

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF NEW JERSEY
CAMDEN VICINAGE

DELAWARE RIVERKEEPER NETWORK,
et al.,

Plaintiffs,

v.

SOIL SAFE, INC.,

Defendant.

Civil No. 14-1349 (RMB/KMW)

OPINION

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BUMB, United States District Judge:

The Court conducted a four-day bench trial in this matter from March 21, 2017 through March 24, 2017 concerning Plaintiff's claim pursuant to the Resource Conservation and Recovery Act ("RCRA"). At the conclusion of the trial, the Court solicited legal briefs from the parties as well as proposed findings of fact. The Court has considered the evidence adduced at trial and the briefs submitted by the parties. For the reasons set forth below, the Court concludes that Plaintiffs have not established that Soil Safe's product is a solid waste or that it may present an imminent and substantial harm to the environment. Accordingly, the Court enters final judgment in favor of Soil Safe.

Having considered the testimony and other evidence, as well as the parties' contentions in regard to the evidence and the law, the Court makes the following findings of fact and conclusions of law pursuant to Fed. R. Civ. P. 52. To the extent any of the Court's findings of fact incorporate a conclusion of law, such conclusions of law are adopted. Likewise, to the extent any of the Court's conclusions of law embody a finding of fact not set forth in the findings of fact, the Court adopts such finding of fact.

I. FINDINGS OF FACT

A. The Parties

i. Soil Safe, Inc.

1. Soil Safe, Inc. ("the Defendant" or "Soil Safe") is a company that has been in business for over 25 years and in business in New Jersey for over 20 years. Joint Statement of Undisputed Facts ("JSOF"), at ¶ 68 [ECF No. 150]. Soil Safe currently has operations in New Jersey, Maryland, and California. Id. ¶ 69. Soil Safe owns a soil recycling center in Logan Township, Gloucester County, New Jersey (the "Logan Recycling Center"). Id. ¶¶ 1, 3 [ECF No. 150]. The Logan Recycling Center is a "recycling center for Class B recyclable materials" as that term is defined in New Jersey's Recycling Regulations. Id. ¶ 3; Def.'s Ex. 1 (Class B Permit).

ii. Plaintiffs

2. Plaintiff Maya van Rossum was a witness in this case as the Delaware Riverkeeper, a role she has occupied for the other plaintiff in this case the Delaware Riverkeeper Network (“Delaware Riverkeeper Network” and collectively, “Plaintiffs”) since 1996. Trial Tr. 26:18-22, 27:14-18.

3. The Delaware Riverkeeper Network was organized in 1988 and currently has approximately 20,000 members. Id. at 27:13, 28:22-24. As set forth by Ms. van Rossum, the Delaware Riverkeeper Network is a non-profit organization whose mission is to “champion the rights of communities to the Delaware River and tributary streams that are free flowing, healthy[,] and abundant with the diversity of life.” Id. at 27:2-6. The Delaware Riverkeeper Network has several programs through which it purports to accomplish this mission, including a litigation program, a stream bank restoration program, and a citizen monitoring program. Id. at 27:6-10. The Delaware Riverkeeper Network also has an educational component. Id. at 27:10-11.

4. The Delaware Riverkeeper Network limits its focus to the Delaware River watershed and all issues that might impact the main-stem Delaware River and its tributaries. Id. at 28:1-3.

5. Birch Creek and Raccoon Creek, two bodies of water at the center of this case, are both parts of the Delaware River watershed. Id. at 28:17-21. In her capacity as the Delaware

Riverkeeper, Ms. van Rossum is aware of members of the Delaware Riverkeeper Network using Birch Creek and Raccoon Creek. Id. at 30:7-8. The Delaware Riverkeeper Network has many members that enjoy the Delaware River watershed, including the main-stem river and tributaries, which also includes the area of the DREAM Park. Id. at 35:4-9.

6. Ms. van Rossum lives in Bryn Mawr, Pennsylvania and, accordingly, she does not live near the property in Logan Township, New Jersey where Soil Safe's Logan Recycling Center is located or Soil Safe's product was used as relevant to this case. Id. at 46:1. Additionally, Ms. van Rossum has never been to the Birch Creek Site (discussed below), nor has she engaged in any recreational activities there. Id. at 46:15-23, 47:5-7. This includes any usage or planned usage of the equestrian facilities at issue in this case. Id. at 48:1-2. Ms. van Rossum does, however, engage in recreational activities on the Delaware River adjacent to the DREAM Park. Id. at 48:5-6.

7. With regard to the two creeks involved in this case, Ms. van Rossum has been on one kayak trip on Raccoon Creek. Id. at 49:17-23. Ms. van Rossum anticipates visiting Raccoon Creek again at some point, although she does not have a specified time at which she anticipates doing so. Id. at 50:5-8. She makes a practice of trying to visit various portions of the watershed to appreciate them. Id. at 50:1-2.

8. Ms. van Rossum's enjoyment of her use of the Delaware River has diminished because she believes that Soil Safe's operations are ongoing and create potential implications for water quality because Raccoon Creek and Birch Creek are tributaries of the Delaware River. Id. at 50:22-51:5. Specifically, Ms. van Rossum passionately testified to her personal belief that Soil Safe was contaminating the Delaware River and its tributaries and that "does impact [her] enjoyment of the Delaware River when [she] go[es] into that reach of the river, knowing that those operations are ongoing, that there are potential implications of water quality, whether it's on the tributary or on the main stem river, as well as the ecological system's critters that [she] ha[s] worked very long and hard to protect because of professional appreciation for them and a personal appreciation of them does impact [her] enjoyment when [she] visit[s] that reach of the river, both [her] recreational enjoyment and [her] aesthetic enjoyment." Id. at 50:22-51:5.

9. Ms. van Rossum has used the Delaware River between Raccoon Creek and Birch Creek, both professionally and personally. Id. at 32:6-9. She testified that when she uses a boat in this area, there is a lot of water spray, so one would expect to get wet while boating there. Id. at 33:22-23. She credibly testified that she plans to continue her work in the area, including in the tributaries of the Delaware River to "undertake

both recreational activities as well as environmental protection activities.” Id. at 33:5-11.

10. Ms. van Rossum also testified that she is concerned about Soil Safe’s activities in the following way: “Well, me as the Delaware Riverkeeper, professionally and personally, it’s very concerning. We have a lot of members that enjoy that area of the Delaware River [w]ater[s]hed, including the main[-]stem and the tributaries, including the park area. And so, you know, it’s a concern about how they are going to be impacted. It’s a concern about how the aquatic ecosystems, how the water quality of those waterways will be impacted having these dangerous contaminants introduced, whether it be through ground water, surface water, runoff, through the air.” Id. at 35:4-13.

11. Ms. van Rossum and the Delaware Riverkeeper Network pursued this litigation after learning in 2012 there might be contamination of the Delaware River watershed as part of Soil Safe’s operations. Soil Safe Proposed Findings of Fact and Pls.’ Resps. (“Soil Safe PFOF & PR”) ¶ 30 [ECF No. 155]; Trial Tr. 40:17-21. The lawsuit was filed after Delaware Riverkeeper Network engaged in a “significant amount” of independent analysis of these concerns and formed the belief that there was an issue of concern with regard to Soil Safe’s operations and what they believed to be a potential violation of law that

needed to be addressed through legal action. Trial Tr. 40:17-41:14.

12. Louis Perti, a resident of Aston, Pennsylvania, has been a member of the Delaware Riverkeeper Network since 2013. Soil Safe PFOF & PR ¶ 18; Trial Tr. 80:20-23. He is an avid outdoorsman, enjoying recreational activities such as fishing, crabbing, sightseeing, and boating in the areas of Raccoon Creek and Birch Creek. Trial Tr. 79:23-80:3. He has been engaging in this type of activity for 42 years. Id. at 80:4-7.

13. Mr. Perti further credibly testified that he uses portions of Birch Creek and Raccoon Creek; however, he also testified one cannot access Birch Creek past "a certain point" because of access issues by boat. Id. at 81:2-5.

14. Mr. Perti is also the director of the Delaware River Striper Tournament, which is a fishing tournament that has been held for eight years. Id. at 81:8-10. Raccoon Creek is one of the "premier fishing areas" in the tournament that he runs. Id. at 88:17-18. He plans to continue running that tournament in the future. Id. at 92:17.

15. Mr. Perti has visited the Birch Creek area to see if sediment from Soil Safe's operations is present there. Id. at 93:17-21.

16. One fishing route that Mr. Perti has followed is to "[s]tart fishing the Raccoon Creek. I'll work my way to Birch,

to Oldman's, all the way down to Carneys Point, down to the Delaware Memorial Bridge." Id. at 96:25-97:2. In following this fishing route, Mr. Perti observed "in the area of Birch Creek" that the "soil was running off into Birch Creek[.]" Id. at 96:19-20.

17. Mr. Perti greatly enjoys fishing the Delaware River from the Salem Nuclear Plant to Trenton, an area of at least 60 or 70 nautical miles. Id. at 112:12-14. He particularly enjoys fishing the tributaries that flow into the Delaware River. Id. at 112:17-19. He greatly enjoys exploring those tributaries and finding out "what's going on in there[.]" Id.

18. Although Mr. Perti testified that it was difficult to say how Soil Safe's activities affected his enjoyment of the river because he is still actively fishing in the area, id. at 93:15-21, the Court finds that Mr. Perti answered this question with the understanding that he was being asked if he no longer uses the Raccoon Creek for fishing, which he does. Id. at 93:22-23. Nevertheless, the Court also finds Mr. Perti to be genuinely concerned about the aquatic life in the area as a result of problematic silt he perceived to be coming from Soil Safe. He is specifically concerned that silt kills much of the habitat for bait fish eaten by stripers, which he fishes and which are central to his fishing tournament. Id. at 98:2-8.

19. Mr. Perti's fishing tournament has grown over the years; however, this increase has much to do with the weather. Id. at 122:12-13, 124:16.

20. Mr. Perti also testified that he is worried that leaching of materials from Soil Safe's operation have a carcinogenic effect, although he has not communicated that to anyone he knows fishing in Raccoon Creek. Id. at 25:14-24.

B. The Sites and Surrounding Area

21. From the early 1950s through the 1980s, the United States Army Corp of Engineers used the property at issue in this case for placement of dredged materials from the Delaware River. JSOF ¶¶ 66, 113.

22. The Class B Recycling Permit authorizes use of Soil Safe Product at three specified "End Market Sites": (i) the Logan Equine Park Site, which is owned by the Gloucester County Improvement Authority ("GCIA"); (ii) the Birch Creek Site, which is owned by Soil Safe; and (iii) the Gloucester County Park Site, also owned by the GCIA. Id. ¶ 8.

i. The Logan Equine Park Site

23. Pre-development testing of the Logan Equine Park Site determined that the historic fill material present at the site contained elevated levels of several contaminants above the most stringent criteria then in effect from the New Jersey Department

of Environmental Protection ("NJDEP"), the Residential Direct Contact Soil Cleanup Criteria ("RDCSCC"). Id. ¶ 114.

24. However, the near surface soils at the Logan Equine Park Site did not contain contaminants of concern under the RDCSCC, which made a remedial cap unnecessary. Id. ¶ 115. However, fill material was brought in for geotechnical stabilization to permit the planned construction of buildings and roads on the soft, unstable dredge covering the site. Id. ¶¶ 115-16.

25. The GCIA approached Soil Safe with the intent to secure Soil Safe product as geotechnical fill at the Logan Equine Park. Id. ¶ 117.

26. The Logan Equine Park is a 71-acre part of the GCIA's DREAM Park¹ on Logan Township, Gloucester County, New Jersey. Id. ¶ 112.

27. Shipment of this product began in 2006 and between 2006 and 2008, over 300,000 tons of Soil Safe product was used at the Logan Equine Park. Id. ¶ 119. This product was mostly used under buildings, roads, paddocks, or parking areas. Id. ¶ 122.

