approximately 160 feet

REQUIRED SETBACKS WITHOUT ADDITIONAL REVIEW: Setbacks are a minimum of 1.1 times the total extended height or 176 feet, to the project property lines when adjacent to a residential, Conservation Reserve or Agricultural zoning district.

5.	PROVIDED SETBACKS:	North:	120 feet*
		South:	206 feet
		East:	140 feet*
		West:	156 feet*

* Variations to the regulations and standards may only be permitted by special use permit, approval of which shall be pursuant to Title 18, Section 18.02 (Special Use Permits).

DISCUSSION:

A Special Use Permit is required by CCMC Section 18.05.080(c) Wind Energy Conversion Systems. This code states that:

Compliance with Regulations.

c. Variations to the regulations and standards of CCMC 18.05.080 may only be permitted by special use permit, approval of which shall be pursuant to Title 18, Section 18.02 (Special Use Permits).

The applicant is proposing to install a10KW wind turbine of approximately 160 foot in height. This is proposed to be centrally located on site. Per the applicant the average American family uses between 10,000-15,000 kilowatt hours per year. The proposed turbine will generate approximately 14,000 KW annually.

The subject site is located in the southern portion of Carson City on a 2.48 acre parcel zoned Single Family 6,000 which is currently improved with a 1,008 square foot mobile home which was placed on site in 1979. The site also has an exiting barn structure of 2,400 square feet and a 3,400 square foot accessory farm structure constructed in 2008. The site was improved in 2008 and 2009 with two ground mounted photovoltaic arrays.

Carson City adopted the Wind Energy Conversion Systems ordinance in 2009. There have been two previously installed Wind Energy Conversion Systems in Carson City on one acre lots, since the adoption of the ordinance. The previously installed (WECS) met all standards identified in CCMC 18.05.080. Both projects were required to obtain building permit approval prior to installation, without Special Use Permit approval.

The proposed project is the first project submitted with the request of variations to the regulations and standards of CCMC 18.05.080.

City staff has identified three important factors that must be addressed related to the proposed project:

- *Justification for the proposed wind turbine height. Why is a height of 160 feet identified as the need in this instance?*

The applicant has noted that the 2.48 acre site is improved with an assortment of large accessory structures in addition to the mobile home on site. The following justification has been provided:

Per the applicant, the wind turbine requires a 160 foot height in order to stand above the nearby 105 foot hill and catch the wind coming off of the top of the eastern slope of the Sierras. The applicant states the proposed turbine at the proposed 160 foot height will increase performance from poor to fair.

Per the applicant a turbine of 160 feet is needed to produce good wind results and maximize energy production on site, also taking into account the existing features on site of trees and buildings.

- *Noise generation. What is the proposed noise generation at the adjacent property lines related to the 160 Bergey wind Turbine?*

  The applicant has provided estimated noise levels at all property lines abutting the subject site at wind levels of 19.5 mph:

  At northern property line at 120 feet = noise level of 47.56 dBA
  At eastern property line at 140 feet = noise level of 47dBA
  At western property line at 156 feet = noise level of 46.7dBA
  At southern property line at 206 feet = noise level of 45.25 dBA

- *Needs of the subject site. The proposed turbine is part of a wind/photovoltaic system.*

  The applicant has noted that this proposed project is part of his overall master plan for the subject site. It is the intention of the applicant to utilize the existing solar arrays, proposed wind turbine, and future grey water system for irrigation on site. The applicant has noted that wind speeds vary from month to month as shown in the applicants' submission in the three tier analysis. It is the intention of the applicant for the solar and wind component to work together to compensate for the low production periods of wind and solar production that are expected.

There is no question that the addition of the proposed wind turbine use on the subject site will increase physical activity on and to the site and increase the noise currently generated on site. Staff has offered 25 conditions of approval and modifications to this SUP to assist in the mitigation of these impacts.

In reviewing and acting on this Special Use Permit application, the Planning Commission must consider the provisions of Nevada Revised Statutes (NRS) 278.02077 regarding limitations on regulating the use of wind energy systems (see NRS 278.02077 attached to this staff report). NRS 278.02077(1)(a) states:

> *A governing body shall not adopt an ordinance, regulation or plan or take any other action that prohibits or unreasonably restricts the owner of real property from using a system for obtaining wind energy on his or her property.*

However, this section of NRS allows local governments to impose "reasonable" restrictions on such systems relating to the height, noise or safety of the system. It should be noted that the applicant is requesting variation to the height and noise requirements of the Carson City Municipal code for the installation of the wind energy system. The complete text of NRS 278.02077 follows (pertinent sections are underlined by staff for emphasis):

> ***NRS 278.02077 – Prohibition against prohibiting or unreasonably restricting use of system for obtaining wind energy; exceptions.***
>
> 1. *Except as otherwise provided in subsection 2:*
>   (a) *A governing body shall not adopt an ordinance, regulation or plan or take any other action that prohibits or unreasonably restricts the owner of real property from using a system for obtaining wind energy on his or her property.*
>   (b) *Any covenant, restriction or condition contained in a deed, contract or other legal instrument which affects the transfer or sale of, or any other interest in, real property and which prohibits or unreasonably restricts the owner of the property from using a system for obtaining wind energy on his or her property is void and unenforceable.*
> 2. *The provisions of subsection 1 do not prohibit a reasonable restriction or requirement:*
>   (a) *Imposed pursuant to a determination by the Federal Aviation Administration that the installation of the system for obtaining wind energy would create a hazard to air navigation; or*
>   (b) *Relating to the height, noise or safety of a system for obtaining wind energy.*
> 3. *For the purposes of this section, "unreasonably restricts the owner of the property from using a system for obtaining wind energy" includes the placing of a restriction or requirement on the use of a system for obtaining wind energy which significantly decreases the efficiency or performance of the system and which does not allow for the use of an alternative system at a substantially comparable cost and with substantially comparable efficiency and performance.*

The proposed wind turbine installation application is seeking variations to the regulations and standards of the Wind Energy Conversion System ordinance. The standards related to wind turbines are noted below:

Standards. All Wind Energy Conversion Systems are subject to and must comply with the following provisions of this section:

a. Location. A minimum parcel size of one acre is required for the placement of any horizontal axial wind turbine. Vertical axial wind turbines are permitted on any parcel. No part of a wind energy conversion system shall be located within or over drainage, utility or other established easements.

The parcel proposed for the horizontal axis wind turbine is more than one acre in size. The proposed wind turbine is not proposed in a location within or over drainage, utility or other established easements.

b. Number per parcel. A maximum of one wind machine per parcel is permitted on parcels less than one acre in size; a maximum of one wind machine per acre is permitted on parcels greater than one acre in size.

The applicant is proposing one wind machine on 2.5 acres.

c. Setbacks. Minimum setbacks for private use wind machines shall be:

i) A minimum of 1.1 times the total extended height from the project property lines adjacent to a residential, Conservation Reserve or Agricultural zoning district.

The applicant is proposing a variation from the required 1.1 height minimum set back required of 176 feet. The following are the variations requested :

- North 56 feet
- East 36 feet
- West 20 feet

ii) Guy wire anchors may not extend closer than 10 feet to/from any property line.

A condition of approval has been included as part of this Special Use Permit.

iii) A 10 foot minimum setback from any part of the machine, rotors or guy wires to the property line of any other non-residential zoning district.

There is a .23 acre non-residentially zoned parcel to the southwest of the subject site. The proposed setbacks will be in compliance with the standard noted above.

iv) Wind machines shall not be located within the front yard setback nor within the street-side setback of any parcel of land in residential zoning districts.

The proposed wind turbine will not be located within the front yard setback.

d. Height. The maximum total extended height of Wind Energy Conversion Systems is 60 feet.

i) Tower Height shall mean the height above adjacent grade of the fixed portion of the tower, excluding the wind turbine itself.

ii) Total Extended Height shall mean the height above adjacent grade to a blade tip at its highest point of travel and including any other portion of the Wind Energy Conversion System.

The proposed wind turbine is proposed at an overall height of 160 feet.

e. Lighting. Wind system towers shall not be artificially lighted unless required, in writing, by the Federal Aviation Administration (FAA) or other applicable authority that regulates air safety. Where the FAA requires lighting, the lighting shall be the lowest intensity allowable under FAA regulations; the fixtures shall be shielded and directed to the greatest extent possible to minimize glare and visibility from the ground; and no strobe lighting shall be permitted, unless expressly required by the FAA.

f. Access. All wind machine towers must comply with the following provisions:

i) The tower shall be designed and installed so that there shall be no exterior step bolts or a ladder on the tower readily accessible to the public for a minimum height of 12 feet above the ground. For lattice or guyed towers, sheets of metal or wood or other barrier shall be fastened to the bottom tower section such that it cannot readily be climbed; and

ii) All ground-mounted electrical and control equipment shall be labeled or secured to prevent unauthorized access.

Conditions of approval have been included as part of this Special Use Permit.

g. Rotor Safety. Each wind machine shall be equipped with both manual and automatic controls to limit the rotational speed of the blade within the design limits of the rotor. An external, manual shut-off switch shall be included with the installation. The minimum distance between the ground and any protruding blades utilized on a private wind machine shall be 10 feet as measured at the lowest point of the arc of the blades.

A condition of approval addressing rotor safety has been included as part of this Special Use Permit.

h. Noise. All wind machines shall comply with the noise requirements in this section. These levels, however, may be exceeded during short-term events such as utility outages and severe wind storms. A manufacturer's sound report shall be required with a building permit application.

i) No wind machine or combination of wind machines on a single parcel shall create noise that exceeds a maximum of 25 decibels (dBA) at any property line where the property on which the wind machine is located or the abutting property is one acre or less or a maximum of 50 decibels (dBA) at any other property line.

Measurement of sound levels shall not be adjusted for, or averaged with, non-operating periods. Any wind machine(s) exceeding these levels shall immediately cease operation upon notification by Carson City and may not resume operation until the noise levels have been reduced in compliance with the required standards and verified by an independent third party inspector, approved by Carson City, at the property owner's expense. Upon review and acceptance of the third party noise level report, Carson City will allow operation of the affected wind machine(s). Wind Energy Conversion System(s) unable to comply with these noise level restrictions shall be shut down immediately and removed upon notification by Carson City, after a period established by Carson City.

ii) Sound below 20 Hertz. No wind machine or combination of wind machines shall be operated so that impulsive sound below 20 Hertz adversely affects the habitability or use of any off-site dwelling unit, hospital, school, library or nursing home.

Conditions of approval addressing noise have been included as part of this Special Use Permit.

A*s presented the noise levels are required to be less than 50 dBA for all lots abutting the subject site, with the exception of the two vacant residential parcels to the immediate east and one parcel to the immediate south, which require noise levels not to exceed 25 dBA.*

The applicant has provided conflicting statements regarding dBA in the original submittal, which have been resolved through the information received by the Planning Division via fax on January 13, 2011 (see attached).

At northern property line at 120 feet = noise level of 47.56 dBA
At eastern property line at 140 feet = noise level of 47dBA
At western property line at 156 feet = noise level of 46.7dBA
At southern property line at 206 feet = noise level of 45.25 dBA

i. Aesthetics and Maintenance.

i) Appearance. Wind machines, unless subject to any applicable standards of the FAA, shall be a non-reflective, non-obtrusive color such as tan, sand, gray, black or similar colors. Galvanized steel or metal is acceptable for the support structures. Any painting or coating shall be kept in good repair for the life of the wind machine. In addition, any changes to the approved color shall result in notification by Carson City that the affected wind machine(s) shall cease operation until a color correction has been made. If the affected wind machine(s) are not repainted, using an approved color, within the period established by Carson City, the

owner shall remove the affected Wind Energy Conversion System(s).

A condition of approval addressing aesthetics and maintenance has been included as part of this Special Use Permit.

ii) Electrical Wires. All electrical wires leading from the tower to electrical control facilities shall be located underground.

A condition of approval addressing electrical wiring has been included as part of this Special Use Permit.

iii) Maintenance. Wind machines shall be maintained in good repair, as recommended by the manufacturer's scheduled maintenance or industry standards, and shall be free from rust.

A condition of approval addressing maintenance has been included as part of this Special Use Permit.

j. Signs/Labels. The only advertising sign allowed on the wind machine shall be a manufacturer's label, not exceeding one square foot in size, located on the generator housing.

A condition of approval addressing signs/labels has been included as part of this Special Use Permit.

k. Compliance with FAA Regulations. All wind machines shall comply with applicable FAA regulations, including any necessary approvals for installations.

A condition of approval addressing FAA regulations has been included as part of this Special Use Permit.

l. Ice Throw. The potential ice throw or ice shedding from the proposed wind machine shall not cross the property lines of the site.

A condition of approval addressing ice throw has been included as part of this Special Use Permit.

m. Certified Safe. Evidence shall be submitted with a building permit application that the wind machine has been constructed in accordance with accepted industry standards and certified safe.

A condition of approval addressing certification of safety has been included as part of this Special Use Permit.

PUBLIC COMMENTS: Public notices were mailed on January 7, 2011 to 30 adjacent property owners within 600 feet of the subject site pursuant to the provisions of NRS and CCMC. Staff has received opposition comments related to the proposed installation. Any comments that are received after this report is complete will be submitted prior to or

at the Planning Commission meeting, depending on their submittal date to the Planning Division.

OTHER CITY DEPARTMENT OR OUTSIDE AGENCY COMMENTS: The following comments were received from various city departments. Recommendations have been incorporated into the recommended conditions of approval, where applicable.

Building Division comments:
NOTE: These comments do not constitute a complete plan review, but are merely observations based on the information provided.

Building Division GENERAL PLAN SUBMITTAL COMMENTS:

1. This project requires an application for a Building Permit, issued through the Carson City Building Division. This will necessitate a complete review of the project to verify compliance with all adopted construction codes and municipal ordinances applicable to the scope of the project.

2. The plans submitted for review shall comply with the prescriptive requirements found in the Carson City Building Division handout titled: *Residential Submittal Requirements.* This handout may also be found online at: www.carson.org/building

3. Effective January 1, 2008, all new commercial submittals shall show compliance with the following codes, and adopted amendments:

   - 2007 Northern Nevada Amendments*
   - 2006 International Building Code
   - 2006 International Energy Conservation Code
   - 2006 International Existing Building Code
   - 2006 International Fire Code
   - 2006 Uniform Mechanical Code
   - 2006 Uniform Plumbing Code
   - 2005 National Electrical Code
   - 2003 ICC/ANSI A117.1 (For accessible design)

   * Carson City has adopted the 2007 Northern Nevada Amendments, which are available online at both the Carson City Building Division website and the Northern Nevada Chapter of the International Code Council (NNICC) at www.nnicc.org. With the adoption of the amendments, the snow and wind loads have increased within Carson City.

