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BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

In the Matter of the Application of Rocky Mountain Power for Approval of a Waiver of the Requirement for Solicitation Process and of a Significant Energy Resource Decision and Report of Sale

DOCKET NO. 25-035-55

DIRECT TESTIMONY OF
KARL G. BOOTHMAN
ON BEHALF OF
WESTERN RESOURCE ADVOCATES

January 23, 2026

REDACTED

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List of Attachments

Exhibit WRA (KB-1)	Karl Boothman Resume
Exhibit WRA (KB-2)	RMP's Confidential Response to OCS Data Request 3.1
Exhibit WRA (KB-3)	RMP's Response to DPU Data Request 5.4

1 **I. INTRODUCTION AND QUALIFICATIONS**

2 **Q: Please state your name and business address.**

3 A: My name is Karl Boothman. My business address is 307 West 200 South, Suite 2000,
4 Salt Lake City, UT 84101.

5 **Q: By whom are you employed and in what position?**

6 A: I am employed by Western Resource Advocates (WRA) in its Clean Energy Program as a
7 Senior Policy Advisor. WRA is a regional nonprofit advocacy organization that fights
8 climate change and its impacts to sustain the environment, economy, and people of the
9 West. WRA's Clean Energy Program develops and implements policies to reduce the
10 environmental impacts of utilities in the Interior West by advocating for a western
11 electric system that provides clean, affordable, reliable energy, reduces economic risks,
12 and protects the environment through the expanded use of energy efficiency, renewable
13 energy resources, and other clean energy technologies. WRA has offices in Salt Lake
14 City, Utah; Boulder and Denver, Colorado; Reno, Nevada; Phoenix, Arizona; and Santa
15 Fe, New Mexico.

16 **Q: On whose behalf are you testifying in this proceeding?**

17 A: I am testifying on behalf of Western Resource Advocates.

18 **Q: Please describe your education and professional experience.**

19 A: I provide policy analysis and regulatory support to WRA in electric-industry-related
20 matters. I have a B.A. in economics, conferred with distinction from the University of

21 Michigan. From 2013-2016, I was employed as a Staff Analyst with ApplEcon LLC, a
22 consultancy based in Ann Arbor, Michigan that provides regulatory and econometric
23 support in litigation related to antitrust, collusion, and price fixing. From 2016-2019, I
24 was employed as a Consultant and from 2019-2022 as a Senior Consultant with 5 Lakes
25 Energy LLC, an energy policy consultancy based in Lansing, Michigan. In this role, I
26 provided analysis for clients on a wide range of topics in the energy industry, including
27 but not limited to, cost of service and rate design, energy efficiency and demand
28 response, energy siting, and integrated resource planning. Since 2022, I have been
29 employed as a Senior Policy Advisor with Western Resource Advocates where I have
30 worked on Utah energy policy. In addition to my formal education and work experience,
31 I have completed professional development courses including power grid school, utility
32 accounting and ratemaking, and the annual regulatory studies program at Michigan State
33 University Institute of Public Utilities as well cost of service, rate design, and
34 depreciation courses with EUCL. A more detailed description of my qualifications is
35 attached as Exhibit WRA__(KB-1).

36 **Q: Have you previously testified before the Public Service Commission of Utah**
37 **(“Commission”)?**

38 A: Yes. I submitted direct, rebuttal, and/or surrebuttal testimony in the following
39 proceedings before the Utah Public Service Commission:

- 40 • Docket No. 24-035-04 (PacifiCorp General Rate Case)
- 41 • Docket No. 20-035-34 (Application of Rocky Mountain Power for Approval of
- 42 Electric Vehicle Infrastructure Program)

- 43 • Docket No. 25-035-06 (Application of Rocky Mountain Power to Implement
 44 Community Clean Energy Program Authorized by the Community Clean Energy
 45 Act)

46 I have also filed comments and/or reply comments in the following non-litigated dockets
 47 before the Utah Public Service Commission:

- 48 • PacifiCorp’s 2023 IRP (Docket No. 23-035-10)
 49 • PacifiCorp’s 2025 IRP (Docket No. 25-035-22)
 50 • Investigation into Interconnection Rule Amendments (Docket No. 23-R312-01)
 51 • Schedule 37 Avoided Costs (Docket No. 25-035-T03)
 52 • Solicitation Process for URC Program (Docket No. 24-035-55)

53 I have or currently participate in multiple stakeholder processes such as the DSM
 54 Steering Committee and DSM Advisory Group, RMP’s Residential Time-of-Use
 55 Stakeholder workshops, RMP’s wildfire workshops, RMP’s Schedule 2E working group,
 56 RMP’s Grid Modernization Collaborative, and the Multi-State Process (MSP).