28. Remediation of the Logan Equine Park was completed and approved in 2008. Id. ¶ 120.

¹ The DREAM Park is more fully known as the Delaware River Equestrian Agricultural Marina Park. JSOF ¶ 112.

ii. The Birch Creek Site

29. The Birch Creek Site is a 165-acre property that is home to the Logan Recycling Center. Id. ¶ 2.

30. Historically, the Birch Creek Site was filled with dredge spoils from the Delaware River. Id. ¶¶ 66, 113.

31. Arsenic was identified as a contaminant existing at elevated levels in the dredge material at the Birch Creek sites before Soil Safe began its operations. Id. ¶ 57.

32. Soil Safe began placing product at the Birch Creek Site in 2004. JSOF ¶ 109. Use of the Soil Safe Product at both the Birch Creek Site and the Gloucester County Park Site (see infra) originally occurred under the direct supervision of a NJDEP case manager, but since 2012 has occurred under the supervision of LSRP Albert Free. Soil Safe PFOF & PR ¶ 175. Mr. Free is paid by Soil Safe for his work as LSRP. Plaintiffs' Prop. Findings of Fact and Def.'s Resps. ("Pls.' PFOF & DR") ¶¶ 37-38 [ECF No. 153].

33. The Birch Creek Site remediation project is approximately 80% complete. Id. ¶ 111. Soil Safe intends to sell the Birch Creek Site. Soil Safe PFOF & PR ¶ 188.

iii. The Gloucester County Park Site

34. The Gloucester County Park Site is also a part of the DREAM Park. JSOF ¶ 112.

35. "Approval of the RAWP [for the Gloucester County Park Site] was supported by a 14-month study and review, with permits and approvals for the project being obtained from the United States Army Corps of Engineers, several different units of the NJDEP (Site Remediation Program, Land Use, and the Historic Preservation Office), the Gloucester Soil Conservation District, the Gloucester County Health Department, the GCIA, the Gloucester County Board of Chosen Freeholders, and Logan Township." Id. ¶ 11.

36. The review of the RAWP for the Gloucester County Park Site involved a range of technical studies, including a full ecological inventory, a comprehensive evaluation of the product to be used at the site, and a Baseline Ecological Evaluation that included a baseline ecological assessment, ecological modeling, and a comprehensive evaluation of potential impacts to aquatic and terrestrial ecosystems. JSOF ¶ 123.

37. The RAWP concluded that the entire Gloucester County Park Site is covered with historic fill material. JSOF ¶ 125; Pls. Ex. 3A at 13, 28 (Gloucester County Park RAWP). Limited sampling at the County Park site determined that this historic fill material contained levels of several contaminants above NJDEP's RDCSCC. Id. ¶ 126.

38. Arsenic was identified as a contaminant existing at elevated levels in the dredge material at the Gloucester County Park Site before Soil Safe began its operations. Id. ¶ 57.

39. The RAWP adopted for the Gloucester County Park Site employs a multi-layer cap design. It also provides for minimum mandatory drainage requirements, as well as pleasing surface vistas "appropriate for a park." Id. ¶¶ 127-28.

40. The Gloucester County Park Site RAWP also includes a Sampling and Analysis Plan reviewed by the NJDEP. Id. ¶ 19.

41. The RAWP for the Gloucester County Park Site was approved by the NJDEP in November 2008. Id. ¶ 10.

42. The Gloucester County Park Site RAWP requires that the Soil Safe product placed at the County Park site meet the RDCSCC requirements. Id. ¶ 133.

43. The product placed at the Gloucester County Park Site is placed under the supervision of an LSRP. Id. ¶ 9. That LSRP is Mr. Free. Soil Safe PFOF & PR ¶ 223.

44. Beginning in March 2009, Soil Safe shipped product to the Gloucester County Park Site and began constructing the remedial cap. JSOF ¶ 12. The soil is sampled and analyzed at least twice before shipment to the Gloucester County Park Site. Id. ¶ 14, 18.

45. Soil Safe product has been placed at the park in compliance with the grading plan and capping remedy requirements set forth in the Gloucester County Park RAWP. JSOF ¶ 129.

C. The Soil Recycling Process

46. The Logan Recycling Center is located on a portion of the Birch Creek Site. Id. ¶ 2.

47. Soil Safe's recycling operation is governed by permits issued by the NJDEP and local authorities, including a Class B Recycling Permit issued by the NJDEP. Id. ¶ 4. The Class B recycling permit covers "Concrete, Asphalt, Brick, Block, [and] Petroleum Contaminated Soil." Id. ¶ 72. This permit was issued in December 2003, subsequently modified, and renewed in April 2009 and January 2014. Id. ¶ 5.

48. The Class B Recycling Permit also contains 80 enumerated conditions that govern the operation of the Logan Recycling Center. Soil Safe PFOF & PR ¶ 71. Condition 47 of the Class B Permit places three limitations on the soil that Soil Safe is authorized to recycle at the Logan Recycling Facility: "(1) Soil Safe is only allowed to accept non-hazardous petroleum-contaminated soil; (2) the soil must meet NJDEP's RDCSCC residential standard for all chemical constituents except for six constituents for which other maximum levels are provided; and (3) the trailing 12-month average for all soil used for remedial capping at the Birch Creek property End Market Site

must meet the RDCSCC for all constituents, except for total polycyclic aromatic hydrocarbons ("total PAH"), which must meet the NJDEP's impact to groundwater standard cleanup criteria for benzo(a)pyrene ("BaP")." Id. ¶ 78.

49. The permits issued by NJDEP "are part of programs developed through the Solid Waste Plan required of New Jersey by Subtitle D of RCRA (which regulates non-hazardous materials like those accepted at the Logan Recycling Center) to reduce the volume of materials discarded as waste through beneficial use and recycling." JSOF ¶¶ 30, 73, 107.

50. Soil Safe's other operation in New Jersey "involves the remedial capping of six cyanide sludge impoundments covering 85 acres at a former American Cyanamid company site, through Soil Safe's construction of a low permeability, high strength durable cap using its recycled soil-cement [p]roduct." Soil Safe PFOF & PR ¶ 62. Soil Safe spent nearly five years acquiring the permits required for this project. Soil Safe PFOF & PR ¶ 64.

i. Incoming Soil

51. Approximately half of Soil Safe's customers who supply soil to be recycled by Soil Safe are government entities. Id. ¶ 60.

52. Soil Safe's customers are required to complete a "Material Characterization Report" ("MCR") form, which requires the customers to describe the source of and various characteristics of the soil that they are sending to be recycled. The MCR

details what sampling data the customer is obligated to provide and requires that the customer certify to the accuracy of the provided information, including that the soil is non-hazardous. Id. ¶ 90.

53. Completion of the MCR is a requirement of Soil Safe's Class B recycling permit. Id. ¶ 91.

54. Soil Safe requires customers to perform sampling of the soil at its source before it can be accepted by Soil Safe. JSOF ¶ 76. Specifically, in accordance with the Class B Recycling Permit issued to Soil Safe, prior to being accepted at the Logan Recycling Center the soil is tested for total petroleum hydrocarbons ("TPH"), as well as a variety of other constituents (volatile organic compounds ("VOCs"), metals, polychlorinated biphenyls, semi-volatile organic compounds, polycyclic aromatic hydrocarbons). The product is also subject to Toxicity Characteristic Leaching Procedure ("TCLP") testing. Id. ¶ 15. Soil that does not meet the limits set forth in the Class B Recycling Permit is not accepted at the Logan Recycling Center. Id. ¶ 16.

55. The customer must also provide any additional testing and documentation regarding the site. Trial Tr. 242:16-21.

56. Soil Safe is not required by the NJDEP Class B Recycling Permit to conduct TCLP testing or any other leach test after receipt of the soil. JSOF ¶ 103.

57. The Class B Recycling Permit also does not contain any requirements that Soil Safe remove contaminants from the incoming soil as a part of the recycling process. JSOF ¶ 102.

58. Soil Safe requires its customers who are supplying soil to be recycled to provide copies of the results of the testing Soil Safe requires, in addition to any other sampling results and environmental reports that they have for the material and source site. JSOF ¶ 77. Soil Safe reviews this data in a specially designed, proprietary computer software called SoilSmart. JSOF ¶ 80. SoilSmart required over a year and \$3 million to create. Soil Safe PFOF & PR ¶ 100.

59. The customer sending soil to be recycled must also certify and the provided customer analytical data must prove that the soil being sent to the Logan Recycling Center for recycling is non-hazardous within the meaning of RCRA. JSOF ¶ 79.

60. Once Soil Safe has reviewed analytical data and supporting paperwork for soil to be recycled, an approval letter is generated for the customer. Id. ¶ 81. The customer must pre-schedule the arrival of trucks containing the soil each day, and only approved jobs are allowed to drop off soil. A truck driver must show certain required paperwork identifying the source of the material to deposit it with Soil Safe. Id. ¶ 82. The truck is then weighed and the soil in the truck is visually inspected by Soil Safe personnel. Id. ¶ 83.

61. The Soil Smart software tracks the total amount of soil accepted by Soil Safe from each approved project and/or project grid to ensure the amount delivered “does not exceed the amount of soil approved to be accepted and originates from an approved grid location.” JSOF ¶ 84. Unauthorized truckloads of soil are rejected and turned away. Id. ¶ 85.

62. Soil that is received by Soil Safe for recycling typically contains incidental scraps of wood, metal, bricks, block, and/or rocks which are removed during the recycling process. Id. ¶ 89.

63. The incoming soil may also contain different soil types (ranging from clay-like to sand-like), different grain distribution, and varying moisture content. Id. ¶ 90.

64. The condition of the incoming soil to Soil Safe is not suitable for use in remedial capping or geotechnical fill purposes. Id. ¶ 88.

65. Nevertheless, the levels of constituents in the soil that Soil Safe accepts for recycling are significantly less than the maximum levels permitted under the Class B Recycling Permit:

Constituent	Acceptance Level (mg/kg)	Raw Soil Levels at 95% UCL (mg/kg)
Total PAH	100	2.15
Lead	1,390	109
Arsenic	39.5	5.27

Def.'s Ex. 487; Def.'s Ex. 1 at ¶ 47.

66. Although done for many reasons, including the size of the project or the presence of problematic contaminant levels, approximately 50% of potential Soil Safe projects are screened out by Soil Safe sales personnel. Trial Tr. 340:13-341:1.

67. Soil Safe's Compliance Department performs internet searches to ensure that Soil Safe has pertinent information about the source of soil it is to receive and approximately 25% of the proposed projects that make it through the initial screening by the sales staff end up rejected by the Compliance Department. Soil Safe PFOF & PR ¶¶ 95-96.

68. Moreover, particularly complex projects, such as projects "with large amounts of data, or where there are concerns despite [] the sampling data show[ing] that the soil meets Soil Safe's permit requirements - are subject to additional review by a five-person committee, requiring a unanimous vote by all five committee members before a project can be accepted." Id. ¶ 97.

ii. Recycling Process

69. Soil Safe processes petroleum-impacted soil using a number of different process steps. JSOF ¶ 91.

70. When necessary, lime is added to the soil to reduce excess moisture. Id. ¶ 99.

71. The product resulting from Soil Safe's recycling process has a uniform appearance and meets the AASHTO A-2-4 specification for fill material. Id. ¶ 29.

72. Both parties agree that the steps of Soil Safe's recycling process are depicted in Def.'s Ex. 187, which lists the following steps in order: (1) soil is profiled at the Generator's site prior to shipment; (2) soil history is reviewed and Soil Safe Compliance Department approves or rejects project; (3) approved projects are scheduled; (4) the soil arrives at the facility and the trucks are weighed, compliance is confirmed, and the load is accepted or rejected; (5) soil deposited in pre-process area under Soil Safe direction; (6) soil is pre-conditioned and moved to immediate plant loading area; (7) the soil is run through a screening plant where oversize constituents are removed; the additives are metered into soil and blended in a pug mill where thorough homogenization occurs; (8) processed soils are stockpiled and tested; and (9) approved product is placed in 8" to 12" lifts in accordance with site specifications. Def.'s Ex 187. The Court also finds that Def.'s Ex. 403 accurately depicts these steps actually occurring at Soil Safe's Logan Recycling Center. The Court additionally finds there to be a significant visual difference between the soil as it arrives to Soil Safe and what the soil looks like as it is placed and compacted. Def.'s Ex. 403.