Building Division COMMENTS APPLICABLE TO THE WIND TURBINES:

4. The plan submittal for the wind turbines shall comply with the prescriptive requirements outlined within the Carson City Building Division handout titled *PLAN SUBMITTAL REQUIREMENTS: Wind Electrical Systems.*

5. *2006 IBC Section 1803.1 requires excavations for any purpose shall not remove lateral support from any footing or foundation without first underpinning or protecting the footing or foundation against settlement or lateral translation. The proposed footing is located very close to the existing dwelling footing.*

6. *The electrical system shall be designed by a Nevada registered electrical engineer in order to show code compliance for tying in of the multiple electrical generating systems located on the subject property.*

Engineering Division comments:

- The Engineering Division has no preference or objection to the special use request.

Health Department comments:

- Carson City Health and Human Services has no comments regarding the project as described in the packet received. The applicant must meet all applicable codes and ordinances as they apply to this request.

Fire Department comments:

- The applicant must meet all codes and ordinances as they relate to this request.

Parks Department comments:

- The Carson City Parks and Recreation Department does not have any comments regarding this item. We found that there are no conflicts in the areas of purview with the Parks and Recreation Department.

FINDINGS: Staff recommends approval of the Special Use Permit based the findings below, pursuant to CCMC 18.02.080 (Special Use Permits), subject to the recommended conditions of approval, and further substantiated by the applicant's written justification.

As herein described, the proposed project is consistent with the following applicable goals and policies (in italics) of the Master Plan in accordance with the seven findings (in bold) required for approval of a Special Use Permit:

1. The use will be consistent with the objectives of the Master Plan elements.

Chapter 3: A Balanced Land Use Pattern

Establishing a balance of land uses within the community promotes vitality and long-term economic stability. A balanced community is able to provide

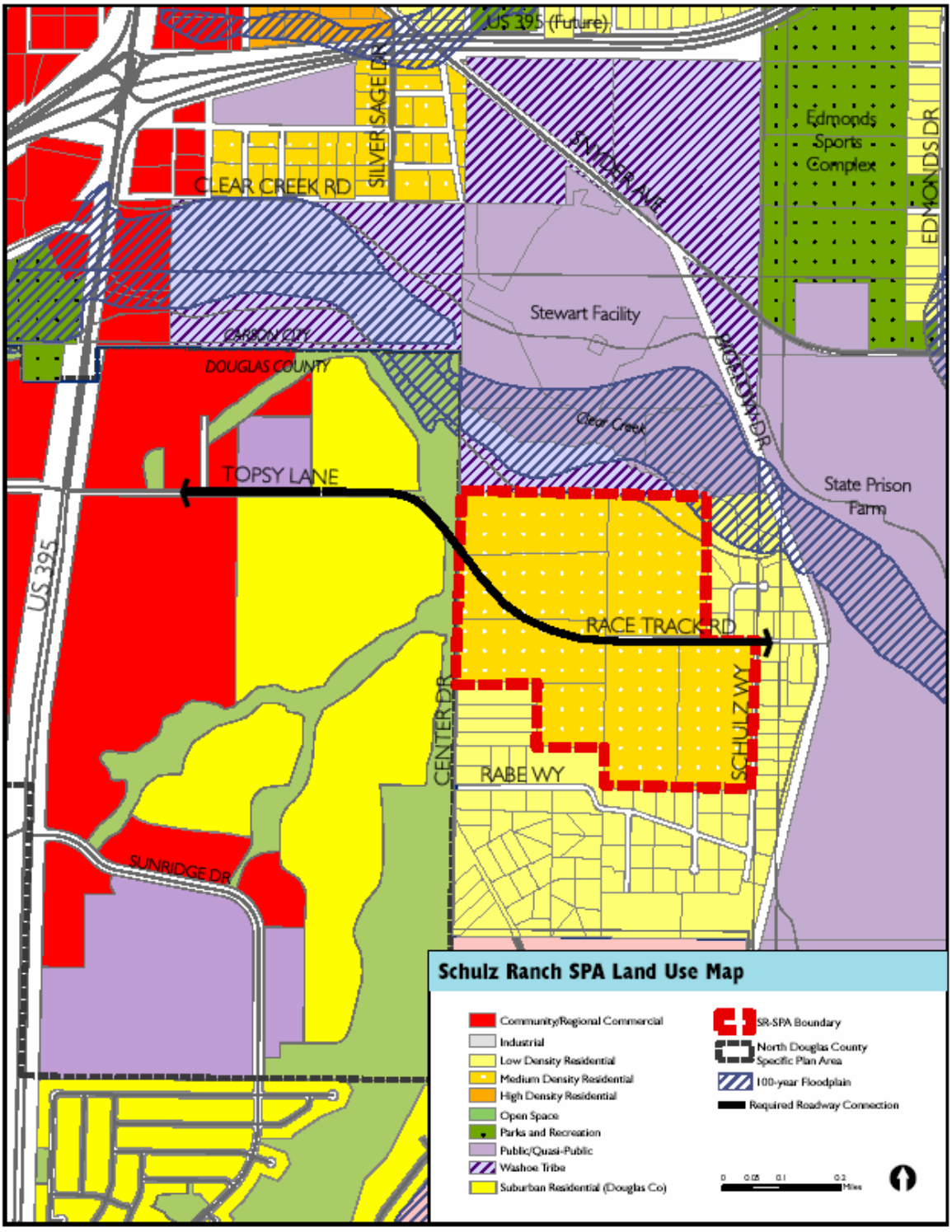
employment opportunities for its residents as well as a diverse choice of housing, recreational opportunities, and retail services. Carson City strives to maintain its strong employment base and extensive network of public lands while increasing housing options and the availability of retail services to serve residents of the City and surrounding growth areas.

The purpose of this project is to utilize alternative energy solutions (wind energy) and existing solar energy to assist in the powering of the existing single family dwelling unit and accessory structure on site, in addition to a future grey water irrigation system. Per the applicant, the proposed project could potentially attract "green" building developers to the area. Materials used in the construction will be sustainable building materials and construction techniques to promote water and energy conservation (1.le, f).

Schulz Ranch Specific Plan Area (SR-SPA)

The intent of the Schulz Ranch Specific Plan Area (SR-SPA) is to establish policies that provide a framework for the incorporation of additional housing in the area following the closure of the Race Track in a manner that: ensures the compatibility of future development with an established suburban neighborhood in the area and future development on adjacent property in Douglas County; protects the natural features of the site and of surrounding lands; provides a distinct benefit to and protects the quality of life for existing and future residents in the area; and ensures that appropriate public facilities and services will be provided to serve the area.

The applicant has stated the proposed wind turbine is compatible with the Schulz Ranch Specific Plan which is intended for a higher density neighborhood. The information provided by the applicant notes there will be no impacts to the circulation and access, infrastructure, Services and facilities, regional coordination or Environmental and Cultural artifacts related to the Schulz Ranch project.


US 395 (Future)
SILVER SAGE DR
CLEAR CREEK RD
SNYDER AVE
Edmonds Sports Complex
EDMONDS DR
Stewart Facility
CARSON CITY
DOUGLAS COUNTY
Clear Creek
RIDGEVIEW DR
TOPSY LANE
State Prison Farm
US 395
RACE TRACK RD
CENTER DR
SCHULZ WY
RABE WY
SUNRIDGE DR
Schulz Ranch SPA Land Use Map
Community/Regional Commercial
Industrial
Low Density Residential
Medium Density Residential
High Density Residential
Open Space
Parks and Recreation
Public/Quasi-Public
Washoe Tribe
Suburban Residential (Douglas Co)
SR-SPA Boundary
North Douglas County Specific Plan Area
100-year Floodplain
Required Roadway Connection
0 0.05 0.1 0.2
Miles

2. The proposed use will not be detrimental to the use, peaceful enjoyment, economic value, or development of surrounding properties or the general neighborhood; and will cause no noise, vibrations, fumes, odors, dust, glare or physical activity.

The proposed wind machine will be subject to the noise criteria of CCMC 18.05.080. No wind machine or combination of wind machines on a single parcel shall create noise that exceeds a maximum of 25 decibels (dBA) at any property line where the property on which the wind machine is located or the abutting property is one acre or less or a maximum of 50 decibels (dBA) at any other property line.

The applicant has provided estimated noise levels for the proposed project. The information provided by the applicant clearly notes that the two vacant parcels to the east will have noise impact of 47dBA or less and the noise impact to the immediate southern parcel will be 45.25 dBA. The adjacent parcel to the south is one acre in size and the existing house is approximately 300-plus feet south of the proposed turbine.

3. The project will have little or no detrimental effect on vehicular or pedestrian traffic.

The proposal will have little effect on traffic or pedestrian facilities.

4. The project will not overburden existing public services and facilities, including schools, police and fire protection, water, sanitary sewer, public roads, storm drainage and other public improvements.

The request is not in conflict with any Engineering Master Plans for streets or storm drainage.

The proposed project will not impact existing public services and facilities, including schools, police and fire protection, water, sanitary sewer, public roads, and other public improvements.

5. The project meets the definition and specific standards set forth elsewhere in this Title 18 for such particular use and meets the purpose statement of that district.

Pursuant to CCMC 18.04.065 Single Family 6,000 (SF6) and 12,000 (SF12) Residential Districts Purpose:

- The purpose of the SF6 and SF12 Districts is to provide for the development of single family detached dwellings in a suburban setting. The SF6 and SF12 districts are consistent with the policies of the Low Density Residential category of the Master Plan.

Pursuant to CCMC 18.05.080 Private Use Wind Energy Conversion Systems:

- In order to balance the need for clean, renewable energy resources with the protection of the health, safety and welfare of the community, the purpose of this section is to regulate private use wind energy conversion systems (WECS) for the production of electricity for use on the subject site and for net metering through the power company.

The reason for this Special Use Permit review is the inability of the proposed project to meet the standards identified in CCMC 18.05.080. Specifically, setback, height, and noise criteria.

6. The project will not be detrimental to the public health, safety, convenience and welfare.

Dust control measures must be employed during the construction period.

Guy wire anchors may not extend closer than 10 feet from/to any property line. Per the information provided by the applicant the proposed project will produce a noise level of more than 25 decibels of noise at the boundary of the parcel.

The tower shall be designed and installed so that there shall be no exterior step bolts or a ladder on the tower readily accessible to the public for a minimum height of 12 feet above the ground. For lattice or guyed towers, sheets of metal or wood or other barrier shall be fastened to the bottom tower section such that it cannot readily be climbed.

All ground-mounted electrical and control equipment shall be labeled or secured to prevent unauthorized access.

Evidence shall be submitted with a building permit application that the wind machine has been constructed in accordance with accepted industry standards and certified safe.

The potential ice throw or ice shedding from the proposed wind machine shall not cross the property lines of the site.

The only advertising sign allowed on the wind machine shall be a manufacturer's label, not exceeding one square foot in size, located on the generator housing.

Wind machines, unless subject to any applicable standards of the FAA, shall be a non-reflective, non-obtrusive color such as tan, sand, gray, black or similar colors. Galvanized steel or metal is acceptable for the support structures. Any painting or coating shall be kept in good repair for the life of the wind machine.

The wind machine shall be equipped with both manual and automatic controls to limit the rotational speed of the blade within the design limits of the rotor. An external, manual shut-off switch shall be included with the installation. The minimum distance between the ground and any protruding blades utilized on a private wind machine shall be 10 feet as measured at the lowest point of the arc of the blades.

7. The project will not result in material damage or prejudice to other property in the vicinity.

Additional conditions of approval have been provided to ensure that the proposed project will not result in material damage to other properties within the vicinity. Noticing was sent out to 30 adjacent property owners within 600 feet of the subject site. Staff has not heard any evidence or concerns that indicate that material damage or prejudice to other property in the vicinity will result from the proposed project. There have been concerns expressed related to the height of the proposed wind turbine and the noise it will potentially generate.

If a motion for denial is made, here is the appropriate finding for denial: If the Planning Commission wishes to deny the application based on the evidence presented, the following findings are recommended for denial pursuant to the Carson City Municipal Code (CCMC) Sections 18.02.080 (Special Use Permits). The finding states:

2. The project **will not be** detrimental to the use, peaceful enjoyment, economic value, or development of surrounding properties or the general neighborhood; and will cause no objectionable noise, vibrations, fumes, odors, dust, glare or physical activity.

The proposed wind turbine will be detrimental to the use, peaceful enjoyment, economic value and development of surrounding properties. The proposed height causes visual impacts to the adjacent parcels and does not meet the required noise or setback standards at property lines which could be detrimental to the peaceful enjoyment, economic value, or development of surrounding properties or the general neighborhood.

Respectfully submitted,

PUBLIC WORKS, PLANNING DIVISION

Jennifer Pruitt

Jennifer Pruitt, AICP, LEED AP
Principal Planner

Kathe Green

Kathe Green
Assistant Planner

Attachments:
Application (SUP-10-114)
Building Division comments
Engineering Division comments
Health Department comments
Fire Department comments
Parks and Recreations comments

Engineering Division
Planning Commission Report
File Number SUP 10-114

TO: Planning Commission

FROM Rory Hogen – Engineer Intern

DATE: December 23, 2010 **MEETING DATE:** January 26, 2011

SUBJECT TITLE:

Action to consider an application for a Special Use Permit for Joseph Goni and James Medeiros at 7300 Schulz Dr., apn 10-671-02 to place a wind turbine on the site, which is zoned SF6.

RECOMMENDATION:

The Engineering Division has no preference or objection to the special use request.

DISCUSSION:

The Engineering Division has reviewed the conditions of approval within our areas of purview relative to adopted standards and practices and to the provisions of CCMC 18.02.080, Conditional Uses. The issue of possible blocking of drainage due to the proximity of the concrete base to the home can be addressed on the submittals for a construction permit.

CCMC 18.02.080 (2a) - Adequate Plans
The information submitted by the applicant is adequate for this analysis.

CCMC 18.02.080 (5a) - Master Plan
The request is not in conflict with any Engineering Master Plans for streets or storm drainage.

CCMC 18.02.080 (5c) - Traffic/Pedestrians
The proposal will have little effect on traffic or pedestrian facilities.

CCMC 18.02.080 (5d) - Public Services
Existing facilities are not impacted.

