DOCKETED	
Docket Number:	23-OPT-01
Project Title:	Fountain Wind Project
TN #:	262352-3
Document Title:	Additional Administrative Records for the Fountain Wind Proceeding_Part 3
Description:	N/A
Filer:	Ngoc Tran
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	3/25/2025 3:27:14 PM
Docketed Date:	3/25/2025

TABLE OF CONTENTS

FW0000458	FW0000459	RE: disposition for PO-18
FW0000460	FW0000460	Fig6_Substation Design Details.pdf
FW0000461	FW0000461	fwp_project_description- page 42.pdf
FW0000462	FW0000462	Disposition for PO-18
FW0000463	FW0000463	Fountain Wind Project, Docket Number 23-OPT-01
FW0000464	FW0000464	FW: Fountain Wind Project Comment
FW0000465	FW0000465	FWP Existing Land Uses Map.pdf
FW0000466	FW0000468	Jan 2023- Fountain Wind rejected in Shasta County gets fresh look from California.pdf
FW0000469	FW0000470	Oct 2023 - Shasta County plans media campaign opposing Fountain Wind project.pdf
FW0000471	FW0000473	Sept 2023 - Who is siding with Shasta County to fight a revived wind farm project_.pdf
FW0000474	FW0000474	RE: Fountain Wind Farm | California Energy Commission
FW0000475	FW0000475	Re: Fountain Wind Project Planning Commission Public Hearing - Group Presentations
FW0000476	FW0000476	RE: Fountain Wind Tribal Consultation Letters
FW0000477	FW0000477	FW: Fountain Wind Farm | California Energy Commission
FW0000478	FW0000478	Shasta County Supervisor Mary Rickert Ltr. to Chair Hochschild re Opposition to Fountain Wind Project (23-OPT-01)
FW0000479	FW0000480	Letter to CEC Chair from Supr. Rickert-c1.pdf
FW0000481	FW0000481	RE: Fountain Wind Pit River Tribe Comment Letter
FW0000482	FW0000482	Request for Voluntary AB 52 Consultation for the Fountain Wind Project

FW0000483	FW0000484	Courtesy Copy: CEC To Hold Fountain Wind Project Public Meeting in Shasta County on November 28
FW0000485	FW0000487	RE: Request for Voluntary AB 52 Consultation for the Fountain Wind Project
FW0000488	FW0000489	RE: Request for Voluntary AB 52 Consultation for the Fountain Wind Project
FW0000490	FW0000491	RE: Fountain Wind Project (23-OPT-01) - water supply
FW0000492	FW0000494	Re: Fountain Wind Application Update
FW0000495	FW0000495	Fountain Wind Project NOP
FW0000496	FW0000496	RE: Fountain Wind Project NOP
FW0000497	FW0000497	Fountain Wind Presentations
FW0000498	FW0000498	Fwd: Environmental Scoping and Informational Meeting for the proposed Fountain Wind Project: Meeting Comments
FW0000499	FW0000499	Fountain Wind Project - Informational and Scoping Meeting
FW0000500	FW0000500	Fountain Wind Project--Notice of Preparation of EIR
FW0000501	FW0000501	Fountain Wind Water Scoping Comments...
FW0000502	FW0000502	RE: Fountain Wind Water DR...
FW0000503	FW0000507	2023110139_NAHC Comment.pdf
FW0000508	FW0000508	Fw: Fountain Wind Project--Notice of Preparation of EIR
FW0000509	FW0000509	'+FNW_CECSiteVisit_20231110 (1).pdf
FW0000510	FW0000510	RE: follow-up call this Fri or Mon?
FW0000511	FW0000511	Fountain Wind Project (23-OPT-01) Environmental Scoping and Informational Meeting
FW0000512	FW0000512	FW: Fountain Wind Project--Notice of Preparation of EIR

FW0000513	FW0000513	Caltrans Comments-Fountain Wind Project, NOP of Draft EIR
FW0000514	FW0000515	Drainage Info-Caltrans.pdf
FW0000516	FW0000516	NAHC input
FW0000517	FW0000518	Final_Shadow-Flicker-Fact-Sheet.pdf
FW0000519	FW0000519	Re: FWP | checking in
FW0000520	FW0000521	RE: Fountain Wind DR
FW0000522	FW0000522	FW: night sky comments on Fountain Wind project near two National Park sites
FW0000523	FW0000524	Fountain Wind LAVO&WHIS comments 12-15-23.pdf
FW0000525	FW0000529	LAVO070716_LassenPeakDarkSkyReport_Attachment_I.pdf
FW0000530	FW0000532	Sustainable Outdoor Lighting Principles_Attachment_II.pdf
FW0000533	FW0000603	RP-43-22 Lighting Exterior Applications_Attachment_III.pdf
FW0000604	FW0000604	Re: Requests for Fountain Wind
FW0000605	FW0000605	Fountain Wind Cultural Resources Study Area and Survey Area GIS datasets
FW0000606	FW0000608	RE: Meeting on January 11
FW0000609	FW0000609	fwp_file_submittal_memo_2023-0629_gis(caitlin.barns@stantec.com).pdf
FW0000610	FW0000611	Questions Regarding Fountain Wind Project
FW0000612	FW0000612	FW: Stop the Fountain Wind Project
FW0000613	FW0000613	Fountain Wind (23-OPT-01) - Cultural Resources Survey Coverage
FW0000614	FW0000614	Fountain Wind_Cultural Resources_Figure 2.png
FW0000615	FW0000615	Fountain Wind_Cultural Resources_Figure 1.png

FW0000616	FW0000616	Fountain Wind_Cultural Resources_Figure 2.png
FW0000617	FW0000617	23-OPT-01 - Fountain Wind - Consultation with Pit River Tribe
FW0000618	FW0000618	Fountain Wind Project
FW0000619	FW0000620	RE: Requests for Fountain Wind
FW0000621	FW0000622	RE: Inquiry Regarding Construction Hour Regulations in Shasta County
FW0000623	FW0000623	Attn:Mr. Leonidas Payne
FW0000624	FW0000625	Re: Fountain Wind Project
FW0000626	FW0000626	Re: Fountain Wind Bio Coordination Call
FW0000627	FW0000627	Fountain Wind Bio Meeting
FW0000628	FW0000629	RE: Fountain Wind GIS Data Request - fuel break, vegetation communities, and disturbed areas
FW0000630	FW0000630	Fountain Wind Project
FW0000631	FW0000631	Fountain Wind Project Support Letter
FW0000632	FW0000632	Request for Input from Shasta County AQMD on the Opt-in Application for the Fountain Wind Project
FW0000633	FW0000633	Re: quick questions
FW0000634	FW0000634	Informal data request--Fountain Wind--Worker Safety/Fire Protection
FW0000635	FW0000635	DO NOT stop the Fountain Wind Project
FW0000636	FW0000636	Shasta County Air Quality Management District Input on the Opt-in Application for Certification of the Fountain Wind Project (23-OPT-01)
FW0000637	FW0000648	383_PS_CA_Fuel_Break-Forestland_05-2020.pdf
FW0000649	FW0000649	RE: Fountain Wind - County request for confidential GIS data

FW0000650	FW0000651	Re: Meeting with CEC and CAL FIRE to discuss the Fountain Wind Project
FW0000652	FW0000653	Re: Meeting with CEC and CAL FIRE to discuss the Fountain Wind Project
FW0000654	FW0000654	RE: FWP | water supply report
FW0000655	FW0000655	Fountain Wind Project Draft EIR
FW0000656	FW0000656	Re: Fountain Wind check-in call
FW0000657	FW0000657	Re: Fountain Wind Project Draft EIR
FW0000658	FW0000659	RE: Fountain Wind check-in call
FW0000660	FW0000660	Data Requests
FW0000661	FW0000661	Fountain Wind Wildfire ROC Response Letter
FW0000662	FW0000663	RE: Fountain Wind Bio Support for Sand Hill Crane Mitigation
FW0000664	FW0000665	Re: Fountain Wind check-in call
FW0000666	FW0000667	RE: Pit River Comments Cultural Resource Report_7-29-2024.docx
FW0000668	FW0000669	RE: Pit River Comments Cultural Resource Report_7-29-2024.docx
FW0000670	FW0000673	RE: [EXTERNAL] Fountain Wind vs Altamont Pass Mitigation
FW0000674	FW0000678	Re: Fountain Wind Project: Shasta County Request for Inspection
FW0000679	FW0000679	California wind project conclusion summary
FW0000680	FW0000683	S_U Impacts in California Wind Projects Summary(17901734.1).docx
FW0000684	FW0000685	Additional fire documents in record
FW0000686	FW0000688	Re: Fountain Wind public convenience and necessity
FW0000689	FW0000690	RE: Fountain Wind check-in call
FW0000691	FW0000691	Fountain Wind Question

FW0000692	FW0000695	RE: County Comments on Fountain Wind
FW0000696	FW0000696	Re: Fountain Wind check-in call
FW0000697	FW0000700	RE: County Comments on Fountain Wind
FW0000701	FW0000702	RE: Fountain Wind check-in call

To: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
Cc: Henry Woltag[hwoltag@connectgenllc.com]; Barnes, Brooke[brooke.barnes@stantec.com]
From: Barns, Caitlin[Caitlin.Barns@stantec.com]
Sent: Tue 7/11/2023 1:55:29 PM (UTC-07:00)
Subject: FWP | updated tracker
fwp_CEC_master_tracker_2023-0711.xlsx

Hi Lon,

See attached for the updated tracker. Purple items represent the newest submittals (within the last week). Yellow dates indicate those items for which we need your team's initial or follow-up responses (post 30-day timeline). The one facilities item we discussed this morning I confirmed was initially adequate, so I have removed it from the spreadsheet.

Please send any additional disposition responses to Henry and Brooke, copied, while I'm out!

Thank you!
Caitlin

Caitlin Barns (she/her)
Senior Biologist
Regional Group Leader: Ecosystems
601 SW 2nd Avenue, Suite 1400
Portland, Oregon 97204
503-207-4368
Vacation Alert: I am out of the office July 12-21

Stantec

To: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
Cc: Barnes, Brooke[brooke.barnes@stantec.com]; Henry Woltag[hwoltag@connectgenllc.com]
From: Barns, Caitlin[Caitlin.Barns@stantec.com]
Sent: Tue 7/11/2023 1:49:37 PM (UTC-07:00)
Subject: FWP | draft project description
fwp_project_description.docx
fwp_project_description_figures1-8c.docx.pdf

Lon,

Attached please find a Word version of the draft project description for the Fountain Wind Project. PDF figures are also attached. Based on our discussion this morning, my understanding is that this is not part of the Appendix B data responses and thus will not be docketed. In addition, your staff's review will not be tied to the determination of completeness for our opt-in application.

I am out of the office starting tomorrow, back 7/24, so please coordinate directly with Brooke and Henry, copied, with any questions.

Thanks!
Caitlin

Caitlin Barns (she/her)
Senior Biologist
Regional Group Leader: Ecosystems
601 SW 2nd Avenue, Suite 1400
Portland, Oregon 97204
503-207-4368
Vacation Alert: I am out of the office July 12-21

Stantec

To: Knight, Eric@Energy[Eric.Knight@energy.ca.gov]
From: Payne, Leonidas@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=AA9D25DDE24E40429EFA06C4EED35807-PAYNE, LEON]
Sent: Tue 7/18/2023 2:23:25 PM (UTC-07:00)
Subject: Fwd: Applicant Responses to RWQCB Data Adequacy Comments, Fountain Wind Energy Project

This email thread confirms that RWQCB was OK with the response the applicant provided, so if you have any concerns regarding the timing of the receipt of info as it relates to RWQCB permits that are subsumed into our license, please let me know which particular item(s) in the tracker are impacted and how we might convey that concern to the applicant.

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From: Ackerman, James@Energy <james.ackerman@energy.ca.gov>
Sent: Tuesday, July 18, 2023 2:04:08 PM
To: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Cc: Khoshmashrab, Shahab@Energy <Shahab.Khoshmashrab@energy.ca.gov>; Abulaban, Abdel-Karim@Energy <Abdel-Karim.Abulaban@energy.ca.gov>
Subject: FW: Applicant Responses to RWQCB Data Adequacy Comments, Fountain Wind Energy Project

Lon: Lynn Coster does concur that the applicant addressed RWQCB comments (See email below).

One thing she did note is that Dannas Berchtold retired in 2019 and should not be listed as the contact.

James Ackerman, PG #6493
Engineering Geologist
California Energy Commission
Siting, Transmission and Environmental Protection Division
Direct: (530) 878-4966
Email: james.ackerman@energy.ca.gov

From: Coster, Lynn@Waterboards <Lynn.Coster@Waterboards.ca.gov>
Sent: Tuesday, July 18, 2023 1:59 PM
To: Ackerman, James@Energy <james.ackerman@energy.ca.gov>
Subject: RE: Applicant Responses to RWQCB Data Adequacy Comments, Fountain Wind Energy Project

Hi James,
I apologize for not responding yesterday but was on vacation. I agree that they adequately responded to the Central Valley RWQCB's comments. They did incorrectly list the RWQCB contact as Dannas Berchtold, who retired in 2019, but that is not a big deal.

Best regards,

Lynn Coster
Senior Environmental Scientist
Storm Water / Water Quality Certifications / Irrigated Lands
Central Valley Regional Water Quality Control Board
(530) 224-2437

From: Ackerman, James@Energy <james.ackerman@energy.ca.gov>
Sent: Monday, July 17, 2023 2:24 PM
To: Coster, Lynn@Waterboards <Lynn.Coster@Waterboards.ca.gov>
Cc: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: FW: Applicant Responses to RWQCB Data Adequacy Comments, Fountain Wind Energy Project

EXTERNAL:

Lynn: I took the time to review the applicants' responses to RWQCB comment with respect to the January 27, 2023 comment letter.

It appears they have addressed all the comments. Do you concur?

James Ackerman, PG #6493
Engineering Geologist
California Energy Commission
Siting, Transmission and Environmental Protection Division
Direct: (530) 878-4966
Email: james.ackerman@energy.ca.gov

From: Ackerman, James@Energy
Sent: Monday, July 17, 2023 10:21 AM
To: Coster, Lynn@Waterboards <Lynn.Coster@Waterboards.ca.gov>
Cc: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>; Khoshmashrab, Shahab@Energy <Shahab.Khoshmashrab@energy.ca.gov>; Abulaban, Abdel-Karim@Energy <Abdel-Karim.Abulaban@energy.ca.gov>
Subject: RE: Applicant Responses to RWQCB Data Adequacy Comments, Fountain Wind Energy Project

Lynn: I was wondering if you and your staff were able to determine if your comments on the data-adequacy tracker were addressed by the applicant.

As we need to complete the data-adequacy process today, your prompt response is required.

Otherwise, we will need to make our best effort to make a value judgement on whether the comments were addressed.

James Ackerman, PG #6493
Engineering Geologist
California Energy Commission
Siting, Transmission and Environmental Protection Division
Direct: (530) 878-4966
Email: james.ackerman@energy.ca.gov

From: Ackerman, James@Energy
Sent: Thursday, July 6, 2023 1:25 PM
To: Coster, Lynn@Waterboards <Lynn.Coster@Waterboards.ca.gov>
Cc: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>; Abulaban, Abdel-Karim@Energy <Abdel-Karim.Abulaban@energy.ca.gov>
Subject: Applicant Responses to RWQCB Data Adequacy Comments, Fountain Wind Energy Project

Lynn: Please find attached a copy of the data-adequacy tracker for the proposed Fountain Wind Energy project in eastern Shasta County (CEC Docket no. 23-Opt-01) with RWQCB comments.

The applicant has recently responded to data adequacy comments in column K of the tracker highlighted in purple.

Please determine whether the applicant's response is adequate or note what is deficient in Column P (CEC Deposition No. 3).

Reference documents can be found in the project docket on the CEC website using the following link:

https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01

Please respond by Friday, July 14, 2023.

Contact me if you have any questions.

James Ackerman, PG #6493
Engineering Geologist
California Energy Commission
Siting, Transmission and Environmental Protection Division
Direct: (530) 878-4966
Email: james.ackerman@energy.ca.gov

To: Kerr, Steven@Energy[Steven.Kerr@energy.ca.gov]; Roark, Gabriel@Energy[gabriel.roark@energy.ca.gov]; Hughes, Joseph@Energy[Joseph.Hughes@energy.ca.gov]; Fooks, Brett@Energy[Brett.Fooks@energy.ca.gov]; Hesters, Mark@Energy[Mark.Hesters@energy.ca.gov]; Ng, Laiping@Energy[Laiping.Ng@energy.ca.gov]
Cc: Knight, Eric@Energy[Eric.Knight@energy.ca.gov]
From: Payne, Leonidas@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=AA9D25DDE24E40429EFA06C4EED35807-PAYNE, LEON]
Sent: Thur 7/27/2023 8:04:20 AM (UTC-07:00)
Subject: next round of Fountain Wind responses

Per Caitlin, here is when we'll see responses for the items in the tracker shaded light orange (meaning the ball is in their court):

I'm on vacation July 31 to Aug 4, so for any of these new responses I'll be asking that dispositions get written up by COB Aug 4.

--Lon

Data Request	General Description	Status
AIR-013, -014	Dispersion modeling	Modeling ongoing, response by 7/28
CUL-003, CUL2-02	Maps	Awaiting signature for confidentiality application, response asap
LU-001	Timber harvest specifications	Awaiting timber harvest plan from ConnectGen contractor; submittal week of 7/31
SOC-004	Description of Pit River Trust Lands poverty statistics	Response by 7/28
SOC-006	Skilled workers by craft	We'd like to have a conversation about these. We've reached the point of diminishing returns on responses and will need to come to a collective agreement on how to close these out.
SOC-008	Permanent housing	
SOC-021	Labor regulations	
SOC2-007, -008, -009	See SOC-006	
TRAF-001	Aggregate deliveries error	Response by 7/28
TRAF-004, -007	HCM methodologies	
TSD-05	ISO Cluster 8 study	Awaiting signature for confidentiality application, response asap
VIS-01, -08, -09	Updated VIA, simulations	Response by 7/28
WILDFIRE-02	Wildfire effects on health	Response by 7/28

To: Kerr, Steven@Energy[Steven.Kerr@energy.ca.gov]; DeCarlo, Lisa@Energy[Lisa.DeCarlo@energy.ca.gov]; Ponce, Mariah@Energy[Mariah.Ponce@Energy.ca.gov]
Cc: Knight, Eric@Energy[Eric.Knight@energy.ca.gov]; Vorters, Dian@Energy[Dian.Vorters@Energy.ca.gov]
From: Payne, Leonidas@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=AA9D25DDE24E40429EFA06C4EED35807-PAYNE, LEON]
Sent: Wed 7/26/2023 10:51:23 AM (UTC-07:00)
Subject: Fountain Wind (23-OPT-01) applicant request for Land Use/Soc meeting

The applicant is requesting a technical meeting to discuss resolution of the Land Use and Socio items listed in the table below. This is turning into a replay of the prior Alts-related conversations where the applicant is not inclined to send us anything more and want us to accept what they've provided as adequate for the purposes of data completeness. Annie Mudge will be participating, so we need someone from CCO to be on the call as well. Their preference is to do this meeting tomorrow (Thurs) or Friday. Be on the lookout for an invite.

If we need to push this meeting to next week, I am fine with it happening while I am away on vacation. Steve—can you play the host role in that scenario?

Lon Payne—Project Manager
California Energy Commission

From: Barns, Caitlin
Sent: Wednesday, July 26, 2023 10:14 AM
To: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: RE: re Land Use/Soc meeting

Here's the list of items we'd like to discuss:

Data Request	General Description	Status
SOC-006	Skilled workers by craft	We'd like to have a conversation about these. We've done our due diligence on these responses and will need to come to a collective agreement on how to close these out.
SOC-008	Permanent housing	
SOC-021	Labor regulations	
SOC2-007, -008, -009	See SOC-006	
LU-002, LU2-02, LU2-04	Mapping overlap with NF	
LU-008, LU2-05	Lease	
LU-010	Prime Farmland designation of inholding	
LU-012	FMMP database information	
LU2-01	Community Benefits Program	
SOC-001	Coordination with Shasta County	
SOC-007, -013, -014	Emergency response times	

From: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Sent: Wednesday, July 26, 2023 8:19 AM
To: Barns, Caitlin <Caitlin.Barns@stantec.com>
Subject: re Land Use/Soc meeting

It occurred to me that you might not have seen this message I sent to Brooke while you were on vacation. I highlighted the relevant bits. This provides some context for why I am asking for an estimate on responses for the items shaded in light orange—I was hoping to get those responses and do another round of staff reviews and hopefully clear them out before we meet.

I'm fine with this meeting happening next week while I am out since it's really a matter for the technical staff reviewers (and potentially the attorneys).

From: Payne, Leonidas@Energy
Sent: Thursday, July 20, 2023 11:34 AM
To: Barnes, Brooke <brooke.barnes@stantec.com>
Subject: RE: Fountain Wind: Monday call

In order to have a productive meeting, I think we need to get a better sense of which specific items would be the subject of the meeting, not just topic areas.

I currently count 58 outstanding items.

For 13 of those you've submitted something and they are in our court—I should have dispositions on those by COB Friday and I will be going over them with Caitlin on Monday. Many are AQ related.

There are 4 Alts related items which you've marked as "on hold"—we've already held multiple meetings to discuss those items and we understand the applicant is not inclined to send us anything additional on those, so it comes down to a judgment call—we'll either need to accept the info submitted as sufficient or repackage our request somehow.

That leaves 41 items where we need an additional response from the applicant. Of those, you've requested clarifications via email on 2 items—that was forwarded to technical staff and I will follow up.

I guess what I need to figure out is how many of those 41 items you actually expect to respond to, and when, and which items more appropriately belong in the "on hold" category (i.e. those where there is a difference of opinion about what is needed and whether it is/should be relevant to CEC's data adequacy determination). Otherwise my assumption is that you are actively working on providing responses.

I've attached the most current version of the tracker so we're working form the same info.

Lon Payne—Project Manager
California Energy Commission

From: Barnes, Brooke <brooke.barnes@stantec.com>
Sent: Thursday, July 20, 2023 10:20 AM
To: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: RE: Fountain Wind: Monday call

I misunderstood. Is a meeting on those topics in the works? I'm trying to keep things moving in Caitlin's absence.

Brooke

From: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Sent: Thursday, July 20, 2023 1:19 PM
To: Barnes, Brooke <brooke.barnes@stantec.com>
Subject: Re: Fountain Wind: Monday call

Monday's meeting with Caitlin is just my general coordination meeting where we go over outstanding items on the tracker. There is no meeting date with specific technical teams like alts, socio, and land use scheduled yet.

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From: Barnes, Brooke <brooke.barnes@stantec.com>
Sent: Thursday, July 20, 2023 9:54:34 AM
To: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: Fountain Wind: Monday call

Hi Lon

I know you were trying to set up a call with Caitlin and the team for Monday to talk Alternatives, SOC and LU. Has that time been set?

Brooke

Brooke E. Barnes
Principal

Direct: 207 406-5461
Mobile: 207 522-4870
Fax: 207 729-2715
brooke.barnes@stantec.com

Stantec
30 Park Drive
Topsham ME 04086-1737

From: Payne, Leonidas@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=AA9D25DDE24E40429EFA06C4EED35807-PAYNE, LEON]

Attendees: DeCarlo, Lisa@Energy; Knight, Eric@Energy; NVahidi@aspeneg.com; Tatiana Inouye; Irene Kaufman; Eileen Allen; Jon Davidson; Babula, Jared@Energy; Anderson, Kari@Energy; Ponce, Mariah@Energy; Kerr, Steven@Energy; Barns, Caitlin (Caitlin.Barns@stantec.com)

Location: Microsoft Teams Meeting

Importance: Normal

Subject: Fountain Wind Land Use/Socio discussion

Start Time: Thur 7/27/2023 12:00:00 PM (UTC-07:00)

End Time: Thur 7/27/2023 1:00:00 PM (UTC-07:00)

Required Attendees: Kerr, Steven@Energy; Barns, Caitlin (Caitlin.Barns@stantec.com); DeCarlo, Lisa@Energy

Optional Attendees: Knight, Eric@Energy; NVahidi@aspeneg.com; Tatiana Inouye; Irene Kaufman; Eileen Allen; Jon Davidson; Babula, Jared@Energy; Anderson, Kari@Energy; Ponce, Mariah@Energy

Caitlin—here is the invite for forwarding.

Items to be discussed:

Required Attendees: Kerr, Steven@Energy; Barns, Caitlin (Caitlin.Barns@stantec.com); DeCarlo, Lisa@Energy
Optional Attendees: Knight, Eric@Energy; NVahidi@aspeneg.com; Tatiana Inouye; Irene Kaufman; Eileen Allen; Jon Davidson; Babula, Jared@Energy; Anderson, Kari@Energy; Ponce, Mariah@Energy

Data Request	General Description	Status
SOC-006	Skilled workers by craft	We'd like to have a conversation about these. We've done our due diligence on these responses and will need to come to a collective agreement on how to close these out.
SOC-008	Permanent housing	
SOC-021	Labor regulations	
SOC2-007, -008, -009	See SOC-006	
LU-002, LU2-02, LU2-04	Mapping overlap with NF	
LU-008, LU2-05	Lease	
LU-010	Prime Farmland designation of inholding	
LU-012	FMMP database information	
LU2-01	Community Benefits Program	
SOC-001	Coordination with Shasta County	
SOC-007, -013, -014	Emergency response times	

Required Attendees: Kerr, Steven@Energy; Barns, Caitlin (Caitlin.Barns@stantec.com); DeCarlo, Lisa@Energy
Optional Attendees: Knight, Eric@Energy; NVahidi@aspeneg.com; Tatiana Inouye; Irene Kaufman; Eileen Allen; Jon Davidson; Babula, Jared@Energy; Anderson, Kari@Energy; Ponce, Mariah@Energy

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Microsoft Teams meeting

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Learn More | Meeting options

To: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
From: Barns, Caitlin[Caitlin.Barns@stantec.com]
Sent: Wed 7/26/2023 10:37:27 AM (UTC-07:00)
Subject: RE: re Land Use/Soc meeting

See updated table below.

From: Barns, Caitlin
Sent: Wednesday, July 26, 2023 10:14 AM
To: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: RE: re Land Use/Soc meeting

This is helpful, and I had missed it. Here's the list of items we'd like to discuss:

Data Request	General Description	Status
SOC-006	Skilled workers by craft	We'd like to have a conversation about these. We've done our due diligence on these responses and will need to come to a collective agreement on how to close these out.
SOC-008	Permanent housing	
SOC-021	Labor regulations	
SOC2-007, -008, -009	See SOC-006	
LU-002, LU2-02, LU2-04	Mapping overlap with NF	
LU-008, LU2-05	Lease	
LU-010	Prime Farmland designation of inholding	
LU-012	FMMP database information	
LU2-01	Community Benefits Program	
SOC-001	Coordination with Shasta County	
SOC-007, -013, -014	Emergency response times	

From: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Sent: Wednesday, July 26, 2023 8:19 AM
To: Barns, Caitlin <Caitlin.Barns@stantec.com>
Subject: re Land Use/Soc meeting

It occurred to me that you might not have seen this message I sent to Brooke while you were on vacation. I highlighted the relevant bits. This provides some context for why I am asking for an estimate on responses for the items shaded in light orange—I was hoping to get those responses and do another round of staff reviews and hopefully clear them out before we meet.

I'm fine with this meeting happening next week while I am out since it's really a matter for the technical staff reviewers (and potentially the attorneys).

From: Payne, Leonidas@Energy
Sent: Thursday, July 20, 2023 11:34 AM
To: Barnes, Brooke <brooke.barnes@stantec.com>

Subject: RE: Fountain Wind: Monday call

In order to have a productive meeting, I think we need to get a better sense of which specific items would be the subject of the meeting, not just topic areas.

I currently count 58 outstanding items.

For 13 of those you've submitted something and they are in our court—I should have dispositions on those by COB Friday and I will be going over them with Caitlin on Monday. Many are AQ related.

There are 4 Alts related items which you've marked as "on hold"—we've already held multiple meetings to discuss those items and we understand the applicant is not inclined to send us anything additional on those, so it comes down to a judgment call—we'll either need to accept the info submitted as sufficient or repackage our request somehow.

That leaves 41 items where we need an additional response from the applicant. Of those, you've requested clarifications via email on 2 items—that was forwarded to technical staff and I will follow up.

I guess what I need to figure out is how many of those 41 items you actually expect to respond to, and when, and which items more appropriately belong in the "on hold" category (i.e. those where there is a difference of opinion about what is needed and whether it is/should be relevant to CEC's data adequacy determination). Otherwise my assumption is that you are actively working on providing responses.

I've attached the most current version of the tracker so we're working form the same info.

Lon Payne—Project Manager
California Energy Commission

From: Barnes, Brooke <brooke.barnes@stantec.com>
Sent: Thursday, July 20, 2023 10:20 AM
To: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: RE: Fountain Wind: Monday call

I misunderstood. Is a meeting on those topics in the works? I'm trying to keep things moving in Caitlin's absence.

Brooke

From: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Sent: Thursday, July 20, 2023 1:19 PM
To: Barnes, Brooke <brooke.barnes@stantec.com>
Subject: Re: Fountain Wind: Monday call

Monday's meeting with Caitlin is just my general coordination meeting where we go over outstanding items on the tracker. There is no meeting date with specific technical teams like alts, socio, and land use scheduled yet.

Get Outlook for iOS

From: Barnes, Brooke <brooke.barnes@stantec.com>
Sent: Thursday, July 20, 2023 9:54:34 AM
To: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: Fountain Wind: Monday call

Hi Lon

I know you were trying to set up a call with Caitlin and the team for Monday to talk Alternatives, SOC and LU. Has that time been set?

Brooke

Brooke E. Barnes
Principal

Direct: 207 406-5461
Mobile: 207 522-4870
Fax: 207 729-2715
brooke.barnes@stantec.com

Stantec
30 Park Drive
Topsham ME 04086-1737

To: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
Cc: Barns, Caitlin[Caitlin.Barns@stantec.com]
From: Barnes, Brooke[brooke.barnes@stantec.com]
Sent: Fri 7/21/2023 10:26:42 AM (UTC-07:00)
Subject: Fountain updates
fwp_CEC_master_tracker_July 21_FW.xlsx

Hi Lon

Attached please find an updated matrix, with new responses in purple.

In addition, the following have been docketed:

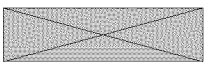
-updated tracker
-log of inquiry calls to emergency service providers (responsive to SOC-007 and 013)
-updated CSO survey plan (responsive to BIO-005 and 030)
-project lease option (responsive to LU-008 and LU2-05)

Brooke

Brooke E. Barnes
Principal

Direct: 207 406-5461
Mobile: 207 522-4870
Fax: 207 729-2715
brooke.barnes@stantec.com

Stantec
30 Park Drive
Topsham ME 04086-1737



To: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]; Salyphone, Kenneth@Energy[kenneth.salyphone@energy.ca.gov]; Ng, Laiping@Energy[Laiping.Ng@energy.ca.gov]; Michael Clayton[mc.mca@comcast.net]; Tatiana Inouye[TInouye@aspeneg.com]; Negar Vahidi[NVahidi@aspeneg.com]; Hughes, Joseph@Energy[Joseph.Hughes@energy.ca.gov]; Watson, Carol@Energy[Carol.Watson@energy.ca.gov]; Chris Huntley[Chuntley@aspeneg.com]; Leane Dunn[LDunn@aspeneg.com]; Sofi, Ardalan@Energy[ardalan.sofi@energy.ca.gov]; Turner, Michael@Energy[Michael.Turner@Energy.ca.gov]; Aurie Patterson[apatterson@aspeneg.com]; Irene Kaufman[IKaufman@aspeneg.com]; Jon Davidson[Jdavidson@aspeneg.com]; David Robinson[D.Robinson@fehrandpeers.com]; Ackerman, James@Energy[james.ackerman@energy.ca.gov]; Gutierrez, Ashley@Energy[Ashley.Gutierrez@energy.ca.gov]; Brewster Birdsall[bbirdsall@aspeneg.com]; rdporto@aspeneg.com[rdporto@aspeneg.com]; Eileen Allen[eallen@aspeneg.com]
Cc: Knight, Eric@Energy[Eric.Knight@energy.ca.gov]; Roark, Gabriel@Energy[gabriel.roark@energy.ca.gov]; Fooks, Brett@Energy[Brett.Fooks@energy.ca.gov]; Abulaban, Abdel-Karim@Energy[Abdel-Karim.Abulaban@energy.ca.gov]; Khoshmashrab, Shahab@Energy[Shahab.Khoshmashrab@energy.ca.gov]; Hilliard, Jon@Energy[jon.hilliard@energy.ca.gov]
From: Kerr, Steven@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=D0D5A66BED2249FCA830918F58B3B921-KERR, STEVE]
Sent: Wed 8/2/2023 1:40:52 PM (UTC-07:00)
Subject: Fountain Wind (23-OPT-01) Data Adequacy review--UPDATED TRACKER

Hello Fountain Wind Project team,

Lon is on vacation this week so I'm helping get the latest information from the applicant to you. Here is the link on SEBE to the updated Excel tracker that Caitlin sent today: fwp CEC master tracker Aug2.xlsx. (I also shared this direct link within SEBE to Aspen staff already.)

A PDF copy of the tracker was just filed to the docket too, along with several supporting filings this morning. This table summarizes latest filings:

Data Request	General Description	Status
AIR-013, -014	Dispersion modeling	Response submitted 7/28
CUL-003, CUL2-02	Maps	Response submitted 7/31
LU-001	Timber harvest specifications	Response submitted 8/1
SOC-004	Description of Pit River Trust Lands poverty statistics	Response submitted 8/2. Includes a response memo along with all other outstanding responses.
SOC-006	Skilled workers by craft	
SOC-008	Permanent housing	
SOC-021	Labor regulations	
SOC2-007, -008, -009	See SOC-006	
TRAF-001	Aggregate deliveries error	Response submitted 8/2.
TRAF-004, -007	HCM methodologies	
TSD-05	ISO Cluster 8 study	Response submitted 8/1.
VIS-01, -08, -09	Updated VIA, simulations	Response submitted 7/28.
WILDFIRE-02	Wildfire effects on health	Response submitted 7/28.

Caitlin said this is their final tracker; they have nothing left to submit to us. Caitlin will docket a letter today notifying the CEC that they believe the Applicant has submitted all data requested and they believe their supplemental application to be complete.

Please review the latest tracker and provide updated dispositions where applicable to confirm if you agree or not that everything you need for your analyses has been submitted. If possible provide updated dispositions by COB this Friday 8/4 so that Lon can get

an accounting of where we're at when he returns to work on Monday 8/7.

Thanks for your help!
Let me know if you have trouble accessing anything.

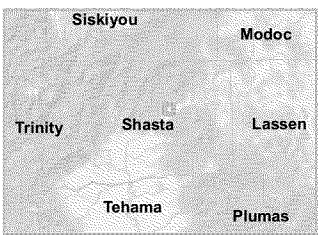
-Steve

Cc: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
To: Kerr, Steven@Energy[Steven.Kerr@energy.ca.gov]
From: Michael Clayton[mc.mca@comcast.net]
Sent: Sat 7/29/2023 3:24:38 PM (UTC-07:00)
Subject: Most Recent Applicant Responses - Fountain Wind
master_tracker_July 29.MC.xlsx

Hi Steve,
Attached is an edited tracker sheet that includes Applicant Response No. 3 and my (CEC) Disposition No. 3 for VIS-01, -08, and -09 (all highlighted in pale yellow). I cut and pasted the Applicant's responses from the recently submitted file: *TN251216_20230727T151052_fwp_vis_aq_lu_responses_2023-0727.pdf.* All three Applicant Responses and CEC Dispositions are the same.

I am sending this along now because I will be in the field all of next week and will have limited opportunity to respond to them then. This follows from my previous (yesterday) email to you regarding the missing Kiteworks PDF file referenced above.

Michael



Legend
- O&M Building
- Potential O&M Building Visibility
- Access Road
- Batch Plant

0 3,000 Feet
(At original document size of 8.5x11)
1:36,000

N

Stantec

Project Location
Shasta County
California

Prepared by GC on 2023-07-26
Reviewed by JH on 2023-07-26

Client/Project
Fountain Wind LLC
Fountain Wind Project

203723159

Figure No.
1

Title
Viewshed Analysis – Operations & Maintenance Building

Notes
1. Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
2. Data Sources: USGS, Stantec
3. Background: ESRI World Topographic Base Map

V:\1956\active_Task Owner and other Non-BC\1956 Jobs\185703743\03_data\gis_cad\gis\mxd\Viewshed\2023\OandM_Viewshed_Visibility\OandM_Viewshed_Visibility.aprx Revised: 2023-07-28 By: gcarpentier

To: Khoshmashrab, Shahab@Energy[Shahab.Khoshmashrab@energy.ca.gov]; Abulaban, Abdel-Karim@Energy[Abdel-Karim.Abulaban@energy.ca.gov]; Fooks, Brett@Energy[Brett.Fooks@energy.ca.gov]
From: Hughes, Joseph@Energy[Joseph.Hughes@energy.ca.gov]
Sent: Mon 8/7/2023 11:10:51 AM (UTC-07:00)

For Fountain Wind, the AQ and PH sections were deemed data adequate as of today. We don't need anymore information to start the clock. How about the other Engineering sections? It looks like they are all data adequate as well?

To: Knight, Eric@Energy[Eric.Knight@energy.ca.gov]
Cc: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]; Kerr, Steven@Energy[Steven.Kerr@energy.ca.gov]
From: Barns, Caitlin[Caitlin.Barns@stantec.com]
Sent: Fri 8/4/2023 9:28:33 AM (UTC-07:00)
Subject: FWP | letter of completion of application submittals
Fountain_Application Completion_Letter_2023-0803.pdf

Eric,

Please see attached for the Applicant's notice that they have provided all data CEC requested related to 23-OPT-01, Fountain Wind Project.

Thank you,
Caitlin

Caitlin Barns (she/her)
Senior Biologist
Mountain Region Ecosystems Group Leader
Portland, Oregon
503-207-4368

Stantec

To: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
From: Barns, Caitlin[Caitlin.Barns@stantec.com]
Sent: Wed 8/9/2023 9:58:25 AM (UTC-07:00)
Subject: RE: PD summary confirmation

It actually wasn't a "change" per se because the Applicant has always intended to install three towers, they've just been considering four locations. The PD you have in your possession says three towers so the only change is to that blurb.

From: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Sent: Wednesday, August 9, 2023 9:48 AM
To: Barns, Caitlin <Caitlin.Barns@stantec.com>
Subject: RE: PD summary confirmation

In case anyone asks, is there a TN I can reference for when that project change was made? Is the updated PD (as yet, undocketed) the only document which makes this change from 4 to 3?

From: Barns, Caitlin <Caitlin.Barns@stantec.com>
Sent: Wednesday, August 9, 2023 9:45 AM
To: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: RE: PD summary confirmation

Hi Lon, see revisions below. Everything else looks good and this is ready to be "the blurb" as needed!

"Fountain Wind LLC (Applicant) proposes to construct and operate a wind energy generation facility on approximately 4,500 acres of private, leased land in unincorporated Shasta County, California. The property is located approximately 1 mile west of the existing Hatchet Ridge Wind Project, 6 miles west of Burney, 35 miles northeast of Redding, immediately south of California State Route 299 (SR 299), and near the private recreational facility of Moose Camp~~2~~ and other private inholdings. Overall, the project would have a total nameplate generating capacity of up to 205 megawatts. The Applicant proposes to construct up to 48 turbines, each with a generating capacity of up to 7.2 megawatts. Associated infrastructure and facilities would include a 34.5-kilovolt overhead and underground electrical collector system to connect turbines together and to an on-site collector substation; overhead and underground fiber-optic communication lines; an on-site switching station to connect the project to the existing regional grid operated by the Pacific Gas and Electric Company; a temporary construction and equipment laydown area; nine temporary laydown areas distributed throughout the project site to temporarily store and stage materials and equipment; an operation and maintenance facility with employee parking; up to~~four~~ three permanent meteorological evaluation towers (METs); temporary, episodic deployment of mobile Sonic Detection and Ranging (SoDAR) or Light Detection and Ranging (LiDAR) systems within identified disturbance areas (e.g., at MET locations); two storage sheds; and three temporary batch plants. Up to 19 miles of new access roads would be constructed within the project site, and up to 19 miles of existing roads would be improved. No new transmission lines are proposed."

From: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Sent: Wednesday, August 9, 2023 9:33 AM
To: Barns, Caitlin <Caitlin.Barns@stantec.com>
Subject: PD summary confirmation

Can you confirm that the summary PD language below remains accurate and that no details have changed over the course of the past 6+ months? Can you think of any additional project related details that seem worthy of mentioning in a summary PD like this? This blurb will likely end up in the memo with the Executive Director's conclusion on data completeness, notice for the scoping meeting, the project webpage, etc.

"Fountain Wind LLC (Applicant) proposes to construct and operate a wind energy generation facility on approximately 4,500 acres of private, leased land in unincorporated Shasta County, California. The property is located approximately 1 mile west of the existing Hatchet Ridge Wind Project, 6 miles west of Burney, 35 miles northeast of Redding, immediately south of California State

Route 299 (SR 299), and near the private recreational facility of Moose Camp2 and other private inholdings. Overall, the project would have a total nameplate generating capacity of up to 205 megawatts. The Applicant proposes to construct up to 48 turbines, each with a generating capacity of up to 7.2 megawatts. Associated infrastructure and facilities would include a 34.5-kilovolt overhead and underground electrical collector system to connect turbines together and to an on-site collector substation; overhead and underground fiber-optic communication lines; an on-site switching station to connect the project to the existing regional grid operated by the Pacific Gas and Electric Company; a temporary construction and equipment laydown area; nine temporary laydown areas distributed throughout the project site to temporarily store and stage materials and equipment; an operation and maintenance facility with employee parking; up to four permanent meteorological evaluation towers (METs); temporary, episodic deployment of mobile Sonic Detection and Ranging (SoDAR) or Light Detection and Ranging (LiDAR) systems within identified disturbance areas (e.g., at MET locations); two storage sheds; and three temporary batch plants. Up to 19 miles of new access roads would be constructed within the project site, and up to 19 miles of existing roads would be improved. No new transmission lines are proposed."

To: Hughes, Joseph@Energy[Joseph.Hughes@energy.ca.gov]
Cc: Knight, Eric@Energy[Eric.Knight@energy.ca.gov]
From: Payne, Leonidas@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=AA9D25DDE24E40429EFA06C4EED35807-PAYNE, LEON]
Sent: Tue 8/15/2023 6:45:26 PM (UTC-07:00)
Subject: Fwd: Determination of Completeness for the Fountain Wind, LLC Emergency Engine ATC Application
23-PO-07Complete AppLetter.pdf

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From: Barns, Caitlin <Caitlin.Barns@stantec.com>
Sent: Tuesday, August 15, 2023 3:59 PM
To: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Cc: Mudge, Annie <amudge@coxcastle.com>; Henry Woltag <hwoltag@connectgenllc.com>; John Kuba <jkuba@connectgenllc.com>; Lance Olenius <lolenius@connectgenllc.com>; Hull, Robbie C. <rhull@coxcastle.com>
Subject: FW: Determination of Completeness for the Fountain Wind, LLC Emergency Engine ATC Application

Lon, see attached for the completeness letter from AQMD. I will also docket it.

From: Monica Stant <mstant@co.shasta.ca.us>
Sent: Tuesday, August 15, 2023 3:57 PM
To: Henry Woltag <hwoltag@connectgenllc.com>; Barns, Caitlin <Caitlin.Barns@stantec.com>; Joey - CEC <Joseph.Hughes@energy.ca.gov>; Mudge, Annie <amudge@coxcastle.com>; John Kuba <jkuba@connectgenllc.com>; Lance Olenius <lolenius@connectgenllc.com>; Hull, Robbie C. <rhull@coxcastle.com>
Cc: Rob Stahl <rstahl@co.shasta.ca.us>; Paul Hellman <phellman@co.shasta.ca.us>
Subject: Determination of Completeness for the Fountain Wind, LLC Emergency Engine ATC Application

Good afternoon,

Attached is the notification letter mailed out today stating the application for an Authority to Construct for an emergency standby engine for Fountain Wind, LLC had been determined to be administratively complete.

Should the Shasta County Air Quality Management District later require further information, we will reach out to you.

If you have any questions, please feel free to let me know.

Respectfully,

MONICA STANT
Air Pollution Inspector II
Shasta County Air Quality Management District
1855 Placer Street, Suite 101
Redding, CA 96001
530-225-5674

Shasta County

DEPARTMENT OF RESOURCE MANAGEMENT
1855 Placer Street, Redding, CA 96001

Paul A. Hellman
Director

Adam Fieseler
Assistant Director

August 15, 2023

ConnectGEN
Attn: Henry Woltag
1001 McKinney Street, Suite 700
Houston, TX 77002

NOTIFICATION OF COMPLETE APPLICATION FOR AUTHORITY TO CONSTRUCT-FOUNTAIN WIND LLC EMERGENCY GENERATOR

The Shasta County Air Quality Management District (District) received your application for an Authority to Construct at AP# 029-190-010-000 on July 12, 2023. Additional information was requested by the District on July 26, 2023 and was received on August 10, 2023. Pursuant to District Rule 2:1 Part 601, the application has been deemed administratively complete on August 14, 2023.

Pursuant to District Rule 2:1 Part 606:

> *Within 180 days after acceptance of an application as complete, the APCO shall take final action on the application after considering all written comments.*

The District will work to process the application in a timely manner and may be contacting you if more information is needed. Upon completion of review, the District will mail you an Authority to Construct permit.

If you have questions, please call me at 530-225-5674.

Sincerely,

Monica Stant
Air Pollution Inspector II

MS/rs/md

CC: Caitlin Barns via email, caitlin.barns@stantec.com
Joseph Hughes via email, joseph.hughes@energy.ca.gov
Annie Mudge via email, amudge@coxcastle.com
John Kuba via email, jkuba@connectgenllc.com
Lance Olenius via email, lolenius@connectgenllc.com
Robbie Hull via email, rhull@coxcastle.com

To: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
Cc: Mudge, Annie[amudge@coxcastle.com]; Henry Woltag[hwoltag@connectgenllc.com]; John Kuba[jkuba@connectgenllc.com]; Lance Olenius[lolenius@connectgenllc.com]; Hull, Robbie C.[rhull@coxcastle.com]
From: Barns, Caitlin[Caitlin.Barns@stantec.com]
Sent: Tue 8/15/2023 3:59:43 PM (UTC-07:00)
Subject: FW: Determination of Completeness for the Fountain Wind, LLC Emergency Engine ATC Application
23-PO-07Complete AppLetter.pdf

Lon, see attached for the completeness letter from AQMD. I will also docket it.

From: Monica Stant <mstant@co.shasta.ca.us>
Sent: Tuesday, August 15, 2023 3:57 PM
To: Henry Woltag <hwoltag@connectgenllc.com>; Barns, Caitlin <Caitlin.Barns@stantec.com>; Joey - CEC <Joseph.Hughes@energy.ca.gov>; Mudge, Annie <amudge@coxcastle.com>; John Kuba <jkuba@connectgenllc.com>; Lance Olenius <lolenius@connectgenllc.com>; Hull, Robbie C. <rhull@coxcastle.com>
Cc: Rob Stahl <rstahl@co.shasta.ca.us>; Paul Hellman <phellman@co.shasta.ca.us>
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If you have any questions, please feel free to let me know.

Respectfully,

MONICA STANT
Air Pollution Inspector II
Shasta County Air Quality Management District
1855 Placer Street, Suite 101
Redding, CA 96001
530-225-5674

Shasta County

DEPARTMENT OF RESOURCE MANAGEMENT
1855 Placer Street, Redding, CA 96001

Paul A. Hellman
Director

Adam Fieseler
Assistant Director

August 15, 2023

ConnectGEN
Attn: Henry Woltag
1001 McKinney Street, Suite 700
Houston, TX 77002

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Pursuant to District Rule 2:1 Part 606:

> *Within 180 days after acceptance of an application as complete, the APCO shall take final action on the application after considering all written comments.*

The District will work to process the application in a timely manner and may be contacting you if more information is needed. Upon completion of review, the District will mail you an Authority to Construct permit.

If you have questions, please call me at 530-225-5674.

Sincerely,

Monica Stant
Air Pollution Inspector II

MS/rs/md

CC: Caitlin Barns via email, caitlin.barns@stantec.com
Joseph Hughes via email, joseph.hughes@energy.ca.gov
Annie Mudge via email, amudge@coxcastle.com
John Kuba via email, jkuba@connectgenllc.com
Lance Olenius via email, lolenius@connectgenllc.com
Robbie Hull via email, rhull@coxcastle.com

To: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
Cc: Hesters, Mark@Energy[Mark.Hesters@energy.ca.gov]; Ng, Laiping@Energy[Laiping.Ng@energy.ca.gov]
From: Barns, Caitlin[Caitlin.Barns@stantec.com]
Sent: Wed 8/30/2023 2:48:42 PM (UTC-07:00)
Subject: RE: disposition for PO-18
Fig6_Substation Design Details.pdf

Hi Lon, the "bubbling" on the figure on p. 42 indicates "final design pending" for those components.
On p. 37 this is an error. Please see attached for the updated figure.

Thanks,
Caitlin

From: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Sent: Wednesday, August 30, 2023 12:22 PM
To: Barns, Caitlin <Caitlin.Barns@stantec.com>
Subject: Fwd: disposition for PO-18

The latest from the transmission folks…

Get Outlook for iOS

From: Hesters, Mark@Energy <Mark.Hesters@energy.ca.gov>
Sent: Wednesday, August 30, 2023 12:14:19 PM
To: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>; Ng, Laiping@Energy <Laiping.Ng@energy.ca.gov>
Subject: Re: disposition for PO-18

Laiping is off today but...it is hard to talk about figures that don't have titles or figure numbers.

See the highlighted section on the attached page 37 figure. We think it is just an error and something taken from another project, but it raises concerns about the rest of the information in the figure.

See the circled part on page 42. We can't tell why the FW Switching Station to Pit #1 section is "bubbled." We expected the Fountain Wind Substation to Fountain Wind Switching Station would be bubbled.

Mark Hesters
California Energy Commission
(916) 931-8942

From: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Sent: Wednesday, August 30, 2023 11:40 AM
To: Ng, Laiping@Energy <Laiping.Ng@energy.ca.gov>; Hesters, Mark@Energy <Mark.Hesters@energy.ca.gov>
Subject: Fw: disposition for PO-18

Still need to resolve this one—I shared the disposition I see in the tracker and Caitlin still has questions about what we mean.

--Lon

From: Barns, Caitlin <Caitlin.Barns@stantec.com>
Sent: Wednesday, August 30, 2023 11:29 AM
To: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: RE: disposition for PO-18

Hi Lon, in revisiting the document referenced below (TN# 251663, project description + figures), I'm not seeing any reference to BPA Slatt Substation on p. 37. Page 42 correctly references the Fountain Wind SW STA ("switching station") – to – Pit #1 line connection, which is indeed what we propose. I also don't see anywhere we "circled the wrong part of the diagram." Can you advise?

From: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Sent: Wednesday, August 30, 2023 10:32 AM
To: Barns, Caitlin <Caitlin.Barns@stantec.com>
Subject: disposition for PO-18

The figures provided in TN# 251663 appear to have errors. On page 37, the 11.5 mile-long 230 kV transmission lines would be connected to the BPA Slatt Substation from the Fountain Wind project substation. On page 42, a modification of Fountain Wind SW STA - PIT #1 230 kV line is proposed. We think it is as simple as circling the wrong part of the diagram. If these are errors, please provide corrected figures and provide the 230 kV line rating, conductor type and current carrying capacity of the conductor. Otherwise, provide detailed information and figures of the modification.

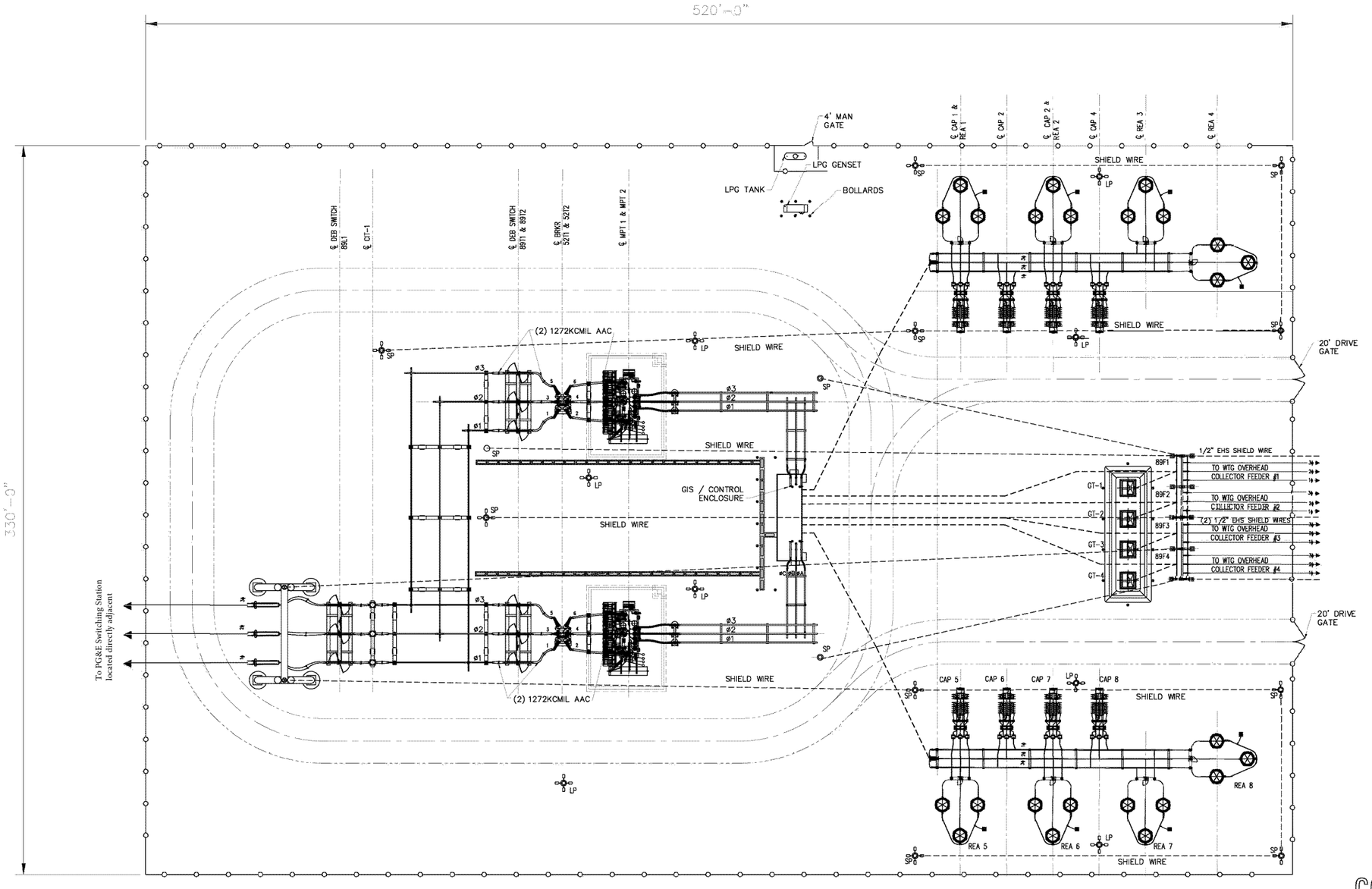
Caution: This email originated from outside of Stantec. Please take extra precaution.

Attention: Ce courriel provient de l'extérieur de Stantec. Veuillez prendre des précautions supplémentaires.

Atención: Este correo electrónico proviene de fuera de Stantec. Por favor, tome precauciones adicionales.

VOLTAGE		MINIMUM METAL-TO-METAL DISTANCE FOR RIGID BUS PHASE-TO-PHASE	MINIMUM CENTERLINE TO CENTERLINE PHASE SPACING FOR RIGID BUS	MINIMUM CREEPAGE DISTANCE	MINIMUM PHASE TO GROUND SPACING	MINIMUM CLEARANCE BETWEEN LIVE PARTS TO FENCE	MINIMUM CLEARANCE PHASE TO SUBSTATION GRADE	MINIMUM CLEARANCE PHASE TO SUBSTATION ROADWAY
KV	BIL							
230	1050	7'-2"	13'-0"	195"	6'-7"	16'-5"	16'-0"	28'-0"
34.5	250	1'-9"	4'-0"	37"	1'-7"	10'-11"	10'-0"	22'-0"

NOTE:
1050KV BIL COMES FROM REQUIRED 900KV BIL X ALTITUDE FACTOR
250KV BIL COMES FROM REQUIRED 200KV BIL X ALTITUDE FACTOR



CONCEPTUAL- NOT FOR CONSTRUCTION

NO.	REVISIONS	DATE	BY	CHK	APR	NO.	REVISIONS	DATE	BY	CHK	APR

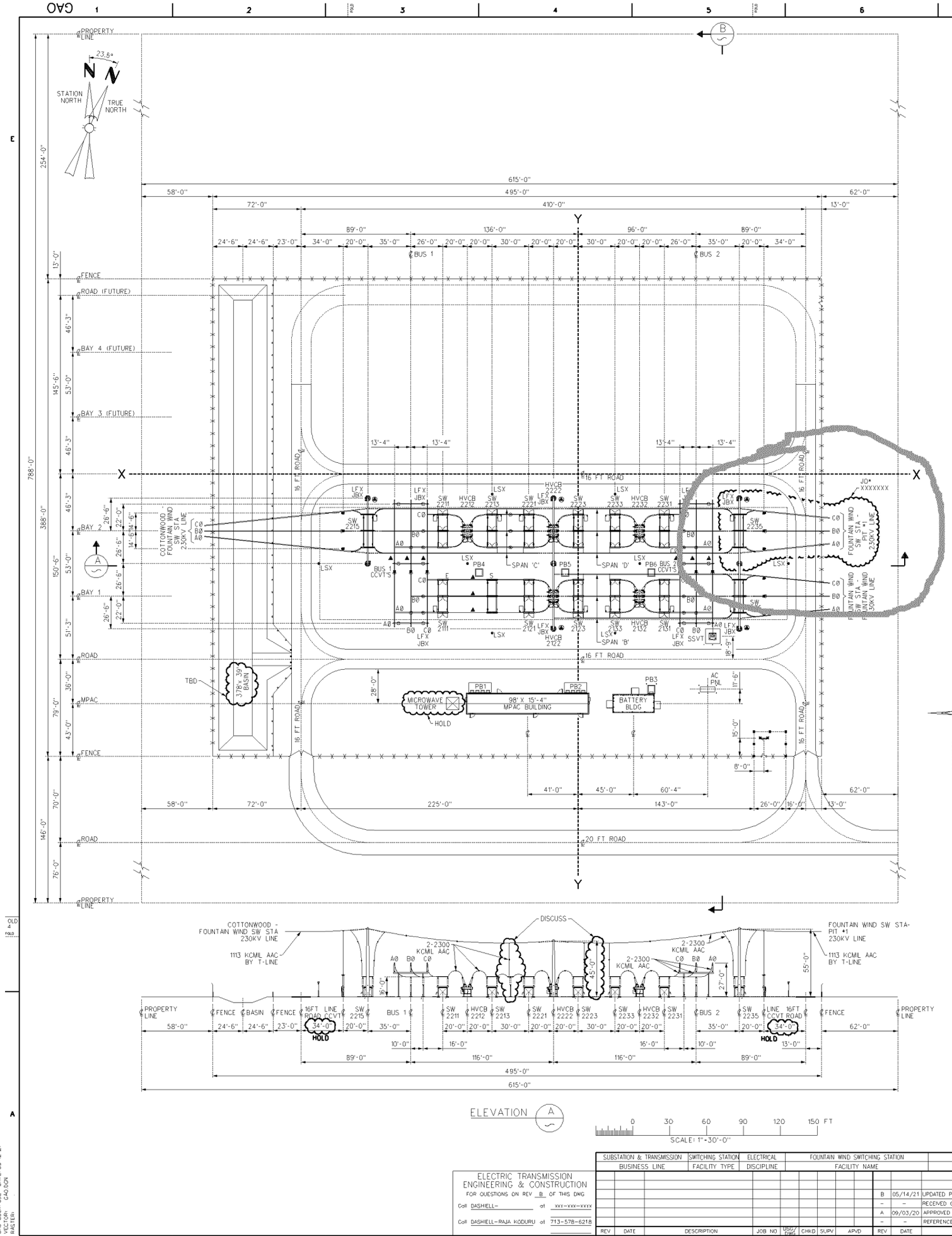
AVANGRID RENEWABLES

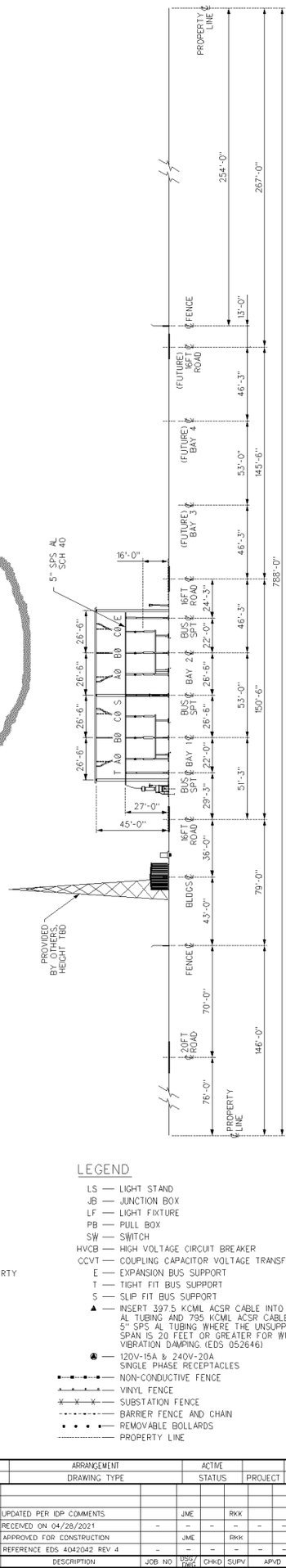
ENGINEERING RECORD	DATE
DRAWN:	
DESIGNED:	
CHECKED:	
APPROVED:	
CADFILE:	

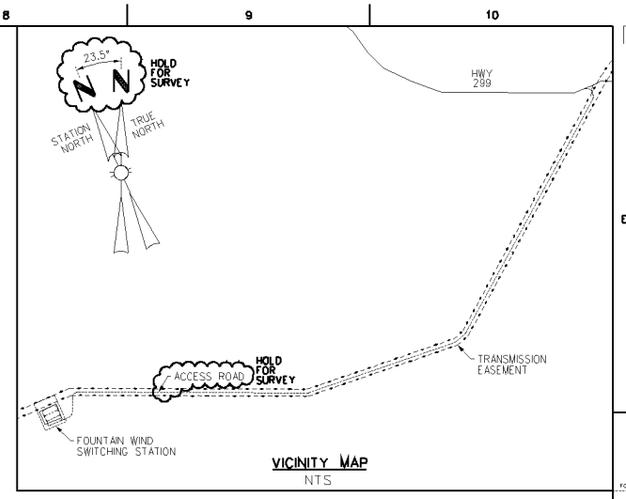
FOUNTAIN WIND PROJECT
230-34.5KV COLLECTOR SUBSTATION
GENERAL ARRANGEMENT

SCALE: 1"=25'-0" | DWG.NO. | SHEET OF | REV

LINE NAMES
CHECKED
BY
CH
DATE - -







VICINITY MAP
NTS

SPAN 'A'			SPAN 'B'			SPAN 'D'		
DEADEND–DEADEND			DEADEND–DEADEND			DEADEND–DEADEND		
2–2300 KCMIL AAC CONDUCTOR 151' SPAN			2–2300 KCMIL AAC CONDUCTOR 151' SPAN			2–2300 KCMIL AAC CONDUCTOR 151' SPAN		
TEMP °F	TENSION LB	SAG FT – IN	TEMP °F	TENSION LB	SAG FT – IN	TEMP °F	TENSION LB	SAG FT – IN
30	659	9–11	30	659	9–11	30	659	9–11
50	654	10–0	50	654	10–0	50	654	10–0
70	646	10–2	70	646	10–2	70	646	10–2
90	641	10–3	90	641	10–3	90	641	10–3
110	635	10–4	110	635	10–4	110	635	10–4
MAX. TENSION = 750# PER SUBCONDUCTOR @ 25° F, 8#WIND			MAX. TENSION = 750# PER SUBCONDUCTOR @ 25° F, 8#WIND			MAX. TENSION = 750# PER SUBCONDUCTOR @ 25° F, 8#WIND		

ELEVATION A

0 30 60 90 120 150 FT
SCALE: 1"=30'-0"

LEGEND

- LS — LIGHT STAND
- JB — JUNCTION BOX
- LF — LIGHT FIXTURE
- PB — PULL BOX
- SW — SWITCH
- HVCB — HIGH VOLTAGE CIRCUIT BREAKER
- CCVT — COUPLING CAPACITOR VOLTAGE TRANSFORMER
- E — EXPANSION BUS SUPPORT
- T — TIGHT FIT BUS SUPPORT
- S — SLIP FIT BUS SUPPORT
- ▲ — INSERT 397.5 KCMIL ACSR CABLE INTO 4" SPS AL TUBING AND 795 KCMIL ACSR CABLE INTO 5" SPS AL TUBING WHERE THE UNSUPPORTED SPAN IS 20 FEET OR GREATER FOR WIND VIBRATION DAMPING (EDS 052646)
- ⓐ — 120V-15A & 240V-20A SINGLE PHASE RECEPTACLES
- NON-CONDUCTIVE FENCE
- VINYL FENCE
- SUBSTATION FENCE
- BARRIER FENCE AND CHAIN
- REMOVABLE BOLLARDS
- PROPERTY LINE

ELECTRICAL CLEARANCES (ES 067908 REV 5)

PHASE TO PHASE (METAL TO METAL)	7'-5"(MIN)
PHASE TO GROUND	5'-11"(MIN)
VERTICAL CLEARANCE TO UNGUARDED LIVE PARTS (RECOMMENDED)	15'-0"
SWITCHING STATION SHORT CIRCUIT INTERRUPTING RATING	63KA

NOTES

1. 1/4" WEEP HOLES ARE INCLUDED IN THE LOW POINT OF ALL TUBULAR BUS RUNS.
2. BOND ALL SWITCH OPERATING PLATFORMS PER ES 067910.
3. IN NO CASE SHALL THE ELECTRICAL CLEARANCES BETWEEN PHASE TO PHASE AND PHASE TO GROUND BE LESS THAN SHOWN IN TABLE 3 COLUMN 4 AND TABLE 1 COLUMN 5 ON EDS 067908 RESPECTIVELY.
4. MAKE UP ALUMINUM-TO-ALUMINUM AND ALUMINUM-TO-COPPER CONNECTIONS PER ES 037788.