73. Elaborating on the above paragraph, the Court notes that the first step for Soil Safe's recycling process after the soil has arrived on site is "pre-blending" or "pre-conditioning" of the soil. This involves the use of large machinery like bulldozers and front-end loaders to physically mix the product. This takes soils of various types (such as sand or clay), different grain sizes, and different moisture contents and creates a more consistent feedstock. Soil Safe PFOF & PR ¶ 116. This blending of the soil creates a stronger product because smaller particles mix in well with large particles of soil and fill the gaps. Trial Tr. 638:24-639:2. Also during this process deleterious material like metal reinforcing bars and other scrap material are removed by hand. Soil Safe PFOF & PR ¶ 118; Def.'s Ex. 403. Metals removed in this way are sent to be recycled while other trash materials are sent to a permitted landfill. Soil Safe PFOF & PR ¶ 118 ¶¶ 119-20. Similarly, rock, concrete, and brick are removed. Id. ¶ 121.

74. After pre-blending, the soil is loaded into a hopper, which leads to a vibrating 4-inch by 4-inch screen which further removes any oversized material from the mix. Id. ¶ 122. This material can clearly be seen in photos of the process. Def.'s Ex. 403.

75. After the material has been screened, it passes to a pugmill, where cementitious additives are added. Soil Safe PFOF & PR ¶ 125.

76. The recycling process employed by Soil Safe at the Logan Recycling Center involves processes such as mixing the soil with cementitious additives (sometimes called "pozzolanic" additives). One such additive is Cement Kiln Dust ("CKD"). JSOF ¶¶ 6, 97. In this case Soil Safe adds CKD to its soil using a pugmill, a device that stabilizes and mixes soil. Trial Tr. 245:17-21 (testimony concerning mixing ability of pugmill); id. 352:4-12 (testimony concerning stabilizing ability of pugmill). As the soil comes out of the pugmill, it is different in color and texture. Id. at 353:1-2.

77. CKD does nothing to change the concentration of metals in the raw contaminated soils. Id. at 299:16-20. Indeed, as a result of the filing of this suit, Soil Safe voluntarily agreed to "dial down" discussion of stabilization in their marketing literature because it may yield confusion to the hazardous waste context. Id. at 300:20-301:1.

78. CKD is added to achieve a 1% volume of it. Id. at 213:4-5. Soil Safe chose this amount by experimentation. Soil Safe PFOF & PR ¶ 134.

79. Notably, Soil Safe is not required to use any specific amount of CKD, or even use it at all, by the Class B Recycling

Permit. JSOF ¶ 100. Other recyclers in New Jersey of Class B materials include no such additives in their recycling process. Id. ¶ 101.

80. CKD solidifies the soil and adjusts the pH of the soil which can have the effect of lowering the solubility of metals which reduces their mobility and leachability. It does this by clogging the void ratios in the soil. Mr. Mark Smith credibly testified that this process is like a "strainer basket full of marbles" and that if the spaces between the marbles "get filled with material that actually clogs those interstitial space or void ratios, then water does not go through. That's when we talk about permeability, we clog those pour spaces with the cement dust." Trial Tr. 301:15-23.

81. CKD functions in a manner similar to Portland cement when added to soil because it is a residual material from production of Portland cement. Id. at 601:12-17. That said, if one took an equal mass of CKD and Portland cement, one would typically get a greater increase in strength or stiffness per unit mass of Portland cement than CKD. Id. at 625:1-12.

82. In the manner Soil Safe deploys CKD, it is not intended to create chemical sequestration. Id. at 625:24-626:1. However, it may ultimately have some of those effects. Id. at 626:3-9.

83. At the time of trial, Soil Safe was paying \$60 per ton to purchase CKD for use in the recycling process and has spent over

\$3 million for the cement dust used at the Logan Recycling Center. Soil Safe PFOF & PR ¶ 129.

84. CKD is not added specifically to stabilize chemicals in the soil, but rather to improve the geotechnical properties of the soil through physical stabilization. JSOF ¶¶ 104-05. However, CKD also plugs pores in the soil. Id. ¶ 106.

85. Plaintiffs admit that the soil is different when it leaves Soil Safe than when it came in with regard to texture, grain size distribution, color, absence of oversized and deleterious materials in the product, and moisture content. Soil Safe PFOF & PR ¶ 150.

iii. Oversight and Testing

86. The Logan Recycling Center is monitored in its work and it has been inspected by a number of regulatory agencies, including NJDEP's Water Quality, Air, Solid Waste, Land Use, and Site Remediation Program units, the United States Environmental Protection Agency, the Gloucester County Health Department, and Logan Township. JSOF ¶ 74. The Logan Recycling Center's operations have been inspected over 200 times since 2004; the parties agree this amounts to, on average, an inspection once every three weeks over twelve years. Id. ¶ 75.

87. NJDEP requires the preparation of quarterly summaries by Soil Safe, in an NJDEP-selected format, of the generator sampling data for all incoming material accepted by Soil Safe.

NJDEP requires this data be reviewed and certified by an independent third-party engineering firm prior to submittal of each quarterly report. The summaries must identify each individual soil source, and for each source they must also identify the quantity of soil shipped to Soil Safe, the number of samples taken, the chemical constituents samples for, and the average and maximum concentrations detected for each constituent. Soil Safe PFOF & PR ¶ 98.

88. At the instruction of NJDEP, in March 2009, Soil Safe began conducting testing on the soil generated from the recycling process intended for remediation at the Gloucester County Park. This sampling requirement was specified in the Class B Recycling Permit and the Gloucester County Park Site RAWP. JSOF ¶ 87. Prior to March 2009, Soil Safe performed sampling on incoming soil immediately after receipt at the Logan recycling Center to confirm its compliance with the acceptance criteria in the Class B Recycling Permit. Id. ¶ 86.

89. Before being shipped to the Gloucester County Park Site, Soil Safe samples the product created through its process. Id. ¶ 18. This sampling occurs pursuant to a Sampling and Analysis Plan that was approved by the NJDEP in 2008 as part of the RAWP for the County Park. Id. ¶ 19. Under this plan, a sample (called a "grab sample") is collected for every 200 cubic yards of engineered fill product produced. Id. ¶ 20. Ten of these

samples are then blended, and a sample is taken from the composite of the samples for analysis by an independent and certified laboratory, New Jersey Certified Analytical Laboratories.² Id. ¶¶ 21, 25. This analysis is then submitted to an independent New Jersey Professional Engineer to be certified, before being sent to the LSRP for review and final approval. Id. ¶¶ 27, 138. The GCIA then reviews and approves the data, and it is ultimately reported to the NJDEP. Id. ¶ 28.

90. For the soil sent to the Gloucester County Park Site, prior to acceptance by Soil Safe more than 970 samples were analyzed for TPH and the Target Compound List and Target Analyte List. JSOF ¶ 17. Another 970 discrete samples have been analyzed for VOCs. Id. ¶ 137.

D. The Application of Soil Safe Product

91. As LSRP of the Birch Creek Site and the Gloucester County Park Site Mr. Free performs oversight of the development of the design for remediating contaminated sites, oversight of implementation of the remedy, and determining when the remediation has been completed in satisfaction of the NJDEP's regulations. Soil Safe PFOF & PR ¶ 176. Mr. Free is an environmental engineer with 37 years of experience. Id. ¶ 177.

² VOCs are separately analyzed. JSOF ¶ 21.

92. The Birch Creek RAWP refers to a remedial cap thickness of at least five feet is required to achieve the degree of compaction and reduced permeability desired by the NJDEP and Soil Safe. Pl.'s Ex. 14 at 3 (Birch Creek Site RAWP indicating "Capping activities shall consist of five (5) feet of manufactured material placed overtop of the existing dredge materials."). An amount of two-feet caused "pumping," an undesired effect. Trial Tr. 396:22-397:10.

93. The cap as deployed at the Gloucester County Park Site has several layers and each of these layers has a purpose. The "reduced permeability layer" is designed to prevent human contact with the underlying dredge spill, impede the flow of water into the underlying soil (which is contaminated dredge spoils), and prevent burrowing animals from exposure to the underlying dredge materials. Soil Safe PFOF & PR ¶ 227; Trial Tr. 588:11-15, 589:2-5, 628:15-19; Pl.'s Ex. 3A at 9, 33-34.

94. The "contouring" layer is constructed over the top of the reduced permeability layer. Its purpose is to help achieve proper compaction of the reduced permeability layer, protect the reduced permeability layer from damages from frost or wet/dry cycling, and to provide elevation changes to allow for proper drainage and stormwater management. Soil Safe PFOF & PR ¶ 228; Pls.' Ex. 3A at 9, 10 (Fig. 2.3), 33-34; 589:6-22; 590:5-11; 628:19-629:3). Both the contouring layer and the reduced

permeability layer are manufactured from Soil Safe's product. Soil Safe PFOF & PR ¶ 229.

95. Finally, on top of both the reduced permeability layer and the contouring layer is a layer of topsoil which provides a rooting area for grasses and vegetation to grow, which helps minimize erosion. Id. ¶ 230; Pls. Ex. 3A at 9, 36; 589:23-590:4, 629:3-6).

96. The Court finds that the NJDEP November 19, 2008 letter concerning the thickness of the remedial cap does not establish that anything in excess of a two-foot cap amount is not required for remediation. Indeed, the RAWP indicates that a minimum of five feet would be required. Pl.'s Ex. 3A at 34.

97. The Gloucester County Park Site capping project is approximately 90% complete. JSOF ¶ 132. In many areas the cap has been completely constructed, including the placing of a 12-inch topsoil layer and seeding with grass seed, which is in compliance with the Gloucester County Park Site RAWP. Id. ¶¶ 129, 132.

98. To date, none of the samples analyzed for product to be placed at the County Park site have exceeded the applicable RDCSCC. Id. ¶ 139.

99. Evidence was also adduced concerning erosion and sediment control mechanisms in place to prevent stormwater from carrying loose soil from the Logan Recycling Center and Birch Creek

property into the nearby Birch Creek and adjacent wetlands. Soil Safe PFOF & PR ¶ 322. This evidence showed, among other features, that the entire Logan Recycling Center is lined with an impervious material, surrounded by berms, and surrounded by a silt fence. Id. ¶¶ 323, 326-31, 334. The Court does not find that Mr. Perti's testimony, based simply on his unspecified construction expertise, credible to the extent he testified to missing silt barriers.

100. Several of Plaintiffs' photographs purporting to show erosion are from areas inside the confines of the sediment and erosion control mechanisms. Id. ¶ 335.

101. Plaintiffs admit that: "Signs of erosion inside the sediment and erosion control areas are not a sign of a problem. Some erosion is expected, which is why sediment and erosion control plans were created and implemented." Id. ¶ 337.

E. Recycling and Soil Safe's Product

102. Dr. Craig Benson, an expert witness for Soil Safe, was admitted as an expert to testify in the fields of recycling, beneficial reuse, and solid waste issues. Id. ¶ 240. Dr. Benson is an environmental engineer, geological engineer, and geotechnical engineer, with a PhD and Master Degree in Civil Engineer. Among many other professional accolades, he currently serves as Dean of the School of Engineering and Applied Science at the University of Virginia. Soil Safe PFOF & PR ¶ 241.

103. Dr. Benson credibly testified that recycling is the repurposing of materials after their first use to be beneficially used in another form. Id. ¶ 242. In Dr. Benson's persuasive analysis, Soil Safe's activity is an example of recycling, not the discarding of solid waste. Id. ¶ 243. Dr. Benson also credibly testified that there are benefits to recycling petroleum-contaminated soil. Id. ¶ 246. Dr. Benson observed Soil Safe's process and convincingly testified that he saw no aspects that were consistent with an operation to discard any unwanted waste. Id. ¶ 249.