CARSON CITY FIRE DEPARTMENT

"Service with Pride, Commitment, Compassion"

MEMORANDUM

TO: Community Development

FROM: Duane Lemons, Fire Inspector

DATE: January 14, 2011

SUBJECT: AGENDA ITEMS FOR JANUARY 26, 2011 PLANNING COMMISSION MEETING.

We reviewed the agenda items for the Planning Commission Meeting and have the following comments:

- SUP-10-114 Joseph Goni, James Medeiros The applicant must meet all codes and ordinances as they relate to this request.
- SUP-10-115 CB Maddox The applicant must meet all codes and ordinances as they relate to this request. Of additional note, applicant will need to refer to response to MPR 10-098, Sec 8, page 5 for further instructions.
- SUP-10-117 Carson City School District, Mark Korinek The applicant must meet all codes and ordinances as they relate to this request.
- SUP-08-046 Boys & Girls Club of Western Nevada We have no concern with the applicant's request.

DL/llb

777 S. Stewart Street, Carson City, Nevada 89701
Business Phone (775) 887-2210 • Fax (775) 887-2209 • www.carsonfire.org

Jennifer Pruitt - Planning Commission Applicants

From: Teresa Hayes
To: MPR Committee
Date: 12/21/2010 10:08 am
Subject: Planning Commission Applicants

SUP 10-114

Carson City Health and Human Services has no comments regarding the project as described in the packet received. The applicant must meet all applicable codes and ordinances as they apply to this request. *Et. Seq.*

SUP 10-115

Carson City Health and Human Services has no comments regarding the project as described in the packet received. The applicant must meet all applicable codes and ordinances as they apply to this request. *Et. Seq.*

SUP 10-117

Carson City Health and Human Services has no comments regarding the project as described in the packet received. The applicant must meet all applicable codes and ordinances as they apply to this request. *Et. Seq.*

SUP 08-046

Carson City Health and Human Services has no comments regarding the project as described in the packet received. The applicant must meet all applicable codes and ordinances as they apply to this request. *Et. Seq.*

Teresa Hayes, R.E.H.S.
Environmental Health Specialist II
Carson City Health and Human Services
900 E. Long St
Carson City, NV 89706
Phone: (775) 887-2190 ext 7227
Fax: (775) 883-4701
e-mail: thayes@carson.org

Go Green: Please do not print this e-mail unless you really need to!

File # (Ex: MPR #07-111)	*SUP 10-114*
Brief Description	*Goni Wind turbine*
Project Address or APN	*7300 Schulz Drive*
Bldg Div Plans Examiner	*Kevin Gattis*
Review Date	*January 10, 2011*
Total Spent on Review	

BUILDING DIVISION COMMENTS:

NOTE: These comments do not constitute a complete plan review, but are merely observations based on the information provided.

GENERAL PLAN SUBMITTAL COMMENTS:

1. This project requires an application for a Building Permit, issued through the Carson City Building Division. This will necessitate a complete review of the project to verify compliance with all adopted construction codes and municipal ordinances applicable to the scope of the project.

2. The plans submitted for review shall comply with the prescriptive requirements found in the Carson City Building Division handout titled: *Residential Submittal Requirements.* This handout may also be found online at: www.carson.org/building

3. Effective January 1, 2008, all new commercial submittals shall show compliance with the following codes, and adopted amendments:

   - 2007 Northern Nevada Amendments*
   - 2006 International Building Code
   - 2006 International Energy Conservation Code
   - 2006 International Existing Building Code
   - 2006 International Fire Code
   - 2006 Uniform Mechanical Code
   - 2006 Uniform Plumbing Code
   - 2005 National Electrical Code
   - 2003 ICC/ANSI A117.1 (For accessible design)

   *- Carson City has adopted the 2007 Northern Nevada Amendments, which are available online at both the Carson City Building Division website and the Northern Nevada Chapter of the International Code Council (NNICC) at www.nnicc.org. With the adoption of the amendments, the snow and wind loads have increased within Carson City.

COMMENTS APPLICABLE TO THE WIND TURBINES:

4. The plan submittal for the wind turbines shall comply with the prescriptive requirements outlined within the Carson City Building Division handout titled *PLAN SUBMITTAL REQUIREMENTS: Wind Electrical Systems.*

5. *2006 IBC Section 1803.1 requires excavations for any purpose shall not remove lateral support from any footing or foundation without first underpinning or protecting the footing or foundation against settlement or lateral translation. The proposed footing is located very close to the existing dwelling footing.*

6. *The electrical system shall be designed by a Nevada registered electrical engineer in order to show code compliance for tying in of the multiple electrical generating systems located on the subject property.*

CARSON CITY, NEVADA

CONSOLIDATED MUNICIPALITY AND STATE CAPITAL

MEMORANDUM

To: Lee Plemel, Planning Director

From: Roger Moellendorf, Parks and Recreation Director
Juan F. Guzman, Open Space Manager
Vern L. Krahn, Park Planner

Subject: Parks & Recreation Department's Comments for the Planning Commission meeting on January 26, 2011

Date: January 14, 2011

SUP-10-114 Height variance for a wind energy tower in a sfF6 district.
The Carson City Parks and Recreation Department does not have any comments regarding this item. We found that there are no conflicts in the areas of purview with the Parks and Recreation Department.

SUP-10-115 Asphalt plant and aggregate crushing facility including a 1.5 megawatt wind turbine at a height of 225 feet plus blade height.

The subject SUP for a aggregate and crushing facility is not in conflict with any of the areas of purview by the operations of the Parks and Recreation Department. Staff has concerns relating to the turbine's proposed height.

The Open Space Program has worked in cooperation with the Planning Department towards the implementation of the Carson City Federal Lands Bill. The proposed use is adjacent to lands that are to be transferred from the Bureau of Land Management to Carson City for the purpose of parks and public purposes. The zoning of the parcels for the proposed aggregate plant and crushing facility is General Industrial where this type of industrial use is appropriate. Staff believes that, due to the zoning of the property in question, this is the correct site for industrial operations of this type to take place.

The adjacent lands to be transferred to Carson City also contain uses that are of industrial nature including the Carson City waste disposal facility and a water tank. Among these industrial uses there are some recreation facilities such as a shooting range located towards the south end and a model aircraft landing strip and flying field. Staff will venture to state that the previously described uses have been compatible and further conflicts are not readily discernable as a consequence of approving the proposed special use permit.

In reference to the height of the wind turbine, it is found that the proposed height is in excess of the maximum height requirement of 45 feet for the General Industrial zoning district. Therefore, granting of this special use permit to exceed the height standard is a discretionary action by the Planning Commission. Staff finds that there is not City policy regarding the placement of wind turbines for commercial purposes, particularly in contrast of scenic regulations and in contrast to regulations, programs, and policy already adopted toward the protection of our scenic resources. Staff anticipates that the visual intrusion that may be caused by the height of this turbine and antenna may be somewhat mitigated if in fact the overall height does not exceed the height of the Pinion Mountains in the background. Staff believes that the crux of this matter is the discussion of the need to provide for our community renewable energy facilities as opposed to the preservation of scenic values. Again, even when the City has adopted multiple standards and regulations towards the preservation of its scenic beauty, this specific question has not been studied comprehensively. It is staff's opinion that impacts of the proposed tower height and turbine is not likely to have a significant impact on the scenic quality of the eastern hills surrounding the Eagle Valley. This opinion is rendered in light of the extensive mass and length of the Pinion Range in relation to the single proposed turbine.

SUP-10-117 The Carson City Parks and Recreation Department does not have any comments regarding this item. We found there are no conflicts with the Parks and Recreation Department or the Open Space Program.

SUP-08-046 The Carson City Parks and Recreation Department is the applicant and is requesting a time extension for the project's approved special use permit for the construction of a recreation center. This time extension is necessary for our department to find additional funding for the project.

Rea Thompson - special use permit File No. SUP-10-114

From: Perry Batten <pbatten74@hotmail.com>
To: <planning@carson.org>
Date: 1/10/2011 8:45 AM
Subject: special use permit File No. SUP-10-114

This E-mail is in respone to the special use permit requested at 7300 Schultz Dr.

As a home owner in the immediate area I request that a special use permit not be issued for this project. A 160' wind turbine structure in our neighborhood would be out of the question. Not only would it be a eye sore, but it could potentially reduce our already falling resale values in the area. Also there is a large migratory bird population that frequently flies overhead and a wind turbine would directly affect there flight paterns. Again, I say no to the proposed special use permit requested for 7300 Schultz Dr..

Sincerely,
Perry & Jenera Batten

Totally against turbine. / Dudley 1/10/2011
/ Lynda Leavitt

OFFICIAL NOTICE OF PUBLIC HEARING

You are hereby notified that the Carson City Planning Commission will conduct a public hearing on Wednesday, January 26, 2011, regarding the item noted below. The meeting will commence at 5:00 p.m. The meeting will be held in the Carson City Community Center, Sierra Room, 851 East William Street, Carson City, Nevada. For information on the approximate time these items will be heard by the Planning Commission or for staff reports, please contact the Planning Division after 9 am, Friday, January 21, 2011, at 887-2180.

SUBJECT: Special Use Permit **FILE NO. SUP-10-114***

SUP-10-114 Action to consider a Special Use Permit request from the Rainbow Conservation Corp (property owner: Joseph Goni) for a height variance for the installation of a wind energy tower at 160 feet, on property zoned Single Family 6000 (SF6), located at 7300 Schultz Dr., APN 010-671-02.

Summary: Carson City adopted standards related to Private Use Wind Energy Conversion Systems in 2009. Pursuant to the Carson City Municipal Code (CCMC) 18.05.080(5c), variations to the regulations and standards related to Private Use Wind Energy Conversion Systems may only be permitted by special use permit approval. This request will allow the placement of a wind turbine of 160 feet on the subject site for personal use accessory to the existing single family dwelling unit on site, which will exceed the height standard of 60 feet maximum and not satisfy the setback standard of 1.1 times the height from the project property lines.

The application materials are available for public review at the Planning Division, 108 E. Proctor St., Carson City, Nevada, 89701. If you have questions related to this application, you may contact Jennifer Pruitt, Principal Planner, at 775-283-7076 (JPruitt@carson.org). Staff reports are available approximately six days prior to the Planning Commission meeting or online at www.carson.org/planning/pc under Agendas with Supporting Materials.

As an owner of property in the vicinity, you are invited to submit comments relative to this matter to the Planning Commission, either in writing or at the Planning Commission meeting. Written comments should be sent to the Carson City Planning Division at the above-noted address, via fax at 775-887-2278, or via e-mail at planning@carson.org. Written comments received at least seven days prior to the Planning Commission meeting will be forwarded to the Commissioners for their review prior to the meeting; written comments received after that but by noon on the day of the meeting will be given to the Commissioners at the meeting.

Dudley & Lynda Leavitt
Dudley D & Jeffrey D
7501 Martha Circle
Carson City, NV 89701

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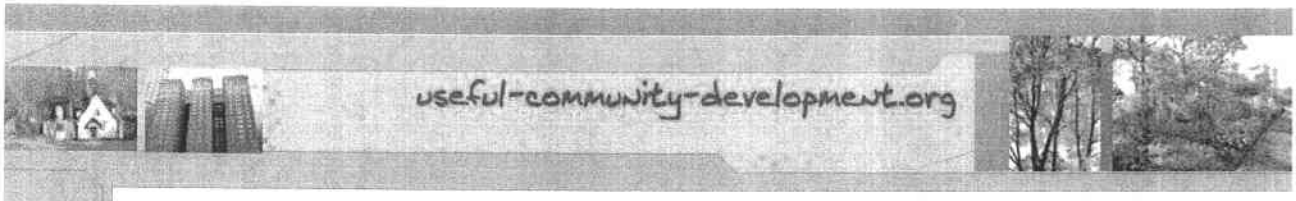

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Wind Turbine Zoning Issues Could Be the Next Big Thing

Wind turbine zoning presents a dilemma to any municipality seeking to promote green development and sustainability. With alternative energy a hot topic, and with the LEED® standards from the U.S. Green Building Council awarding points for alternative energy, the topic will pop up. First we'll discuss the issue of a single wind turbine, providing energy mostly to the property owner, although more than half the states allow "net metering" in which an individual may sell excess electricity generated to the power grid.

Most municipalities simply wouldn't know how to deal with such a request, so it's time to start thinking about how to revise your zoning ordinance to deal with an immediate or future possibility. Of course, many towns may not have any locations suitable for wind energy generation, so this will be a moot point for them.

If you already have a tower zoning, cell phone zoning, or antenna zoning provision, refer to those for ideas on how you want to regulate this new form of tall, slender object.

Usually it's helpful to divide wind turbines into small and large, based on their energy output. But even "small" may seem like a problem to planning commissioners who aren't ready for a 60-foot tall turning object in back yards.

Until the technology settles down, and people get used to the idea, we suggest that any wind energy generating device require a conditional use permit under the wind turbine zoning provisions. A conditional use permit usually requires public hearings before the planning commission and city council, and action by the latter. "Conditions" for construction and/or performance also may be imposed by the governing body.

Usually the ordinance will define a structure in such a manner that a single turbine would have to be reviewed under zoning, but height restrictions and limits on the number of accessory uses (examples are garages and sheds) would stop the proposal in its tracks in both locations.

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All About Green


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Open Space

Thus far people seem pretty much united in the notion that we don't want a single-family residence in a subdivision erecting a tall wind turbine. However, be aware that there are small rooftop units that generate only a tiny amount of electricity. But a single house on forty acres, with no close neighbors, might be a different story.

Be aware that there are different types of wind turbines, and a Minnesota model ordinance in 2005 divided them into commercial and non-commercial scales. You may want to do the same. Just be aware that outputs, height, and thickness do vary.

So the question becomes how much land is enough to prevent a wind turbine from having a negative impact on the neighborhood? The National Academy of Sciences has recommended a 2600 foot setback, about half a mile, from the nearest home. Other recommendations and ordinances have allowed much less. You should have a professional engineer specify the "fall zone" for where the turbine could conceivably land if it were to topple. Certainly your setback from both property lines and buildings that may lie on the same property should exceed that fall zone.

We are early in the process of determining what is appropriate and whether there is any real reason for people to be concerned. Also the technology is advancing, so design changes in the products available might make a real difference in their performance characteristics.