REFERENCES

	DWG NO.
SINGLE LINE DIAGRAM	SLD
ULTIMATE SINGLE LINE DIAGRAM	ULTSLD
ULTIMATE GENERAL ARRANGEMENT OUTDOORS	ULTGAD
PROPERTY PLAN	PROPPLN

SWITCHING STATION NAME TO BE PROVIDED BY PG&E

ELECTRIC TRANSMISSION ENGINEERING & CONSTRUCTION
FOR QUESTIONS ON REV B OF THIS DWG
Call DASHIELL– at XXX–XXX–XXXX
Call DASHIELL–RAJA KODURU at 713–578–6218

SUBSTATION & TRANSMISSION	SWITCHING STATION	ELECTRICAL	FOUNTAIN WIND SWITCHING STATION	ARRANGEMENT	ACTIVE	PROJECT	SUBSTATION	230KV
BUSINESS LINE	FACILITY TYPE	DISCIPLINE	FACILITY NAME	DRAWING TYPE	STATUS		FACILITY COMPONENT	UNIT

REV	DATE	DESCRIPTION	JOB NO	DSG/DWG	CHKD	SUPV	APVD
B	05/14/21	UPDATED PER IDP COMMENTS			JME		RKK
–	–	RECEIVED ON 04/28/2021	–	–	–	–	–
A	09/03/20	APPROVED FOR CONSTRUCTION			JME		RKK
–	–	REFERENCE EDS 4042042 REV 4	–	–	–	–	–

W.O. REV. 1
DSG J. EMMERT
DWN
CHKD
SUPV R. KODURU
APVD
APVD
DATE

GENERAL ARRANGEMENT OUTDOORS
FOUNTAIN WIND SWITCHING STATION
DEPARTMENT OF ENGINEERING
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

SCAN IC
BILL OF MATL
DWG LIST
SUPSDS
SUPSD BY
SHEET NO SHEETS
GAO REV B

CAD USER: JME DATE: 05-12-21
VECTORS: GAO.DGN
RASTER:

ETECHS (4434)

GAO.DGN 05/12/2021 1:00:04 PM

To: Barns, Caitlin (Caitlin.Barns@stantec.com)[Caitlin.Barns@stantec.com]
From: Payne, Leonidas@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=AA9D25DDE24E40429EFA06C4EED35807-PAYNE, LEON]
Sent: Wed 8/30/2023 10:31:39 AM (UTC-07:00)
Subject: disposition for PO-18

The figures provided in TN# 251663 appear to have errors. On page 37, the 11.5 mile-long 230 kV transmission lines would be connected to the BPA Slatt Substation from the Fountain Wind project substation. On page 42, a modification of Fountain Wind SW STA - PIT #1 230 kV line is proposed. We think it is as simple as circling the wrong part of the diagram. If these are errors, please provide corrected figures and provide the 230 kV line rating, conductor type and current carrying capacity of the conductor. Otherwise, provide detailed information and figures of the modification.

To: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
From: Ron Dykstra[dbdykstra@sbcglobal.net]
Sent: Mon 9/11/2023 10:33:20 AM (UTC-07:00)
Subject: Fountain Wind Project, Docket Number 23-OPT-01

Dear Mr. Payne:
The 31 August 2023 letter to Henry Woltag of Fountain Wind, LLC from Eric Knight, Manager of the CEC Siting and Environmental Branch, stated that "Current information in the record indicates that due to the height of the proposed turbine towers, aerial firefighting will be precluded over and near the proposed [Fountain Wind] project." According to Bret Gouvea, then Unit Chief at CAL FIRE, who presented testimony at the 26 October 2021 Shasta County Board of Supervisors Fountain Wind appeal hearing, it is unlikely that **all** aerial firefighting will be precluded at the project. In Chief Gouvea's testimony he agreed that use of very large aerial tankers (VLATs-e.g. a converted DC-10) at the proposed turbine towers would not be possible (where precisely VLAT use will be precluded of course depends on the definition of "near" in the CEC letter). But he also indicated he didn't agree that the project creates a no-fly zone, and that smaller aerial equipment, both fixed- and rotary-wing, might be used at the project according to his consultation with the CAL FIRE Tactical Air Operations Unit. You can access the recording of the appeal hearing here. Chief Gouvea's testimony can be viewed at 8:19:36 to 8:27:56. His testimony must be entered into the record if it has not been already.
CEC's decision on this project must be based on the most accurate information available. Please inform me whether the above hearing testimony is part of the record, and if not, please inform me how it can be entered into the record. I also request, in accordance with the above testimony, the CEC clarify that aerial firefighting potential at the Fountain Wind project is not as clear cut as indicated in its letter.
Thank you for your attention to this matter.

Ron Dykstra

To: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
From: Energy - STEP Siting[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=14E6AC2919EC428BB3378E30CE9A58E9-ENERGY - ST]
Sent: Wed 9/27/2023 11:57:16 AM (UTC-07:00)
Subject: FW: Fountain Wind Project Comment

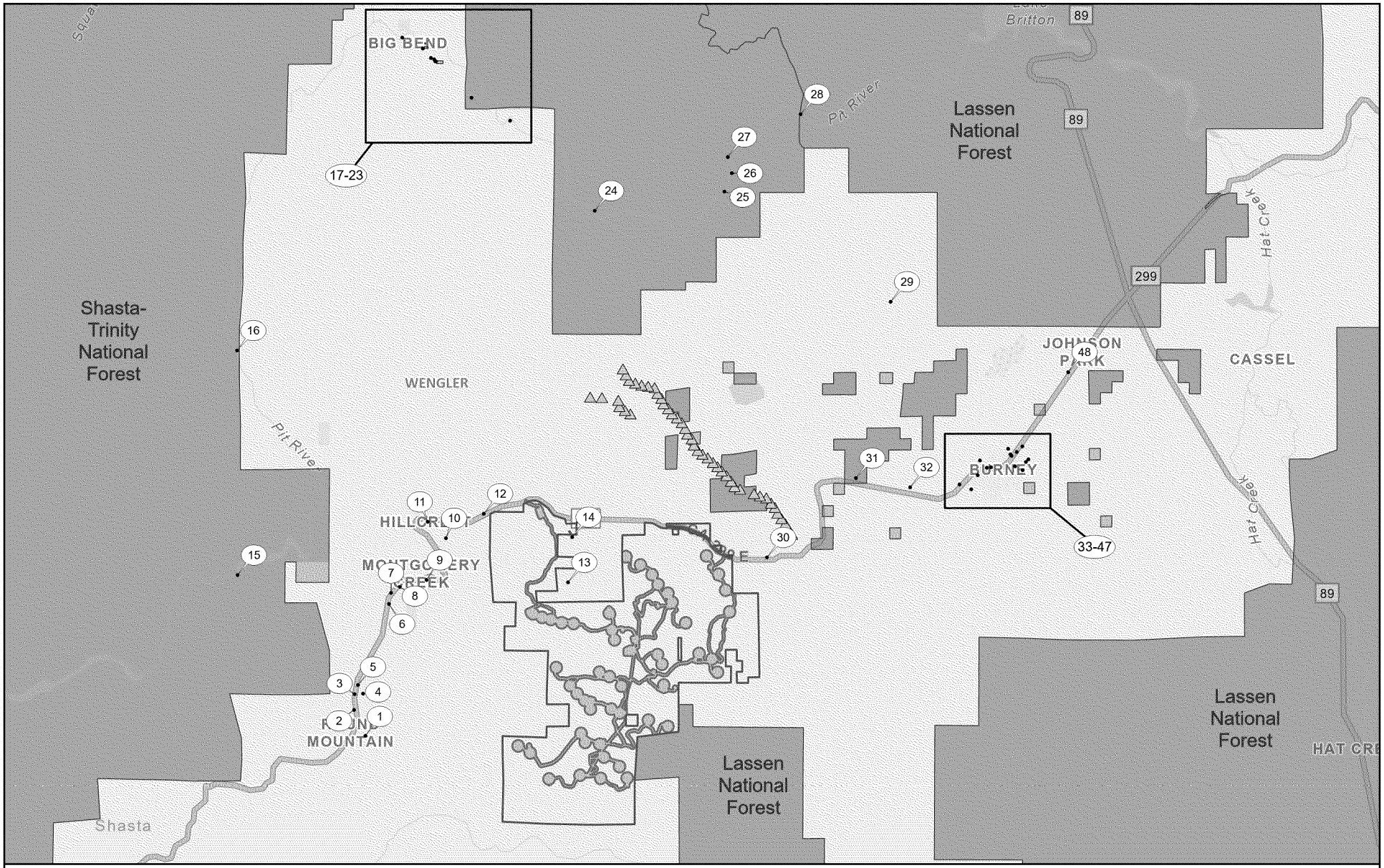
From: Nordensten, Nancy J <nancy_nordensten@nps.gov>
Sent: Wednesday, September 27, 2023 10:51 AM
To: Energy - STEP Siting <STEPsiting@energy.ca.gov>
Subject: Fountain Wind Project Comment

Hello, I'm hoping to reach Leonidas Payne, the CEC Project Manager.

Lassen Volcanic National Park would like to comment on the Fountain Wind project. Yesterday, we became aware that this project is again in the planning stages. I'm writing to let you know of our intent to submit a letter and also to enquire what our deadline is for submitting a comment? I could have missed it, but I did not see a date on the Fountain Wind Project webpage.

Thank you,
Nancy

Nancy Nordensten
Chief of Resources, Lassen Volcanic National Park
Office: 530-595-6180
Cell: 530-200-1897



Fountain Wind Project
Land Uses

Record Searchlight

LOCAL

Shasta County rejected this wind farm. A new California law gives it a second chance

David Benda
Redding Record Searchlight

Published 5:59 a.m. PT Jan. 10, 2023 | **Updated 6:40 a.m. PT Jan. 10, 2023**

A controversial wind farm project that Shasta County supervisors rejected more than a year ago after nearly five years of development and planning has new life.

Last week, the California Energy Commission (CEC) notified Shasta County that ConnectGen under the name Fountain Wind LLC applied to the state for a 205-megawatt, 48-turbine wind farm under the opt-in provision established under Assembly Bill 205, county Resource Management Director Paul Hellman said.

Hellman said in an email the project is proposed for the same site south of Highway 299 in the Round Mountain-Montgomery Creek area of eastern Shasta County that supervisors voted down 4-1 on Oct. 26, 2021, after more than 10 hours of public comment.

In denying the appeal by the company, supervisors upheld a June 22, 2021, unanimous decision by the Shasta County Planning Commission to reject the use permit for the Fountain Wind project.

But now the state could overrule the county and approve the project under AB 205, which Gov. Gavin Newsom signed on June 30, 2022. The law authorizes the CEC to establish a new certification program for eligible non-fossil-fuel power plants 50 megawatts or more and related facilities.

Prior to AB 205, the CEC's powerplant licensing jurisdiction was limited to thermal powerplants 50 megawatts or larger.

This is the first project to take advantage of the new opt-in provision for non-fossil-fuel facilities, according to the CEC.

"We remain committed to the belief that this is the right project in the right location and we are excited to go back to work with all the local partners and businesses," Henry Woltag of ConnectGen told the Record Searchlight. "This is a tremendous opportunity to generate local jobs (and) increase the tax base. ... This will be a tremendous benefit for the county."

Woltag says he takes exception to the project being labeled controversial.

"There were as many who supported this project than opposed it. But that didn't get picked up in the dialogue of the project," he said.

Hellman said Intermountain residents who for years fought the project were aware this could happen.

“A lot of the opponents learned about this new law, which went into effect at the end of June,” Hellman said.

A majority of supervisors agreed with opponents' arguments in October 2021 that the massive project would increase the risk for wildfire in the area and the negative impact on Shasta County outweighed any economic benefits.

Initially, ConnectGen proposed a 72-turbine wind generation project, but reduced it to 48 turbines — which cut the overall footprint of the project by more than 33% – after the planning commission denied the permit. The company also proposed to decrease the height of the turbines by 10%, from 679 feet to about 610 feet.

Woltag said that was an example of the process working.

"We took feedback and tried to address as many concerns as possible," he said.

Hellman said he has spoken to the California Energy Commission.

“I’ve already talked to staff and made it very clear to them what occurred. They are very aware of the history of the project as I went through the process,” Hellman said.

But will it matter?

CEC spokesman Mike Ward said in an email to the Record Searchlight that the regulatory agency will consider factors that went into Shasta County's decision to deny the project, in addition to the local ordinance that was passed after the denial that bans large-scale wind farms.

"The CEC must make findings regarding a project's conformation with applicable laws, ordinances, regulations and standards," Ward said.

The CEC website says the new law will help speed up California's transition to renewable energy and help maintain electricity reliability as it provide a “new, streamlined process for their review and a decision by the CEC.”

Information about the application, which Hellman said has not been complete, can be seen by visiting the Fountain Wind project on the California Energy Commission website at https://bit.ly/3GRIkCe. People can also submit comments.

Hellman said once the application is complete, there will still be steps to take before it can be considered for approval.

Ward said ConnectGen started the application process on Jan. 3 and has not finished uploading all the documents necessary to complete the process.

Hellman expects public outreach to include at least one project information and environmental scoping meeting in Shasta County.

Ward said a public meeting will be held within 30 days after the application is deemed complete.

A new draft environmental impact report will have to be done, and the CEC public hearing to consider approval of the project is expected to be in Sacramento.

Ward said a public meeting on the draft EIR will be held within 190 days of the completion of the application.

"When the application is determined by the CEC's executive director to be complete, this will start the 270-day clock for a decision," Ward said.

Record Searchlight

LOCAL

Shasta County fights back, plans media campaign against Fountain Wind project

Damon Arthur
Redding Record Searchlight

Published 6:00 a.m. PT Oct. 26, 2023 | **Updated 6:01 a.m. PT Oct. 26, 2023**

Shasta County residents are likely to hear more from their county government over the next year as it rolls out a media campaign against a proposed wind energy generation farm in the eastern part of the county.

The county plans to spend up to $100,000 on creating a website, sending out direct mail ads, creating video and radio ads and developing a media kit to inform the public about what the county considers the negative effects of the proposed Fountain Wind energy generation facility.

"I'm glad we're spending money on this. This is the right thing. Our ability to prevail ultimately on this is probably only 50-50, but it's the right thing to do. It's the right thing for us to address it and to fight back," Board of Supervisors Chairman Patrick Jones said at a recent board meeting.

Texas-based ConnectGen wants to build up to 48 wind turbines on 4,500 acres in the Montgomery Creek-Round Mountain area, which is about 35 miles east of Redding. According to the company's website, the turbines would have the capacity to generate about 200 megawatts, enough potential to power about 80,000 homes.

The project has faced stiff opposition from county residents who claim the wind generators would hamper firefighting efforts in an area of high fire danger potential. The turbines would also be unsightly and would disrupt burial sites sacred to the Pit River Tribe, according to county officials and comments at public meetings.

The Fountain Wind project would be west of the Hatchet Ridge wind farm, which consists of 44 turbines near Burney.

The project was rejected by the county planning commission, and two years ago by the Board of Supervisors. However, new legislation, AB 205, allows the California Energy Commission to consider approving the project. That means the state could overrule Shasta County and approve the Fountain Wind project.

According to county spokesman David Maung, the energy commission is still reviewing ConnectGen's application for approval. Once the application is considered complete, the commission has 270 days to

further review the project and finally issue a decision on whether to approve plans for the turbines.

County officials have said they consider the state's effort to consider the project an "overreach" to take away local control from county officials.

ConnectGen, however, sees the project as an economic boon to the county, creating $30 million in property tax revenue over a 30-year period, according to the company's website. Among other benefits, the company would also provide $1 million to the county sheriff's office and $3.5 million in sales tax revenue during the project's construction, the website says.

Reporter Damon Arthur welcomes story tips at 530-338-8834, by email at damon.arthur@redding.com and on X, formerly known as Twitter, at @damonarthur_RS. Help local journalism thrive by subscribing today!

Record Searchlight

LOCAL

Shasta County's opposition to a revived Fountain Wind project gets a new ally

David Benda
Redding Record Searchlight

Published 1:18 p.m. PT Sept. 19, 2023 | Updated 2:46 p.m. PT Sept. 19, 2023

Shasta County has gained an ally in its battle to stop a controversial wind farm that has new life thanks to a state law that took effect months after the Board of Supervisors turned down the renewable energy project.

The San Bernardino County Land Services Department in a Sept. 1 letter to California Energy Commission Executive Director Drew Bohan wrote that the CEC lacks the jurisdiction to consider an application for an energy project that the state, local, regional or federal agency, collectively acting as the local agency, has denied.

Any other interpretation "would create absurd results, invite manipulation, and directly conflict with the intent and processes of AB 205," the San Bernardino County letter in part states.

Shasta County officials contend that after years of debate, planning and long public meetings, the Fountain Wind project planned for eastern Shasta County was resolved when supervisors rejected it nearly two years ago. And what the developer is attempting to do now is circumventing local control, with the help of the state.

Assembly Bill 205, which Gov. Gavin Newsom signed on June 30, 22022, established a new certification program through the CEC for eligible non-fossil-fuel powered plants of 50 megawatts or more and related facilities.

That means the state could overrule Shasta County and approve the Fountain Wind project, which supervisors voted down 4-1 on Oct. 26, 2021, after more than 10 hours of public comment.

In denying the appeal by the company, supervisors upheld a unanimous decision by the Shasta County Planning Commission to reject the use permit for the wind farm, which Texas-based ConnectGen — under the name Fountain Wind LLC — wants to build in the Round Mountain-Montgomery Creek area east of Redding.

Supporters of what ConnectGen is doing include California Unions for Reliable Energy, which argued in a letter sent last month to the CEC that Shasta County's interpretation of AB 205 "is contrary to the

statue's plain language, inconsistent with the bill's legislative history and statutory scheme, and unsupported by caselaw."

The San Bernardino County Land Use Services Department in its letter to the CEC contends that under AB 205, the state still has to consult with local authorities prior to ruling on the project.

"Engaging in this consultation process for a previously denied Energy Project would be wasteful by consuming the time and resources of both the CEC and the Local Agency in order to re-evaluate matters already decided," the letter says.

Mark Wardlaw, director of the San Bernardino County Land Use Services Department, did not immediately return a phone call seeking comment.

Chuck Bell, president of the Lucerne Valley Economic Development Association in San Bernardino County, said their region is a popular spot for large-scale solar projects. The county has a renewable energy conservation element in its general plan, which is a local process for assessing renewable energy projects.

"The state of California is usurping local control and it's just got to stop," Bell said of AB 205.

Shasta County Resource Management Director Paul Hellman said San Bernardino is the only county that he knows of that has come to Shasta County's defense.

ConnectGen resubmitted its application to the CEC in early 2023.

More: Former proposed Redding Rodeo site, equestrian center, now shielded from development

Hellman said this week that ConnectGen's application has not been deemed complete by the CEC.

The state has ruled that the application hasn't adequately addressed, among other things, the impact the wind farm and its turbines would have on wildfire.

A CEC spokesperson did not immediately return an email seeking comment.

Once the application is complete, the state will have 270 days to make a decision.

A public meeting will be held within 30 days after the application is deemed complete, while a public meeting on the draft environmental impact report will be held within 190 days of the completion of the application, the CEC has said.

David Benda covers business, development and anything else that comes up for the USA TODAY Network in Redding. He also writes the weekly "Buzz on the Street" column. He's part of a team of dedicated reporters that investigate wrongdoing, cover breaking news and tell other stories about your community. Reach him on Twitter @DavidBenda_RS or by phone at 1-530-338-8323. To support and sustain this work, please subscribe today.

To: Ohara, Sean@CALFIRE[Sean.Ohara@fire.ca.gov]
Cc: Schaefer, Leah@CALFIRE[leah.schaefer@fire.ca.gov]; Fooks, Brett@Energy[Brett.Fooks@energy.ca.gov]
From: Aurie Patterson[apatterson@aspeneg.com]
Sent: Tue 10/31/2023 5:04:55 PM (UTC-07:00)
Subject: RE: Fountain Wind Farm | California Energy Commission
Cal Fire Aerial Firefighting Questions 103123.pdf

We are looking forward to our meeting with you tomorrow regarding the Fountain Wind Project and discussing Cal Fire's perspective on the Project.
To expedite our discussion we have prepared a list of questions and information that we would like to discuss as time allows. The list is a guide for our discussion and we do not expect you to have all the answers tomorrow.

Aurie Patterson, PG
Environmental Scientist & Geologist
Aspen Environmental Group
Office: (415) 696-5312 Cell: (714) 745-9779

-----Original Appointment-----
From: Schaefer, Leah@CALFIRE <leah.schaefer@fire.ca.gov> **On Behalf Of** Ohara, Sean@CALFIRE
Sent: Friday, October 20, 2023 10:33 AM
To: Aurie Patterson; Fooks, Brett@Energy; Payne, Leonidas@Energy; Knight, Eric@DOT; Babula, Jared@Energy; Ponce, Mariah@Energy
Subject: Fountain Wind Farm | California Energy Commission
When: Wednesday, November 1, 2023 1:00 PM-1:30 PM (UTC-08:00) Pacific Time (US & Canada).
Where: Microsoft Teams Meeting

To: Paul Hellman[phellman@co.shasta.ca.us]
From: Huber, Elizabeth@Energy[/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=93f40660c3d446578d63390926fd5e5a-Huber, Eliz]
Sent: Tue 10/31/2023 11:24:59 PM (UTC-07:00)
Subject: Re: Fountain Wind Project Planning Commission Public Hearing - Group Presentations

Thank you, Paul. All your insight is so valuable and appreciated! Elizabeth

Get Outlook for iOS

From: Paul Hellman <phellman@co.shasta.ca.us>
Sent: Tuesday, October 31, 2023 6:49:50 PM
To: Huber, Elizabeth@Energy <Elizabeth.Huber@energy.ca.gov>
Subject: Fountain Wind Project Planning Commission Public Hearing - Group Presentations

Elizabeth,

Below are the organized groups that requested additional time to speak during the Fountain Wind Project Planning Commission public hearing (many of which also spoke during the appeal hearing before the Board of Supervisors). The times allocations listed represent the amount of time the Chair granted to each group ahead of the meeting, some being exactly what the group requested and some being less than what the group requested.

Applicant - 40 minutes

Groups in Support
Shasta VOICES (no longer in existence) - 10 minutes
California State Building & Contractors Trades Council - 6 minutes
Northeastern California Building & Construction Trades Council - 6 minutes

Groups in Opposition
Wintu Audubon Society - 5 minutes
Pit River Tribe - 30 minutes
Madesi Band of the Pit River Tribe - 20 minutes
Illmawi Band of the Pit River Tribe - 20 minutes
Moose Camp - 15 minutes
Associated Aerial Firefighters - 5 minutes
California Pilots Association - 8 minutes
Shasta Environmental Alliance - 5 minutes
Citizens in Opposition to the Fountain Wind Project - 30 minutes

Thanks,
Paul Hellman, Director
Shasta County Department of Resource Management
(530) 225-5114
https://www.shastacounty.gov/resource-management

To: Knight, Eric@Energy[Eric.Knight@energy.ca.gov]
From: Haws, Marichka@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=952E0B50C8AE422588958C273050B0B0-HAWS, MARIC]
Sent: Mon 10/30/2023 1:39:26 PM (UTC-07:00)
Subject: RE: Fountain Wind Tribal Consultation Letters

Okay, thank you.

From: Knight, Eric@Energy <Eric.Knight@energy.ca.gov>
Sent: Monday, October 30, 2023 1:38 PM
To: Haws, Marichka@Energy <Marichka.Haws@energy.ca.gov>
Subject: FW: Fountain Wind Tribal Consultation Letters

Tribal letters will need to go out by Friday

From: Roark, Gabriel@Energy <gabriel.roark@energy.ca.gov>
Sent: Monday, October 30, 2023 9:00 AM
To: Knight, Eric@Energy <Eric.Knight@energy.ca.gov>
Cc: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: Fountain Wind Tribal Consultation Letters

Hi, Eric! I wonder if Marichka and Mineka are available to help me next week with the Fountain Wind letters. I would ask Marichka to conduct the mail merge (10 letters) and Mineka to arrange for mailing. These letters need to go out no more than five days after the completion letter is mailed.

Thanks,

Gabriel Roark, M.A.
Supervisor, Cultural Resources Unit
Assistant Tribal Liaison
Siting, Transmission, and Environmental Protection Division
California Energy Commission
916-237-2544 (mobile)
www.energy.ca.gov
(he/him/his)

From: Fooks, Brett@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=870DF74143964B71ADA0039BF13C5A9A-FOOKS, BRET]
Location: Microsoft Teams Meeting
Importance: Normal
Subject: FW: Fountain Wind Farm | California Energy Commission
Start Time: Wed 11/1/2023 1:00:00 PM (UTC-07:00)
End Time: Wed 11/1/2023 1:30:00 PM (UTC-07:00)
Required Attendees: Knight, Eric@Energy; Aurie Patterson; Fooks, Brett@Energy; Payne, Leonidas@Energy; Knight, Eric@DOT; Babula, Jared@Energy; Ponce, Mariah@Energy

Here is the Cal Fire Meeting.

From: Ohara, Sean@CALFIRE <Sean.Ohara@fire.ca.gov>
Sent: Friday, October 20, 2023 10:32:47 AM (UTC-08:00) Pacific Time (US & Canada)
To: Ohara, Sean@CALFIRE <Sean.Ohara@fire.ca.gov>; Aurie Patterson <apatterson@aspeneg.com>; Fooks, Brett@Energy <Brett.Fooks@energy.ca.gov>; Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>; Knight, Eric@DOT <Eric.Knight@dot.ca.gov>; Babula, Jared@Energy <Jared.Babula@energy.ca.gov>; Ponce, Mariah@Energy <Mariah.Ponce@Energy.ca.gov>
Subject: Fountain Wind Farm | California Energy Commission
When: Wednesday, November 1, 2023 1:00 PM-1:30 PM.
Where: Microsoft Teams Meeting

Aurie Patterson, the New Enviromental Group Consultant requested this meeting.
2 California Energy Commission representatives will be asked to join.

Microsoft Teams meeting

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Passcode: HgRvyU
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+1 650-564-3271,,334294617# United States, San Jose
Phone Conference ID: 334 294 617#
Find a local number | Reset PIN

Welcome to the California Natural Resources Agency and affiliated organizations online meeting system.
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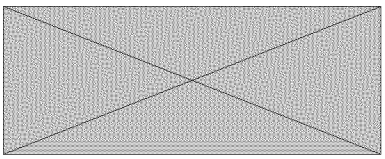
To: Hochschild, Chair@Energy[Chair.Hochschild@energy.ca.gov]; Energy - Commissioner Gunda[CommissionerGunda@energy.ca.gov]; Energy - Commissioner McAllister[CommissionerMcAllister@energy.ca.gov]; Energy - Commissioner Monahan[CommissionerMonahan@energy.ca.gov]; Energy - Commissioner Gallardo[CommissionerGallardo@energy.ca.gov]
Cc: Robinson, Katerina@Energy[Katerina.Robinson@Energy.ca.gov]; Park, Jane@Energy[Jane.Park@Energy.ca.gov]; 'bryan.early@energy.cal.gov'[bryan.early@energy.cal.gov]; Lim, Sarah@Energy[Sarah.Lim@Energy.ca.gov]; Stokes, Erik@Energy[Erik.Stokes@energy.ca.gov]; Timothy Lyons[Timothy.Lyons@bbklaw.com]; Ryan Baron[Ryan.Baron@bbklaw.com]
From: Claudia Peach[Claudia.Peach@bbklaw.com]
Sent: Fri 11/3/2023 4:00:27 PM (UTC-07:00)
Subject: Shasta County Supervisor Mary Rickert Ltr. to Chair Hochschild re Opposition to Fountain Wind Project (23-OPT-01)
Letter to CEC Chair from Supr. Rickert-c1.pdf

Dear Commissioners,

Please find attached a letter to Chair Hochschild from Shasta County District 3 Supervisor Mary Rickert regarding opposition to the opt-in application submitted by Fountain Wind LLC (ConnectGen). This letter was filed and docketed today in Docket 23-OPT-01.

Thank you,



Claudia Peach
Legal Practice Assistant
claudia.peach@bbklaw.com
T: (916) 551-2855
bbklaw.com |

SHASTA COUNTY
BOARD OF SUPERVISORS

Mary Rickert, District 3

1450 Court Street, Suite 308B
Redding, CA 96001-1673
(530) 225-5557
(800) 479-8009
FAX (530) 229-8238

Chair David Hochschild
California Energy Commission
715 P Street
Sacramento, CA 95814

Dear Chair Hochschild:

I am writing you regarding the Fountain Wind Project that is currently before the California Energy Commission (CEC) for review of an opt-in application submitted by Fountain Wind LLC (ConnectGen). I am the Shasta County Supervisor representing District 3, which includes the area where the project is proposed to be located. As the elected official serving District 3 as a member of the Shasta County Board of Supervisors, I can speak on behalf of the County and my communities that the project is universally opposed by residents, businesses, and other organizations throughout Shasta County due to the significant adverse impacts with respect to wildfire hazards, aerial firefighting, viewshed, water quality, biological resources, Shasta County's economic base, and Tribal cultural resources.

The Fountain Wind Project was previously reviewed by Shasta County in an extensive permitting and environmental review process that resulted in the Shasta County Planning Commission denying the project. This project was reviewed again on appeal and denied by the Board of Supervisors of which I participated in and voted no. Despite the CEC not having any jurisdiction over the project, as has been demonstrated in our comments to you in the docket, CEC staff continues to process the application and has reached out to County staff for a site to hold a meeting on the project at the end of November. There has been no public discussion from the CEC Commissioners on jurisdiction, who ultimately have the authority to not assert jurisdiction over the project, or any other direction to set a public meeting to discuss the legal comments that have been raised and the outcry by the communities I represent. This is untenable.

This 205-megawatt wind project would consist of 48 extremely large wind turbines and other facilities proposed on 1,600 acres of Shasta County timberlands in a very high fire hazard severity zone. In addition to other environmental impacts, the Pit River Tribe, who the County fully supports, has detailed the tremendous and irreversible impacts the project would have on it and its Tribal cultural resources and has called into question the integrity and transparency of ConnectGen. Numerous comments have been filed by my constituents opposing the project. None of the comments that have been filed are "me-too" letters or from people that oppose development or renewable energy. Instead, detailed comments have been filed by experts living in the area describing impacts on aerial firefighting, by lawyers and ranchers who live adjacent to the site, and even personal stories from those who lived through the horrendous Fountain Fire.

It has come to my attention, quite disturbingly, that ConnectGen has proposed a so-called "community benefits agreement" to the Community Foundation of the North State to try and satisfy one of its primary obligations under its application, a foundation I previously sat on the board of directors for. The agreement proposes to give $2.8 million to the Foundation over a 17-year period to be used by the Pit

River Tribe and programs and activities in the Round Mountain, Montgomery Creek, and Burney areas of Shasta County. The Pit River Tribe recently filed comments that it "vehemently opposes any association with this financial arrangement" and "vehemently" objects to the misleading claims by ConnectGen suggesting that the Tribe has consented to receive these "community benefits."

As the County Supervisor that represents the Round Mountain, Montgomery Creek, and Burney communities, and the official who speaks with these communities daily and understands their concerns, I can state on their behalf, and without qualification, that the Round Mountain, Montgomery Creek, and Burney communities "vehemently" oppose this financial arrangement and will not accept any "blood money" through the Foundation or otherwise be bought off by ConnectGen. Not one organization in the communities I represent will accept funds from the Foundation associated with this project. When the developer proposed a similar community benefits agreement during the time the project was reviewed and denied by the County, no community organization agreed to sign a community benefits agreement or accept money.

I agree with the Pit River Tribe that ConnectGen's community benefits proposal calls into question their veracity and ethics because they do not indicate whatsoever that no community organization will accept the money and have not done so the first time around. As a former Foundation board member, I very much understand their process for accepting donations. Even though ConnectGen places its agreement on Foundation letterhead, there is no indication that the Foundation is even negotiating the agreement, and even if it were, it would need to be approved by the Foundation's board. In other words, if the board hasn't approved an agreement, there's no evidence of negotiating an agreement, and more importantly, the Pit River Tribe and the Round Mountain, Montgomery Creek, and Burney communities won't accept the money . . . **there is no community benefits agreement**. Therefore, the application should not have been deemed complete by CEC staff, and it must be withdrawn or denied.

I implore you as Chair of the CEC and your fellow Commissioners to seriously consider the jurisdictional and community benefit objections, and the comments that have been raised by my constituency who will be the victims of this project and future wildfires caused or exacerbated by it, and direct your staff at a public meeting to stop reviewing the application and reject it outright. You have a legal and moral imperative to do so and not be taken in by the false claims of the applicant.

Very truly yours,

Mary Rickert

Supervisor Mary Rickert
District 3, Shasta County

To: Paul Hellman[phellman@co.shasta.ca.us]
From: Huber, Elizabeth@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=93F40660C3D446578D63390926FD5E5A-HUBER, ELIZ]
Sent: Thur 11/16/2023 9:35:24 AM (UTC-08:00)
Subject: RE: Fountain Wind Pit River Tribe Comment Letter

Thank you and thank you for all the emails. As soon I get my answers I will connect with you. EH

From: Paul Hellman <phellman@co.shasta.ca.us>
Sent: Wednesday, November 15, 2023 1:54 PM
To: Huber, Elizabeth@Energy <Elizabeth.Huber@energy.ca.gov>
Subject: Fountain Wind Pit River Tribe Comment Letter

Elizabeth,

Attached is the Pit River Tribe comment letter that I referred to during our conversation this morning, which was docketed on 10/18. Section VIII on pages 7-8 addresses the Tribe's unwillingness to accept funds as part of any community benefits agreement associated with the project.

Thanks,
Paul Hellman, Director
Shasta County Department of Resource Management
(530) 225-5114
https://www.shastacounty.gov/resource-management

To: 'Chairman@pitrivertribe.gov'[Chairman@pitrivertribe.gov]
Cc: 'michelle@thecirclelaw.com'[michelle@thecirclelaw.com]
From: Roark, Gabriel@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=ED87FF1E22CD49F3AAFF644C82538D46-ROARK, GABR]
Sent: Tue 11/21/2023 11:09:25 AM (UTC-08:00)
Subject: Request for Voluntary AB 52 Consultation for the Fountain Wind Project

Honorable Tribal Chairman Bamford,

The California Energy Commission (CEC) acknowledges receipt of your letter, dated November 2, 2023, requesting that the CEC engage in voluntary AB 52 consultation (pursuant to the Public Resources Code, Section 21080.3.1) with the Pit River Tribe concerning the proposed Fountain Wind Project. Please accept this email as the CEC's agreement to engage in consultation with the Pit River Tribe pursuant to Public Resources Code, Section 21080.3.1.

The CEC understands that the Pit River Tribe's willingness to consult with the CEC does not indicate that the Tribe supports the proposed Fountain Wind Project. Consultation topics, as requested in your letter of November 2, include:

- Provision of detailed information about the proposed project and location
- Arrangements for tribal cultural practitioners to access the project site to determine whether specific traditional tribal cultural sites are in the areas that the proposed project would affect
- Identification of specific concerns raised by the presence of any traditional tribal cultural sites

The CEC proposes that Gabriel Roark, Assistant Tribal Liaison for our Siting, Transmission, and Environmental Protection Division will be the lead for CEC in this consultation. If acceptable to the Pit River Tribe, it would be useful to the CEC for Lauren DeOliveira, Cultural Resources Group Manager from our contractor, Aspen Environmental Group, to participate in consultation meetings.

Please let us know when you would like to hold the initial consultation meeting and whether you prefer to meet remotely via Zoom or similar or wish to meet in person. The CEC appreciates the Pit River Tribe's desire to consult on the Fountain Wind Project and looks forward to meeting with you.

Sincerely,

Gabriel Roark, M.A.
Supervisor, Cultural Resources Unit
Assistant Tribal Liaison
Siting, Transmission, and Environmental Protection Division
California Energy Commission
916-237-2544 (mobile)
www.energy.ca.gov
(he/him/his)

Sent: Mon 11/20/2023 4:24:41 PM (UTC-08:00)
From: California Natural Resources Agency <CNRA@public.govdelivery.com>
Subject: Courtesy Copy: CEC To Hold Fountain Wind Project Public Meeting in Shasta County on November 28
To: govdeliveryinfo@energy.ca.gov, tim.garza@resources.ca.gov, Carmen.Au-yeung@energy.ca.gov, steven.pansoy@water.ca.gov, Kevin.Kidd@energy.ca.gov, Simi.Keechilot@water.ca.gov, Anabel.Ruiz@water.ca.gov, olaf.vanardenne@water.ca.gov, GovDelivery@energysafety.ca.gov, david.poukish@water.ca.gov, Devin.Soriano@energy.ca.gov, yee.xiong@energy.ca.gov, Jason.Waggoner@water.ca.gov, Farideh.Namjou@energy.ca.gov, felipe.renteria@water.ca.gov

This is a courtesy copy of an email bulletin sent by Kevin Kidd.

This bulletin was sent to the following groups of people:

Subscribers of CEC Electricity Issues, CEC Fountain Wind Project, or CEC Siting Division General List (2246 recipients)

View as a webpage / Share

CEC To Hold Fountain Wind Project Public Meeting in Shasta County on November 28

The California Energy Commission (CEC) announced it will host the first public meeting on the Fountain Wind Project's application for opt-in certification on **Tuesday, November 28, 2023 from 2:00 – 10:00 p.m.** The meeting will take place at the Gaia Hotel in Anderson, California.

During this scoping and informational meeting, staff will describe CEC's role and responsibilities in reviewing the application and engaging with government agencies, California Native American Tribes, neighboring communities, and the public. The project applicant will present its proposed plans for constructing and operating the project and related facilities. The CEC's Public Advisor will describe how interested members of the public can participate in the process, including during environmental review and decision-making. Then California Native American Tribes, responsible and trustee agencies, elected officials, and other government agencies will provide comments followed by open public comment.

Download and read the formal meeting notice.

For more information, visit the Fountain Wind Project application webpage.

Background

In 2022, Governor Gavin Newsom signed Assembly Bill 205 creating the Opt-In Certification Program at the California Energy Commission (CEC), a consolidated permitting approach to provide a timely and efficient permitting process for non-fossil fuel, clean energy projects. This new option will help fast-track the deployment of clean energy in California to allow the eventual retirement of fossil-fuel based resources.

The CEC serves as the lead agency to review opt-in projects under the California Environmental Quality Act. The Fountain Wind Project is the first to start the 270-day review process which requires the CEC to prepare an environmental impact report (EIR) and decide whether to approve or deny the project.

The law requires tribal consultation and the opportunity for public comment throughout the process. With some exceptions, the CEC's approval is in lieu of any permit, certificate, or similar document required by any state, local, regional agency, or federal agency to the extent permitted by federal law.

More information about the Opt-In Certification Program can be found on the CEC's power plant licensing webpage.

Contact Info

Public Participation Questions
publicadvisor@energy.ca.gov
916-957-7910

Media Inquiries
mediaoffice@energy.ca.gov
916-654-4989

Project-Related Inquires
Leonidas Payne
STEPsiting@energy.ca.gov
(In your email, please enter the project name in the subject line.)

To: 'Michelle Lee'[Michelle@thecirclelaw.com]; 'Chairman@pitrivertribe.gov'[Chairman@pitrivertribe.gov]
Cc: Jason Lee[jason@thecirclelaw.com]
From: Roark, Gabriel@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=ED87FF1E22CD49F3AAFF644C82538D46-ROARK, GABR]
Sent: Tue 11/21/2023 4:07:45 PM (UTC-08:00)
Subject: RE: Request for Voluntary AB 52 Consultation for the Fountain Wind Project

No problem, Michelle. To your initial questions, the purpose of the joint environmental scoping and informational meeting is to inform the public, tribes, and local governments about the Opt-in process; provide information about the proposed Fountain Wind Project; and take comments from tribes, governments, and members of the public.

Here is the agenda for the public hearing next week:

AGENDA
Tuesday, November 28, 2023
Joint Environmental Scoping and Informational Meeting
Fountain Wind Project (23-OPT-01)
The meeting begins at 2:00 p.m. and will conclude at 10:00 p.m.
All start and end times are estimates

1. Welcome
2. Presentation on the opt-in certification process
3. Presentation by the Applicant on the project as currently proposed, including information on project features which address mandatory requirements of the opt-in licensing process (e.g. labor agreements/prevailing wage, economic benefits, community benefits)
4. CEC staff Presentation on analysis and issues identified so far
5. Presentation on public participation opportunities by the CEC's Public Advisor
6. (Break)
7. Input and comments from California Native American Tribes, responsible and trustee agencies, elected officials, other government agencies.
8. (Break)
9. Comments from interested members of the public, organizations, and neighboring communities.
10. Adjourn

I would guess that items 1–5 above will take about 1.5 hours. We have not yet determined how long the breaks might be. The CEC typically allots 3 minutes for each speaker during comment periods.

I will be in a meeting tomorrow at 11:00 a.m. to discuss the logistics of the public hearing. If you know of anything that the Pit River Tribe would like the CEC to consider ahead of the meeting, feel free to let me know so that I can raise it with the group.

Sierra Graves from our Tribal Affairs Office will be at the meeting in person. I plan to attend via Zoom so that I am able to work on a competing deliverable before the meeting starts.

Here is the link to the meeting notice: https://efiling.energy.ca.gov/GetDocument.aspx?tn=253231&DocumentContentId=88438.

Thank you,

Gabriel

From: Michelle Lee <Michelle@thecirclelaw.com>
Sent: Tuesday, November 21, 2023 2:48 PM
To: Roark, Gabriel@Energy <gabriel.roark@energy.ca.gov>; 'Chairman@pitrivertribe.gov' <Chairman@pitrivertribe.gov>

Cc: Jason Lee <jason@thecirclelaw.com>
Subject: RE: Request for Voluntary AB 52 Consultation for the Fountain Wind Project

Thank you Gabriel,

I will discuss this with the Tribal Council and get back to you as soon as possible. In the interim, can you please provide us with some information about the public hearing next week? What is the agenda? Are there time limitations for presentations? Any information you can share with us so that we can adequately prepare would be greatly appreciated.

Respectfully,

Michelle C. Lee
The Circle Law Group, P.C.
930 F Street
Sacramento, CA 95814
Phone: (916) 809-8900
Fax: (916) 809-8901
Cell: (916) 204-5724
michelle@thecirclelaw.com

From: Roark, Gabriel@Energy <gabriel.roark@energy.ca.gov>
Sent: Tuesday, November 21, 2023 11:09 AM
To: 'Chairman@pitrivertribe.gov' <Chairman@pitrivertribe.gov>
Cc: Michelle Lee <Michelle@thecirclelaw.com>
Subject: Request for Voluntary AB 52 Consultation for the Fountain Wind Project

Honorable Tribal Chairman Bamford,

The California Energy Commission (CEC) acknowledges receipt of your letter, dated November 2, 2023, requesting that the CEC engage in voluntary AB 52 consultation (pursuant to the Public Resources Code, Section 21080.3.1) with the Pit River Tribe concerning the proposed Fountain Wind Project. Please accept this email as the CEC's agreement to engage in consultation with the Pit River Tribe pursuant to Public Resources Code, Section 21080.3.1.

The CEC understands that the Pit River Tribe's willingness to consult with the CEC does not indicate that the Tribe supports the proposed Fountain Wind Project. Consultation topics, as requested in your letter of November 2, include:

- Provision of detailed information about the proposed project and location
- Arrangements for tribal cultural practitioners to access the project site to determine whether specific traditional tribal cultural sites are in the areas that the proposed project would affect
- Identification of specific concerns raised by the presence of any traditional tribal cultural sites

The CEC proposes that Gabriel Roark, Assistant Tribal Liaison for our Siting, Transmission, and Environmental Protection Division will be the lead for CEC in this consultation. If acceptable to the Pit River Tribe, it would be useful to the CEC for Lauren DeOliveira, Cultural Resources Group Manager from our contractor, Aspen Environmental Group, to participate in consultation meetings.

Please let us know when you would like to hold the initial consultation meeting and whether you prefer to meet remotely via Zoom or similar or wish to meet in person. The CEC appreciates the Pit River Tribe's desire to consult on the Fountain Wind Project and looks forward to meeting with you.

Sincerely,

Gabriel Roark, M.A.
Supervisor, Cultural Resources Unit
Assistant Tribal Liaison
Siting, Transmission, and Environmental Protection Division
California Energy Commission
916-237-2544 (mobile)
www.energy.ca.gov
(he/him/his)

To: 'Michelle Lee'[Michelle@thecirclelaw.com]; 'Chairman@pitrivertribe.gov'[Chairman@pitrivertribe.gov]
From: Roark, Gabriel@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=ED87FF1E22CD49F3AAFF644C82538D46-ROARK, GABR]
Sent: Wed 11/22/2023 10:48:09 AM (UTC-08:00)
Subject: RE: Request for Voluntary AB 52 Consultation for the Fountain Wind Project

Good morning, Michelle,

We will have a court reporter recording the entire proceeding.

Update: We estimate that agenda items 1 through 5 will last until 3:45. The break will be about 30 minutes, then we resume for Agenda Item 6. Representatives of the Pit River Tribal government will have a 10-minute speaking slot at that point in the meeting. The public comment period at the end of the meeting will allow 3 minutes per speaker.

Many thanks,

Gabriel

From: Michelle Lee <Michelle@thecirclelaw.com>
Sent: Wednesday, November 22, 2023 10:40 AM
To: Roark, Gabriel@Energy <gabriel.roark@energy.ca.gov>; 'Chairman@pitrivertribe.gov' <Chairman@pitrivertribe.gov>
Subject: RE: Request for Voluntary AB 52 Consultation for the Fountain Wind Project

Gabriel,

I have another question regarding the scoping meeting on Tuesday. Do you know if there will be a court reporter making a transcript of the testimony that will be presented?

Respectfully,

Michelle C. Lee
The Circle Law Group, P.C.
930 F Street
Sacramento, CA 95814
Phone: (916) 809-8900
Fax: (916) 809-8901
Cell: (916) 204-5724
michelle@thecirclelaw.com

From: Roark, Gabriel@Energy <gabriel.roark@energy.ca.gov>
Sent: Tuesday, November 21, 2023 11:09 AM
To: 'Chairman@pitrivertribe.gov' <Chairman@pitrivertribe.gov>
Cc: Michelle Lee <Michelle@thecirclelaw.com>
Subject: Request for Voluntary AB 52 Consultation for the Fountain Wind Project

Honorable Tribal Chairman Bamford,

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- Identification of specific concerns raised by the presence of any traditional tribal cultural sites

The CEC proposes that Gabriel Roark, Assistant Tribal Liaison for our Siting, Transmission, and Environmental Protection Division will be the lead for CEC in this consultation. If acceptable to the Pit River Tribe, it would be useful to the CEC for Lauren DeOliveira, Cultural Resources Group Manager from our contractor, Aspen Environmental Group, to participate in consultation meetings.

Please let us know when you would like to hold the initial consultation meeting and whether you prefer to meet remotely via Zoom or similar or wish to meet in person. The CEC appreciates the Pit River Tribe's desire to consult on the Fountain Wind Project and looks forward to meeting with you.

Sincerely,

Gabriel Roark, M.A.
Supervisor, Cultural Resources Unit
Assistant Tribal Liaison
Siting, Transmission, and Environmental Protection Division
California Energy Commission
916-237-2544 (mobile)
www.energy.ca.gov
(he/him/his)

To: Ackerman, James@Energy[james.ackerman@energy.ca.gov]; Abulaban, Abdel-Karim@Energy[Abdel-Karim.Abulaban@energy.ca.gov]
Cc: Babula, Jared@Energy[Jared.Babula@energy.ca.gov]; Ponce, Mariah@Energy[Mariah.Ponce@Energy.ca.gov]; Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
From: Knight, Eric@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BE42548337F44852A291A9845F226F62-KNIGHT, ERI]
Sent: Thur 11/30/2023 2:44:00 PM (UTC-08:00)
Subject: RE: Fountain Wind Project (23-OPT-01) - water supply

Thank you James

From: Ackerman, James@Energy <james.ackerman@energy.ca.gov>
Sent: Thursday, November 30, 2023 2:41 PM
To: Knight, Eric@Energy <Eric.Knight@energy.ca.gov>; Abulaban, Abdel-Karim@Energy <Abdel-Karim.Abulaban@energy.ca.gov>
Cc: Babula, Jared@Energy <Jared.Babula@energy.ca.gov>; Ponce, Mariah@Energy <Mariah.Ponce@Energy.ca.gov>; Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: RE: Fountain Wind Project (23-OPT-01) - water supply

Eric: I just got off the phone Burney Water District manager David Zevely.

I asked his about the status of BWD providing water to the Fountain Wind Project.

He informed me that in a BWD board meeting on 9-21-23, the board voted to not provide water for the Fountain Wind project.

I will prepare a ROC to document the conversation.

James Ackerman, PG #6493
Engineering Geologist
California Energy Commission
Siting, Transmission and Environmental Protection Division
Direct: (530) 878-4966
Email: james.ackerman@energy.ca.gov

From: Knight, Eric@Energy <Eric.Knight@energy.ca.gov>
Sent: Wednesday, November 29, 2023 5:31 PM
To: Ackerman, James@Energy <james.ackerman@energy.ca.gov>; Abulaban, Abdel-Karim@Energy <Abdel-Karim.Abulaban@energy.ca.gov>
Cc: Babula, Jared@Energy <Jared.Babula@energy.ca.gov>; Ponce, Mariah@Energy <Mariah.Ponce@Energy.ca.gov>; Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: RE: Fountain Wind Project (23-OPT-01) - water supply

Thank you James, appreciate it

From: Ackerman, James@Energy <james.ackerman@energy.ca.gov>
Sent: Wednesday, November 29, 2023 5:20 PM
To: Knight, Eric@Energy <Eric.Knight@energy.ca.gov>; Abulaban, Abdel-Karim@Energy <Abdel-Karim.Abulaban@energy.ca.gov>
Cc: Babula, Jared@Energy <Jared.Babula@energy.ca.gov>; Ponce, Mariah@Energy <Mariah.Ponce@Energy.ca.gov>; Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: RE: Fountain Wind Project (23-OPT-01) - water supply

Eric: According to the WSA prepared in January 2023, the Burney Water District option was one of two water supply options.

The other being groundwater extraction from the fractured volcanic rock at the project site.

Although, the WSA concludes that that the water needs of the project would not result in a significant impact to the resource based on the withdrawal by current water wells in the area, the resource maybe limited and may need to be characterized.

With BWD withdrawing as one of the options, aquifer testing may be necessary to characterize the resource prior to certification.

I can contact BWD and verify if they still intend to supply water to the project.

James Ackerman, PG #6493
Engineering Geologist
California Energy Commission
Siting, Transmission and Environmental Protection Division
Direct: (530) 878-4966
Email: james.ackerman@energy.ca.gov

From: Knight, Eric@Energy <Eric.Knight@energy.ca.gov>
Sent: Wednesday, November 29, 2023 5:02 PM
To: Ackerman, James@Energy <james.ackerman@energy.ca.gov>; Abulaban, Abdel-Karim@Energy <Abdel-Karim.Abulaban@energy.ca.gov>
Cc: Babula, Jared@Energy <Jared.Babula@energy.ca.gov>; Ponce, Mariah@Energy <Mariah.Ponce@Energy.ca.gov>; Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: Fountain Wind Project (23-OPT-01) - water supply

Hi James and Karim -

We were told at a meeting this morning with Shasta County representatives that the Burney Water District will not be providing water for the project. Do you know if this is correct? Could you contact the water district and find out if they still intend on being the water supplier? If this is correct it could impact the schedule for the Draft EIR.

Thanks,
Eric

From: Gallardo, Noemi@Energy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=6D80AF906F4F4846958A22A1FBFC0795-GALLARDO, N]
Sent: 11/29/2023 7:26:05 PM
To: Ross, Bruce [Bruce.Ross@sen.ca.gov]; Senator Dahle [Senator.Dahle@senate.ca.gov]
CC: Borcherding, Brady@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=32bc4682bdd84ada8c9bc60f002e2605-4e23d763-0b]; Qaqundah, James@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7da5ec0923de49488685fdaa76c71e51-Qaqundah, J]
Subject: Re: Fountain Wind Application Update

Hello Senator Dahle and District Director Ross,

Thank you for having representation at yesterday's meeting in Anderson for the proposed Fountain Wind project. There were about 120 participants, both on Zoom and in the room. We listened to nearly 60 commenters who provided their insight, expertise and opinions. I believe it was Anthony Gorman who spoke and did a great job conveying your perspective.

There will be another meeting in the community set up by the CEC when the draft EIR is complete. We will apprise you once we have more details.

In the meantime, we have accepted an invite from County Supervisors Rickert and Garman to visit the project site area to deepen our understanding of impacts from their perspective. We look forward to returning to Shasta County.

Sincerely,
Commissioner Noemí Gallardo

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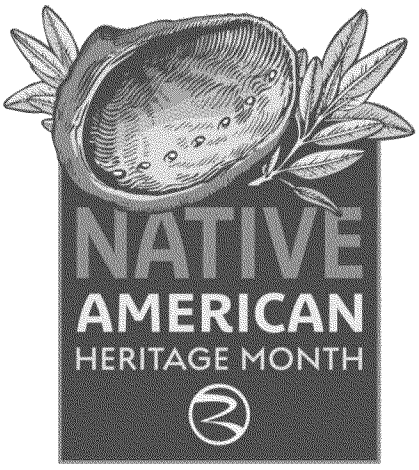
From: Gallardo, Noemi@Energy <noemi.gallardo@energy.ca.gov>
Sent: Wednesday, November 1, 2023 11:12 AM
To: Ross, Bruce <Bruce.Ross@sen.ca.gov>; Senator Dahle <Senator.Dahle@senate.ca.gov>
Cc: Borcherding, Brady@Energy <Brady.Borcherding@energy.ca.gov>; Qaqundah, James@Energy <James.Qaqundah@energy.ca.gov>
Subject: RE: Fountain Wind Application Update

We appreciate that, Bruce. Community engagement will be very helpful.

I'll ask Brady and Jimmy to work together to ensure we're sending you all of the key notices and updates about the upcoming workshop that we think will be November 30, other participation opportunities, and any major milestones the Senator and your office should be aware of relating to Fountain Wind.

Noemí Otilia Osuna Gallardo
(she/her/ella)
Commissioner, California Energy Commission



From: Ross, Bruce <Bruce.Ross@sen.ca.gov>
Sent: Wednesday, November 1, 2023 10:27 AM
To: Gallardo, Noemi@Energy <noemi.gallardo@energy.ca.gov>; Senator Dahle <Senator.Dahle@senate.ca.gov>
Cc: Borcherding, Brady@Energy <Brady.Borcherding@Energy.ca.gov>; Qaqundah, James@Energy <James.Qaqundah@energy.ca.gov>
Subject: RE: Fountain Wind Application Update

Commissioner Gallardo,

Thank you very much for the update. We'll look forward to helping the community stay engaged in the Energy Commission's permitting process, so any information your team could share about how to do that would be very welcome.

Warmest regards,

Bruce Ross
District Director, ***Senator Brian Dahle***
Office: (530) 224-7001 • Mobile: (530) 229-3769
Bruce.Ross@sen.ca.gov

"An opinion should be the result of thought, not a substitute for it." -- Frazz

From: Gallardo, Noemi@Energy <noemi.gallardo@energy.ca.gov>
Sent: Wednesday, November 1, 2023 8:30 AM
To: Senator Dahle <Senator.Dahle@senate.ca.gov>
Cc: Ross, Bruce <Bruce.Ross@sen.ca.gov>; Borcherding, Brady@Energy <Brady.Borcherding@Energy.ca.gov>; Qaqundah, James@Energy <James.Qaqundah@energy.ca.gov>
Subject: Fountain Wind Application Update

Dear Senator Dahle,

Thank you for the letter you sent in late September representing your position and the interests of your constituents on the Fountain Wind proposed project in your district in Shasta County.

I am writing to inform you that the California Energy Commission (CEC), in carrying out our required duties under AB 205, has issued a Statement of Completeness for the Fountain Wind project. We are required to issue this statement within 30 days of receiving a project application if the proposal satisfies the requirements under the law. The project will now begin a 270-day phase during which the CEC will conduct an Environmental Impact Report, hold meetings near the project site to hear from the local community, and determine if this project should be approved.

I included in this message two attachments. The first attachment provides additional information about the process for the Fountain Wind proposed project and the second attachment is the Statement of Completeness for the project. I would appreciate continuing an open line of communication with you if you have additional comments or questions related to this proposal. Please feel free to contact me or my lead advisor on siting matters Jimmy Qaqundah (copied). You could also reach out to Brady Borcherding at the Office of Governmental and International Affairs (copied) via email or at 916-890-7019.

Thank you for your engagement and understanding,
Commissioner Noemi Gallardo

To: Knight, Eric@Energy[Eric.Knight@energy.ca.gov]; Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
From: Paul Hellman[phellman@co.shasta.ca.us]
Sent: Wed 11/29/2023 6:25:03 PM (UTC-08:00)
Subject: Fountain Wind Project NOP

It was a pleasure to meet you both in person this week. I hope that your trip back home was a smooth one.

I would like to verify whether or not your office has filed the Fountain Wind Project NOP with the county clerk of Shasta County as required pursuant to State CEQA Guidelines section 15082. I checked with the county clerk's office yesterday and was informed that they have not received it.

Thanks,
Paul Hellman, Director
Shasta County Department of Resource Management
(530) 225-5114
https://www.shastacounty.gov/resource-management

To: Knight, Eric@Energy[Eric.Knight@energy.ca.gov]; Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
From: Paul Hellman[phellman@co.shasta.ca.us]
Sent: Thur 11/30/2023 3:31:38 PM (UTC-08:00)
Subject: RE: Fountain Wind Project NOP

Is the meeting video available to view online yet? If not, would it be possible for you to provide the applicant's presentation to me?

Thanks,
Paul Hellman, Director
Shasta County Department of Resource Management
(530) 225-5114
https://www.shastacounty.gov/resource-management

From: Paul Hellman
Sent: Wednesday, November 29, 2023 6:25 PM
To: Knight, Eric@Energy <Eric.Knight@energy.ca.gov>; Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: Fountain Wind Project NOP

It was a pleasure to meet you both in person this week. I hope that your trip back home was a smooth one.

I would like to verify whether or not your office has filed the Fountain Wind Project NOP with the county clerk of Shasta County as required pursuant to State CEQA Guidelines section 15082. I checked with the county clerk's office yesterday and was informed that they have not received it.

Thanks,
Paul Hellman, Director
Shasta County Department of Resource Management
(530) 225-5114
https://www.shastacounty.gov/resource-management

To: 'Chairman@pitrivertribe.gov'[Chairman@pitrivertribe.gov]
Cc: Graves, Sierra@Energy[Sierra.Graves@Energy.ca.gov]
From: Roark, Gabriel@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=ED87FF1E22CD49F3AAFF644C82538D46-ROARK, GABR]
Sent: Tue 11/28/2023 3:57:02 PM (UTC-08:00)
Subject: Fountain Wind Presentations
00 - Master Slide Deck for FW Scoping Mtg.pdf

Dear Chairman Bamford,

Per your request, I have attached the presentations that CEC and ConnectGen walked us through in the early phases of the public meeting. If I can be of other assistance, please reach out to me or Sierra Graves. Thank you.

Gabriel Roark, M.A.
Supervisor, Cultural Resources Unit
Assistant Tribal Liaison
Siting, Transmission, and Environmental Protection Division
California Energy Commission
916-237-2544 (mobile)
www.energy.ca.gov
(he/him/his)

From: Graves, Sierra@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=45C241DF0B224E7F964FAF53E30CF8BA-D3ACDA1C-69]
Sent: Tue 11/28/2023 10:42:15 AM (UTC-08:00)
Subject: Fwd: Environmental Scoping and Informational Meeting for the proposed Fountain Wind Project: Meeting Comments

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From: Graves, Sierra@Energy <Sierra.Graves@Energy.ca.gov>
Sent: Wednesday, November 22, 2023 5:35:25 PM
To: Graves, Sierra@Energy <Sierra.Graves@Energy.ca.gov>
Subject: Environmental Scoping and Informational Meeting for the proposed Fountain Wind Project: Meeting Comments

Dear Honorable Tribal Leader,

As you are likely aware, the California Energy Commission (CEC) is hosting a hybrid Environmental Scoping and Informational Meeting for the proposed **Fountain Wind Project** on **November 28, 2023** from 2:00 p.m.-10:00 p.m. in person at the Gaia Hotel and Spa in Anderson and virtually or by phone via Zoom. Please see the event web page for more information. The formal event notice is available via download here.