104. The economics of Soil Safe's recycling process vary. Soil Safe's customers pay Soil Safe a recycling fee when they provide it with soil to be recycled. Id. ¶ 258. As testified to by Mr. Smith, the CEO of Soil Safe, occasionally, Soil Safe also sells its product to the end user. Trial Tr. 399:21-400:3. Although not the primary driver of Soil Safe's business, the sale of its product (as opposed to the collection of recycling fees from suppliers) has provided Soil Safe with millions of dollars of invoices. Id.

105. Other recycling industries use this same generator-fee structure, such as the production of carbon fly ash. Soil Safe PFOF & PR ¶ 273. It is not uncommon for the recycler not to be paid by the end-user of a recycled product. Trial Tr. 576:6-13.

106. The parties both agree, and the Court finds, that “[m]ost recycled materials do not have contaminants removed. Instead, an appropriate next use of the material is chosen such that the presence of any contaminants is not an issue. Asphalt, concrete, and aluminum are examples of materials that are recycled without contaminants being removed.” Soil Safe PFOF & PR ¶ 57.

F. Ecological Impact

i. Testing of the Area at Issue

107. Plaintiffs hired an environmental consultant, Uhl & Associates, Inc., to perform sampling on Plaintiffs’ behalf. JSOF ¶¶ 53, 164. Uhl & Associates is headed by Mr. Vincent Uhl, who holds a degree in mechanical engineering and a master’s degree in agricultural engineering, as well as a master’s in hydrogeology from the University of Arizona. Trial Tr. 421:3-13.

108. Uhl & Associates collected one sediment sample from Birch Creek and two sediment samples from “drainage pathways” between the County Park and Raccoon Creek. JSOF ¶ 53, 165, 167.

109. The Birch Creek sample is depicted in an aerial photo map in the Uhl offsite Sampling Report as more than 1000 feet from the portion of the Birch Creek property where Soil Safe carries out its operations. Id. ¶ 166. There is a densely vegetated

area of trees and brush, a large berm, a stormwater management swale, and a tide gate in between. Id. ¶ 166.

110. No Raccoon Creek sediment samples were taken upstream from the Gloucester County Park to compare against the two Raccoon Creek samples. Id. ¶ 170.

111. No background samples were taken from locations nearby the Raccoon Creek samples to compare against the Raccoon Creek samples. Id. ¶ 170.

112. No Uhl & Associates employee ever observed rainwater runoff flowing into the drainage pathways. Id. ¶ 172. Mr. Uhl never visited the County Park during a rainfall. Id. ¶ 173.

113. Uhl & Associates did not collect any surface water samples, groundwater samples, or plant or animal tissue samples from Raccoon Creek. JSOF ¶ 171. They also did not collect any stormwater runoff from the County Park for laboratory analysis. Id. ¶ 174.

114. Mr. Uhl did not test Soil Safe's product for its susceptibility to erosion or examine any data regarding the cohesion and surface strengths of Soil Safe's product after it is placed. JSOF ¶¶ 175-76.

115. The Birch Creek sampling site was more than 2000 feet from the portion of the property where Soil Safe conducts its operations. Soil Safe PFOF & PR ¶ 299.

116. The results of the sampling are summarized in a report by Uhl & Associates. JSOF ¶ 54; Pl. Ex. 8 at Table 3.

117. Sample RC-SED-1 contained three chemical constituents at levels above the Residential Direct Contact Soil Remediation Standards ("RDCSRS"), two PAHs (dibenz(a,h)anthracene and indeno(1,2,3-cd)pyrene) and one metal, arsenic. Mr. Free credibly testified that these constituents do not match the fingerprint of Soil Safe product, which does not have "significant concentrations of dibenz and indeno." Soil Safe PFOF & PR ¶¶ 404-06. Plaintiffs admit that dibenz(a,h)anthracene was detected in less than five percent of Soil Safe product sampling and that the 95% UCL for that chemical was at the laboratory detection limit. Id. ¶¶ 405-06.

118. Uhl & Associates did not identify background levels of arsenic or any other contaminant in Birch Creek or Raccoon Creek. JSOF ¶ 58.

119. Mr. Uhl acknowledged that just having one sample from Birch Creek left him unable to say whether the sediment that Uhl & Associates sampled was more or less contaminated than other parts of the creek. Soil Safe PFOF & PR ¶ 353.

120. Mr. Uhl did not conduct any investigation to rule out other potential point source, non-point source, agricultural, or industrial sources of pollution to Birch Creek. JSOF ¶ 61.

121. Mr. Uhl never observed rainwater runoff flowing into the drainage pathways, nor did he test any runoff. Id. ¶ 62.

122. Mr. Uhl undertook no study or investigation to rule out other potential sources impacting the locations where the two Raccoon Creek sediment samples were collected. Id. ¶ 64.

123. The Uhl & associates off-site sampling report described the collection of three off-site sediment samples by Uhl & Associates in August 2015 and summarized the results of that sampling. Id. ¶ 160.

124. Mr. Uhl was not present at and did not participate in the off-site sampling. Id. ¶ 162.

125. Mr. Uhl's sediment samples do not match the physical characteristics of Soil Safe's product. Trial Tr. 842:14-19. Indeed, as Mr. Free credibly testified, the physical description of Uhl & Associates off-site sediment sample taken from Raccoon Creek, "gray-dark gray in color" and other features, matched the dredge material pre-existing on the site, rather than the Soil Safe product. Id. at 842:8-19.

126. Mr. Free also credibly testified that the sieving analysis of the sediment samples taken by Mr. Uhl is inconsistent with Soil Safe product. Id. at 843:1-14; Soil Safe PFOF & PR ¶ 394; Trial Tr. 843:17-18.

127. In light of the physical differences between the sediment samples taken by Uhl & Associates and Soil Safe product, the

Court is unable to conclude that Mr. Uhl's sampling does anything to demonstrate Soil Safe product was actually located in the samples.

128. Mr. Uhl testified that he was not expressing an opinion that the sediment that Uhl & Associates sampled from Birch Creek was Soil Safe product. Soil Safe PFOF & PR ¶ 413.

129. Indeed, the chemical substances, including metals, PAHs, PCBs, and dioxins, detected in the Uhl & Associates Birch and Raccoon Creed sediment samples are "ubiquitous" and common in soil and sediments in New Jersey. Trial Tr. 721:11-722:14, 781:14-24.

130. Metals, PAHs, and PCBs were detected in the dredge spoils deposited by the U.S. Army Corps of Engineers in the area of the Birch Creek Property and the future Gloucester County Park prior to the start of Soil Safe's operations. Pls.' Ex. 3A at 8, 12-31; Def.'s Ex. 14 at 2; Trial Tr. 394:24-395:14.

ii. Stockpile Sampling

131. Mr. Uhl also conducted on-site sampling of Soil Safe product. Soil Safe PFOF & PR ¶ 375. Specifically, he sampled two stockpiles by digging six test pits into each stock pile. Pls. PFOF ¶ 129. Testing of one of the stockpiles indicated the presence of indeno(1,2,3-cd)pyrene, a semi-volatile compound found at each depth tested. Pls. PFOF & DR ¶ 133; Trial Tr. 449:22-25. Likewise, other PAHs were found in the stockpile

samples. Pls. PFOF & DR ¶¶ 134-35. However, the Court also heard credible testimony that PAHs, which are the product of combustion, are present virtually everywhere. Trial Tr. 721:17-21.

132. The results of the Uhl stockpile sampling showed no chemical constituents at levels over the RDCSCC, and thus showed that the sampled product met the NJDEP requirements for use as capping material at the Gloucester County Park. Soil Safe PFOF & PR ¶ 377.

iii. Guidance as to Ecological Evaluation

133. An Ecological Risk Assessment "is a quantitative assessment of the actual or potential impacts of contaminants from a contaminated site on plants and animals." JSOF ¶ 37. The parties agree it is performed for at least two reasons. First, to determine whether actual or potential ecological risks are present at the site. Second, it is performed to identify those constituents that pose the adverse ecological risks. Id. ¶ 38.

134. The NJDEP has issued a document called "Ecological Evaluation and Technical Guidance" (the "NJDEP Guidance"). Id. ¶¶ 34, 141.

135. The purpose of the NJDEP Guidance is "to provide efficient and streamlined tiered guidance for the evaluation of ecological risk in aquatic and terrestrial habitats associated with

contaminated sites.” Id. ¶ 141. The NJDEP Guidance is based upon, and the parties agree it is consistent with, the United States Environmental Protection Agency (the “USEPA”) ecological risk assessment and technical guidance, which is called “Ecological Risk Assessment Guidance for Superfund, Process for Designing and Conducting Ecological Risk Assessments” (“USEPA Guidance”). Id. ¶¶ 35, 142.

136. The NJDEP Guidance stresses that in evaluating ecological risk “it is important to establish background contaminant levels in sediment, surface water, and soil on or near the site, but not influenced by the site.” Id. ¶ 146. In accordance with this, it is recommended by the NJDEP Guidance that three to five samples be collected at minimum from areas believed to be impacted by suspected contamination from the site in question to help establish background contaminant levels. Id. ¶ 147.

137. The parties agree that Ecological Evaluations are for screening purposes only. Id. ¶ 36.

138. The NJDEP Guidance described Ecological Screening Criteria (“ESC”) as “conservative screening values,” and indicates that “[i]f site contaminant levels are less than or equal to the ESC for all samples, then no further ecological evaluation may be appropriate; however, if any of the site contaminants are above the ESC, then further evaluation will be required.” Id. ¶ 155.

139. The NJDEP Guidance indicates a need for investigators to collect and evaluate multiple sediment and surface water samples, including both upstream and downstream samples when dealing with tidally influenced waters like Birch Creek and Raccoon Creek. JSOF ¶ 150.

iv. Ecological Evaluation

140. Plaintiffs rely upon the expert testimony of Dr. Robert Tucker to support their contention that Soil Safe's product creates an "imminent and substantial endangerment" to the environment. Id. ¶¶ 31-32, 140. The parties agree that Dr. Tucker and his partner Dr. Angela Cristini provided a four page report, "with no citation to any scientific studies or technical guidance." Id. ¶ 32.

141. Among other qualifications, Dr. Tucker received a PhD from Duke University in Zoology, specializing in physical ecology, which studies environmental effects on animals. Pls. Ex. 15; Trial Tr. 648:21-24.

142. Dr. Tucker testified that his understanding of an imminent and substantial endangerment occurred when he looked at the sampling results and they contained "a variety of toxics." Trial Tr. 697:3-4. Turning to specifically beryllium as a representative compound, Dr. Tucker testified that any amount other than zero creates an imminent and substantial endangerment. Id. at 702:12-14. Pressed further on this, Dr.

Tucker stated that he did not know whether berylliums exceedance of the Impact to Groundwater Screening criteria made it harmful to aquatic organisms. Id. at 703:6-8.

143. Drs. Cristini and Tucker did not conduct an ecological evaluation pursuant to NJDEP guidelines, nor did they reference toxicity reference values ("TRVs") in arriving at their opinion. JSOF ¶¶ 34-40. TRVs "are literature-based levels defined as a dose above which ecologically relevant effects might occur in wildlife species following chronic dietary exposure and below which it is reasonable expected that such effects will not occur. TRVs provide a basis for estimating whether the exposure to [contaminants] at a site is likely to result in adverse ecological effects (e.g., survival, growth, and reproduction of wildlife species)." Id. ¶ 39.

144. Drs. Cristini and Tucker additionally did not rely upon Lowest Observed Adverse Effect Level ("LOAEL") and No Observed Adverse Effect Level ("NOAEL").³ TRVs are based on LOAELs and NOAELs. Id. ¶ 41.

³ LOAEL is the "level of exposure of an organism, found by experiment or observation, at which there is a biologically or statistically significant increase in the frequency or severity of any adverse effects in the exposed population when compared to its appropriate control." NOAEL is the "level of exposure of an organism, found by experiment or observation, at which there is no biologically or statistically significant increase in the frequency or severity of any adverse effects in the exposed population when compared to its appropriate control. JSOF ¶¶ 42-43.