57 **Q: Have you previously testified before a Public Service Commission in another**
 58 **jurisdiction?**

59 **A:** Yes, I have submitted testimony in the following proceedings before the Michigan Public
 60 Service Commission:

- 61 • U-20561 (DTE Energy 2019 General Rate Case)
 62 • U-20697 (Consumers Energy 2020 General Rate Case)
 63 • U-20963 (Consumers Energy 2021 General Rate Case)

64 **Q: Please describe any additional qualifications or experience relevant to this**
 65 **proceeding.**

66 **A:** I have analyzed the Natrium project in the Company’s Integrated Resource Plan (IRP)
 67 process since at least 2022. Since that time, I have closely followed TerraPower’s

68 progress with the Nuclear Regulatory Commission (NRC) under the 10 CFR Part 50
69 permitting pathway. I have attended in-person and virtual NRC meetings as part of the
70 mandatory public outreach of the Natrium reactor in Kemmerer, Wyoming. In May 2025,
71 I attended a professional development course covering nuclear energy safety, waste
72 management, finance, policy, and public opinion jointly hosted by the Clean Air Task
73 Force and the Massachusetts Institute of Technology in Washington, D.C. Additionally, I
74 have reviewed discovery in this proceeding and many public documents accessible
75 through the NRC's document repository including topical reports, permitting
76 correspondence, and environmental impact documents.

77 **II. SUMMARY**

78 **Q: Please summarize your testimony.**

79 A: In this proceeding, I provide my assessment of the Power Purchase Agreement (PPA)
80 with US SFR Owner, LLC (US SFR) for energy output from the Kemmerer Unit 1 (KU1)
81 nuclear demonstration plant.

82 **Q: Please summarize your recommendations.**

83 A: In my opinion, the proposed PPA is a fair, if still theoretical, arrangement that effectively
84 protects ratepayers and the utility from excessive financial and operational risks endemic
85 to first-of-a-kind (FOAK) nuclear energy demonstration projects. It is also my opinion
86 that the PPA agreement between PacifiCorp and US SFR reasonably warrants a waiver of

87 the resource solicitation requirement.¹ Due to the financial safeguards in the PPA and the
88 opportunity for PacifiCorp customers to be served by firm, non-emitting energy from an
89 emerging technology that displaces fossil fuel generation, WRA does not oppose
90 approval of the Company's application.

91 **III. ANALYSIS AND RECOMMENDATIONS ON THE PPA BETWEEN**
92 **PACIFICORP AND US SFR OWNER, LLC**

93 **Q: Please describe WRA's interest and approach in this proceeding.**

94 A: WRA works to mitigate the adverse effects of climate change on the environment and
95 economy of the West through grid decarbonization. WRA seeks just and reasonable
96 regulatory outcomes based on facts, economics, and the best available science. In doing
97 so, WRA is committed to supporting energy resource and procurement decisions that
98 improve the welfare of the public and environment, while remaining agnostic to
99 electricity generating technologies. At the same time, WRA is generally supportive of
100 cost-effective, non-emitting resources that reduce reliance on emitting sources of
101 generation, serve existing and additional load, or enable higher penetrations of variable
102 renewable energy technologies.

103 **Q: Does WRA support nuclear energy development?**

104 A: The last nuclear facility built in WRA's region was the Palo Verde Generating Station in
105 Arizona, which came online in 1988. While proposals for new nuclear facilities are rare

¹ U.C.A. § 54-17-501.

106 in our region, WRA acknowledges legacy harms to lands, people, and sovereign tribal
107 nations stemming from uranium extraction, processing, and weapons testing. WRA
108 evaluates resource procurement requests in the context of specific proceedings,
109 evaluating the system value and economics of a particular proposal, including
110 environmental externalities. Any resource evaluation should include a comparison to
111 other clean, firm resource alternatives such as geothermal, hydrogen, hydropower,
112 pumped storage hydropower, renewables paired with long duration energy storage, and
113 carbon capture, and any resource acquisition should be supported by least-cost, least-risk
114 modeling.