We are inviting tribes that are culturally and traditionally associated with the geographic area of the proposed project to select a **Tribal Leader or designee** to make up to 10 minutes of **extended comments** before the start of the general public comment period. We ask that you notify us before or at the event if you would like to make extended comments so we can prioritize your comments and make sure event organizers know of the extended timeframe for your comments. Anyone can also make comments during the general public comment portion of the agenda.

Please let us know if you have any questions.

Thank you,

Sierra Graves, MPA
Pronouns: She/ Her/ Hers
Tribal Engagement Specialist
Office of the Public Advisor, Energy Equity, & Tribal Affairs
Phone: (916)-839-0386
Website: www.energy.ca.gov

To: 'Michelle Lee'[Michelle@thecirclelaw.com]
From: Roark, Gabriel@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=ED87FF1E22CD49F3AAFF644C82538D46-ROARK, GABR]
Sent: Tue 11/28/2023 1:07:38 PM (UTC-08:00)
Subject: Fountain Wind Project - Informational and Scoping Meeting

Good afternoon, Michelle,

Would you be able to tell me who from the Pit River Tribe is attending tonight's meeting (virtually or in person) and planning to speak during the tribal and other governmental comment period? I want to help my colleagues keep an eye out on Zoom to make sure we do not miss anybody.

Many thanks,

Gabriel

Gabriel Roark, M.A.
Supervisor, Cultural Resources Unit
Assistant Tribal Liaison
Siting, Transmission, and Environmental Protection Division
California Energy Commission
916-237-2544 (mobile)
www.energy.ca.gov
(he/him/his)

From: Payne, Leonidas@Energy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=AA9D25DDE24E40429EFA06C4EED35807-PAYNE, LEON]
Sent: 11/30/2023 5:39:37 PM
To: countyclerk@co.shasta.ca.us
Subject: Fountain Wind Project--Notice of Preparation of EIR
Attachments: TN252898_20231102T141040_Notice of Preparation of a Draft Environmental Impact Report.pdf

I have a document (attached) that I need to file with the Shasta County Clerk and I need confirmation of receipt. I do not see an electronic filing portal on the County Clerk website. Are there particular instructions I need to follow, or will this email suffice?

Leonidas Payne—Project Manager
California Energy Commission

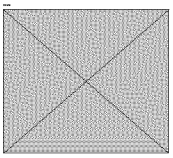
To: Ackerman, James@Energy[james.ackerman@energy.ca.gov]
Cc: Aurie Patterson[apatterson@aspeneg.com]; Abulaban, Abdel-Karim@Energy[Abdel-Karim.Abulaban@energy.ca.gov]
From: Fooks, Brett@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=870DF74143964B71ADA0039BF13C5A9A-FOOKS, BRET]
Sent: Wed 12/6/2023 1:39:11 PM (UTC-08:00)
Subject: Fountain Wind Water Scoping Comments...

Afternoon James,

Could you please give Aurie and I some insight in to the Burnie Water District comments? We just need to know if we need to ask any data requests related to the water tanks for the fire protection. Please let me know if you have any questions or concerns.

Regards,

Brett Fooks | Program Manager - Safety & Reliability Branch
Direct: 916.931.9603 **| Fax:** 916.654.3882
Brett.Fooks@energy.ca.gov



CALIFORNIA ENERGY COMMISSION
Siting, Transmission, and Environmental Protection Division
715 P Street, MS 46, Sacramento, CA, 95814
www.energy.ca.gov

To: Fooks, Brett@Energy[Brett.Fooks@energy.ca.gov]
From: Aurie Patterson[apatterson@aspeneg.com]
Sent: Thur 12/7/2023 3:57:54 PM (UTC-08:00)
Subject: RE: Fountain Wind Water DR...

After looking through the WSA, the Hydrology section, and the water resources data request, I feel that we don't really need an additional DR.

If we end up having a meeting with the applicant about the latest wildfire tech report, I can ask them at that time about the size of the three tanks and point out that the report only mentions one tank.

Aurie Patterson, PG
Environmental Scientist & Geologist
Aspen Environmental Group
Office: (415) 696-5312 Cell: (714) 745-9779

From: Fooks, Brett@Energy <Brett.Fooks@energy.ca.gov>
Sent: Thursday, December 7, 2023 3:33 PM
To: Aurie Patterson <apatterson@aspeneg.com>
Subject: Fountain Wind Water DR...
Importance: High

Afternoon Aurie,

I just shared Water Resources data request with you. It provides good background for the identified issue. Please let me know if you think we need to add a DR for the water tanks.

Regards,

Brett Fooks | Program Manager - Safety & Reliability Branch

Direct: 916.931.9603 | **Fax:** 916.654.3882

Brett.Fooks@energy.ca.gov

CALIFORNIA ENERGY COMMISSION

Siting, Transmission, and Environmental Protection Division

715 P Street, MS 46, Sacramento, CA, 95814

www.energy.ca.gov

STATE OF CALIFORNIA Gavin Newsom, *Governor*

NATIVE AMERICAN HERITAGE COMMISSION

November 6, 2023

Leonidas Payne
California Energy Commission
715 P Street, MS 40
Sacramento, CA 95814

Re: 2023110139, Fountain Wind Project, Shasta County

Dear Mr. Payne:

The Native American Heritage Commission (NAHC) has received the Notice of Preparation (NOP), Draft Environmental Impact Report (DEIR) or Early Consultation for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code §21000 et seq.), specifically Public Resources Code §21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource, is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, §15064.5 (b) (CEQA Guidelines §15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) shall be prepared. (Pub. Resources Code §21080 (d); Cal. Code Regs., tit. 14, § 5064 subd.(a)(1) (CEQA Guidelines §15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources within the area of potential effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code §21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code §21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code §21084.3 (a)). **AB 52 applies to any project for which a notice of preparation, a notice of negative declaration, or a mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements.** If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. §800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments.

Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.

AB 52

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:

a. A brief description of the project.

b. The lead agency contact information.

c. Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).

d. A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code §21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or Environmental Impact Report. (Pub. Resources Code §21080.3.1(b)).

a. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:

a. Alternatives to the project.

b. Recommended mitigation measures.

c. Significant effects. (Pub. Resources Code §21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:

a. Type of environmental review necessary.

b. Significance of the tribal cultural resources.

c. Significance of the project's impacts on tribal cultural resources.

d. If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code §6254 (r) and §6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code §21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:

a. Whether the proposed project has a significant impact on an identified tribal cultural resource.

b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:

a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or

b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code §21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code §21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code §21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code §21084.3 (b). (Pub. Resources Code §21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:

a. Avoidance and preservation of the resources in place, including, but not limited to:

i. Planning and construction to avoid the resources and protect the cultural and natural context.

ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.

b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:

i. Protecting the cultural character and integrity of the resource.

ii. Protecting the traditional use of the resource.

iii. Protecting the confidentiality of the resource.

c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.

d. Protecting the resource. (Pub. Resource Code §21084.3 (b)).

e. Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).

f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:

a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.

b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.

c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code §65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf.

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).

2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.

3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).

4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:

- **a.** The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
- **b.** Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/.

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (https://ohp.parks.ca.gov/?page_id=30331) for an archaeological records search. The records search will determine:

- **a.** If part or all of the APE has been previously surveyed for cultural resources.
- **b.** If any known cultural resources have already been recorded on or adjacent to the APE.
- **c.** If the probability is low, moderate, or high that cultural resources are located in the APE.
- **d.** If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.

- **a.** The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
- **b.** The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:

a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.

b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.

a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, §15064.5(f) (CEQA Guidelines §15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.

b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.

c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code §7050.5, Public Resources Code §5097.98, and Cal. Code Regs., tit. 14, §15064.5, subdivisions (d) and (e) (CEQA Guidelines §15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions or need additional information, please contact me at my email address: Cameron.Vela@nahc.ca.gov.

Sincerely,

Cameron Vela

Cameron Vela
Cultural Resources Analyst

cc: State Clearinghouse

To: Paul Hellman[phellman@co.shasta.ca.us]
Cc: Knight, Eric@Energy[Eric.Knight@energy.ca.gov]; Anderson, Kari@Energy[Kari.Anderson@Energy.ca.gov]
From: Payne, Leonidas@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=AA9D25DDE24E40429EFA06C4EED35807-PAYNE, LEON]
Sent: Fri 12/1/2023 9:43:01 AM (UTC-08:00)
Subject: Fw: Fountain Wind Project--Notice of Preparation of EIR
TN252898_20231102T141040_Notice of Preparation of a Draft Environmental Impact Report.pdf

Problem corrected. Thanks for bringing this to our attention, Paul. We will docket this confirmation of receipt from the County Clerk.

Lon Payne—Project Manager
California Energy Commission

From: Aaron Joyner <ajoyner@co.shasta.ca.us>
Sent: Friday, December 1, 2023 9:34 AM
To: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: FW: Fountain Wind Project--Notice of Preparation of EIR

Hello Leonidas Payne,

The Shasta County Clerk's Office has received your email regarding the "Notice of Preparation of a Draft Environmental Impact Report". This email and attachment will suffice for the Shasta County Clerk's Office to post it in the Public Notice binder.

If you have any questions, please contact me.

Aaron Joyner
Clerk/ Election Specialist III
Ph. (530)225-5206

From: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Sent: Thursday, November 30, 2023 9:40 AM
To: County Clerk <countyclerk@co.shasta.ca.us>
Subject: Fountain Wind Project--Notice of Preparation of EIR

I have a document (attached) that I need to file with the Shasta County Clerk and I need confirmation of receipt. I do not see an electronic filing portal on the County Clerk website. Are there particular instructions I need to follow, or will this email suffice?

Leonidas Payne—Project Manager
California Energy Commission

299

Stop 1

Stop 2

Stop 6

PMM-F02

Stop 5

PMM-F03

PMM-M03

Stop 4 - Optional

Stop 3 - Optional

N

Each Square = 2 Sq. Mi

Scale: 1:60,000

- Starting Point
- Planned Stops
- Optional Stops
- End Point
- Site Visit Route
- Hatchet Ridge Turbine Location (Existing)
- Existing Transmission Line
- State Highway
- Project Area
- Met Tower Location
- Turbine Location
- Access Road
- Collection Line
- Batch Plant Location
- OM Location
- Staging Area Location
- Substation and Switchyard

To: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
From: Barns, Caitlin[Caitlin.Barns@stantec.com]
Sent: Wed 12/6/2023 1:10:48 PM (UTC-08:00)
Subject: RE: follow-up call this Fri or Mon?

Ok sounds good, and thanks for the letters!

From: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Sent: Wednesday, December 6, 2023 12:08 PM
To: Barns, Caitlin <Caitlin.Barns@stantec.com>
Subject: Re: follow-up call this Fri or Mon?

As for a meeting, I may not know if we have any DRs beyond what's being prepared for Water until late Monday. I'll give you an update when things become clearer.

From: Barns, Caitlin <Caitlin.Barns@stantec.com>
Sent: Wednesday, December 6, 2023 12:00 PM
To: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: follow-up call this Fri or Mon?

Hi Lon, can you and I and possibly Henry from ConnectGen get on the phone to better understand 1) what topics we might receive related to data requests [particularly CDFW's letter which includes items which may take us more than 30 days to address], and 2) whether we might be able to request to review the NAHC and Caltrans comment letters?

We're generally free between 11am and 2pm Fri 12/8 or 9am-4pm on Monday 12/11.

Thanks,
Caitlin

Caitlin Barns (she/her)
Senior Biologist
Mountain Region Ecosystems Group Leader
Portland, Oregon
503-207-4368

Stantec

To: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
Cc: 'Henry Woltag'[HWoltag@connectgenllc.com]
From: Eihnard Diaz[ediaz@diazplanning.com]
Sent: Mon 12/4/2023 9:28:50 AM (UTC-08:00)
Subject: Fountain Wind Project (23-OPT-01) Environmental Scoping and Informational Meeting
120423 EDiaz - CEC Fountain Wind Environmental Scoping Comment Letter No. 23-OPT-01.pdf

Good Morning, Mr. Payne,

Attached for your review and consideration are my comments regarding the Fountain Wind Project (23-OPT-01) being submitted for the Environmental Scoping and Informational Meeting held on November 28, 2023. Unfortunately, I was out of town the entire week and could not attend. I tried to attend the meeting via Zoom to submit some of my comments over the three-minute period, but I was unable to do so. However, I was pleased that we are being allowed to submit comments by today, December 4, before 5:00 AM.

I submitted the attached comment letter to the Docket earlier this morning, but I wanted to make sure the letter was provided to you, similar to the Department of Fish and Wildlife's comment letter submittal to you dated November 30, 2023.

Your review of the attached letter is appreciated.

Cordially,

Eihnard

Eihnard Diaz
Diaz Associates
4277 Pasatiempo Ct.
Redding, CA 96002
(530) 949-9810 - Cell
ediaz@diazplanning.com

To: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
From: Aaron Joyner[ajoyner@co.shasta.ca.us]
Sent: Fri 12/1/2023 9:34:15 AM (UTC-08:00)
Subject: FW: Fountain Wind Project--Notice of Preparation of EIR
TN252898_20231102T141040_Notice of Preparation of a Draft Environmental Impact Report.pdf

Hello Leonidas Payne,

The Shasta County Clerk's Office has received your email regarding the "Notice of Preparation of a Draft Environmental Impact Report". This email and attachment will suffice for the Shasta County Clerk's Office to post it in the Public Notice binder.

If you have any questions, please contact me.

Aaron Joyner
Clerk/ Election Specialist III
Ph. (530)225-5206

From: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Sent: Thursday, November 30, 2023 9:40 AM
To: County Clerk <countyclerk@co.shasta.ca.us>
Subject: Fountain Wind Project--Notice of Preparation of EIR

I have a document (attached) that I need to file with the Shasta County Clerk and I need confirmation of receipt. I do not see an electronic filing portal on the County Clerk website. Are there particular instructions I need to follow, or will this email suffice?

Leonidas Payne—Project Manager
California Energy Commission

To: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
Cc: Grah, Kathy M@DOT[kathy.grah@dot.ca.gov]; Babcock, Kelly M@DOT[kelly.babcock@dot.ca.gov]
From: Battles, Michael@DOT[Michael.Battles@dot.ca.gov]
Sent: Mon 12/4/2023 4:05:23 PM (UTC-08:00)
Subject: Caltrans Comments-Fountain Wind Project, NOP of Draft EIR
Drainage Info-Caltrans.pdf

Good afternoon,

Thank you for the opportunity to review and comment on the Notice of Preparation for the Draft EIR for the proposed Fountain Wind Project in Shasta County. Caltrans District 2 functional units staff have the following comments:

1. If the proposed project contains areas that drain to the State Highway System (SHS) Right-of-Way, a drainage report is required, which shows no increase in flow to Caltrans drainage systems, or that demonstrates that Caltrans drainage systems are adequate to carry the increased flow. Caltrans criteria for a drainage report can be found in the attached document.
2. If appropriate, Caltrans requires plans that show how debris control will be addressed so that Caltrans channels and culvert inlets are not obstructed.
3. The project proponent shall provide a memo style safety analysis of planned State Route access points. This memo shall indicate the types of traffic entering and exiting each access point, the Postmiles of these access points, approximate volumes, sight distance, and a safety assessment. If potential safety concerns are identified, the memo shall include a list of potential mitigations, including revised temporary signing, traffic control, and the clearing of obstructions.
4. Detail showing road connections, including weather these connections are new or existing road connections.
5. A list of Best Management Practices (BPM's) which will be utilized to control dust and mud accumulation onto State Route 299.

Once again, thank you for the opportunity to review and comment on the proposed Fountain Wind Project.

Sincerely,

Michael Battles, M.P.A.
Associate Transportation Planner
Local Development Review Coordinator
Regional Planning and Local Development Review
Caltrans District 2

Required Information for Drainage Review

A Drainage Report shall be submitted that clearly defines the scope of the project related to the existing and proposed drainage. The level of detail in the report should be commensurate to the complexity of the proposed project and should contain summaries of the input parameters as well as the results of calculations. Calculations for each drainage basin, drainage system, and individual drainage unit must accompany the Drainage Report, application and plans. The calculations and report must be signed, checked, dated, and stamped by a registered Civil Engineer. Following is an outline of the items typically included in a Drainage report.

Hydrology:

1. Drainage Basin Maps for the before and after project conditions (contours at a reasonable scale).

    a. Before Condition (Existing/Pre-Development) – drainage basin(s) delineated and labeled, major features labeled, and flow direction arrows.

    b. After Condition (Post- Development) – same info as above reflecting project changes in land use and improvements. Submit grading and drainage plans.

    c. Points of concentrations, and outfalls shall be indicated and include flow direction.

2. Hydrology Summary Tables: Include Pre- Development and Post- Development flow quantities, time of concentration, drainage basin characteristics, area, slopes, soil types, vegetative cover, storage, present usage, runoff coefficient, etc.

3. Applicant shall use California Department of Transportation Drainage Design Standards in Chapter 800 of the Highway Design Manual when connecting or draining to the State Highway Drainage Facilities. The applicant may use local agency standards when they meet or exceed State standards.

Hydraulics: Show all affects of proposed changes on State Highway drainage structures from the "before condition" to the "after condition" including but not limited to:

1. **Cross Drains and Storm drain networks in the State Right of Way:**

    Typically designed for 10-yr (to the soffit) and 100-yr flows (with no objectionable flooding) include headwater or hydraulic grade line produced referenced to the invert of system. Include the available headwater at the culvert or drainage inlet, size, slope, end treatments and type of culvert. Culverts that run longitudinal to the State Highway across a road connection are typically designed for a 25-year flow.

2. **Gutters, ditches, and drainage inlets in the State Right of Way:**

    Typically designed for 25-yr flows (where traffic speed exceeds 45 mph) to not encroach on the traveled way. Include spread, intercept, and bypass information for each drainage inlet. Equations to determine these parameters are in FHWA's HEC 22.

Required Information for Drainage Review

3. **Detention or Retention facility:**

   Include design storm method, table or graph of the inflow and outflow hydrograph(s), the depth vs. storage of the facility, and the configuration of the outfall structure with its stage discharge relationship. Include a table of volume stored at each time step.

4. **"Master" Plan:**

   State what agencies were contacted and the impacts the project will have on the downstream drainage.

Drainage Report Narrative: The Drainage Report should include a narrative section describing the project and any effects to drainage. State all relevant assumptions. This section can also explain any historical issues or special aspects of the drainage design.

Historic Drainage patterns should be perpetuated, or drainage systems analyzed to show that there are no impacts or the impacts are mitigated (capacity, velocity related to flooding and erosion). Is a Master plan available?

We recommend considering detention facilities be designed to reduce a project's impact, but the designer should consider that detention facilities low in a watershed could cause detrimental effects if their release increases the peak flow of the overall watershed.

Will the proposed development impact a FEMA-mapped floodplain or other floodplain? Will it cause an increase in floodwater depth that would affect State assets or the assets of others?

Caltrans' primary concern is the safety of the traveling public and protection of facilities within the State's right of way. The State is also concerned about the impact to adjacent and downstream properties.

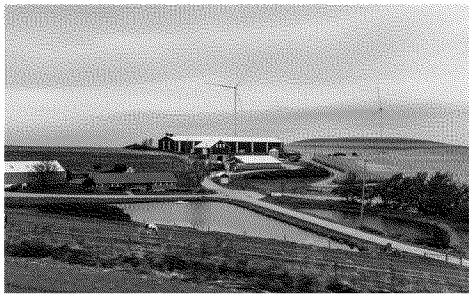
To: Barns, Caitlin (Caitlin.Barns@stantec.com)[Caitlin.Barns@stantec.com]
From: Payne, Leonidas@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=AA9D25DDE24E40429EFA06C4EED35807-PAYNE, LEON]
Sent: Wed 12/6/2023 12:13:52 PM (UTC-08:00)
Subject: NAHC input
2023110139_NAHC Comment.pdf

letter attached.

Wind Turbines and Shadow Flicker: Facts and Proven Mitigation Strategies

November 2020

As wind development continues to grow and expand into new regions, the industry understands community concerns regarding potential shadow flicker from wind turbines. Wind developers prioritize being a good neighbor and long-term partner with host communities and recognize the need to collaborate with community members on wind turbine siting to limit potential impacts. The overwhelming majority of homes within a project footprint usually do not experience any shadow flicker.



What is Shadow Flicker?

Shadow Flicker occurs when rotating wind turbine blades pass between the sun and an individual's home, casting a periodic shadow that may result in a flickering phenomenon. However, it cumulatively only occurs for a few hours per year. Shadow flicker is more common around sunrise and sunset when the shadows are long since the sun is low on the horizon. Shadow flicker duration can be longer at high latitudes due to the sun's low position on the horizon, which results in longer shadows[1].

The orientation of and the distance between the wind turbine and a home affect the perception and intensity of the shadows cast by the blades. The closer the home is to the wind turbine the more intense the shadow flicker appears. However, obstacles including vegetation, terrain, or other structures between receptors and wind turbines may greatly reduce or eliminate shadow-flicker at the receptor. It is important to note that shadow flicker does not occur when fog or clouds obscure the sun, or when turbines are not operating. As the sun's position changes seasonally, the potential for shadow flicker may be limited to certain months.

Modeling and Mitigation

Shadow flicker can be minimized with proper planning and siting. The duration of shadow flicker in hours per year can be calculated using software routinely used in wind energy project design. These models can provide the results in graphical and tabular format. The models incorporate project information such as proposed wind turbine locations, along with homes and other potentially sensitive locations; site topography data; weather data; and wind turbine dimensions (e.g., hub height and rotor diameter). Because developers have techniques to model the potential shadow flicker at neighboring residences, they can often adjust wind turbine locations to reduce the shadow flicker. However, given the spacing requirements between turbines as well as the presence of scattered residences in rural areas, it is difficult to reduce shadow flicker to zero hours at all residences.

A study funded by the Department of Energy's Office of Energy Efficiency and Renewable Energy investigated the impacts of shadow flicker to residents living within 1 mile of the nearest wind turbine around 15 wind farms. They reported "Relatively few participants perceived shadow-flicker on their property, particularly in the U.S."[2]

---

[1] U.S. Department of Energy (DOE). 2015. Wind Vision: A New Era for Wind Power in the United States. Accessed October 5, 2020: https://www.energy.gov/sites/prod/files/2015/03/f20/wv_full_report.pdf

[2] Gundula Hübner, Johannes Pohl, Ben Hoen, Jeremy Firestone, Joseph Rand, Debi Elliott, Ryan Haac. 2019. Monitoring annoyance and stress effects of wind turbines on nearby residents: A comparison of U.S. and European samples. Accessed October 30, 2020: https://www.sciencedirect.com/science/article/pii/S0160412018323353.

Shadow Flicker Is Not A Health Concern

In 2012, the Massachusetts Department of Environmental Protection, in collaboration with the Massachusetts Department of Public Health, commissioned a study that included a panel of independent experts to identify any documented or potential health impacts that may be associated with exposure to wind turbines.[3] The panel of experts concluded that there is no scientific evidence to suggest that shadow flicker negatively effects health.

Some people have wondered if shadow flicker can increase risk of seizures in the small percentage of those people with photosensitive epilepsy. Photosensitive epilepsy affects approximately 3 percent of people with epilepsy, where flashing lights can trigger seizures . The Epilepsy Foundation reports:

"Generally, flashing lights most likely to trigger seizures are between the frequency of 5 to 30 flashes per second (Hertz)."[4]

The Massachusetts study found that for these individuals, shadow flicker from wind turbines does not pose a seizure risk due to the fact that shadow flicker from modern commercial wind turbines occurs at "flash" frequencies between 0.3 and 1 Hertz. Massachusetts Institute of Technology (MIT) researchers also concluded shadow flicker "would pose negligible risk to developing a photoepileptic seizure."[5]

Industry Position

The industry understands neighboring residents may have concerns about shadow flicker. Throughout the United States a common regulatory target is 30 hours per year at homes, which represents less than 0.3 percent of annual daylight hours. The target of 30 hours per year is based on an expected or realistic scenario incorporating cloud cover and operational statistics. This results in an acceptable balance of those wishing to host turbines on their land and their neighbors, and it means homes in proximity to wind turbines will not experience shadow flicker 99.7 percent of the year. Therefore, the industry recommends a limit of no less than 30 hours per year at a nonparticipating home.

For more information email Hilary Clark, Social License Director, Siting and Asset Management, hclark@cleanpower.org

3 Wind Turbine Health Impact Study: Report of Independent Expert Panel. Prepared for: Massachusetts Department of Environmental Protection Massachusetts Department of Public Health, January 2012. Accessed October 6, 2020: https://www.mass.gov/doc/wind-turbine-health-impact-study-report-of-independent-expert-panel/download.

4 Epilepsy Foundation.

5 Robert J. McCunney, MD, MPH, Kenneth A. Mundt, PhD, W. David Colby, MD, Robert Dobie, MD, Kenneth Kaliski, BE, PE, and Mark Blais, PsyD. 2014. Wind Turbines and Health. A Critical Review of the Scientific Literature. Accessed October 30, 2020: https://journals.lww.com/joem/Fulltext/2014/11000/Wind_Turbines_and_Health__A_Critical_Review_of_the.9.aspx.

To: Barns, Caitlin[Caitlin.Barns@stantec.com]
From: Payne, Leonidas@Energy[/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=aa9d25dde24e40429efa06c4eed35807-Payne, Leon]
Sent: Tue 12/12/2023 8:18:31 AM (UTC-08:00)
Subject: Re: FWP | checking in
25519 and 25538 Notice to Shasta County.pdf

Here's that Jan 25 notice email (attached).

From: Barns, Caitlin <Caitlin.Barns@stantec.com>
Sent: Monday, December 11, 2023 9:16 AM
To: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: FWP | checking in

Hi Lon,

Any insights into the data requests that will be coming to us this week? Let me know if any of them might require more than 30 days to respond, i.e., any of CDFW's request for additional surveys.

Also, we're doing some following up internally on some of the items raised in Shasta County's most recent letter. Would you be able to send me a copy of the email you sent to Paul Hellman (and other agencies) on January 25, 2023 notifying them of the project?

Thanks!
Caitlin

Caitlin Barns (she/her)
Senior Biologist
Mountain Region Ecosystems Group Leader
Portland, Oregon
503-207-4368

Stantec

To: Chris Huntley[chuntley@aspeneg.com]; Hawk, Debra@Wildlife[Debra.Hawk@Wildlife.ca.gov]; Knight, Eric@Energy[Eric.Knight@energy.ca.gov]; Watson, Carol@Energy[Carol.Watson@energy.ca.gov]; Leane Dunn[ldunn@aspeneg.com]
From: Iacona, Erika@Wildlife[Erika.Iacona@Wildlife.ca.gov]
Sent: Fri 12/15/2023 3:25:18 PM (UTC-08:00)
Subject: RE: Fountain Wind DR
Data Requests_FW_Bio_2023-12-14 dh.docx

Hi Chris,
Please see the attached data request with Debra's comments. I did not include revisions or comments within the document however, I do recommend including the following, which are detailed in the CDFW NOP comment letter:

1. Adding a request to update all special status species lists and reevaluate such species with potential to occur based on current information.
2. Adding a request to perform biological surveys for those species that have been included in the updated potential-to-occur list (i.e., Bumble bees).
3. Adding a request to update biological surveys to account for changes over elapsed time.
4. Based on our phone conversation, adding a request for a plan outlining the parallel efforts of biological surveys and the formulation of impact analyses for the DEIR.

Thank you for the collaboration on this!
Erika

--
Erika Iacona
Senior Environmental Scientist, Specialist
R1 Interior Habitat Conservation Planning
(530) 806-1389
601 Locust Street
Redding, CA 96001
CALIFORNIA DEPARTMENT OF FISH and WILDLIFE

From: Chris Huntley <Chuntley@aspeneg.com>
Sent: Friday, December 15, 2023 9:16 AM
To: Hawk, Debra@Wildlife <Debra.Hawk@Wildlife.ca.gov>; Iacona, Erika@Wildlife <Erika.Iacona@Wildlife.ca.gov>; Knight, Eric@Energy <Eric.Knight@energy.ca.gov>; Watson, Carol@Energy <Carol.Watson@energy.ca.gov>; Leane Dunn <LDunn@aspeneg.com>
Subject: Fountain Wind DR

Debra and Erika,

Please take a look at our DR and see if you have anything to add or any suggested revisions. Last minute but if we could get your feedback today that would be wonderful.

Best,

Chris

Aspen environmental group

Chris Huntley
Executive Vice President
Biological Resources Director
www.aspeneg.com

5020 Chesebro Road, Suite 200
Agoura Hills, CA 91301
Cell: 818-292-2327

To: Knight, Eric@Energy[Eric.Knight@energy.ca.gov]
Cc: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
From: Energy - STEP Siting[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=14E6AC2919EC428BB3378E30CE9A58E9-ENERGY - ST]
Sent: Mon 12/18/2023 6:24:59 PM (UTC-08:00)
Subject: FW: night sky comments on Fountain Wind project near two National Park sites
Fountain Wind LAVO&WHIS comments 12-15-23.pdf
LAVO070716_LassenPeakDarkSkyReport_Attachment_I.pdf
Sustainable Outdoor Lighting Principles_Attachment_II.pdf
RP-43-22 Lighting Exterior Applications_Attachment_III.pdf

From: Richardson, James F <Jim_Richardson@nps.gov>
Sent: Monday, December 18, 2023 5:05 PM
To: Energy - STEP Siting <STEPsiting@energy.ca.gov>
Cc: Hoines, Josh D <josh_hoines@nps.gov>
Subject: night sky comments on Fountain Wind project near two National Park sites

Hello Leonidas,
Attached please find a letter and 3 documents related to the night sky impacts to this project's surrounding community including the two National Park sites close to the project. I have also submitted this letter to the CEC project website but it would accept only one upload attachment which was the letter. Thank you for your consideration.

Sincerely,

Jim Richardson

Park Superintendent
Lassen Volcanic National Park
PO Box 100
Mineral, CA
530 595-6101, cell 530 604-3410

'May your trails be crooked, winding, lonesome, dangerous, leading to the most amazing view' - *Edward Abbey*

United States Department of the Interior

Lassen Volcanic National Park
Pacific West Region
38050 Hwy 36 E
Mineral, CA 96063

IN REPLY REFER TO:

(LAVO-L76) ELECTRONIC SUBMISSION ONLY

California Energy Commission
Fountain Wind Project comments
715 P Street
Sacramento, California 95814

Dear California Energy Commission:

Lassen Volcanic National Park and Whiskeytown National Recreation Area are within the potential maximum viewshed of the proposed Fountain Wind Project. We would like to collaborate with you to develop measures that would protect night skies within Lassen and Whiskeytown from possible impacts associated with this development. Protection of night skies is important to the visitor experience of park visitors, as well as for surrounding public lands and nearby communities.

At both parks, protecting photic resources, lightscapes, and naturally dark skies is related to the following park priorities:

- Ability to enhance visitor experience;
- Interpretive programs to highlight night sky resources; and
- Nighttime setting in the parks as experienced by hikers, campers, and stargazers.

Both Lassen and Whiskeytown are great places to learn about and enjoy the dark night sky. Stargazing events are the most popular ranger-led activity at Lassen, and the significance of preserving the night sky is further demonstrated in the park's annual Dark Skies Festival that attracts thousands of visitors, scientists, and partners. An NPS viewshed analysis indicates that this project will be visible from Lassen Peak. The current Hatchet Ridge Wind project is directly visible from Lassen Peak and from several locations within Whiskeytown. Previously measured night sky conditions ranked Lassen Peak as one of the darkest locations in the national park service.

The biggest threat to dark night skies is artificial lighting from nearby developments. Flashing red lights at the Hatchet Ridge Wind Project have caused some impacts to the night sky viewing experience at both Lassen and Whiskeytown, and we are concerned that the proposed Fountain Wind Project could introduce more impacts with the addition of artificial lights. We understand the requirement for safety lights to be included as required by the Federal Aviation Administration and look forward to working with you to explore mutually satisfactory measures that can help reduce impacts.

Recommendations:

The NPS recommends the use of an Aircraft Detection Lighting system (ADLS) as allowed by current FAA guidelines which will be important for reducing artificial light impacts to the night sky and nocturnal wildlife. To fully anticipate potential changes to the nighttime scene the NPS requests a lighting management plan be developed. Furthermore, given that the permanent turbine lighting, temporary construction lighting and associated facility lighting would have night sky effects, the NPS requests that the lighting management plan follow the NPS Sustainable Lighting Guidelines to minimize impacts. For prescriptive design of facility lighting we recommend the use of IES RP-43-22 Lighting Zone 1 Low. Lighting Zone 1 Low recommendations are in keeping with NPS guidance and are appropriate given natural levels of ambient light of the project area.

Sincerely,

JAMES RICHARDSON Digitally signed by JAMES RICHARDSON Date: 2023.12.18 13:57:21 -08'00'

Jim Richardson
Superintendent
Lassen Volcanic National Park
Lavo_superintendent@nps.gov
(530) 595-6101

JOSH HOINES Digitally signed by JOSH HOINES Date: 2023.12.18 14:47:04 -08'00'

Josh Hoines
Superintendent
Whiskeytown National Recreation Area
whis_superintendent@nps.gov
(530) 242-3460

Cc: Leonidas Payne, CEC Project Manager, STEPsiting@energy.ca.gov

Attachments: (3)

NPS NIGHT SKIES PROGRAM DATA NIGHT REPORT

LAVO070716 Lassen Volcanic NP **Lassen Peak** **16-Jul-07**

Data Night Attributes

Longitude:	-121.50762	Camera:	SBIG 1	Air temp. (C):	7.2	ZLM:	7.60	OBS_1:	D Duriscoe
Latitude:	40.48660	# of sets:	3	R. H. (%):	22.0	BORTLE:	3	OBS_2:	
Elevation (m):	3165	Exposure (secs):	12	Wind Speed (mph):	10	SQM:		OBS_3:	

NARRATIVE: Windy, with fair seeing, but pretty good transparency (visibility 100+ miles) some fire smoke layered haze, large fire to the north but smoke plume under 3 degrees. Very dark at start (not much airglow), but sky brightens significantly as night progresses. Wind variable, from 6 to 20 mph, gusts to 25 making visual observations difficult. Nevertheless, mag 7.6 reached at 20 percent. From this high vantage point, many cities can be located, including direct glare of Chester and Susanville to the east, but their skyglow is minor. However, unshielded lights in Chester appear brighter than Venus, even though they are below the true horizon they can affect night vision.

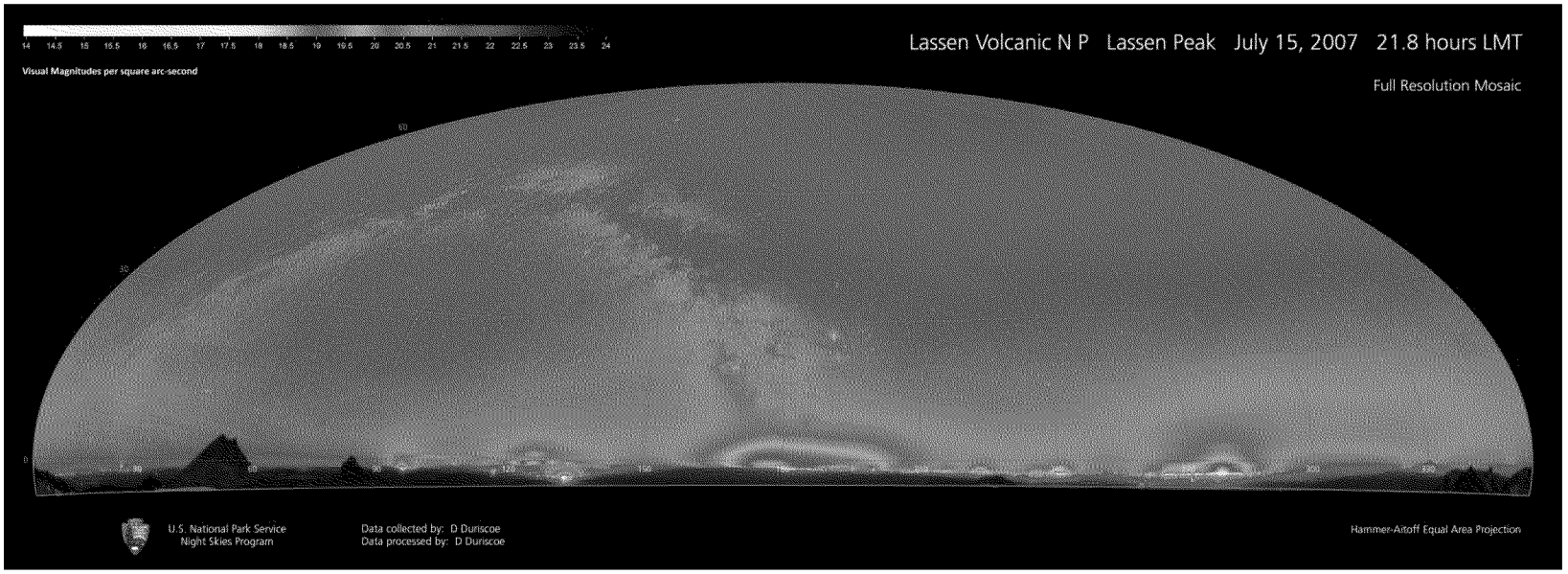
Data Set Attributes

	Quality Flags				Natural Sky Model			Extinction				Collection Properties			
Data Set	Use-able	Col-lection	Pro-cessing	Atmo-sphere:	Zenith airglow (µcd/m²)	Fit quality	Natural sky model fit notes	Ext. coeff. (mag/ airmass)	Std err Y	# stars used	# stars reject	% Clouds	Ave. Point Error	Max Point Error	total bias drift
1	Y	4	4	4	73	4	variable airglow but good	0.114	0.03	65	2	0	0.44	0.77	2.0
2	Y	4	4	4	89	5	excellent fit	0.117	0.03	82	2	0	0.44	0.76	1.8
3	Y	4	4	4	111	3	banded airglow	0.116	0.03	60	2	0	0.43	0.76	1.8

Populated Places

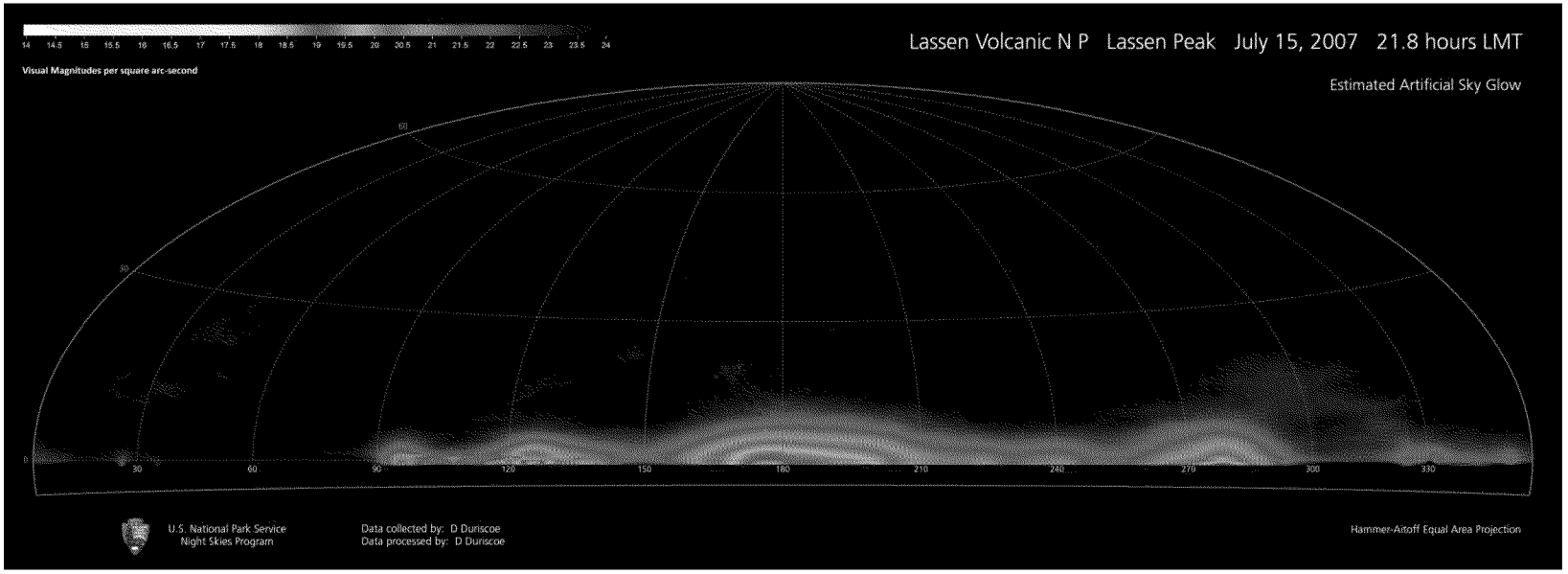
Place	Population (2010)	Distance (km)	Azimuth	Walker's	Apparent Half-Width (degrees)
Redding city	89,861	73.0	277	0.198	5.5
Chico city	86,187	85.5	198	0.128	3.5
Sacramento city	466,488	213.4	179	0.070	2.4
Shingletown CDP	2,283	29.5	274	0.048	8.7
Reno city	225,221	185.4	127	0.048	2.8
Paradise town	26,218	81.8	186	0.043	2.7
Chester CDP	2,144	31.1	131	0.040	4.5
San Jose city	945,942	355.5	184	0.040	1.9
San Francisco city	805,235	333.6	204	0.040	1.1
Susanville city	17,947	74.4	94	0.038	2.0
Mineral CDP	123	10.6	215	0.034	29.8
Red Bluff city	14,076	71.2	241	0.033	2.0
Anderson city	9,932	66.8	267	0.027	2.0
Magalia CDP	11,310	74.6	187	0.023	2.6
Oakland city	390,724	308.2	192	0.023	1.3
Yuba City city	64,925	150.7	184	0.023	1.3
Roseville city	118,788	192.0	175	0.023	1.6
Stockton city	291,707	279.4	177	0.022	1.5
Burney CDP	3,154	46.9	343	0.021	2.5
Shasta Lake city	10,164	76.5	287	0.020	2.2
Sparks city	90,264	184.0	123	0.020	1.7
Elk Grove city	153,015	230.5	177	0.019	1.5
Santa Rosa city	167,815	248.9	205	0.017	1.3
Citrus Heights city	83,301	200.0	175	0.015	1.0
Arden-Arcade CDP	92,186	209.6	177	0.015	1.0

LAVO070716 Date (LMT) 15-Jul-07 Time (LMT): 21.81



PHOTOMETRY OF ALL SOURCES

Average Sky Luminance (mag arcsec^{-2})	Average Sky Luminance (µcd/m^2)	Zenith Luminance (mag arcsec^{-2})	Zenith Luminance (µcd/m^2)	Brightest luminance (mag arcsec^{-2})	Brightest lumininance	Synthetic SQM (mag arcsec^{-2})	Total luminous emittance (mags)	Illuminance (mlux) Horizontal	Max Vert
21.26	339	22.04	166	15.28	83,822	21.69	-7.40	0.839	0.753



PHOTOMETRY OF ARTIFICIAL SKYGLOW

Sky Quality Index (SQI)	Average Sky Luminance (µcd/m^2)	Average Sky Luminance to zenith angle 80°	Average Sky Luminance to zenith angle 70°	Zenith Luminance	Brightest lumininance (µcd/m^2)	All-sky light pollution ratio (ALR)	Total luminous emittance (mags)	Illuminance (mlux) Horizontal	Max Vert
94.6	38	3.5	0.6	1	4,048	0.15	-4.94	0.013	0.152

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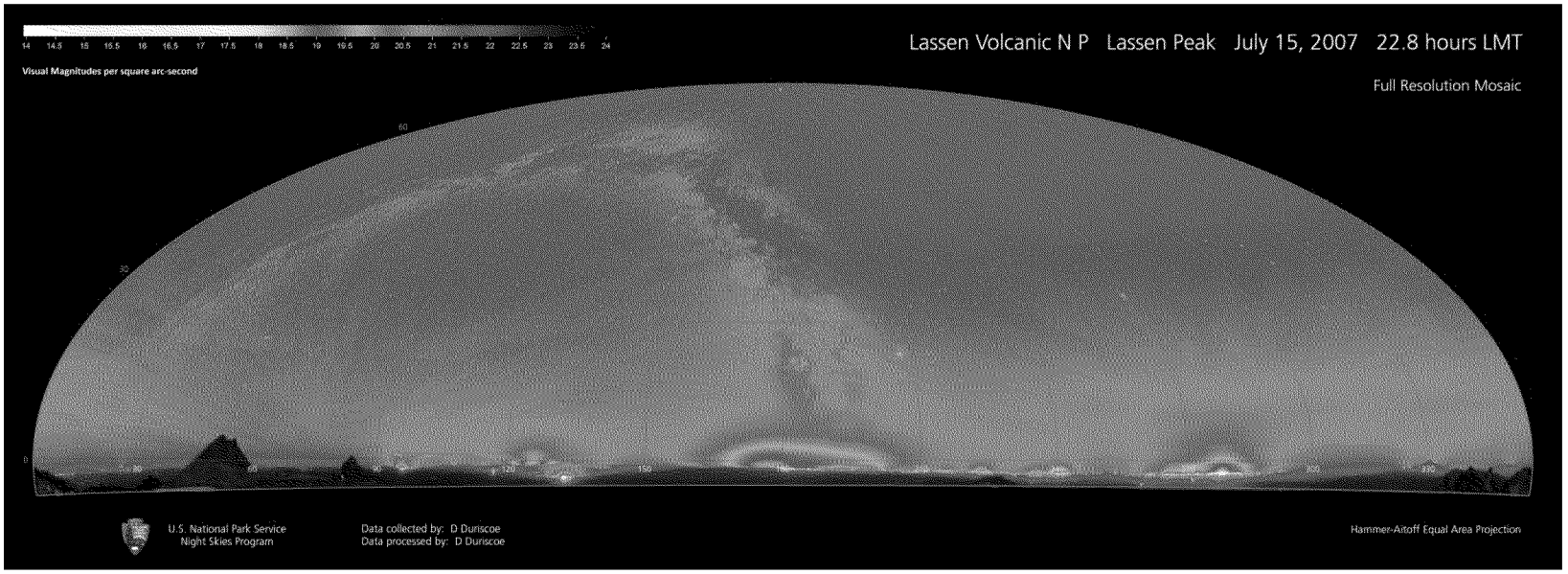
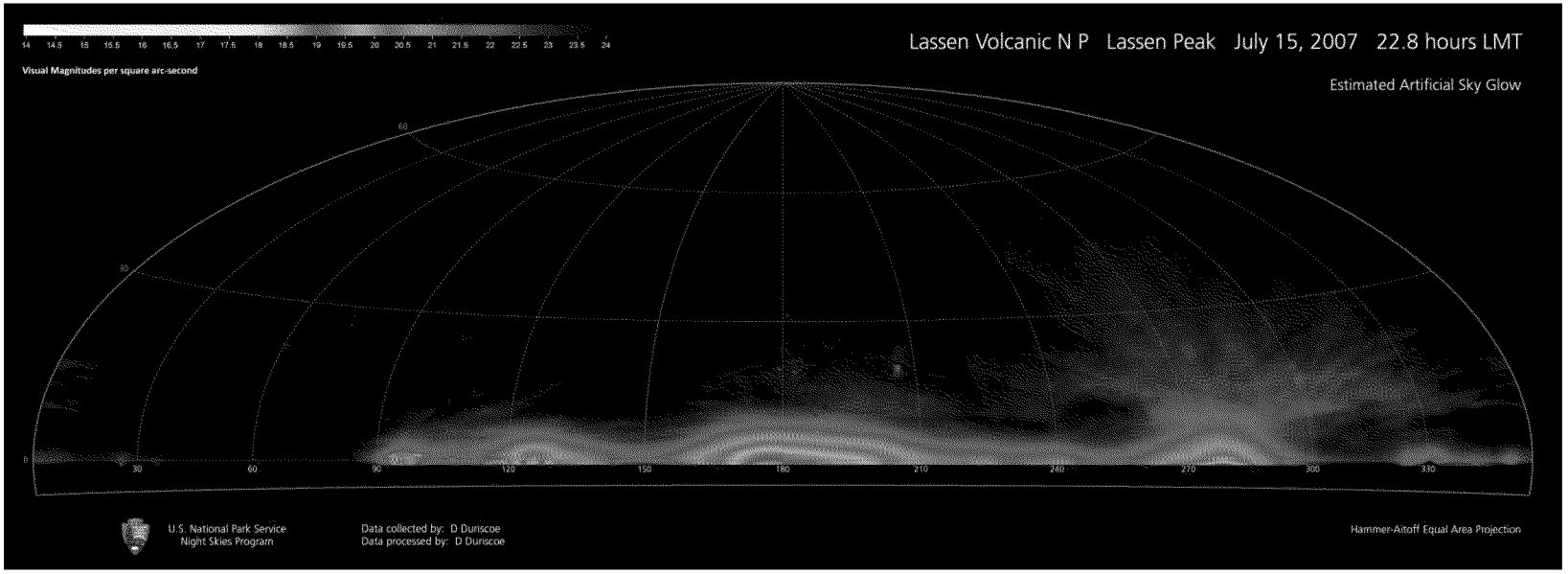


PHOTOMETRY OF ALL SOURCES

Average Sky Luminance (mag arcsec^{-2})	Average Sky Luminance (µcd/m^2)	Zenith Luminance (mag arcsec^{-2})	Zenith Luminance (µcd/m^2)	Brightest luminance (mag arcsec^{-2})	Brightest lumininance	Synthetic SQM (mag arcsec^{-2})	Total luminous emittance (mags)	Illuminance (mlux) Horizontal	Max Vert
21.18	366	21.78	210	15.28	83,822	21.57	-7.47	0.929	0.806



PHOTOMETRY OF ARTIFICIAL SKYGLOW

Sky Quality Index (SQI)	Average Sky Luminance (µcd/m^2)	Average Sky Luminance to zenith angle 80°	Average Sky Luminance to zenith angle 70°	Zenith Luminance	Brightest lumininance (µcd/m^2)	All-sky light pollution ratio (ALR)	Total luminous emittance (mags)	Illuminance (mlux) Horizontal	Max Vert
92.7	45	12.9	7.3	5	4,099	0.18	-5.11	0.033	0.159

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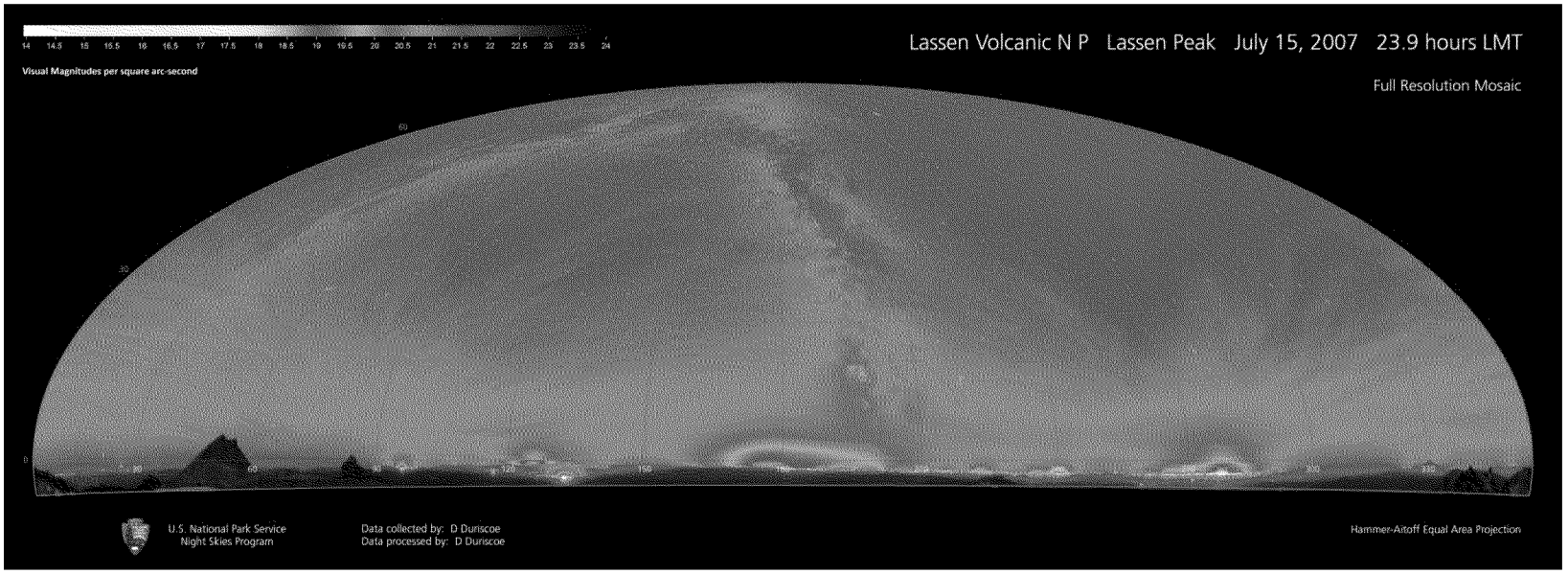
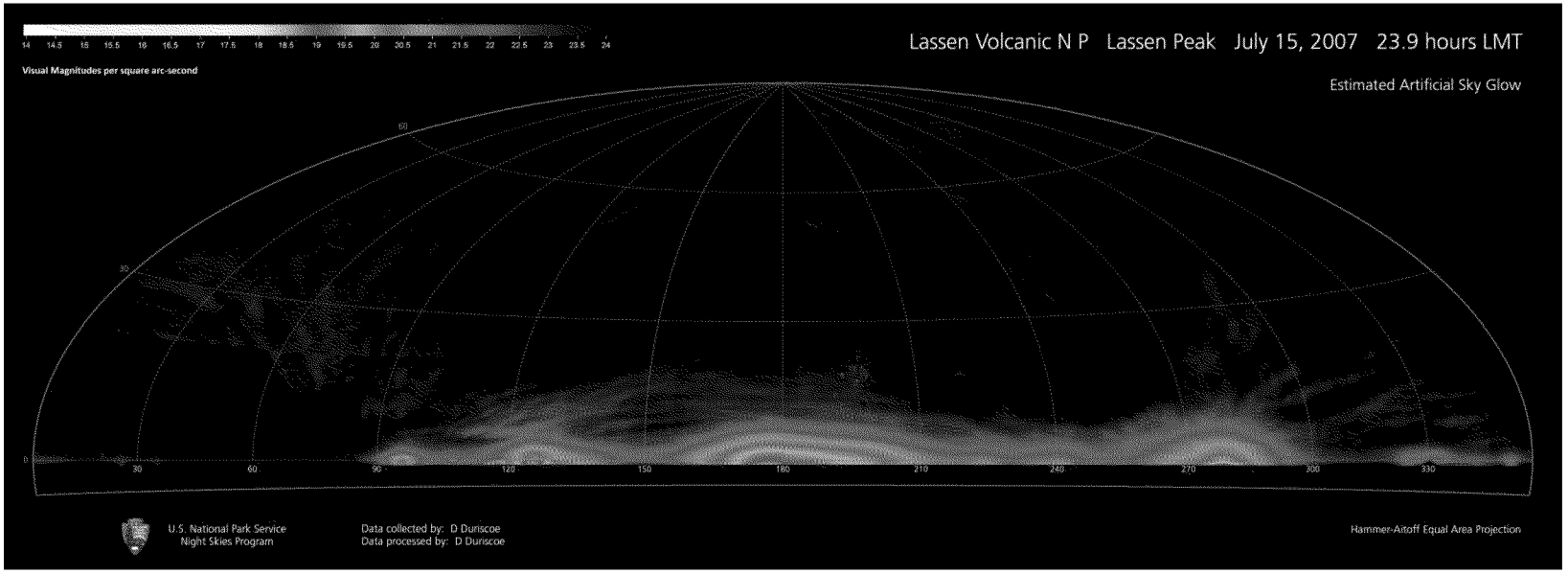


PHOTOMETRY OF ALL SOURCES

Average Sky Luminance (mag arcsec^{-2})	Average Sky Luminance (µcd/m^2)	Zenith Luminance (mag arcsec^{-2})	Zenith Luminance (µcd/m^2)	Brightest luminance (mag arcsec^{-2})	Brightest lumininance	Synthetic SQM (mag arcsec^{-2})	Total luminous emittance (mags)	Illuminance (mlux) Horizontal	Max Vert
21.09	397	21.32	321	15.28	83,822	21.44	-7.55	1.033	0.850



PHOTOMETRY OF ARTIFICIAL SKYGLOW

Sky Quality Index (SQI)	Average Sky Luminance (µcd/m^2)	Average Sky Luminance to zenith angle 80°	Average Sky Luminance to zenith angle 70°	Zenith Luminance	Brightest lumininance (µcd/m^2)	All-sky light pollution ratio (ALR)	Total luminous emittance (mags)	Illuminance (mlux) Horizontal	Max Vert
94.0	37	8.4	6.1	18	3,720	0.15	-4.92	0.029	0.140

Sustainable Outdoor Lighting Principles

The National Park Service recognizes that natural lightscapes and dark night skies are critical for natural and cultural resources, the visitor experience, and astronomy-based recreation and interpretive programming. National Park Service managers and staff work to protect natural lightscapes by minimizing light that emanates from park facilities, and seek the cooperation of park visitors, neighbors, and state and local governments to prevent or minimize light pollution that can affect park ecosystems (*NPS Management Policies 4.10).* Outdoor lighting often obscures natural darkness. To reduce the effects of light pollution and restore natural lightscapes in national parks, working with partners and gateway communities, the national park service developed a set of science-based principles for sustainable outdoor lighting.

Further information regarding specific effects that light pollution can have on wildlife and other natural and cultural resources, as well as human health and visitor experience can be found on our Night Sky as a Resource and Value page.

Benefits of Sustainable Outdoor Lighting (Park Friendly Lighting)

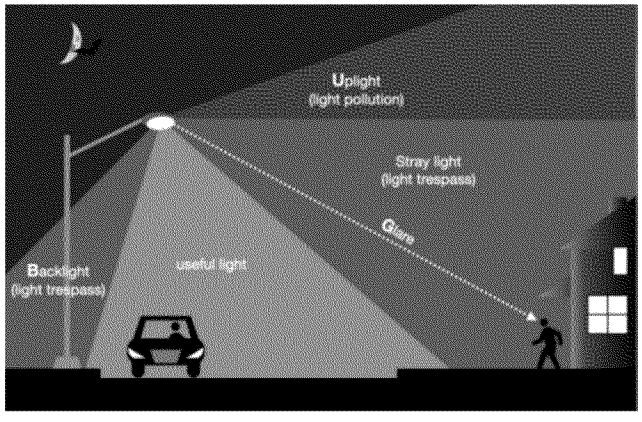
When properly designed and installed, outdoor lighting has many benefits, including:

- Improves energy efficiency
- Enhances human health
- Preserves night skies
- Minimizes Impacts to Wildlife and Visitors
- Reduces operational and cyclic maintenance costs
- Provides for basic human safety
- Reduces carbon footprint
- Enhances wilderness character
- Enhances historic authenticity
- Provides opportunities for economic development through astronomy-based tourism

Sustainable Outdoor Lighting Principles

To recognize the benefits of sustainable outdoor lighting, NPS recommends the following basic principles.

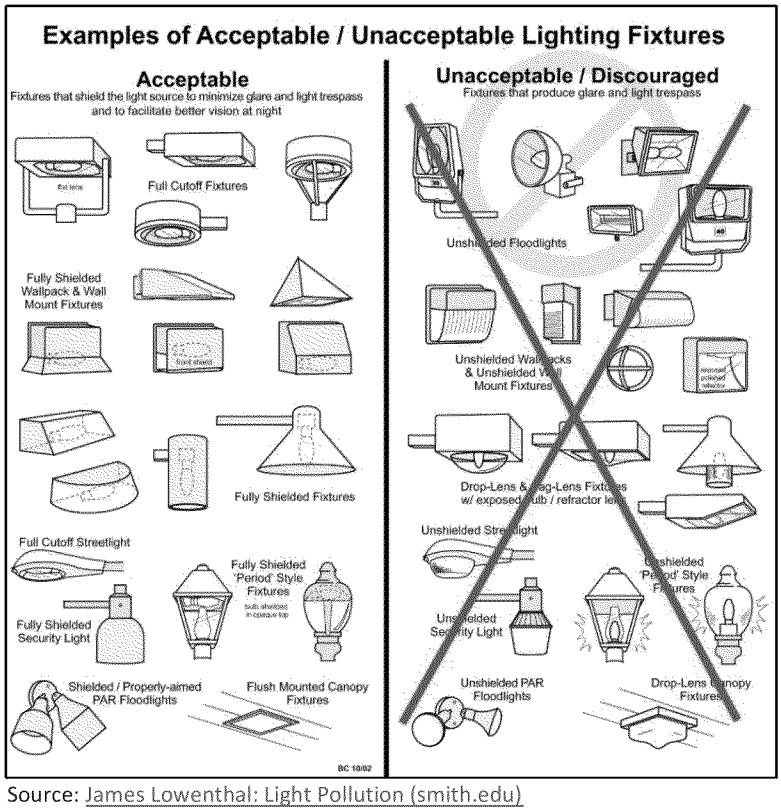
1. **Ensure the Lighting is Necessary** – the first question in considering what type of outdoor lighting is appropriate for an area or structure/facility in a national park is whether there even needs to be a light at all. In many cases, reflective tape, paint, or reflective surfaces can be used instead (this is a good option for roadways, parking areas, and trails where people will have headlamps, flashlights, and cell phone lights).



2. **Light Only Where Needed** – When lighting is necessary, identify the task area that needs to be illuminated. Lights should be selected and installed with proper height and light distribution to

prevent light spill or trespass beyond the task area. LED technology allows for a wide range of light distributions and control making it possible to tailor lighting to a specific task.

3. **Use Recessed and Fully Shielded Fixtures** – A fully shielded or full cut-off fixture emits light downward onto the task area and not into the sky. A shielded fixture ensures the light source (bulb or LED) is recessed within the housing so no portion of the bulb is visible at eye level. Globes or diffusers that hang below the light fixture emit a great deal of light upward into the sky causing an inordinate amount of glare that degrades visual performance and should be avoided. Lights that are directed laterally such as floodlights should also be avoided.



Source: James Lowenthal: Light Pollution (smith.edu)

4. **Use Light Only When Needed –** Fixtures that include or can accommodate lighting controls such as timers, motion detectors, and dimmers ensure the appropriate amount of light is used when needed. These technologies can increase energy efficiency and reduce impacts to park natural and cultural resources.

5. **Minimum Light Level Necessary** – The amount of light needed to safely illuminate an area for a given task in a park is often much lower than that needed for urban environments. Increasing light output does not necessarily equate to a safer nighttime environment and can often reduce visibility and therefore safety.[1] Consequently, it is important to use the lowest light output for a task. Light output can be measured in Lumens- the unit of measurement used to specify the intensity or brightness of LED bulbs. LEDs are highly efficient and use significantly fewer watts to achieve equal lumen outputs of older light types, therefore wattage is no longer used as a measure of brightness.

6. **Use LEDs in Warm Colors** – For many outdoor uses, warm white colors are appropriate and readily available from commercial retailers. 2700 Kelvin can provide excellent color rendition while minimizing unintended impacts. For sensitive environments, 2200k or direct amber

[1] The effect of reduced street lighting on road casualties and crime in England and Wales: controlled interrupted time series analysis | Journal of Epidemiology & Community Health (bmj.com)

options may be appropriate. LEDs with color temperatures greater than 2700k emit a moderate to significant proportion of short wavelength (blue) light that may appear brighter than warm lights. This may reduce safety by creating discomfort glare -and impacting dark-adapted vision. Blue light may also adversely affect both human and wildlife health and behavior.