145. Drs. Cristini and Tucker did not analyze any surface water samples, groundwater samples, or animal or plant tissue samples. Id. ¶ 46-48. They additionally did not conduct any food web modeling or any other kind of modeling. Id. ¶ 49. Additionally, they made no effort to identify and rule out other potential sources of contamination to Birch Creek and Raccoon Creek. Id. ¶ 50. Indeed, Drs. Cristini and Tucker admitted they were not presenting any opinion that Soil Safe was the source of the chemical constituents in the Birch Creek and Raccoon Creek sediment samples. Id. ¶ 51.

146. Instead, Dr. Tucker testified at his deposition that he did not know what the NJDEP Impact to Groundwater Default Screening Level signified, but that he nonetheless believed that the presence of beryllium at a concentration about that level meant that beryllium posed a danger. Soil Safe PFOF & PR ¶¶ 448-50. When asked what level of beryllium would not pose a risk to aquatic organisms, Dr. Tucker was unable to give an answer other than "I don't know exactly[.]" Id. ¶ 454.

147. Dr. Tucker spent a total of four to five hours developing his opinion and drafting his report. Id. ¶ 446.

148. Uhl & Associates also generated a report on the sampling of Soil Stockpiles. That report, produced in January 2016, was entitled "Sampling Report: Soil Safe Facility Stockpiles Bound for Gloucester County Park Logan Township, New Jersey" (the "Uhl

Stockpile Sampling Report"). Id. ¶ 179. This report described and summarized the results of November 2015 collection of samples from two stockpiles of finished product that was awaiting delivery to the County Park. Id. ¶ 180. It did not compare its results to the results of the Uhl Off-Site Sampling Report. Id. ¶ 181.

149. Drs. Cristini and Tucker did not follow the NJDEP Guidance nor the USEPA Guidance in preparing their expert reports.

150. Drs. Cristini and Tucker have both never performed an Ecological Evaluation or an Ecological Risk Assessment.

151. Drs. Cristini and Tucker did not perform any investigation to determine background levels of contaminants for Birch Creek or Raccoon Creek. Id. ¶ 148.

152. Drs. Cristini and Tucker evaluated one sediment sample from Birch Creek and two sediment samples from near Raccoon Creek. Id. ¶ 151.

153. Drs. Cristini and Tucker did not evaluate surface water samples for Birch Creek or Raccoon Creek. Id. ¶ 151.

154. Drs. Cristini and Tucker did not analyze upstream samples from Birch Creek and Raccoon Creek. Id. ¶ 151.

155. Drs. Cristini and Tucker did not review any sampling data from any background area for either Birch Creek or Raccoon Creek. Id. ¶ 149.

156. Drs. Cristini and Tucker did not visit Raccoon Creek or Birch Creek, nor did they visit the Birch Creek site or the Gloucester County Park. Id. ¶ 158.

157. Drs. Cristini and Tucker did not conduct an Ecological Evaluation or an Ecological Risk Assessment in connection with their report. Id. ¶ 153.

158. An NJDEP report shows that in 1984, decades before Soil Safe placed any of its product at the Gloucester County Park, dioxin was found in the Raccoon Creek sediments at levels 50 times higher than detected in the Uhl & Associates off-site sampling. Id. ¶ 159.

159. Soil Safe was not informed of Uhl & Associates' off-site sampling and, despite their request to the contrary, Soil Safe was not invited to witness Uhl & Associates sampling or obtain split samples. Id. ¶ 163.

160. Defendant called Dr. Janet Kester, a toxicologist and risk assessor, as an expert witness. Soil Safe PFOF & PR ¶¶ 474-75. Dr. Kester has an impressive array of professional experience in the fields of human health and ecological risk assessment.

161. Dr. Kester opined that the exposure and dose to chemical constituents is key to determining whether a risk is posed by the presence of a chemical in the environment. Id. ¶ 484.

162. Dr. Kester also credibly opined that one or two sediment samples from a body of water like Birch Creek or Raccoon Creek

is not sufficient to permit a reliable, scientifically valid evaluation of risk. Trial Tr. 722:23-723:2.

163. While Dr. Kester found exceedances of ecological screening criteria for some metals. Id. at 733:19-734:1, she also credibly testified that the presence of a chemical substance above a screening level does not mean that a significant environmental risk exists. It only means that further investigation is required. Soil Safe PFOF & PR ¶ 496.

164. Dr. Kester credibly testified that understanding background levels is an essential element of ecological risk evaluation and assessment. Id. ¶ 499. This is because comparison to background levels enables the investigator to determine if the off-site area being studied is actually impacted by the suspected source. Trial Tr. 724:2-15.

II. CONCLUSIONS OF LAW

A. Standing

i. General Legal Standard

After full litigation on the merits, “plaintiffs must establish standing in the same manner as would be required to prevail on the ultimate merits of their case.” ACLU-NJ v. Twp. of Wall, 246 F.3d 258, 261 (3d Cir. 2001). “The standing inquiry . . . focuse[s] on whether the party invoking jurisdiction had the requisite stake in the outcome when the suit was filed.” Davis v. FEC, 554 U.S. 724, 734 (2008). There

are three well-known elements to establishing this stake in the outcome: (1) injury-in-fact, (2) traceability, and (3) redressability. Constitution Party v. Aichele, 757 F.3d 347, 360 (3d Cir. 2014) (citing Lujan v. Defenders of Wildlife, 504 U.S. 555, 560 (1992)).

When standing is contested, as the Third Circuit has observed, “the injury-in-fact element is often determinative.” In re Schering Plough Corp., 678 F.3d 235, 235 (3d Cir. 2012) (quoting Toll Bros., Inc. v. Twp. of Readington, 555 F.3d 131, 138 (3d Cir. 2009)). The requirement of injury-in-fact is that the injury must be “‘particularized’ in that it ‘must affect the plaintiff in a personal and individual way.’” Id. (quoting Lujan, 504 U.S. at 560 n.1).

Even if injury-in-fact is established, “[a] federal court may act only to redress injury that fairly can be traced to the challenged action of the defendant, and not injury that results from the independent action of some third party not before the court.” Constitution Party, 757 F.3d at 366 (internal citation marks omitted). However, this traceability analysis is not the same as proximate cause from tort law, and the courts should not “wrongly equate[] . . . injury ‘fairly traceable’ to the defendant with injury as to which the defendant’s actions are the very last step in the chain of causation.” Bennet v. Spear, 520 U.S. 154, 168-69 (1997). Indeed, “an indirect causal

relationship will suffice, so long as there is a fairly traceable connection.” Toll Bros., 555 F.3d at 142.

The final requirement of standing is redressability, “which is a showing that the injury will be redressed by a favorable decision.” Constitution Party, 757 F.3d at 368. This requirement is closely related to causation, and indeed the inquiries often overlap. Toll Bros., 555 F.3d at 142. “The difference is that while traceability looks backward (did the defendants cause the harm?), redressability looks forward (will a favorable decision alleviate the harm?)” Id. It is sufficient for the plaintiff to show a “substantial likelihood that the requested relief will remedy the alleged injury in fact.” Vermont Agency Nat. Resources v. Stevens, 529 U.S. 765, 771 (2000).

Plaintiff Delaware Riverkeeper Network in this case is an association. As the Supreme Court set forth in Friends of the Earth, Inc. v. Laidlaw Env'tl Servs. (TOC), Inc.:

An association has standing to bring suit on behalf of its members when its members would otherwise have standing to sue in their own right, the interests at stake are germane to the organization's purpose, and neither the claim asserted nor the relief requested requires the participation of individual members in the lawsuit.

528 U.S. 167, 181 (2000); see also Interfaith Community Org. v. Honeywell Int'l, Inc., 399 F.3d 248, 257-58 (3d Cir. 2005) (citing Laidlaw, 528 U.S. at 181).

ii. Plaintiffs' Standing to Pursue RCRA Claim

1. Injury-in-Fact

In assessing the injury-in-fact requirement, the Court is mindful of Laidlaw, where the Supreme Court held that the plaintiffs, for purposes of standing, needed to establish that they “use the affected area and are persons for whom the aesthetic and recreational values of the area will be lessened by the challenged activity.” 528 U.S. at 183. In finding that the plaintiffs had met the injury-in-fact requirement, the Court noted that it saw “nothing ‘improbable’ about the proposition that a company’s continuous and pervasive illegal discharges of pollutants into a river would cause nearby residents to curtail their recreational use of that waterway and would subject them to other economic and aesthetic harms.” Id. at 184. Indeed, “[t]he proposition was entirely reasonable, the District Court found it was true in [that] case, and that is enough for injury in fact.” Id. at 184-85.

The Court is also mindful of the Supreme Court’s holding in Lujan, where the Supreme Court found that plaintiffs bringing an environmentally-related cause of action did not have standing to proceed. 504 U.S. at 578. Specifically, the plaintiffs in that case sought a determination that they had standing on novel grounds, one of which was the “ecosystem nexus.” Id. at 565-66. The Court found that theory was premised on the notion that a

plaintiff would have standing if he used "any part of a 'contiguous ecosystem' adversely affected by a funded activity . . . even if the activity is located a great distance away." Id. at 565 (emphasis in original). As the Supreme Court later explained, in Lujan, it was "held that the plaintiff could not survive the summary judgment motion merely by offering 'averments which state only that one of [the organization's] members uses unspecified portions of an immense tract of territory, on some portions of which mining activity has occurred or probably will occur by virtue of the governmental action." Laidlaw, 528 U.S. at 183; see also Lujan, 504 U.S. at 565 ("To say that the [Endangered Species] Act protects ecosystems is not to say that the Act creates (if it were possible) rights of actions in persons who have not been injured in fact, that is, persons who use portions of an ecosystem not perceptibly affected by the unlawful action in question.").

Applying the law set forth supra, the Court finds that the Plaintiffs have demonstrated an injury-in-fact. As noted in the Court's findings of fact, Ms. van Rossum persuasively testified that she uses (and is aware of Delaware Riverkeeper Network members who use) the areas surrounding the Delaware River between Raccoon Creek and Birch Creek, which is the epicenter of the purported contamination, and that while boating on that stretch of the river she often comes into contact with the

water. Findings of Fact ("FOF") supra ¶ 9. It is not disputed that these creeks are tributaries of the Delaware River and that Delaware Riverkeeper Network and its members use both the creeks and the main-stem river nearby. Id. ¶ 5,7 . Ms. van Rossum testified that her use and enjoyment of the area surrounding the two creeks at the epicenter is reduced by Soil Safe's purportedly problematic conduct. Id.

Likewise, Mr. Perti testified concerning the annual fishing competition that he runs, as well as his general enjoyment of recreational fishing. See, e.g., id. ¶¶ 13-15. He also testified concerning his fear that fish populations, particularly "stripers" which are fished in his tournament, would be impacted by Soil Safe's activity. Id. ¶ 18. He testified about his concerns - correct or not - about silt control at the sites as it relates to his interest in fishing. Id. Here, Mr. Perti historically used and will continue to use the very creeks purportedly impacted to conduct a fishing tournament, in addition to his own personal fishing route on these exact creeks. Id. ¶ 16. While he testified that he does not fish less because of the conduct, the Court does believe that his concerns about damage to fish life, which is central to a fishing tournament he runs, still give rise to a finding of injury-in-fact for purposes of standing. In re Global Indus. Tech., Inc., 645 F.3d 201, 210 (3d Cir. 2011) ("The standard is

met as long as the party alleges a specific identifiable trifle of injury[.]” (internal quotation marks omitted).

While Defendant is correct that neither Ms. van Rossum nor Mr. Perti testified that they use the exact locations where Soil Safe’s product has been used for capping, the Birch Creek property or the GCIA’s DREAM Park, Soil Safe Br. 2, this does not end the inquiry. If conduct on property a plaintiff does not use causes harm to a plaintiff on property they do use for recreation, an injury-in-fact is still present. Certainly to the extent the usage of the remedial capping affects Plaintiffs because it has impacts for surrounding property, such an injury can yield an injury in fact for standing purposes. As the Supreme Court has noted, the “proposition that a company’s continuous and pervasive illegal discharges of pollutants,” if proven, “would cause nearby residents to curtail their recreational use of that waterway” is not an improbable one. Laidlaw, 528 U.S. at 184-85; see also Interfaith, 399 F.3d at 255-56 (citing Laidlaw, 528 U.S. at 184-85).