115 WRA's position in this proceeding is based on the terms of the PPA under consideration
116 in Docket No. 25-035-55 and should not be interpreted as past, present, or future support
117 for nuclear energy at either a generalized industry or individual project level. My
118 testimony does not include a position on nuclear energy's (or KU1's) upstream or
119 downstream fuel supply chain impacts, as PacifiCorp [REDACTED] per
120 the PPA, and those issues are outside the scope of this limited proceeding. These issues
121 include but are not limited to uranium extraction and milling, uranium enrichment, and
122 nuclear waste transport, storage, and disposal. Nor should my position in this limited
123 proceeding be construed implicitly or explicitly as an exoneration of any past, present, or
124 future societal and tribal injustices, environmental harms, or proliferation risks from the
125 civil nuclear energy industry. My testimony in this docket concerns only the unique
126 contractual arrangement under consideration for KU1 between PacifiCorp and US SFR.

127 WRA reserves the right to alter or withdraw this position during this proceeding or at any
128 time during the resulting term of the PPA should conditions, terms, or corporate actions
129 warrant a change. Finally, WRA's position of non-opposition to the PPA does not extend
130 to any future extension, termination, or change to this PPA nor to any future energy
131 resource acquisition or ownership agreement for KU1, in whole or in part, that may or
132 may not materialize between PacifiCorp and US SFR, its corporate parent, or any other
133 ownership interest.

134 **Q: How does the PPA mitigate risks associated with the Natrium demonstration plant**
135 **for PacifiCorp and its ratepayers?**

136 A: Broadly speaking, the PPA insulates PacifiCorp and its customers from two categories of
137 risk.² The first category includes resource development risks, such [REDACTED]
138 [REDACTED]
139 [REDACTED]. It is my understanding that PacifiCorp will
140 not be liable for [REDACTED] associated with KU1 under the PPA.

141 The second category includes performance and energy cost risk for PacifiCorp's
142 customers. The PPA's "lower of" pricing formula for energy delivered through the
143 surplus interconnection agreement ensures that customers are [REDACTED]
144 [REDACTED]

² My understanding is that the resource costs of KU1 [REDACTED]. See Exhibit RMP___(RTL-3) at page 1.

146

147 **Q: What value does PacifiCorp present to US SFR through the PPA?**

148 A: PacifiCorp provides at least three important services to TerraPower at this stage of the
149 project: priority interconnection, conveyance of water rights, and revenues from
150 electricity offtake. By providing water rights, priority interconnection, and a revenue
151 stream, PacifiCorp is essentially facilitating a workshop environment by which
152 TerraPower can demonstrate technological feasibility and gain knowledge through
153 learning-by-doing,³ while PacifiCorp remains insulated from operational and financial
154 risk. An offtake agreement is necessary for TerraPower to access additional federal
155 funding through the Department of Energy's (DOE) Advanced Reactor Demonstration
156 Program (ARDP), but relative to interconnection and water rights, the revenue stream to
157 US SFR from energy output may be of tertiary importance.

158 **Q: Why do you assert that the payment stream for KU1's energy output may be**
159 **tertiary in importance to the PPA's interconnection and water provisions?**

160 A: Simply put, the compensation from PacifiCorp to US SFR is far below the full
161 development costs of KU1. Based on information presented in the Company's workpaper
162 titled "25-035-55 RMP CONF Workpapers Hourly Sodium Analysis 10-20-25.xlsx," the

³ Learning-by-doing is an established concept in economic literature that explains how systems and labor forces can increase performance and efficiency through actual practice rather than additional theoretical training. It is well-established in literature that learning-by-doing (in this case, building multiple reactors of the same design) can reduce levelized costs per reactor and time from breaking ground to criticality.

163 Sodium reactor operates at a [REDACTED] capacity factor over the modeled period. Contract
164 payments from PacifiCorp to US SFR total roughly [REDACTED] for total energy output of
165 [REDACTED], yielding an average price of [REDACTED]. According to the Nuclear
166 Energy Institute (NEI) in 2023, the average cost of nuclear generation, (including capital,
167 fuel, and operating cost) for the United States nuclear fleet was \$31.76/MWh.⁴
168 Importantly, none of these figures represent the full cost of nuclear plant ownership as
169 they omit market risk, regulatory and operational risk management, property taxes,
170 depreciation and interest, spent fuel storage and decommissioning costs, and return on
171 investment.⁵ For FOAK technologies, massive research and development costs must be
172 added. Further operational costs accumulate in the event of unplanned outages (foregone
173 generation and revenues), which traditionally also require nuclear plant owners to procure
174 market power to fill contractual obligations. Finally, the modeled price of [REDACTED]
175 [REDACTED] the average price of single-unit nuclear plants (\$41.62/MWh⁶), suggesting
176 significant economies of scale for multiple-reactor facilities. The United States' civil
177 nuclear fleet is comprised of large light water reactors (LLWRs), a very mature
178 technology that operates on low enriched uranium (LEU) fuel rather than high-assay,
179 low-enriched uranium (HALEU) for which there is no commercial-scale domestic supply
180 chain. Therefore, it is reasonable to assume that the PPA price offsets a miniscule portion
181 of the full cost of KU1.