Partial list of where sustainable outdoor lighting principles should be applied:

- Park housing, roads, campgrounds, marinas, visitor centers and contact stations, amphitheaters, flag poles, lighthouses, front-country trails, fee collection stations, historic structures, docks, inholdings, vacation cabins or special park uses.
- Parking areas, office buildings, research centers
- Communication towers (cellular, television, radio)
- Signs (park entrance signs, roadways, and directional signing, etc.).
- Wayside exhibits, bulletin boards, and other interpretive/informational installations

References

- Artificial Night Lighting and Protected Lands: Ecological Effects and Management Approaches (Revised August 2017). Natural Resource Report NPS/NRSS/NSNS/NRR—2017/1493
- Dan Duriscoe, "Preserving Pristine Night Skies in National Parks and the Wilderness Ethic," The George Wright Forum, 18:4, 2001.[64 KB PDF].
- Steinbach, Rebecca, et.al, Journal of Epidemiology and Community Health, 2015. The effect of reduced street lighting on road casualties and crime in England and Wales: controlled interrupted time series analysis | Journal of Epidemiology & Community Health (bmj.com)

ANSI/IES RP-43-22

Illuminating ENGINEERING SOCIETY

RECOMMENDED PRACTICE:
LIGHTING EXTERIOR APPLICATIONS
AN AMERICAN NATIONAL STANDARD

Approved American National Standard

ANSI

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ANSI/IES RP-43-22

RECOMMENDED PRACTICE: LIGHTING EXTERIOR APPLICATIONS

AN AMERICAN NATIONAL STANDARD

Publication of this document
has been approved by IES.
Suggestions for revisions
should be directed to IES.

Prepared for IES by the
IES Lighting for Outdoor Public Spaces Committee

Approved by the IES Standards Committee, February 28, 2022, as a Transaction of the Illuminating Engineering Society.

Approved May 31, 2022, as an American National Standard.

Published by the Illuminating Engineering Society, 120 Wall Street, New York, New York 10005.

IES Standards are developed through committee consensus and produced by the IES Office in New York. Careful attention is given to style and accuracy. If any errors are noted in this document, please forward them to the Director of Standards, at standards@ies.org or the above address for verification and correction. The IES welcomes and urges feedback and comments.

Printed in the United States of America.

ISBN# 978-0-87995-435-2

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CONTENTS

Preface

This preface is not part of ANSI/IES RP-43-22. It is provided for informational purposes only.

This Recommended Practice (RP) does not provide general lighting information that is included in other IES documents. If the reader does not already have this information, it may be obtained as needed from the following IES Standards:

The Lighting Science Series:

- *ANSI/IES LS-1-21, Lighting Science: Nomenclature and Definitions for Illuminating Engineering*
- *ANSI/IES LS-2-20, Lighting Science: Concepts and Language of Lighting*
- *ANSI/IES LS-3-20, Lighting Science: Physics and Optics of Radiant Power*
- *ANSI/IES LS-4-20, Lighting Science: Measurement of Light – The Science of Photometry*
- *ANSI/IES LS-5-21, Lighting Science: Color*
- *ANSI/IES LS-6-20, Lighting Science: Calculation of Light and Its Effects*
- *ANSI/IES LS-7-20, Lighting Science: Vision – Eye and Brain*
- *ANSI/IES LS-8-20: Lighting Science: Vision – Perceptions and Performance*

The Lighting Practice Series:

- *ANSI/IES LP-1-20, Lighting Practice: Designing Quality Lighting for People and Buildings*
- *ANSI/IES LP-2-20, Lighting Practice: Designing Quality Lighting for People in Outdoor Environments*
- *ANSI/IES LP-3-20, Lighting Practice: Designing and Specifying Daylighting for Buildings*
- *ANSI/IES LP-4-20, Lighting Practice: Electric Light Sources – Properties, Selection, and Specification*
- *ANSI/IES LP-6-20, Lighting Practice: Lighting Control Systems – Properties, Selection, and Specification*
- *ANSI/IES LP-7-20, Lighting Practice: The Lighting Design and Construction Process*
- *ANSI/IES LP-8-20, Lighting Practice: The Commissioning Process Applied to Lighting and Control Systems*
- *ANSI/IES LP-9-20, Lighting Practice: Upgrading Lighting Systems in Commercial and Industrial Facilities*
- *ANSI/IES LP-10-20, Lighting Practice: Sustainable Lighting- An Introduction to the Environmental Impacts of Lighting*
- *ANSI/IES LP-11-20, Lighting Practice: Environmental Considerations for Outdoor Lighting*
- *ANSI/IES LP-12-21, Lighting Practice: IoT Connected Lighting*
- *ANSI/IES LP-13-21, Lighting Practice: Introduction to Resilient Lighting Systems*

1.0 Introduction and Scope

1.1 Introduction

Lighting for the outdoor environment is different from lighting for an interior space. The natural cycle for light is to arrive from the sun and sky during the day and from the stars and moon at night, with gradual changes between dark and light. However, electric lighting is different from the natural cycle in numerous ways.

While recognizing the many benefits of electric lighting for visual tasks, safety, reassurance, and security, it is important to also recognize that the nighttime "ceiling" is typically relatively dark, resulting in high contrast with any light or lighted surface. This is significant because the eye works differently at low light levels than at high light levels. Once eyes have adapted to low light levels, they are very sensitive to bright light and will lose their low-level adaptation almost immediately. While total dark adaptation takes up to 30 minutes to complete, light adaptation happens very quickly, usually in less than a minute. This has implications for both pedestrian safety and comfort.

Nighttime tasks, such as playing sports or driving automobiles, have very specific lighting requirements so that people can perform these tasks safely and accurately. Nighttime lighting designed specifically for pedestrians (i.e., people walking outdoors) is often very different. People experience different emotions related to the nighttime environment. The quality of the lighting affects how people feel while viewing dramatic scenery, enjoying an evening of quiet relaxation, or

moving with assurance and confidence through a nighttime environment.

The negative impacts of using outdoor electric lighting should also be considered. When the need for darkness conflicts with a desire or need for light, good lighting design finds a workable balance between nighttime use and concerns related to human health, aesthetics, and environmental impact. This Recommended Practice will provide guidance in finding that balance.

1.2 Scope

The purpose of this Recommended Practice (RP) is to provide pedestrian-oriented illumination recommendations for the reassurance, safety, comfort, amenity, and enjoyment of people in outdoor environments in lighting zones LZ-1 through LZ-4. This RP includes recommendations beyond illuminance, which when considered alone is inadequate for addressing the visual needs of pedestrians. Rather, it takes a comprehensive approach and makes recommendations based on lighting zone, glare avoidance, spectrum, and other visually influential conditions. Application of these recommendations will ultimately enhance the visual experience for people, while also respecting the environment.

A number of other IES Recommended Practice publications provide recommendations and design guidelines for specific outdoor lighting applications. This document will reference these various documents when appropriate, augmenting them in subject areas not otherwise addressed.

2.0 General Information for Outdoor Pedesrian Applications

2.1 Lighting For Pedestrians

Decisions about where, when, and how much light to use will be site specific, but the general rule should be to provide the minimum amount of light necessary and no more. Lighting systems that over-illuminate pedestrian-based tasks are a major concern addressed in this RP. Nighttime lighting designed specifically for pedestrians (i.e., people walking outdoors) is often very different from the commonly used sidewalk light generated by adjacent buildings or vehicular lighting systems.

Pedestrians have a priority of tasks after dark, and they need a lighting system capable of supporting tasks such as navigation and enjoyment of public spaces. For example, deciding the direction in which to navigate while also avoiding hazards may require different lighting than social interaction. What to illuminate and why are critical components of pedestrian lighting.

Whether for people who are walking, cycling, resting, or socializing, pedestrian based lighting systems need to address nighttime vision and tailor the visual experience toward helping pedestrians accomplish their tasks. Appropriate lighting design for nighttime pedestrians places a priority on how people see and the tasks they need to perform. This will serve to increase pedestrian reassurance, activate outdoor spaces, and begin the positive cycle of attracting more pedestrians to outdoor spaces at night.

Further discussion on pedestrian-oriented lighting may be found in ANSI/IES LP-2-20 (see **Preface**).

2.2 Minimizing Environmental Impact

Humans have been using nighttime lighting since the dawn of history. However, since the industrial revolution the amount and distribution of this additional light has increased dramatically. Satellite images of the night sky from the National Oceanic and Atmospheric Administration's National Geophysical Data Center show vividly how heavily illuminated the planet is (see **Figure 2-1**).

Light pollution, *sky glow*, and *obtrusive light* are terms used to describe the excess or nuisance light created by humans. Light pollution and light trespass have become extremely important considerations whenever a new outdoor lighting design is being prepared. As people increasingly appreciate the beauty and benefits of the night, they become less tolerant of unnecessary and intrusive lighting.

Research data show the deleterious effects of electric lighting in the natural world. The addition of electric

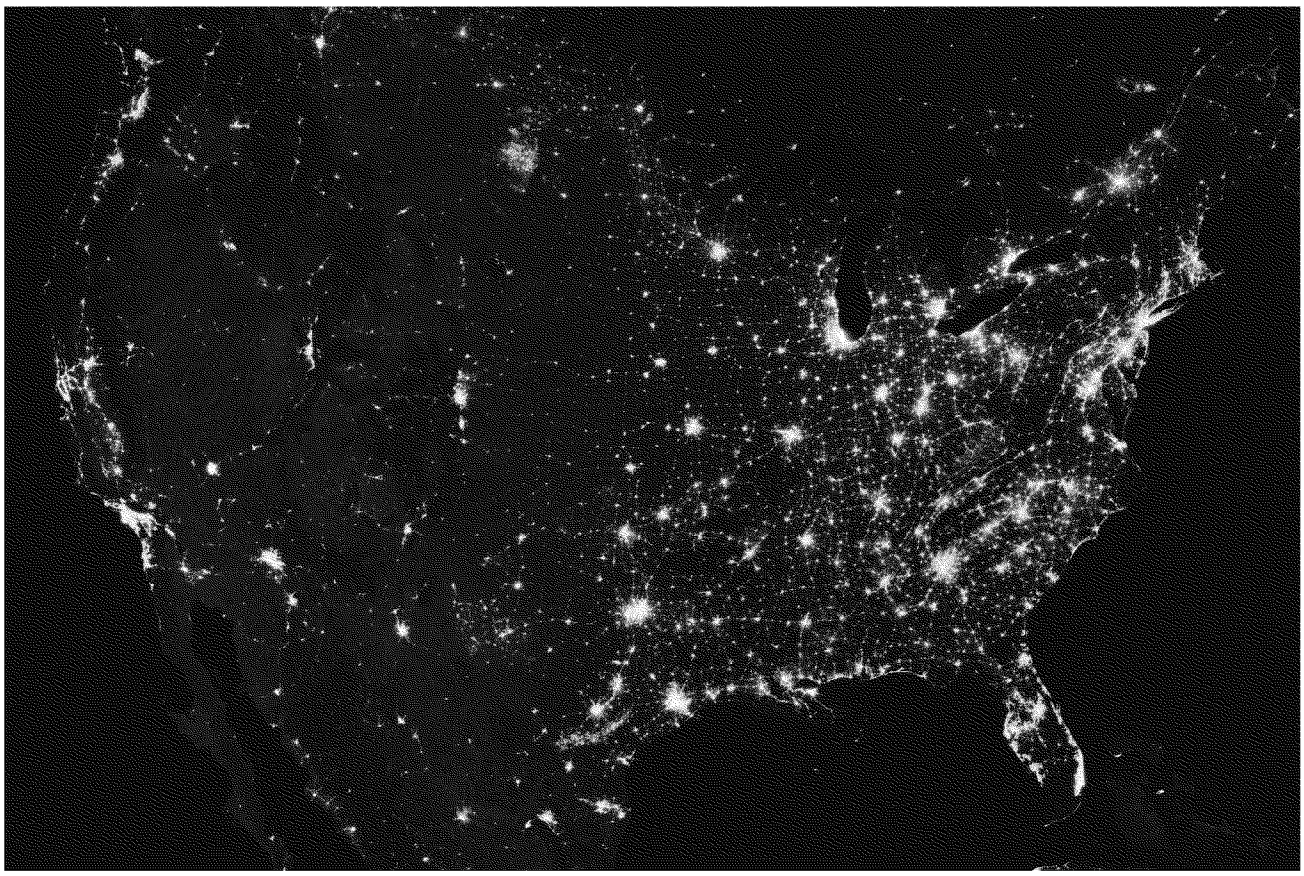

Figure 2-1. Satellite image of United States and parts of Mexico and Canada. (Photo courtesy of NASA/NOAA)

light into the nocturnal environment can have negative environmental consequences. While much more research is required to fully understand the interaction between electric light sources and animals and plants, the likely overall negative impact is not in doubt.

Further discussion on the environmental impact of light pollution may be found in ANSI/IES LP-11-20, (see **Preface**).

2.3 Five Principles for Responsible Outdoor Lighting

In 2020, the IES and the International Dark-Sky Association (IDA) jointly adopted the Five Principles for Responsible Outdoor Lighting:

1. *Useful* — All lighting should have a clear purpose
2. *Targeted* — Light should be directed only where it is needed
3. *Low Light Levels* — Light should be no brighter than necessary
4. *Controlled* — Lighting should only be used when it is useful
5. *Color* — Warmer color lighting should be used when possible.

By applying these principles, properly designed electric lighting at night can be beautiful, healthful, and functional. Projects that incorporate these principles will save energy and money, reduce light pollution, and minimize wildlife disruption. These five principles together with lighting zones form a framework for responsible application of outdoor light at night. Users of this IES Recommended Practice are advised to apply lighting with care not only for pedestrian-oriented activities but also in consideration for the surrounding human and natural environment. A key tactic is to avoid using the maximum lighting allowances in every category. Instead, responsible outdoor lighting dictates that these five principles be considered holistically. For example, if a lighting designer chooses a higher *Light Level* (the third principle), then compensation should be made among *Useful*, *Targeted*, *Controlled*, and *Color*. Perhaps other lighting that is not necessary can be

removed, or advanced controls can be integrated that reduce environmental impact, or a warmer toned lamp with less blue in its spectrum can be specified. This framework allows designers flexibility to meet site-specific needs while curtailing the cumulative impact upon the environment.

2.4 Lighting Zones

Zoning is a well-established practice in community planning. The fundamental idea behind zoning is that it allows a community to determine and regulate appropriate use of land in different spaces.

Introduced by the International Commission on Illumination (CIE) in 1997 and adopted by the IES in 1999, lighting zones for the exterior environment were originally implemented to help reduce light pollution. In the years since, lighting zones have become a useful tool for designing environmentally responsible solutions and making decisions that support high-quality lighting based on the prescribed ambient lighting conditions of adjacent properties. Lighting zones will be referred to throughout this document as one of the primary influencers of lighting design and light level decisions.

Lighting zones give communities the opportunity to set lighting criteria limits, thereby establishing a predictable amount of ambient lighting, including uplight and glare limits, within certain areas. Lighting zones help minimize the contrast (and conflict) between extremes in lighting, such as a brightly lighted car dealership or sports facility adjacent to, or within sight of, a residential neighborhood. When used properly, lighting zones facilitate minimal changes in visual adaptation when traveling between areas and allow designers the flexibility to use different lighting techniques without the burden of excessive regulation.

The selection and designation of an appropriate lighting zone is a matter of planning and judgement based on community priorities. During planning, it is recommended that the lowest reasonable lighting zones be adopted. New developments amidst legacy spaces should consider the proposed differences in light levels. If existing spaces have a higher light level than the designated lighting zone, the new development should deploy a flexible strategy supporting pedestrian vision initially, with the ability to transition to more appropriate lower light levels in the future. Dimming controls are one good way to allow flexibility for potential future uses of a lighting installation.

ANSI/IES LP-2-20 (see **Preface**) provides additional information on addressing community goals and themes.

General lighting zone descriptions:

As used in the Joint IDA-IES Model Lighting Ordinance (MLO),[1] lighting zones are defined in ANSI/IES LP-11-20 (see Preface). The following descriptions are general and abbreviated to provide a quick overview of each type of lighting zone.

LZ-0: No ambient light. Applies to areas where the natural environment could be seriously and adversely affected by even small amounts of electric lighting at night. Human activity here is sparse and subordinate in importance to the natural environment. Pedestrian vision within this zone is adapted to very low light levels, with no expectation of electric lighting.

LZ-1: Low ambient light. Applies to developed areas within a natural environment, including areas of human activity that are inherently dark at night. Pedestrian vision within this zone is adapted to low light levels. Non-continuous electric lighting (i.e., pools of light rather than uniform) is used at low levels to improve pedestrian visibility and safety where needed.

LZ-2: Moderate ambient light. Applies to areas of human activity (i.e., habitation, recreation, and/or work) where electric lighting may be required for safety and convenience at night. Pedestrian vision within this zone is adapted to moderate light levels, and the pedestrian has a moderate expectation of electric lighting.

LZ-3: Moderately high ambient light. Applies to areas of human activity (i.e., habitation, recreation, and/or work) where electric lighting is required for safety and convenience at night. Pedestrian vision within this zone is adapted to moderately high light levels, and the pedestrian needs are increased. There is an expectation of more continuous electric lighting within this zone.

LZ-4: High ambient light. Applies to areas with high levels of human activity at night, including significant

interaction among pedestrians and/or vehicles. Pedestrian vision within these areas is typically adapted to high light levels. Lighting is continuous and required for safety and convenience. Expectations for electric lighting are high, in terms of both light levels and uniformity.

3.0 Considerations for Pedestrian Vizion

The issues surrounding outdoor lighting are complex. The recommendations within ANSI/IES LP-2-20 (see **Preface**) and this RP focus on the predominate conditions of outdoor built environments described in lighting zones LZ-1 through LZ-3. It is in these environments that research shows most urban and suburban pedestrians experience high-mesopic (generated by approximately 1 to 3 lux, assuming typical outdoor reflectance values) or low-photopic (4 to 40 lux) adaptation levels.[2] This is significant because the physiology of the human eye in these conditions leverages different photoreceptors that are particularly efficient at different tasks. At night, in mesopic conditions, the rod receptors are extremely useful in peripheral vision, which is important to a pedestrian at night.

Factors beyond illuminance (lux or footcandles) need to be considered when designing and evaluating exterior lighting. These factors include glare, visual adaptation, uniformity, and spectral distribution. Each is discussed briefly here.

3.1 Glare

Glare, by any definition, needs to be considered. High luminances projected directly from luminaires, and excessive luminance differences between surfaces within the field of view (either horizontal or vertical), may reduce visibility, creating a safety hazard. High luminance may also cause annoyance or disrupt the theme of an area or community. Examples include the safety consequences of a motorist blinded by a floodlight, the aggravation when a parking lot luminaire shines in a bedroom window, or the lost ambience when an over-lighted service station or fast-food establishment opens in a small community that has minimal (or no) street lighting. *Disability glare* is a reduction in task visibility resulting from a bright light source close to the axis of view. The bright light is scattered within the eye, superimposing a "veil" of light across the retinal image, thus reducing the image contrast. That scatter can also raise the adaptation level of the visual system, making it difficult to resolve details in the darker areas. *Discomfort glare* may or may not reduce task visibility, but it causes a physiological response of pain or aversion. Harder to characterize, discomfort glare can result from a bright light source anywhere in the visual field, including areas slightly outside the visual field. *Nuisance glare* can be described as unwanted light that is distracting, glaring, or unnecessary. It can be light trespass from a neighboring property, a point of bright light coming through windows, or lights visible from a distance when darkness is preferred. (See **Figures 3-1** and **3-2**.)

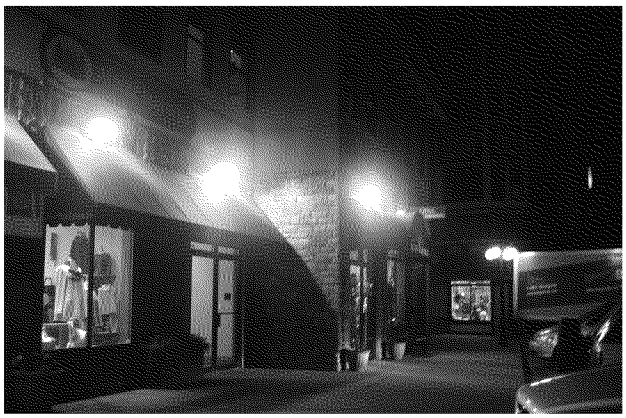

Figure 3-1. These high-glare wall packs mounted on the building facade may be causing discomfort glare for pedestrians. (Image courtesy of N. Clanton)

Figure 3-2. An example of potential nuisance glare, with light shining on residential windows in this urban residential area. (Image courtesy of N. Clanton)

3.2 Light Levels

Illuminance, measured in lux or footcandles, describes the amount of light cast upon a surface, such as a stairway or pedestrian walkway. However, this is not what the eye sees. The eye sees reflected light from a surface (measured as *luminance*) rather than the light incident upon that surface (illuminance).

It stands to reason that luminance-based design would be ideal. However, variations in surface reflectances and the direction of pedestrian gaze make luminance a more extensive method when designing lighting for people in outdoor environments. In reality, a good portion of lighting design is done without the ability to select or maintain colors and materials. For this reason, the amount of light needed in an outdoor environment is most often specified using illuminance.

It is extremely important that lighting designers consider the available lighting metrics, such as glare, adaptation, and uniformity, so that they can apply the appropriate lighting techniques at night. A well-designed lighting system can reduce overall light levels and simultaneously improve vision.

3.3 Visual Adaptation

When moving from a brightly illuminated area to a dark one, the eye takes time to become dark-adapted so that low-contrast details can be seen. A combination of pupil size change, neural shifts, and photochemical changes takes place. The first two occur quite rapidly, allowing adaptation within a second, but the photochemical changes take up to 30 minutes.

Adaptation effects have significant safety implications. Transitions from a brightly illuminated or very dark environment to one of very different luminance will cause a transitional loss of visual acuity, and this effect grows worse with age. Quality lighting design should create smooth transitions from light to dark. For example, building entrances and tunnels now often incorporate a transition zone with a light level between the dark night outside and the brighter interior lighting (or vice versa during the day). This smoother transition minimizes adaptation effects and permits better vision. Additional information may be found in *ANSI/IES LS-7-20, Lighting Science: Vision – Eye and Brain* and in *ANSI/IES LS-8-20, Lighting Science: Vision – Perceptions and Performance; see* **Preface.**

3.4 Uniformity

It is not typical for the illuminance across a lighted area to be equal at all locations; it varies, reaching a maximum near a light source and a minimum midway between two successive light sources (see **Figure 3-3**). The difference between the minimum and maximum illuminance levels, and the distance between those two extremes, can affect pedestrian reassurance and physical safety. If the minimum and maximum illuminance levels are in the same field of view, the minimum illuminance will appear darker. The magnitude of dark will be a function of uniformity. Just as important will be the size of these dark areas, which is why an average-to-minimum illuminance ratio is more commonly used than maximum-to-minimum.

Table A-3 in **Annex A** provides uniformity recommendations for the various types of visual tasks. Commonly listed average-to-minimum ratios are between 4:1 and 10:1. However, the lighting designer should also understand the frequency of the changes in illuminance levels, and that if the changes from bright to dark and back to bright again occur suddenly, it is more difficult for a pedestrian's eyes to adapt while he or she moves through these bright and dark areas. This would happen if a sidewalk, for example, were lit with

Figure 3-3. The term *uniformity* refers to the degree of illuminance variation across a lighted area.
(Image courtesy of Landscape Forms)

pools of light with distinct edges, as opposed to softer gradients of illumination. Increased awareness of this issue is important as light sources move away from the broad distributions of conventional luminaires to the more precisely focused distribution of LED arrays.

3.5 Spectrum

Because the cones (one type of photoreceptor in the retina) become less active as light levels drop, perception of color also becomes difficult. Thus, if color perception is necessary for a nighttime task, it is important to provide enough illuminance and an appropriate spectrum for the task.

The rods are more sensitive than the cones to shorter wavelengths, such as those of blue light, and are responsible for off-axis and peripheral vision at low light levels. Cones, on the other hand, are more sensitive than rods to long-wavelength (red) light. This is why submariners and astronomers dark-adapt under red light: it keeps the foveal cones functional (for detail vision) while minimally light-adapting the rods.

In urban environments, there is enough ambient light at night to keep the cones at least somewhat active and prevent scotopic (rod only) vision. Instead, the eye experiences mesopic vision, with both cones and rods operating. The color rendering ability of a light source depends on its spectral power distribution (SPD). **Figures 3-4** and **3-6** show the poor color rendering that occurs under low pressure sodium (LPS) lamps, which are

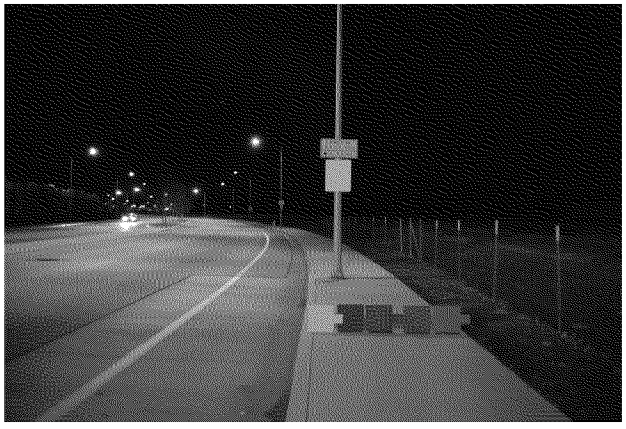

Figure 3-4. Multi-colored targets on a sidewalk, under a low-pressure sodium (LPS) light source. (Image courtesy of Clanton & Associates, Inc.)

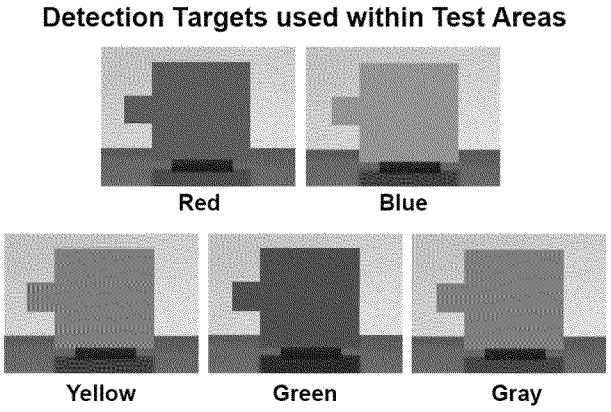

Figure 3-5. The color targets used for the test shown in Figure 3-4. (Image courtesy of Clanton & Associates, Inc.)

Figure 3-6. The effect of limited spectrum on a red car. The side is illuminated by low pressure sodium and the front by fluorescent store-front spill light. (Image courtesy of Clanton & Associates, Inc.)

essentially monochromatic in the yellow. Nevertheless, even under white light sources, the diminished cone activity associated with low light levels means that color perception will also be diminished.

All light sources emit energy in various parts of the visible spectrum, 380 nm to 780 nm. The radiant watts emitted at each wavelength of the spectral power distribution (SPD) can be weighted by the daytime foveal vision (i.e., cone-based, photopic) response, and summed to give the number of light source lumens. SPD can also be weighted by the rod responses or the intrinsically photosensitive retina ganglion cell (ipRGC) responses to determine the scotopic or melanopic radiant watts, respectively. Therefore, the same SPD can be weighted according to the responses of the different photoreceptors. The

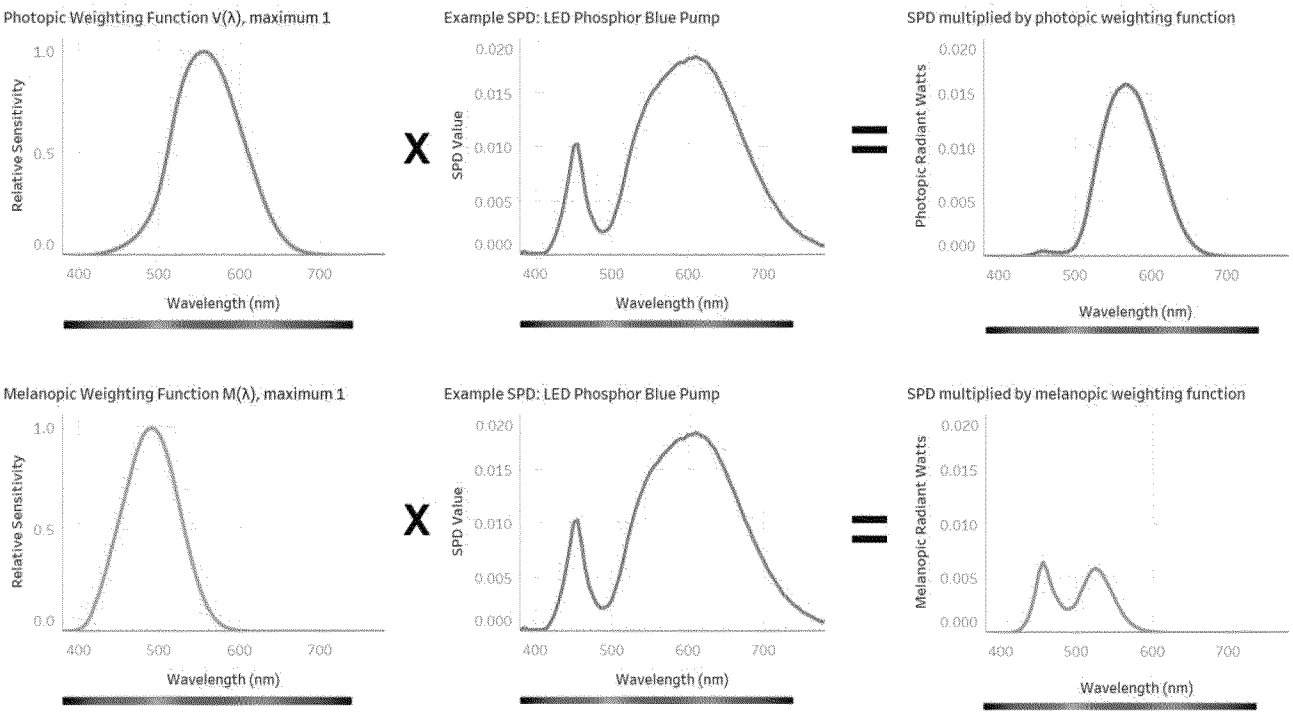

Figure 3-7. An illustration of how weighting functions (left) are multiplied by an SPD (middle) to result in the weighted SPD (right). The top row is the photopic function; the bottom row is the melanopic function. The M/P value (see Annex B) numerically compares the two resulting curves. (Graphics courtesy of Naomi Miller)

scotopic function is related to nighttime visual response. The melanopic function is believed more related to the human physiological responses of alertness, sleepiness, and melatonin secretion. For these reasons, light source spectrum becomes an important component in the different aspects of the outdoor lighting design process (see in **Figure 3-7**). (Refer to Section 4.5.2 of ANSI/IES LP-2-20, [see **Preface**] for additional information regarding spectrum strategies to create emotion and enjoyment in outdoor environments.)

Humans and several other species have similar physiological response sensitivity in the blue-cyan range of the spectrum, peaking at 480 to 490 nm. The ipRGCs' melanopic response provides one means, via the photopigment melanopsin, to evaluate a light source for its effectiveness or ineffectiveness on human health and its potential for disruption to the natural environment. The relative melanopic and photopic content from a single light source SPD is a proxy for that light's potential impact on the natural world. Given two light sources delivering 10 lux to the ground, the light source with the higher melanopic content has the potential to cause more disruption at night than the one with less melanopic content. It is for this reason that the illuminance recommendations in **Annex A** include a Spectrum recommendation intended to limit short wavelength (blue) content.

4.0 Lighting Design for People in Outdoor Environments

Lighting is a complex, often subtle constituent of the nighttime environment. It can add value and meaning to objects and space, while supporting basic visibility for tasks. Quality lighting can help define a positive urban image and influence the decision of a pedestrian to visit, navigate, or engage with an outdoor space at night.[3]

Design recommendations should consider the larger environmental context of the community and transitions across multiple lighting zones. **Figure 4-1** graphically provides a hierarchical foundation and starting point in

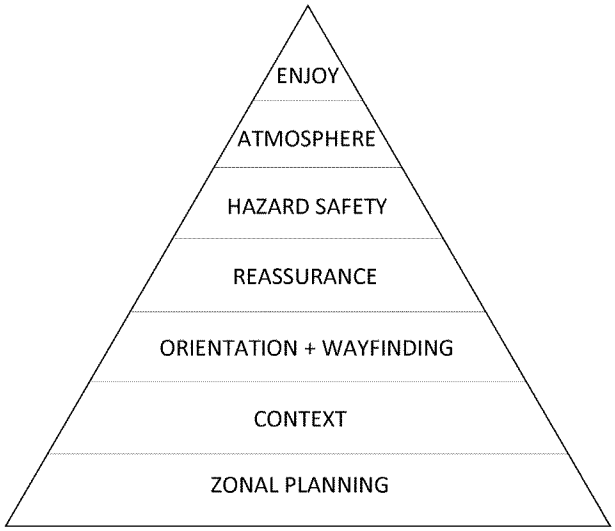

Figure 4-1. Hierarchical process of designing quality lighting for people in outdoor environments. The hierarchy begins at the largest wedge of the triangle, so planning lighting appropriate for the lighting zone is primary. Then, providing cues for the pedestrian of important destinations (hierarchy) and information on surroundings (context) is next. And so on. (Figure courtesy of Landscape Forms)

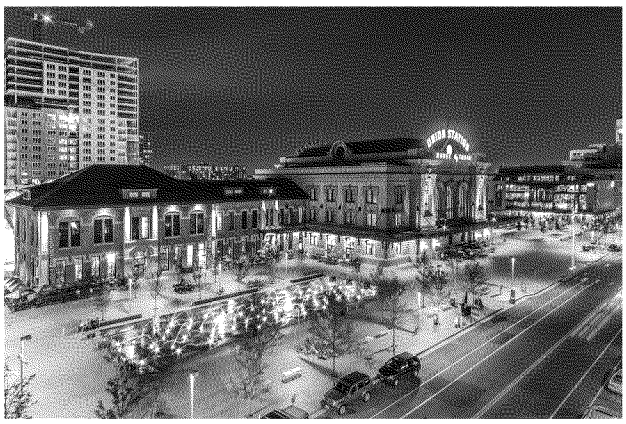

Figure 4-2. Hierarchy of urban lighting design in a Lighting Zone LZ-3. The brightest objects in view are often the most important for drawing the eye, helping in wayfinding and orientation, and for providing visual context. In this photo, the Union Station sign, the fountain lighting, and the facade lighting help the observer, both knowingly and subconsciously, understand where they are in space and what kind of environment they are engaging in. (Image courtesy of Clanton and Associates)

the approach to exterior lighting design, which can serve as guidance in designing quality lighting for people in outdoor environments. Additional information may be found in ANSI/IES LP-2-20 (see **Preface**).

4.1 Context, Orientation, Wayfinding, and Reassurance

An important consideration in lighting a nighttime environment is how light is (or is not) applied to various elements and features within a community. Illuminating building facades, fountains, bridges, or other structures, and accenting trees and plantings can add dimensionality and context to a nighttime scene. The use of buildings and markers as reference points is important for clarity and visual orientation. When properly illuminated, these urban landscape elements may act as visual anchors or serve as "points of arrival" for neighborhood residents. (See **Figure 4-2**.) If done incorrectly and without a hierarchical context, the scene can also create a visual distraction.

Quality outdoor lighting should communicate visual order and urban character. Even the placement of equipment should help determine much of the environment's visual character after dark. Consistency and coordination applied to illuminating special features will strengthen a public lighting design and can improve the sense of community. The subsections that follow provide an effective design process for implementing a hierarchy of public lighting.

Whenever emphasis is placed on nighttime activities such as recreation, shopping, and wayfinding, accent lighting offers an opportunity to create architectural impressions. Design guidelines establish the criteria for public and private lighting (residential and commercial) for communities and developers. These guidelines should explain community themes and goals, including a family of luminaires or related families for different districts.

Reassurance can be influenced with lighting and has been found critical to pedestrians' willingness to engage with their surroundings. When boundary and peripheral illumination are absent or disjunct and the spatial perimeter is visually uncertain, the feeling of well-being and perception of safety may be compromised. Vertical illuminance plays a critical role in addressing

this need. Illuminated vertical planes formed by plant materials, objects, and surfaces along pathways help define and soften surroundings, and typically aid in depth perception and increased feelings of comfort and well-being.

4.1.1 Community Planning. A hierarchy of public lighting conveys the relative importance and character of cityscapes and helps define the urban image. Limitations and restrictions applied to public lighting also impart information and create impressions about the character of an area. A community design process considers the concerns of all the community to ensure that the resulting lighting system is planned, coherent, and satisfactory for the community. This system may include lighting for streets, roadways, sidewalks, pedestrian malls, pathways, bikeways, parks, monuments, buildings and other structures, statues, fountains, and landscapes. It also considers the larger environmental context of the community.

Periodic review of goals and accomplishments should be part of any lighting plan. For example, rather than requiring that all non-conforming lighting be immediately replaced, it could be phased out. Alternative methods of reducing light levels could be allowed, such as shields on existing lights or a lighting control system.

Thoughtful consideration is necessary when developing community guidelines to address these issues and help find the proper balance between the use of accent lighting and the introduction of obtrusive light. Some communities may choose to severely limit accent lighting in order to maintain a dark environment. Other communities that permit accent lighting should have a review process in place to analyze proposed lighting schemes and determine their suitability. Prioritizing community goals will help define lighting zones and promote a community theme for outdoor lighting systems. When developing community guidelines, some of the issues to consider include:

- Adjacent areas and existing master plans
- Desired nighttime ambience and possible light level reductions during curfew
- Pedestrian and vehicular safety
- Security and crime prevention
- Environmental and light pollution concerns
- Signage and dynamic lighting restrictions
- Economics, including energy usage and maintenance

4.1.2 Design Themes and "Families of Luminaires". Common themes in architecture and lighting can help communities and special districts establish unique identities. The community design theme can also help establish methods of approach for meeting the lighting needs of the community based on vehicular and pedestrian activity. The type of equipment selected can reinforce the sense of activity and excitement in an entertainment and shopping district, maintain the visual character of a historic neighborhood, or simply provide quality lighting in a residential development with a minimum of visual clutter (see **Figure 4-3**).

Scale, detailing, light source color, and the apparent brightness of light sources are some of the lighting system decisions that help bring a consistent overall character and balance to a community. It is important to select equipment not only for daytime appearance, but also for nighttime performance.

For example, a rural mountain community may wish to limit the height, visibility, and brightness of lighting equipment to minimize light pollution and light trespass. This will help maintain a sense of quiet solitude in the wilderness, where few cars or pedestrians are expected. In contrast, the high volume of traffic and pedestrians in

Figure 4-3. Architecture, furnishings, and lighting can come from the same design "vocabulary."
(Image courtesy of Landscape Forms)

an urban retail and entertainment district requires higher light levels for safety, reassurance, and security. To meet the higher lighting criteria, several different types of lighting equipment might be used: human-scale poles with visible low-glare optical systems providing downward lighting for pedestrian zones; taller poles for roadways and parking areas; and lighting on nearby architecture.

With careful coordination of such issues as decorative detailing, light source color(s), and luminaire brightness, these separate elements can combine to provide a visual identity for the area. The appearance of the streetscape and pedestrian spaces should be consistent with the community theme and be well integrated. Traditionally, street lighting has been the basic component of public nighttime lighting. In urban settings, it is the street lighting, along with traffic signals and signage, that organizes and defines the visual environment at night. Other lighting for building facades and landscape features can also provide information and visual cues about the extent and character of the area. The quality of this visual information is critical for both traffic safety and pedestrian reassurance.

The height and location of poles, and the size, type, and quantity of equipment all contribute to the lighting hierarchy. Light source color(s) and color rendering properties are also important and influence how a lighting system is perceived. A luminaire family should include products that illustrate thematic styles, with equipment scale, color, detailing, and mounting heights as appropriate for roadways, parking lots, and pedestrian areas within a specific district or the community (see **Figure 4-4**, for example). Issues for consideration include:

- Luminaire styles (contemporary, historic, transitional, or some combination)
- Hierarchy of luminaires (major roadway, minor roadway, parking areas, pedestrian)
- Light source selection (type, light output, CCT, and color rendering)
- Potential shielding or other means of avoidance of glare and light pollution
- Controls

The application of thematic elements should be mindful of the proximity and movement of observers. Luminaires

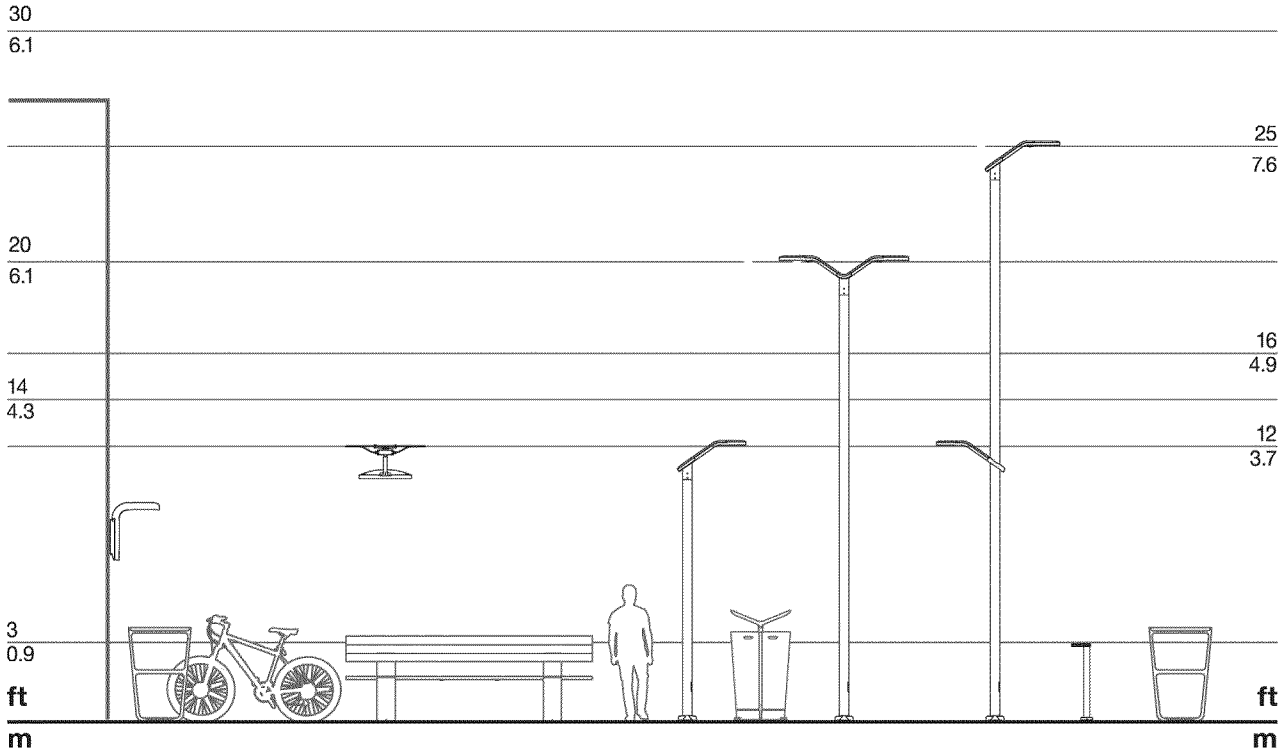

Figure 4-4. An example of a family of luminaires showing scale and mounting options. (Image courtesy of Landscape Forms)

mounted 9 m (30 ft) above the ground may need large-scale detailing if they are to contribute to the visual theme. Alternatively, less-decorative detailing may be used on the functional luminaires in the design, with more visual emphasis placed on the decorative luminaires and poles with which pedestrians have closer interaction along the sidewalks and paths. Shorter, pedestrian-scale poles with luminaires 3 to 5 m (10 to 16 ft) above the ground can allow more-intricate detail to be appreciated but should still be scaled to fit in with the larger environment and nearby buildings and other features.

No single luminaire type can be expected to fulfill all of the lighting requirements that will present themselves in the community. However, some general requirements can be put in place. For lighting predominantly horizontal areas such as roadways, parking areas, and sidewalks, the use of luminaires meeting the lighting zone back light, uplight and glare (BUG) ratings, as defined in ANSI/IES TM-15-20,[4] or a lighting design meeting the performance requirements of the MLO, when properly applied, will minimize sky glow, light trespass, and glare. For lighting predominantly vertical areas such as building facades, fountains, and landscaping, where fully shielded (U0 in the BUG rating) luminaires would probably not be appropriate, it would be appropriate to require that the lighting equipment be selected, placed, aimed, and shielded in such a manner as to confine the luminaire output to the objects being illuminated. In addition, the use of facade lights might be limited to only those areas where they can be properly shielded to avoid glare. In these areas, light movement or dynamic lighting might be limited due to light trespass concerns.

4.1.3 Facade and Structure Lighting. When approaching any lighting project, the first decision that should be resolved is what type of lighting is necessary and appropriate. After the owner and regulatory requirements are satisfied, then any supplemental or decorative lighting may be considered. **Figure 4-5** is an example of lighting a facade with downlights, which meets the following design objectives:

- Permit reasonable uses of outdoor lighting for the vision of people, nighttime reassurance, and pedestrian safety, enjoyment, and commerce
- Conserve energy and resources to the greatest extent possible

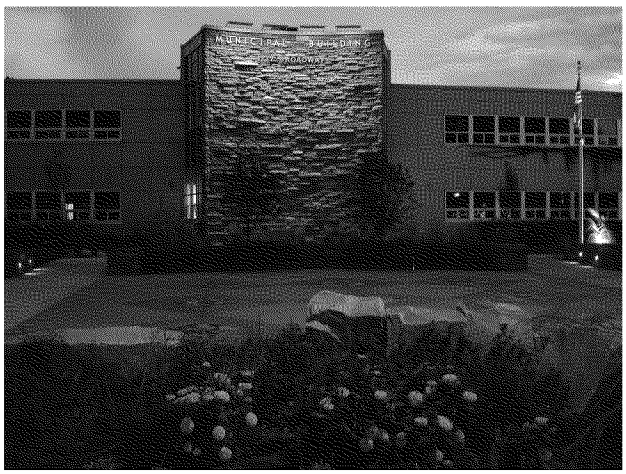

Figure 4-5. Architectural facade lighting illuminated from the top downward. (Image courtesy of Clanton & Associates, Inc.)

- Minimize adverse offsite impacts, including glare, uplight, and other forms of obtrusive light
- Help protect the natural environment from the adverse effects of nighttime lighting from electric sources
- Help preserve the dark night sky for astronomy and enjoyment

Structure lighting serves many purposes, including prestige, safety, symbolism, and recognition. Whatever the application, distinctive, well-designed lighting can be one of the best ways to attract attention. Well-designed facade lighting can make a significant, favorable impact with a minimal investment. Light can enhance the intrinsic charm, beauty, and utility of many settings. The focus here is on essential structure lighting principles, including appropriate light sources, the use of color, and design techniques.

Architectural lighting may include facade floodlighting, coloring, outlining, spot-lighting, silhouetting, or any applicable combination of these techniques. Whenever emphasis is placed on nighttime activities such as recreation, shopping, and traveling, structure lighting offers a ready opportunity to create architectural impressions.

Architecture-mounted lighting can also provide illumination for adjacent pedestrian walkways, as shown in **Figure 4-6**.

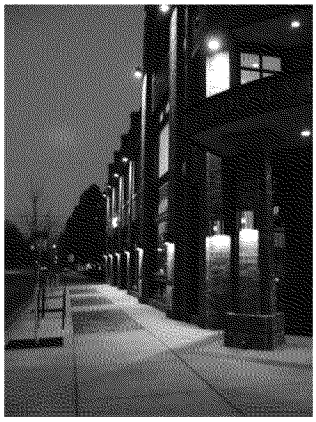

Figure 4-6. This building's downward-aimed facade lighting also illuminates the sidewalk. (Image courtesy of Clanton & Associates, Inc.)

4.1.4 Building Entrances. Building entrances come in all shapes and sizes, but they do have one thing in common: they are a destination for people and should contribute to feelings of reassurance. For this reason, the lighting design should facilitate the ability to easily identify building entrances and reveal potential hazards. Entrance lighting should work in concert with ambient lighting and adjacent walkways so that hierarchy and pedestrian navigation is possible. One way to do this is to provide higher illuminances at the entrances, especially on the vertical surfaces. Intentional use of different or branded colors could also work. If site lighting and parking lot lighting have automated controls, a sensor could be added to the building entry canopy to increase the site lighting to the "occupied" light levels, to enhance the feeling of security.

Table A-3 in **Annex A** makes building entrance and porte cochere illuminance recommendations based on ambient lighting conditions expected from community planning and the use of lighting zones. The specific illuminance target criteria present an acceptable range of illumination, allowing the designer to increase or decrease light based on additional factors. For example, entrances and porte cocheres that serve a greater number of elderly people may need to use the highest light level within the allowable range. Entrances and porte cocheres with highly illuminated adjacent areas may also need light levels on the higher side of the range. Including entrances as part of the context and hierarchy planning is prudent. Entrances illuminated brighter than their adjacent areas will always be more easily recognized, which will assist with instinctive pedestrian wayfinding.

4.1.5 Art, Sculptures, Monuments, and Fountains. *Hardscape lighting* is a special category of landscape lighting associated with architectural features such as monuments, fountains, water features (see **Figure 4-7**), outdoor structures, sculptures, walls, and vertical displays. Lighting may include frontal wall-wash lighting, coloring, outlining, spot-lighting, silhouetting, or any applicable combination of these techniques. Certain hardscape features such as swimming pools, fountains, and playgrounds may be regulated by electric code and/or by local authorities.

Figure 4-7. An example of accent lighting for a fountain wall. (Image courtesy of Lighting Design Alliance and MGM Casinos)

4.1.6 Trees, Gardens, and Other Landscape Elements. Often designed into the built environment for their beauty, trees, gardens, and other landscape elements are key components to the exterior environment. Since reflected light from surfaces is the means by which people see at night, lighting of these *softscape* elements is a good way to maximize users' understanding of the surrounding environment (see **Figure 4-8**).

Techniques for lighting softscape elements may include frontal-wash lighting, coloring, outlining, spot-lighting, silhouetting, or any applicable combination of these techniques. It is also important to consider what happens when the season changes and the tree or garden loses its mass. Since plants are alive, they cannot be treated as if they were hardscape features.

In conjunction with the growth of living plants, softscape lighting needs to be reviewed and maintained on a

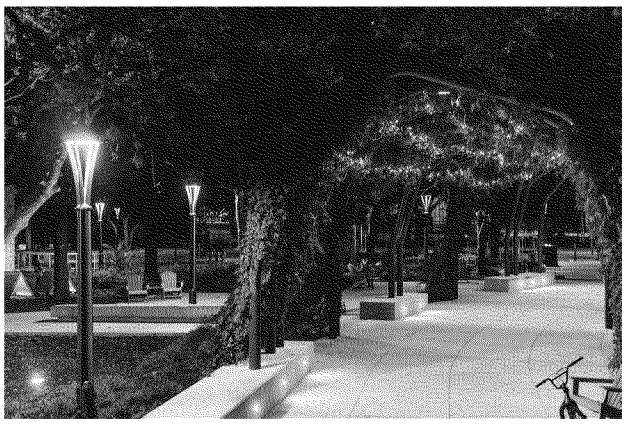

Figure 4-8. Illuminated trees and other softscape elements can help reveal the surrounding area. (Image courtesy of Landscape Forms)

regular basis to ensure its optimal operation. Landscape lighting will disturb the health of the living plants and therefore should be turned off at curfew, seasonally, or in periods of low pedestrian activity. Some communities allow tree uplighting. However, whenever possible, downlighting techniques are preferred in order to limit the amount of light directed or reflected upward into the atmosphere. When using uplighting techniques, it is important that the light hit the intended targets in order to minimize light spill. In addition, upward aimed luminaires should have proper glare shields or snoots to prevent glare to nearby pedestrians. ANSI/IES LP-11-20 (see **Preface)** provides additional information on lighting plants outdoors.

4.1.7 Walls, Fences, and Barriers. Essential for pedestrian reassurance is the opportunity to become informed of possible threats, such as from other people, as early as possible so that there is an appropriate amount of time to make decisions and react. This pending decision requires not only line-of-sight recognition of the possible threat, but also the identification and status of surrounding boundaries and egress points. It is for both of these reasons that it may make sense to illuminate walls, fences, and/or barriers.

As discussed in ANSI/IES LP-2-20 (see **Preface**), pedestrian reassurance is not fostered if surroundings are misunderstood and exits from a space are not obvious, numerous enough, or near enough. Lighting a wall or other vertical feature may increase the opportunity for recognition of approaching pedestrians at a distance. Threat assessment decisions can be lifesaving when exits are easily identified, or when shelter and aid opportunities are clear and apparent. It is, therefore, not wasted light when exits and special refuge spaces are emphasized with additional lighting.

Another benefit of wall or perimeter illumination is vertical facial illumination or creation of silhouettes. Human faces are key to a pedestrian's appraisal of other people. A face can convey information about age, gender, identity, emotional state, and possible behavior or intent. However, because direct illuminance will vary and is not always practical, reflected light may become useful. While less helpful for facial recognition, silhouette lighting nonetheless can help determine gender, stride length, gait, body type, speed, arm swing, and hand gestures of nearby pedestrians. In these cases, the lighting strategy can be less "surrounding" because vertical illumination of nearby surfaces will be helpful in presenting information via silhouette. If this is the strategy, silhouette lighting needs to be continuous, without interruptions or dark spaces. **Figure 4-9** provides an example.

Table A-3 in **Annex A** makes wall, fence, and barrier illuminance recommendations based on ambient lighting conditions expected from community planning and the use of lighting zones. The specific illuminance target criteria present an acceptable range of illumination, allowing the designer to increase or decrease light based on additional factors. For example, a wall constructed of light-colored brick may require

Figure 4-9. Illumination of walls should be continuous, to provide egress information and visual cues for threat assessment. (Image courtesy of Rick Utting)

less illumination than the same wall covered in ivy, because the reflectance is so different.

4.1.8 Internally Lighted Signage and Adjacent Property. The introduction and development of LED sources have introduced source-intensity issues that need careful consideration for exterior lighting. The luminances of luminaires and signs are an important consideration in determining the overall quality of a lighting installation. All luminaires provide some level of luminance. It is when this luminance becomes excessive that problems will arise. Excessive luminaire or sign luminance can be distracting, uncomfortable, or even visually disabling (see **Figure 4-10**). (Refer to ANSI/IES RP-39-19 for recommended limitations on sign luminances.[5])

Control systems can introduce dynamic brightness and color effects that may produce subtle enhancements or gaudy distractions, depending on the range, speed, and duration of the changes and the preferences of the owner. Use of rapidly changing text, images, or patterns, especially with directly viewed sources, requires extreme care to avoid creating distraction hazards for motorists and/or presenting obtrusive light to the surrounding community.

In consideration of safety, visibility, annoyance, and community appropriateness in exterior lighting design, it will be important to establish luminance ratio criteria for the internally lighted sign compared to the site and compared to neighboring sites having a direct view of the sign. As a rule, the ratio of internally lighted sign luminance to average pavement luminance should not exceed 20:1 for continuous lighting. Non-continuous lighting may illuminate only conflict areas or may use lighting for emphasis or effect. Lower ratios may be required for a rural environment in order to preserve lower lighting levels overall, while higher ratios may be needed in an urban area to provide versatility in facade lighting. In hilly or mountainous communities, direct views of luminous surfaces and sources may affect an entire community. Additional information on this topic may be found in *ANSI/IES LP-11-20, Lighting Practice: Environmental Considerations for Outdoor Lighting* (see **Preface**) and in *ANSI/IES RP-39-19, Recommended Practice: Off-Roadway Sign Luminance*.[5]

4.2 Pedestrian Safety

Providing safety and security is a critical function for exterior lighting. Lighting for *safety* involves ensuring proper level of illumination to identify hazards or obstructions, with low-glare lighting to allow for better adaptation, which will help provide safe working conditions and safe passage. **Section 4.5** provides information on security lighting.

Terrain hazards are potential hazards within the pathway ahead caused by changes in surface or grade. Stairways, curbs, wheel stops, raised pavement, potholes, and slippery surfaces are all examples of possible trip and fall hazards in the outdoor space. Pedestrian safety

Figure 4-10. Excessive sign brightness a block away from an internally lighted sign. (Images courtesy of Clanton & Associates, Inc.)

includes the ability to detect and avoid potential terrain hazards. Lighting after dark should provide for sufficient identification of and differentiation between multiple pathway choices to enable pedestrians to see likely trip-and-fall hazards. Effective safety lighting is unobtrusive. It provides comfortable visibility of activity areas and possible hazards, while avoiding unnecessary glare, excessive light levels, light pollution, or light trespass.

Too often, people associate brighter light and glare with "safer" surrounds. In reality, more light and glare do not necessarily equate to better lighting. It can be easily demonstrated that too much light, or poorly directed light, can actually cause a *loss* of visibility. For example, if a light produces disability glare, it prevents a person from discerning important detail because of the high brightness contrast or glare**.** Another example would be a small area where excessive illumination, as compared to surrounding areas, may prevent a person from discerning or recognizing any objects or activity beyond the area being illuminated. This situation can also result in luminance adaptation issues as a person moves from the area of high luminance into the darker surroundings.

Several specific pedestrian areas are discussed in **Sections 4.2.1** through **4.2.4**.

4.2.1 Adjacent Walkways. Proper lighting of pedestrian walkways is essential to their safe use by pedestrians, herein assumed to include joggers and those using rollerblades. There are two types of "adjacency" covered here:

- *Roadway adjacency*. Many walkways are adjacent to illuminated roadways, and their lighting criteria are covered in *ANSI/IES RP-8-21, Recommended Practice: Lighting Roadway and Parking Facilities*.[6]
- *Architectural adjacency*. When pedestrian walkways are not adjacent to a roadway but are adjacent to architecture and structure, it is assumed that escaping light from windows and doorways, as well as reflected light, will be present. In addition, it is assumed that these walkways will play a key role in helping pedestrians navigate through different lighting conditions.

The first step in determining an appropriate illumination level for adjacent walkways is to identify the lighting zone classification. This will help define the ambient lighting conditions of adjacent areas and the likely adaptation level of the pedestrian. (See **Section 4.1.1** for more information regarding community planning and lighting zones.)

Table A-3 in **Annex A** makes architecturally adjacent walkway illuminance recommendations based on lighting zone, and therefore on ambient lighting conditions. The specific illuminance target criteria present an acceptable range of illumination for hazard detection, allowing the designer to increase or decrease the amount of light based on additional factors. For example, walkways constructed next to retail windows may need to use a higher light level within the allowable range to compensate for the higher adaptation level.

4.2.2 Non-adjacent Walkways. The primary purpose of illuminating non-adjacent walkways is to provide the opportunity for pedestrians to navigate, recognize hazards, and identify areas of conflict such as intersections.

Walkways and paths not adjacent to roadway or architecture, do not necessarily need to be continuously illuminated. However, uniformity of illumination and minimal glare will be important to support a pedestrian's adaptation when viewing the entire scene. For non-continuous walkway illumination, it is important to consider the lighting zones and light levels of adjacent surroundings so visual adaptation is supported. Walkways need not be illuminated at all if the walkways are not permitted for nighttime use. For more information regarding community planning and lighting zones see **Sections 4.1.1** and **4.1.2**, respectively.

Illumination of specific hazards along the walkway, such as stairs, abrupt changes in elevation, intersections, merging paths, bridges, and curves may be required. Designing for contrast on hazards, such as consistent shadows on stairs, will aid in navigating. For pedestrians, clearly seeing hazards, landmarks and destinations is important, which may mean the illumination of objects in the visual distance and not part of the path or walkway. Lighting objects and edges in the immediate surrounding may be an acceptable alternative for continuous walkway illumination.

Walkways located in the middle of a park or large landscaped area require a unique blend of lighting that leverages key landscape features, select structures, resting points, intersection and merge areas, and any walkway hazards (e.g., stairs, abrupt changes in elevation, bridges, and curves). Providing lighting on the termination or resting points along the walkway is another useful technique. These approaches give pedestrians visual clues about where important destinations are located.

Table A-3 in **Annex A** makes walkway illuminance recommendations based on ambient lighting conditions expected from community planning and the use of lighting zones. The specific illuminance target criteria present an acceptable range of illumination, allowing the designer to increase or decrease light based on additional factors. For example, walkways constructed of asphalt may need to use a higher light level within the allowable range to compensate for the lower reflectance of asphalt.

4.2.3 Non-adjacent Bicycle and Mixed-Use Paths. Many bicycle lanes and mixed-use pathways are adjacent to illuminated roadways, and their lighting criteria are covered in ANSI/IES RP-8-21.[6]

Non-adjacent pathways allowing bicycle traffic and mixed use are visually challenging, since pedestrians, animals, and cyclists are traveling at different speeds and in different patterns. Lighting will need to support the identification of all users in a timely manner in order to support safe navigation.

Cyclists are traveling at higher speeds than pedestrians, and they require navigation information at further distances, such as for detecting intersections and other cyclists and pedestrians on the path. Horizontal illuminance uniformity, and low glare are extremely important for these tasks. In addition, the system will need to adequately light small obstacles, depressions, and terrain transitions in elevation or in materials making up the bikeway. Changes in terrain surfaces, such as from concrete to chipped gravel, or other transitions in surface materials should be highlighted. Other cyclists' headlamps can cause confusing glare, and the lighting needs to balance out this contrast.

Table A-3 in **Annex A** makes non-adjacent mixed-use path illuminance recommendations based on the lighting zone and expected ambient lighting conditions. The specific illuminance target criteria present an acceptable range of illumination, allowing the designer to increase or decrease light based on additional factors.

4.2.4 Outdoor Sporting Venues. All outdoor sporting fields should consider surrounding community brightness and nuisance glare and should be designed to minimize their contribution to sky glow. Curfews may require lights to be turned off or reduced in output between certain hours, but may also provide for occasional exceptions. The reader is referred to *ANSI/IES RP–6-20, Recommend Practice: Lighting Sports and Recreational Areas* for specific design guidance and criteria.[7]

The pedestrian areas associated with outdoor sporting venues have their own illumination guidance because they may be especially challenging and complex. While the guidance given in **Section 4.2.1 Adjacent Walkways** or **Section 4.2.2 Non-adjacent Walkways** may seem applicable, the typical illumination levels, pedestrian density, and speed and frequency of moving obstacles around sporting venues are all unusual enough to make a quality lighting solution more complex.

Because higher illumination levels are associated with outdoor sporting fields and spectator areas, great attention should be given to transitional lighting requirements. In addition, the egress paths deserve specific attention with consideration for pedestrian safety because pedestrians may be moving more quickly than average and pathway visibility may be reduced due to pedestrian density.

Recommendations for outdoor sporting venue areas associated with dining or social enjoyment can be found in **Section 4.3 Atmosphere and Enjoyment**.

Table A-3 in **Annex A** makes illuminance recommendations for pedestrians at outdoor sporting venues based on the expected ambient lighting conditions. The specific illuminance target criteria present an acceptable range of illumination, allowing

the designer to increase or decrease light based on additional factors.

4.3 Atmosphere and Enjoyment

4.3.1 Pedestrian Malls. Pedestrian malls have often been described as outdoor living rooms. The first step in creating this illusion is to provide soft vertical and horizontal surface brightness. This "fill light" provides boundary definition for the mall. Cornerstone building features, such as a clock tower or steeple, will add depth to the mall when illuminated.