Another issue is noise, an actual complaint when wind turbines have been installed somewhat near residential neighborhoods. However, this problem seems easily addressed. The wind turbine zoning amendment simply should refer to the acceptable decibel level (a measure of noise) in residential neighborhoods, providing one has been established either through zoning or in a separate ordinance. If not, the highest level of total noise on a regular basis you should tolerate at the outside wall of any house is probably 40 decibels, abbreviated dB. (The higher the decibel number, the louder the noise.)

Our recommendation is to provide through wind turbine zoning that the ambient (existing normal) noise level at the property line could not be increased by any more than 10 dB through addition of the turbine. If you face opposition, of course permitting no increase is a viable option.

Height is certainly an appropriate concern, and related to height is appearance and community design. While almost all residential zoning districts specify a height restriction, wind turbine zoning will need to be realistic about the products and technology available. Current wind turbines need to be at least 20 feet above the trees to be effective.

A minimum clearance from the ground to the lowest turbine also must be established. At least 12 feet is recommended. Other setbacks, such as from roads, rivers, streams, wetlands, conservation areas, or scenic or historic sites may need to be established.

The fact that the stem of the wind turbine designs now most prevalent is slender means that the mass of a single turbine will not appear to be great. The most common design also is white or near-white, with the effect of a graceful appearance to most people. Some will find them ugly because they are unfamiliar. In fact, however, the design is simple and pleasant enough near newer suburban neighborhoods.

The appearance debate seems much more viable when the proposed wind turbine zoning is adjacent to a vintage neighborhood or historic district. The wind industry will have to be resourceful to design a complement to a richly textured neighborhood.

Commercial wind farm zoning also presents the same issues--noise, appearance, height, and proximity to residences. I personally find a large wind farm in a rural or industrial area not at all offensive in appearance, but it will be a matter of lively local debate. We recommend that in a county or town with an agricultural zoning district, wind turbine zoning be allowed with a conditional use permit.

In industrial or commercial zoning districts, you certainly need to require the conditional use permit so that you can control individual site conditions. Generally, we like the potential of applying a wind farm zoning overlay in areas of your city that are appropriate. This can provide that some debate occurs before an actual case arises--always good policy in zoning matters.

A few other requirements apply. Require that feeder power lines from the turbines be buried underground, as those would be some high and ugly wires. Also require compliance with FAA regulations, which may include a small light.

You probably will need to permit any type of safety warning signs suggested by the manufacturer.

A couple of last things. You also will hear from bird lovers that wind turbine zoning would cause terrible collisions for our feathered friends. In fact, however, there are many other hazards for birds, but it would be wise to avoid known nesting and migration areas.

But also the word is around that wind turbines might interfere with cell phone reception, and we're mighty cranky when that happens. Investigate that closely; it seems to be approaching urban myth status.

The trade association for the wind industry is the American Wind Energy Association.

Return from Wind Turbine Zoning to Zoning

WFAA.com
DALLAS/ FORT WORTH | WFAA-TV

Neighbors claim wind turbine makes them ill

by By JANET ST. JAMES / WFAA-TV

wfaa.com

Posted on August 15, 2009 at 3:43 PM

Updated Friday, Oct 16 at 2:04 PM

WFAA-TV
Some neighbors say the wind turbine next door makes too much noise.
Video
Janet St. James reports
July 28, 2008
LINK:
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SAGINAW - T. Boone Pickens says they're the wave of the future. But a wind turbine meant to generate electricity for one Saginaw family has sparked a huge headache for their neighbors.

"It makes a terrible 'air raid' noise," said Debbie Behrens, talking about the high-pitched whine made by the turbine. "It's driving me crazy."

What's worse - Debbie and her son Lance both say that the high-pitched hum is now causing physical problems.

"You occasionally have the dizziness," Lance explained, "The ringing in the ears; I've

never experienced the ringing in the ears."

It turns out there is a documented health condition associated with the noise generated by some windmills called "Wind Turbine Syndrome."

Symptoms include headaches, dizziness, nausea and ringing in the ears, known as tinnitus.

Dr. Lee Wilson of the UT Dallas Callier Center says the noise from most turbines isn't loud enough to cause actual loss, but constant sound can cause other problems.

"Any kind of thing like that has the potential to affect those kinds of feelings," Dr. Wilson said. "And they're real. I mean you're really sick, nauseated, but it may be a result of some anxiety that's related to what you're hearing rather than the actual sound."

Because there aren't many windmills around, Dr. Wilson hasn't yet seen any cases.

And not every turbine makes that whine.

For example, the giant mills near Sweetwater make a quiet thump as they spin.

Doctors say some people are more sensitive to constant sound than others.

WFAA-TV
Debbie Behrens and her son Lance say they've suffered since a neighbor installed a wind turbine.

The people who installed the small, residential turbine in Saginaw aren't bothered at all.

But the Behrens believe without attention and - potentially - regulation, wind turbine noise could become a major problem in neighborhoods as the country switches to more eco-friendly energy sources.

Some science shows turbines should be at least a mile away from homes.

The turbine that stands 50 yards from the Behren's back door is loud enough to make them want to move.

"My life savings is in this house," said Debbie, "but, I would not live with that going here for the rest of my life, no."

E-mail

Add another comment

Carson City Planning Division
108 E. Proctor St.
Carson City, Nevada 89701
ATTN: JENNIFER PRUITT
Re: SUP-10-114

January 11, 2011

Dear Ms. Pruitt,

My family and I live directly downwind of Mr. Goni's property along with 2-3 other homes. I do not work and am at home all day with my disabled child. I live in this area because it is quiet and serene here.
I have very serious concerns regarding the height, noise and setback issues regarding the special use permit #SUP-10-114. As your office states, the typical residential use height is 60 foot max. I don't believe an additional 100 feet is fair to any of the neighbors when all the other personal use wind towers in the area have stayed within the max. restrictions. To our knowledge, Mr. Goni lives alone, so what constitutes a 160 ft. tower for one resident? If this is for personal use only, I believe Mr. Goni's tower should remain within the designated max. The wind tower is in addition to his recent solar power set-up, so between the *two* systems he should have plenty of power.
I have also enclosed a copy of a study from Lawrence University regarding wind turbines & noise. It is written in layman's terms and I believe is easily understood.
I hope this article is helpful in your decision making process.
Once again, I am not against solar or wind power, I am 100% for changes that help our planet survive, but I believe we can do this without destroying each others serenity.

Thank you,

Ann Essex- Bankston Legal Guardian of Melanie L. Essex
Melanie Essex
Ruben Bankston
7305 Schulz Dr.
Carson City, Nevada 89701
775-841-8998

Primer for

Addressing Wind Turbine Noise

Revised Oct. 2006

by Daniel J. Alberts

LAWRENCE
TECHNOLOGICAL
UNIVERSITY

Table of Contents

Introduction

Michigan is proceeding to develop renewable energy policies. The Energy Office of Michigan, in their 2004 Annual Report to the Michigan Public Service Commission on Michigan's Renewable Energy Program, recommended that the State of Michigan adopt the following policies:

- Set a goal of installing 800 MW of wind power by the year 2010.
- Adopt statewide policies to encourage the development of wind energy in Michigan.
- Adopt a Renewable Portfolio Standard (RPS) that requires 1.0% of all energy sold within the state of Michigan be generated from renewable sources (including wind) by December 2006.
- Increase the RPS requirement by 0.5 % each year to reach a total of 10% by 2015.

Although the State of Michigan may encourage renewable energy development, local governments within the state will be responsible for zoning and permitting wind turbines. To develop zone and permit wind turbines, local governments will need to examine a variety of issues, including the impact of wind turbine noise on land use compatibility.

To help wind energy advocates and Michigan's policy makers better understand this issue, Michigan's Energy Office asked Lawrence Technological University to research the noise issue and present their findings to Michigan's Wind Working Group. The formal research documents are available at Lawrence Technological University's web site:

http://www.ltu.edu/engineering/mechanical/delphi_wind.asp

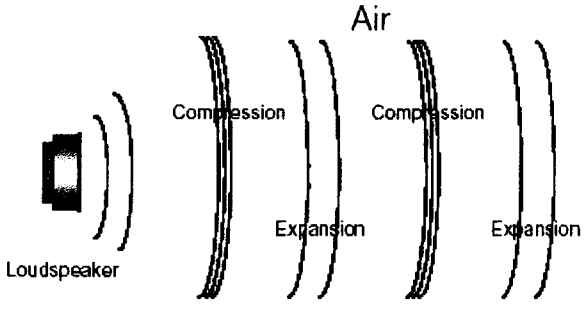
This paper consolidates the education material on noise concepts and assessment distributed through the two formal phases of the research with additional material on engineering standards for noise measurement. The author hopes this paper will help decision makers understand wind turbine noise well enough to develop beneficial permitting procedures and zoning ordinances, and permit wind energy development with minimal conflicts.

Noise Concepts and Definitions

The dictionary defines noise as unwanted sound. But to understand noise measurement and assessment, it is necessary to examine noise from an engineering perspective. This means defining several characteristics of sound, and redefining noise based on these definitions.

Sound is a defined as rapid fluctuations of air pressure which create a repeating cycle of compressed and expanding air.

Figure 1. Sound



Sound power is the energy converted into sound by the source. Sound power is not measured directly, it is calculated from measurements, and is used to estimate how far sound will travel and to predict the sound levels at various distances from the source. Several wind turbine manufacturers provide sound power with their turbine brochures. For example, Vestas' V80, 1.8 MW turbine emits between 98 and 109 dB(A) of sound power depending on configuration.

As sound energy travels through the air, it creates a sound wave that exerts pressure on receivers such as an ear drum or microphone. *Sound pressure* is typically measured in micropascals (μPa) and converted to a *sound pressure level* in decibels (dB) for reporting. The decibel scale is a logarithmic scale relative to the human threshold of hearing. Sound pressure level is used to determine loudness, noise exposure, and hazard assessment. (The next section covers sound pressure scales in more detail.) ANSI, the EPA, ISO, OSHA, and the WHO[1] all base their recommendations for maximum noise exposure on sound pressure levels.

As stated above, sound is a repeating cycle of compressed and expanding air. The *frequency* is the number of times per second, or Hertz (Hz), that this cycle repeats. An *octave* is a range where the lowest frequency is exactly half the highest frequency. A Concert A is 440 Hz, the next higher A is 880 Hz.

Sounds are often classified by the number of frequency components they contain. A *tone* is a sound that contains only one frequency. Musical notes are tones. Mechanical systems often emit noise that contains a noticeable tone. *Narrowband* sounds contain two or more frequency components, but the frequencies are very close to each other, within 1/3 of an octave. *Broadband* sounds contain multiple frequency components, and the frequencies span more than 1/3 of an octave. Cars, lawn equipment, jet engines and wind turbines all produce broadband noise.

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[1] American National Standards Institute (ANSI), US Environmental Protection Agency (EPA), International Standards Institute (ISO), Occupational Safety and Health Administration (OSHA) and the World Health Organization (WHO)

Table 1 lists some important frequency ranges for studying the impact of wind turbine noise.

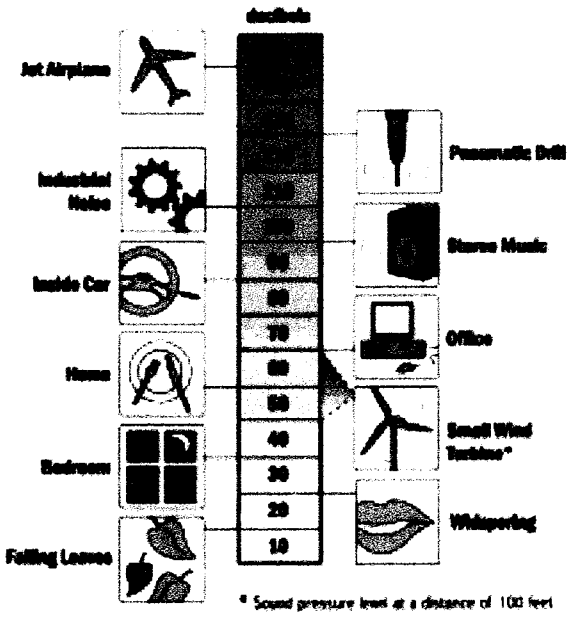
Table 1. Important Frequency Ranges

	Range
Normal Hearing	20 Hz – 20 kHz
Normal Speech	100 Hz – 3 kHz
Low Frequency	20 – 200 Hz
Infra Sound	< 16 Hz

Sound Pressure Level Scales

The human ear can detect and respond to sound pressures, from 20 μPa to over 200,000,000 μPa. (beyond 200,000,000 μPa the response becomes pain.) Engineers wanted a scale with a smaller range, so they mapped sound pressure on logarithmic scale which they defined as the decibel (dB). Zero decibels is the lowest pressure (20 μPa) that a person with normal hearing can detect. One hundred forty decibels is the pressure (20,000,000 μPa) that causes most people physical pain. Figure 2 shows how this scale relates to some common noise sources.

Figure 2. The Decibel Scale[2]



[2] Source: The American Wind Energy Association, http://www.awea.org/faq/noisefaq.html

Because decibels are a logarithmic scale, values do not add the same as they would for a linear scale. Doubling the sound power increases the sound pressure level by 3 dB. For example, two wind turbines each generating 110 dB of noise would produce a combined noise of 113 dB. However, doubling the sound pressure will increase the sound level by 6 dB.

A few additional things to remember about the decibel scale:

- Outside the laboratory most people cannot notice a volume change of less than 3 dB.
- A volume change of 3–5 dB is clearly noticeable.
- Most people subjectively perceive volume increase of 10 dB as twice as loud.

Peoples' perception of noise, however, do not always correspond with the dB scale. Sounds created with the same energy, but with different frequencies are not perceived to be equally loud. A lower frequency sound will seem quieter than a higher frequency sound of the same sound level. Noise control engineers wanted scales that reflected peoples' perception of noise. So they created 'weighting' scales.

In one sense, noise scales are like temperature scales. A thermometer measures the amount of heat in the air. The heat measurement is then compared to a reference scale such as Fahrenheit or Celsius. When we measure noise, we are actually measuring the amount of pressure that sound exerts on the receiver. We then compare that pressure to a decibel scale. However, the decibel scales are also adjusted by frequency. Engineers specify adjusted values by appending the scale name to the units, i.e., dB(A) or dB(C). Unadjusted values are reported as simply dB. Three of the scales, A, C, and G, have been identified as potentially relevant to addressing wind turbine noise.

The A scale is the most commonly used for community noise assessment and for specifying exposure limits. Designed to reflect the way people perceive sounds, the A scale divides the range of possible frequencies into octaves, and for each octave adjusts the decibel level so that a specified decibel level will seem to have the same loudness in each range. Table 2 shows how to adjust a sound pressure level for each frequency range to report a sound pressure level on the A, C, and G scales.