⁴ Nuclear Energy Institute, *Nuclear Costs in Context* (February 2025) at 2,
<https://www.nei.org/getContentAsset/47fa8caa-9b0d-4029-932c-07f902e82f4f/8d8ff8d6-b2ae-401b-a63c-f6b108e809d2/2024-Costs-in-Context-final.pdf?language=en-US>.

⁵ *Id.* at 3.

⁶ *Id.* at 4.

182 **Q: If the PPA provides substantial ratepayer protections, does any uncertainty remain**
183 **to ratepayers?**

184 A: Yes, although little financial risk exists, some uncertainty remains. That uncertainty is
185 focused on three areas: (1) revenue and cost allocation related to water rights; (2) the
186 long-term customer benefits of the project; (3) broader system impacts and potential
187 costs.

188 **Q: Please describe the uncertainty related to water rights for the facility.**

189 A: It is my understanding that Utah ratepayers will be allocated revenues and costs for water
190 rights commensurate with their share of output⁷ from KU1 among PacifiCorp's states
191 [REDACTED].⁸ This revenue and cost allocation is uncertain based on the
192 actual performance of KU1 but should not have a meaningful effect on costs to
193 ratepayers.

194 **Q: Please describe the uncertainty related to the longer-term customer benefits of the**
195 **project.**

196 A: This uncertainty is a minor difference of opinion but I do not wholly agree that the [REDACTED]
197 [REDACTED] generate any clear

⁷ Assuming the 2020 Protocol or similar interjurisdictional cost allocation agreement is in effect. See *Application of Rocky Mountain Power for Approval of the 2020 Inter-Jurisdictional Cost Allocation Agreement*, Docket No. 19-035-42, Exhibit RMP_JRS-1, 2020 Protocol (filed December 3, 2019).

⁸ [REDACTED] Exhibit RMP___(RTL-3) at page 1.

198 long-term customer benefits at this stage, as suggested by the Company.⁹ The terms of
199 [REDACTED] are purely speculative and PacifiCorp would not be exempt from
200 demonstrating that [REDACTED] would be in the public interest.

201 **Q: Please describe uncertainty related to PacifiCorp’s broader system and resource**
202 **mix.**

203 A: Some uncertainty remains due to unknowable operational characteristics of KU1. The
204 Company’s PLEXOS model estimates LMP based on assumptions that are more static
205 than real markets.¹⁰ So, while model results are indicative of nodal prices, they are not
206 perfect (and the Company rightly acknowledges this). This means that customer benefit is
207 more uncertain if more of KU1’s dispatch is based on [REDACTED]. One way this could occur is
208 if one or more Naughton units retire, as [REDACTED] may be unavailable in
209 the “lower of” pricing formula. Generation [REDACTED]
210 [REDACTED] would be priced based on [REDACTED].¹¹
211 The Company confirmed this possibility in its response to OCS Data Request 3.1, stating,
212 [REDACTED]

⁹ *Direct Testimony of Rick T. Link for Rocky Mountain Power*, Docket No. 25-035-55 (filed October 20, 2025) at lines 100-102.

¹⁰ For example, PLEXOS calculates a single optimized nodal price, rather than representing actual EDAM day-ahead unit commitments and intra-hour dispatch from the Western Energy Imbalance Market (WEIM). [REDACTED]

[REDACTED] Exhibit
RMP ___ (RTL-3) at page 3.

¹¹ [REDACTED]

214 [REDACTED]

215 [REDACTED]¹² The Company then explains that [REDACTED]

216 [REDACTED], thus the effect should be minimal. I

217 agree, hence my classification of such a scenario as an “uncertainty” rather than a “risk.”