The next step is to provide light on people's faces. This is preferably accomplished by using pedestrian-scale luminaires at mounting heights lower than five meters. The glow from these luminaires should add visual variations and contextual detail rather than adding substantial brightness to the overall visual scene. Finally, subtle highlights are added by softly lighting statues and key landscape features.

The success of the three-step layered-design process ultimately depends on careful coordination of all lighting in the plaza area to create a cohesive design. Awareness of lighting zones and appropriate luminaire selection will provide the desired effect without adding nuisance light (see **Section 3.1**).

Dynamic lighting systems that blink, flash, or frequently change can sometimes be effective in creating an active environment, but bright sources and blinking lights may also destroy a peaceful setting and create visual hazards for motorists or annoyances for nearby residents and/or office employees. These systems are only successful when coordinated with adjacent property owners and the street lighting authorities, and when they account for all neighborhood viewing angles.

Walkways within a pedestrian mall should be illuminated according to the recommendations in **Section 4.2** and **Annex A**.

4.3.2 Outdoor Dining. *Outdoor dining* is a broad term meant to represent areas within the outdoor space where the "atmosphere" attracts people to come experience extended moments of enjoyment that typically include other people and the opportunity to eat or drink.

The lighting design process may begin by determining the lighting zone and confirming who the "landlord" of the dining area will be. These two answers will help the lighting designer understand ambient lighting conditions, adjacent lighting conditions, and desired branding for the dining atmosphere. Of note, outdoor dining areas may be found in LZ-1 or LZ-2 spaces, such as a municipal park, as well as LZ-3 or LZ-4 spaces, such as a pedestrian mall or public streetscape. For example, if the subject area is in a municipal park, then statutory lighting requirements might be the logical starting point for the lighting design. However, if the outdoor dining is at the edge of the public realm and serviced by private restaurants or retail food outlets, the character of the venue may be a more appropriate baseline at which to begin the design process.

Outdoor dining areas are often adjacent to architecture and other parts of the built environment, meaning that there are likely other light sources nearby, and transitional lighting techniques may be necessary to facilitate the change of primary task from navigation to relaxation. The challenge for the lighting designer is to create a luminous environment that is attractive and comfortable while also meeting lighting criteria related to personal navigation and reassurance. Whether the selected illuminance level on the dining table is 5 lux or 100 lux, the designer is advised to consider the overall lit environment as a lighting hierarchy. Consideration of Richard Kelly's lighting design principles of "ambient luminescence," "focal glow," and "play of brilliants" is recommended.[8] In all cases, the lighting for outdoor dining areas will need to consider the lighting zone and ambient surroundings to support the foundational pedestrian tasks of orientation, navigation, and reassurance, in addition to creating the atmosphere and enjoyment tasks associated with an outdoor dining area.

Table A-3 in **Annex A** makes outdoor dining illuminance recommendations based on ambient lighting conditions expected from community planning and the use of lighting zones. The specific illuminance target criteria present an acceptable range of illumination, allowing

the designer to increase or decrease light based on additional factors. For example, lower light levels may be desired for dining areas with low occupancy to create an intimate atmosphere, as opposed to dining areas with higher patron traffic that need to be on the higher end of the range for navigation safety and reassurance.

4.3.3 Retail. Exterior areas where customers view and select merchandise, such as car dealerships, automobile service stations, and lumber yards, require outdoor retail lighting. This lighting is used to attract shoppers, to allow customers to comfortably review the merchandise, and for safe pedestrian passage. Security is also an issue, especially when the merchandise is left outside continuously. Typically, the first step in determining lighting zones and lighting levels for outdoor retail areas should come from the community responsive design process described in **Section 4.0**.

Care should be taken that outdoor retail areas are only appropriately brighter than their surrounds. For example, if the adjacent properties and roadways are illuminated to a base level, a restaurant's drive-up and parking areas should be no more than five times that level. Additional brightness may present a hazard to motorists on adjacent roadways. The adaptation level of customers leaving the retail property may also be an issue as they leave the bright zone of the establishment for the relatively dark public zones surrounding it. (See **Section 2.4** for information on lighting zones.)

Additional information may be found in *ANSI/IES RP-2-20, Recommended Practice: Lighting Retail Spaces*.[9]

4.3.4 Automobile Dealership Lighting. The merchandise located on lots surrounding an automobile showroom usually consists of a front row of cars or trucks adjacent to a primary road. Attracting customers to these vehicles can be artfully accomplished. The lighting should fill the area without producing excessive brightness. Luminaires should be selected and located to provide minimal luminance levels as seen by motorists from normal viewing angles on adjacent roadways, and from potential customers examining merchandise close up. This can be accomplished by locating certain luminaire support poles between the roadway and the front-row merchandise, and careful aiming of well-shielded, low-glare luminaires directly at the front row. Glare reflected off of the merchandise at normal viewing angles should be avoided. A light source should be selected that renders colors well, to enhance merchandise appearance.

Other luminaires should be located on poles throughout the lot. The luminance of these luminaires should not cause disability glare for motorists or customers. In all cases, luminaires should be selected and located to avoid nuisance glare for homeowners in surrounding neighborhoods. Lighting should also be dimmed during periods of curfew or inactivity.

As with other retail lighting, additional information may be found in ANSI/IES RP-2-20.[9]

4.3.5 Service Station Lighting. The key to quality service station lighting is providing sufficient illuminance to safely and effectively perform the visual tasks required,[9] while providing only the luminance levels needed to create a sense of welcome and security. Too often, these sites use more and brighter lights than are necessary. Many facilities combine automobile fueling with convenience stores or fast-food facilities on the same site. This suggests the need for a more holistic approach to the lighting design, considering not only the various visual tasks but also the lighting levels of the building interior, roadway, and adjacent areas. Visual adaptation when changing viewing direction from inside the store to the exterior is an issue for the dispenser manager, who needs to monitor the interior activities as well as the dispenser conditions.

Safety can be enhanced by using low-brightness sources that do not project glare into pedestrians' and drivers' eyes, and by maintaining proper maximum-to-minimum uniformity ratios within and between the important areas of the site. For example, a store clerk may need to monitor activity at the dispensers, which will affect the lighting design levels of at the dispenser island and inside the store. Service station canopy areas lighted to high illuminance levels may pose adaptation problems for customers leaving the station and re-entering the much darker street or roadway nearby. Minimizing glare from the luminaires will help avoid similar adaptation problems for those entering the dispensing area.

Service stations can be illuminated indirectly very effectively by uplighting the dispenser island canopy, as opposed to direct illumination from bright sources that may also create glare for those on the adjacent roadway. By lighting service station surfaces (like the dispenser island canopy and the station's facade), customers can be drawn to a retail area that is comfortable and attractive, yet free of the negative impacts associated with very bright lighting conditions.

For downward-directed light, it is recommended that luminaires with a U0 (BUG) rating[4] be used; for example, a flat lens may be used instead of dropped lenses or refractors. This will reduce the direct glare from the luminaires within the driver's field of view and generally decrease light-trespass problems. A sense of site security and a welcoming feeling can be achieved in part through the use of light-colored finishes on pavements and vertical surfaces such as the building facade. Avoiding deep shadows throughout the site will also help.

4.3.6 Pools and Pool Decks. Pools and pool decks are complex zones, as they have many visual tasks and expectations. Safety is of extreme importance, and on many occasions, jurisdictions mandate extremely high lighting levels, which could in fact hinder proper visibility. The primary task areas addressed here include the pool, hot tubs or spas, the pool perimeter—usually 1.2 to 1.5 meters (4 to 5 ft) along the pool edge—and the pool deck area, which is usually covered with chaise lounges.

It is important that the lighting design for a pool and pool deck adequately illuminate anyone in distress in the pool, and it should help identify the pool's edge to help prevent guests from falling into the pool. The primary lighting decision is selection of appropriate in-pool (underwater) lighting equipment. Several codes outline safety requirements, but few specify how much lighting is required under the water. It is also difficult to calculate underwater lighting levels accurately. Older codes sometimes specify lighting requirements in terms of watts per square foot, but they do not consider newer, more efficient sources such as LEDs, potentially leading to over-lighting the pool.

Underwater luminaires can also become glare sources, so their placement is critical; they should usually be mounted on the main viewing side and aimed to the opposite edge of the pool. As water will diffuse and scatter the light, it is recommended that luminaires be used that direct the light out and downwards, to avoid directing the light up and out of the water; this will further reduce glare.

The human visual system is complex and can see contrast within various brightness levels, but the visual process can be hindered by glare. As such, one design alternative is to have a bright, evenly illuminated pool, and a deck surface that is comparatively dimmer. That way, the pool edge is defined—a bright pool next to a slightly dimmer deck surface. This will help prevent anyone from falling into the pool.

Unfortunately, many municipal codes mandate that the surface of the pool or spa and the deck edge be illuminated higher than necessary, with lighting levels similar to those used for sporting events. However, higher light levels do not necessarily increase visibility or safety, but might instead create glare and hurt visibility. Furthermore, they might not be appropriate for creating a resort-like atmosphere, with moods of relaxation, romance, or enjoyment. One major challenge and strategy to avoid is the use of bright spotlights on tall poles aimed toward the pool deck. A major portion of the light will reflect off the water surface, creating a veiling reflection that could blind or hinder lifeguards and guests from seeing into or down below the pool surface. If an injured swimmer were submerged, he or she could be "invisible." However, if the underwater illumination level were higher, and the deck lighting lower or controlled, then a swimmer would be seen in silhouette. The complimentary issue happens when an incapacitated swimmer is pulled from the water: is there adequate illumination for resuscitating the victim? **Table A-3** (**Annex A**) provides illumination recommendations in areas adjacent to the pool. When higher light levels are mandated, local code officials might be asked whether "safety button" type controls can be used to activate higher light levels to meet safety or security lighting requirements.

4.4 Specialty Lighting

There are a multitude of other exterior lighting installations that have not been specifically covered in this Recommended Practice. They include lighting systems for amusement parks, marinas, airports, transportation terminals, industrial sites, fairgrounds, temporary festivals, and holiday lighting.

The basic principles of quality lighting as described in the previous sections should be applied to these other areas and uses, beginning with a community design process (see **Section 4.1**). A balanced lighting design composition demands that surround brightness, light trespass, light pollution, glare, and visual distractions each be carefully considered (see **Figure 4-11**). Recognizing that all exterior lighting becomes part of the overall community image is the critical first step in developing a responsive, high quality design.

4.5 Security Lighting

Lighting for security is installed to enhance the perception of safety and to protect people and property from criminal activity. Because the security of people and property involves psychology, perception, and other issues, it is a much more difficult task than safety lighting for an exterior lighting system to accomplish.

Security lighting is part of a complete security system and should be fully integrated with it, not added on as an afterthought. Lighting alone cannot provide security; other security components are required. It is important to note that increasing lighting levels does not necessarily increase security. The goals of security lighting include:

- Illuminating people, objects, and places with low-glare light to allow observation and identification
- Deterrence of criminal activity by increasing the risk of detection
- Reducing the fear of crime by enhancing the perception of safety
- Increasing the effectiveness of other security measures

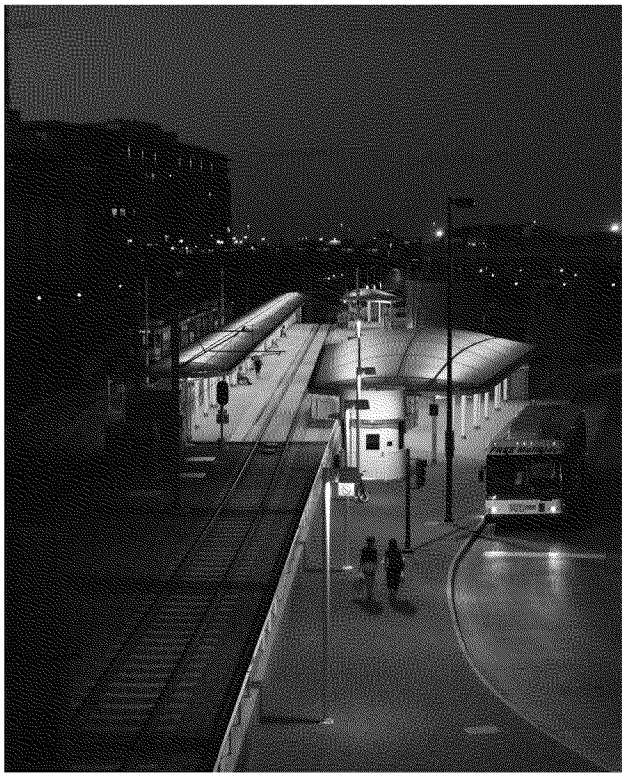

Figure 4-11. Fully shielded luminaires in an LZ-3 area provide a controlled glow confined within the train station. (Image courtesy of Clanton & Associates, Inc.)

It is the *quality* of the light, not the quantity, that is more closely associated with perceptions of a safe and secure area. Comfortable, well-defined exterior environments with clear "zones of recognition" where people's faces can be distinguished are often perceived as secure. Properly illuminated spaces can give the pedestrian adequate reaction time to avoid (or escape from) potential threats. In extreme situations, quality lighting can help the pedestrian identify a safe refuge and/or escape routes.

The challenge for the lighting designer is to integrate required security lighting with other lighting goals, which may not always coincide. With consideration and use of modern equipment, it is usually possible to find a balance between adequate security and the desire for non-polluting light. Many of the suggestions for safety lighting (see **Section 4.2**) also apply for security lighting.

A common error with security lighting is to assume that static lighting (lighting that is always on) is required. However, lighting that is always on may contribute to a sense of complacency and a lack of interest in or attention to the area being illuminated. A change in light level based on motion sensing can focus attention on

the affected area. Using lighting controlled by motion sensors or similar devices that turn lighting on when a potential threat is detected can increase security.

Site security lighting should always be designed to minimize potential glare both from within the project site and from offsite areas, to maintain visibility of any activity occurring on the property site.

Additional guidance on lighting where security is an issue may be found in IES G-1-16.[10]

Annex A – Illuminance Recommendations

A.1 General Information Regarding the Illuminance Table

The illuminance recommendation tables found in **Table A-3** (**Section A.3**) are based on the lighting zone of the space or application. As used in the *Joint IDA-IES Model Lighting Ordinance (MLO)*,[1] lighting zones are defined within ANSI/IES LP-11-20 (see **Preface**). Lighting Zone 1 (LZ-1), for example, is an area with a small human population and natural areas with flora and fauna that could be affected by nighttime lighting, and Lighting Zone 4 (LZ-4) is a high-density urban area. Expectations for lighting are very different in these zones, since the levels of activity and the number of pedestrians will vary widely, and their visual systems will be adapted to low or high light levels, respectively. (Refer to **Section 2.3 Lighting Zones** for examples of exterior applications found within the various types of lighting zones.)

The applications and tasks are presented with a range of values the designer can select from, depending on other visual criteria (refer to **Section A.2 Illuminance Table Explanations and Adjustments**). Energy considerations and lower lighting power density allowances may also require more-careful tailoring of illuminances to task needs.

For outdoor tasks not included in **Table A-3**, the designer should choose a listed task that closely resembles the task in question (similar contrast and difficulty), or refer to *ANSI/IES RP-10-20, Recommended Practice: Lighting Common Applications*.[11]

Additional considerations:

i. Light loss factors such as luminaire dirt depreciation, lumen depreciation, reduced surface reflectance such as that from facades, and other design criteria should be used to adjust lighting calculations; these factors result in reduced lighting levels over time. The reader is referred to *ANSI/IES LS-6-20, Calculation of Light and Its Effects* (see **Preface**) and *ANSI/IES/NALMCO RP-36-20, Recommended Practice: Lighting Maintenance*[12] for additional information.

ii. In cases where the height of the visual task may vary, the abbreviation TS (for "task surface") is used. The illuminance criteria then apply at the height of the visual task.

iii. The values are consensus recommendations for normally sighted people under 65 years of age.

Illuminance targets are design goals; variations from them are expected and may be found at two stages of the construction process: at design time and at commissioning or occupancy time. Variances to maintained illuminance target values at design time include:

i. Health code and safety code requirements supersede these recommendations.

ii. When safety and security or human-vehicular proximity are significant concerns, recommended values are to be minimum maintained illuminances for the task area. For more guidance in applications when security is a concern, refer to *IES G-1-16, Security Lighting for People, Property, and Critical Infrastructure*.[10]

iii. An approximate lux-to-footcandle conversion factor of 10:1 is used in **Table A-3**, instead of the more accurate conversion factor of 10.76:1.[13] Acceptable tolerances for lighting calculations during the design process are within ±10% of the target value. If a predicted value is below a target recommendation by more than 10%, then a significant percentage of the users of the system may not find the visibility acceptable. If a predicted value exceeds a target recommendation by more than 10%, then over-lighting and energy misuse may result.

iv. When a majority of the occupants of a space are over 65, the illuminance recommendations should be doubled. For special considerations for seniors or visually impaired people of any age, refer to *ANSI/IES RP-28-20, Recommended Practice: Lighting and the Visual Environment for Older Adults and the Visually Impaired.*[14] Localized additional task lighting should be considered for occupants who may require additional lighting, before selecting higher illuminance criteria for the entire space or group.

A.2 Illuminance Table Explanations and Adjustments

The illuminance table (see **Section A.3, Table A-3)** includes recommendations based on human vision, visibility, and reassurance, as well as specific recommendations pertaining to lighting for responsible design. These considerations are explained in **Sections A.2.1** and **A.2.2**. Guidance for adjusting the target illuminances and related criteria is provided in **Section A.2.3.**

Another special consideration is Lighting Zone 0 (LZ-0). LZ-0 is defined for areas where electric lighting is not expected, and the natural environment could be adversely affected by electric lighting at night. Illuminance criteria for LZ-0 are under development. Additional narrative and information regarding LZ-0 are provided in ANSI/IES LP-11-20 (see **Preface**).

Within **Table A-3**, there are superscript numbers corresponding to the numbered notes at the bottom of that table.

A.2.1 Illuminance Recommendations for Vision, Visibility, and Reassurance. These columns include:

- A range of average maintained horizontal illuminances, and recommended average-to-minimum uniformity ratios for those illuminances. If no specific task height is listed, the task plane is the ground. Illuminance targets and uniformity ratios are not intended to test the very extremes of the light pattern on a surface, but serve as a general guideline for uniformity. Guidance on how to select what part of the range to design for is provided in **Section A.2.3 How to Adjust Target Illuminances and Related Criteria.**
- In some situations, the ground plane illuminance is not critical, and a target for vertical illuminance is listed instead; this illuminance is to be provided either on the task surface (such as a wall or facade) or at a specified face height. A range of average maintained vertical illuminances is listed, along with recommended average-to-minimum uniformity ratios for those illuminances. In some cases, vertical illuminance is appropriate (such as the illumination of a building facade).

A.2.2 Recommendations for Responsible Design (Optical Control, Controls, Spectrum). These columns include:

Optical Control: These columns include the Maximum Glare Rating ("G") and the Maximum Uplight Rating ("U"), respectively, from the ANSI/IES TM-15-20 BUG rating system for classifying light distribution from outdoor luminaires.[4] G1 and U1 correspond to maximum classifications recommended in LZ-1, G2 and U2 for LZ-2, G3 and U3 for LZ-3, and G4 and U4 for LZ-4.

A G1 luminaire rating allows a much lower number of lumens emitted at angles close to horizontal, and G4 allows higher lumen output in that range, since a luminaire is perceived as less glaring if the viewer is adapted to a higher ambient light level. User expectations for lighting and glare are also generally higher in more populated areas with greater concerns for nighttime safety and security.

A U1 luminaire rating limits the number of upward lumens tightly, on the assumption that inherently dark rural and low-density areas also have more-sensitive environmental areas, and that excess light that obscures the view of the night sky is unwanted by most residents. U2, U3, and U4 ratings correspond to increasingly more uplight allowed.

Note: The responsible design approach is to minimize uplight and glare whenever possible, even in urban areas. Therefore, although an LZ-4 area can accommodate G4 and U4 luminaires according to the Optical Control columns, it is *strongly* recommended that G1 and U1 luminaires be implemented wherever possible on all projects. At the very least, utilitarian outdoor luminaires such as wall packs and parking lot luminaires should not emit more than a nominal number of lumens upward, and should also tightly limit glare.

Controls: This column recommends a range of light output that is appropriate for the pedestrian application during curfew hours. This is for energy savings, reduced sky glow, and reduced destruction of natural habitat when areas are unused or during community curfew hours. In some cases, no controls reduction is recommended because it could create an unsafe condition. These cells are left blank.

Spectrum: Until there is a universally agreed upon metric for describing the short wavelength content of a light source (see **Section 3.5 Spectrum**), **Table A-3 (Section A.3**) will refer to CCT. Therefore, the Spectrum guidance lists five categories: very high (VH): no CCT or melanopic DER* restriction; high (H): CCT ≤ 4000 K (melanopic DER ≤ 0.6); medium (M): CCT ≤ 3000 K (melanopic DER ≤ 0.5); low (L): CCT ≤ 2400 K (melanopic DER ≤ 0.3); and very low (VL): CCT ≤ 2000 K (melanopic DER ≤ 0.15).

A.2.3 How to Adjust Target Illuminances and Related Criteria. Table A-3 (see **Section A.3**) lists target nighttime illuminance values and related criteria for outdoor public spaces. These values are based on in situ measurements and design experience by IES Lighting for Outdoor Public Spaces (LOPS) Committee members and advisors. The target light levels, uniformity ratios, and other criteria are guidelines based on the lighting zone of a project, acknowledging that criteria need to be different for areas with different characters and needs. Average maintained illuminance recommendations are listed as a range. There are reasons why the lighting professional may choose to target the high, middle, or low end of a range; many of these are listed below. If the reasons for the variance are documented for a project, it is acceptable to raise or lower light levels within that range. **Table A-1** provides weighting factors to assist the lighting professional. The factors (first column) are explained in **Section A.2.1**, and examples for their use are provided in **Section A.2.3.2.**

A.2.3.1 Descriptions of the Weighting Factors. Usage levels. The number of users can increase or decrease the need for security in a public space. For example, if a large number of people are expected to attend a public concert, speech, or event, a higher light level may be needed to increase visibility for security. Conversely, if usage levels are expected to be low, the space is perceived as unsafe by the public, and there is no practical way to improve security, it may be prudent to reduce light levels or even eliminate electric lighting in order to discourage people from using that space or path at night.

Path priorities. Encouraging activity or foot-traffic in a primary outdoor space or path may be accomplished by raising light levels at night. Secondary paths may receive lower light levels, especially if there is a lower expectation of usage and crime.

Seasonal changes. Communities with winter snow cover may choose to reduce light levels during that season, since the snow reflection will increase vertical illuminances and, hence, visibility of objects, but will also redirect more light into the sky.

Adjacencies. The impact of light from adjacent buildings needs to be considered when lighting a public space or path.

- *Type of business or usage.* People in residential units and hospitality accommodations may prefer reduced light trespass into bedroom windows. Conversely, if the adjacency is a retail business or community sports facility, more light from the public space may be welcome because it increases the appearance of activity and perception of safety.
- *Glare versus visibility.* Improved visibility for security, aesthetic appearance, or nighttime activities may inadvertently introduce nuisance glare and light trespass to users on adjacent properties.
- *"Borrowed" light.* Businesses or facilities that can be relied upon to have consistent shop window lighting or outdoor lighting may contribute sufficient direct or reflected light onto a public space such that additional lighting for the path or space may be reduced or eliminated. For example, some downtown areas can be lighted entirely by spill from shop windows or signage, if businesses agree to this.

Clientpreferences;socialsettings;culturalexpectations. Facility owners, managers, and organizations may dictate higher or lower light levels for a variety of reasons, such as perceived safety, or an open or welcoming appearance.

* CCT can be *approximated* by melanopic DER, the CIE melanopic daylight (D65) efficacy ratio.[17] (Refer to **Annex B** for additional information.)

Table A-1. Weighting Factors for Selecting Target Illuminance

Weighting Factors for Variance from Target Illuminance	Reduces Need for Light (-1)	No Impact on Need (0)	Increases Need for Light (+1)
Usage levels	Low usage	Normal usage	High usage
Path priorities	Tertiary	Secondary	Primary
Seasonal changes	Winter snow		
Adjacencies	"Borrowed" light, glare concerns, or light unwanted	Neutral	Light wanted to improve perception of safety and activity; older pedestrians are a critical population
Client preferences; social settings; cultural expectations	Wants less light or prefers less uniformity	Neutral	Wants more light or prefers higher uniformity
Pavement condition	No level variation, high quality surface		Rough, uneven surface
Hazards or obstacles; wayfinding	Curbs, level changes, stairs, or obstacles have finishes that enhance contrast; or, retroreflective materials are used to create contrast		Level changes, tripping hazards, and obstacles do not use high-contrast materials
Mixed travel types			Bicycles, skateboards, or other non-motorized vehicles in addition to foot traffic
Safety; visibility of pedestrians	Subordinate to environmental issues	Neutral	Enhanced safety and/or visibility required
Glare from luminaires	Reduced glare for pedestrians, allowing clear visibility of pavement, objects, and surrounds		Higher glare for pedestrians, necessitating a higher ambient light level
Age of users	Users and supervisors predominantly less than 25 years old	Broad range of user ages	Users predominantly over 60 years old

Nighttime outdoor seating in a high-end restaurant may be more appropriately lit with candles than electric lighting. Lower levels, spectral modifications, or glare control may be desired for reduced environmental impact or desired inconspicuousness. In either case, it is the duty of the lighting professional to communicate responsible lighting approaches. (For example: If a client requests lighting the ocean surf during turtle hatching season, the professional should voice concern about inappropriate light direction, quantity, and spectrum.)

Pavement condition. Uneven pavement or poorly maintained paving surfaces can pose a hazard that may necessitate higher light levels.

Hazards or obstacles; wayfinding. Curbs, walls, stairs, ramps, benches, and similar features can become hazards if not marked with high contrast materials or reflectances. Conversely, high contrast features can safely assist in wayfinding with minimal added lighting. Retroreflective materials can be effectively used to create contrast or delineate edges when headlights or low-output luminaires are involved.

Reflectances and luminances of materials. Lighter color materials (>60% reflectance) reflect more light, potentially making objects more visible or increasing contrast between an object and its background. Lighter-colored materials used in paving result in a greater percentage of reflected light, thus contributing to sky glow, but they can also permit reducing target horizontal light levels because of the higher perceived brightness; very dark-colored materials (<10% reflectance) may necessitate higher light levels.

Mixed travel types. If bicycles or other non-motorized vehicles are sharing a path with pedestrians, it is more

important to avoid collisions. If the path is narrow and bicycle speeds are high, higher light levels may be needed to increase visibility of users on foot.

Safety; visibility of pedestrians. Especially in crosswalks or other areas where vehicles and pedestrians share the right of way, higher vertical illuminance on the bodies of pedestrians will improve safety. However, this should be balanced, knowing that increased vertical illuminance is also related to discomfort glare for pedestrians.

Glare from luminaires. Excessively bright luminaires can introduce discomfort glare and disability glare. This can result in more ambient light needed to raise the observer's adaptation level and compensate for loss of visibility. As a result, sites with low-glare luminaires can deliver equivalent visibility under lower light levels, while sites with more glare may need more ambient light to maintain comparable visibility.

Age of users. Older pedestrians require higher light levels and/or better contrast of objects against their backgrounds in order to see as well as younger viewers. If users will be predominantly over the age of 60, increased light levels can improve visibility of objects and hazards.

A.2.3.2 Using the Weighting Factors Table. For spaces or tasks that seem to require a variance from the target light levels, the weighting factors that apply are summed. If the total is 4 or more, then targeting the high end of the illuminance range is appropriate. If the total is -4 or less, targeting the low end of the illuminance range is appropriate. Scores of -3 to +3 would target the middle of the range. It is important for lighting professionals to document variances from recommended light levels; **Table A-1** can be used as a documentation method.

Example: The project is a dedicated bike path along a highway in an environmentally sensitive area, where residents prefer to keep the roadway and separate, adjacent bike path "dark." The path is used for bicycle commuting, not for pedestrians. The highway and bike path are smooth and well maintained, and the route is fairly straight, with few turns or obstacles. The roadway has no continuous overhead lighting, but roundabouts have some illumination because of increased vehicle and bicycle conflict potential. Lighting is provided for the bicycle pathways only, using pole-mounted luminaires at 3-meter (10-ft) mounting heights, and downward-only luminaires selected with a BUG "U" rating of U0 for limiting uplight and a "G" rating of G1 for glare control. The light source is an amber LED (2200 K) with low blue content (CCT ≤ 2400 K), for minimal disruption to wildlife. All ages of bicyclists use the path. The values of the weighting factors for this project are shown in **Table A-2.**

Table A-2. Weighting Factors for This Example

Weighting Factor	Score
Usage levels	0
Path priorities	0
Seasonal changes	0
Adjacencies	-1
Client preferences and cultural expectations	-1
Pavement condition	+1
Hazards or obstacles, and wayfinding	0
Mixed travel types	0
Safety and visibility of pedestrians	-1
Glare from luminaires	-1
Age of users	0
TOTAL	**-3**

This example would suggest that the target light level would be the middle of the range.

Note 1: The lighting professional should consider using controls to help accomplish some of the needs listed above (such as curfew adjustments), and that some sites may have occasional urgent needs for increased light levels, where a "panic button" or controls setting could provide municipal staff or emergency workers the capability of bringing all luminaires to maximum output instantly, or switching on supplementary lighting.

Note 2: Local life safety codes supersede all recommendations in this document. It is incumbent on the lighting professional to review and adhere to the applicable codes.

A.3 Illuminance Table

Recommended illuminance values are provided in **Table A-3.** Guidance for using the table is provided in **Sections A.1 General Information Regarding the Illuminance Table** and **A.2 Illuminance Table Explanations and Adjustments.**

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

			Lighting for Human Vision, Visibility, and Reassurance								Lighting for Responsible Design			
			Recommended Average Maintained Illuminance Targets[9]								Optic Control		Controls	Spectrum
			Illuminances are at height of Task Surface (TS) above finished grade (AFG)											
	Veiling Reflection Risk		Horizontal Illuminance				Vertical Illuminance							
	Light Level for Task or Area?		Target E_h @ Height AFG		Uniformity		Target E_v @ Height AFG		Uniformity		Glare, Uplight Ratings		Vacancy, Seasonal, & Time of day	Acceptable Short Wavelength Content[7]
APPLICATION TASK/AREA[8]	Task or Area	High Med Low	Lux @ m	(Fc @ Ft)	Ratio (Avg:Min)	Ratio Basis	Lux @ m	(Fc @ Ft)	Ratio (Avg:Min)	Ratio Basis	Max Glare Rating (G)	Max Uplight Rating (U)	Light Output During Controls Reduction	(VL), (L), (M), (H), (VH)[12]
CONTEXT, ORIENTATION, WAYFINDING, REASSURANCE														
Façades														
Façades (low reflectance materials, <0.3)[10]														
LZ4														
Lower limit (avg.)							8 @ TS	(0.8 @ TS)					0% to 50%	VL, L, M, H
Upper limit (avg.)							40 @ TS	(4 @ TS)						
LZ3														
Lower limit (avg.)							4 @ TS	(0.4 @ TS)					0% to 50%	VL, L, M
Upper limit (avg.)							30 @ TS	(3 @ TS)						
LZ2														
Lower limit (avg.)							2 @ TS	(0.2 @ TS)					0% to 50%	VL, L, M
Upper limit (avg.)							20 @ TS	(2 @ TS)						
LZ1														
Lower limit (avg.)							1 @ TS	(0.1 @ TS)					50%	VL, L
Upper limit (avg.)							10 @ TS	(1 @ TS)						
LZ0														
Lower limit (avg.)														
Upper limit (avg.)														

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

			Lighting for Human Vision, Visibility, and Reassurance								Lighting for Responsible Design			
			Recommended Average Maintained Illuminance Targets[9]								Optic Control		Controls	Spectrum
			Illuminances are at height of Task Surface (TS) above finished grade (AFG)											
	Veiling Reflection Risk		Horizontal Illuminance				Vertical Illuminance							
	Light Level for Task or Area?		Target E_h @ Height AFG		Uniformity		Target E_v @ Height AFG		Uniformity		Glare, Uplight Ratings		Vacancy, Seasonal, & Time of day	Acceptable Short Wavelength Content[7]
APPLICATION TASK/AREA[8]	Task or Area	High Med Low	Lux @ m	(Fc @ Ft)	Ratio (Avg:Min)	Ratio Basis	Lux @ m	(Fc @ Ft)	Ratio (Avg:Min)	Ratio Basis	Max Glare Rating (G)	Max Uplight Rating (U)	Light Output During Controls Reduction	(VL), (L), (M), (H), (VH)[12]
Façades (medium reflectance materials, >0.3 and <0.6)[10]														
LZ4														
Lower limit (avg.)							4 @ TS	(0.4 @ TS)					0% to 35%	VL, L, M, H
Upper limit (avg.)							30 @ TS	(3 @ TS)						
LZ3														
Lower limit (avg.)							2 @ TS	(0.2 @ TS)					0% to 35%	VL, L, M
Upper limit (avg.)							15 @ TS	(1.5 @ TS)						
LZ2														
Lower limit (avg.)							1 @ TS	(0.1 @ TS)					0% to 35%	VL, L, M
Upper limit (avg.)							8 @ TS	(0.8 @ TS)						
LZ1														
Lower limit (avg.)							0.5 @ TS	(0.05 @ TS)					0% to 20%	VL, L
Upper limit (avg.)							4 @ TS	(0.4 @ TS)						
LZ0														
Lower limit (avg.)														
Upper limit (avg.)														

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

			Lighting for Human Vision, Visibility, and Reassurance								Lighting for Responsible Design			
			Recommended Average Maintained Illuminance Targets[9]								Optic Control		Controls	Spectrum
			Illuminances are at height of Task Surface (TS) above finished grade (AFG)											
	Veiling Reflection Risk		Horizontal Illuminance				Vertical Illuminance							
	Light Level for Task or Area?		Target E_h @ Height AFG		Uniformity		Target E_v @ Height AFG		Uniformity		Glare, Uplight Ratings		Vacancy, Seasonal, & Time of day	Acceptable Short Wavelength Content[7]
APPLICATION TASK/AREA[8]	Task or Area	High Med Low	Lux @ m	(Fc @ Ft)	Ratio (Avg:Min)	Ratio Basis	Lux @ m	(Fc @ Ft)	Ratio (Avg:Min)	Ratio Basis	Max Glare Rating (G)	Max Uplight Rating (U)	Light Output During Controls Reduction	(VL), (L), (M), (H), (VH)[12]
Façades (high reflectance materials, >0.6)[10]														
LZ4														
Lower limit (avg.)							2 @ TS	(0.2 @ TS)					0% to 20%	VL, L, M, H
Upper limit (avg.)							20 @ TS	(2 @ TS)						
LZ3														
Lower limit (avg.)							1 @ TS	(0.1 @ TS)					0% to 20%	VL, L, M
Upper limit (avg.)							10 @ TS	(1 @ TS)						
LZ2														
Lower limit (avg.)							0.5 @ TS	(0.05 @ TS)					0% to 20%	VL, L, M
Upper limit (avg.)							5 @ TS	(0.5 @ TS)						
LZ1														
Lower limit (avg.)							0.2 @ TS	(0.02 @ TS)					0% to 20%	VL, L
Upper limit (avg.)							2 @ TS	(0.2 @ TS)						
LZ0														
Lower limit (avg.)														
Upper limit (avg.)														

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

APPLICATION TASK/AREA[8]	Veiling Reflection Risk / Light Level for Task or Area? Task or Area	High Med Low	Lighting for Human Vision, Visibility, and Reassurance — Recommended Average Maintained Illuminance Targets[9] — Illuminances are at height of Task Surface (TS) above finished grade (AFG) — Horizontal Illuminance — Target E_h @ Height AFG: Lux @ m	(Fc @ Ft)	Uniformity: Ratio (Avg:Min)	Ratio Basis	Vertical Illuminance — Target E_v @ Height AFG: Lux @ m	(Fc @ Ft)	Uniformity: Ratio (Avg:Min)	Ratio Basis	Lighting for Responsible Design — Optic Control — Glare, Uplight Ratings: Max Glare Rating (G)	Max Uplight Rating (U)	Controls — Vacancy, Seasonal, & Time of day: Light Output During Controls Reduction	Spectrum — Acceptable Short Wavelength Content[7]: (VL), (L), (M), (H), (VH)[12]
Building Entrances, Drop-Off, Pick-Up														
Building Entrances[2,10]														
LZ4														
Lower limit (avg.)			30 @ 0.00	(3 @ 0.0)	5:1	Avg:Min	10 @ 1.5	(1 @ 5.0)	5:1	Avg:Min	G2	U3	20% - 50%	VL, L, M, H
Upper limit (avg.)			50 @ 0.00	(5 @ 0.0)	5:1	Avg:Min	30 @ 1.5	(3 @ 5.0)	5:1	Avg:Min				
LZ3														
Lower limit (avg.)			20 @ 0.00	(2 @ 0.0)	5:1	Avg:Min	8 @ 1.5	(0.8 @ 5.0)	5:1	Avg:Min	G2	U3	20% - 50%	VL, L, M
Upper limit (avg.)			40 @ 0.00	(4 @ 0.0)	5:1	Avg:Min	20 @ 1.5	(2 @ 5.0)	5:1	Avg:Min				
LZ2														
Lower limit (avg.)			10 @ 0.00	(1 @ 0.0)	5:1	Avg:Min	4 @ 1.5	(0.4 @ 5.0)	5:1	Avg:Min	G2	U2	20% - 50%	VL, L, M
Upper limit (avg.)			20 @ 0.00	(2 @ 0.0)	5:1	Avg:Min	10 @ 1.5	(1 @ 5.0)	5:1	Avg:Min				
LZ1														
Lower limit (avg.)			5 @ 0.00	(0.5 @ 0.0)	5:1	Avg:Min	2 @ 1.5	(0.2 @ 5.0)	5:1	Avg:Min	G1	U1	20 - 50%	VL, L
Upper limit (avg.)			10 @ 0.00	(1 @ 0.0)	5:1	Avg:Min	5 @ 1.5	(0.5 @ 5.0)	5:1	Avg:Min				
LZ0														
Lower limit (avg.)														
Upper limit (avg.)														

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

			Lighting for Human Vision, Visibility, and Reassurance								Lighting for Responsible Design			
			Recommended Average Maintained Illuminance Targets[9]								Optic Control		Controls	Spectrum
			Illuminances are at height of Task Surface (TS) above finished grade (AFG)											
	Veiling Reflection Risk		Horizontal Illuminance				Vertical Illuminance						Vacancy, Seasonal, & Time of day	Acceptable Short Wavelength Content[7]
	Light Level for Task or Area?		Target E_h @ Height AFG		Uniformity		Target E_v @ Height AFG		Uniformity		Glare, Uplight Ratings			
APPLICATION TASK/AREA[8]	Task or Area	High Med Low	Lux @ m	(Fc @ Ft)	Ratio (Avg:Min)	Ratio Basis	Lux @ m	(Fc @ Ft)	Ratio (Avg:Min)	Ratio Basis	Max Glare Rating (G)	Max Uplight Rating (U)	Light Output During Controls Reduction	(VL), (L), (M), (H), (VH)[12]
Drop-Off / Pick-Up (curbside)[2,10]														
LZ4														
Lower limit (avg.)			30 @ 0.00	(3 @ 0.0)	5:1	Avg:Min					G2	U2	20% - 50%	VL, L, M, H
Upper limit (avg.)			50 @ 0.00	(5 @ 0.0)	5:1	Avg:Min								
LZ3														
Lower limit (avg.)			20 @ 0.00	(2 @ 0.0)	5:1	Avg:Min					G2	U2	20% - 50%	VL, L, M
Upper limit (avg.)			40 @ 0.00	(4 @ 0.0)	5:1	Avg:Min								
LZ2														
Lower limit (avg.)			10 @ 0.00	(1 @ 0.0)	5:1	Avg:Min					G2	U2	20% - 50%	VL, L, M
Upper limit (avg.)			20 @ 0.00	(2 @ 0.0)	5:1	Avg:Min								
LZ1														
Lower limit (avg.)			5 @ 0.00	(0.5 @ 0.0)	5:1	Avg:Min					G1	U1	0% - 50%	VL, L
Upper limit (avg.)			10 @ 0.00	(1 @ 0.0)	5:1	Avg:Min								
LZ0														
Lower limit (avg.)														
Upper limit (avg.)														

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

APPLICATION TASK/AREA[8]	Veiling Reflection Risk / Light Level for Task or Area? Task or Area	High Med Low	Lighting for Human Vision, Visibility, and Reassurance — Recommended Average Maintained Illuminance Targets[9] — Illuminances are at height of Task Surface (TS) above finished grade (AFG) — Horizontal Illuminance — Target E_h @ Height AFG: Lux @ m	(Fc @ Ft)	Uniformity: Ratio (Avg:Min)	Ratio Basis	Vertical Illuminance — Target E_v @ Height AFG: Lux @ m	(Fc @ Ft)	Uniformity: Ratio (Avg:Min)	Ratio Basis	Lighting for Responsible Design — Optic Control — Glare, Uplight Ratings: Max Glare Rating (G)	Max Uplight Rating (U)	Controls — Vacancy, Seasonal, & Time of day: Light Output During Controls Reduction	Spectrum — Acceptable Short Wavelength Content[7]: (VL), (L), (M), (H), (VH)[12]
Drop-Off / Pick-Up (porte cochere)[2,10]														
LZ4														
Lower limit (avg.)			40 @ 0.00	(4 @ 0.0)	4:1	Avg:Min	15 @ 1.5	(1.5 @ 5.0)	5:1	Avg:Min	G3		20% - 50%	VL, L, M, H
Upper limit (avg.)			80 @ 0.00	(8 @ 0.0)	4:1	Avg:Min	30 @ 1.5	(3 @ 5.0)	5:1	Avg:Min				
LZ3														
Lower limit (avg.)			30 @ 0.00	(3 @ 0.0)	4:1	Avg:Min	10 @ 1.5	(1 @ 5.0)	8:1	Avg:Min	G3		20% - 50%	VL, L, M
Upper limit (avg.)			60 @ 0.00	(6 @ 0.0)	4:1	Avg:Min	20 @ 1.5	(2 @ 5.0)	8:1	Avg:Min				
LZ2														
Lower limit (avg.)			15 @ 0.00	(1.5 @ 0.0)	4:1	Avg:Min	5 @ 1.5	(0.5 @ 5.0)	10:1	Avg:Min	G2		20% - 50%	VL, L, M
Upper limit (avg.)			30 @ 0.00	(3 @ 0.0)	4:1	Avg:Min	10 @ 1.5	(1 @ 5.0)	10:1	Avg:Min				
LZ1														
Lower limit (avg.)			8 @ 0.00	(0.8 @ 0.0)	4:1	Avg:Min	3 @ 1.5	(0.3 @ 5.0)	10:1	Avg:Min	G1		0% - 50%	VL, L
Upper limit (avg.)			15 @ 0.00	(1.5 @ 0.0)	4:1	Avg:Min	6 @ 1.5	(0.6 @ 5.0)	10:1	Avg:Min				
LZ0														
Lower limit (avg.)														
Upper limit (avg.)														

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

			Lighting for Human Vision, Visibility, and Reassurance								Lighting for Responsible Design			
			Recommended Average Maintained Illuminance Targets[9]								Optic Control		Controls	Spectrum
			Illuminances are at height of Task Surface (TS) above finished grade (AFG)											
	Veiling Reflection Risk		Horizontal Illuminance				Vertical Illuminance							
	Light Level for Task or Area?		Target E_h @ Height AFG		Uniformity		Target E_v @ Height AFG		Uniformity		Glare, Uplight Ratings		Vacancy, Seasonal, & Time of day	Acceptable Short Wavelength Content[7]
APPLICATION TASK/AREA[8]	Task or Area	High Med Low	Lux @ m	(Fc @ Ft)	Ratio (Avg:Min)	Ratio Basis	Lux @ m	(Fc @ Ft)	Ratio (Avg:Min)	Ratio Basis	Max Glare Rating (G)	Max Uplight Rating (U)	Light Output During Controls Reduction	(VL), (L), (M), (H), (VH)[12]
Features and Perimeters														
Art, Sculpture, Monuments, Fountains[9]														
LZ4														
Lower limit (avg.)							2 @ TS	(0.2 @ TS)	3:1	Avg:Min			0% - 50%	
Upper limit (avg.)							30 @ TS	(3 @ TS)	3:1	Avg:Min				
LZ3														
Lower limit (avg.)							2 @ TS	(0.2 @ TS)	3:1	Avg:Min			0% - 50%	
Upper limit (avg.)							20 @ TS	(2 @ TS)	3:1	Avg:Min				
LZ2														
Lower limit (avg.)							1 @ TS	(0.1 @ TS)	3:1	Avg:Min			0% - 50%	
Upper limit (avg.)							10 @ TS	(1 @ TS)	3:1	Avg:Min				
LZ1														
Lower limit (avg.)							1 @ TS	(0.1 @ TS)	3:1	Avg:Min			0% - 20%	
Upper limit (avg.)							5 @ TS	(0.5 @ TS)	3:1	Avg:Min				
LZ0														
Lower limit (avg.)														
Upper limit (avg.)														

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

APPLICATION TASK/AREA[8]	Veiling Reflection Risk / Light Level for Task or Area? Task or Area	High Med Low	Lighting for Human Vision, Visibility, and Reassurance — Recommended Average Maintained Illuminance Targets[9] — Illuminances are at height of Task Surface (TS) above finished grade (AFG) — Horizontal Illuminance — Target E_h @ Height AFG: Lux @ m	(Fc @ Ft)	Uniformity: Ratio (Avg:Min)	Ratio Basis	Vertical Illuminance — Target E_v @ Height AFG: Lux @ m	(Fc @ Ft)	Uniformity: Ratio (Avg:Min)	Ratio Basis	Lighting for Responsible Design — Optic Control: Max Glare Rating (G)	Max Uplight Rating (U)	Controls: Vacancy, Seasonal, & Time of day: Light Output During Controls Reduction	Spectrum: Acceptable Short Wavelength Content[7]: (VL), (L), (M), (H), (VH)[12]
Trees, Gardens, Landscape (can be horizontal or vertical)[11]														
LZ4														
Lower limit (avg.)			1 @ 0.00	(0.1 @ 0.0)	5:1		2 @ TS	(0.2 @ TS)			G2	U3	50%	VL, L, M
Upper limit (avg.)			10 @ 0.00	(1 @ 0.0)	5:1		30 @ TS	(3 @ TS)						
LZ3														
Lower limit (avg.)			1 @ 0.00	(0.1 @ 0.0)	8:1		2 @ TS	(0.2 @ TS)			G2	U3	0% to 50%	VL, L, M
Upper limit (avg.)			8 @ 0.00	(0.8 @ 0.0)	8:1		20 @ TS	(2 @ TS)						
LZ2														
Lower limit (avg.)			0.5 @ 0.00	(0.05 @ 0.0)	10:1		1 @ TS	(0.1 @ TS)			G2	U2	0% to 20%	VL, L, M
Upper limit (avg.)			4 @ 0.00	(0.4 @ 0.0)	10:1		10 @ TS	(1 @ TS)						
LZ1														
Lower limit (avg.)			0.5 @ 0.00	(0.05 @ 0.0)	10:1		0.5 @ TS	(0.05 @ TS)			G1	U1	0%	VL, L
Upper limit (avg.)			2 @ 0.00	(0.2 @ 0.0)	10:1		4.0 @ TS	(0.4 @ TS)						
LZ0														
Lower limit (avg.)														
Upper limit (avg.)														

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

APPLICATION TASK/AREA[8]	Veiling Reflection Risk / Light Level for Task or Area? Task or Area	High Med Low	Lighting for Human Vision, Visibility, and Reassurance — Recommended Average Maintained Illuminance Targets[9] — Illuminances are at height of Task Surface (TS) above finished grade (AFG) — Horizontal Illuminance — Target E_h @ Height AFG — Lux @ m	(Fc @ Ft)	Uniformity — Ratio (Avg:Min)	Ratio Basis	Vertical Illuminance — Target E_v @ Height AFG — Lux @ m	(Fc @ Ft)	Uniformity — Ratio (Avg:Min)	Ratio Basis	Lighting for Responsible Design — Optic Control — Glare, Uplight Ratings — Max Glare Rating (G)	Max Uplight Rating (U)	Controls — Vacancy, Seasonal, & Time of day — Light Output During Controls Reduction	Spectrum — Acceptable Short Wavelength Content[7] — (VL), (L), (M), (H), (VH)[12]
Amphitheaters, Grass Areas (if lighting is desired)[9]														
LZ4														
Lower limit (avg.)			1 @ 0.00	(0.1 @ 0.0)	5:1	Avg:Min					G2	U3	0% - 50%	VL, L, M, H
Upper limit (avg.)			10 @ 0.00	(1 @ 0.0)	5:1	Avg:Min								
LZ3														
Lower limit (avg.)			1 @ 0.00	(0.1 @ 0.0)	8:1	Avg:Min					G2		0% - 50%	VL, L, M
Upper limit (avg.)			8 @ 0.00	(0.8 @ 0.0)	8:1	Avg:Min								
LZ2														
Lower limit (avg.)			0.5 @ 0.00	(0.05 @ 0.0)	10:1	Avg:Min					G2		0% - 50%	VL, L, M
Upper limit (avg.)			4 @ 0.00	(0.4 @ 0.0)	10:1	Avg:Min								
LZ1														
Lower limit (avg.)			0.5 @ 0.00	(0.05 @ 0.0)	10:1	Avg:Min					G1		0% - 50%	VL, L
Upper limit (avg.)			2 @ 0.00	(0.2 @ 0.0)	10:1	Avg:Min								
LZ0														
Lower limit (avg.)														
Upper limit (avg.)														

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

APPLICATION TASK/AREA[8]	Veiling Reflection Risk / Light Level for Task or Area? Task or Area	High Med Low	Lighting for Human Vision, Visibility, and Reassurance: Recommended Average Maintained Illuminance Targets[9] — Illuminances are at height of Task Surface (TS) above finished grade (AFG) — Horizontal Illuminance: Target E_h @ Height AFG: Lux @ m	Horizontal Illuminance: Target E_h @ Height AFG: (Fc @ Ft)	Horizontal Illuminance: Uniformity: Ratio (Avg:Min)	Horizontal Illuminance: Uniformity: Ratio Basis	Vertical Illuminance: Target E_v @ Height AFG: Lux @ m	Vertical Illuminance: Target E_v @ Height AFG: (Fc @ Ft)	Vertical Illuminance: Uniformity: Ratio (Avg:Min)	Vertical Illuminance: Uniformity: Ratio Basis	Lighting for Responsible Design: Optic Control: Glare, Uplight Ratings: Max Glare Rating (G)	Optic Control: Max Uplight Rating (U)	Controls: Vacancy, Seasonal, & Time of day: Light Output During Controls Reduction	Spectrum: Acceptable Short Wavelength Content[7]: (VL), (L), (M), (H), (VH)[12]
Walls, Fences, Barriers[9]														
LZ4														
Lower limit (avg.)							2 @ TS	(0.2 @ TS)			G2	U3	0% - 50%	VL, L, M, H
Upper limit (avg.)							30 @ TS	(3 @ TS)						
LZ3														
Lower limit (avg.)							2 @ TS	(0.2 @ TS)			G2	U3	0% - 50%	VL, L, M
Upper limit (avg.)							20 @ TS	(2 @ TS)						
LZ2														
Lower limit (avg.)							1 @ TS	(0.1 @ TS)			G2	U2	0% to 20%	VL, L, M
Upper limit (avg.)							10 @ TS	(1 @ TS)						
LZ1														
Lower limit (avg.)							0.5 @ TS	(0.05 @ TS)			G1	U1	0% to 20%	VL, L
Upper limit (avg.)							4 @ TS	(0.4 @ TS)						
LZ0														
Lower limit (avg.)											G0	U0	0%	VL
Upper limit (avg.)														

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

			Lighting for Human Vision, Visibility, and Reassurance								Lighting for Responsible Design			
			Recommended Average Maintained Illuminance Targets[9]								Optic Control		Controls	Spectrum
			Illuminances are at height of Task Surface (TS) above finished grade (AFG)											
Veiling Reflection Risk			Horizontal Illuminance				Vertical Illuminance						Vacancy, Seasonal, & Time of day	Acceptable Short Wavelength Content[7]
Light Level for Task or Area?			Target E_h @ Height AFG		Uniformity		Target E_v @ Height AFG		Uniformity		Glare, Uplight Ratings			
APPLICATION TASK/AREA[8]	Task or Area	High Med Low	Lux @ m	(Fc @ Ft)	Ratio (Avg:Min)	Ratio Basis	Lux @ m	(Fc @ Ft)	Ratio (Avg:Min)	Ratio Basis	Max Glare Rating (G)	Max Uplight Rating (U)	Light Output During Controls Reduction	(VL), (L), (M), (H), (VH)[12]
PEDESTRIAN SAFETY														
Common Pedestrian Areas for Parks, Malls, Campuses, Commercial Spaces														
Walking Surfaces (general and adjacent to landscape)[2,3,9]														
LZ4														
Lower limit (avg.)			10 @ 0.00	(1 @ 0.0)	8:1	Avg:Min					G2	U2	15% - 50%	VL, L, M, H
Upper limit (avg.)			30 @ 0.00	(3 @ 0.0)	8:1	Avg:Min								
LZ3														
Lower limit (avg.)			5 @ 0.00	(.5 @ 0.0)	10:1	Avg:Min					G2	U2	15% - 50%	VL, L, M
Upper limit (avg.)			15 @ 0.00	(1.5 @ 0.0)	10:1	Avg:Min								
LZ2														
Lower limit (avg.)			4 @ 0.00	(0.4 @ 0.0)	10:1	Avg:Min					G2	U2	15% - 50%	VL, L, M
Upper limit (avg.)			8 @ 0.00	(0.8 @ 0.0)	10:1	Avg:Min								
LZ1														
Lower limit (avg.)			2 @ 0.00	(0.2 @ 0.0)	10:1	Avg:Min					G1	U1	15% - 50%	VL, L
Upper limit (avg.)			4 @ 0.00	(0.4 @ 0.0)	10:1	Avg:Min								
LZ0														
Lower limit (avg.)														
Upper limit (avg.)														

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

			Lighting for Human Vision, Visibility, and Reassurance								Lighting for Responsible Design			
			Recommended Average Maintained Illuminance Targets[9]								Optic Control		Controls	Spectrum
			Illuminances are at height of Task Surface (TS) above finished grade (AFG)											
Veiling Reflection Risk			Horizontal Illuminance				Vertical Illuminance							
Light Level for Task or Area?			Target E_h @ Height AFG		Uniformity		Target E_v @ Height AFG		Uniformity		Glare, Uplight Ratings		Vacancy, Seasonal, & Time of day	Acceptable Short Wavelength Content[7]
APPLICATION TASK/AREA[8]	Task or Area	High Med Low	Lux @ m	(Fc @ Ft)	Ratio (Avg:Min)	Ratio Basis	Lux @ m	(Fc @ Ft)	Ratio (Avg:Min)	Ratio Basis	Max Glare Rating (G)	Max Uplight Rating (U)	Light Output During Controls Reduction	(VL), (L), (M), (H), (VH)[12]
Walking Surfaces (adjacent to architecture/exits/hardscape)[9]														
LZ4														
Lower limit (avg.)			10 @ 0.00	(1 @ 0.0)	8:1	Avg:Min					G2	U3		VL, L, M, H
Upper limit (avg.)			40 @ 0.00	(4 @ 0.0)	8:1	Avg:Min								
LZ3														
Lower limit (avg.)			10 @ 0.00	(1 @ 0.0)	10:1	Avg:Min					G2	U3		VL, L, M
Upper limit (avg.)			30 @ 0.00	(3 @ 0.0)	10:1	Avg:Min								
LZ2														
Lower limit (avg.)			10 @ 0.00	(1 @ 0.0)	10:1	Avg:Min					G2	U2		VL, L, M
Upper limit (avg.)			20 @ 0.00	(2 @ 0.0)	10:1	Avg:Min								
LZ1														
Lower limit (avg.)			5 @ 0.00	(0.5 @ 0.0)	10:1	Avg:Min					G1	U1		VL, L
Upper limit (avg.)			10 @ 0.00	(1 @ 0.0)	10:1	Avg:Min								
LZ0														
Lower limit (avg.)														
Upper limit (avg.)														

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

			Lighting for Human Vision, Visibility, and Reassurance								Lighting for Responsible Design			
			Recommended Average Maintained Illuminance Targets[9]								Optic Control		Controls	Spectrum
			Illuminances are at height of Task Surface (TS) above finished grade (AFG)											
Veiling Reflection Risk			Horizontal Illuminance				Vertical Illuminance						Vacancy, Seasonal, & Time of day	Acceptable Short Wavelength Content[7]
Light Level for Task or Area?			Target E_h @ Height AFG		Uniformity		Target E_v @ Height AFG		Uniformity		Glare, Uplight Ratings			
APPLICATION TASK/AREA[8]	Task or Area	High Med Low	Lux @ m	(Fc @ Ft)	Ratio (Avg:Min)	Ratio Basis	Lux @ m	(Fc @ Ft)	Ratio (Avg:Min)	Ratio Basis	Max Glare Rating (G)	Max Uplight Rating (U)	Light Output During Controls Reduction	(VL), (L), (M), (H), (VH)[12]
Walking Surfaces (adjacent to waterfront)[1,5,9]														
LZ4														
Lower limit (avg.)			10 @ 0.00	(1 @ 0.0)	5:1	Avg:Min					G2	U2		VL, L, M, H
Upper limit (avg.)			40 @ 0.00	(4 @ 0.0)	5:1	Avg:Min								
LZ3														
Lower limit (avg.)			10 @ 0.00	(1 @ 0.0)	8:1	Avg:Min					G2	U2		VL, L, M
Upper limit (avg.)			30 @ 0.00	(3 @ 0.0)	8:1	Avg:Min								
LZ2														
Lower limit (avg.)			10 @ 0.00	(1 @ 0.0)	8:1	Avg:Min					G2	U2		VL, L, M
Upper limit (avg.)			20 @ 0.00	(2 @ 0.0)	8:1	Avg:Min								
LZ1														
Lower limit (avg.)			5 @ 0.00	(0.5 @ 0.0)	8:1	Avg:Min					G1	U1		VL, L
Upper limit (avg.)			10 @ 0.00	(1 @ 0.0)	8:1	Avg:Min								
LZ0														
Lower limit (avg.)														
Upper limit (avg.)														

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

APPLICATION TASK/AREA[8]	Veiling Reflection Risk / Light Level for Task or Area? Task or Area	High Med Low	Lighting for Human Vision, Visibility, and Reassurance — Recommended Average Maintained Illuminance Targets[9] — Illuminances are at height of Task Surface (TS) above finished grade (AFG) — Horizontal Illuminance — Target E_h @ Height AFG: Lux @ m	(Fc @ Ft)	Uniformity: Ratio (Avg:Min)	Ratio Basis	Vertical Illuminance — Target E_v @ Height AFG: Lux @ m	(Fc @ Ft)	Uniformity: Ratio (Avg:Min)	Ratio Basis	Lighting for Responsible Design — Optic Control — Glare, Uplight Ratings: Max Glare Rating (G)	Max Uplight Rating (U)	Controls — Vacancy, Seasonal, & Time of day: Light Output During Controls Reduction	Spectrum — Acceptable Short Wavelength Content[7]: (VL), (L), (M), (H), (VH)[12]
Stairs and Ramps[9]														
LZ4														
Lower limit (avg.)			40 @ 0.00	(4 @ 0.0)	5:1	Avg:Min					G2	U2	20% - 50%	VL, L, M, H
Upper limit (avg.)			50 @ 0.00	(5 @ 0.0)	5:1	Avg:Min								
LZ3														
Lower limit (avg.)			30 @ 0.00	(3 @ 0.0)	5:1	Avg:Min					G2	U2	20% - 50%	VL, L, M
Upper limit (avg.)			40 @ 0.00	(4 @ 0.0)	5:1	Avg:Min								
LZ2														
Lower limit (avg.)			20 @ 0.00	(2 @ 0.0)	5:1	Avg:Min					G2	U2	20% - 50%	VL, L, M
Upper limit (avg.)			30 @ 0.00	(3 @ 0.0)	5:1	Avg:Min								
LZ1														
Lower limit (avg.)			10 @ 0.00	(1 @ 0.0)	5:1	Avg:Min					G1	U1	20% - 50%	VL, L
Upper limit (avg.)			20 @ 0.00	(2 @ 0.0)	5:1	Avg:Min								
LZ0														
Lower limit (avg.)														
Upper limit (avg.)														

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

			Lighting for Human Vision, Visibility, and Reassurance								Lighting for Responsible Design			
			Recommended Average Maintained Illuminance Targets[9]								Optic Control		Controls	Spectrum
			Illuminances are at height of Task Surface (TS) above finished grade (AFG)											
	Veiling Reflection Risk		Horizontal Illuminance				Vertical Illuminance							
	Light Level for Task or Area?		Target E_h @ Height AFG		Uniformity		Target E_v @ Height AFG		Uniformity		Glare, Uplight Ratings		Vacancy, Seasonal, & Time of day	Acceptable Short Wavelength Content[7]
APPLICATION TASK/AREA[8]	Task or Area	High Med Low	Lux @ m	(Fc @ Ft)	Ratio (Avg:Min)	Ratio Basis	Lux @ m	(Fc @ Ft)	Ratio (Avg:Min)	Ratio Basis	Max Glare Rating (G)	Max Uplight Rating (U)	Light Output During Controls Reduction	(VL), (L), (M), (H), (VH)[12]
Playground (if lighting is desired)[2, 9]														
LZ4														
Lower limit (avg.)			50 @ 0.00	(5 @ 0.0)	5:1	Avg:Min					G2	U3	0% to 50%	VL, L, M, H
Upper limit (avg.)			100 @ 0.00	(10 @ 0.0)	5:1	Avg:Min								
LZ3														
Lower limit (avg.)			40 @ 0.00	(4 @ 0.0)	5:1	Avg:Min					G2	U3	0% to 50%	VL, L, M
Upper limit (avg.)			80 @ 0.00	(8 @ 0.0)	5:1	Avg:Min								
LZ2														
Lower limit (avg.)			20 @ 0.00	(2 @ 0.0)	5:1	Avg:Min					G2	U2	0% to 50%	VL, L, M
Upper limit (avg.)			40 @ 0.00	(4 @ 0.0)	5:1	Avg:Min								
LZ1														
Lower limit (avg.)			10 @ 0.00	(1 @ 0.0)	5:1	Avg:Min					G1	U1	0% to 50%	VL, L
Upper limit (avg.)			20 @ 0.00	(2 @ 0.0)	5:1	Avg:Min								
LZ0														
Lower limit (avg.)														
Upper limit (avg.)														