Table 2. Decibel Weighting Scales

Octave-center frequency (Hz)	Weighted response (dB)		
	A scale*	C scale*	G scale**
4			-16.0
8			-4.0
16			+7.7
31.5	-39.4	-3.0	-4.0
63	-26.2	-0.8	
125	-16.1	-0.2	
250	-8.6	0.	
500	-3.2	0.	
1,000	0.0	0.	
2,000	+1.2	-0.2	
4,000	-1.0	-0.7	

*From IEC 60651
**From ISO 7196

Many noise control texts state that the A scale is insufficient for determining the impact of noise or the level of annoyance when the frequency is below 100 Hz. Other texts state that the A scale is insufficient for any sound above 60 dB. These texts recommend the C scale which more closely resembles the actual sound pressure. However, the US Department of Labor based their noise exposure standards on the A scale. ANSI, the EPA, ISO, OSHA and WHO all provide their health impact data and their recommended noise exposure limits on the A scale; so it is likely the A scale will remain predominant.

As Table 2 shows, the difference between the A scale and the actual sound pressure varies significantly from one frequency range to another. So in order to ensure compliance with limits specified on the A scale, engineers specify non-adjusted limits for each range. Table 3 shows how Mundy Township in Michigan specified non-adjusted noise limits for each octave band to achieve the desired A scale limits.

Table 3. Octave Band Noise Limits

Frequency at center of octave band	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz
Non-adjusted dB level	72 dB	71 dB	65 dB	57 dB	51 dB	45 dB
Equivalent dB(A)	32.6 dB(A)	44.8 dB(A)	49 dB(A)	48.4 dB(A)	47.8 dB(A)	45 dB(A)

The G scale is used only for infrasound, i.e., sounds below 20 Hz. A few studies show that wind turbines do generate infrasound. However, the practicality and the importance of using the G scale for measuring this noise is still being debated.

For additional information on noise measurement, visit:

http://www.phys.unsw.edu.au/~jw/dB.html
http://www.dataphysics.com/support/library/downloads/articles/DP-Aweight.pdf

Wind Turbine Noise

Wind turbines generate two types of noise: aerodynamic and mechanical. A turbine's sound power is the combined power of both. Aerodynamic noise is generated by the blades passing through the air. The power of aerodynamic noise is related to the ratio of the blade tip speed to wind speed. Table 4 shows how the sound power of two small wind turbines vary with wind speed.

Table 4. Sound Power of Small Wind Turbines[3]

Make and Model	Turbine Size	Wind Speed (meters/second)	Estimated Sound Power
Southwest Windpower	900 W	5 m/s	83.8 dB(A)
Whisper H400		10 m/s	91 dB(A)
Bergey Excel BW03	10 kW	5 m/s	87.2 dB(A)
		7 m/s	96.1 dB(A)
		10 m/s	105.4 dB(A)

Depending on the turbine model and the wind speed, the aerodynamic noise may seem like buzzing, whooshing, pulsing, and even sizzling. Turbines with their blades downwind of the tower are known to cause a thumping sound as each blade passes the tower. Most noise radiates perpendicular to the blades' rotation. However, since turbines rotate to face the wind, they may radiate noise in different directions each day. The noise from two or more turbines may combine to create an oscillating or thumping "wa-wa" effect.

Wind turbines generate broadband noise containing frequency components from 20 – 3,600 Hz. The frequency composition varies with wind speed, blade pitch, and blade speed. Some turbines produce noise with a higher percentage of low frequency components at low wind speeds than at high wind speeds.

Utility scale turbines must generate electricity that is compatible with grid transmission. To meet this requirement, turbines are programmed to keep the blades rotating at as constant a speed as possible. To compensate for minor wind speed changes, they adjust the pitch of the blades into the wind. These adjustments change the sound power levels and frequency components of the noise. Table 5 lists the sound power for some common utility scale turbines.

Table 5. Sound Power of Utility Scale Wind Turbines

Make and Model	Turbine Size	Sound Power
Vestas V80	1.8 MW	98 – 109 dB(A)
Enercon E70	2 MW	102 dB(A)
Enercon E112	4.5 MW	107 dB(A)

A turbine's sound power represents the sound energy at the center of the blades, which propagates outward at the height of the hub. While writing this paper, I visited the Bowling Green Wind Farm Project, in Bowling Green, OH. At the base of 1.8 MW turbine, we measured the noise level at 58–60 dB(A). However, the turbines stand in a corn field, and depending on our position relative to the turbines, it was very difficult to distinguish the sound of the turbine from the rustling of the corn stalks.

Mechanical noise is generated by the turbine's internal gears. Utility scale turbines are usually insulated to prevent mechanical noise from proliferating outside the nacelle or tower. Small turbines are more likely to produce noticeable mechanical noise because of insufficient insulation. Mechanical noise may contain discernable tones which makes it particularly noticeable and irritating.

The amount of annoyance that wind turbine noise is likely to cause can be related to other ambient noises. One study in Wisconsin[4] reported that turbine noise was more noticeable and annoying at the cut-in wind speed of 4 m/s (9 mph) than at higher wind speeds. At this speed, the wind was strong enough to turn the blades, but not strong enough to create its own noise. At higher speeds, the noise from the wind itself masked the turbine noise. This could be of significance to Michigan communities where the average wind speeds very from 0 to 7 m/s (0–16.7 mph).

Health Impacts of Noise Exposure

Excessive exposure to noise has been shown to cause a several health problems. The most common impacts include:

- Hearing loss (temporary and permanent)
- Sleep disturbance

[3] Source: P. Migliore, J. van Dam and A. Huskey. Acoustic Tests Of Small Wind Turbines http://www.bergey.com/Technical/AIAA%202004-1185.pdf

[4] http://www.ecw.org/ecw/productdetail.jsp?productId=508&numPerPage=100&sortA

Exposure to extremely high noise levels can also cause headaches, irritability, fatigue, constricted arteries, and a weakened immune system[5]. However, there is no evidence that wind turbines generate the level of noise needed to create these problems.

Induced Hearing Loss

Noise exposure can induce two types of hearing loss: threshold shifts, which refers to the lowest volume a person can detect, and frequency loss, which means an inability to hear specific frequencies.

A person with normal hearing can detect any sound above 0 dB. Exposure to loud noises can temporarily desensitize nerve endings so that the lowest volume a person could hear might increase to 6 or 10 dB. With this shift, the person's entire perception of noise changes so that what was previously perceived as a normal volume seems too quiet to understand. If exposure is brief and the noise is removed, most people's hearing will return to normal. Long-term exposure, however, can cause permanent damage.

Hearing loss is related to the total sound energy to which a person is exposed. This is a combination of the decibel level and the duration of exposure. The Environmental Protection Agency (EPA), The American National Standards Institute (ANSI), and the US Occupational Safety and Health Administration (OSHA) have issued separate recommendations for maximum noise exposure to prevent hearing loss. Table 6 summarizes ANSI's recommendations.

Figure 3 shows how ANSI's recommendations compare to those of the EPA and OSHA.

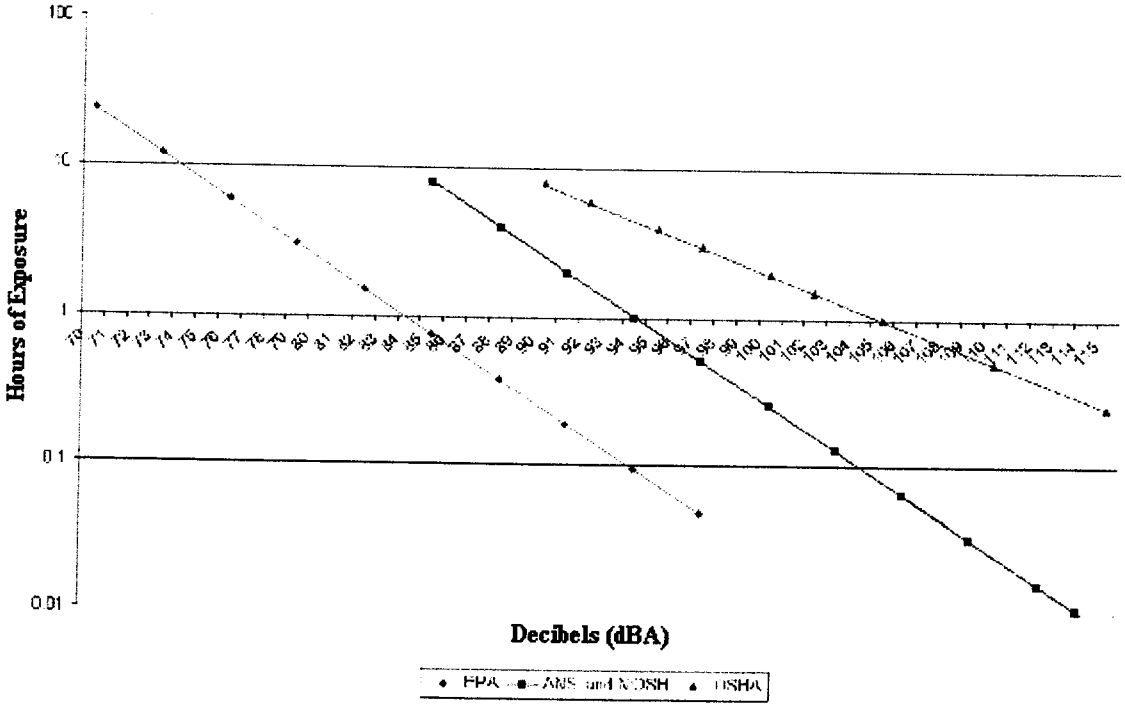
Table 6. ANSI Recommendations for Max Noise Exposure

Sound level dB(A)	Max exposure
90	8 hours
95	4 hours
100	2 hours
110	1/2 hour
115	1/4 hour

[5] Bragdon, Clifford. (19710Noise Pollution The Unquiet Crisis. (pg 69-71) University of Pennsylvania Press.

Stephens, Dafydd and Rood, Graham (1978) The Nonauditory Effects of Noise on Health (pg 285-312)in Handbook of Noise Assessment Edited by Daryl May Van Nostrand Reinhold Company New York

Figure 3. Comparison of Maximum Noise Exposure Standards[6]



Hearing loss can occur in specific frequencies. Elderly people tend to loose the ability to perceive higher frequencies before lower frequencies. Wind turbine noise, however, has not been linked to frequency loss.

Sleep Disturbance

The Institute of Environmental Medicine at Stockholm University prepared an extensive volume for the World Health Organization (WHO) on the impact of community noise on people's health. They report that noise exposure can affect sleep in several ways, including:

- increasing the time needed to fall asleep,
- altering the cycle of sleep stages, and
- decreasing the quality of REM sleep.

Over extended periods of time, any one of these problems could lead to more serious health issues.

[6]Source: http://www.nonoise.org/hearing/exposure/standardschart.htm

Sleep disturbances have been linked to three characteristics of noise exposure, including:

- the total noise exposure (including daytime exposure)
- the peak noise volume
- for intermittent noise, the number of volume peaks

The study reports that:

- Noise levels of 60 dB wakes 90% of people after they have fallen asleep.
- Noise levels of 55 dB affects REM cycles and increases time to fall asleep.
- Noise of 40-45 dB wakes 10% of people.

WHO recommends that ambient noise levels be below 35 dB for optimum sleeping conditions. These recommendations are significant because of a Dutch study[7] that showed noise from a 30 MW wind farm becomes more noticeable and annoying to nearby residents at night. This study noted that although the noise is always present, certain aspects of turbine noise, such as thumping and swishing, were not noticeable during the day, but became very noticeable at night. Residents as far as 1900 meters from the wind farm complained about the nighttime noise.

Intermittent peaks of 45 dB occurring more than 40 times per night, or peaks of 60 dB occurring more than 8 times per night will disturb most people's sleep. Intermittent starts and stops may be an issue for small, residential scale wind turbines (< 500 kW), and medium sized commercial turbines (500 kW – 1 MW) but are not likely to be an issue for utility scale turbines.

Many people (but not all) develop the ability to fall asleep regardless of the sound levels. Studies, however, show that this is only a partial adaptation. The presence of noise continues to negatively affect the sleep cycles and the quality of REM sleep.

Noise Assessment and Exposure Indicators

In many areas, noise levels change several times per day. So a noise that might seem loud at some times might be barely noticeable at other times. To account for these differences, many noise specifications use statistical limits. Table 7 lists some of the most commonly used indicators and their meanings.

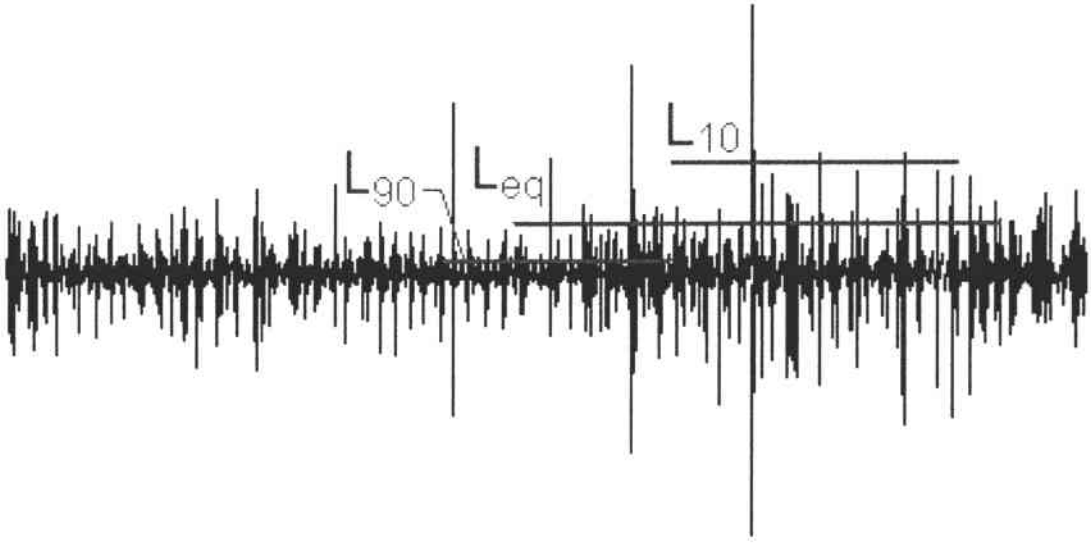
[7] G.P. van den Berg (2003) Effects of the wind profile at night on wind turbine sound. Journal of Sound and Vibration 277 (2004) 955–970

Table 7. Statistical Indicators

Indicator	Meaning
L_{max}	The maximum sound level measured.
L_{eq}	Equivalent continuous sound. An average sound energy for a given time
L_{10}	Sound level exceeded 10 percent of the time. Generally considered to be the sound level that will annoy most people.
L_{90}	Sound level exceeded 90 percent of the time. Generally considered to be a measure of ambient background noise.
L_{dn}	Day-night average sound level, or the average sound level for a 24-hour period

Figure 4 shows how sound levels vary over 1.5 minutes, and shows the relationship between L_{10}, Leq, and L_{90}.