218 Also, and perhaps most significantly, while the PPA adequately addresses the issue of

219 [REDACTED] associated with KU1, the PPA’s virtually [REDACTED]

220 [REDACTED] adds a major layer of uncertainty to the actual benefit of KU1 to ratepayers as

221 well as future resource acquisitions.¹³ While the Company modeled a “No Nuclear” IRP

222 scenario in the 2025 IRP,¹⁴ it is my understanding that Natrium was counted as a capacity

223 resource in the 2025 IRP but will not be in subsequent IRPs. Thus, the “No Nuclear”

224 scenario, which identified several thousand megawatts of wind, solar, and storage to

225 replace Natrium’s firm capacity and energy, may not be indicative of the Company’s

226 actual alternative resource acquisition or dispatch strategy if KU1 [REDACTED]

227 [REDACTED] is unavailable or [REDACTED].¹⁵ If PacifiCorp or US

228 SFR were to [REDACTED], ratepayers could feasibly bear

229 more costs, for example, if cost-effective resources from an optimized portfolio without

¹² RMP’s Confidential Response to OCS Data Request 3.1, attached as Exhibit WRA___(KB-2) CONF.

¹³ The Company acknowledges this by stating, [REDACTED]
 [REDACTED] Exhibit RMP___(RTL-3) at page 4.

¹⁴ See PacifiCorp’s 2025 Integrated Resource Plan, Volume I, Docket No. 25-035-22 (filed March 31, 2025) at 264.

¹⁵ *Id.* at Figure 9.19.

230 Natrium were not acquired (and then pursued at higher cost) or replaced with market
231 purchases.

232 **Q: Do you have recommendations for addressing this uncertainty?**

233 A: Yes. I think additional information from the Company is warranted in rebuttal.
234 Acknowledging the inherent uncertainty with FOAK technologies, the Company stated in
235 its response to DPU Data Request 5.4, “At this time, PacifiCorp cannot know whether
236 KU1 will perform as anticipated in 2032 and beyond or if it will ever generate. A
237 resource portfolio that is optimized with the expectation that KU1 will never reach
238 commercial operation would be sub-optimal if KU1 were to reach commercial operation
239 and operate as expected. On the other hand, a resource portfolio that was optimized with
240 KU1 would be sub-optimal if KU1 did not reach commercial operation. Given KU1 is
241 reliant upon first-of-a-kind technology, it is appropriate to maintain flexibility for either
242 outcome.”¹⁶

243 In short, the Commission must be able to determine that this unique arrangement does not
244 compromise PacifiCorp’s pursuit and operation of a least-cost system, given the
245 uncertainty of KU1 and the [REDACTED] in the PPA. In rebuttal, the Company
246 should explain exactly how the presence of KU1 may or may not impact system dispatch
247 or resource acquisitions should the PPA [REDACTED], should KU1 never

¹⁶ RMP’s Response to DPU Data Request 5.4, attached as Exhibit WRA___(KB-3).

248 be commissioned, should KU1 be commissioned but delayed, or should one or more
249 Naughton units retire.

250 **Q: Should the Company's application for waiver of the solicitation requirement be**
251 **approved?**

252 A: Yes. FOAK, emerging technologies will likely not be developed using typical resource
253 solicitations or even on typical resource procurement timelines. As explained by the
254 Company, the KU1 project exists because it is a Department of Energy Advanced
255 Reactor Demonstration Project (DOE ARPD), is one-of-a-kind, and could not be
256 acquired through a resource solicitation process. In my opinion, the KU1 project satisfies
257 the criteria for granting a waiver of the resource solicitation requirement.

258 **IV. RECOMMENDATIONS**

259 **Q: Please summarize your recommendations.**

260 A: I recommend the following:

- 261 • WRA does not oppose approval of the PPA.
- 262 • A waiver of resource solicitation requirements is reasonable.
- 263 • I recommend the Company explain how it plans to represent the costs of KU1
- 264 under several uncertain scenarios in order to demonstrate continued operation of a
- 265 least-cost, least risk system.

266 **Q: Does this conclude your testimony?**

267 A: Yes.

REDACTED

Direct Testimony of Karl G. Boothman for WRA

Docket No. 25-035-55

I have read this filing and believe that it is supported in fact and in law.

Respectfully submitted,

WESTERN RESOURCE ADVOCATES

A handwritten signature in black ink, appearing to read 'SHAYES', written over a horizontal line.

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