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

			Lighting for Human Vision, Visibility, and Reassurance								Lighting for Responsible Design			
			Recommended Average Maintained Illuminance Targets[9]								Optic Control		Controls	Spectrum
			Illuminances are at height of Task Surface (TS) above finished grade (AFG)											
	Veiling Reflection Risk		Horizontal Illuminance				Vertical Illuminance							
	Light Level for Task or Area?		Target E_h @ Height AFG		Uniformity		Target E_v @ Height AFG		Uniformity		Glare, Uplight Ratings		Vacancy, Seasonal, & Time of day	Acceptable Short Wavelength Content[7]
APPLICATION TASK/AREA[8]	Task or Area	High Med Low	Lux @ m	(Fc @ Ft)	Ratio (Avg:Min)	Ratio Basis	Lux @ m	(Fc @ Ft)	Ratio (Avg:Min)	Ratio Basis	Max Glare Rating (G)	Max Uplight Rating (U)	Light Output During Controls Reduction	(VL), (L), (M), (H), (VH)[12]
Spectator Areas for Outdoor Sporting Venues														
Walking Surfaces (general circulation and egress)[2,3,9]														
LZ4														
Lower limit (avg.)			20 @ 0.00	(2 @ 0.0)	5:1	Avg:Min					G2	U3	20% to 50%	VL, L, M, H
Upper limit (avg.)			50 @ 0.00	(5 @ 0.0)	5:1	Avg:Min								
LZ3														
Lower limit (avg.)			20 @ 0.00	(2 @ 0.0)	5:1	Avg:Min					G2	U3	20% to 50%	VL, L, M
Upper limit (avg.)			40 @ 0.00	(4 @ 0.0)	5:1	Avg:Min								
LZ2														
Lower limit (avg.)			10 @ 0.00	(1 @ 0.0)	5:1	Avg:Min					G2	U2	20% to 50%	VL, L, M
Upper limit (avg.)			20 @ 0.00	(2 @ 0.0)	5:1	Avg:Min								
LZ1														
Lower limit (avg.)			5 @ 0.00	(0.5 @ 0.0)	5:1	Avg:Min					G1	U1	20% to 50%	VL, L
Upper limit (avg.)			10 @ 0.00	(1 @ 0.0)	5:1	Avg:Min								
LZ0														
Lower limit (avg.)														
Upper limit (avg.)														

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

APPLICATION TASK/AREA[8]	Veiling Reflection Risk: Light Level for Task or Area? Task or Area	High Med Low	Lighting for Human Vision, Visibility, and Reassurance: Recommended Average Maintained Illuminance Targets[9] — Illuminances are at height of Task Surface (TS) above finished grade (AFG) — Horizontal Illuminance: Target E_h @ Height AFG: Lux @ m	Horizontal Illuminance: Target E_h @ Height AFG: (Fc @ Ft)	Horizontal Illuminance: Uniformity: Ratio (Avg:Min)	Horizontal Illuminance: Uniformity: Ratio Basis	Vertical Illuminance: Target E_v @ Height AFG: Lux @ m	Vertical Illuminance: Target E_v @ Height AFG: (Fc @ Ft)	Vertical Illuminance: Uniformity: Ratio (Avg:Min)	Vertical Illuminance: Uniformity: Ratio Basis	Lighting for Responsible Design: Optic Control: Glare, Uplight Ratings: Max Glare Rating (G)	Optic Control: Max Uplight Rating (U)	Controls: Vacancy, Seasonal, & Time of day: Light Output During Controls Reduction	Spectrum: Acceptable Short Wavelength Content[7]: (VL), (L), (M), (H), (VH)[12]
Amenity Areas[3,5]														
LZ4														
Lower limit (avg.)			50 @ 0.00	(5 @ 0.0)	5:1	Avg:Min					G2	U3		VL, L, M, H
Upper limit (avg.)			100 @ 0.00	(10 @ 0.0)	5:1	Avg:Min								
LZ3														
Lower limit (avg.)			40 @ 0.00	(4 @ 0.0)	5:1	Avg:Min					G2	U3		VL, L, M
Upper limit (avg.)			80 @ 0.00	(8 @ 0.0)	5:1	Avg:Min								
LZ2														
Lower limit (avg.)			20 @ 0.00	(2 @ 0.0)	5:1	Avg:Min					G2	U2		VL, L, M
Upper limit (avg.)			40 @ 0.00	(4 @ 0.0)	5:1	Avg:Min								
LZ1														
Lower limit (avg.)			10 @ 0.00	(1 @ 0.0)	5:1	Avg:Min					G1	U1		VL, L
Upper limit (avg.)			20 @ 0.00	(2 @ 0.0)	5:1	Avg:Min								
LZ0														
Lower limit (avg.)														
Upper limit (avg.)														

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

APPLICATION TASK/AREA[8]	Veiling Reflection Risk: Light Level for Task or Area? Task or Area	Veiling Reflection Risk: Light Level for Task or Area? High Med Low	Lighting for Human Vision, Visibility, and Reassurance: Recommended Average Maintained Illuminance Targets[9] — Illuminances are at height of Task Surface (TS) above finished grade (AFG): Horizontal Illuminance: Target E_h @ Height AFG: Lux @ m	Horizontal Illuminance: Target E_h @ Height AFG: (Fc @ Ft)	Horizontal Illuminance: Uniformity: Ratio (Avg:Min)	Horizontal Illuminance: Uniformity: Ratio Basis	Vertical Illuminance: Target E_v @ Height AFG: Lux @ m	Vertical Illuminance: Target E_v @ Height AFG: (Fc @ Ft)	Vertical Illuminance: Uniformity: Ratio (Avg:Min)	Vertical Illuminance: Uniformity: Ratio Basis	Lighting for Responsible Design: Optic Control: Glare, Uplight Ratings: Max Glare Rating (G)	Optic Control: Glare, Uplight Ratings: Max Uplight Rating (U)	Controls: Vacancy, Seasonal, & Time of day: Light Output During Controls Reduction	Spectrum: Acceptable Short Wavelength Content[7]: (VL), (L), (M), (H), (VH)[12]
Spectator Seating, Stairs, Ramps, Walkways (adjacent to field)[3,9]														
LZ4														
Lower limit (avg.)			50 @ 0.00	(5 @ 0.0)	5:1	Avg:Min					G2	U2		VL, L, M, H
Upper limit (avg.)			100 @ 0.00	(10 @ 0.0)	5:1	Avg:Min								
LZ3														
Lower limit (avg.)			40 @ 0.00	(4 @ 0.0)	5:1	Avg:Min					G2	U2		VL, L, M, H
Upper limit (avg.)			80 @ 0.00	(8 @ 0.0)	5:1	Avg:Min								
LZ2														
Lower limit (avg.)			20 @ 0.00	(2 @ 0.0)	5:1	Avg:Min					G2	U2		VL, L, M
Upper limit (avg.)			40 @ 0.00	(4 @ 0.0)	5:1	Avg:Min								
LZ1														
Lower limit (avg.)			10 @ 0.00	(1 @ 0.0)	5:1	Avg:Min					G1	U1		VL, L
Upper limit (avg.)			20 @ 0.00	(2 @ 0.0)	5:1	Avg:Min								
LZ0														
Lower limit (avg.)														
Upper limit (avg.)														

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

APPLICATION TASK/AREA[8]	Veiling Reflection Risk / Light Level for Task or Area? Task or Area	High Med Low	Lighting for Human Vision, Visibility, and Reassurance: Recommended Average Maintained Illuminance Targets[9] — Illuminances are at height of Task Surface (TS) above finished grade (AFG) — Horizontal Illuminance: Target E_h @ Height AFG: Lux @ m	Horizontal Illuminance: Target E_h @ Height AFG: (Fc @ Ft)	Horizontal Illuminance: Uniformity: Ratio (Avg:Min)	Horizontal Illuminance: Uniformity: Ratio Basis	Vertical Illuminance: Target E_v @ Height AFG: Lux @ m	Vertical Illuminance: Target E_v @ Height AFG: (Fc @ Ft)	Vertical Illuminance: Uniformity: Ratio (Avg:Min)	Vertical Illuminance: Uniformity: Ratio Basis	Lighting for Responsible Design: Optic Control: Glare, Uplight Ratings: Max Glare Rating (G)	Optic Control: Glare, Uplight Ratings: Max Uplight Rating (U)	Controls: Vacancy, Seasonal, & Time of day: Light Output During Controls Reduction	Spectrum: Acceptable Short Wavelength Content[7]: (VL), (L), (M), (H), (VH)[12]
Special Pedestrian Walkways (not for vehicular use; not adjacent to the roadway)														
Pedestrian Overpass[2,3]														
LZ4														
Lower limit (avg.)			20 @ 0.00	(2 @ 0.0)	5:1	Avg:Min					G2	U2	20% to 50%	VL, L, M, H
Upper limit (avg.)			40 @ 0.00	(4 @ 0.0)	5:1	Avg:Min								
LZ3														
Lower limit (avg.)			16 @ 0.00	(1.6 @ 0.0)	5:1	Avg:Min					G2	U2	20% to 50%	VL, L, M
Upper limit (avg.)			32 @ 0.00	(3.2 @ 0.0)	5:1	Avg:Min								
LZ2														
Lower limit (avg.)			8 @ 0.00	(0.8 @ 0.0)	10:1	Avg:Min					G2	U2	20% to 50%	VL, L, M
Upper limit (avg.)			15 @ 0.00	(1.5 @ 0.0)	10:1	Avg:Min								
LZ1														
Lower limit (avg.)			4 @ 0.00	(0.4 @ 0.0)	10:1	Avg:Min					G1	U1	20% to 50%	VL, L
Upper limit (avg.)			10 @ 0.00	(1 @ 0.0)	10:1	Avg:Min								
LZ0														
Lower limit (avg.)														
Upper limit (avg.)														

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

APPLICATION TASK/AREA[8]	Veiling Reflection Risk: Light Level for Task or Area? Task or Area	High Med Low	Lighting for Human Vision, Visibility, and Reassurance: Recommended Average Maintained Illuminance Targets[9] — Illuminances are at height of Task Surface (TS) above finished grade (AFG) — Horizontal Illuminance: Target E_h @ Height AFG: Lux @ m	Horizontal Illuminance: Target E_h @ Height AFG: (Fc @ Ft)	Horizontal Illuminance: Uniformity: Ratio (Avg:Min)	Horizontal Illuminance: Uniformity: Ratio Basis	Vertical Illuminance: Target E_v @ Height AFG: Lux @ m	Vertical Illuminance: Target E_v @ Height AFG: (Fc @ Ft)	Vertical Illuminance: Uniformity: Ratio (Avg:Min)	Vertical Illuminance: Uniformity: Ratio Basis	Lighting for Responsible Design: Optic Control: Glare, Uplight Ratings: Max Glare Rating (G)	Optic Control: Glare, Uplight Ratings: Max Uplight Rating (U)	Controls: Vacancy, Seasonal, & Time of day: Light Output During Controls Reduction	Spectrum: Acceptable Short Wavelength Content[7]: (VL), (L), (M), (H), (VH)[12]
Pedestrian Tunnel, Daytime[c]														
LZ4														
Lower limit (avg.)			80 @ 0.00	(8 @ 0.0)	4:1	Avg:Min	100 @ 1.5	(10 @ 5)	3:1	Avg:Min	G2			VL, L, M, H
Upper limit (avg.)			100 @ 0.00	(10 @ 0.0)	4:1	Avg:Min	150 @ 1.5	(15 @ 5)	3:1	Avg:Min				
LZ3														
Lower limit (avg.)			80 @ 0.00	(8 @ 0.0)	4:1	Avg:Min	100 @ 1.5	(10 @ 5)	3:1	Avg:Min	G2			VL, L, M
Upper limit (avg.)			100 @ 0.00	(10 @ 0.0)	4:1	Avg:Min	150 @ 1.5	(15 @ 5)	3:1	Avg:Min				
LZ2														
Lower limit (avg.)			80 @ 0.00	(8 @ 0.0)	4:1	Avg:Min	100 @ 1.5	(10 @ 5)	3:1	Avg:Min	G2			VL, L, M
Upper limit (avg.)			100 @ 0.00	(10 @ 0.0)	4:1	Avg:Min	150 @ 1.5	(15 @ 5)	3:1	Avg:Min				
LZ1														
Lower limit (avg.)			80 @ 0.00	(8 @ 0.0)	4:1	Avg:Min	100 @ 1.5	(10 @ 5)	3:1	Avg:Min	G1			VL, L
Upper limit (avg.)			100 @ 0.00	(10 @ 0.0)	4:1	Avg:Min	150 @ 1.5	(15 @ 5)	3:1	Avg:Min				
LZ0														
Lower limit (avg.)														
Upper limit (avg.)														

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

APPLICATION TASK/AREA[8]	Veiling Reflection Risk / Light Level for Task or Area? Task or Area	High Med Low	Lighting for Human Vision, Visibility, and Reassurance — Recommended Average Maintained Illuminance Targets[9] — Illuminances are at height of Task Surface (TS) above finished grade (AFG) — Horizontal Illuminance — Target E_h @ Height AFG: Lux @ m	(Fc @ Ft)	Uniformity: Ratio (Avg:Min)	Ratio Basis	Vertical Illuminance — Target E_v @ Height AFG: Lux @ m	(Fc @ Ft)	Uniformity: Ratio (Avg:Min)	Ratio Basis	Lighting for Responsible Design — Optic Control: Max Glare Rating (G)	Max Uplight Rating (U)	Controls: Vacancy, Seasonal, & Time of day: Light Output During Controls Reduction	Spectrum: Acceptable Short Wavelength Content[7]: (VL), (L), (M), (H), (VH)[12]
Pedestrian Tunnel, Nighttime[3,9]														
LZ4														
Lower limit (avg.)			20 @ 0.00	(2 @ 0.0)	4:1	Avg:Min	20 @ 1.5	(2 @ 5)	3:1	Avg:Min	G2			VL, L, M, H
Upper limit (avg.)			40 @ 0.00	(4 @ 0.0)	4:1	Avg:Min	40 @ 1.5	(4 @ 5)	3:1	Avg:Min				
LZ3														
Lower limit (avg.)			10 @ 0.00	(1 @ 0.0)	4:1	Avg:Min	10 @ 1.5	(1 @ 5)	3:1	Avg:Min	G2			VL, L, M
Upper limit (avg.)			30 @ 0.00	(3 @ 0.0)	4:1	Avg:Min	30 @ 1.5	(3 @ 5)	3:1	Avg:Min				
LZ2														
Lower limit (avg.)			10 @ 0.00	(1 @ 0.0)	4:1	Avg:Min	10 @ 1.5	(1 @ 5)	3:1	Avg:Min	G2			VL, L, M
Upper limit (avg.)			20 @ 0.00	(2 @ 0.0)	4:1	Avg:Min	20 @ 1.5	(2 @ 5)	3:1	Avg:Min				
LZ1														
Lower limit (avg.)			5 @ 0.00	(0.5 @ 0.0)	4:1	Avg:Min	5 @ 1.5	(.5 @ 5)	3:1	Avg:Min	G1			VL, L
Upper limit (avg.)			10 @ 0.00	(1 @ 0.0)	4:1	Avg:Min	10 @ 1.5	(1 @ 5)	3:1	Avg:Min				
LZ0														
Lower limit (avg.)														
Upper limit (avg.)														

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

APPLICATION TASK/AREA[8]	Veiling Reflection Risk: Light Level for Task or Area? Task or Area	High Med Low	Lighting for Human Vision, Visibility, and Reassurance: Recommended Average Maintained Illuminance Targets[9] — Illuminances are at height of Task Surface (TS) above finished grade (AFG) — Horizontal Illuminance: Target E_h @ Height AFG: Lux @ m	Horizontal Illuminance: Target E_h @ Height AFG: (Fc @ Ft)	Horizontal Illuminance: Uniformity: Ratio (Avg:Min)	Horizontal Illuminance: Uniformity: Ratio Basis	Vertical Illuminance: Target E_v @ Height AFG: Lux @ m	Vertical Illuminance: Target E_v @ Height AFG: (Fc @ Ft)	Vertical Illuminance: Uniformity: Ratio (Avg:Min)	Vertical Illuminance: Uniformity: Ratio Basis	Lighting for Responsible Design: Optic Control: Glare, Uplight Ratings: Max Glare Rating (G)	Optic Control: Glare, Uplight Ratings: Max Uplight Rating (U)	Controls: Vacancy, Seasonal, & Time of day: Light Output During Controls Reduction	Spectrum: Acceptable Short Wavelength Content[7]: (VL), (L), (M), (H), (VH)[12]
Cycling Paths (if lighting is desired)[1,5]														
LZ4														
Lower limit (avg.)			20 @ 0.00	(2 @ 0.0)	5:1	Avg:Min					G2	U2	20% to 50%	VL, L, M, H
Upper limit (avg.)			40 @ 0.00	(4 @ 0.0)	5:1	Avg:Min								
LZ3														
Lower limit (avg.)			15 @ 0.00	(1.5 @ 0.0)	5:1	Avg:Min					G2	U2	20% to 50%	VL, L, M
Upper limit (avg.)			30 @ 0.00	(3 @ 0.0)	5:1	Avg:Min								
LZ2														
Lower limit (avg.)			8 @ 0.00	(0.8 @ 0.0)	10:1	Avg:Min					G2	U2	20% to 50%	VL, L, M
Upper limit (avg.)			15 @ 0.00	(1.5 @ 0.0)	10:1	Avg:Min								
LZ1														
Lower limit (avg.)			4 @ 0.00	(0.4 @ 0.0)	10:1	Avg:Min					G1	U1	0% to 50%	VL, L
Upper limit (avg.)			8 @ 0.00	(0.8 @ 0.0)	10:1	Avg:Min								
LZ0														
Lower limit (avg.)														
Upper limit (avg.)														

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

			Lighting for Human Vision, Visibility, and Reassurance								Lighting for Responsible Design			
			Recommended Average Maintained Illuminance Targets[9]								Optic Control		Controls	Spectrum
			Illuminances are at height of Task Surface (TS) above finished grade (AFG)											
	Veiling Reflection Risk		Horizontal Illuminance				Vertical Illuminance						Vacancy, Seasonal, & Time of day	Acceptable Short Wavelength Content[7]
	Light Level for Task or Area?		Target E_h @ Height AFG		Uniformity		Target E_v @ Height AFG		Uniformity		Glare, Uplight Ratings			
APPLICATION TASK/AREA[8]	Task or Area	High Med Low	Lux @ m	(Fc @ Ft)	Ratio (Avg:Min)	Ratio Basis	Lux @ m	(Fc @ Ft)	Ratio (Avg:Min)	Ratio Basis	Max Glare Rating (G)	Max Uplight Rating (U)	Light Output During Controls Reduction	(VL), (L), (M), (H), (VH)[12]
Mixed Cycling and Pedestrian Paths (if lighting is desired)[1,5,9]														
LZ4														
Lower limit (avg.)			20 @ 0.00	(2 @ 0.0)	5:1	Avg:Min					G2	U2	20% to 50%	H, M, L
Upper limit (avg.)			40 @ 0.00	(4 @ 0.0)	5:1	Avg:Min								
LZ3														
Lower limit (avg.)			15 @ 0.00	(1.5 @ 0.0)	5:1	Avg:Min					G2	U2	20% to 50%	H, M, L
Upper limit (avg.)			30 @ 0.00	(3 @ 0.0)	5:1	Avg:Min								
LZ2														
Lower limit (avg.)			8 @ 0.00	(0.8 @ 0.0)	5:1	Avg:Min					G2	U2	20% to 50%	M, L
Upper limit (avg.)			15 @ 0.00	(1.5 @ 0.0)	5:1	Avg:Min								
LZ1														
Lower limit (avg.)			4 @ 0.00	(0.4 @ 0.0)	5:1	Avg:Min					G1	U1	20% to 50%	M, L
Upper limit (avg.)			8 @ 0.00	(0.8 @ 0.0)	5:1	Avg:Min								
LZ0														
Lower limit (avg.)														
Upper limit (avg.)														

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

APPLICATION TASK/AREA[8]	Veiling Reflection Risk: Light Level for Task or Area? Task or Area	High Med Low	Lighting for Human Vision, Visibility, and Reassurance: Recommended Average Maintained Illuminance Targets[9] — Illuminances are at height of Task Surface (TS) above finished grade (AFG) — Horizontal Illuminance: Target E_h @ Height AFG: Lux @ m	(Fc @ Ft)	Uniformity: Ratio (Avg:Min)	Ratio Basis	Vertical Illuminance: Target E_v @ Height AFG: Lux @ m	(Fc @ Ft)	Uniformity: Ratio (Avg:Min)	Ratio Basis	Lighting for Responsible Design: Optic Control: Glare, Uplight Ratings: Max Glare Rating (G)	Max Uplight Rating (U)	Controls: Vacancy, Seasonal, & Time of day: Light Output During Controls Reduction	Spectrum: Acceptable Short Wavelength Content[7]: (VL), (L), (M), (H), (VH)[12]
ATMOSPHERE AND ENJOYMENT														
Outdoor Restaurants and Dining Areas (with full public accommodation)[5,9]														
LZ4														
Lower limit (avg.)			20 @ 0.00	(2 @ 0.0)	8:1	Avg:Min					G2	U3		L, M, H
Upper limit (avg.)			100 @ 0.00	(10 @ 0.0)	8:1	Avg:Min								
LZ3														
Lower limit (avg.)			20 @ 0.00	(2 @ 0.0)	8:1	Avg:Min					G2	U3		L, M, H
Upper limit (avg.)			80 @ 0.00	(8 @ 0.0)	8:1	Avg:Min								
LZ2														
Lower limit (avg.)			10 @ 0.00	(1 @ 0.0)	10:1	Avg:Min					G2	U2		L, M
Upper limit (avg.)			40 @ 0.00	(4 @ 0.0)	10:1	Avg:Min								
LZ1														
Lower limit (avg.)			5 @ 0.00	(0.5 @ 0.0)	20:1	Avg:Min					G1	U1		L
Upper limit (avg.)			10 @ 0.00	(1 @ 0.0)	20:1	Avg:Min								
LZ0														
Lower limit (avg.)														
Upper limit (avg.)														

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

APPLICATION TASK/AREA[8]	Veiling Reflection Risk / Light Level for Task or Area? Task or Area	High Med Low	Lighting for Human Vision, Visibility, and Reassurance — Recommended Average Maintained Illuminance Targets[9] — Illuminances are at height of Task Surface (TS) above finished grade (AFG) — Horizontal Illuminance — Target E_h @ Height AFG: Lux @ m	(Fc @ Ft)	Uniformity: Ratio (Avg:Min)	Ratio Basis	Vertical Illuminance — Target E_v @ Height AFG: Lux @ m	(Fc @ Ft)	Uniformity: Ratio (Avg:Min)	Ratio Basis	Lighting for Responsible Design — Optic Control: Glare, Uplight Ratings: Max Glare Rating (G)	Max Uplight Rating (U)	Controls: Vacancy, Seasonal, & Time of day	Spectrum: Acceptable Short Wavelength Content[7] (VL), (L), (M), (H), (VH)[12]
Terraces, Patios, Decks[8,9]														
LZ4														
Lower limit (avg.)			20 @ 0.00	(2 @ 0.0)	8:1	Avg:Min					G2	U3	20% to 50%	VL, L, M, H
Upper limit (avg.)			40 @ 0.00	(4 @ 0.0)	8:1	Avg:Min								
LZ3														
Lower limit (avg.)			16 @ 0.00	(1.6 @ 0.0)	8:1	Avg:Min					G2	U3	20% to 50%	VL, L, M
Upper limit (avg.)			32 @ 0.00	(3.2 @ 0.0)	8:1	Avg:Min								
LZ2														
Lower limit (avg.)			8 @ 0.00	(0.8 @ 0.0)	8:1	Avg:Min					G2	U2	20% to 50%	VL, L, M
Upper limit (avg.)			15 @ 0.00	(1.5 @ 0.0)	8:1	Avg:Min								
LZ1														
Lower limit (avg.)			4 @ 0.00	(0.4 @ 0.0)	8:1	Avg:Min					G1	U1	0% - 20%	VL, L
Upper limit (avg.)			8 @ 0.00	(0.8 @ 0.0)	8:1	Avg:Min								
LZ0														
Lower limit (avg.)														
Upper limit (avg.)														

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

APPLICATION TASK/AREA[8]	Veiling Reflection Risk: Light Level for Task or Area? Task or Area	Veiling Reflection Risk: Light Level for Task or Area? High Med Low	Lighting for Human Vision, Visibility, and Reassurance: Recommended Average Maintained Illuminance Targets[9] — Illuminances are at height of Task Surface (TS) above finished grade (AFG): Horizontal Illuminance: Target E_h @ Height AFG: Lux @ m	Horizontal Illuminance: Target E_h @ Height AFG: (Fc @ Ft)	Horizontal Illuminance: Uniformity: Ratio (Avg:Min)	Horizontal Illuminance: Uniformity: Ratio Basis	Vertical Illuminance: Target E_v @ Height AFG: Lux @ m	Vertical Illuminance: Target E_v @ Height AFG: (Fc @ Ft)	Vertical Illuminance: Uniformity: Ratio (Avg:Min)	Vertical Illuminance: Uniformity: Ratio Basis	Lighting for Responsible Design: Optic Control: Glare, Uplight Ratings: Max Glare Rating (G)	Optic Control: Max Uplight Rating (U)	Controls: Vacancy, Seasonal, & Time of day: Light Output During Controls Reduction	Spectrum: Acceptable Short Wavelength Content[7]: (VL), (L), (M), (H), (VH)[12]
Areas Adjacent to Swimming Pools[4,8,9]														
LZ4														
Lower limit (avg.)			50 @ 0.00	(5 @ 0.0)	4:1	Avg:Min					G2	U3		VL, L, M, H
Upper limit (avg.)			100 @ 0.00	(10 @ 0.0)	4:1	Avg:Min								
LZ3														
Lower limit (avg.)			40 @ 0.00	(4 @ 0.0)	4:1	Avg:Min					G2	U3		VL, L, M
Upper limit (avg.)			80 @ 0.00	(8 @ 0.0)	4:1	Avg:Min								
LZ2														
Lower limit (avg.)			20 @ 0.00	(2 @ 0.0)	4:1	Avg:Min					G2	U2		VL, L, M
Upper limit (avg.)			40 @ 0.00	(4 @ 0.0)	4:1	Avg:Min								
LZ1														
Lower limit (avg.)			10 @ 0.00	(1 @ 0.0)	4:1	Avg:Min					G1	U1		VL, L
Upper limit (avg.)			20 @ 0.00	(2 @ 0.0)	4:1	Avg:Min								
LZ0														
Lower limit (avg.)														
Upper limit (avg.)														

Table A-3. Recommended Illuminance Criteria for People in Outdoor Environments

			Lighting for Human Vision, Visibility, and Reassurance								Lighting for Responsible Design			
			Recommended Average Maintained Illuminance Targets[9]								Optic Control		Controls	Spectrum
			Illuminances are at height of Task Surface (TS) above finished grade (AFG)											
	Veiling Reflection Risk		Horizontal Illuminance				Vertical Illuminance							
	Light Level for Task or Area?		Target E_h @ Height AFG		Uniformity		Target E_v @ Height AFG		Uniformity		Glare, Uplight Ratings		Vacancy, Seasonal, & Time of day	Acceptable Short Wavelength Content[7]
APPLICATION TASK/AREA[8]	Task or Area	High Med Low	Lux @ m	(Fc @ Ft)	Ratio (Avg:Min)	Ratio Basis	Lux @ m	(Fc @ Ft)	Ratio (Avg:Min)	Ratio Basis	Max Glare Rating (G)	Max Uplight Rating (U)	Light Output During Controls Reduction	(VL), (L), (M), (H), (VH)[12]

APPLICATION TASK/AREA NOTES

1 If the area is environmentally sensitive, please reference ANSI/IES LP-11 for proper zone selection and additional spectral recommendations.

2 Illuminance reductions due to curfew may not be recommended for security reasons.

3 Illuminance reductions may not be recommended for pedestrian or spectator safety reasons.

4 Life safety codes supersede these recommendations. Generally, the underwater pool lighting should be brighter than the deck lighting so that visibility to the bottom of the pool is not obscured. The water surface should not reflect luminaires from such an angle that it becomes a mirror, blocking the view into the water.

5 Should lower fidelity values be desired for environmental reasons, care shall be taken to ensure that visual tasks are supported.

6 Food service and amenity areas may need supplemental lighting for cleaning.

7 There is not yet widespread agreement on a more relevant metric than CCT for outdoor spectral considerations, though discussions are underway through the IES. In the interim, CCT may be used as a placeholder. In the following category definitions, the relationship between CCT and CIE melanopic DER is approximate: VH: no restriction on CCT or melanopic DER; H: CCT ≤ 4000 K (melanopic DER ≤ 0.6); M: CCT ≤ 3000 K (melanopic DER ≤ 0.5); L: CCT ≤ 2400 K (melanopic DER ≤ 0.3); and VL: CCT ≤ 2000 K (melanopic DER ≤ 0.15). Refer to Annex B in ANSI/IES RP-43-20, Recommended Practice: Lighting Exterior Applications for additional information.

8 Illuminance targets will vary according to the conditions of each site and task. Refer to Table A.1 for guidance in selecting the illuminance target value.

9 For average illuminance, a range is recommended instead of a single value. The values shown are the lower and upper ends of this average-illuminance range.

10 In LZ0, wayfinding lighting with low luminance VL light sources or retroreflectors should be considered before area lighting. All lighting should be extinquished after termination of activity.

11 Reducing uplight is necessary but not sufficient to minimize impacts on species and habitat. Every effort should always be made to direct light only to those surfaces that need to be illuminated and keep aware that even light directed downwards may have significant ecological impacts (e.g., into a wetland, river, or other natural habitat).

12 (VL) Very High, (L) Low, (M) Medium, (H) High, (VH) Very High

Annex B – The Reasoning behind Using M/P (or Melanopic DER) Values for Evaluating Light Source Spectra

The Lighting for Outdoor Public Spaces (LOPS) Committee heard concerns from many owners, designers, users, and environmentalists that outdoor lighting in some areas needs to be responsive to:

- Astronomers and people who want to appreciate the beauty, wonder, and science of the night sky
- Human health, usually expressed as concern about "blue" light keeping sleepers awake, or that "blue" light spilling into the bedroom can have adverse health effects because it may suppress melatonin or have downstream effects on the body's clock functions and immune systems[15]
- Health of wildlife, who cannot draw blinds to block light in their habitats; light at night has the potential to shift the timing and location of food gathering, reproduction and rearing, and natural predator relationships

Of course, the committee also recognizes that spectrum alone is not the issue. The potential harm or degradation to the environment is inextricably tied to the irradiance, timing, and duration of light measured at the eye of the human or the photoreceptor in the wildlife species; or, in the case of reduced the visibility of the stars, the luminance of the sky due to back-scattered light from the atmosphere. However, the spectrum of the light source can impact all these issues.

At this point in time, there is no single spectral function that describes each of these issues completely and accurately. Sky glow, in particular, is a complex issue that depends heavily on atmospheric conditions and viewing locations, although the scatter of short wavelengths in the atmosphere is a well-documented phenomenon (shortest wavelengths scatter the most, and this Rayleigh scattering is reduced exponentially with the increase in wavelength). The IES Sky Glow Calculations Committee is evaluating different metrics for quantifying the effects of luminaire spectrum and light distribution on sky glow for different viewing conditions. For additional information refer to ANSI/IES TM-37-21 Technical Memorandum: Description, Measurement, and Estimation of Sky Glow.[20]

The discovery in 2002 of the intrinsically photosensitive retinal ganglion cells (ipRGC) has led many researchers to associate their sensitivity (called "melanopic"; peaking at 490 nm, in the blue-cyan range of the visible spectrum) with many of the photobiological and neurobehavioral functions in the body. Although the physiological functions are complex and include input from rods and cones, the melanopic content of a given light source spectrum relative to its photopic content (i.e., the visual response) is correlated to the biological effect from the spectrum. In short, the melanopic/photopic (M/P) value is a way to quantify the blue-cyan content, which is a concern at night, compared to the useful visible light delivered.

M/P values can be calculated in multiple ways, depending on how the melanopic and photopic functions are normalized.[16] As a way to communicate biologically relevant spectral content and illuminance, the CIE recently recommended a method for calculating the relative melanopic content of a light source in *CIE S026:2018, System for Metrology of Optical Radiation for ipRGC-Influenced Responses to Light*.[17]

This method uses a reference "daylight" SPD, the CIE standardized 6500-K daylight spectrum, called D65. The light source SPD is multiplied by the melanopic response function, then divided by the number of photopic lumens in the source, yielding the melanopic equivalent flux per lumen. The D65 SPD is multiplied by the melanopic function and then divided by its photopic lumens to yield melanopic equivalent flux per lumen of D65. The ratio of the light source melanopic flux per lumen to the D65 melanopic flux per lumen is the *melanopic daylight (D65) efficacy ratio,* or *melanopic DER*. Therefore, melanopic DER is a measure of the melanopic content of a light source, relative to the melanopic content of reference D65 daylight.

Melanopic DER is a handy value because it can be multiplied by the photopic illuminance (lux or footcandles) to yield *melanopic equivalent daylight (D65) illuminance,* or *melanopic EDI*. Example: 2,000 lux

from a source with melanopic DER of 0.50 yields 1,000 melanopic EDI lux. This is a number which communicates the amount of biologically relevant illuminance at the eye.

Another way to think about this: Melanopic DER is a ratio describing the amount of "blue-cyan" content in a given light source spectrum relative to the amount of "blue-cyan" content in the D65 spectrum. It is used to calculate the melanopic daylight equivalent illuminance (melanopic EDI):

Melanopic DER x photopic illuminance = melanopic EDI

Thus, if daylight were considered the perfect way to deliver melanopic stimulus, the EDI value would tell us how much equivalent D65 illuminance is delivered by a specific light source.

For wildlife health, the variety of species is wide: insects, birds, mammals, fish, reptiles, and more. Some species are sensitive in the ultraviolet range, and all UV should be eliminated from electric light sources for this reason. Ongoing research is contributing to a greater understanding of these effects. In spite of the different spectral sensitivities, the majority of animal species seem to be affected by the same sensitivity range as the human ipRGCs. Although there are exceptions, the M/P value (or melanopic DER if the CIE approach is employed) can be used as a proxy for wildlife sensitivity to light at night, with a statistical correlation (R2) of 67%.[18]

The LOPS Committee has examined the "blue-cyan content" of a variety of light sources and has divided them into four categories numerically, using the CIE S026-2018 method, which is based on normalizing the melanopic and photopic functions with the CIE D65 (daylight) spectrum:

- Melanopic DER > 0.6: VERY HIGH melanopic content (i.e., not meaning that very high melanopic content is recommended, but that there are no restrictions on blue-cyan content)
- Melanopic DER ≤ 0.6: HIGH melanopic content (meaning that the light sources in the application should have less blue-cyan than most 4000-K LED products)
- Melanopic DER ≤ 0.5: MEDIUM melanopic content (meaning that the light sources in the application should have less blue-cyan than most 3000-K LED products and less than conventional incandescent)
- Melanopic DER ≤ 0.3: LOW melanopic content (meaning that the light sources in the application should have less blue-cyan than most 2400-K LED products, similar to HPS, LPS, phosphor-converted amber LED, or monochromatic amber LED)
- Melanopic DER ≤ 0.15: VERY LOW melanopic content (meaning that the light sources in the application should have less blue-cyan than most 2000-K LED products

The recommendation for spectral content in the illuminance table (**Table A-3**, **Section A.3**) may vary according to the lighting zone, where the recommended light sources get warmer in appearance and lower in melanopic content as the zone gets more rural. Similarly, as the area increases in sensitive waterways, habitats, riparian zones, and/or natural character (for example, areas that might be classified as lighting zone 0 or 1, as defined in the IDA-IES Model Lighting Ordinance[1]), the recommendation with respect to blue-cyan content is reduced on the assumption that there will be a greater number of sensitive wildlife species. Lighting designers for sports venues, conversely, may prefer light sources with higher melanopic DER values for spectator enjoyment and television broadcasting. For reference, **Table B-1** lists many outdoor light sources and their melanopic DER values as calculated using the CIE S 026-2018 procedure. (*Note:* These are examples only; they do not represent all the possibilities for any given source type.)

Table B-1. Examples of Light Source M/P Values

Light source	CCT (K)	Rf*	Melanopic DER	No. of SPDs**
White LED, 2700 K	2550 – 2850	≥70	0.35 – 0.48	56
White LED, 3000 K	2850 – 3250	≥70	0.40 – 0.53	203
White LED, 3500 K	3250 – 3750	≥70	0.47 – 0.62	72
White LED, 4000 K	3750 – 4250	≥70	0.50 – 0.69	95
White LED, 4500 K	4250 - 4750	≥70	0.57 – 0.69	39
White LED, 5000 K	4750 – 5250	≥70	0.60 – 0.81	38
White LED, 6500 K	6250 – 6750	≥70	0.75 – 0.91	17
Narrowband Amber LED	1606	2	0.02	
Low Pressure Sodium	1718	0	0.02	
PC Amber LED	1872	46	0.07	
High Pressure Sodium	1959	34	0.15	
High Pressure Sodium	2041	42	0.18	
Metal Halide	3145	83	0.46	
Metal Halide	4002	78	0.57	
Metal Halide	4041	90	0.67	
Incandescent	2836	99	0.49	
Moonlight	4681	98	0.82	

* R_f is a measure of color rendering fidelity described in ANSI/IES TM-30-20.[19]

** The number of sources evaluated in determining the range given in the fourth column.

REFERENCES

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7. Illuminating Engineering Society. ANSI/IES RP-6-20, Recommend Practice: Lighting Sports and Recreational Areas. New York: IES; 2020.
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20. Illuminating Engineering Society. ANSI/IES TM-37-21, Technical Memorandum: Description, Measurement, and Estimation of Sky Glow. New York: IES, 2021.

Process for Change to an ANSI/IES Standard under Continuous Maintenance

This standard is maintained under continuous maintenance procedures, for which IES has an established and documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the standard. Committee consideration will be given to proposed changes by June 30 of any given year for proposed changes received by the IES Director of Standards no later than December 31 of the previous year.

Submittal Format

Proposed changes must be submitted to the IES Director of Standards in the announced published format. However, changes may be accepted in an earlier published format, if the differences are immaterial to the proposed change submittal. If the Director of Standards concludes that a current form must be utilized, the proposer may be given up to 20 additional days to resubmit the proposed changes in the current format.

Specific changes in the text or values are required and must be substantiated. Any change proposals that do not meet these requirements will be returned to the proposer. Supplemental background documents to support changes submitted may be included.

Submission to the Committee Chair

The Director of Standards shall forward proposed changes received on appropriate forms to the committee chair for assigning to committee members (responders) to develop responses to submitters of proposed changes.

Review and Clarification

Responders shall review proposals and should contact the proposer if necessary for clarification.

Response Recommendation

Designated responders shall draft a recommended committee response, including any recommended changes to the standard. The 'responders' recommended responses shall be submitted to the committee chair in electronic form usable by Society Staff, including any recommended change to the standard in response to proposals received.

Options for Committee response are limited to:

a) Proposed change accepted for public review without modification
b) Proposed change accepted for public review with modification
c) Proposed change accepted for further study
d) Proposed change rejected

The responders shall provide reasons for any recommendation other than option (a) above.

The designated responders shall not recommend option (c) unless the further study can be completed by October 1 of that year, and providing the Committee can then vote for option (a), (b), or (d) no later than November 15 of that year.

Editing

The Committee chair or his or her designee shall edit the draft responses and circulate the edited drafts to the committee for review.

Form for Proposing Change to an ANSI/IES Standard under Continuous Maintenance

NOTE: Use a separate form for each comment. Submit to the Director of Standards, IES, 120 Wall Street, 17th Floor, New York, NY 10005-4001. Email: standards@ies.org. Fax: 212-248-5017.

1. Submitter: _____
   Affiliation: _____
   Address: _____
   City: _____ State: _____ Zip: _____ Country: _____
   Telephone: _____
   Fax: _____
   E-mail: _____

I hereby grant the Illuminating Engineering Society (IES) the non-exclusive royalty rights, including non-exclusive rights in copyright, in my proposals. I understand that I acquire no rights in publication of the standard in which my proposals in this, or other analogous, form are used. I hereby attest that I have the authority and am empowered to grant this copyright release.

Submitter's signature: _____ Date: _____

2. Title of publications and year published _____
3. Clause (section), sub-clause or paragraph number; and page number: _____
4. My proposal (check one):
   [ ] Change to read as follows
   [ ] Delete and substitute as follows
   [ ] Add new text as follows
   [ ] Delete without substitution

Use underscore to show material to be added (<u>added</u>) and strikethrough for material to be deleted (~~deleted~~). Use additional pages if needed.

5. Proposed change:

_____
_____
_____

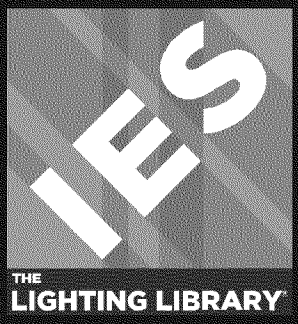
6. Reason and substantiation:

_____
_____
_____

Select as applicable:

[ ] Additional pages are attached. Number of additional pages:
[ ] Attachments or referenced materials cited in this proposal accompany this proposed change.

Please verify that all attachments and references are relevant, current, and clearly labeled to avoid processing and review delays. Please list your attachments here:



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Industry Standardization
Roadway and Parking Facility Lighting Standards
Criteria and Illumination Recommendations

Order# ANSI/IES RP-43-22
ISBN# 978-0-87995-435-2

www.ies.org

To: Barns, Caitlin (Caitlin.Barns@stantec.com)[Caitlin.Barns@stantec.com]
From: Payne, Leonidas@Energy[/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=aa9d25dde24e40429efa06c4eed35807-Payne, Leon]
Sent: Fri 12/15/2023 2:38:45 PM (UTC-08:00)
Subject: Re: Requests for Fountain Wind

Eric sent word that the DRs won't be ready today. Another PM will finalize and docket next week.

Get Outlook for iOS

From: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Sent: Friday, December 15, 2023 9:26:40 AM
To: Barns, Caitlin (Caitlin.Barns@stantec.com) <Caitlin.Barns@stantec.com>
Subject: Re: Requests for Fountain Wind

Please cc Mark and Laiping on any reply.

Mark.Hesters@energy.ca.gov
Laiping.Ng@energy.ca.gov

From: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Sent: Friday, December 15, 2023 9:23 AM
To: Barns, Caitlin (Caitlin.Barns@stantec.com) <Caitlin.Barns@stantec.com>
Subject: Fw: Requests for Fountain Wind

This is not a formal data request, but can you help our transmission technical staff out with this request?

Lon Payne—Project Manager
California Energy Commission

From: Hesters, Mark@Energy <Mark.Hesters@energy.ca.gov>
Sent: Friday, December 15, 2023 9:19 AM
Subject: Re: Requests for Fountain Wind

Energy Commission are hoping to complete the record on the transmission studies for interconnection of the Fountain Wind Project.

1. While most of the California ISO Phase 2 Study has been submitted (under a subsequently approved confidentiality request), the Phase 2 report "PG&E North Interconnection Area Study Report" was not filed. This study report is later referenced in Appendix A of the 2019 Q1106 Generator Interconnection Reassessment Report which states "the details of the reassessment are provided in the PG&E North Interconnection Area Report." Please submit the Phase 2 report titled "PG&E North Interconnection Area Study Report" under a confidentiality request if necessary.

2. The complete record of Material Modification Requests and subsequent California ISO approvals. We understand that these are primarily changes to the commercial operating date but again we would lik e to have them in the record for our certification process.

Mark Hesters
California Energy Commission
(916) 931-8942

To: Barns, Caitlin[Caitlin.Barns@stantec.com]
Cc: Energy - GIS[GIS@energy.ca.gov]
From: David, Travis@Energy[travis.david@energy.ca.gov]
Sent: Mon 1/8/2024 12:10:30 PM (UTC-08:00)
Subject: Fountain Wind Cultural Resources Study Area and Survey Area GIS datasets

Hi Caitlin, would it be possible to provided GIS data of **Fountain Wind Cultural Resources Study Area and Survey Area GIS datasets**?

I received many Fountain Wind biological resources and project description datasets but no Cultural Resources data.

Let me know if you have any questions,

Thanks,

Travis David
Electric Generation System Specialist I
Siting, Transmission and Environmental Protection
California Energy Commission
916-477-1128
www.energy.ca.gov

To: 'Michelle Lee'[Michelle@thecirclelaw.com]
Cc: Jason Lee[jason@thecirclelaw.com]
From: Roark, Gabriel@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=ED87FF1E22CD49F3AAFF644C82538D46-ROARK, GABR]
Sent: Wed 1/10/2024 2:04:23 PM (UTC-08:00)
Subject: RE: Meeting on January 11
CEC's Opt In Permitting Program_ada.pdf
Fountain Wind scoping_ADA.pdf
PAO+_PPT_for_11.28.23_Scoping_and_Info_Mtg_ADA (already docketed).pdf

Hi, Michelle,

I attached the three CEC-presented slide decks from the Informational Hearing and Public Meeting. I think the first file is the one that the tribal representatives would most want to see. I am working on the rest of the documents now.

Cheers,

Gabriel

From: Michelle Lee <Michelle@thecirclelaw.com>
Sent: Wednesday, January 10, 2024 10:07 AM
To: Roark, Gabriel@Energy <gabriel.roark@energy.ca.gov>
Cc: Jason Lee <jason@thecirclelaw.com>
Subject: RE: Meeting on January 11

Gabriel,

Can you please send us the slides that CEC presented at Giaia? The tribal representatives would like to see those.

Also, they would like the CEC to present to us first, for example, can you walk through the description of the project and any updated maps, including the footprint of the project. We are looking at the material on the NAHC website and would like to walk through it like this:

Preparing for AB 52 Consultations
- Review all provided requested documentation:
- Description of project
- Map of project area
- Archaeological/TCR Reports
- Pedestrian survey results
- Off-site improvements proposed
- Infrastructure required for project and off-site improvements
    - Types
    - Depths
    - Timing

They would like the CEC to be able to start on the topics, and then the Tribal Cultural reps would comment on each. If that makes sense. We can talk about it today if that works for you.

Respectfully,

Michelle C. Lee
The Circle Law Group, P.C.
930 F Street

Sacramento, CA 95814
Phone: (916) 809-8900
Fax: (916) 809-8901
Cell: (916) 204-5724
michelle@thecirclelaw.com

From: Roark, Gabriel@Energy <gabriel.roark@energy.ca.gov>
Sent: Wednesday, January 10, 2024 9:39 AM
To: Michelle Lee <Michelle@thecirclelaw.com>
Subject: RE: Meeting on January 11

The titles of attending CEC staff are:

Kari Anderson, Senior Counsel
Sierra Graves, Tribal and Community Engagement Lead
Mariah Ponce, Attorney
James Qaqundah, Advisor to Commissioner Gallardo
Gabriel Roark, Assistant Tribal Liaison and Cultural Resources Unit Supervisor

Thanks,

Gabriel

From: Michelle Lee <Michelle@thecirclelaw.com>
Sent: Wednesday, January 10, 2024 9:11 AM
To: Roark, Gabriel@Energy <gabriel.roark@energy.ca.gov>
Subject: RE: Meeting on January 11

Gabriel,

Can you tell me their titles.

Respectfully,

Michelle C. Lee
The Circle Law Group, P.C.
930 F Street
Sacramento, CA 95814
Phone: (916) 809-8900
Fax: (916) 809-8901
Cell: (916) 204-5724
michelle@thecirclelaw.com

From: Roark, Gabriel@Energy <gabriel.roark@energy.ca.gov>
Sent: Tuesday, January 9, 2024 3:26 PM
To: Michelle Lee <Michelle@thecirclelaw.com>
Subject: Meeting on January 11

Hi, Michelle,

It occurred to me that you might not have email addresses for all of the CEC's attendees of our meeting in a couple of days. They are:

- Sierra.Graves@energy.ca.gov
- Mariah.Ponce@energy.ca.gov
- James.Qaqundah@energy.ca.gov
- Kari.Anderson@energy.ca.gov (substituting for Jared Babula)

I hope this helps the Tribal Council with sending invitations.

Best regards,

Gabriel Roark, M.A.
Supervisor, Cultural Resources Unit
Assistant Tribal Liaison
Siting, Transmission, and Environmental Protection Division
California Energy Commission
916-237-2544 (mobile)
www.energy.ca.gov
(he/him/his)

Stantec

Memo

To:	CEC Docket Office	From:	Caitlin Barns Stantec Consulting Services, Inc.
File:	Memo of File Submittal	Date:	June 29, 2023

Reference: Submittal of Files via Kiteworks FTP

The following files were submitted via Kiteworks FTP to California Energy Commission in support of data responses for the Fountain Wind Project.

Filename	File Type	Data Response Number	Data Description
FNW_Impacts_20230629	.zip	Project Description	Temporary and permanent impact shapefiles
FNW_ProjectSiteBoundary_v1_20230629	.zip	Project Description	Project site boundaries shapefiles: the limit of the area within which all potential ground disturbance may occur and associated construction and maintenance corridors
FNW_ProjectFeatures_20230628	.zip	Project Description	Shapefiles of infrastructure that will be built as part of Project construction (turbines, O&M building, etc.)

To: Ohara, Sean@CALFIRE[Sean.Ohara@fire.ca.gov]
Cc: Schaefer, Leah@CALFIRE[leah.schaefer@fire.ca.gov]; Fooks, Brett@Energy[Brett.Fooks@energy.ca.gov]; Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
From: Dr. Alvin Greenberg[agreenberg@risksci.com]
Sent: Wed 1/17/2024 5:03:44 PM (UTC-08:00)
Subject: Questions Regarding Fountain Wind Project

Hello Chief O'Hara,
I am truly sorry that I have not been available when you have graciously returned my calls. I realize that you are very busy and since we appear to have different schedules, I thought that an email would describe most of the matters I would like to discuss with you. Your response would be greatly appreciated, however, if you would prefer to discuss these points in a phone call, perhaps you could reply with a date and time when it would be convenient for us to talk.
Thank you for your courtesy,
Alvin Greenberg, Ph.D
California Energy Commission Staff
Worker Safety and Fire Protection, Fountain Wind Project

TOPICS/QUESTION
(Regarding Your Staffing and the Fountain Wind Project)

As per AB 205, the Opt-in process designates the California Energy Commission (CEC) as the Lead Agency to prepare and publish the environmental analysis as per CEQA. The CEC must conduct this review before either issuing a license to construct or denying the license. All agencies and entities with an interest in a project must be notified and their opinion solicited on any subject matter in which they wish to opine. A combined Preliminary Staff Assessment (PSA) and Draft Environmental Impact Report (DEIR) must be prepared and presented to all parties and published for a 30-day public comment period, after which a Public Meeting will be held. All comments must be considered and responded to, although similar comments may be grouped under one heading. The five Commissioners, appointed by the Governor, will make the decision. Staff will make a recommendation and will propose mitigation in all subject matter topics as appropriate.

On the topic of Worker Safety and Fire Protection, I have the following questions regarding Fire Protection (which also includes hazmat response, if any, and rescue).

1. If the project were to be approved and built, is your current full-time and volunteer firefighter staffing at the stations that would respond to this Project up to your standards?
a. Which station(s) would respond?
b. What would be the estimated response times for fire, EMS, and rescue?

2. Which of all your stations would respond first to a hazmat spill or a rescue (including high angle rescue)?

3. If full staffing was achieved, would the existing physical infrastructure be adequate for your needs?

4. What complement of engines, trucks, water tenders, EMS vehicles, Chief's trucks/cars exist at the responding stations? Your back-up stations? Automatic Aid or Mutual Aid from other departments for response or in-fill?

5. What is the source of water for your tenders and engines?
a. Is a supplemental source needed in order to adequately serve this Project if built?

6. I am sure you are aware that the Applicant's initial proposed water source (for firefighting and other uses) is no longer available and the use of groundwater may be problematic.
a. Do you feel that Fountain Wind's proposal for having two 10,000-gal water "dip" tanks for firefighting – one on-site the other off-site on the north site of Hwy-299 - is adequate?

7. Do you have familiarity with the fire detection and suppression systems on the proposed turbines? Are you aware of any success or failures rates of fire suppression by these types of turbines?

8. Turning to the existing Hatchet Wind Project, have you had any calls to respond to a fire, hazmat spill, or rescue at that location?
a. If so, let's discuss the circumstances.

9. Have any of the wildfires in your jurisdiction threatened the Hatchet Ridge Wind Project?
a. If so, let's discuss the nature of that threat and what resources you used to address that threat.

10. As staff, I am required to propose mitigation if I identify an impact that requires mitigation. Given your experience and position, I am asking for your frank assessment of what impacts to your ability to respond to emergencies might be presented by the construction and operation of this Project. Please offer your assessment on all impacts *and potential impacts*, including draw-down of equipment and staff.

11. I am also required to assess the "cumulative impact" of adding this Project to others that have either been approved or are in the planning stage. I have identified four energy-related projects plus the one existing project (Hatchet Ridge) that could possibly cause a cumulative impact to your Department. These four other projects are:
* The Anderson River Battery Energy Storage System
* The Crossroads 2 Battery Energy Storage System near Montgomery Creek
* The Meadow Ridge-2 solar PV and battery energy storage system somewhere near Round Mountain
* The Burney-Hat Creek bio energy gasification project somewhere near Burney

a. Do you have any comments from your professional perspective on the above proposed projects individually, or in combination with the proposed Fountain Wind project?
b. Specifically, do you have any concerns with battery energy storage facilities, or a facility that would combine battery energy storage + wind generation?
c. Does your command region have any experience with responding to battery energy storge systems, solar PV generating systems, or gasification projects?

Dr. Alvin Greenberg
37 Mt. Whitney Dr.
San Rafael, CA 94903
415-472-6056
cell 415-302-0438

To: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
Cc: Knight, Eric@Energy[Eric.Knight@energy.ca.gov]
From: Energy - STEP Siting[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=14E6AC2919EC428BB3378E30CE9A58E9-ENERGY - ST]
Sent: Tue 1/16/2024 4:37:55 PM (UTC-08:00)
Subject: FW: Stop the Fountain Wind Project

-----Original Message-----
From: Hugh Cruickshank <vibrantlife4u@earthlink.net>
Sent: Tuesday, January 16, 2024 4:08 PM
To: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>; Energy - STEP Siting <STEPsiting@energy.ca.gov>
Cc: gavin.newsom@gov.ca.gov
Subject: Stop the Fountain Wind Project

To Whom,

I'm writing today to ask you to NOT move forward with the proposed Fountain Wind Project. It's been determined now after data collected from around the world that these types of wind turbines are not ecologically sound or a sustainable way to produce energy. They are also an eyesore, endanger avian species, and the blades fill landfills at the end of their short operating life. We all want clean energy, but this is not the way to produce it.

In my opinion nuclear fusion is the way forward. Invest now to make it a reality in the near future.

Thank you.

Hugh Cruickshank

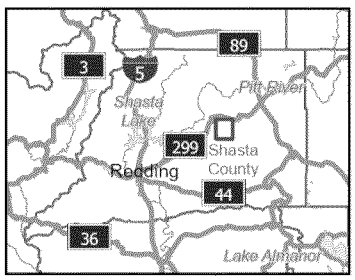
To: Barns, Caitlin[Caitlin.Barns@stantec.com]
Cc: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
From: Roark, Gabriel@Energy[gabriel.roark@energy.ca.gov]
Sent: Fri 1/5/2024 3:50:07 PM (UTC-08:00)
Subject: Fountain Wind (23-OPT-01) - Cultural Resources Survey Coverage

Hi, Caitlin,

Happy New Year! Does your cultural resources staff have shapefiles for their cultural resources survey coverage? I have looked through the GIS data that your office sent us but do not see these specific data. It would help a great deal in accurately presenting your team's survey efforts to have shapefiles of the survey areas. If these data are not available, we will work from the various PDF reports that document survey coverage.

Many thanks,

Gabriel Roark, M.A.
Supervisor, Cultural Resources Unit
Assistant Tribal Liaison
Siting, Transmission, and Environmental Protection Division
California Energy Commission
916-237-2544 (mobile)
www.energy.ca.gov
(he/him/his)



Project Site

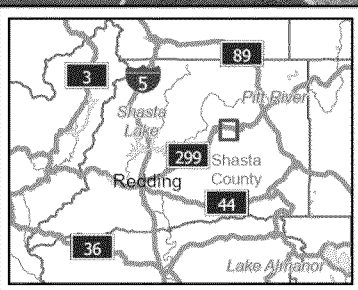
Cultural Resource Survey Area

Study Area

Note: Study Area was created by CEC staff. It represents the extent of the Project Site and a 1/2 mile radius around Proposed Wind Turbines and Aboveground Collector Lines.

Figure 2
Cultural Resources

Sources: Stantec Data June, 2023 & CEC Staff



Project Site

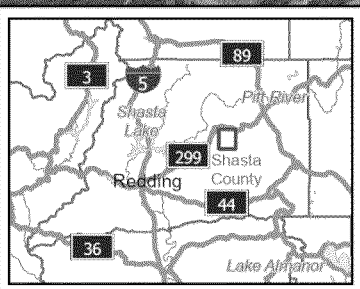
Cultural Resource Survey Area

Highway

Road

Figure 1
Cultural Resources

Source: Stantec Data June, 2023



Project Site
Cultural Resource Survey Area
Highway
Road

Figure 2
Cultural Resources

Source: Stantec Data June, 2023

To: Caitlin.Barns@stantec.com[Caitlin.Barns@stantec.com]
Cc: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
From: /O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=ED87FF1E22CD49F3AAFF644C82538D46-ROARK, GABR[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=ED87FF1E22CD49F3AAFF644C82538D46-ROARK, GABR]
Sent: Thur 1/18/2024 8:17:44 AM (UTC-08:00)
Subject: 23-OPT-01 - Fountain Wind - Consultation with Pit River Tribe

Good morning, Caitlin,

I listened to your voice message yesterday. We had the consultation meeting on January 11. I do not have much more of an update than that, as we have not discussed with the Pit River Tribe what is appropriate to share at this time. I can say that we briefly discussed the prospect of visiting the project site for tribal cultural representatives to assess tribal cultural resources, so the prospect of a tribal site visit is still on the table. We will be scheduling another consultation meeting with the Pit River Tribe soon.

Thanks,

Gabriel Roark, M.A.
Supervisor, Cultural Resources Unit
Assistant Tribal Liaison
Siting, Transmission, and Environmental Protection Division
California Energy Commission
916-237-2544 (mobile)
www.energy.ca.gov
(he/him/his)

To: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
From: Leeman, Thomas[Thomas_Leeman@fws.gov]
Sent: Fri 1/12/2024 4:33:27 PM (UTC-08:00)
Subject: Fountain Wind Project

Hello Mr. Payne,

I recently corresponded with CDFW staff about the subject project and they mentioned that they did not see any USFWS documents in the project docket with the CEC. We provided comments to Shasta County in October 2020, and again in April 2023. I thought I had transmitted those comments to the CEC when you reached out last February but I cannot find a record of having sent them. If I send them to you under another email would that suffice to get them on the docket?

I understand that the CEC held a November 28, 2023, Joint Environmental Scoping and Informational Meeting for Fountain Wind Project, but I did not receive advance notice of the meeting. Can you please confirm that my email address is on the project's distribution list? Other USFWS contacts include:
richard_kuyper@fws.gov
jenny_ericson@fws.gov
trevor_super@fws.gov
bronwyn_hogan@fws.gov

Best regards,
Thomas

Thomas Leeman
Pronouns: he/his/him
Deputy Chief, Migratory Birds
U.S. Fish and Wildlife Service
2800 Cottage Way, Room W-2606
Sacramento, CA 95825

To: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
Cc: Hesters, Mark@Energy[Mark.Hesters@energy.ca.gov]
From: Ng, Laiping@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=C9D8FEE0B1A94A4BB9EEEA36D5272C9E-NG, LAIPING]
Sent: Fri 1/19/2024 11:26:59 AM (UTC-08:00)
Subject: RE: Requests for Fountain Wind

Got it.

Thanks!

From: Barns, Caitlin <Caitlin.Barns@stantec.com>
Sent: Friday, January 19, 2024 11:24 AM
To: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Cc: Hesters, Mark@Energy <Mark.Hesters@energy.ca.gov>; Ng, Laiping@Energy <Laiping.Ng@energy.ca.gov>
Subject: RE: Requests for Fountain Wind

Hi Lon, Mark, and Laiping, documents that address this informal data request have been docketed just now under a confidentiality application. Thank you!

From: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Sent: Friday, December 15, 2023 9:23 AM
To: Barns, Caitlin (Caitlin.Barns@stantec.com) <Caitlin.Barns@stantec.com>
Subject: Fw: Requests for Fountain Wind

This is not a formal data request, but can you help our transmission technical staff out with this request?

Lon Payne—Project Manager
California Energy Commission

From: Hesters, Mark@Energy <Mark.Hesters@energy.ca.gov>
Sent: Friday, December 15, 2023 9:19 AM
Subject: Re: Requests for Fountain Wind

Energy Commission are hoping to complete the record on the transmission studies for interconnection of the Fountain Wind Project.

1. While most of the California ISO Phase 2 Study has been submitted (under a subsequently approved confidentiality request), the Phase 2 report "PG&E North Interconnection Area Study Report" was not filed. This study report is later referenced in Appendix A of the 2019 Q1106 Generator Interconnection Reassessment Report which states "the details of the reassessment are provided in the PG&E North Interconnection Area Report." Please submit the Phase 2 report titled "PG&E North Interconnection Area Study Report" under a confidentiality request if necessary.

2. The complete record of Material Modification Requests and subsequent California ISO approvals. We understand that these are primarily changes to the commercial operating date but again we would lik e to have them in the record for our certification process.

Mark Hesters
California Energy Commission
(916) 931-8942

To: Paul Hellman[phellman@co.shasta.ca.us]
Cc: Khoshmashrab, Shahab@Energy[Shahab.Khoshmashrab@energy.ca.gov]; Salyphone, Kenneth@Energy[kenneth.salyphone@energy.ca.gov]
From: Sofi, Ardalan@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=5599BBA4AAE5432A8F31F7346822A0DD-3A21E80B-4D]
Sent: Wed 1/24/2024 11:35:47 AM (UTC-08:00)
Subject: RE: Inquiry Regarding Construction Hour Regulations in Shasta County

Hi Paul,

Thank you so much for the information. I appreciate your time and consideration in assisting our team.

Best regards,
Ardalan R. Sofi, Ph.D., P.E.
Mechanical Engineer
California Energy Commission
Siting, Transmission, and Environmental Protection Division
Phone#: (747) 206-3847
Email: ardalan.sofi@energy.ca.gov

From: Paul Hellman <phellman@co.shasta.ca.us>
Sent: Wednesday, January 24, 2024 9:47 AM
To: Sofi, Ardalan@Energy <ardalan.sofi@energy.ca.gov>
Cc: Khoshmashrab, Shahab@Energy <Shahab.Khoshmashrab@energy.ca.gov>
Subject: RE: Inquiry Regarding Construction Hour Regulations in Shasta County

Ardalan,

Shasta County does not have any adopted standards or regulations governing construction hours; however, for discretionary projects in areas where sensitive receptors are located staff routinely recommends the imposition of the following condition of approval:

Construction activities shall be limited to daylight hours (between 7:00 a.m. and 7:00 p.m.) in areas where sensitive receptors are located. No construction shall be permitted on Sundays and Federal holidays.

Sincerely,
Paul Hellman, Director
Shasta County Department of Resource Management
(530) 225-5114
https://www.shastacounty.gov/resource-management

From: Sofi, Ardalan@Energy <ardalan.sofi@energy.ca.gov>
Sent: January 22, 2024 2:30 PM
To: Resource Management <resourcemanagement@co.shasta.ca.us>
Cc: Khoshmashrab, Shahab@Energy <Shahab.Khoshmashrab@energy.ca.gov>
Subject: Inquiry Regarding Construction Hour Regulations in Shasta County

---

Hello,

My name is Ardalan Sofi, and I am a mechanical engineer at Siting, Transmission, and Environmental Protection (STEP) Division of the California Energy Commission (CEC). Currently, I'm engaged in the noise and vibration staff assessment for the Fountain Wind project in Shasta County. In the course of my work, I am exploring the existence of any standards or regulations governing

construction hours within Shasta County.

Understanding these regulations would significantly contribute to the comprehensive staff assessment I am conducting. Could you please provide information on any such standards or regulations that may limit construction hours in your jurisdiction?