With regard to injury-in-fact, Soil Safe contends that Plaintiffs cannot show any of its members are injured in a personal and individual way and that they used “the area affected by the challenged activity and not an area roughly ‘in the vicinity’ of it.” Soil Safe Br. 2. However, the injuries set forth in testimony by the two standing witnesses in this

case, Ms. van Rossum and Mr. Perti, are far from the “ecosystem nexus” of Lujan that proposed standing for any person who used “any part of a ‘contiguous ecosystem’ adversely affected by a funded activity . . . even if the activity is located a great distance away.” Id. at 565 (emphasis in original). Plaintiffs have not placed themselves “roughly in the vicinity” of the complained-of conduct, but among the creeks central to the inquiry and in the waterways into which those creeks flow. Cf. Lujan, 504 U.S. at 565-66.

Establishing an injury-in-fact is not the same as proving a claim. See U.S. v. Western Radio Servs. Co., 869 F. Supp. 2d 1282, 1288 (D. Or. 2012) (“Because plaintiff may have standing to bring suits that are ultimately unsuccessful, they need not prove [elements of their claim] in order to establish standing; setting too high a bar . . . would conflate the standing inquiry with the merits inquiry.”) (emphasis in original) (citing Citizens for Better Forestry v. U.S. Dept. of Agriculture, 341 F.3d 961, 971 n.5 (9th Cir. 2012) (“A contrary rule would allow only successful environmental plaintiffs standing to bring their claims.”)). Many of Soil Safe’s arguments regarding injury-in-fact boil down to the proposition that they simply did not injure Plaintiff. Indeed, they are correct that no liability ultimately exists in this case, see infra, but that is not the inquiry for a court assessing standing and its injury-in-fact

requirement. See In re Navy Chaplaincy, 697 F.3d 1171, 1175 (D.C. Cir. 2012) (“[I]n reviewing the standing question, we must be careful not to decide the questions on the merits for or against the plaintiff, and must therefore assume that on the merits the plaintiffs would be successful in their claims.”). The Court determines that Plaintiffs have met their requirement demonstrating an injury-in-fact.

2. Traceability

As in other RCRA cases, once the injury-in-fact inquiry is resolved, the remaining standing requirements in this case are relatively straightforward to resolve. See Interfaith, 399 F.3d at 257 (“Having found an injury-in-fact, [the defendant’s] arguments as to traceability and redressability do not detain us long.”). The causation inquiry does not require a plaintiff to show with “scientific certainty” that the defendant “alone caused the precise harm suffered by plaintiffs” Id.; see also Cmty. Ass’n for Restoration of the Env’tl. v. Cow Palace, LLC, 80 F. Supp.3d 1180, 1209 (E.D. Wa. 2015) (“Plaintiffs here are not required to prove that the exact . . . molecules from [defendant] are contributing or causing the standees’ injuries. . . . [RCRA] merely requires Plaintiffs demonstrate that Defendants’ practices have or are ‘contributing’ to the pollution; not that Defendant’s conduct is

the only cause or that, as established by a degree of certainty, the standees' injuries stem from the Defendants' conduct.").

As discussed above, the entire premise of the case is that Soil Safe product is ending up in the waterways in Raccoon Creek and Birch Creek. Ms. van Rossum and Mr. Perti both testified that Soil Safe's conduct was the source of the above-discussed injury-in-fact. Mr. Perti testified to his concerns about silt leaching from Soil Safe property, which was formed in part after his exploration of the areas. While this may not establish causation for purposes of liability, it certainly does not require a convoluted analysis to trace Plaintiffs' complained-of injury-in-fact to Soil Safe's conduct.

Soil Safe's counterargument on the issue of whether the Plaintiffs' injuries are fairly traceable to Soil Safe is a scant three sentences indicating that Plaintiffs have failed to meet their evidentiary burden with regard to a RCRA claim. Once again, this is insufficient. Interfaith, 399 F.3d at 255 ("[S]tanding in no way depends on the merits of the plaintiff's contention that particular conduct is illegal[.]" (citation omitted)). The failure to prevail on issues of liability is not determinative of whether the complained-of injury is fairly traceable to the defendant's conduct. See generally Davis v. Wells Fargo, 824 F.3d 333, 348 (3d Cir. May 27, 2016) ("Although standing and merits questions may involve overlapping facts,

standing is generally an inquiry about the plaintiff: is this the right person to bring this claim.”). Here, it is a relatively common-sense proposition that Plaintiffs’ complaints about injuries arising from pollution are fairly traceable to the party that they have described as the polluter.

3. Redressability

With regard to the issue of redressability, “a favorable ruling by this Court would surely provide at least some incremental benefit[.]” Cow Palace, LLC, 80 F. Supp. 3d at 1209 (internal quotation marks omitted). Under the requisite legal standard, Plaintiffs must show a “substantial likelihood that the requested relief will remedy the injury in fact that the requested relief will remedy the alleged injury in fact.” Interfaith, 399 F.3d at 255. That said, Plaintiffs need only show that the request relief will likely, not certainly, redress their injuries. Toll Bros., 533 F.3d at 143.

Here, Plaintiffs seek, as set forth in the complaint at the very outset of this case, an injunction requiring “Soil Safe [to] . . . take such actions as may be necessary to investigate, abate[,] and remediate any imminent and substantial endangerment posed to . . . the environment . . . as well as the off-site migration of pollutants” Compl. 22-23 [ECF No. 1]. Soil Safe’s only counterargument to Plaintiffs’ requested relief is that Plaintiffs have insufficiently articulated what relief

is sought and how that relief would remedy the injury at issue in this case, but Soil Safe does not directly respond to this requested relief in its responsive briefing. Soil Safe Br. 3-4; Soil Safe Rep. Br. 2. Yet, as Plaintiffs correctly point out, “[i]t can scarcely be doubted that, for a plaintiff who is injured or faces the threat of future injury due to illegal conduct ongoing at the time of the suit, a sanction that effectively abates that conduct and prevents its recurrence provides a form of redress.” Laidlaw, 528 U.S. at 185-86. Indeed, it would simple be enough that “the relief will materially reduce their reasonable concerns about those endangerments.” Interfaith, 399 F.3d at 257. Plaintiffs have put forward enough to show this Court that the injury it complains of would be redressed by the relief they request.

4. Associational Standing

Soil Safe does not seem to challenge the associational standing of the Delaware Riverkeeper Network to sue on behalf of its members. Nevertheless, the Court would find - even if that portion of the standing analysis were challenged - that Plaintiff Delaware Riverkeeper Network does have standing to sue on behalf of its members. See supra. The interests at stake are clearly germane to the organization’s purpose, which was credibly testified to be “to champion the rights of communities to the Delaware River and tributary streams that are free

flowing, healthy and abundant with the diversity of life.” Trial Tr. 27:3-6. Finally, the suit does not involve the individual participation of members. See generally Interfaith, 399 F.3d at 257-58 (finding associational standing in a RCRA suit under similar circumstances).

Having addressed all the parties’ arguments concerning standing, the Court finds that both Plaintiffs have demonstrated they have standing to proceed in this action. Although Soil Safe makes much of the fact that it thinks little of the merits of Plaintiffs’ case, that is not the central question of the standing inquiry, and indeed, Courts in environmental disputes find standing after a bench trial while ultimately finding for the defendant on the merits. See, e.g., Waterkeeper Alliance v. Hudson, Civ. A. No. WMN-10-487, 2012 WL 6651930, at *15, 19 (D. Md. Dec. 20, 2012) (finding plaintiff had standing to proceed, but that the plaintiff had not shown by a preponderance of the evidence that poultry operation had discharged pollutants).

B. RCRA

As the Court set forth at summary judgment, Plaintiffs’ theory of the case that was to be tried was whether “Soil Safe is ‘putting lipstick on a pig’ and has no intent to remediate with the soil, but rather is simply abandoning polluted soil with the purpose of using the RAWP to erect a Potemkin village in front of waste disposal.” Summ. J. Op. 16 [ECF No. 126].

Accordingly, the principal issues after the bench trial conducted by the Court are whether Soil Safe's product amounts to "solid waste" under RCRA and, if so, whether it may pose an imminent and substantial endangerment to the environment. The Court sets forth its conclusions of law on each of these issues below.

i. General Legal Standard

"RCRA is a comprehensive environmental statute that governs the treatment, storage, and disposal of solid and hazardous waste." Meghrig v. KFC Western, Inc., 516 U.S. 479, 483 (1996) (citing Chicago v. Env'tl. Def. Fund, 511 U.S. 328, 33-32 (1994)). The statute's primary purpose "is to reduce the generations of hazardous waste and to ensure the proper treatment, storage and disposal of that waste which is nonetheless generated, 'so as to minimize the present and future threat to human health and the environment.'" Id. (quoting 42 U.S.C. § 6902(b)). In so effectuating that overarching goal, RCRA permits citizens to bring lawsuits as an enforcement mechanism. Specifically, 42 U.S.C. § 6972(a)(1)(B) sets forth the standard by which citizens may commence a civil action:

[A]ny person may commence a civil action on his own behalf—

(1) . . . (B) [A]gainst any person, including the United States and any other governmental instrumentality or agency, to the extent permitted by the eleventh amendment to the Constitution, and including any past or

present generator, past or present transporter, or past or present owner or operator of a treatment, storage, or disposal facility, who has contributed or who is contributing to the past or present handling, storage, treatment, transportation, or disposal of any solid or hazardous waste which may present an imminent and substantial endangerment to health or the environment[.]

Id.

ii. Solid Waste

The term "solid waste" and the legal framework interpreting that term is central to the Court's determination in this case.

RCRA describes "solid waste" as:

[A]ny garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility **and other discarded material**, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under section 1342 of Title 33, or source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954, as amended (68 Stat. 923) [42 U.S.C.A. § 2011 et seq.].

42 U.S.C. § 6903(27) (emphasis added). As the Court set forth at summary judgment, the definitional provisions of the applicable statutory framework are "dense, turgid, and circuitous." Summ. J. Op. 9 (quoting United States v. White, 766 F. Supp. 873, 880 (E.D. Wash. 1991)); see also Conn. Coastal Fishermen's Ass'n v. Remington Arms Co., 989 F.2d 1305, 1308 (2d Cir. 1993) ("Defining what Congress intended by ['solid waste']

and 'hazardous waste' in RCRA] is not child's play, even though RCRA has an 'Alice in Wonderland' air about it.").

The Court also identified at summary judgment that the case law and legislative history indicate that "other discarded" materials embodies those materials that are disposed of or abandoned. Summ. J. Op. 11-12 ("The Court agrees with the above-cited opinions and legislative history that have concluded that "disposal" or "abandonment" of material is essential to the material being "discarded" for the purpose of being "solid waste.") (citing H.R. Rep. 94-1491(I)); see also Am. Min. Congress v. U.S. E.P.A., 824 F.2d 1177, 1184 (D.C. Cir. 1987) ("The ordinary, plain-English meaning of the word 'discarded' is 'disposed of,' 'thrown away' or 'abandoned.'"); id. at 1193 ("We are constrained to conclude that, in light of the language and structure of RCRA, the problems animating Congress to enact it, and the relevant portions of the legislative history, Congress clearly and unambiguously expressed its intent that 'solid waste' . . . be limited to materials that are 'discarded' by virtue of being disposed of, abandoned, or thrown away."). In that light, the Court held at summary judgment that "recycled, petroleum-laced soil that has undergone proper review and testing, a fact [that was not in genuine dispute at that time], is not solid waste when applied for purposes of remediation." Summ. J. Op. 14-15.