Figure 4. Statistical Noise Indicators



With the exception of L_{max}, statistical indicators are not used to determine the effects of noise exposure on hearing or sleep. Community planners, however, often use these statistics to determine the existing noise levels and predict the impact or community responses of adding a new source of noise.

For example, the Oregon Noise Control Regulation[8] requires the operator of noise producing equipment to determine the L_{10} and L_{50} of a community prior to installing the equipment.

[8] http://www.energy.state.or.us/siting/noise.htm. (This web site also discusses some of the difficulty of measuring statistical noise levels for wind turbines.)

Operating the new equipment must not raise the statistical levels L_{10} or L_{50} by more than 10 dB in any one hour.

Kolano and Saha Engineers[9] especially recommend using statistical limits for regulating noise in hospital and school zones:

> For residential, community park, school, or hospital receiving zones the maximum wind turbine noise limit should be 10 dB greater than the preexisting statistical background sound level (L_{90}) of the community, or 3 dB less than the preexisting statistical high sound level of the community (L_{10}), whichever is lower. The preexisting L_{10} and L_{90} should be measured over a minimum of 3 continuous days that reasonably represents the community over the course of a year. For other zones, such as commercial, industrial and public rights of way the wind turbine noise limit should be 15 dB greater than the L_{90}, or equal to the L_{10}, whichever is less.

Sound Propagation and Attenuation

Propagation refers to how sound travels. Attenuation refers to how sound is reduced by various factors. Many factors contribute to how sound propagates and is attenuated, including air temperature, humidity, barriers, reflections, and ground surface materials. ISO 9613, "Predictive Modeling Standard," provides a standard method for predicting noise propagation and attenuation. This paper summarizes three of the most influential factors:

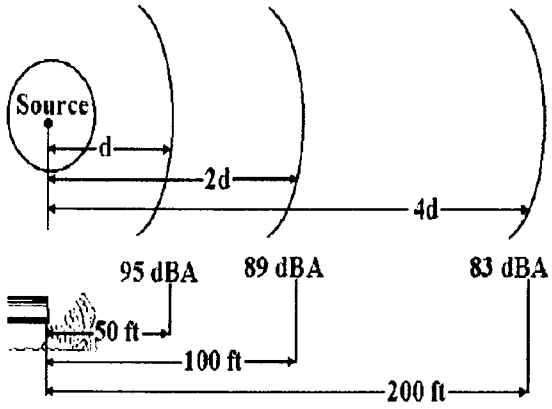
- distance
- wind direction
- building material absorption

Distance

As stated earlier, the decibel scale is logarithmic. Doubling the sound energy increases the sound pressure level by three decibels. But doubling the distance from a stationary source reduces the sound level by six decibels.

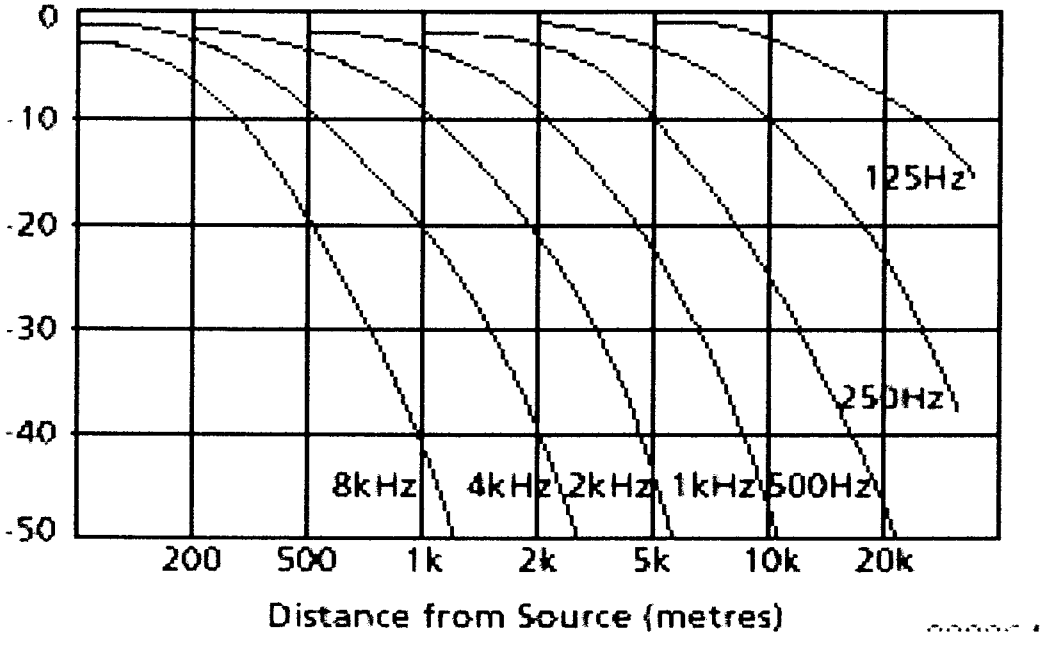
[9] Unpublished correspondence.

Figure 5. Attenuation by Distance[10]



Low frequencies travel further than high frequencies. An 8 kHz tonal sound will be attenuated (reduced in volume) about 40 dB per kilometer. By comparison, a 4 kHz tonal sound will be attenuated only about 20 dB per kilometer. For broadband noise, such as wind turbines produce, the low frequency components may travel further than the higher frequency components. Since low-frequency noise is particularly annoying to most people, it is important to specify limits for low frequency noise.

Figure 6. Frequency Attenuation[11]



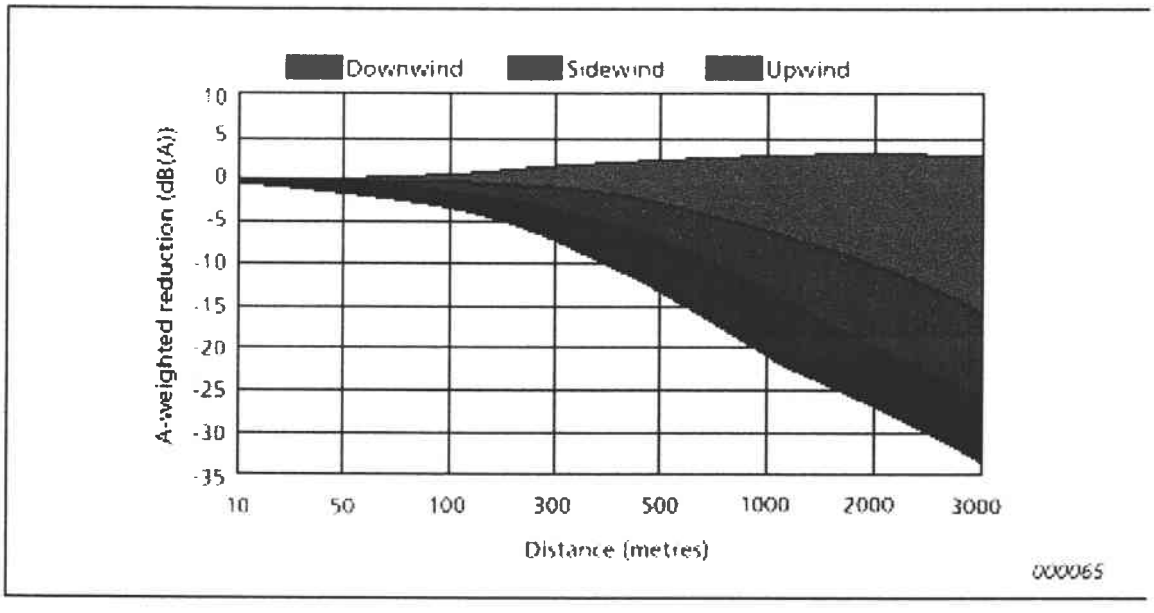
[10] Image source unknown.

[11] Source: Environmental Noise Booklet from Brüel & Kjær Sound & Vibration Measurement A/S. Retrieved from http://www.nonoise.org/library/envnoise/index.htm

Wind Direction

Wind direction also has an influence on sound propagation. Within 900 ft of a sound source, the wind direction does not seem to influence the sound. But after about 900 ft., the wind direction becomes a major factor in sound propagation. Downwind (meaning the wind is moving from the noise source towards the receiver) of the source, sound volume will increase for a time before decreasing. Upwind (the wind is moving from the receiver to the noise source), sound volumes decrease very quickly.

Figure 7. Wind Attenuation of Sound[12]



Building Materials

General home construction, with stud walls and windows in consideration, reduces noise differently for each frequency range. The EPA estimates that in cold climates, such as we have in Michigan, these types of homes attenuate 27 dB of noise. However, this estimate was based on traffic noise which consists of different frequency components than wind turbine noise.

Wind turbine noise, especially at lower wind and blade speeds, will contain more low frequency components than traffic noise. Light weight building home structures will not attenuate these frequencies components as well as higher frequency components. Table 8 lists the estimated attenuation for three octave bands in the low frequency range.

[12] Source: Environmental Noise Booklet from Brüel & Kjær Sound & Vibration Measurement A/S. Retrieved from http://www.nonoise.org/library/envnoise/index.htm

Table 8. Low Frequency Attenuation by Homes

Center of Octave Range	Estimated Attenuation
250 Hz	20 dB
125 Hz	10-15 dB
63 Hz	5-10 dB

Noise Ordinances

There are several methods to specifying noise limits:

- specifying a single all-encompassing maximum limit
- determining preexisting ambient noise levels and specifying that a new noise source may not increase the ambient noise by more than a particular amount
- setting a base limit, with adjustments for district types and time of day or night
- specifying maximum sound levels for each octave range

The American Wind Energy Association (AWEA) and the State of California recommend that noise from small turbines be limited to 60 dB(A) at the closest inhabited dwelling[13]. However, many people feel these simple limits are insufficient to protect people from noise's harmful effects, or even to address the annoyance level.

As mentioned before, the State of Oregon requires that turbine operators determine the preexisting L_{10} and L_{50} of a community. Operating the new equipment must not raise the statistical levels L_{10} or L_{50} by more than 10 dB in any one hour[14]. This method is adopted to address noise as a public nuisance, and takes into consideration the fact that each community will find different noise levels acceptable. However, many people consider it insufficient to account for low frequency noise or to protect people's sleep.

The International Standards Organization (ISO) recommends setting a base limit of 35– 40 dB(A) and adjusting the limit by district type and time of day. Table 9 lists the adjusted limits from a base of 35 dB(A).

[13] Permitting Small Wind Turbines: Learning from the California Experience http://www.energy.ca.gov/renewables/

[14] http://egov.oregon.gov/ENERGY/RENEW/Wind/docs/OAR340-035-0035.pdf

Table 9. ISO 1996-1971 Recommendations for Community Noise Limits

District Type	Daytime Limit	Evening Limit (7 -11 PM)	Night limit (11 PM – 7 AM)
Rural	35 dB(A)	30 dB(A)	25 dB(A)
Suburban	40 dB(A)	35 dB(A)	30 dB(A)
Urban residential	45 dB(A)	40 dB(A)	35 dB(A)
Urban Mixed	50 dB(A)	45 dB(A)	40 dB(A)

The most comprehensive method combines the district method with specific limits for frequency components in each octave range. The Charter Township of Mundy, MI's noise ordinance contains two tables; one specifying an overall limit, and one specifying octave band limits for each type of district. Table 10 shows an excerpt from Mundy's ordinance.

Table 10. Mundy Township Octave Band Noise Limits

		Frequency at center of octave band					Total Noise Limit
District Type		31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	
Residential	Day	72 dB	71 dB	65 dB	57 dB	51 dB	55 dB(A)
	Night	67 dB	66 dB	60 dB	52 dB	46 dB	50 dB(A)
Agricultural	Day	82 dB	81 dB	75 dB	67 dB	61 dB	65 dB(A)
	Night	72 dB	71 dB	65 dB	57 dB	51 dB	55 dB(A)

Note: The standard practice among noise control engineers is to specify limits for octave band components as unadjusted dB, and limits for total noise exposure as dB(A).

Engineering Standards

Several organizations have issued recommendations and standards related to noise measurement, assessment and control. Table 11 lists some of the applicable engineering standards.

Table 11. Noise Control Engineering Standard

Standard	Title
ASTM E1014-84	Standard Guide for Measurement of Outdoor A-Weighted Sound Level
ISO 9613	Predictive Modeling Standard
IEC 61400-11	Wind turbine generator systems –Part 11: Acoustic noise measurement techniques
ISO 1996-1971	Recommendations for Community Noise Limits
ANSI S1.4-1983	Specifications for Sound Level Meters
ANSI S12.18-1994	Procedures for Outdoor Measurement of Sound Pressure Levels

Referencing these standards in noise control ordinances will help clarify many aspects of community noise control that might otherwise be left open to interpretation.

Example Ordinance Language

> Prior to installing the turbines, establish the existing ambient noise level according to ANSI S12.18-1994 with a sound meter that meets or exceeds ANSI S1.4-1983 specifications for a Type I sound meter.
>
> Use the sound propagation model of ISO 9613 to micro site the turbines within a wind farm so that the turbines will not emit noise above the limits specified in Table 9 and Table 10 beyond the property line of the wind farm.

Conclusions

Community noise assessment and control is a land compatibility issue which must be carefully addressed. A few years ago, the city of Sterling Hts., MI permitted an outdoor concert venue adjacent to a residential neighborhood. The noise became a nuisance, neighbors filed law suits, and the city spent more than $31 million trying to settle the conflict.

With good preparation, however, similar conflicts with wind energy development can be avoided. This paper provides a foundation which should help decision makers develop beneficial permitting procedures and zoning ordinances, and permit wind energy development with minimal conflicts.