I appreciate your time and consideration in assisting me with this matter. Your cooperation will significantly enhance the accuracy and completeness of our assessment.

Best regards,
Ardalan R. Sofi, Ph.D., P.E.
Mechanical Engineer
California Energy Commission
Siting, Transmission, and Environmental Protection Division
Phone#: (747) 206-3847
Email: ardalan.sofi@energy.ca.gov

To: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
From: Lynette Helle[dlhelle@sbcglobal.net]
Sent: Fri 1/19/2024 3:03:55 PM (UTC-08:00)
Subject: AttN:Mr. Leonidas Payne

I do not support the Fountain Wind Project.. Waste of Money Time, and not needed.

To: Leeman, Thomas[Thomas_Leeman@fws.gov]
From: Payne, Leonidas@Energy[/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=aa9d25dde24e40429efa06c4eed35807-Payne, Leon]
Sent: Mon 1/22/2024 9:00:40 AM (UTC-08:00)
Subject: Re: Fountain Wind Project

Yes, you can send the files to me and I'll make sure they get up on the docket. If the files are very large I can send you an FTP link you can use—just let me know.

If you'd prefer to do it yourself, you can go here and click the "Submit e-Filing" link if you're already in our system. https://www.energy.ca.gov/powerplant/wind/fountain-wind-project

As for notices, you'll want to get yourself signed up for the Fountain Wind subscription topic—I can't do that for you. Go here and look at the bottom right of the page for the subscription box where you insert your email. https://www.energy.ca.gov/powerplant/wind/fountain-wind-project

The other USFW contacts you mentioned should do the same thing if they want to get notices of everything that hits the docket. Fair warning, it's a lot—there isn't an option to just get notices of things docketed by CEC or the applicant or stakeholder agencies—those items are mixed in with a whole bunch of public comments.

I maintain an agency contact list for the project, and I will put all the emails you provided on there. It would be good if you could send me everyone's office address as well, if anyone is based somewhere other than the Cottage Way address in your signature block.

Lon Payne—Project Manager
California Energy Commission

From: Leeman, Thomas <Thomas_Leeman@fws.gov>
Sent: Friday, January 12, 2024 4:33 PM
To: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: Fountain Wind Project

Hello Mr. Payne,

I recently corresponded with CDFW staff about the subject project and they mentioned that they did not see any USFWS documents in the project docket with the CEC. We provided comments to Shasta County in October 2020, and again in April 2023. I thought I had transmitted those comments to the CEC when you reached out last February but I cannot find a record of having sent them. If I send them to you under another email would that suffice to get them on the docket?

I understand that the CEC held a November 28, 2023, Joint Environmental Scoping and Informational Meeting for Fountain Wind Project, but I did not receive advance notice of the meeting. Can you please confirm that my email address is on the project's distribution list? Other USFWS contacts include:
richard_kuyper@fws.gov
jenny_ericson@fws.gov
trevor_super@fws.gov
bronwyn_hogan@fws.gov

Best regards,
Thomas

Thomas Leeman
Pronouns: he/his/him
Deputy Chief, Migratory Birds
U.S. Fish and Wildlife Service
2800 Cottage Way, Room W-2606
Sacramento, CA 95825

To: Chris Huntley[chuntley@aspeneg.com]; Iacona, Erika@Wildlife[Erika.Iacona@Wildlife.ca.gov]
Cc: Knight, Eric@Energy[Eric.Knight@energy.ca.gov]; Watson, Carol@Energy[Carol.Watson@energy.ca.gov]; Leane Dunn[ldunn@aspeneg.com]
From: Hawk, Debra@Wildlife[Debra.Hawk@Wildlife.ca.gov]
Sent: Mon 1/29/2024 4:06:54 PM (UTC-08:00)
Subject: Re: Fountain Wind Bio Coordination Call

That day and time works well.

From: Chris Huntley <Chuntley@aspeneg.com>
Sent: Monday, January 29, 2024 3:43:24 PM
To: Hawk, Debra@Wildlife <Debra.Hawk@Wildlife.ca.gov>; Iacona, Erika@Wildlife <Erika.Iacona@Wildlife.ca.gov>
Cc: Knight, Eric@Energy <Eric.Knight@energy.ca.gov>; Watson, Carol@Energy <Carol.Watson@energy.ca.gov>; Leane Dunn <LDunn@aspeneg.com>
Subject: Fountain Wind Bio Coordination Call

Hi Debra,

Last week we talked about setting up a bio focused call to discuss FW. Will Friday at 11:00 work for your group? I am still working up the setting and we are waiting form site specific impact data from the applicant to address micro siting and veg/waters impacts.

Best regards,

Chris

Aspen environmental group

Chris Huntley
Executive Vice President
Biological Resources Director
www.aspeneg.com

5020 Chesebro Road, Suite 200
Agoura Hills, CA 91301
Cell: 818-292-2327

From: Chris Huntley[Chuntley@aspeneg.com]
Attendees: Hawk, Debra@Wildlife; Iacona, Erika@Wildlife; Knight, Eric@Energy; Watson, Carol@Energy; Leane Dunn
Location: Microsoft Teams Meeting
Importance: Normal
Subject: Fountain Wind Bio Meeting
Start Time: Fri 2/2/2024 11:00:00 AM (UTC-08:00)
End Time: Fri 2/2/2024 12:00:00 PM (UTC-08:00)
Required Attendees: Hawk, Debra@Wildlife; Iacona, Erika@Wildlife; Knight, Eric@Energy; Watson, Carol@Energy; Leane Dunn

Team,

Meeting is to discuss bio impacts and mitigation for the FW Project.

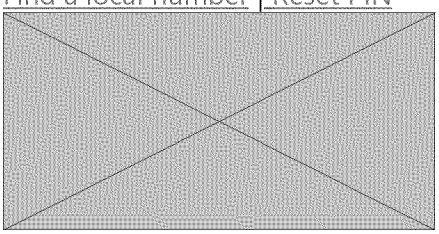
Please join us and share with any staff you feel appropriate.

Best regards,

Chris

Microsoft Teams meeting

Join on your computer, mobile app or room device
Click here to join the meeting
Meeting ID: 240 103 917 714
Passcode: usXfMp
Download Teams | Join on the web
Or call in (audio only)
+1 213-493-9022,,687818926# United States, Los Angeles
Phone Conference ID: 687 818 926#
Find a local number | Reset PIN



Learn More | Help | Meeting options

To: David, Travis@Energy[travis.david@energy.ca.gov]
Cc: Watson, Carol@Energy[Carol.Watson@energy.ca.gov]; Chris Huntley[chuntley@aspeneg.com]; Leane Dunn[ldunn@aspeneg.com]; Knight, Eric@Energy[Eric.Knight@energy.ca.gov]; Energy - GIS[GIS@energy.ca.gov]
From: Barns, Caitlin[Caitlin.Barns@stantec.com]
Sent: Thur 2/1/2024 9:25:06 AM (UTC-08:00)
Subject: RE: Fountain Wind GIS Data Request - fuel break, vegetation communities, and disturbed areas

Yes, we're hoping to get it to you by tomorrow. Would you be able to send me a Kiteworks link?

From: David, Travis@Energy <travis.david@energy.ca.gov>
Sent: Thursday, February 1, 2024 8:46 AM
To: Barns, Caitlin <Caitlin.Barns@stantec.com>
Cc: Watson, Carol@Energy <Carol.Watson@energy.ca.gov>; Chris Huntley <Chuntley@aspeneg.com>; Leane Dunn <ldunn@aspeneg.com>; Knight, Eric@Energy <Eric.Knight@energy.ca.gov>; Energy - GIS <GIS@energy.ca.gov>
Subject: RE: Fountain Wind GIS Data Request - fuel break, vegetation communities, and disturbed areas

Good morning Caitlin, following up on our data request for GIS data representing fuel breaks, vegetation communities, and disturbed areas. Any word on when this request will be fulfilled?

Thank you,

Travis David
California Energy Commission
916-477-1128

From: David, Travis@Energy
Sent: Tuesday, January 23, 2024 11:04 AM
To: Barns, Caitlin <Caitlin.Barns@stantec.com>; David, Travis@Energy <travis.david@energy.ca.gov>
Cc: Watson, Carol@Energy <Carol.Watson@energy.ca.gov>; Chris Huntley <chuntley@aspeneg.com>; Leane Dunn <ldunn@aspeneg.com>; Knight, Eric@Energy <Eric.Knight@energy.ca.gov>; Energy - GIS <GIS@energy.ca.gov>
Subject: RE: Fountain Wind GIS Data Request - fuel break, vegetation communities, and disturbed areas

Great news Caitlin! I look forward to the email request to send the FTP link.

Travis David
California Energy Commission
916-477-1128

From: Barns, Caitlin <Caitlin.Barns@stantec.com>
Sent: Tuesday, January 23, 2024 10:35 AM
To: David, Travis@Energy <travis.david@energy.ca.gov>
Cc: Watson, Carol@Energy <Carol.Watson@energy.ca.gov>; Chris Huntley <chuntley@aspeneg.com>; Leane Dunn <ldunn@aspeneg.com>; Knight, Eric@Energy <Eric.Knight@energy.ca.gov>; Energy - GIS <GIS@energy.ca.gov>
Subject: RE: Fountain Wind GIS Data Request - fuel break, vegetation communities, and disturbed areas

Hi Travis, we do have GIS for fuel breaks, vegetation communities, and disturbed areas and will be providing it as part of our data responses in the next few weeks. I will need a FTP link but I'll let you know a few days ahead of time so it doesn't expire in the interim.

Thanks!
Caitlin

From: David, Travis@Energy <travis.david@energy.ca.gov>
Sent: Tuesday, January 23, 2024 9:35 AM

To: Barns, Caitlin <Caitlin.Barns@stantec.com>
Cc: Watson, Carol@Energy <Carol.Watson@energy.ca.gov>; Chris Huntley <Chuntley@aspeneg.com>; Leane Dunn <ldunn@aspeneg.com>; Knight, Eric@Energy <Eric.Knight@energy.ca.gov>; Energy - GIS <GIS@energy.ca.gov>
Subject: Fountain Wind GIS Data Request - fuel break, vegetation communities, and disturbed areas

Hi Caitlin, the biological resources team would like to do a study on the Fountain Wind shaded **fuel break, vegetation communities, and disturbed areas**. Does the applicant have GIS datasets that represent these features? If so can you please send them to me? Let me know if you need me to send a secure FTP link.

Travis David
Electric Generation System Specialist I
Siting, Transmission and Environmental Protection
California Energy Commission
916-477-1128
www.energy.ca.gov

Caution: This email originated from outside of Stantec. Please take extra precaution.

Attention: Ce courriel provient de l'extérieur de Stantec. Veuillez prendre des précautions supplémentaires.

Atención: Este correo electrónico proviene de fuera de Stantec. Por favor, tome precauciones adicionales.

To: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
From: Gene Donham[glstr6689@gmail.com]
Sent: Tue 1/30/2024 1:30:28 PM (UTC-08:00)
Subject: Fountain Wind Project

I would like to express my opposition to the Fountain Wind Project. The people of Shasta county have rejected it and that should be considered. There are so many problems associated with this project, the risk of fires and and aerial firefighting access, the loss of wildlife, local tribal concerns and County Ordinances. I encourage you to stop this project.
Thank you

To: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
From: Michael Dacquisto[mdacquisto2@gmail.com]
Sent: Thur 2/1/2024 3:47:20 PM (UTC-08:00)
Subject: Fountain Wind Project Support Letter
Document_2024-01-30_122842.pdf

Mr Payne

Please find attached my letter of support for the Fountain Wind Project. Thank you.

Michael Dacquisto

To: phellman@co.shasta.ca.us[phellman@co.shasta.ca.us]
Cc: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
From: Hughes, Joseph@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=7DD5E80572B644209E9607BA7BDCB630-HUGHES, JOS]
Sent: Fri 2/9/2024 2:21:55 PM (UTC-08:00)
Subject: Request for Input from Shasta County AQMD on the Opt-in Application for the Fountain Wind Project
Request for Input from Shasta County AQMD 2-9-2024.pdf

Good afternoon, Paul Hellman,

attached is a courtesy copy of the CEC's request for input from the Shasta County Air Quality Management District on the Opt-in application for the Fountain Wind Project. We plan to docket this request to the docket log for the Fountain Wind Project (23-OPT-01) this afternoon.

Thank you,

Joseph Hughes
California Energy Commission
Siting, Transmission and Environmental Protection Division
Engineering Branch Manager
916-980-7951

To: Barns, Caitlin[Caitlin.Barns@stantec.com]
From: Payne, Leonidas@Energy[/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=aa9d25dde24e40429efa06c4eed35807-Payne, Leon]
Sent: Thur 2/15/2024 10:01:21 AM (UTC-08:00)
Subject: Re: quick questions

Our fire people are actively discussing how to respond to Henry's request to do that "walk through" meeting. I can't tell you exactly when they'll have an answer, but can confirm it's being actively considered. So, stay tuned.

I will work with Dockets to get access to those old files. That situation comes up a lot when dealing with old proceedings—the documents exist but they likely weren't transferred over to the new electronic storage system when we moved to fully electronic docketing.

From: Barns, Caitlin <Caitlin.Barns@stantec.com>
Sent: Thursday, February 15, 2024 9:39 AM
To: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: quick questions

Hi Lon,

One quick question from my call with ConnectGen yesterday, and one unrelated:

1. Would your fire experts be interested in setting up a call with ConnectGen's fire experts to walk through any questions they might have on the fire detection, suppression, or response procedures?

And

2. I'm looking for a few documents from an old AFC project that doesn't have active links in the docket system – Three Mountain Power Project (99-AFC-2). Who might I contact at CEC to get a copy of these docs? (TN numbers 11798, 13456, 13679, 13949+, 14666, 14716, 14837, 15553, 15689, 15690, 16142, 16896, 17338, 18967 and 19046)

Thanks!
Caitlin

Caitlin Barns (she/her)
Senior Biologist
Mountain Region Ecosystems Group Leader
Portland, Oregon
503-207-4368

Stantec

To: Barns, Caitlin (Caitlin.Barns@stantec.com)[Caitlin.Barns@stantec.com]
From: Payne, Leonidas@Energy[/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=aa9d25dde24e40429efa06c4eed35807-Payne, Leon]
Sent: Wed 2/7/2024 9:11:12 AM (UTC-08:00)
Subject: Informal data request--Fountain Wind--Worker Safety/Fire Protection

Our technical specialist handling Worker Safety/Fire Protection had a question he is hoping you may be able to answer:

Background: In a phone conversation with Shasta Country Fire Chief Sean O'Hara, the Chief mentioned to Energy Commission staff that he had discussed concerns with the Applicant about if any photo-activation fire detection method is used in the turbines. If so, a near-to-moderate distant (even 30 miles distant) wildland fire could possibly result in enough particulates in the air at the Fountain Wind Project's (FWP) location and activate the fire suppression systems of the turbines. This would then leave the turbine fire protection systems non-functional in the event of an actual FWP turbine fire. Chief O'Hara mentioned that the FWP was researching this matter and would respond back to him. Staff's review of fire detection systems for wind turbines shows that this is a distinct possibility.

DR WS-1. Please provide a detailed description of the turbine fire detection systems and discuss the possibility of smoke from a distant wildland fire dispersing to the FWP site and triggering the fire suppression systems in the turbines. If this is a possibility, please describe how the FWP will either guard against this from happening or utilize different or redundant fire detection systems in the turbines."

Lon Payne—Project Manager
California Energy Commission

To: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
From: Daniel Stevens[daniel.stevens17@yahoo.com]
Sent: Wed 2/21/2024 8:08:51 PM (UTC-08:00)
Subject: DO NOT stop the Fountain Wind Project

I would like to voice my support for the Fountain Wind Project.

Daniel Stevens

If we weren't all crazy, we would go insane.
Jimmy Buffett

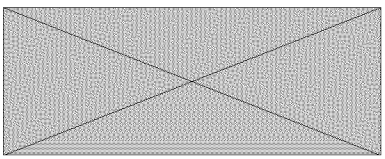
To: Hughes, Joseph@Energy[Joseph.Hughes@energy.ca.gov]
Cc: 'acox@co.shasta.ca.us'[acox@co.shasta.ca.us]; Paul Hellman[phellman@co.shasta.ca.us]; Ryan Baron[Ryan.Baron@bbklaw.com]; Timothy Lyons[Timothy.Lyons@bbklaw.com]
From: Kelly Lotz[Kelly.Lotz@bbklaw.com]
Sent: Fri 2/23/2024 4:01:00 PM (UTC-08:00)
Subject: Shasta County Air Quality Management District Input on the Opt-in Application for Certification of the Fountain Wind Project (23-OPT-01)
Shasta County Air Quality Management District Input on the Opt-in Application for Certification of the Fountain Wind Project (23-OPT-01)-c1.pdf

Mr. Hughes,

On behalf of the Shasta County Air Quality Management District (SCAQMD), please find attached SCAQMD's input on the Opt-in Application for Certification of the Fountain Wind Project (23-OPT-01) in response to your February 23rd request for the same (TN254394).

Please do not hesitate to contact the undersigned with any questions.

Sincerely,



KellyLotz
kelly.lotz@bbklaw.com
T: (925) 977-3336
bbklaw.com |

We are moving our office
Effective Monday, February 26, 2024 our new address will be:
Best Best & Krieger LLP | 1333 N. California Blvd | Suite 220 | Walnut Creek, CA 94596
Our phone and fax numbers will remain the same: Telephone: (925) 977-3300 | Fax: (925) 977-1870

USDA

383-Spec-1

NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE SPECIFICATION

FUEL BREAK – FORESTLAND

(Ac.)

CODE 383

Fuel Break—NRCS Definition:

A strip or block of land on which the vegetation, debris and detritus have been reduced and/or modified to control or diminish the risk of the spread of fire crossing the strip or block of land.

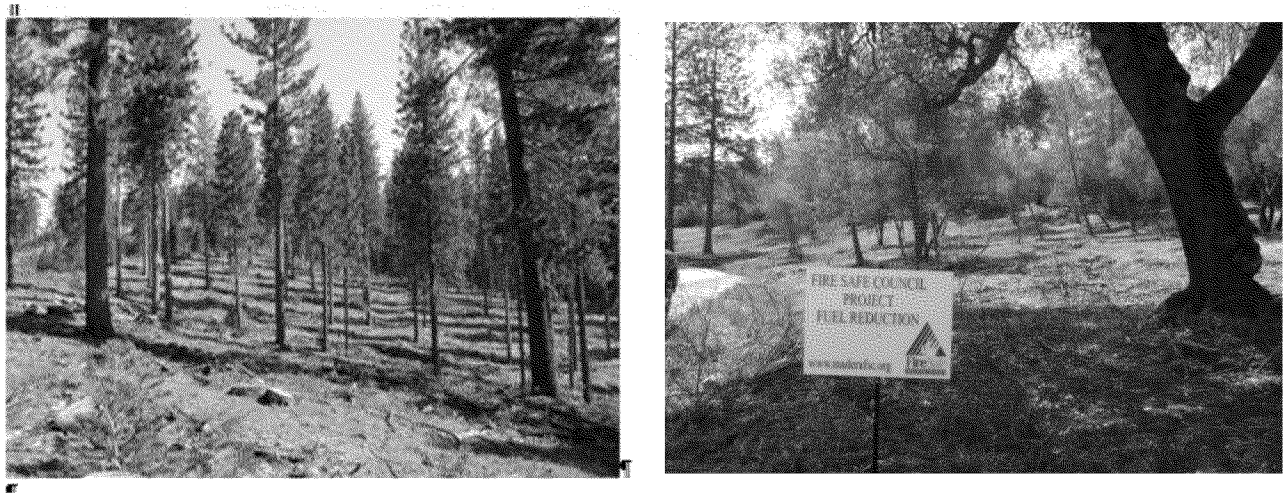


Figure 1. A fuel break on forest land involves the reduction of flammable fuels, eliminating ladder fuels, and increasing the spacing of residual trees in order to minimize the risk of crown fires.

Purpose

Control and reduce the risk of the spread of fire by treating, removing, or modifying forestland vegetation, debris and detritus.

Conditions Where Practice Applies

This practice applies on all land where protection from wildfire is needed. A fuel break is typically an easily accessible strip of land of varying width (depending on fuel and terrain), where fuel density is reduced, resulting in positive impacts to fire behavior and providing fire control opportunities.

Forestland Protection

This practice is specific to fuel breaks which are applied to forestland including conifer, montane confer-hardwood, and woodlands/grasslands forest types. Fuel breaks are installed in advance of a fire event in order to protect wildland and wildland urban interface forested landscapes and aid in wildfire suppression. This practice may also be used in Wildland Urban Interface settings for safe ingress/egress access on roads during wildfire events.

Fuel breaks are planned and located at strategic locations on the landscape as part of an integrated system on lands that have an elevated risk of wildfire. They break up large, continuous tracts of dense natural fuels, thus limiting the uncontrolled spread of wildfire. They are commonly associated with fire

breaks (permanent or temporary strips of bare or vegetated land planned to retard fire, or other features such as roads).

Fuel breaks aid in firefighting efforts by slowing fire spread, and by providing an area of less extreme fire behavior from which other actions (e.g., back burns) are taken. However, under extreme conditions even properly designed fuel breaks cannot significantly reduce fire behavior in the event of large, rapidly spreading wildfires, regardless of the efforts of firefighters.

A "shaded" fuel break is commonly applied on strategic locations within larger forested areas. Shaded fuel breaks have lower fuel loads relative to areas outside of the fuel break, and the shade provided by the canopy improves the microclimate conditions of the underlying fuels.

Fuel breaks typical have well-spaced, large sized "dominate" trees; a low number of trees per acre (e.g. 50 trees/acre - < 100 sq. ft. of basal area); few understory smaller trees; high "height to live crown" distance; less than 10 % cover of brush arranged in isolated groups; and low levels of snags and down logs.

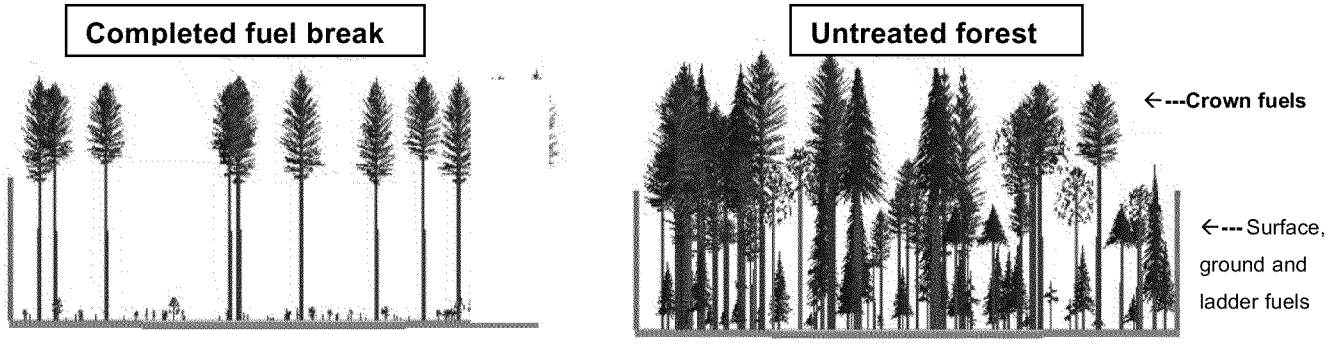


Figure 2. (Right) A typical fuel stratum for forest stands in California prior to fuel break installation. Fire behavior is a function of various inter-related elements including density of tree crown vegetation, smaller tree and brush "ladder" fuels, and ground surface vegetative debris. (Left) A completed fuel break

General guidance

The primary goal of this practice is to significantly alter (modify) fire behavior within the treated area.

This specification is designed to achieve different results from those expected from pre-commercial thinning, applied under NRCS practice 666 (Forest Stand Improvement). Although thinning can produce positive benefits in fuel reduction, the primary purpose of the Forest Stand Improvement as applied by NRCS is to address forest health, productivity and other closely related resource concerns. The post-treated structural attributes of a thinned stand are not exactly the same as those of a fuel break. In many cases thinning operations will not adequately address surface or ladder fuels, and will not increase the distance to the base of the live crown. Siliviculturally thinned stands usually have less crown separation. However, the effectiveness of an applied fuel break will be enhanced when it is located adjacent to a properly thinned stand.

Crown fires (those that rapidly spread from tree to tree) pose the greatest danger to human and ecological values. For that reason, decreasing the overall risk of a rapidly spreading crown fires is the principal objective of the fuel break. The risk of crown fires will be minimized by actions which:

- Reduce surface fuels (grasses, forbs and small brush) – complete treatment/disposal of dead woody debris and slash necessary.
- Increase the height of the base of the live crown of the overstory retention trees
- Reduce ladder fuels (small trees and larger brush species)

- Reduce the continuity of the forest canopy (tree to tree), and
- Reduce the crown bulk density of the canopy.

While some fuel breaks have little to no post treatment vegetation, this CPS 383 requires creation of a "shaded fuel break" (one that retains a degree of canopy cover). This is preferable because of the temperature and relative humidity moderation that shading provides to the surface fuels and can provide some suppression of rapidly resprouting vegetation following the initial site clearing. In addition, any degree of crown retention provides additional benefits in retaining wildlife and aesthetic values within the forested landscape.

The design of fuel breaks varies in width according to numerous factors such as on-site and adjacent fuel loads, topography (both positive and negative attributes), proximity to roads and anchor points, and other factors. There are no absolute standards for fuel break construction, but design must meet minimum criteria in the 383 Practice Standard. When possible, each situation needs to be tailored to the risk and complexity of expected wildfire and assets at risk when considering terrain, fuels, historic fire regimes, expected occurrence, and the predictable weather and fuel conditions that may be present during a wildfire.

Fuel break widths applied in the United States vary from less than 100 up to 1,000 feet. When possible, a wildland fire fuels specialist or Area Forester with wildfire prevention planning experience should be consulted for designing the width based on the above factors and local site considerations. In this specification widths are therefore presented as general guidelines, especially maximum width guidelines.

Specifications

Fuel breaks shall comply with the following items, and any additional specifications based on purpose(s) and requirements listed for environmental protection and those for facilitating practices (pruning, slash treatment, burning etc.).

Purpose

Implementation Requirements sheets shall identify the purpose for protection, the type of fuel break (road, ridgeline etc.), provide a brief explanation of what is being protected, why it is being protected, and where the protection is needed. Include a map of location and sketch of design of fuel break.

Fuel break siting/location

1. When available, refer to local fire protection plans for information on locations and specifications of fuel breaks. Ideally, installation of fuel breaks should be done when fire service agencies, local community wildfire protection or other local fire safe planning efforts have identified the area as strategic need for a fuel break system.

2. Locate all potential ignition sources that could create hazardous or catastrophic fires. These sources may include public roads, railroads, urban developments, recreation sites, utilities, etc.

3. Locate fuel break(s) between the potential ignition source and the resources/structures to be protected and as close as feasible to the ignition source. Favor locations for fuel break(s) that are on strategic ridgelines for fire suppression control, at the bottoms of canyons leading up to saddles to reduce the risk of fires moving upslope (chimney effect), roads, and other critical public safety infrastructure.

4. Connect fuel break(s) to natural or artificial fire barriers such as rivers, creeks, large rock outcrops, wet meadows, roads, or areas with low fuel loads/cover or flammability such as

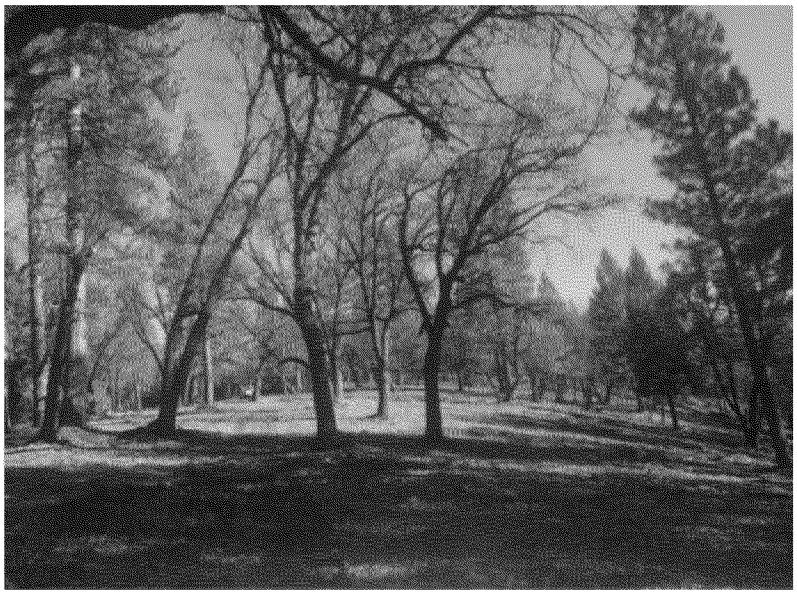
existing adjacent fuel break. Favor locations that are linked to road systems to facilitate fire-fighting access.

5. Generally, fuel breaks should not be located on midslope areas or along arbitrary property line boundaries that do not comport with strategic fuels or fire suppression control areas.
6. Often terrain limits the location and dimension of the fuel break. For safety purposes and to protect site resources, treatment methods involving equipment are generally not applied on slopes exceeding 35 percent.
7. Feather the edges of the fuel break(s) as feasible into the adjacent protected areas for aesthetic purposes.

Fuel break Dimensions

Ridges

1. The dimensions of the fuel break (width and length) shall be sufficient to reduce fire spread and intensity with consideration given to the assets being protected by the fuel break.
2. Width on level ground should be 2 ½ times the height of the average codominant tree or brush species vegetation or a minimum of 200 feet. Add 10 feet to the width for every 10 percent increase in slope (e.g., for a 50% slope 200 ft + 50 ft = 250 feet total width).
3. When terrain or other factor limits the width, the minimum fuel break width must be at least 100 feet. Use Practices CPS 666, 384, 660, and 490 (for hand chemical post installation resprout control) when narrower width "fuel breaks" are installed due width limitations.
4. Where slopes are less than 20%, the maximum width of the fuel break will generally not exceed 300 feet unless warranted by specific on-site conditions. Wider fuel break are allowable when conditions and assets at risk justify the widened area.



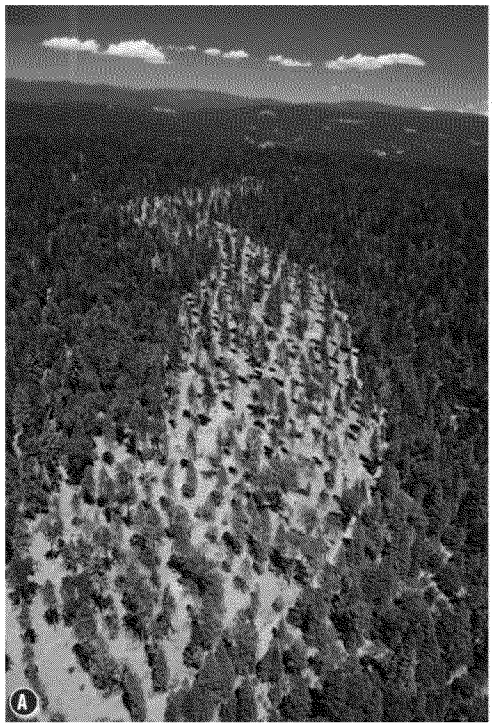


Figure 3: Ridgeline fuel breaks (left) *Photo from El Dorado County and Georgetown Divide RCD. (right) University of California ANR)*

Roads

Apply roadside fuel breaks may along county roads or private roads at an effective minimum width of 2 ½ times the height of the average codominant tree or brush species vegetation or a minimum of 200 feet. Add 10 feet to the width for every 10 percent increase in slope (e.g., for a 50% slope 200 ft + 50 ft = 250 feet total width), on level ground. Ideally, roadside fuel break widths are installed evenly on each side of the road (i.e.100 feet side of road).

Use Practices CPS 666, 384, 660, and 490 (for hand chemical post installation resprout control) when narrower width "fuel breaks" are installed due width limitations. Fuel breaks applied along roads provide enhanced protection due to the minimal fuel levels associated with roads. Roads also allow fire suppression crews quick access to the fuel break, and the road can be used as an anchor point for a back burn. Figures 4 & 5 provides visual examples of a fuel break established in conjunction with a road.

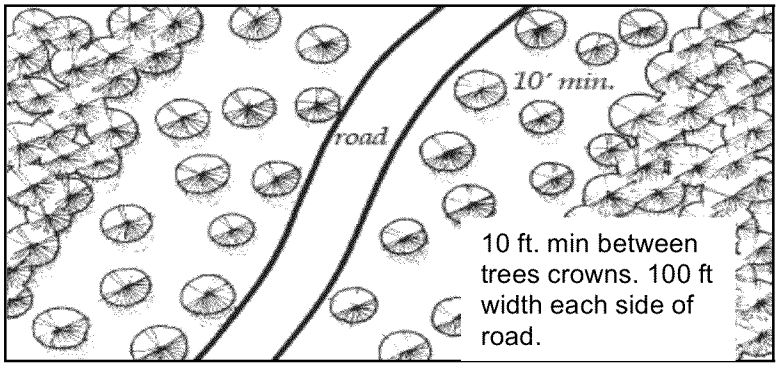


Figure 4: Aerial plan view of a road buffered by a fuel break.

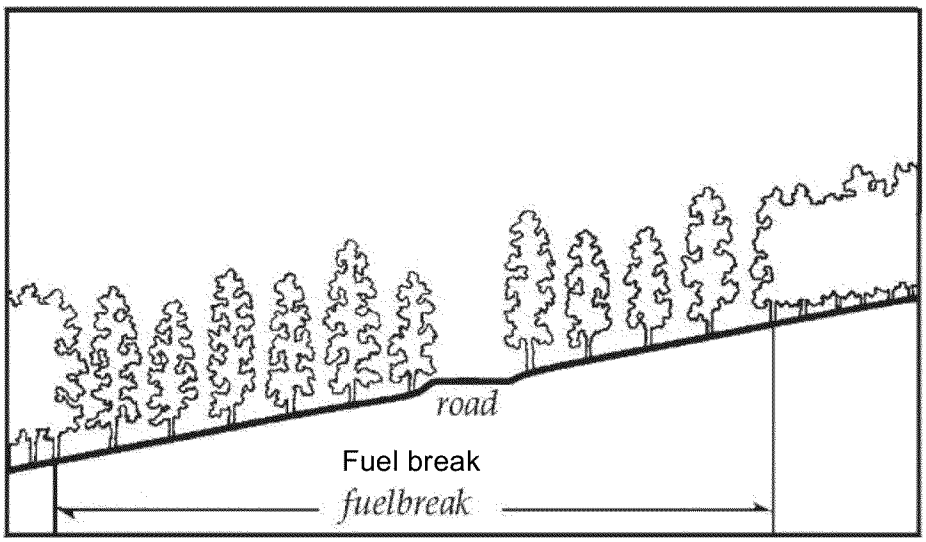


Figure 5: Cross sectional view of a fuel break established on both sides of a road *(Images are from "Fuel break Guidelines for Forested Subdivisions and Communities", Colorado State University)*

Vegetation Treatment Specification

1. Reduce or modify the existing fuel load (live vegetation and debris) to diminish the risk and/or rate of the spread of fire crossing the strip or block of land. Vegetation treatments shall focus on treating/removing fuels in all vegetative layers including tree crowns, understory trees and brush, and dead and down surface fuels or live ground cover. Focus on substantial vegetative removal and debris clean-up.

2. Vegetation treatment shall create both horizontal space and vertical space between retained vegetation.

3. Maximum Tree size removal: The maximum size live tree to be removed is 12 inches DBH. Dead/dying trees have no diameter size limit.

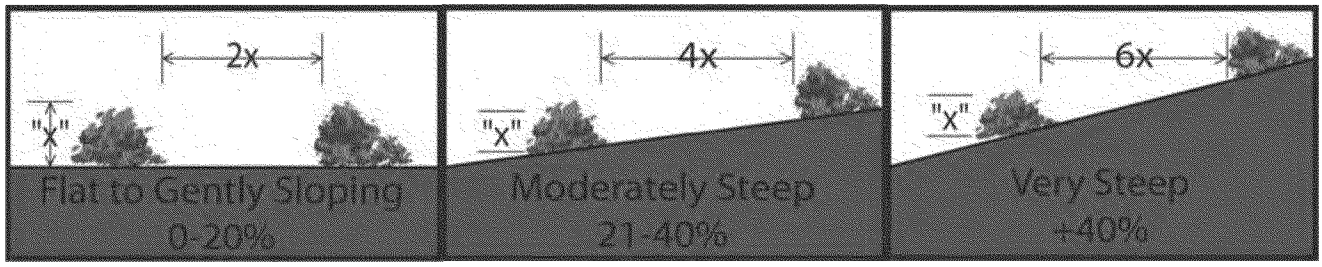
   Larger size live trees may be needed to be removed to effectively create a fuel break. When forest stand conditions necessitate removal of > 12-inch DBH tree, clients should be advised to obtain a commercial tree harvesting permit to remove the larger trees. Commercial tree removal operations should be completed and approved by CAL FIRE prior to implementation of the EQIP fuel break project.

4. Thin trees and brush to spacing standards shown below in Figure 6. Small, isolated clusters or groups of trees can be left for visual diversity or for wildlife value. State in the IR the target post treatment level of brush cover. Generally, brush cover should be less than 20% cover. Wider spacing of vegetation can be included when fire hazard and assets at risk warrant less standing vegetation.

Figure 6:

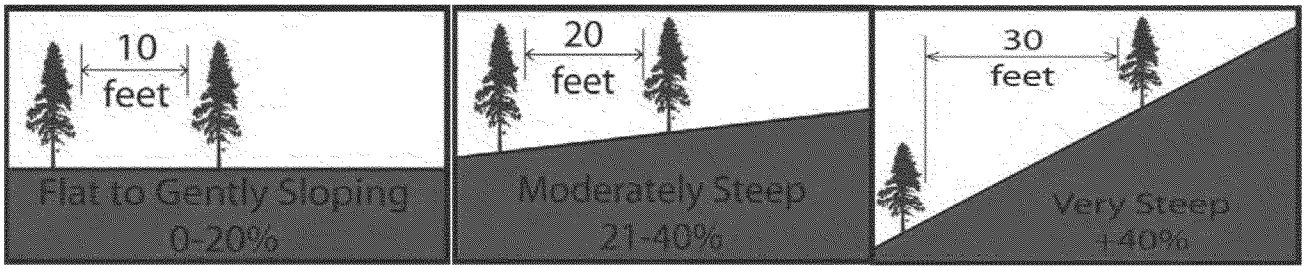
SHRUBS AND SMALL TREES (<15 ft tall): HORIZONTAL SEPARATION DISTANCES

Separation distances are measured between canopies (outer most branches) and not between trunks. Separation can be between individual shrubs/small trees or groups of shrubs/small trees.



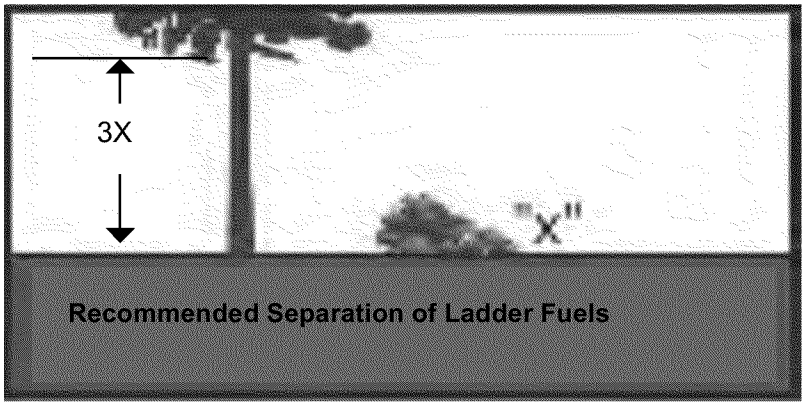
LARGER TREES: HORIZONTAL SEPARATION DISTANCES BETWEEN TREE CANOPIES

For forested areas, the recommended amount of separation between tree canopies is determined by steepness of slope. Crown separation can be between individual trees or groups of trees.



VERTICAL SEPARATION DISTANCES NEEDED BETWEEN FUEL LAYERS

Removal of ladder fuels is the most critical feature of a fuel break. Remove shrubs and small trees within the drip line of trees when sufficient space cannot be created between the tree crown and top of shrub/small trees. Pruning residual trees will also contribute to creating vertical separation of fuels.



Species composition to be favored for retention

Tree species differ in their ability to withstand wildfire. Select trees to retain that are more adapted and fire resistant to the local setting.

Table 1. Resistance of mature trees to fire damage and mortality, in order of decreasing resistance

Coastal species	Interior species
coast redwood, tanoak	ponderosa and Jeffrey pine, Douglas-fir
Douglas-fir	sugar pine, white fir, grand fir
grand fir, white fir	incense cedar
mountain hemlock	western white pine
noble fir	lodgepole pine, western hemlock
western white pine	canyon live oak
lodgepole pine	black oak
western hemlock	
Sitka spruce, western red cedar	

Source: D. Minore, Comparative autecological characteristics of northwestern tree species: A literature review. USDA Forest Service PNW Research Station Gen. Tech. Rep. PNW-87 (1979), p. 39; Forest Service Web site, http://www.fs.fed.us/pnw/pubs/journals/pnw_1979_minore001.pdf.

Prioritize removal of highly flammable shrubs.[1] After treatment retain a cover of low-growing forbs and perennial grasses for easy fire control on fuel breaks. For shrubs select species for ground cover that have low heights and contain low level of dead material.

Vegetation Treatment Methods

Implementation Requirements shall specify vegetation treatment method.

1. Vegetation treatment methods shall use techniques according to specification set forth in CPS 666 Forest Stand Improvement for tree/brush thinning, CPS 660 for pruning limbs of residual trees, CPS 384 for dispose of treated woody debris, and CPS 490 Tree Shrub Site Preparation for post treatment resprouting vegetation control.

[1] Flammability of any species is determined by moisture levels, and by the chemical composition and density of the individual species.

2. Chipping and masticating of thinned trees and shrubs is the preferred method for thinning and woody debris disposal. Lop and scatter slash treatment is generally not used for fuel breaks due to the need for low levels of of hazardous vegetative fuels following treatments. Areas with low vegetative tonage (less than approxiately 2 ton/ac.) may include lop and scatter.

Figure 7 - Mastication equipment grinds vegetation into small debris creating a fire safe fuel profile, organic material for soil health improvement, and avoids burning debris and the associated air quality, fire hazard and pest breeding issues.

Use of straight blade dozers and brush rakes are another treatment option. It can be useful for uprooting vegetation such as live oak that is susecptible to aggressive resprouting. But such methods can create substantial soil disturbance and environmental protection measures should be taken on soils and slopes that are susceptible to erosion and compaction. Mitigations/design features to reduce the soil disturbance impacts include max slope limitations for brush rake use; use of hand treatments on steeper portions of fuel break, retention of isolated vegetation groups to help filter interpret soil erosion, situating down logs on the contour to act as erosion barriers.

Remove all standing dead trees and shrubs except for a limited number of large, dead trees (snags >15" diameter- at-breast-height or larger) that may be retained for wildlife use. Low height snags, less than 20 ft in height, generally do not present a lightening fire ignition source.

3. Remove all downed dead trees and shrubs within the zone if they are solid (not rotten) and are not yet embedded into the ground. Downed trees that are embedded into soil and which cannot be removed without soil disturbance will be left in place.

Facilitating Practices

Most NRCS-CA CPS 383 Practice Scenarios contain cost components to cover costs associated with implementing facilitating practices to complete the fuel break. **Facilitating practices generally should not be included as a payment item in the contract.** Cutting trees, slash treatment, pruning and other necessary vegetative treatments must be implemented as part of the CPS 383, and are not included as separate payment items.

Additional General Requirements

Permitting and Environmental compliance

All activities associated with applying this practice shall comply with federal, state, tribal and local forestry and related laws and regulations. It is the landowner's responsibility to obtain appropriate permits and/or applications prior to commencing an activity. Typical permits that may be needed include slash burning/air quality, commercial harvesting permit from CAL FIRE when cut vegetation is used for commercial purposes, Pesticide Control Advisors Report when herbicides are applied, archeological protection review, and wildlife, threatened, endangered, sensitive species (TES) protection waivers.

Compliance with State fire protection statutes (Public Resource Code 4427) is required regarding equipment needed during open burning (sharp point shovel and fire extinguisher etc.) and fire

suppression tools when operating internal combustion (Public Resource Code 4428). Advise clients to contact local CAL FIRE Office for information. Also, CAL FIRE will advise on periods of no/curtailed operations of equipment use and post operations fire patrols during extreme fire conditions such as Red Flag Warnings or Fire Weather Watch when issued by the National Weather Service.

Watercourse and Meadow Protection Standards

The IR shall include information on watercourses, riparian areas, wetlands, including a map, in the project area.

Protection measures/treatment limitations must be provided when the project affects any Class I or II perennial watercourses, or Class III seasonal/intermittent watercourses[2]. Refer to the Table1 below for watercourse protection zones in non-anadromous water bodies. If slopes are greater than 40%, the buffer will extend to the topographic break above the stream. All watercourse riparian stream buffer areas exclude entry by heavy equipment, except at existing crossing or designated locations.

Vegetation treatment and heavy equipment is generally excluded in watercourse buffer zones, particularly in remote areas that are not associated with WUI areas or presence of public safety infrastructure. These exclusions are needed to continue large snag/wood recruitment and avoid impacts to species that utilize aquatic and riparian areas such as fish, red-legged and yellow-legged frogs, Pacific fisher, and great gray owl.

Table 1 – Protection measures/treatment limitations for watercourse protection zones (Buffer Zones)

	Class 1 wet	**Class II wet**	**Class III dry**	**Class III wet**	**Wet meadow**
Work Exclusion Zone (from channel edge or edge of meadow)	25 ft.	25 ft.	None	25 ft.	100 ft.
Heavy Equipment Exclusion Zone (Hand work only)	75 ft.	25 ft.	25 ft.	25 ft.	N/A
Total Buffer for Limited Work	100 ft.	50 ft.	25 ft.	50 ft.	100 ft.

Vegetative treatments and equipment entry within watercourse buffer zones can be included when an assessment is made that the buffer treatment is needed to protect human life, structures, or public safety or commercial infrastructure assets that are at risk to damage from wildfires. Vegetative treatments and equipment entry to address post wildfire and insect mortality resource concerns can also be included following an assessment and consultation with a NRCS biologist. Contact a NRCS biologist early in the planning process if working in the buffer zones. Consultations may be required with USFWS, NOAA Fisheries, or other state or federal regulatory agencies (i.e. Lake, Streambed Alteration Permit, 401 Water Quality Certification, 404 Clean Water Act.)

Forest management operations outside the watercourse buffer zones will ensure tree falling and other operations will not fell trees into buffer zones so that no part of the tree enters buffer. Slash will not be placed, piled or burned in any watercourse channel, buffer zone, or ephemeral drainage carrying seasonal runoff. Additional operating restrictions around ponds will apply, contact below NRCS Biologist for specification.

[2] See California Forest Practices rules section 14 CCR 895.1

Migratory and Threatened, Endangered or Sensitive Species (TES) Birds and Other Species

Project activities will not commence until a biologist concurrence is received.

Migratory Birds: Work will not occur during the migratory bird nesting season unless an assessment is conducted to determine active nesting or breeding behavior. Assessments will be completed by NRCS staff persons knowledge on migratory birds. Assessments shall be conducted within ten days prior to the start of work. The nesting season varies by region. Below are the nesting season dates by region. Refer to Technical Note TN-Biology-CA-23 for complete information on measures to minimize disturbance migratory birds.

Generally, projects less than 10 acres in size are not required to conduct migratory bird assessments, as well as projects implemented after July 15. These projects are not expected to have migratory bird population level adverse effects. Consider conducting surveys on <10-acre projects when they are adjacent to other areas planned for treatment in the same year.

TES: No known threatened, endangered, sensitive (TES) or rare plants or animals, including migratory birds, will be disturbed or harmed. Measures to avoid disturbance to TES may be required if known species are present or suitable habitat is found on-site in areas accessible to TES. In consultation with NRCS Biologist, develop a project alternative that avoids or minimizes these potential effects. Avoidance and/or minimization measures may include:

- Buffer zones around nests and dens,
- Limitations to types of equipment and/or times used,
- Limited operating periods,
- TES monitoring prior to or during activities,
- Additional snag and downlog retention.
- Any requirements when provided from ESA consultation with USFWS, NOAA Fisheries, or requirements of a state or federal permit (i.e. Lake, Streambed Alteration Permit, 401 Water Quality Certification, 404 Clean Water Act.)

Archeology

No operations may begin until archeological clearance is provided by NRCS. No operations in known archeology or historical sites.

Pest Control

1. **Pine Beetle Infestations**: In areas with bark beetle, piles containing green material will be burned within 2 months if conditions permit. If residues are green and cannot be burned within 2 months of pile creation, it will remain scattered on the ground until a burn window is available. Slash must be piled or chipped before practice can be certified.

2. **Sudden Oak Death and Goldspotted Oak Borer** In areas with known infections of pathogen or insects, specific sanitation precaution will be implement including no transport of woody outside the State Designated Zone of Infestation, covering vegetative debris moved by vehicles, and equipment sanitization measures.

   See: BMP for SOD: http://www.suddenoakdeath.org/wp-content/uploads/2014/12/forestry-08-10-with-new-2014-map.pdf

   Goldspotted Oak Borer: http://ipm.ucanr.edu/PMG/PESTNOTES/pn74163.html

Maintaining Soil Quality/ Soil Health

All operations will be planned and executed in a manner that maintains or improves soil quality. This includes using machinery that minimizes compaction, displacement, rutting and other disturbances to the forest floor. Surface organic material will be retained or improved throughout the treatment process.

Soils, site factors, and timing of application must be suitable for any ground-based equipment utilized for creating a fuel break to avoid excessive compaction, rutting, or damage to the soil surface layer.

Operation and Maintenance

- A maintenance plan will be prepared which shall list various items that are to be inspected and follow-up work to be conducted.
- Treating resprouting ground and surface fuels is the most important factor to ensuring fuel break effectiveness.
- Treat or graze vegetative fuel breaks to avoid a build-up of excess litter and to control noxious and invasive plants.
- The more open the overstory following fuel break construction, the more maintenance will be required.
- Unshaded openings that are created will encourage establishment and growth of understory vegetation.
- Fuel breaks should be inspected annually.
- Maintenance of the fuel break must be conducted at least every three to five years, to the following specifications:

  a. Treat (mow, spray, browse) or graze vegetative fuel breaks to avoid a build-up of excess litter and to control unwanted vegetation. Continuous areas of resprouting vegetation greater than 18 inches in height should be controlled.

  b. Remove lower tree and/or shrub branches that have died and stumps that pose a fire hazard.

  c. Properly dispose of slash created by maintenance.

  d. Inspect all fuel breaks for woody materials such as dead limbs or blown down trees and remove them as necessary to maintain the desired level of fire spread risk. Downed woody material >2 inches in diameter be disposed of or treated.

- Repair erosion control measures as necessary to ensure proper function.
- Access by vehicles or people will be controlled to prevent damage to the fuel break.
- Maintain the functionality of the original design throughout the life of the practice.

-

REFERENCES AND FURTHER READING

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University of California Integrated Pest Management. Goldspotted Oak Borer.
http://ipm.ucanr.edu/PMG/PESTNOTES/pn74163.html

To: phellman@co.shasta.ca.us[phellman@co.shasta.ca.us]
Cc: Anderson, Kari@Energy[Kari.Anderson@Energy.ca.gov]; Ponce, Mariah@Energy[Mariah.Ponce@Energy.ca.gov]; Babula, Jared@Energy[Jared.Babula@energy.ca.gov]; Knight, Eric@Energy[Eric.Knight@energy.ca.gov]; Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
From: David, Travis@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=08B483B8D5464B41B536DAF809EB1A0D-DAVID, TRAV]
Sent: Thur 3/7/2024 10:33:21 AM (UTC-08:00)
Subject: RE: Fountain Wind - County request for confidential GIS data
Shasta County Data Request_03052024.zip

Hello Paul, attached are the Fountain Wind applicant submitted GIS datasets of proposed turbines and access road locations. This data was submitted to CEC on June 29, 2023.

Let me know if you have any questions or if there is anything else I can do for you.

Travis David
Electric Generation System Specialist
Siting, Transmission & Environmental Protection Division

From: Paul Hellman <phellman@co.shasta.ca.us>
Sent: Tuesday, March 5, 2024 10:01:00 AM
To: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: Fountain Wind

Lon,

Has Fountain Wind provided the CEC with GIS data regarding the proposed turbines and access roads? If so, would it be possible to provide that data to Shasta County?

Thanks,
Paul Hellman, Director
Shasta County Department of Resource Management
(530) 225-5114
https://www.shastacounty.gov/resource-management

To: Kerr, Steven@Energy[Steven.Kerr@energy.ca.gov]; Ramaley, John@CALFIRE[John.Ramaley@fire.ca.gov]
Cc: Knight, Eric@Energy[Eric.Knight@energy.ca.gov]; Negar Vahidi[nvahidi@aspeneg.com]; Tatiana Inouye[tinouye@aspeneg.com]
From: Tim Keesey[timkeesey@tckecological.com]
Sent: Thur 3/14/2024 1:57:31 PM (UTC-07:00)
Subject: Re: Meeting with CEC and CAL FIRE to discuss the Fountain Wind Project

Hi Steven,

Both of those days and times work for me.

Tim

From: Kerr, Steven@Energy <Steven.Kerr@energy.ca.gov>
Sent: Thursday, March 14, 2024 12:50 PM
To: Ramaley, John@CALFIRE <John.Ramaley@fire.ca.gov>; Tim Keesey <timkeesey@tckecological.com>
Cc: Knight, Eric@Energy <Eric.Knight@energy.ca.gov>; Negar Vahidi <nvahidi@aspeneg.com>; Tatiana Inouye <tinouye@aspeneg.com>
Subject: Meeting with CEC and CAL FIRE to discuss the Fountain Wind Project

Hello John,

I'm reaching out to coordinate a meeting with you to discuss the Fountain Wind Project in Shasta County, which is currently under review by the California Energy Commission (CEC) under our Opt-in Certification program. Tim Keesey has been contracted by CEC to assist us with preparing the Forestry Resources analysis for an Environmental Impact Report on the project. Tim got your contact information from Ben Rowe (CAL FIRE Shasta Co. Unit Forester).

Would you be available to meet with Tim and I and other CEC staff on Tuesday March 26th from 1-2pm or Wednesday March 27th from 1-2pm? The purpose would be to have an initial discussion about the project and how CEC can best coordinate with CAL FIRE if the issuance of a Timberland Conversion Permit with an associated Timber Harvest Plan need to be subsumed into a CEC certification of the project. *(Tim, would these times work for you too? I've checked internal CEC staff schedules and these are the soonest times available.)*

Here is some background information about the CEC Opt-in program, the Fountain Wind Project, and questions we hope to begin addressing with you:

In 2022, Assembly Bill 205 established a new Opt-in Certification program for eligible non-fossil-fueled power plants, energy storage, and manufacturing and assembly facilities to optionally seek certification through the CEC. If CEC approves a project, the certification would be in lieu of any permit, certificate, or similar document required by any state, local, or regional agency, or federal agency to the extent permitted by federal law, with some exceptions. The Fountain Wind Project is the first project that has submitted an application under this program.

- The applicant submitted a **Timberland Conversion Permit Application and Plan** to Cal Fire on April 23, 2021. This TCP application was for an earlier iteration of the project that was being considered by Shasta County, which proposed 72 turbines instead of 48 turbines. This application is available on the project docket (TN 248312: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01). The CEC has a webpage for the project here: https://www.energy.ca.gov/powerplant/wind/fountain-wind-project.
- In the Data Adequacy Worksheet (TN 248742) submitted to the applicant on 2/10/23, the Land Use team requested details on timber conversion activities to support a comprehensive Forestry analysis, and noted that this information should have been included in a Timber Harvest Plan for the project. The Applicant responded that timber removal was part of "baseline conditions" for the site, and that baseline activities are not required to be analyzed under CEQA (TN 250705). The applicant further responded (in TN 252053) that less timber removal would occur under the proposed project than under baseline conditions, and for this reason there would be no significant timber conversion impacts. In TN 252053, the applicant stated that they had no further information to provide to

staff.

- What is the status of the Conversion Permit application?
- Is there a methodology for CEC to work with CALFIRE and the landowner to develop Conversion Permit and THP, and subsume CALFIRE responsibilities for Conversion Permit and THP approval through CEC EIR process?
- If the CEC EIR acts as the CEQA clearance document in lieu of the typical CAL FIRE THP CEQA clearance, please advise as to what components the CEC EIR needs to specifically address or analyze.

Thank you,

Steve Kerr
Supervisor, Community Resources Unit
Siting and Environmental Branch
Siting, Transmission, and Environmental
Protection Division
www.energy.ca.gov

To: Kerr, Steven@Energy[Steven.Kerr@energy.ca.gov]; Tim Keesey[timkeesey@tckecological.com]; Strong, James@CALFIRE[James.Strong@fire.ca.gov]; Headley, Shawn@CALFIRE[Shawn.Headley@fire.ca.gov]; Woessner, Jonathan@CALFIRE[Jonathan.Woessner@fire.ca.gov]
Cc: Knight, Eric@Energy[Eric.Knight@energy.ca.gov]; Negar Vahidi[nvahidi@aspeneg.com]; Tatiana Inouye[tinouye@aspeneg.com]; Huff, Eric@CALFIRE[Eric.Huff@fire.ca.gov]
From: Ramaley, John@CALFIRE[John.Ramaley@fire.ca.gov]
Sent: Fri 3/15/2024 2:10:03 PM (UTC-07:00)
Subject: Re: Meeting with CEC and CAL FIRE to discuss the Fountain Wind Project

Steven,

I need to see if others from CAL FIRE in this meeting can meet.

At this time, the TCP permit has not gone anywhere. CAL FIRE's stance is that this is a timberland conversion and requires a timberland conversion permit. We rely on the counties lead agency authority to perform the CEQA analysis for compliance. At this time, the CEQA for this project is not complete as the county has denied the permit. We cannot issue the TCP without the CEQA, and a timber harvesting plan (THP) must be prepared for the cutting and removal of the trees. This must be prepared and approved before the TCP. We cannot approve the THP until we know the TCP can be approved - they essentially happen simultaneously. Therefore, we have not done any work on this project.

Also, due to the nature of this project, if there is a new law that might allow the project proponents to have the project even though the county has opposed it and denied the permit, I would not feel comfortable discussing anything until I conferred with our counsel.

John Ramaley
Staff Chief - Forest Practice HQ
(916) 203-9755

From: Kerr, Steven@Energy <Steven.Kerr@energy.ca.gov>
Sent: Thursday, March 14, 2024 12:50 PM
To: Ramaley, John@CALFIRE <John.Ramaley@fire.ca.gov>; Tim Keesey <timkeesey@tckecological.com>
Cc: Knight, Eric@Energy <Eric.Knight@energy.ca.gov>; Negar Vahidi <nvahidi@aspeneg.com>; Tatiana Inouye <tinouye@aspeneg.com>
Subject: Meeting with CEC and CAL FIRE to discuss the Fountain Wind Project

Hello John,

I'm reaching out to coordinate a meeting with you to discuss the Fountain Wind Project in Shasta County, which is currently under review by the California Energy Commission (CEC) under our Opt-in Certification program. Tim Keesey has been contracted by CEC to assist us with preparing the Forestry Resources analysis for an Environmental Impact Report on the project. Tim got your contact information from Ben Rowe (CAL FIRE Shasta Co. Unit Forester).

Would you be available to meet with Tim and I and other CEC staff on Tuesday March 26th from 1-2pm or Wednesday March 27th from 1-2pm? The purpose would be to have an initial discussion about the project and how CEC can best coordinate with CAL FIRE if the issuance of a Timberland Conversion Permit with an associated Timber Harvest Plan need to be subsumed into a CEC certification of the project. *(Tim, would these times work for you too? I've checked internal CEC staff schedules and these are the soonest times available.)*

Here is some background information about the CEC Opt-in program, the Fountain Wind Project, and questions we hope to begin addressing with you:

In 2022, Assembly Bill 205 established a new Opt-in Certification program for eligible non-fossil-fueled power plants, energy

storage, and manufacturing and assembly facilities to optionally seek certification through the CEC. If CEC approves a project, the certification would be in lieu of any permit, certificate, or similar document required by any state, local, or regional agency, or federal agency to the extent permitted by federal law, with some exceptions. The Fountain Wind Project is the first project that has submitted an application under this program.

- The applicant submitted a **Timberland Conversion Permit Application and Plan** to Cal Fire on April 23, 2021. This TCP application was for an earlier iteration of the project that was being considered by Shasta County, which proposed 72 turbines instead of 48 turbines. This application is available on the project docket (TN 248312: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-OPT-01). The CEC has a webpage for the project here: https://www.energy.ca.gov/powerplant/wind/fountain-wind-project.
- In the Data Adequacy Worksheet (TN 248742) submitted to the applicant on 2/10/23, the Land Use team requested details on timber conversion activities to support a comprehensive Forestry analysis, and noted that this information should have been included in a Timber Harvest Plan for the project. The Applicant responded that timber removal was part of "baseline conditions" for the site, and that baseline activities are not required to be analyzed under CEQA (TN 250705). The applicant further responded (in TN 252053) that less timber removal would occur under the proposed project than under baseline conditions, and for this reason there would be no significant timber conversion impacts. In TN 252053, the applicant stated that they had no further information to provide to staff.
- What is the status of the Conversion Permit application?
- Is there a methodology for CEC to work with CALFIRE and the landowner to develop Conversion Permit and THP, and subsume CALFIRE responsibilities for Conversion Permit and THP approval through CEC EIR process?
- If the CEC EIR acts as the CEQA clearance document in lieu of the typical CAL FIRE THP CEQA clearance, please advise as to what components the CEC EIR needs to specifically address or analyze.

Thank you,

Steve Kerr
Supervisor, Community Resources Unit
Siting and Environmental Branch
Siting, Transmission, and Environmental
Protection Division
www.energy.ca.gov

To: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
Cc: Knight, Eric@Energy[Eric.Knight@energy.ca.gov]
From: Barns, Caitlin[Caitlin.Barns@stantec.com]
Sent: Mon 3/18/2024 9:01:00 AM (UTC-07:00)
Subject: RE: FWP | water supply report
fwp_water_supply_report.pdf

Lon, here's a resubmittal of the water supply report. I have no idea how several pages flipped upside-down. Fixed in this version. It's also been re-docketed.

Thanks,
Caitlin

From: Barns, Caitlin
Sent: Friday, March 15, 2024 11:41 AM
To: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Cc: Knight, Eric@Energy <Eric.Knight@energy.ca.gov>
Subject: FWP | water supply report

Lon,

Attached (and docketed) please find the Fountain Water Supply Report.
Thanks!
Caitlin

Caitlin Barns (she/her)
Senior Biologist
Mountain Region Ecosystems Group Leader
Portland, Oregon
503-207-4368

Stantec

Vacation Alert: March 25-29

To: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
From: Paul Hellman[phellman@co.shasta.ca.us]
Sent: Wed 3/27/2024 3:53:27 PM (UTC-07:00)
Subject: Fountain Wind Project Draft EIR

Lon,

Is there an approximate ETA for the release of the Fountain Wind Project Draft EIR?