The Court remains convinced that material being used for its intended purpose is not being "discarded." To this end, the Court finds Ecological Rights Foundation v. Pacific Gas & Elec. Co. to be particularly persuasive. 713 F.3d 502 (9th Cir. 2013). That case concerned the use of a biocide called pentachlorophenol, or PCP, in telephone poles and whether chemicals leaching from those telephone poles amounted to "solid waste" under RCRA. In concluding that it did not, the Ninth Circuit determined that "such escaping preservative is neither a manufacturing waste by-product nor a material that the consumer - in this case, PG & E or Pacific Bell - no longer wants and has disposed of or thrown away. Thus, we conclude that PCP-based wood preservative that escapes from treated utility poles through normal wear and tear, while those poles are in use, is not automatically a RCRA 'solid waste.'" 713 F.3d at 515.

Likewise, in Oklahoma v. Tyson Foods, Inc., after finding that, "[p]oultry litter has market value because it can be beneficially used as a fertilizer and soil amendment," the court ultimately determined that the evidence was insufficient "to establish that poultry litter is being 'discarded' in the [Illinois River Watershed] by being disposed of, thrown away or abandoned." No. 05-CV-0329-GKF-PJC, 2010 WL 653032, at *10 (N.D. Ok. Feb. 17, 2010). The court explained that, "[i]n determining whether a material is a 'beneficial' product or a

RCRA solid waste, courts have examined whether the material has market value, and whether the party intended to throw the material away or put it to a beneficial use. Neither of these factors is outcome determinative, but rather each informs the court's view of the evidence. In this case, both factors point to the same conclusion—that poultry litter is not a[] RCRA 'solid waste.'" Id. at *11.

Similarly, in Krause v. City of Omaha, a court in the District of Nebraska ruled at the motion to dismiss stage that the plaintiff had not sufficiently alleged that the use of road salt demonstrated it was a RCRA solid waste. No. 8:15CV197, 2015 WL 5008657, at *4 (D. Neb. Aug. 19, 2015) (citing Cordiano v. Metacon Gun Club, Inc., 575 F.3d 199, 206 (2d Cir. 2009)). The court noted that the road salt was being placed on the streets for "snow and ice control" and that when put to its "ordinary, intended use of snow and ice control [it] is [not] 'material which is . . . abandoned by being . . . [d]isposed of[.]'" Id. at *5. The court relied upon Ecological Rights Foundation for the premise that when the materials in question were "applied for a specific use" and were used to "effectuate their intended purposes," that "they were not discarded under the RCRA." Id. at *4.

The issue in this case that prevented resolution before a bench trial is that Plaintiffs disputed that Soil Safe was

legitimately using the soil to remediate. Summ. J. Op. 16.

Plaintiffs do not take issue with many of the above holdings which suggest that the application of a material for a beneficial purpose precludes it from being a "solid waste," at least as far as that particular beneficial application is concerned. That makes sense, of course, because a common-sense reading of words like "discard," "disposal," and "abandon" connotes that the material is not being applied for a beneficial or intentional purpose. Instead, Plaintiffs argue that the mere fact that a material can or might be used for a beneficial purpose does not in and of itself foreclose a determination that it is nevertheless a solid waste under the relevant facts of its deployment in a particular case. Pl.'s Br. 3. This argument, too, comports with the case law concerning RCRA. Indeed, both parties seem in accord on that: Soil Safe agrees that if its product were hypothetically discarded at a landfill or otherwise, it would be a "solid waste." Pls.' PFOF & DR ¶ 111.

So, the question with regard to this portion of the analysis is whether Soil Safe is engaging in recycling and beneficial use of petroleum-contaminated soil for the purpose of remediation or something more nefarious. Having made its findings of fact, and as set forth below, the Court settles the issue: Soil Safe is not discarding petroleum-contaminated soil, but rather recycling it for deployment in site remediation.

With regard to Plaintiffs' specific arguments on the facts, the Court notes that credible evidence was admitted showing that petroleum-contaminated soil is capable of being recycled. This point does not appear disputed by the parties. Although Plaintiffs contend that, and are at least generally correct that, "the mere fact that petroleum-contaminated soil can be recycled does not support the conclusion that Soil Safe's product is recycled," Pl.'s Rep. Br. 7, the Court concludes that the fact that petroleum-contaminated soil is capable of being recycled and applied to remediate is somewhat probative to whether Soil Safe is discarding it. To put it simply, Soil Safe is not purporting to do the impossible. The relevance of this is further magnified by two issues illuminated by trial:

(1) Plaintiffs' failure to present any evidence, expert or otherwise, as to how petroleum-contaminated soil might be recycled or deployed for remediation if not by the method set forth by Soil Safe; and (2) the fact that the NJDEP has reviewed the projects throughout their lifespans, which is again corroborative of actual recycling taking place with an ultimate goal of deployment for remediation.

Moreover, another key theme of trial convincingly demonstrates that Soil Safe is remediating with this soil: the extensive testing it undertakes of its product. The Court has made lengthy factual findings concerning Soil Safe's careful

procedure governing receipt of soil to be recycled, from reviewing supplier records to designing proprietary software from its tracking, and from taking thousands of grab samples to analyzing those samples for a series of problematic chemical constituents. At base, if Soil Safe were simply looking to turn a quick profit by dumping contaminated soil in the name of remediation, it would not undertake this degree of testing.

Another of several arguments Plaintiffs advance in favor of a finding that Soil Safe product is "solid waste" is that CKD serves no real purpose in remediating soil. Plaintiffs contend that "[a]side from the addition of cement kiln dust[], all that Soil Safe does to recycle the soil is remove debris and deleterious materials and screen-out oversize particles and objects." Pl.'s Br. 4. Plaintiffs aver that the addition of CKD was established at trial to do nothing to meaningfully alter or recycle the soil, and therefore, Soil Safe does nothing but perform one superficial addition to the soil to hide its discarding of solid waste. Id.

As an initial matter, the Court concludes that the removal of debris and deleterious materials, and the screening of oversize particles, are corroborative of the fact that Soil Safe is not disposing of or discarding its product. Furthermore, the Court is unpersuaded by Plaintiffs' contention that CKD does not meaningfully alter the soil, or, for that matter, that whether

it does is even outcome determinative. One reason Plaintiffs argue CKD does nothing to the soil is that it is not Portland cement, a material Plaintiffs do not seem to challenge as a legitimate soil additive. But, importantly, Dr. Benson credibly testified that CKD is a beneficial additive for soil recycling specifically because it is like Portland cement:

Cement kiln dust functions a lot like Portland cement. It's not surprising because it's just a residual material from production of Portland cement. It is important to think about cement kiln dust, we take essentially a byproduct of crushed limestone and clay providing us with calcium, aluminum and silica that creates cement. So what that function is is when the CKD, like a Portland cement, we add it to soil with a little bit of moisture and cement, reactions occur that binds the soil particles together, and so they make it stiffer and stronger and less permeable because they fill void space in between particles.

Trial Tr. 601:12-17. Making soil stiffer, stronger and less permeable so that it can function as a remedial cap is, of course, consistent with Soil Safe remediating with its recycled product, not discarding it. Moreover, evidence was also credibly put forward that the CKD enhances the physical characteristics of the soil, making it less permeable to water by filling in spaces between soil particles and reducing the mobility of contaminants that are present inherently in the soil.

But, upon consideration of all of the evidence adduced at trial, the Court is also convinced that whether CKD achieves

chemical sequestration is not in and of itself the sine qua non of recycling and remedial intent, because the physical characteristics of the soil may not lead to it needing to achieve sequestration of problematic chemicals. Competent evidence was put forward that Soil Safe carefully screens the soil that comes in, ensures the soil is consistent with the TCLP, stabilizes the soil, and deploys the soil in such a way that erosion and leaching are not likely outcomes.⁴ The Court noted at summary judgment that Plaintiffs' argument that the addition of CKD was essentially a meaningless addition to the soil for purposes of recycling it was permitted past summary judgment "by a sliver." Summ. J. Op. 15. Having now heard the evidence on CKD's use and purpose, the Court is convinced that its addition is part of a legitimate process to repurpose the soil for construction of a remedial cap.

The Court also finds that Soil Safe does far more than simply add CKD to petroleum-laced soil. Soil Safe examines soil as it comes in and removes debris from the soil. Soil Safe then stabilizes the moisture content of the soil, if needed, with

⁴ The Court is also unpersuaded by Plaintiffs' argument that Mr. Free's analysis of the soil shows no evidence it prevents leaching. That testimony, which essentially concerned Mr. Free's addition of diesel fuel to Soil Safe product because Soil Safe did not appear to leach enough constituents to test the utility of CKD is not necessary to this Court's determination of the case.

lime and then blends the soil to create a uniform particle size. As Dr. Benson persuasively testified, and as this Court is now firmly convinced, Soil Safe's process is "textbook" recycling of materials.

Plaintiffs also contend that Soil Safe's application of an extremely large amount of its product, in excess of what Plaintiffs deem can or should be used for remediation, means that Soil Safe is discarding excess soil under the guise of remediation. Plaintiffs point to several pieces of evidence presented at trial purportedly in support of this theory: (1) the fact that Soil Safe makes money by accepting contaminated soil rather than by selling it; (2) the limitations of the Class B permit, which indicates that Soil Safe cannot accumulate recycling fees without an end-use application for the product; and (3) Plaintiffs' contention that Soil Safe has used more product than "originally called for" at the sites. Pl.'s Br. 8.

With regard to the first two contentions, the Court finds these do not demonstrate that the Soil Safe product is not recycled. Dr. Benson credibly testified that the recycling process often involves producers of contaminated material paying for it to be disposed of, and that often the recycled material is provided to the customer free of charge.⁵ Plaintiffs did not

⁵ The Court is unpersuaded by Plaintiffs' argument that "Dr. Benson testified that it is common in the recycling industry,

seek to rebut this testimony with any affirmative evidence of its own. While certainly it is conjecturally possible that the financial structure of front-end payment might lead to an inference that a recycler has a financial motive to identify as many opportunities as possible to distribute product, the record was devoid of any evidence that Soil Safe abuses that financial structure at the expense of actually recycling the soil. As Soil Safe correctly points out, on the evidence adduced at trial, the mere fact that Soil Safe "has an economic interest in recycling as much [contaminated soil] as it can" does not in and of itself mean that Soil Safe is not recycling the soil. Soil Safe Rep. Br. 6.

With regard to the third contention by Plaintiffs, that Soil Safe is over-supplying soil by dumping far more than

generally, for the recycling [party] not to be paid by the end user, but did not testify that it is any more common that getting paid, and acknowledged that it is also common to be paid by the end user as well. Dr. Benson did not testify one way or the other whether payment by the end user is common in soil recycling in particular." Pl.'s Br. 6. First, this argument appears to improperly shift the burden of proof from Plaintiff to Defendant to prove that its economic model is consistent with recycling. Second, there was credible testimony that under certain circumstances, Soil Safe is paid for product it produces, although not always. Third, in the Court's view, whether the recycling process is funded by the supplier or the end-user of soil does not meaningfully undermine whether recycling is taking place when credible testimony is given indicating that recycling can make use of both payment models. Similarly, the fact that one model is "more common" than another - something neither party sought to prove at trial - is not probative in this Court's weighing of the evidence.

needed, the Court does not find that the NJDEP "required only two feet of capping for remedial purposes" thereby making deployment of anything above that mere dumping of contaminated soil. Cf. Pl.'s Br. 8. Based on a review of the RAWP, the Court simply does not credit Plaintiffs' theory that only two feet could possibly be for remedial purpose, particularly where other portions of the RAWP make clear that more than two feet of cap would be needed. Based on the above-discussed evidence concerning Soil Safe's robust recycling process, the Court cannot conclude that Plaintiffs have carried their burden of showing Soil Safe product is discarded.