About the Author

Daniel J. Alberts is a senior member of the Society for Technical Communication. He holds a BS in Engineering from the University of Michigan and a Master of Science in Technical and Professional Communication from Lawrence Technological University (LTU). Mr Alberts was a founding member of LTU's Alternative Energy Student Group and served as the group's Vice President for the 2004-05 school year.

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108 E. Proctor Street · Carson City NV 89701
Phone: (775) 887-2180 • E-mail: planning@carson.org

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SPECIAL USE PERMIT

FILE # SUP - 10 - 114

FEE: $2,450.00 MAJOR
$2,200.00 MINOR (Residential zoning districts)
+ noticing fee and CD containing application digital data (all to be submitted once the application is deemed complete by staff)

Joseph Goni
PROPERTY OWNER

7300 Schulz Dr, Carson City, NV 89701
MAILING ADDRESS, CITY, STATE, ZIP

775-267-9743 N/A
PHONE # FAX #

Name of Person to Whom All Correspondence Should Be Sent

James Medeiros, Rainbow Conservation Corp.
APPLICANT/AGENT

1803 No. Carson St, Ste A, Carson City, NV 89701
MAILING ADDRESS, CITY, STATE ZIP

775-841-9225 775-841-9225
PHONE # FAX #

Solar suitcase@sbcglobal.net
E-MAIL ADDRESS

SUBMITTAL PACKET
- ☑ 6 Completed Application Packets (1 Original + 5 Copies) including:
- ☑ Application Form
- ☑ Site Plan
- ☑ Building Elevation Drawings and Floor Plans
- ☑ Proposal Questionnaire With Both Questions and Answers Given
- ☑ Applicant's Acknowledgment Statement
- ☑ Documentation of Taxes Paid-to-Date (1 copy)
- ☐ Project Impact Reports (Engineering) (4 copies)

Application Reviewed and Received By:

Submittal Deadline: See attached PC application submittal schedule.
Note: Submittals must be of sufficient clarity and detail such that all departments are able to determine if they can support the request. Additional information may be required.

Project's Assessor Parcel Number(s):	Street Address	ZIP Code
010-671-02	7300 Schulz Dr, Carson City, NV	89701

Project's Master Plan Designation	Project's Current Zoning	Nearest Major Cross Street(s)
Medium Density	SF6	Racetrack + Rabe Way

Briefly describe your proposed project: (Use additional sheets or attachments if necessary). In addition to the brief description of your project and proposed use, provide additional page(s) to show a more detailed summary of your project and proposal. In accordance with Carson City Municipal Code (CCMC) Section: 18.04.190, or Development Standards, Division ____, Section ____, a request to allow as a conditional use is as follows:

Special use permit for height variance for installation of 160' tower to support Bergey 10Kw wind turbine for production of electricity.

PROPERTY OWNER'S AFFIDAVIT

I, Joseph R. Goni, being duly deposed, do hereby affirm that I am the record owner of the subject property, and that I have knowledge of, and I agree to, the filing of this application.

Joseph R. Goni — 7300 Schulz dr CC, Nev. 89701 — 12/15/10
Signature — Address — Date

Use additional page(s) if necessary for other names.

STATE OF NEVADA)
COUNTY)

On December 15, 2010, Joseph R Goni personally appeared before me, a notary public, personally known (or proved) to me to be the person whose name is subscribed to the foregoing document and who acknowledged to me that he/she executed the foregoing document.

Lena E Tripp
Notary Public

LENA E. TRIPP
NOTARY PUBLIC
STATE OF NEVADA
No.06-104525-12 My Appt. Exp. Mar. 28, 2014

NOTE: If your project is located within the historic district, airport area, or downtown area, it may need to be scheduled before the Historic Resources Commission, the Airport Authority, and/or the Redevelopment Authority Citizens Committee prior to being scheduled for review by the Planning Commission. Planning personnel can help you make the above determination.

January 15, 2011

TO: **City Planning Staff and Planning Commissioners**
FROM: **Joseph R. Goni**

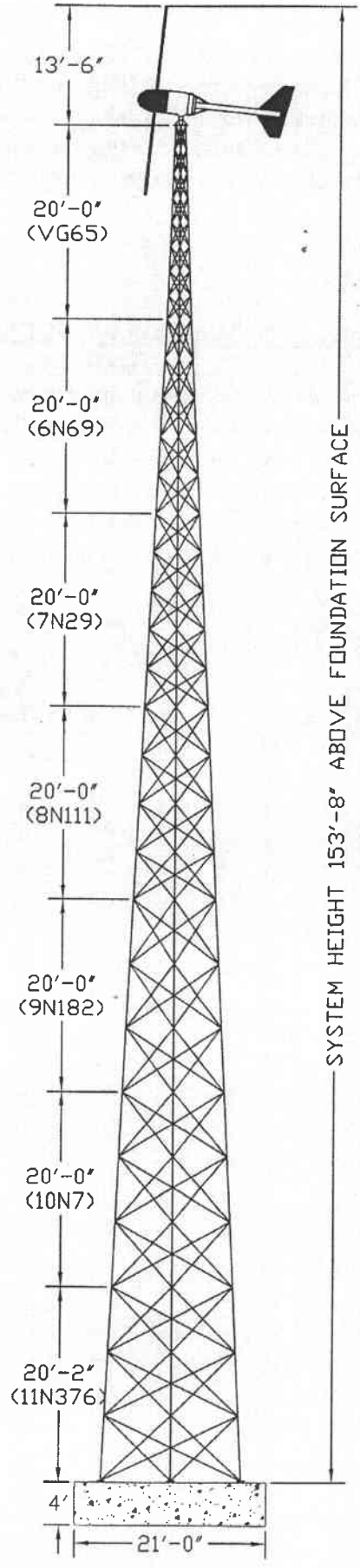
Howdy! First of all I would like to introduce myself: My name is Joseph R. Goni. I have lived in Carson all my life. I've lived at 7300 Schulz Dr. for 36 years. The way my body is designed-I breathe oxygen and I exhale carbon dioxide. I drive a 52 mile per gallon automobile that emits carbon monoxide. I have planted approximately 200 trees on my property. Hopefully my life style and philosophy will help to offset a certain percentage of harmful gases released in the atmosphere. I'm not under the illusion that I can change the whole world, nor would I want to. I'm only one person, but I would like to do my humble part.

My present utility bills do not represent my future utility bills. My Master Plan: Application: Special Use Permit for wind turbine to be used in conjunction with my photovoltaic arrays plays a very integral part, especially the wind turbine, in my Master Plan. By reclaiming my gray water (i.e., washing machine, dishwasher, shower and bathing water, as well as my wash basin), combined with the few thunderstorms that we have, will help with irrigation of those 200 trees. I have approximately 6,000 sq.ft. of roof surfaces to capture that rain water. The system uses gray water that consists of an 18,000 gal. fiberglass holding tank underground about 3 ft. deep and two 600 gal. underground tanks next to my remote accessory building to catch the rain water from those roof surfaces; they will be connected to the larger water storage tank. There is a 5-10hp electric motor driving the water pump. From the tank there is hooked an electric timer controlling 18 water zones thru 2,000 ft. of irrigation pipe. Presently I use Carson City potable water at peak times in summer, 10,000 to 15,000 gallons of water; during less peak times 5,000 to 10,000 gallons. This system should offset a percentage of that very precious natural resource that we Carson citizens enjoy. Hopefully this wind turbine in conjunction with the PV arrays will also offset the amount of electrical energy that is used by the electric motors. The future energy usage will also provide for the installation of a 250 amp welder and a 5hp two-stage air compressor in my 4 bay garage. The Master Plan will also put back electrical energy into NVEnergy's grid and help my neighborhood and my community. A byproduct of this proposal will result in jobs for **excavators, plumbers, electrical, engineers, rain gutter installer, City planning staff, and the Planning Commission.** ***In addition it will raise property values and increase the city tax coffers.*** The first step in the system is the wind turbine. I believe this is a good comprehensive plan. I can't change world events but I have the power to do my part by conserving and using renewable energy and, most certainly this Body, the Planning Commission, has the power to make this happen.

I hope you will approve this Special Use Permit application. We are breaking new ground, and I hope we keep this journey heading in the right direction into the future.

THANK YOU FOR YOUR TIME AND CONSIDERATION OF THIS MATTER!

Sincerely: Joseph R. Goni


13'-6"
20'-0"
(VG65)
20'-0"
(6N69)
20'-0"
(7N29)
20'-0"
(8N111)
20'-0"
(9N182)
20'-0"
(10N7)
20'-2"
(11N376)
4'
21'-0"
SYSTEM HEIGHT 153'-8" ABOVE FOUNDATION SURFACE

Conclusion: This project requires a 160' wind tower in order to stand above the nearby 105' hill and catch the wind coming off the top of the eastern slope of the Sierras. (Eastern slope winds have proven to be measurably consistent which aids tremendously in the production of wind power). Installing and utilizing this form of alternative energy helps the environment as well as providing physical proof that wind energy is a viable product that can be beneficial to the entire community.

ACKNOWLEDGMENT OF APPLICANT

I certify that the forgoing statements are true and correct to the best of my knowledge and belief. I agree to fully comply with all conditions as established by the Planning Commission. I am aware that this permit becomes null and void if the use is not initiated within one year of the date of the Planning Commission's approval; and I understand that this permit may be revoked for violation of any of the conditions of approval. I further understand that approval of this application does not exempt me from all City code requirements.

Joseph R. Gerri
Applicant

12/15/10
Date

Key Issues

Land Use

- This project is compatible the land use intended for a adjacent higher density neighborhood. There will no impact to this development
- Will not interfere with a Urban/rural interface

Circulation and Access

- There will not be any accessibility issues as a result of this Wind Turbine
- Will not interfere with the new traffic and proposed street corridor to Topsy Lane/US 395
- Does not impact the connection to Edmonds sports complex.
- Will not effect future NDOT studies

Infrastructure, Services, and Facilities

- There will not be any accessibility issues as a result of this Wind Turbine
- Will not interfere with the new traffic and proposed street corridor to Topsy Lane/US 395

Regional Coordination

- Project is located on 7300 Schulz Ave will not impact Douglass County It does not interfere with the boarder to effect any non motorized pathways to the county

Environmental and Cultural

- Project does not effect watershed nor does the culture around this project suffer a negative impact. The potential resources are protected.

Planning Division
Special Use Permit Package

Q: The subject site is located in the Schulz Ranch Specific Plan Area (SR-SPA). Please address the proposed project as it relates to the policies identified in the SPA document.

A: The special use permit requested relates to the Schulz Ranch Specific Plan Area and addresses minimal property easements. In the Schulz ranch plan with respect to the construction of a suburban sub-division, A minimal easement of 30' is observed as a standard see SPA-SR- 1.2. The plan also incorporates a demand for park/public access type areas. Although a percentage ratio of park per building area has not yet been established it is proposed to incorporate a Pedestrian and Bicycle Connection (SPA-SR-2.3) adjacent to the Goni property as a integral effort in accomplishing the needs of the City's adopted Bicycle Master Plan. SPA – SR-3.3 suggests that large buffer areas be utilized to accomplish transitions. It is therefore proposed that a walkway and possible obstacle course be implemented in future designs of the aforesaid Schulz Ranch Specific Plan Area. To enhance public enjoyment, a health beneficial training course and access area will enhance leisure and quality of life for all to enjoy. In the future construction of this suburban neighborhood a consistent 30' minimal easement plan may allow for future wind generators and renewable LEED certified housing for would be occupant homeowner/residents. Please see attached improvised plan addendum for impacted yet unprejudiced results as to adjacent corridor park and recreation possibilities. It is also possible that land use be incorporated and available to the option of documenting this historic racetrack as part of a certified par exercise course. The benefit of establishing newer LEED certification type "New Construction Housing" may prevail in future building. There could be a new and improved race track (obstacle course) with public access and unilateral enjoyment for the community, schools and local enthusiastic individuals to enjoy. The policies of the Schulz Ranch Specific Plan Area calling for a thirty foot (30') minimum easement may pave the way for using this land

successfully as a recreational path. In addition a call for park type area to be created is consistent with the master plan of Carson City. The area of suburban development around the proposed future subdivision may develop into a grid interactive community utilizing wind resources as well.

Q: Address all findings related to the Special Use Permit. The findings submitted do not address the proposed development specifically findings (a-h) as noted in CMCC 18.02.080(5)

A: According to Impact due to this special use permit being granted it is addressed as line item issues.

- **a.** **The Special use permit is consistent with the objectives of CMCC 18.02.080(5) in that property easements are encourages and additional wind generators may be a possibility for future land/home owners. The special use permit also encourages incorporating a park/trail access route utilized for the leisure and benefit of the public.**
- **b.** **The erection of a WECS (Wind Energy Conversion System) will not be detrimental to establishing the development of the surrounding property. There will be less than 25 decibels of noise produced at the boundary of residences located a considerable 30' plus from known boundaries. It will enhance surrounding properties to encourage more WECS systems.**
- **c.** **Any and all traffic effects due to this special use permit project will be benign.**
- **d.** **There will be no additional burden on public services from this project. Wind energy towers will be protected in accordance with municipal standards removing all accessible climbing steps for twelve feet. It may be beneficial to light a potential park site utilizing a series of future community wind towers and allow remote access monitoring and weather data available for the US weather**

service, and local emergency traffic to gain local measurement data

e. The succession of this project paves the way for future wind projects in this area. The goal to establish a suburban neighborhood is consistent with newly established LEED certification type housing. For future developments a new perspective can be adapted to incorporate renewables to a new and modern subdivision.

f. The tower of 160' in height meets all IDEC building codes and standards. The creation of this WECS (Wind Energy Conversion System) will not be any inconvenience or effect to the welfare of the public.

g. There will be no result in material damage or future property development values. This project encourages the development of a adjacent suburban community. Although the project of the Schulz Ranch Specific Plan Area is now owned by a bank A WECS will encourage future wind generation projects potentially attracting "green" building developers. Adapted policies from this commission favoring a wind eligible developmental community will demonstrate and signify Carson City as a leader in renewables.

h. The burden of presenting this information exists within the evidence here presented. To see the total effect of this wind energy system will present itself as a step into the future and a endorsement of N.R.S. 278.0208 That discourages unreasonable restriction from renewables intergrading into the community.

SPECIAL USE PERMIT APPLICATION QUESTIONNAIRE

1. How will the proposed development further and be in keeping with, and not contrary to, the goals of the Master Plan Elements?

The proposed project uses sustainable building materials and construction techniques to promote energy conservation while protecting existing features. The materials used in construction are durable and long lasting. Installation of a wind generator is economically and environmentally friendly, generating electricity for the primary residence which reduces the neighborhood's overall power consumption.