Thanks,
Paul Hellman, Director
Shasta County Department of Resource Management
(530) 225-5114
https://www.shastacounty.gov/resource-management

To: Barns, Caitlin[Caitlin.Barns@stantec.com]
From: Payne, Leonidas@Energy[/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=aa9d25dde24e40429efa06c4eed35807-Payne, Leon]
Sent: Tue 4/2/2024 1:29:03 PM (UTC-07:00)
Subject: Re: Fountain Wind check-in call

Need to cancel tomorrow's session—today was my first day in the office in 3.5 weeks and I'm still trying to get caught up. Eric told me that he had mentioned to Henry last week that our water folks will have Data Requests on the water supply assessment filing—hopefully that info already got passed on to you. I don't have a firm estimate yet on when those will be sent out. That was my only substantive update to pass on. If you've got anything for me, please shoot me an email.

--Lon

From: Barns, Caitlin
Sent: Wednesday, January 18, 2023 1:22 PM
To: Barns, Caitlin <Caitlin.Barns@stantec.com>; Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: Fountain Wind check-in call
When: Wednesday, April 3, 2024 10:30 AM-11:00 AM.
Where: Microsoft Teams Meeting

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(833) 266-3861,,58373190# Canada (Toll-free)
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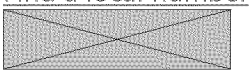

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To: Paul Hellman[phellman@co.shasta.ca.us]
From: Payne, Leonidas@Energy[/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=aa9d25dde24e40429efa06c4eed35807-Payne, Leon]
Sent: Fri 3/29/2024 2:47:07 PM (UTC-07:00)
Subject: Re: Fountain Wind Project Draft EIR

No specific ETA. We need to see how discovery will play out on the newly filled information which qualifies as a project change.

Get Outlook for iOS

From: Paul Hellman <phellman@co.shasta.ca.us>
Sent: Wednesday, March 27, 2024 3:53:27 PM
To: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: Fountain Wind Project Draft EIR

Lon,

Is there an approximate ETA for the release of the Fountain Wind Project Draft EIR?

Thanks,
Paul Hellman, Director
Shasta County Department of Resource Management
(530) 225-5114
https://www.shastacounty.gov/resource-management

To: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
From: Barns, Caitlin[Caitlin.Barns@stantec.com]
Sent: Tue 4/2/2024 3:20:21 PM (UTC-07:00)
Subject: RE: Fountain Wind check-in call

No worries, welcome back and hope all is well. I'll let you know if ConnectGen has any questions. Have not yet received data requests re: water supply.

From: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Sent: Tuesday, April 2, 2024 1:29 PM
To: Barns, Caitlin <Caitlin.Barns@stantec.com>
Subject: Re: Fountain Wind check-in call

Need to cancel tomorrow's session—today was my first day in the office in 3.5 weeks and I'm still trying to get caught up. Eric told me that he had mentioned to Henry last week that our water folks will have Data Requests on the water supply assessment filing—hopefully that info already got passed on to you. I don't have a firm estimate yet on when those will be sent out. That was my only substantive update to pass on. If you've got anything for me, please shoot me an email.

--Lon

From: Barns, Caitlin
Sent: Wednesday, January 18, 2023 1:22 PM
To: Barns, Caitlin <Caitlin.Barns@stantec.com>; Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: Fountain Wind check-in call
When: Wednesday, April 3, 2024 10:30 AM-11:00 AM.
Where: Microsoft Teams Meeting

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(833) 266-3861,,58373190# Canada (Toll-free)

Phone Conference ID: 583 731 90#

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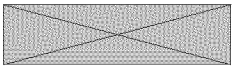

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To: Barns, Caitlin (Caitlin.Barns@stantec.com)[Caitlin.Barns@stantec.com]
From: Payne, Leonidas@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=AA9D25DDE24E40429EFA06C4EED35807-PAYNE, LEON]
Sent: Tue 4/16/2024 9:15:40 AM (UTC-07:00)
Subject: Data Requests
FW recent flings DR package for docket.pdf

Just submitted—should show up on docket soon. Apologies for the delay.

Lon Payne—Project Manager
California Energy Commission

To: Knight, Eric@Energy[Eric.Knight@energy.ca.gov]
Cc: Ohara, Sean@CALFIRE[Sean.Ohara@fire.ca.gov]; Morris III, George@CALFIRE[George.MorrisIII@fire.ca.gov]; Shane Lauderdale[Shane@pyroanalysis.com]; John Messina[john@pyroanalysis.com]
From: Henry Woltag[HWoltag@connectgenllc.com]
Sent: Tue 4/23/2024 2:08:16 PM (UTC-07:00)
Subject: Fountain Wind Wildfire ROC Response Letter
fwp_wildfire_response_to_ROCs_memo.pdf

Hello Eric,

Please find attached the Applicant's formal response to the wildfire related Record of Conversation's (ROC's) between the CEC and representatives of both CAL FIRE and the Shasta County Fire Department, which was submitted to the project docket earlier today. As you will read in this letter, we are respectfully requesting that CAL FIRE and the Shasta County Fire Department are afforded an opportunity to provide formal written responses to the issues that were discussed in the ROC's. Please don't hesitate to reach out if you have any questions.

Best,
Henry

Henry Woltag
Director

ConnectGEN
1001 McKinney, Suite 700
Houston, TX 77002
Cell: 281.520.6995
Email: hwoltag@connectgenllc.com

To: Weaver, Melanie@Wildlife[Melanie.Weaver@wildlife.ca.gov]; Knight, Eric@Energy[Eric.Knight@energy.ca.gov]; Burkett, Esther@Wildlife[Esther.Burkett@wildlife.ca.gov]
Cc: Iacona, Erika@Wildlife[Erika.Iacona@Wildlife.ca.gov]; Hawk, Debra@Wildlife[Debra.Hawk@Wildlife.ca.gov]; Klip, Mario@Wildlife[Mario.Klip@wildlife.ca.gov]
From: Chris Huntley[Chuntley@aspeneg.com]
Sent: Mon 5/6/2024 1:29:39 PM (UTC-07:00)
Subject: RE: Fountain Wind Bio Support for Sand Hill Crane Mitigation

That would be great, thank you!

Sorry to be a pest, just trying to get this right.

Chris

From: Weaver, Melanie@Wildlife <Melanie.Weaver@wildlife.ca.gov>
Sent: Monday, May 6, 2024 9:18 AM
To: Chris Huntley <Chuntley@aspeneg.com>; eric.knight@energy.ca.gov; Burkett, Esther@Wildlife <Esther.Burkett@wildlife.ca.gov>
Cc: Iacona, Erika@Wildlife <Erika.Iacona@Wildlife.ca.gov>; Hawk, Debra@Wildlife <Debra.Hawk@Wildlife.ca.gov>; Klip, Mario@Wildlife <Mario.Klip@wildlife.ca.gov>
Subject: RE: Fountain Wind Bio Support for Sand Hill Crane Mitigation

Totally understand. The best I can offer is monitoring data from the Waterfowl Breeding Pop Survey-Northeastern Stratum and our Midwinter Waterfowl Survey in the valley.

Melanie

From: Chris Huntley <Chuntley@aspeneg.com>
Sent: Monday, May 6, 2024 9:14 AM
To: Weaver, Melanie@Wildlife <Melanie.Weaver@wildlife.ca.gov>; Knight, Eric@Energy <Eric.Knight@energy.ca.gov>; Burkett, Esther@Wildlife <Esther.Burkett@wildlife.ca.gov>
Cc: Iacona, Erika@Wildlife <Erika.Iacona@Wildlife.ca.gov>; Hawk, Debra@Wildlife <Debra.Hawk@Wildlife.ca.gov>; Klip, Mario@Wildlife <Mario.Klip@wildlife.ca.gov>
Subject: RE: Fountain Wind Bio Support for Sand Hill Crane Mitigation

Melanie,

Thank you for the feedback and I have cc'd Esther here. Just looking for expertise in that species ecology that could contribute to our analysis at the CEC.

Best regards and thank you for the contact.

Chris

From: Weaver, Melanie@Wildlife <Melanie.Weaver@wildlife.ca.gov>
Sent: Monday, May 6, 2024 9:10 AM
To: Chris Huntley <Chuntley@aspeneg.com>; eric.knight@energy.ca.gov
Cc: Iacona, Erika@Wildlife <Erika.Iacona@Wildlife.ca.gov>; Hawk, Debra@Wildlife <Debra.Hawk@Wildlife.ca.gov>; Klip, Mario@Wildlife <Mario.Klip@wildlife.ca.gov>
Subject: RE: Fountain Wind Bio Support for Sand Hill Crane Mitigation

Hi Chris,

Understand your situation however I am not the appropriate person for such discussions or efforts. While my program does monitor cranes (while performing waterfowl surveys), we are not charged with management of cranes. In this state, cranes are considered a nongame animal assigned to our Diversity Program by structure and funding. May I suggest you contact Esther Burkett at esther.burkett@wildlife.ca.gov.

Melanie

Melanie Weaver

Waterfowl Program Leader
Senior Environmental Scientist
P.O. Box 944209
Sacramento, CA 94244-2090
(916)502-1139

From: Chris Huntley <Chuntley@aspeneg.com>
Sent: Friday, May 3, 2024 3:41 PM
To: Weaver, Melanie@Wildlife <Melanie.Weaver@wildlife.ca.gov>; Knight, Eric@Energy <Eric.Knight@energy.ca.gov>
Cc: Iacona, Erika@Wildlife <Erika.Iacona@Wildlife.ca.gov>; Hawk, Debra@Wildlife <Debra.Hawk@Wildlife.ca.gov>; Klip, Mario@Wildlife <Mario.Klip@wildlife.ca.gov>
Subject: Fountain Wind Bio Support for Sand Hill Crane Mitigation

Hello Melanie,

This is Chris Huntley from Aspen. I am supporting the California Energy Commission as a staff biologist on a large wind project in Shasta County. For reference it is near the Hatchet Ridge project.

I am hoping we could talk about analysis and mitigation approaches for sandhill crane.

As proposed the project would have several rows of wind turbine generators that stand approximately 600-feet above ground level. During surveys conducted by the applicant in 2017-2019 they noted approximately 450 cranes (some could be sandhill) overflying the sites. Based on the presence of the species we cannot rule out that at some point in time sandhill cranes among other species will be lost from collisions. As this species requires full mitigation, I wanted to strategize on how we could mitigate for this species. I have reviewed a number of crane mitigation measures but thought your expertise would be valuable to ensure we come up with some out of the box solutions.

Please let me know if you have time to meet. This is very important to the CEC as we are partnering with the CDFW on this project. I just want to make it right.

Best,

Chris

Aspen environmental group

Chris Huntley
Executive Vice President
Biological Resources Director
www.aspeneg.com

5020 Chesebro Road, Suite 200
Agoura Hills, CA 91301
Cell: 818-292-2327

To: Barns, Caitlin[Caitlin.Barns@stantec.com]
From: Payne, Leonidas@Energy[/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=aa9d25dde24e40429efa06c4eed35807-Payne, Leon]
Sent: Wed 6/12/2024 7:18:43 AM (UTC-07:00)
Subject: Re: Fountain Wind check-in call

I've got nothing today beyond apologizing for how long it has taken for our Water DRs to clear review. Hopefully they will get docketed later today. Here's a preview of what you should expect to see barring any late changes. Let me know if OK to cancel our 10:30.

WATER RESOURCES

BACKGROUND: Water Supply

Applicant's response to CEC staff water supply report data requests (TN 256385) was not complete. Data request **WATER-2** from CEC staff communication of April 16, 2024 (TN 255722) stated:
Please identify the location, or locations, where groundwater would be extracted for project water supply.

In response to data requests **WATER-1** and **WATER-2,** the following was stated:

Nonetheless, the applicant has obtained a letter of intent to supply water required for construction and operations from Hat Creek Construction & Materials, Inc. (HCC), located at 24339 State Hwy 89, Burney, California, 96013. This supplier draws water from existing private wells owned and operated by it within the Burney Creek Valley Groundwater Basin.

The identified water purveyor HCC is located along Hwy 89, close to Burney Falls, approximately 7.7 miles north-northeast of the town of Burney. If the wells to be used are located at the HCC facility, groundwater would be extracted from near the Lake Britton Area groundwater basin (5.046), rather than the Burney Creek Valley groundwater basin (5.048) according to Department of Water Resources Bulletin 118. The Lake Britton Area groundwater basin was not evaluated in the most recent version of the Water Supply Report (TN 256386).

DATA REQUEST:

WATER-5: Please provide documentation to verify that the groundwater extraction wells are located in the Burney Creek Valley groundwater basin. If these wells are located at the HCC facility, please revise the Water Supply Report to include an evaluation of the Lake Britton Area groundwater basin.

From: Barns, Caitlin
Sent: Wednesday, January 18, 2023 1:22 PM
To: Barns, Caitlin <Caitlin.Barns@stantec.com>; Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: Fountain Wind check-in call
When: Wednesday, June 12, 2024 10:30 AM-11:00 AM.
Where: Microsoft Teams Meeting

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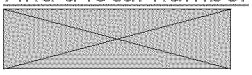

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To: 'Michelle Lee'[Michelle@thecirclelaw.com]; Graves, Sierra@Energy[Sierra.Graves@Energy.ca.gov]
From: Roark, Gabriel@Energy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=ED87FF1E22CD49F3AAFF644C82538D46-ROARK, GABR]
Sent: Mon 7/29/2024 4:54:51 PM (UTC-07:00)
Subject: RE: Pit River Comments Cultural Resource Report_7-29-2024.docx

Much obliged!

Gabriel Roark (he/him/his)
Supervisor & Assistant Tribal Liaison
Siting, Transmission, and Environmental Protection Division

From: Michelle Lee <Michelle@thecirclelaw.com>
Sent: Monday, July 29, 2024 4:18 PM
To: Roark, Gabriel@Energy <gabriel.roark@energy.ca.gov>; Graves, Sierra@Energy <Sierra.Graves@Energy.ca.gov>
Subject: RE: Pit River Comments Cultural Resource Report_7-29-2024.docx

Thank you! The Bancroft essay is attached here for your review.

Respectfully,

Michelle C. Lee
The Circle Law Group, P.C.
930 F Street
Sacramento, CA 95814
Phone: (916) 809-8900
Fax: (916) 809-8901
Cell: (916) 204-5724
michelle@thecirclelaw.com

From: Roark, Gabriel@Energy <gabriel.roark@energy.ca.gov>
Sent: Monday, July 29, 2024 3:40 PM
To: Michelle Lee <Michelle@thecirclelaw.com>; Graves, Sierra@Energy <Sierra.Graves@Energy.ca.gov>
Subject: RE: Pit River Comments Cultural Resource Report_7-29-2024.docx

Hello, Michelle,

Thank you for the thoughtful comments (including the initial written comments from your email) and time today. The draft figure that we looked at today is attached to this email.

Best regards,

Gabriel

Gabriel Roark (he/him/his)
Supervisor & Assistant Tribal Liaison

Siting, Transmission, and Environmental Protection Division

From: Michelle Lee <Michelle@thecirclelaw.com>
Sent: Monday, July 29, 2024 12:22 PM
To: Roark, Gabriel@Energy <gabriel.roark@energy.ca.gov>; Graves, Sierra@Energy <Sierra.Graves@Energy.ca.gov>
Subject: Pit River Comments Cultural Resource Report_7-29-2024.docx

Gabriel and Sierra,

Thank you for spending time with the Pit River Tribe to discuss the Fountain Wind project. My initial comments are attached for your review.

We would like to know if you could send the maps that you showed during the conversation today. Please let me know if you have any questions.

Respectfully,

Michelle C. Lee
The Circle Law Group, P.C.
930 F Street
Sacramento, CA 95814
Phone: (916) 809-8900
Fax: (916) 809-8901
Cell: (916) 204-5724
michelle@thecirclelaw.com

To: Roark, Gabriel@Energy[gabriel.roark@energy.ca.gov]; Graves, Sierra@Energy[Sierra.Graves@Energy.ca.gov]
From: Michelle Lee[Michelle@thecirclelaw.com]
Sent: Mon 7/29/2024 4:18:20 PM (UTC-07:00)
Subject: RE: Pit River Comments Cultural Resource Report_7-29-2024.docx
H.H. Bancroft Book.pdf

Thank you! The Bancroft essay is attached here for your review.

Respectfully,

Michelle C. Lee
The Circle Law Group, P.C.
930 F Street
Sacramento, CA 95814
Phone: (916) 809-8900
Fax: (916) 809-8901
Cell: (916) 204-5724
michelle@thecirclelaw.com

From: Roark, Gabriel@Energy <gabriel.roark@energy.ca.gov>
Sent: Monday, July 29, 2024 3:40 PM
To: Michelle Lee <Michelle@thecirclelaw.com>; Graves, Sierra@Energy <Sierra.Graves@Energy.ca.gov>
Subject: RE: Pit River Comments Cultural Resource Report_7-29-2024.docx

Hello, Michelle,

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Best regards,

Gabriel

Gabriel Roark (he/him/his)
Supervisor & Assistant Tribal Liaison
Siting, Transmission, and Environmental Protection Division

From: Michelle Lee <Michelle@thecirclelaw.com>
Sent: Monday, July 29, 2024 12:22 PM
To: Roark, Gabriel@Energy <gabriel.roark@energy.ca.gov>; Graves, Sierra@Energy <Sierra.Graves@Energy.ca.gov>
Subject: Pit River Comments Cultural Resource Report_7-29-2024.docx

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Respectfully,

Michelle C. Lee
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Sacramento, CA 95814
Phone: (916) 809-8900
Fax: (916) 809-8901
Cell: (916) 204-5724
michelle@thecirclelaw.com

To: Iacona, Erika@Wildlife[Erika.Iacona@Wildlife.ca.gov]
Cc: Knight, Eric@Energy[Eric.Knight@energy.ca.gov]; Bowman, Helen@Wildlife[Helen.Bowman@Wildlife.ca.gov]; McKannay, Adam@Wildlife[Adam.McKannay@wildlife.ca.gov]
From: Chris Huntley[Chuntley@aspeneg.com]
Sent: Sat 8/10/2024 9:07:27 AM (UTC-07:00)
Subject: RE: [EXTERNAL] Fountain Wind vs Altamont Pass Mitigation

Thank you. Looking into this as well.

Chris

From: Iacona, Erika@Wildlife <Erika.Iacona@Wildlife.ca.gov>
Sent: Friday, August 9, 2024 11:37 AM
To: Chris Huntley <Chuntley@aspeneg.com>
Cc: eric.knight@energy.ca.gov; Bowman, Helen@Wildlife <Helen.Bowman@Wildlife.ca.gov>; McKannay, Adam@Wildlife <Adam.McKannay@wildlife.ca.gov>
Subject: RE: [EXTERNAL] Fountain Wind vs Altamont Pass Mitigation

Hi Chris,
I think where USFWS and CDFW differ is that CDFW is open to accepting more "creative" avenues of mitigation. Retrofitting, in my mind, would be better considered as enhancements that are included for avoidance and minimization, and full mitigation for eagle take would require more rigorous efforts. I did think that Heather was more involved in the adaptive management strategies, particularly with Altamont but perhaps that was a Heather here at CDFW. I will have to poke around.

Thanks,
Erika
--
Erika Iacona
Senior Environmental Scientist, Specialist
R1 Climate and Conservation Planning
(530) 806-1389
601 Locust Street
Redding, CA 96001
CALIFORNIA DEPARTMENT OF FISH and WILDLIFE

From: Beeler, Heather <Heather_Beeler@fws.gov>
Sent: Friday, August 9, 2024 10:48 AM
To: Chris Huntley <Chuntley@aspeneg.com>; Iacona, Erika@Wildlife <Erika.Iacona@Wildlife.ca.gov>
Cc: Knight, Eric@Energy <Eric.Knight@energy.ca.gov>
Subject: RE: [EXTERNAL] Fountain Wind vs Altamont Pass Mitigation

Hi Chris,
I coordinated with PG&E and introduced them to the two in lieu fee programs several weeks ago as I understand it would be easier for CDFW to use retrofits for mitigation if that work is done in CA. We also all have interest in more local mitigation for the Altamont Projects. PG&E is in active discussions with both in lieu fee programs. Today I am passing the requested info on too you at the CEC and also to CDFW for the Mulqueeny Ranch Wind Project in the Altamont Pass WRA. My goal here is to help us have some overlapping mitigation to be reasonable. I'll keep you informed regarding if PG&E formally agrees to work with one of the in lieu fee programs. Mike Best, PG&E's Avian Program Manager, assured me today that they will make something work to help us and/or CDFW meet any obligations either way. Accordingly, below I'm sharing some info for you. I haven't played with it, but if this

project might qualify for a General Permit under our Eagle Act wind regulations, you could probably use the project specs and our tools to calculate how much compensatory mitigation the Service would require should the project apply for a permit, which we do recommend. I haven't used these tools, but let me know if a work session would be helpful and I can find us some support.

Under our website (https://fws.gov/program/eagle-management/eagle-incidental-take-wind-energy-permits) half way down the page there are resources available for General Permit Standard Conditions - Wind Energy Permits including General Permit Standard Conditions - Wind, and or General Permit Eagle Mitigation Calculator . Please be advised should there be a golden eagle nest located within 2 miles of proposed turbines or a bald eagle nest within 660 feet, the project would not qualify for our General Permits. Our standard permits requirements are also available on our Eagle Management webpage and are more rigorous. FYI.

Below is info I provide to CDFW that you may also find helpful. You might consider the compensatory mitigation conditions I edited below. If using retrofitting, I would advise drafting it such that the work would need to be completed in California either by working directly with a utility or purchasing credits form one of the in-lieu fee programs. Or add some kind of flexibility with written approval from the agencies should CDFW approve work outside of CA I guess.

REA info from our website:

The Service developed Resource Equivalency Analysis tools to calculate the compensatory mitigation needed to offset permitted eagle take via direct mortality, disturbance, or territory loss using power pole retrofits. Electrocution of eagles by power pole elements is a significant cause of mortality to eagles. The Resource Equivalency Analysis estimates the number of high-risk poles that would need to be retrofitted per eagle taken.

The Resource Equivalency Analysis is based on the current understanding of golden eagle and bald eagle life history inputs, effectiveness of retrofitting high-risk electric power poles, the expected annual take, and the timing of both the eagle take permit and implementation of compensatory mitigation. As would be expected, the estimated number of eagle fatalities and the permit renewal period affect the number of poles to be retrofitted. Delays in retrofitting would lead to more retrofitted poles owed. New information on changes in the level of take, understanding of the eagle life history, or effectiveness of retrofitting could be used to change the number of retrofitted poles needed for compensation.

As there is evidence that golden eagle populations may be declining, for golden eagles, there is a regulatory requirement for a mitigation ratio of 1.2:1.

While only electric pole retrofitting is presented here in detail, the Resource Equivalency Analysis metric of bird -years lends itself to consideration of other compensatory mitigation options.

https://fws.gov/library/collections/eagle-resource-equivalency-analyses

The REA also present mitigation owed at the 1:1 ratio if that's helpful for your purposes.
You might consider phrasing your requirement/option as:
Retrofits:
would either contract with an electric utility company

USFWS Standard eagle permit conditions for Wind Projects

Our USFWS Wind Permit Standard Conditions available here: https://fws.gov/sites/default/files/documents/2024-04/sp-standard-tier1-terms_wind_final_04.08.24.pdf
Below I slightly modified them as a suggestion for you, see C(1)(b) below.
C. Compensatory Mitigation.
The following compensatory mitigation is required.

(1) You must purchase or acquire bald eagle and golden eagle credits to offset take. You must either:
(a) Acquire <Service calculated> bald eagle credits and <Service calculated> golden eagle credits once, within 90-days of issuance, to offset take for the full tenure of this permit.
OR
(b) Contract with an electric utility company based in California to conduct retrofits. Or, Contract with Pacific Gas and Electric Company (PG&E) to conduct retrofits within California's oak wood land-savannah habitats.
OR
© Acquire <Service calculated> bald eagle credits and <Service calculated> golden eagle credits every 5 years, acquired first within 90 days of permit issuance, and with subsequent acquisitions within 90 days of the start of each Five-Year Period.
(2) Credits must be purchased or acquired from a Service-approved mitigation provider. A list of Service-approved mitigation providers can be found online at https://www.fws.gov/program/eagle-management/eagle-permits. If mitigation credits are not acquired within 90 days, you are disqualified from exercising the privileges of this permit as long as the deficiency exists.
(a) You must provide a copy of a signed agreement between you and the Service-approved mitigation provider to the Service within 90 days from the effective date of your permit. The copy of this agreement must include the number of eagle credits acquired. Reports can be uploaded into ePermits under this permit record or sent, via email, to the Issuing Office contact email on the face of this permit, with the subject line "EAGLE INCIDENTAL TAKE PERMIT MITIGATION AGREEMENT." Include your permit number in the email.
(b) Any modified or subsequent agreements must be provided to the Service as part of the next due annual report (Condition F). All submitted agreements must include the number of eagle credits acquired.
(3) You must keep records to document compliance with mitigation requirements and provide them to the Service upon request.
(4) During the permit tenure, the Service will regularly estimate, using what we determine to be the best available information, the number of eagles the project has taken. The Service will contact you if current mitigation requirements are inconsistent with estimated take. We may amend your permit, consistent with 50 CFR 13.23(b), to decrease or increase the compensatory mitigation requirement to ensure consistency with estimated take and with our preservation standard.

Please call me or we can set up a working meeting if you would find that helpful.
Thanks,
Heather

Heather Beeler (she/her)
Eagle Permit Coordinator
Migratory Bird Program, R8
U.S. Fish and Wildlife Service
Cell: 775-508-9754

From: Chris Huntley <Chuntley@aspeneg.com>
Sent: Thursday, August 8, 2024 2:29 PM
To: Beeler, Heather <Heather_Beeler@fws.gov>; Iacona, Erika@Wildlife <Erika.Iacona@Wildlife.ca.gov>
Cc: Eric Knight <Eknight@energy.state.ca.us>
Subject: [EXTERNAL] Fountain Wind vs Altamont Pass Mitigation

Heather,

I understand you may have some additional information for adaptive management strategies for the Altamont pass. Can you share this approach.

Best,

Chris

Chris Huntley
Executive Vice President
Biological Resources Director
www.aspeneg.com

5020 Chesebro Road, Suite 200
Agoura Hills, CA 91301
Cell: 818-292-2327

Cc: Alan Cox[acox@shastacounty.gov]; Chad Colton[Chad.Colton@bbklaw.com]; Anderson, Kari@Energy[Kari.Anderson@Energy.ca.gov]; Paul Hellman[phellman@shastacounty.gov]
To: Ryan Baron[Ryan.Baron@bbklaw.com]
From: Babula, Jared@Energy[/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=6cf386251c7a47f697f411cee0910882-Babula, Jar]
Sent: Thur 8/1/2024 6:14:07 PM (UTC-07:00)
Subject: Re: Fountain Wind Project: Shasta County Request for Inspection

Ryan,

Yes, a discussion of LORS is a component of the staff analysis for Opt-in projects as it is in a PSA under an application for certification process. A more recent example of a Commission decision that includes a LORS override issue would be the Carlsbad decision. See https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=07-AFC-06

Jared Babula
Attorney V
Chief Counsel's Office
California Energy Commission

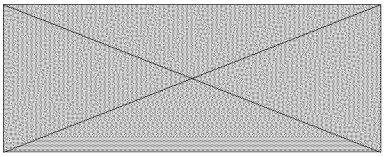
From: Ryan Baron <Ryan.Baron@bbklaw.com>
Sent: Thursday, August 1, 2024 4:16 PM
To: Babula, Jared@Energy <Jared.Babula@energy.ca.gov>
Cc: Alan Cox <acox@shastacounty.gov>; Chad Colton <Chad.Colton@bbklaw.com>; Anderson, Kari@Energy <Kari.Anderson@Energy.ca.gov>; Paul Hellman <phellman@shastacounty.gov>
Subject: RE: Fountain Wind Project: Shasta County Request for Inspection

Hi Jared & Kari:

Thank you for meeting with us the other day. It was very helpful to have you clarify the CEC's process. I had a follow-up question I wasn't able to ask before I dropped off. Will the Preliminary Staff Assessment include an analysis on any LORS issues? I ask because in prior Commission AFC proceedings, LORS was briefed and commented on after the PSA was issued like in the Eastshore Energy Center proceeding in 2007 where staff docketed a brief on override issues a few months after the PSA was issued. The Eastshore proceeding appears to be last time the CEC addressed an override issue in detail, and prior to that in 1981, 2001 and 2006, but the PSA is not available online to see how staff addresses override in an assessment and if recommendations are made at that time. Obviously, there are override issues here regarding the County's ordinance as well as CEQA and we are trying to see how the Commission has addressed LORS historically through briefs, counsel opinions, testimony, preliminary and final staff assessments, and commission decisions.

Any color you can provide on the process of LORS is most helpful. Thanks.

Best,
Ryan



Ryan M. F. Baron
Partner
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T: (949) 263-6568
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From: Ryan Baron
Sent: Friday, July 26, 2024 3:45 PM
To: 'Babula, Jared@Energy' <Jared.Babula@energy.ca.gov>
Cc: Alan Cox <acox@shastacounty.gov>; Chad Colton <chad.colton@bbklaw.com>; Anderson, Kari@Energy <Kari.Anderson@Energy.ca.gov>
Subject: RE: Fountain Wind Project: Shasta County Request for Inspection

Sounds good, thanks. I will send a Zoom for that time.

From: Babula, Jared@Energy <Jared.Babula@energy.ca.gov>
Sent: Friday, July 26, 2024 3:44 PM
To: Ryan Baron <Ryan.Baron@bbklaw.com>
Cc: Alan Cox <acox@shastacounty.gov>; Chad Colton <Chad.Colton@bbklaw.com>; Anderson, Kari@Energy <Kari.Anderson@Energy.ca.gov>
Subject: Re: Fountain Wind Project: Shasta County Request for Inspection

CAUTION - EXTERNAL SENDER.

Tuesday July 30 10-11am works. We can schedule it for the hour to have the time if we need it. Do you want to send Kari and I a teams or zoom meeting link? Thanks

From: Ryan Baron <Ryan.Baron@bbklaw.com>
Sent: Friday, July 26, 2024 3:23 PM
To: Babula, Jared@Energy <Jared.Babula@energy.ca.gov>
Cc: Alan Cox <acox@shastacounty.gov>; Chad Colton <Chad.Colton@bbklaw.com>; Anderson, Kari@Energy <Kari.Anderson@Energy.ca.gov>
Subject: RE: Fountain Wind Project: Shasta County Request for Inspection

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Jared:

Thanks for the clarification. We will submit a request under the PRA exception and glad to discuss at the meeting. We're free Monday from 2-4 and Tues 9-12 and 1-4. I have availability Weds and Th but am travelling to a conference. I can provide times then if you need.

Right now, the County is requesting all of the confidential records. We are, however, going through the list to determine if there's anything that is not needed for its review.

I should add that the County will also be submitting invoices to the CEC and Fountain Wind LLC for reimbursement per the various filings in the docket. We would like to be transparent in how we're doing that and can discuss our proposed process in the meeting if you all have time.

Thanks again.

Ryan

Ryan M. F. Baron

Partner

ryan.baron@bbklaw.com

T: (949) 263-6568

bbklaw.com |

From: Babula, Jared@Energy <Jared.Babula@energy.ca.gov>
Sent: Thursday, July 25, 2024 10:30 AM
To: Ryan Baron <Ryan.Baron@bbklaw.com>
Cc: Alan Cox <acox@shastacounty.gov>; Chad Colton <Chad.Colton@bbklaw.com>; Anderson, Kari@Energy <Kari.Anderson@Energy.ca.gov>
Subject: Re: Fountain Wind Project: Shasta County Request for Inspection

The petition process set forth under California Code of Regulations, title 20, section 2506, would not be the appropriate process for a governmental entity to obtain confidential records from the CEC. A letter that comports with Government Code section 7921.505(c)(5) is all that is necessary. We can discuss the mechanics next week when we meet. Also it would be helpful if you can identify the TNs of the confidential records listed in the docket that you would like.

Thanks

From: Ryan Baron <Ryan.Baron@bbklaw.com>
Sent: Thursday, July 25, 2024 9:08 AM
To: Babula, Jared@Energy <Jared.Babula@energy.ca.gov>
Cc: Alan Cox <acox@shastacounty.gov>; Chad Colton <Chad.Colton@bbklaw.com>; Anderson, Kari@Energy <Kari.Anderson@Energy.ca.gov>
Subject: RE: Fountain Wind Project: Shasta County Request for Inspection

Hi Jared:

Thanks for responding so quickly. We will likely be filing the petition in the next few days so maybe early next week if schedules allow. I will check on our side and send you suggested days and times. 30 minutes is sufficient. Thank you again.

Ryan

Ryan M. F. Baron

Partner

ryan.baron@bbklaw.com

T: (949) 263-6568

bbklaw.com |

From: Babula, Jared@Energy <Jared.Babula@energy.ca.gov>
Sent: Thursday, July 25, 2024 8:47 AM
To: Ryan Baron <Ryan.Baron@bbklaw.com>
Cc: Alan Cox <acox@shastacounty.gov>; Chad Colton <Chad.Colton@bbklaw.com>; Anderson, Kari@Energy

<Kari.Anderson@Energy.ca.gov>
Subject: Re: Fountain Wind Project: Shasta County Request for Inspection

Ryan,

Thanks for reaching out on this matter. I think it would be most efficient if we set up a call so we can walk through your questions. If you can provide some dates your team is available next week we can schedule a meeting. I think 30 minutes should be adequate.

Sincerely,

Jared Babula
Attorney V
Chief Counsel's Office
California Energy Commission

From: Ryan Baron <Ryan.Baron@bbklaw.com>
Sent: Monday, July 22, 2024 3:47 PM
To: Babula, Jared@Energy <Jared.Babula@energy.ca.gov>
Cc: Alan Cox <acox@shastacounty.gov>; Chad Colton <Chad.Colton@bbklaw.com>
Subject: Fountain Wind Project: Shasta County Request for Inspection

Hi Jared:

I hope your summer is going well. The County of Shasta has been reviewing the Fountain Wind Project application and documents that have been obtained from the docket and in PRA requests. Our consultant team has asked us on several occasions if everything in the "project folder" is in the docket or if there are other documents, interviews and technical materials that are part of the Commission proceeding but not posted in the docket. I'm not meaning things like emails that would go into an administrative record, but technical documents that are part of the CEC's application and environmental review for certification. It seems that there are data requests that are not in the docket or information that has been submitted by the applicant via email but not posted in the docket. In that sense, the docket seems like more of a mechanism where certain formal documents are posted but not everything. Paul Hellman, the County's Resource Management Director tried to clarify this with the Project Manager a while back and was referred to the Chief Counsel's office. When we attempted to clarify, I believe the response was that additional records needed to be requested through a CPRA request but this didn't clarify the question necessarily. Respectfully, we would like to know whether there is more in the record. If so, would you help clarify how those records are obtained?

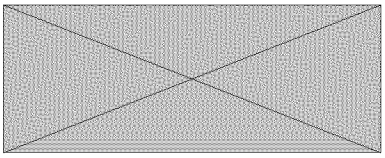
In addition, the County will be requesting inspection of records designated confidential by the CEC. 20 CCR sec. 2507(c) states that the Executive Director can disclose records previously designated as confidential to other government bodies that need the records to perform their official functions and agree to hold them confidential. We wanted to verify if the petition procedure under section 2506 is the mechanism for such a request. Section 2506 provides for a petition; however, that section mostly discusses whether records keep their confidential status or not and not a request by another agency who will keep those records confidential. For instance, if California Department of Fish and Wildlife was requesting confidential survey information, it would seem that records

would be shared between two agencies, and not through a formal petition process. Can you please advise on the correct procedure for the County's request?

Thanks much.

Best,
Ryan

Ryan M. F. Baron



Partner

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To: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
From: Barns, Caitlin[Caitlin.Barns@stantec.com]
Sent: Wed 8/7/2024 1:07:04 PM (UTC-07:00)
Subject: California wind project conclusion summary
S_U Impacts in California Wind Projects Summary(17901734.1).docx

Hi Lon, as we discussed, here is some information to circulate to your team regarding S/U impacts for other wind projects that have been approved/built in California.

Thanks,
Caitlin

Caitlin Barns (she/her)
Senior Biologist
Mountain Region Ecosystems Group Leader
Portland, Oregon
503-961-2728

Vacation Alert: August 12-16

Significant and Unavoidable Impacts in California Wind Projects
(Green highlighting denotes wind projects on working forest land)

Summary

Project Name	County	Date of CEQA EIR/SEIR/EIS	Number of Significant and Unavoidable Impacts	Summary of Significant and Unavoidable ("S/U") Impacts
Fountain Wind	Shasta County	April 2021	Project Level: 7	• *Aesthetics*: S/U impacts regarding scenic vista and the existing visual character or quality of public view of the site and its surroundings. • *Air Quality*: S/U impacts regarding net increase in emissions of PM_{10} during construction and decommissioning. • *Biological Resources*: S/U impacts regarding potential mortality and injury to raptors and bats. • *Cultural and Tribal Cultural Resources*: S/U regarding changes in the significance of a tribal cultural resource.
Hatchet Ridge Wind Project	Shasta County	June 2008	Project Level: 6	• *Aesthetics*: S/U impacts regarding degradation of the visual character of the scenic vista. • *Biological Resources*: S/U impacts regarding mortality of greater sandhill cranes, bald eagles, raptors and other avian species. • *Cultural Resources*: S/U regarding disruption of religious practices conducted on Hatchet Ridge.
Boulder Brush & Campo Wind	San Diego County	September 2020	Project Level: 11	• *Aesthetics*: S/U impacts regarding visual character, community character, scenic vistas, light and glare. • *Biological Resources*: S/U impacts regarding special status plant species; direct loss of sensitive vegetation communities. • *Noise*: S/U regarding noise impacts from turbines on nearby reservation.
Tule Wind	San Diego County	October 2011	Project Level: 9	• *Biological Resources*: S/U impacts regarding risk of collision for golden eagles. • *Visual Resources*: S/U regarding impacts to scenic vistas, existing visual character, light/glare, inconsistency with policies/plans. • *Cultural Resources*: S/U potential adverse change to traditional cultural properties.

				• *Air Quality*: S/U regarding short term construction impacts. • *Noise*: S/U regarding short term construction impacts.
Addison Energy Wind Project	Kern County	November 2013	Project Level: 6	• *Aesthetics*: S/U impacts regarding visual changes at individual key observation point locations. • *Air Quality*: S/U impacts regarding increase in emissions of PM_{10} during construction. • *Biological Resources*: S/U impacts regarding bird and bat species due to potential collision with wind turbine generators. • *Cultural Resources*: S/U regarding known prehistoric cultural resources remains.
Avalon Wind Energy Project	Kern County	August 2012	Project Level: 6	• *Aesthetics*: S/U impacts regarding visual changes at individual key observation point locations. • *Air Quality*: S/U impacts regarding increase in emissions of PM_{10} during construction. • *Biological Resources*: S/U impacts regarding bird and bat species due to potential collision with wind turbine generators. • *Cultural Resources*: S/U regarding known prehistoric cultural resources remains.
Pacific Wind	Kern County	June 2010	Project Level: 8	• *Aesthetics*: S/U impacts regarding substantial degrading the existing visual character; creating a new source of glare. • *Air Quality*: S/U impacts regarding violating air quality standards or contributing substantial to an existing or projected air quality violation; emission of air pollutants during construction. • *Biological Resources*: S/U impacts regarding effects to avian and bat populations due to collisions. • *Cultural*: S/U impacts regarding sensitive prehistoric and historical archeological resources. • *Recreation*: S/U impacts regarding recreational experience of hiking PCT.
Alta-Oak Creek Mojave Project	Kern County	October 2009	Project Level: 4	• *Aesthetics*: S/U impacts regarding alteration of the open space character of site. • *Biological Resources*: S/U impacts regarding substantial adverse effects to special status species.

				• *Cultural Resources*: S/U impacts regarding sensitive prehistoric and historical archeological resources. • *Recreation*: S/U impacts regarding recreation.
Manzana	Kern County	July 2011	Project Level: 4	• *Aesthetics*: S/U impacts adversely affecting a scenic vista; altering or degrading existing visual character of project site and surroundings; result in light or glare that adversely affects day or night views in the area. • *Air Quality*: S/U impacts regarding construction impacts that would violate air quality standards or contribute substantially to an existing or projected air quality violation. • *Biological Resources*: S/U impacts regarding contribution to cumulative impacts on special status species (Swainson's Hawk); contribution to cumulative impacts on wildlife movement. • *Recreation*: S/U impacts regarding recreational experience for hikers using the PCT.
Strauss Wind Energy Project	Santa Barbara	October 2019	Project Level: 8	• *Aesthetics*: S/U impacts regarding WTG, transmission line, and related structures visibility, road widening and tree removal, and nighttime lighting. • *Biological Resources*: S/U impacts regarding woodland and forest and mortality of avian and bird species. • *Land Use and Planning*: S/U impacts regarding tree protection.
Humboldt Wind Energy Project	Humboldt County	April 2019	Project Level: 6	• *Aesthetics*: S/U impacts regarding scenic vistas, existing visual character or quality of public views of the site and its surroundings, and light or glare. • *Air Quality*: S/U impacts regarding short-term, construction generated emissions. • *Biological Resources*: S/U impacts regarding injury to and mortality of marbled murrelet and raptors. • *Cultural Resources, Including Tribal Cultural Resources*: S/U impacts regarding tribal cultural resources and the Bear River Ridge and Valley Historic Landscape and Bear River Ridge Ethnobotanical/Cultural Landscape.
Altamont Pass Wind Resource Area Repowering (Golden Hills and	Alameda County	October 2014	Project Level: 5	• *Air Quality*: S/U impacts regarding construction emissions. • *Biological Resources*: S/U impacts regarding mortality of raptors, other birds, and bats. • *Traffic*: S/U impacts regarding traffic operation, safety hazards, emergency

Patterson Pass Projects)				• access and bicycle facilities.
Mulqueeney Ranch Wind Repowering Project	Alameda County	April 2021	Project Level: 3	• *Biology*: S/U impacts regarding avian mortality, turbine-related fatalities of special-status and other bats, and movement of specific wildlife.

To: Bohan, Drew@Energy[Drew.Bohan@energy.ca.gov]
From: LAWLOR, MARK[mark.lawlor@repsol.com]
Sent: Tue 8/13/2024 1:45:22 PM (UTC-07:00)
Subject: Additional fire documents in record

Hi Drew,
Here are links to two of the more recent docketed items related to wildfire. The first is a Fire Behavior Analysis report from Pyroanalysis that also gets into detail on CAL FIRE's aerial firefighting capabilities (TN# 253505). The report notes that aerial treatment is only limited immediately adjacent to the wind turbines which have been cleared of fuel to begin with. The conclusion on p. 24 states "The immediate access provided by the road systems into the wind farm, the fuel modification created by the roads and shaded fuel breaks, and the 2.5 acres of vegetation removed around the turbines far outweigh any restrictions that the project may have on the use of air resources."

The second is a copy of the presentation the CalFire veterans prepared. Their expertise includes aerial firefighting and forested lands. This presentation was made to CEC staff back in May (TN# 256430). A few key takeaways;

- The project would result in 510 acres of cleared defensible space plus an additional 687 acres of shaded fuel breaks surrounding the project.
- A fire behavior analysis model was run on the site as-is, and then again with the clearing improvement and shaded fuel breaks that the project would bring. The results show a 10x reduction in the rate of fire spread through the area if the project is built.
- CAL FIRE has a suit of resources when it comes to aerial firefighting, from tankers to twin prop planes to helicopters, all of which can drop aerial retardant. CAL FIRE has successfully used firefighting aircraft in and around turbines and they will be able to operate in and around the Fountain Wind project.
- Modern wind turbines do not have a history of wildfires.
- Conclusion: The wind "*project will improve fire safety over existing conditions*"

Finally, regarding history of wind projects in forested lands

- There are thousands of wind turbines installed in forested landscapes throughout the US and Canada. No increase in risk is posed by these turbines and most importantly we have over a decade of experience in this exact location with a wind project safely operating.

STATE	# of Projects	# of Turbines
CA	2	67
ID	1	35
MA	6	36
MD	4	76
ME	20	400
MN	1	10
NH	5	83
NY	26	1019
OK	2	34
PA	28	773

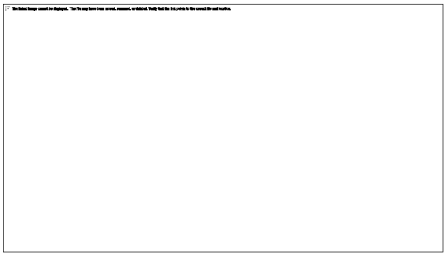
PROVINCE	# of Projects	# of Turbines
British Columbia	9	292
New Brunswick	4	119
Newfoundland and Labrador	1	9
Nova Scotia	67	311
Ontario	5	303
Prince Edward Island	3	24
Quebec	35	1903
Yukon	1	2
Grand Total	**125**	**2963**

RI	6	10
TN	2	18
VT	4	63
WA	1	38
WV	11	497
Grand Total	**119**	**3159**

Mark Lawlor
VICE PRESIDENT - DEVELOPMENT
LOW CARBON GENERATION
Tel.: (+1) 913-302-3990
mark.lawlor@repsol.com

From: Bohan, Drew@Energy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=7DD07A25FCBC49B0BBB219CC3B788983-BOHAN, DREW]
Sent: 8/22/2024 1:36:08 AM
To: LAWLOR, MARK [mark.lawlor@repsol.com]
Subject: Re: Fountain Wind public convenience and necessity

Drew Bohan
Executive Director
California Energy Commission



From: LAWLOR, MARK <mark.lawlor@repsol.com>
Sent: Wednesday, August 21, 2024 9:30:55 AM
To: Bohan, Drew@Energy <Drew.Bohan@energy.ca.gov>
Subject: Fountain Wind public convenience and necessity

Drew,

We appear to have a call scheduled with staff this afternoon, so I appreciate your assistance there.

Regarding the issue of public convenience and necessity, it seems counter to prevailing evidence that the project would not meet this standard, based on the CEC's own findings along with other state agencies and CAISO.

The balancing of factors based on the context and purpose of the Warren Alquist Act supports a conclusion that the project is need for public convenience and necessity:

1. This project is well-sited with an average number of true environmental impacts. Evidence in support of this extends beyond the record at hand and includes real-life evidence in the form of Hatchet Ridge (immediately adjacent to Fountain) which has operated safely and reliably for 13 years and without most of the mitigation measures proposed by Fountain.
2. This project is needed to help the state's legislative mandate for renewables. AB 100 requires renewable energy and zero-carbon resources supply 100 percent of electric retail sales to end-use customers by 2045. These targets cannot be met without additional in-state on-shore wind additions.
3. CEC's Joint Agency Report on AB 100 states "solar and wind build rates need to nearly triple." The report Identifies **2.2 GW of new onshore wind in its model by 2030** with an additional 6.6 GW onshore wind by 2040.
4. Progress towards these targets is behind schedule. "After dropping during the pandemic, California's emissions of carbon dioxide, methane and other climate-warming gases increased 3.4% in 2021, when the economy rebounded. The increase puts California further away from reaching its target mandated under state law: emitting 40% less in

2030 than in 1990 — a feat that will become more expensive and more difficult as time passes…" *California isn't on track to meet its climate change mandates — and a new analysis says it's not even close* - CalMatters.

5. The state is even further away from meeting a more aggressive goal set by the Air Resources Board in the state's new climate blueprint. Under that plan, greenhouse gases must be cut 48% below 1990 levels by 2030. Gov. Gavin Newsom had urged the board to adopt the more difficult goal, calling the new scoping plan the "most ambitious set of climate goals of any jurisdiction in the world." Id.
6. Supply to meet on-shore wind targets are exceptionally scarce. Few places in CA have wind regimes that can support utility scale wind: this site has been demonstrated to have a good wind regime. No other new onshore wind project are scheduled to be on line by 2030 leaving a significant shortfall in CEC's modeled wind requirements. In addition to limited viable sites for in-state wind, years of permitting denials or delays have affected investment in developing in-state wind projects. As a result, there are less than three known greenfield wind projects under development in the state. The primary purpose behind AB 205 is to end the status quo around barriers to permitting wind and solar in California.
7. Out of state wind additions cannot meet these targets without significant new transmission build out. Currently import capacity is capped due to congestion. The state must prioritize in-state resources that do not require new transmission. Fountain Wind does not require any new transmission.
8. There is an established and urgent need for in-state wind per studies by CPUC and CAISO. The CPUC found that **8.3 GW of in-state wind was needed** by 2045 in its Preferred System Plan (per Decision 24-02-047) and **CAISO found a need of just over 3 GW of in-state wind**. The big difference between the two cases was the assumption for offshore—CPUC had 4.5 GW, CAISO had 20 GW. CPUC's numbers are economically driven while CAISO's are based more on statewide planning targets, so arguably the CPUC's numbers are more reflective of a lower cost resource case. Offshore wind is more than 10 years from reality if it can be permitted and be financially viable, making the need for near-term in-state wind more critical to meeting these targets.
9. Per Joint Agency Report "Disadvantaged communities — low-income neighborhoods that have historically suffered poor health, dirty air and other burdens — will reap the highest health benefits from clean electricity. Half of the state's natural gas power plants are in communities that rank among the 25 percent most disadvantaged." Shovel-ready wind projects like Fountain Wind are needed for public convenience and necessity to reduce impacts to disadvantaged communities in the wake of polluting fossil plants.

The preponderance of the evidence shows Fountain wind meets the public convenience and necessity standard as it is demonstrably well-sited, helps meet legislatively mandated goals, is part of a scarce supply of in-state on-shore wind, and provides attributes to the gird that cannot be met with solar and storage. As the CEC has correctly observed, the state must triple build rates for renewables to have a chance of meeting these mandates. Reliance on other solar, storage or geothermal projects in development is not a viable option and not what the CEC has identified from a resource mix.

This project was not rejected at the county level based on the four SUs identified by CEQA. The county previously approved Hatched Ridge with overrides on the same SUs they identified for Fountain Wind (including landscape cultural impacts). Instead, the county rejected Fountain for political reasons lead by individuals who view wind and renewables as a Newsom/Sacramento scheme being pushed on those who don't believe in climate change and don't care about the state's efforts to combat it. These individuals do not hide their intentions but rather boast about them in public meetings and through lawsuits against the administration.

Mark Lawlor
VICE PRESIDENT - DEVELOPMENT
LOW CARBON GENERATION
Tel.: (+1) 913-302-3990
mark.lawlor@repsol.com

REPSOL

To: Payne, Leonidas@Energy[leonidas.payne@energy.ca.gov]
From: Barns, Caitlin[Caitlin.Barns@stantec.com]
Sent: Wed 8/21/2024 10:22:06 AM (UTC-07:00)
Subject: RE: Fountain Wind check-in call

Sure! Yep, I'm not going to that meeting but don't have anything to report either.

From: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Sent: Wednesday, August 21, 2024 10:12 AM
To: Barns, Caitlin <Caitlin.Barns@stantec.com>
Subject: Re: Fountain Wind check-in call

I don't have anything for today. I heard there is a higher level meeting later this afternoon. Should we cancel?

From: Barns, Caitlin
Sent: Wednesday, January 18, 2023 1:22 PM
To: Barns, Caitlin <Caitlin.Barns@stantec.com>; Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: Fountain Wind check-in call
When: Wednesday, August 21, 2024 10:30 AM-11:00 AM.
Where: Microsoft Teams Meeting

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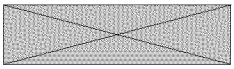

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To: Iacona, Erika@Wildlife[Erika.Iacona@Wildlife.ca.gov]
Cc: Knight, Eric@Energy[Eric.Knight@energy.ca.gov]
From: Chris Huntley[Chuntley@aspeneg.com]
Sent: Fri 9/6/2024 12:25:07 PM (UTC-07:00)
Subject: Fountain Wind Question

Hi Erika,

Can you please give me a call when you have a moment. I have tried reaching out but only get your message. Working on the operational impacts to birds and bats related to wildfire and wanted to run a few conclusions by you. I have a workshop starting at 2:00 today but am around before then.

Best,

Chris

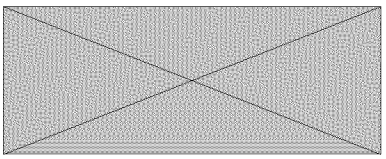
Aspen environmental group

Chris Huntley
Executive Vice President
Biological Resources Director
www.aspeneg.com

5020 Chesebro Road, Suite 200
Agoura Hills, CA 91301
Cell: 818-292-2327

To: Babula, Jared@Energy[Jared.Babula@energy.ca.gov]; Alan Cox[acox@shastacounty.gov]
Cc: Anderson, Kari@Energy[Kari.Anderson@Energy.ca.gov]
From: Ryan Baron[Ryan.Baron@bbklaw.com]
Sent: Fri 9/13/2024 3:49:49 PM (UTC-07:00)
Subject: RE: County Comments on Fountain Wind

Thanks, Jared.



Ryan M. F. Baron
Partner
ryan.baron@bbklaw.com
T: (949) 263-6568
bbklaw.com |

From: Babula, Jared@Energy <Jared.Babula@energy.ca.gov>
Sent: Friday, September 13, 2024 12:14 PM
To: Ryan Baron <Ryan.Baron@bbklaw.com>; Alan Cox <acox@shastacounty.gov>
Cc: Anderson, Kari@Energy <Kari.Anderson@Energy.ca.gov>
Subject: Re: County Comments on Fountain Wind

Ryan and Alan,

Here are sample comment letters from various local jurisdictions in response to a Public Resources Code section 25519(f) request for comments on the application. There is a wide variety in the level of detail provided.

https://efiling.energy.ca.gov/GetDocument.aspx?tn=243152&DocumentContentId=76834

https://efiling.energy.ca.gov/GetDocument.aspx?tn=245911&DocumentContentId=80088

https://efiling.energy.ca.gov/GetDocument.aspx?tn=68804&DocumentContentId=46742

https://efiling.energy.ca.gov/GetDocument.aspx?tn=211504&DocumentContentId=6960

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https://efiling.energy.ca.gov/GetDocument.aspx?tn=56264&DocumentContentId=52408

Sincerely,

Jared Babula
Attorney V
Chief Counsel's Office
California Energy Commission

From: Ryan Baron <Ryan.Baron@bbklaw.com>
Sent: Thursday, September 12, 2024 2:06 PM
To: Alan Cox <acox@shastacounty.gov>; Babula, Jared@Energy <Jared.Babula@energy.ca.gov>
Subject: RE: County Comments on Fountain Wind

Thank you both. I will send a Zoom invite for 10am.

Ryan M. F. Baron

Partner

ryan.baron@bbklaw.com

T: (949) 263-6568

bbklaw.com |

From: Alan Cox <acox@shastacounty.gov>
Sent: Thursday, September 12, 2024 11:56 AM
To: Babula, Jared@Energy <Jared.Babula@energy.ca.gov>; Ryan Baron <Ryan.Baron@bbklaw.com>
Subject: RE: County Comments on Fountain Wind

10-10:30 am works for me as well.

Thanks,

Alan B. Cox

Alan B. Cox
Senior Deputy County Counsel
Shasta County Counsel
1450 Court Street, Room 332
Redding, California 96001
Phone (530) 225-5711
Fax (530) 225-5817

From: Babula, Jared@Energy <Jared.Babula@energy.ca.gov>
Sent: Thursday, September 12, 2024 10:51 AM
To: Ryan Baron <Ryan.Baron@bbklaw.com>
Cc: Alan Cox <acox@shastacounty.gov>
Subject: Re: County Comments on Fountain Wind

Tomorrow at 10am works for me if you want to send a meeting invite. Can you also include Kari Anderson, thanks.

From: Ryan Baron <Ryan.Baron@bbklaw.com>
Sent: Thursday, September 12, 2024 10:34 AM
To: Babula, Jared@Energy <Jared.Babula@energy.ca.gov>
Cc: Alan Cox <acox@shastacounty.gov>
Subject: RE: County Comments on Fountain Wind

Hi Jared:

Thanks for the email. Are you free tomorrow morning for a quick call with Alan and me to clarify? Thanks much.

Ryan M. F. Baron

Partner

ryan.baron@bbklaw.com

T: (949) 263-6568

bbklaw.com |

From: Babula, Jared@Energy <Jared.Babula@energy.ca.gov>
Sent: Tuesday, September 10, 2024 9:19 AM
To: Ryan Baron <Ryan.Baron@bbklaw.com>
Subject: County Comments on Fountain Wind

Ryan,

Based on the invoices you provided to the CEC it appears that Shasta County has developed comments on

the application addressing various topics including the project's economic costs/benefits, the project's impacts to natural resources, the design, construction and operation of the project and the public convenience and necessity of the project. To date, I have seen comments by the SCAQMD on air quality and comments by the County on community benefits. Does the county have an estimate when these other comments will be filed into the proceeding's docket? It would be helpful to have these comments to inform staff's development of the DEIR.

Sincerely,

Jared Babula
Attorney V
Chief Counsel's Office
California Energy Commission

To: Barns, Caitlin[Caitlin.Barns@stantec.com]
From: Payne, Leonidas@Energy[/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=aa9d25dde24e40429efa06c4eed35807-Payne, Leon]
Sent: Wed 9/18/2024 8:27:24 AM (UTC-07:00)
Subject: Re: Fountain Wind check-in call

I've got nothing to report beyond slow, steady progress on the Preliminary Staff Assessment.

Out of 21 technical sections, 13 are done and formatted or the formatting work is in progress. An additional 3 are with Legal for review or are in the "author correction" phase following Legal review. I'm still waiting to see first drafts of the remaining 5 sections.

This tally does not include a number of additional sections (like EJ and Alternatives) that tend to come in after the other technical sections are finalized (since they draw material from those sections) nor the opt-in exclusive sections like Public Benefits and Conformity with Mandatory Opt-in Regulations. Work on all of those is still in progress.

Unless you've got something to pass on, feel free to cancel this week's session.

From: Barns, Caitlin
Sent: Wednesday, January 18, 2023 1:22 PM
To: Barns, Caitlin <Caitlin.Barns@stantec.com>; Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: Fountain Wind check-in call
When: Wednesday, September 18, 2024 10:30 AM-11:00 AM.
Where: Microsoft Teams Meeting

Microsoft Teams meeting

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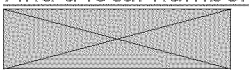

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To: Babula, Jared@Energy[Jared.Babula@energy.ca.gov]; Alan Cox[acox@shastacounty.gov]
Cc: Anderson, Kari@Energy[Kari.Anderson@Energy.ca.gov]
From: Ryan Baron[Ryan.Baron@bbklaw.com]
Sent: Fri 10/11/2024 3:35:37 PM (UTC-07:00)
Subject: RE: County Comments on Fountain Wind

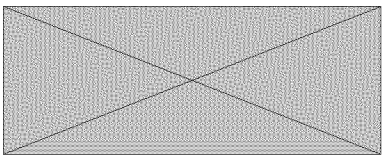
Hi Jared:

Happy Friday. Based on your September 10 email below, we wanted to let you know that the County will be submitting comments on biological resources and fire costs no later than Monday.

We also wanted to check in on the cost reimbursement request. The County has not seen any payment or objection from Fountain Wind LLC on the invoices or heard anything otherwise. We don't want to file for dispute resolution again and understand timing regarding review of the invoices by both the Commission and the applicant, but want to ensure the format is correct for the next submittal and that too much time doesn't pass.

Thanks much.

Ryan



Ryan M. F. Baron
Partner
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T: (949) 263-6568
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To: Ryan Baron <Ryan.Baron@bbklaw.com>; Alan Cox <acox@shastacounty.gov>
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https://efiling.energy.ca.gov/GetDocument.aspx?tn=56264&DocumentContentId=52408

Sincerely,

Jared Babula
Attorney V
Chief Counsel's Office
California Energy Commission

From: Ryan Baron <Ryan.Baron@bbklaw.com>
Sent: Thursday, September 12, 2024 2:06 PM
To: Alan Cox <acox@shastacounty.gov>; Babula, Jared@Energy <Jared.Babula@energy.ca.gov>
Subject: RE: County Comments on Fountain Wind

Thank you both. I will send a Zoom invite for 10am.

Ryan M. F. Baron

Partner

ryan.baron@bbklaw.com

T: (949) 263-6568

bbklaw.com |

From: Alan Cox <acox@shastacounty.gov>
Sent: Thursday, September 12, 2024 11:56 AM
To: Babula, Jared@Energy <Jared.Babula@energy.ca.gov>; Ryan Baron <Ryan.Baron@bbklaw.com>
Subject: RE: County Comments on Fountain Wind

10-10:30 am works for me as well.

Thanks,

Alan B. Cox

Alan B. Cox
Senior Deputy County Counsel
Shasta County Counsel
1450 Court Street, Room 332

Redding, California 96001
Phone (530) 225-5711
Fax (530) 225-5817

From: Babula, Jared@Energy <Jared.Babula@energy.ca.gov>
Sent: Thursday, September 12, 2024 10:51 AM
To: Ryan Baron <Ryan.Baron@bbklaw.com>
Cc: Alan Cox <acox@shastacounty.gov>
Subject: Re: County Comments on Fountain Wind

Tomorrow at 10am works for me if you want to send a meeting invite. Can you also include Kari Anderson, thanks.

From: Ryan Baron <Ryan.Baron@bbklaw.com>
Sent: Thursday, September 12, 2024 10:34 AM
To: Babula, Jared@Energy <Jared.Babula@energy.ca.gov>
Cc: Alan Cox <acox@shastacounty.gov>
Subject: RE: County Comments on Fountain Wind

Hi Jared:

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Ryan M. F. Baron

Partner

ryan.baron@bbklaw.com

T: (949) 263-6568

bbklaw.com |

From: Babula, Jared@Energy <Jared.Babula@energy.ca.gov>

Sent: Tuesday, September 10, 2024 9:19 AM
To: Ryan Baron <Ryan.Baron@bbklaw.com>
Subject: County Comments on Fountain Wind

Ryan,

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Sincerely,

Jared Babula
Attorney V
Chief Counsel's Office
California Energy Commission

From: Barns, Caitlin [Caitlin.Barns@stantec.com]
Sent: 11/13/2024 7:34:18 PM
To: Payne, Leonidas@Energy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=aa9d25dde24e40429efa06c4eed35807-Payne, Leon]
Subject: RE: Fountain Wind check-in call

Yes, we responded to the comments on water supply (docketed last week), and are working on a response related to wildfire. So you're expecting a letter in addition to the one they filed on 10/2?

From: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Sent: Wednesday, November 13, 2024 11:25 AM
To: Barns, Caitlin <Caitlin.Barns@stantec.com>
Subject: Re: Fountain Wind check-in call

Yes. They haven't really submitted much of anything in terms of comments on the application. I'm assuming whatever they file will primarily deal with Public Benefits, Wildfire, and maybe Water (although they did submit some comments on that before)

From: Barns, Caitlin <Caitlin.Barns@stantec.com>
Sent: Wednesday, November 13, 2024 11:11 AM
To: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: RE: Fountain Wind check-in call

What are you expecting them to file? More comments on the application?

From: Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Sent: Wednesday, November 13, 2024 6:57 AM
To: Barns, Caitlin <Caitlin.Barns@stantec.com>
Subject: Re: Fountain Wind check-in call

I need to take Zeb in for a follow-up X-ray at 10 so need to cancel. I've got no update beyond that folks are waiting for Shasta County to file whatever they plan to file. If you have something for me you can email me or we can push this to later in the afternoon.

From: Barns, Caitlin
Sent: Wednesday, January 18, 2023 1:22 PM
To: Barns, Caitlin <Caitlin.Barns@stantec.com>; Payne, Leonidas@Energy <leonidas.payne@energy.ca.gov>
Subject: Fountain Wind check-in call
When: Wednesday, November 13, 2024 10:30 AM-11:00 AM.
Where: Microsoft Teams Meeting

Microsoft Teams meeting

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(833) 266-3861,,58373190# Canada (Toll-free)

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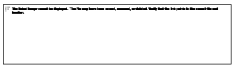

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