Plaintiffs additionally argue that "[e]ven were the Court to find that Soil Safe's product is not discarded when applied for purposes of remediation, it may still become a solid waste when it erodes and migrates off-site, where it is 'abandoned' to serve no remedial or other useful purpose." Pl.'s Br. 9. In support of this proposition Plaintiffs rely upon Zands v. Nelson, 779 F. Sup. 1254, 1262 (S.D. Cal. 1991), among other cases. Zands dealt with gasoline-contaminated soil and ruled that gasoline-contaminated media is solid waste. The court reached this holding because the soil had been "abandoned" and the gasoline could not be used or recycled; it found it difficult to believe "that Congress intended that soil and groundwater contaminated with gasoline would not be covered by

RCRA[.]” Id. at 1262. This holding comports with the subsequent case Dydio v. Hesston Corp., which similarly held that leaking petroleum was a solid waste product amenable to a citizen suit under RCRA. 887 F. Supp. 1037 (N.D. Ill. May 22, 1995); see also Zands v. Nelson, 779 F. Supp. 1254, 1262 (S.D. Cal. 1991) (“The fact, however, that a product may at one time in the past be useful is of no benefit to those trying to avoid this statute once the product’s usefulness lapses [and] gasoline is no longer a useful product after it leaks into, and contaminates, the soil.”); Conn. Coastal Fishermen’s Ass’n, 989 F.2d 1305, 1316 (2d Cir. 1993) (holding that lead shot and clay targets “left to accumulate long after they had served their intended purpose” met RCRA’s statutory definition of solid waste); Cow Palace, 80 F. Supp. 3d at 1223 (holding that manure leaking from poorly-designed storage lagoons was a “solid waste” under the facts of that case, even if it had beneficial applications).

However, these cases all simply stand for the proposition that material that is purposefully applied for a beneficial or intended reason (i.e. not discarded) may become solid waste when it is neglectfully permitted to migrate or languish. As the Court previously remarked, confronted with this issue at summary judgment, “[t]he cases cited by Soil Safe stand for the proposition that material being used with the intention of

carrying out a task is not 'discarded' (and therefore not solid waste) because it is not being abandoned, while the cases cited by DRN stand for the proposition that oil or gasoline leaking into soil and groundwater is abandoned and does embody or create 'solid waste' under [] RCRA." Summ. J. Op. 14. That straightforward proposition does not affect the Court's conclusion that any Soil Safe product that has migrated off-site has not been abandoned.

Assuming that Plaintiffs established Soil Safe product was eroding and travelling off-site, the issue would closely track the one analyzed in Ecological Rights Foundation, where the Court found "untenable" the notion that the incidental release of some amount of PCP after its application to telephone poles rendered that PCP "abandoned." The Court explained, "[s]uch escaping preservative is neither a manufacturing waste by-product nor a material that the consumer . . . no longer wants and has disposed of or thrown away." Id. at 515. The cases cited by Plaintiffs instead involved intentionally deployed material being permitted to migrate into the environment through neglectful cleanup or containment mechanisms, for instance knowingly permitting gasoline or manure to leak from a tank or a storage lagoon, or allowing close to "2,400 tons of lead shot (5 million pounds) and 11 million pounds of clay target fragments . . . [to remain] deposited on land around the club

and in the adjacent waters of the long island sound." Zands, 779 F. Supp. at 1262; Cow Palace, 80 F. Supp. 3d at 1223; Conn. Coastal Fishermen's Ass'n, 989 F.2d at 1308. Indeed, the case law cited by Plaintiffs confirms this reading:

Here, manure leaking from Defendants' lagoons is not a natural, expected consequence of the manure's use or intended use but rather a consequence of the poorly designed temporary storage features of the lagoons. The consequences of such permeable storage techniques, thus, converts what would otherwise be a beneficial product (the stored manure) into a solid waste (the discarded, leaching constituents of manure) under RCRA because the manure is knowingly abandoned to the underlying soil.

Cow Palace, 80 F. Supp. 3d at 1223. Here, even if Plaintiffs demonstrated the migration of some of Soil Safe's product, Plaintiffs have not demonstrated that such erosion "is not a natural, expected consequence of the [soil's] use." Id.

Plaintiffs clearly take great issue with the manner and process by which Soil Safe recycles soil for purposes of deployment in site remediation. The evidence they adduced at trial, however, came nowhere near lending credence to their concerns. Plaintiffs' criticisms additionally are unwarranted for another reason: this was a trial about whether Soil Safe is discarding petroleum-contaminated soil, not a trial to determine whether Plaintiffs' subjective opinion that Soil Safe could recycle better is correct.⁶ Moreover, even if the manner of Soil

⁶ The Court notes the disconcerting allegation made by Soil Safe concerning the role that Mr. Andrew Voros, a consultant for

Safe's recycling is not optimal in the eyes of Plaintiffs, "[w]hatever other liability" the purported polluter might have, it cannot be premised here on the notion that a material is being "discarded." Ecological Rights Foundation, 713 F.3d at 516.

iii. Imminent and Substantial Harm

Even if this Court were to find that Soil Safe's product is a "solid waste," the Court would still not find that Soil Safe has violated RCRA. Pursuant to RCRA, Plaintiffs must show that Soil Safe "has contributed or . . . is contributing to the . . . disposal of any solid . . . waste which may present an imminent and substantial endangerment to . . . or the environment." 42 U.S.C. § 6972(a)(1)(B). For purposes of this Court's analysis post-trial, two issues are relevant: (1) whether the threat Plaintiffs identify "may" be an "imminent and substantial endangerment to the environment"; and (2) whether Soil Safe has contributed to the threat Plaintiffs purport to identify. The Court answers both of these questions in favor of Soil Safe.

1. Imminent and Substantial

Whether a particular threat may be an imminent and substantial endangerment to the environment turns significantly

Clean Earth, a direct competitor of Soil Safe, purportedly played in the genesis of this litigation. The Court need not address this issue, which was not part of the record at trial.

on the word "may." Interfaith, 399 F.3d at 258. Specifically, "[p]laintiffs must only show that there is a potential for an imminent threat of serious harm as an endangerment is substantial if it is serious to the environment[.]" Id. (quoting Parker, 386 F.3d at 1015). An endangerment is imminent if it threatens to occur immediately. Id. As the Interfaith court noted, no particular quantitative showing must be made to show liability. Id. In Interfaith, the court was confronted with levels of hexavalent chromium that were as high as 17,900 to 22,100 parts per million, as compared to New Jersey's applicable soil standard which allows for 240 parts per million. Id.

As Soil Safe correctly points out, there "is a limit to how far the tentativeness of the word **may** can carry a plaintiff." Crandall v. City & Cty. Of Denver, 594 F.3d 1231, 1236 (10th Cir. 2010). "No matter how broadly read, . . . the statute still requires a showing that the contamination as issue may present an 'endangerment' that is both 'imminent' and 'substantial.'" Lewis v. FMC Corp., 786 F. Supp. 2d 690, 707 (W.D.N.Y. 2011). Reviewing the evidence, and mindful of the relatively permissive standard, the Court concludes that the record simply does not support a finding of any substantial or imminent endangerment to the environment.

Plaintiffs' sampling expert Mr. Uhl⁷ took a mere three off-site samples of sediment from the entire area at issue in this case. Only one of those samples contained any soil constituent above the NJDEP residential soil levels. Drs. Cristini and Tucker also did not conduct an ecological risk assessment or an ecological risk assessment. To be clear, there is no requirement that they did so, and the Court does not discount their testimony for that reason. Nevertheless, what the Court does note is the very thin ground upon which their opinions are supported - a four-page expert report. While state criteria are not determinative of the potential existence of an endangerment, the extremely low number of samples does little to convince this Court of the potential of an imminent and substantial endangerment. Moreover, the evidence in the case shows that the constituents identified by Plaintiffs through the testing are common in New Jersey, further undermining the notion that their presence is an endangerment. This Court is simply unable to hold that Plaintiffs carried their burden of showing a potential environmental endangerment by showing the presence of even a

⁷ The Court is mindful of Soil Safe's contention that the testimony of Mr. Uhl, as well as the expert evidence of Drs. Cristini and Tucker should be precluded. Mot. [114]; Mot. [113]. Because the Court finds that - even considering their testimony - Plaintiff does not prevail, the Court does not reach the merits of Soil Safe's contention in this regard.

single molecule of a harmful substance. Certainly this Court cannot do so with the record before it anyway.

However, the primary failure of the evidence with regard to this claim element is simply shown by the expert testimony of Dr. Tucker and associated materials. In support of Plaintiffs' request that this Court find that Soil Safe's product may pose an imminent and substantial endangerment, Dr. Tucker testified that the presence of any of several constituents at any level poses such an endangerment. The Court is not in possession of sufficient evidence to conclude this to be the case, other than Plaintiffs' bare word for it.

This shortage of evidence is magnified in comparison to the far more fulsome treatment of the issue given by Soil Safe's expert, Dr. Kester, who compared the sampling results to ecological screening criteria and background data. Dr. Kester found, and supported with her testimony, that none of the chemical constituents in the Birch and Raccoon Creek sediment samples were present at such levels that they would be qualified as chemicals of potential concern under NJDEP ecological evaluation or risk assessment guidance. Once again, while state guidance is not determinative, it does orient the analysis. Moreover, the Court is in possession of no other evidence - expert or otherwise - from which it can infer what level does create the potential for an imminent and substantial

endangerment. Dr. Kester additionally credibly debunked Dr. Tucker's theory that any amount of these constituents was too much. This is, importantly, consistent with case law which has held that merely showing presence of constituents of concern absent further evidence about the import of the level of those constituents is insufficient. See, e.g., Leese v. Lockheed Martin Corp., Civ. No. 11-5091 (JMB/AMD), 2014 WL 3925510, at *11 (D.N.J. Aug. 12, 2014) ("Proof of the mere detection of some measurable amount of hazardous materials on a property is not enough to maintain a RCRA claim.").

2. Contribution

Moreover, even if this Court found that the analysis by Plaintiffs' experts and other evidence in the case may amount to a substantial and imminent endangerment, the Court would not find that Plaintiffs have shown a causal link to Soil Safe's activities. Unlike the relatively flexible "may" requirement discussed supra, the causal requirement is more stringent. While a plaintiff need not show that the defendant is the only source of the endangerment, Oklahoma v. Tyson Foods, Inc., 565 F.3d 769, 778-79 (10th Cir. 2009) ("Nowhere does the district court say that poultry litter must be the only contributing source. Thus, we find no abuse of discretion."), a plaintiff must show a "nexus" between the defendant and the solid waste. Zands, 797 F. Supp. at 810. Having reviewed the evidence put

forward, the Court is not able to find such a nexus between Soil Safe's conduct and the potential for an imminent and substantial endangerment identified by Plaintiff. Put differently, the Court is not able to conclude that Soil Safe contributes to the situation of which Plaintiffs complain.

The area remediated by Soil Safe is a historic dredge spoil dumping ground. Against that history, the Court is particularly troubled by the failure to perform any meaningful background analysis by Mr. Uhl, to the extent the Court would even accept Mr. Uhl's expert testimony. Moreover, to draw a causal inference about Soil Safe's conduct from the on-site sampling and just three off-site samples is a relatively tall order, particularly in light of Dr. Kester's credible testimony. Other problems permeate Mr. Uhl's testimony. For instance, Mr. Uhl did not discuss or analyze the impact of soil erosion control features such as silt fences or berms. To simply conclude that the existence of drainage swales indicates drainage of Soil Safe product as well is speculative and not supported well enough for a factual determination in his favor. Having granted little to no weight to Mr. Uhl's testimony on the issue of causation, the Court is left with little else to conclude the existence of causation in favor of Plaintiffs.

Moreover, other affirmative evidence from Soil Safe undermines any finding that it is contributing to Plaintiffs'

identified potential for substantial and imminent endangerment. Mr. Free testified that the grain size of Mr. Uhl's samples shows a marked difference between what he sampled and Soil Safe product. Further, the Court finds that many of the constituents identified by Mr. Uhl as corroborative of the notion that Soil Safe's product is a contributor to the contamination are common constituents in soil in this area. As such, Plaintiffs have not shown contribution by Soil Safe, either.

III. CONCLUSION

For the reasons set forth above, the Court concludes that Plaintiffs have not established by a preponderance of the evidence that Soil Safe's product is a solid waste or that it may present an imminent and substantial harm to the environment. An appropriate Order follows.

DATED: June 30, 2017

s/Renée Marie Bumb
RENÉE MARIE BUMB
UNITED STATES DISTRICT JUDGE