2. Will the effect of the proposed development be detrimental to the immediate vicinity? To the general neighborhood?

The subject property is bounded on the south by single family residences, zoned SF6; on the west, north, and east by undeveloped acreage zoned Single-Family SF6; on the northeast by a minimum security prison with surrounding acreage.

While there are currently no other wind generators installed in this neighborhood, the anticipated sound level at the property line should not exceed 25 dB in no-wind scenarios or 5 dB above ambient noise in wind.

SOURCE/ACTIVITY	INDICATIVE NOISE LEVEL dB (A)
Threshold of hearing	0
Quiet Library	30
Rural night-time background	20 - 40
Quiet bedroom	35
Car at 40 mph at 300'	55
Busy general office	60
Truck at 30 mph at 300'	65

It should be noted that, as wind increases, the ambient noise increases. When the wind speed reaches 15 mph to 30 mph, the noise created by trees alone often exceeds 60 db (A) which would tend to mask any noise output from the wind generator.

There are no anticipated problems, such as dust, odors, vibration, fumes, glare, or physical activity, associated with the generation of electricity by wind or the installation of a tower to support a wind generator. The entire project is outside of an enclosed structure. Installing the tower should cause minimal disturbance to the surrounding area.

Installation of a tower to support a wind generator should have minimal impact on the surrounding neighborhood as it does not intrude physically on any surrounding properties and is a positive move toward the utilization of alternative energy as currently endorsed by the federal government.

Due to the fact that the proposed project is fully contained within private residential property boundaries with no changes made to existing traffic patterns and flow, there is no anticipated impact on the existing traffic, pedestrian or vehicular, and no anticipated change to the existing time frame for emergency vehicle response when the project is fully operational.

Installation and use of a wind generator and tower is a major step in demonstrating Carson City to be proactive in promoting alternative energy services in accordance with US energy trends.

3. Has sufficient consideration been exercised by the applicant in adapting the project to existing improvements in the vicinity?

This is a minor development project that is strictly contained within the boundaries of the private residential property upon which it is located and will have no effect on the school district, water supply, water drainage, sewage disposal, roads, lighting, public landscaping, or require additional parking.

Conclusion: This project requires a 160' wind tower in order to stand above the nearby 105' hill and catch the wind coming off the top of the eastern slope of the Sierras. (Eastern slope winds have proven to be measurably consistent which aids tremendously in the production of wind power). Installing and utilizing this form of alternative energy helps the environment as well as providing physical proof that wind energy is a viable product that can be beneficial to the entire community.

ACKNOWLEDGMENT OF APPLICANT

I certify that the forgoing statements are true and correct to the best of my knowledge and belief. I agree to fully comply with all conditions as established by the Planning Commission. I am aware that this permit becomes null and void if the use is not initiated within one year of the date of the Planning Commission's approval; and I understand that this permit may be revoked for violation of any of the conditions of approval. I further understand that approval of this application does not exempt me from all City code requirements.

James Medeiros — 1/7/11

Applicant — Date

Master Plan Policy Checklist

Special Use Permit, Major Project Review & Administrative Permits

PURPOSE

The purpose of a development checklist is to provide a list of questions that address whether a development proposal is in conformance with the goals and objectives of the 2006 Carson City Master Plan that are related to non-residential and multi-family residential development. This checklist is designed for developers, staff, and decision-makers and is intended to be used as a guide only.

Development Name: Goni Wind Generator Project

Reviewed By: James Medeiros - Jennifer Pruit

Date of Review: 1/7/11 (Final)

DEVELOPMENT CHECKLIST

The following five themes are those themes that appear in the Carson City Master Plan and which reflect the community's vision at a broad policy level. Each theme looks at how a proposed development can help achieve the goals of the Carson City Master Plan. A check mark indicates that the proposed development meets the applicable Master Plan policy. The Policy Number is indicated at the end of each policy statement summary. Refer to the Comprehensive Master Plan for complete policy language.

CHAPTER 3: A BALANCED LAND USE PATTERN

The Carson City Master Plan seeks to establish a balance of land uses within the community by providing employment opportunities, a diverse choice of housing, recreational opportunities, and retail services.

Is or does the proposed development:

- ☑ Meet the provisions of the Growth Management Ordinance (1.1d, Municipal Code 18.12)?
- ☑ Use sustainable building materials and construction techniques to promote water and energy conservation (1.1e, f)?
- ☑ Located in a priority infill development area (1.2a)?
- ☑ Provide pathway connections and easements consistent with the adopted Unified Pathways Master Plan and maintain access to adjacent public lands (1.4a)?
- ☑ Protect existing site features, as appropriate, including mature trees or other character-defining features (1.4c)?

- [x] At adjacent county boundaries or adjacent to public lands, coordinated with the applicable agency with regards to compatibility, access and amenities (1.5a, b)?
- [x] In identified Mixed-Use areas, promote mixed-use development patterns as appropriate for the surrounding context consistent with the land use descriptions of the applicable Mixed-Use designation, and meet the intent of the Mixed-Use Evaluation Criteria (2.1b, 2.2b, 2.3b, Land Use Districts, Appendix C)?
- [x] Meet adopted standards (e.g. setbacks) for transitions between non-residential and residential zoning districts (2.1d)?
- [x] Protect environmentally sensitive areas through proper setbacks, dedication, or other mechanisms (3.1b)?
- [x] Sited outside the primary floodplain and away from geologic hazard areas or follows the required setbacks or other mitigation measures (3.3d, e)?
- [x] Provide for levels of services (i.e. water, sewer, road improvements, sidewalks, etc.) consistent with the Land Use designation and adequate for the proposed development (Land Use table descriptions)?
- [x] If located within an identified Specific Plan Area (SPA), meet the applicable policies of that SPA (Land Use Map, Chapter 8)?

CHAPTER 4: EQUITABLE DISTRIBUTION OF RECREATIONAL OPPORTUNITIES

The Carson City Master Plan seeks to continue providing a diverse range of park and recreational opportunities to include facilities and programming for all ages and varying interests to serve both existing and future neighborhoods.

Is or does the proposed development:

- [x] Provide park facilities commensurate with the demand created and consistent with the City's adopted standards (4.1b)?
- [x] Consistent with the Open Space Master Plan and Carson River Master Plan (4.3a)?

CHAPTER 5: ECONOMIC VITALITY

The Carson City Master Plan seeks to maintain its strong diversified economic base by promoting principles which focus on retaining and enhancing the strong employment base, include a broader range of retail services in targeted areas, and include the roles of technology, tourism, recreational amenities, and other economic strengths vital to a successful community.

Is or does the proposed development:

- [x] Encourage a citywide housing mix consistent with the labor force and non-labor force populations (5.1j)
- [x] Encourage the development of regional retail centers (5.2a)
- [ ] Encourage reuse or redevelopment of underused retail spaces (5.2b)?
- [x] Support heritage tourism activities, particularly those associated with historic resources, cultural institutions and the State Capitol (5.4a)?
- [x] Promote revitalization of the Downtown core (5.6a)? *

* If Public Works Wind Energy Conversion Becomes common

- ☐ Incorporate additional housing in and around Downtown, including lofts, condominiums, duplexes, live-work units (5.6c)?

CHAPTER 6: LIVABLE NEIGHBORHOODS AND ACTIVITY CENTERS

The Carson City Master Plan seeks to promote safe, attractive and diverse neighborhoods, compact mixed-use activity centers, and a vibrant, pedestrian-friendly Downtown.

Is or does the proposed development:

- ☑ Use durable, long-lasting building materials (6.1a)?
- ☑ Promote variety and visual interest through the incorporation of varied building styles and colors, garage orientation and other features (6.1b)?
- ☑ Provide variety and visual interest through the incorporation of well-articulated building facades, clearly identified entrances and pedestrian connections, landscaping and other features consistent with the Development Standards (6.1c)?
- ☑ Provide appropriate height, density and setback transitions and connectivity to surrounding development to ensure compatibility with surrounding development for infill projects or adjacent to existing rural neighborhoods (6.2a, 9.3b 9.4a)?
- ☑ If located in an identified Mixed-Use Activity Center area, contain the appropriate mix, size and density of land uses consistent with the Mixed-Use district policies (7.1a, b)?
- ☐ If located Downtown:
  - o Integrate an appropriate mix and density of uses (8.1a, e)?
  - o Include buildings at the appropriate scale for the applicable Downtown Character Area (8.1b)?
  - o Incorporate appropriate public spaces, plazas and other amenities (8.1d)?
- ☐ Incorporate a mix of housing models and densities appropriate for the project location and size (9.1a)?

CHAPTER 7: A CONNECTED CITY

The Carson City Master Plan seeks promote a sense of community by linking its many neighborhoods, employment areas, activity centers, parks, recreational amenities and schools with an extensive system of interconnected roadways, multi-use pathways, bicycle facilities, and sidewalks.

Is or does the proposed development:

- ☑ Promote transit-supportive development patterns (e.g. mixed-use, pedestrian-oriented, higher density) along major travel corridors to facilitate future transit (11.2b)?
- ☐ Maintain and enhance roadway connections and networks consistent with the Transportation Master Plan (11.2c)?
- ☑ Provide appropriate pathways through the development and to surrounding lands, including parks and public lands, consistent with the Unified Pathways Master Plan (12.1a, c)?

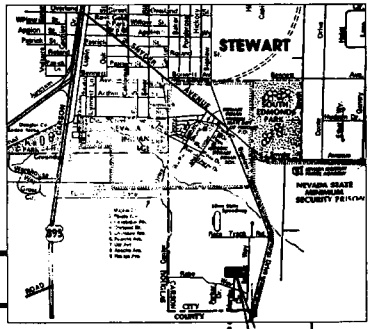
I. GENERAL NOTES

A. All construction on the above-noted project shall be in accordance with the minimum of the latest adopted edition of the International Building Code (IBC) and all local building ordinances, or as specifically noted on these plans and calculations, with the most stringent condition governing. It is the responsibility of the contractor/builder to be familiar with and comply with the requirements as stated in the IBC, and all local building ordinances. The certified blueprints are an integral part of these design calculations.

PROJECT: 160' TOWER WITH 10KW BERGEY WIND TURBINE
THE TURBINE AND TOWER TO MEET IBC CODE REQUIREMENTS FOR PUBLIC SAFETY.
GRID TIE SYSTEM PROVIDING ELECTRICITY
OCCUPANCY GROUP: U
TYPE OF CONSTRUCTION: V-B
FLOOD ZONE: C-MINIMAL FLOODING, NATURAL DRAINAGE

JOE GONI
7300 SCHULZ DRIVE
CARSON CITY, NEVADA 89701
APN 010-671-02

VICINITY MAP



34.09 ACRES
A.P.N. 10-671-07
SF6-SRSPA

2.48 ACRES
A.P.N. 10-671-02
SF6-SRSPA

0.15 ACRES
A.P.N. 10-671-14
COMMON AREA

0.31 ACRES
A.P.N. 10-671-15
SF6-SRSPA

0.45 ACRES
A.P.N. 10-671-03
SF6-SRSPA

0.23 ACRES
A.P.N. 10-671-01
PC

1.13 ACRES
A.P.N. 9-321-06
MH1A

1 ACRE
A.P.N. 9-323-04
MH1A

1.17 ACRES
A.P.N. 9-323-01
MH1A

S89° 17' 25.00"E 143.480
S88° 29' 51.00"E 99.790
N10° 41' 31.00"E 120.350
S21° 11' 01.00"E 124.410
S21° 11' 01.00"E 38.210
S81° 33' 28.00"E 257.540
S21° 11' 01.00"E 144.550
S1° 01' 09.00"W 99.470
S1° 01' 09.00"W 43.720
N9° 13' 47.00"W 164.530
N89° 20' 21.00"W 86.870
N0° 39' 39.00"E 50.000
N89° 20' 21.00"W 463.870
S89° 17' 25.00"E 200.760

SOLAR PANEL GRID TIE SYSTEM ON WATSON TRACKER
125.99'
64'
140.43'
100'
60'
3" CONDUIT
EXISTING 32'x54' ACCESSORY FARM STRUCTURE (1,728 SF)
2 FLOORS 3,456 SF TOTAL
EXISTING 14'x67' RESIDENCE (1,002 SF)
64.51'
EXISTING GAS METER
32'
45'
54'
PULL BOX
EXISTING GAS METER
53.2'
EXISTING SS LEACH FIELD
ALT. LEACH FIELD
112.68'
EXISTING DIRECT BURIAL POWER
GAS TAP
DRIVEWAY
100.56'
40'X60'
EXISTING SOLAR PANEL GRID-TIE SYSTEM WITH TRACKER ON 8" POLE FOR HOUSE
ABANDONED WELL
EXISTING SHOP METER AND DISCONNECT FOR SHOP
NEW PANEL FOR SOLAR GRID-TIE SYSTEM TO BE AT EXISTING SHOP METER
EXISTING BARN APPROX. 2,400 SF
72.42'
EXISTING 200A METER & OLD WELL HOUSE ABOUT 16'X16' 256 SQ.FT.
EXISTING WATER METER
EXISTING 1.5" DOMESTIC WATER
EXISTING NATURAL GAS
EXISTING OH POWER POLE
MARTHA CIRCLE
EXISTING OH POWER POLE
SCHULZ DRIVE
DRIVEWAY

NORTH

PROFESSIONAL ENGINEER STATE OF NEVADA
JAMES JAY SWANN
CIVIL
No. 8289

PLOT PLAN
WITH INFORMATION PROVIDED BY OWNER
SCALE: 1/32" = 1'-0"

PLOT AND NOTES

CREATED
DRAWN BY: JJS
CHECKED BY: JJS
DATE: 10-26-2010
SCALE: 1/32" = 1'-0"
JOB NO: 2010-027

JAMES J SWANN, P.E.
P.O. 2078 PORTOLA
CALIF. 96122
530-832-1410

SPECIAL USE PERMIT
PROPOSED PLANS FOR :

JOE GONI RESIDENCE NEW 160' TOWER WITH 10KW WIND TURBINE

JOE GONI 775-841-9225
7300 SCHULZ DRIVE
CARSON CITY, NEVADA 89701
APN 010-671-02
CONTACT PERSON
MEDEIROS, JAMES
RAINBOW CONSERVATION CORP.
1803 N. CARSON ST, NV
PHONE 775-247-1071
775-247-2507
E-MAIL
solarsuitcase@sbcglobal.net
39.170544/-119.872798

SHEET 1