



# RAILROAD COMMISSION OF TEXAS

## HEARINGS DIVISION

### PROPOSAL FOR DECISION

**OIL & GAS DOCKET NO. 01-0308862**

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**ADMINISTRATIVE DENIAL PURSUANT TO STATEWIDE RULE 8 AND STATEWIDE RULE 78 FOR PERMIT TO OPERATE A COMMERCIAL OIL AND GAS SOLID WASTE RECYCLING FACILITY FOR THE MCMULLEN COUNTY COMMERCIAL RECYCLING FACILITY, APPLICATION CONTROL NOS. CN-0120, CN-012430, CN-012523 (A THROUGH F), CN-012524 (A THROUGH F), CN-012525, CN-012526 AND CN-012553, MCMULLEN COUNTY, TEXAS**

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**HEARD BY:** Richard Eyster, P.G. – Technical Examiner  
Clayton J. Hoover – Administrative Law Judge

**HEARING DATE:** July 16-18, 2018

**APPEARANCES:**

**APPLICANT:**

Jamie Nielson  
Richard Galloway  
Michael Stewart, P.E.  
Alan Kane

**REPRESENTING:**

4 Halfcircle Remediation, LLC  
Attorney  
Managing Principal  
Engineer  
Engineer

**PROTESTANTS:**

Matthew Baab  
Craig Kissock

**REPRESENTING:**

McMullen County Conservation  
Group, Inc.

Attorney  
Geoscientist

RRC Technical Permitting

Kathy Keils  
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Attorney  
Attorney  
Technical Permitting Manager

**PROCEDURAL HISTORY**

Application Filed:	October 12, 2016
First Administrative Denial:	December, 28, 2016
First RRC RAD Letter:	December 28, 2016
4 Halfcircle Response:	February 27, 2017
Second RRC RAD Letter:	March 31, 2017
4 Halfcircle Response:	May 17, 2017
Third RRC RAD Letter:	June 26, 2017
4 Halfcircle Response:	July 24, 2017
Second Administrative Denial:	September 18, 2017
Request for Hearing:	January 26, 2018
Notice of Hearing:	April 9, 2018
Hearing Held:	July 16-18, 2018
Transcript Received:	August 1, 2018
1st Applicant Closing:	August 14, 2018
Protestant Closing	August 30, 2018
2nd Applicant Closing:	September 14, 2018
Record Closed:	September 14, 2018
Proposal for Decision Issued:	December 21, 2018

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### **STATEMENT OF THE CASE**

Pursuant to Statewide Rules 4, 8 and 78 (16 Tex. Admin. Code §§ 3.4, 3.8 and 3.78), 4 Halfcircle Remediation, LLC ("4HC"), seeks authority to construct and operate a commercial stationary treatment and recycling facility ("STR") in McMullen County, approximately 20 miles south of Tilden, Texas. The proposed facility is located north of FM 624 and will be accessed by an unimproved private road. The proposed approximately 8-acre facility will be constructed on a portion of the 568 acres of ranch land owned by the applicant's managing principal Richard Galloway. The facility will be operated by 4HC. The facility will accept non-hazardous Resource Conservation and Recovery Act ("RCRA") exempt oil and gas exploration and production waste under the jurisdiction of the Railroad Commission ("Commission"). 4HC anticipates the bulk of the waste to be crude oil impacted soil and drill cuttings. 4HC proposes to combine native soils and fertilizer with the waste to make road base and a reusable product. The overall facility is identified in Commission records as a Surface Treatment Facility CN-0120. The application was originally submitted on October 12, 2016.

Notice of the application was mailed on December 23, 2016, to those on the service list. On June 21, June 28, July 5 and 12, 2017, an amended notice of the application was published in *The Progress*, a newspaper of general circulation in McMullen County.

#### **Administrative Denials:**

On October 12, 2016, 4HC submitted the initial application. On December 28, 2016, technical permitting staff at the Commission ("Staff") responded with a first administrative denial and request for additional data letter. 4HC submitted additional information on February 27, 2017. Staff addressed the technical deficiencies in this supplemental submission with a letter titled "Second Request for Additional Data" on March 31, 2017. 4HC again responded with supplemental information in a submission dated May 17, 2017. Staff provided a third request for additional technical data, noting the applicant's technical deficiencies on June 26, 2017. 4HC submitted another supplemental filing on July 24, 2017. The information submitted still failed to address the technical issues highlighted in Staff's numerous correspondence with the applicant. On September 18, 2017, a second administrative denial was issued.<sup>1</sup>

Commission Practice and Procedure Rule 1.201(c)(4) states that if an application is incomplete after an applicant's second supplemental submission, the division shall administratively deny the application. The division shall notify the applicant of the right to request a hearing on the application as it stands. (Rule 1.201(c)(4)). The scope of the hearing will be limited to the application at the time of the denial as it stands. Under this rule, an applicant that requests a hearing on an administratively denied application due to incompleteness cannot supplement with additional information after the denial but before the hearing. When an application is denied after the second supplemental filing, the applicant has an option other than going to hearing. The applicant may withdraw the

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<sup>1</sup> 4HC Ex. 5.

application pursuant to the last sentence in Rule 1.201(c)(4) and resubmit a new application.<sup>2</sup> Staff referred the administratively denied application to the Hearings Division on January 26, 2017. A hearing was held on the application from July 16 – 18, 2018.<sup>3</sup>

The application is protested by the McMullen County Conservation Group, Inc. ("MCCG") and Staff. Members of the MCCG are Ken Galloway; the 624 Ranch, Limited; the Estate of James A. Chipman and the James A. and Minnie Chipman Trust; Blackstone Dilworth; Lonesome Coyote Ranch, LLC; Mary Elizabeth McCall; Carmen O'Brien; Thomas R. Shelton; Helen M. Shelton; Thomas R. Shelton, Jr.; Emmett Shelton, and Richard Shelton.<sup>4</sup>

Based on the evidence presented at the hearing and the Findings of Fact and Conclusions of Law contained within this Proposal for Decision, the Technical Examiner and the Administrative Law Judge (collectively "Examiners") conclude that the proposed facility does not meet the requirements of Statewide Rules 4 and 8(d)(6)(A) and that its operation will result in the waste of oil, gas, or geothermal resources or the pollution of surface or subsurface water. The Examiners recommend 4 Half Circle's application be denied.

### **APPLICABLE LAW**

Statewide Rule 4.201(b) [16 Tex. Admin. Code § 4.201] provides that a permit for commercial recycling of oil and gas waste can only be issued if:

- (1) the storage, handling, treatment, and/or recycling of oil and gas wastes and other substances and materials will not result in the waste of oil, gas or geothermal resources, the pollution of surface or subsurface water, a threat to public health and safety; and
- (2) the recyclable product can meet engineering and environmental standards the Commission establishes in the permit or in this subchapter [16 TAC Part 1, Chapter 4, Subchapter B Commercial Recycling] for its intended use.

Statewide Rule 8(d)(6)(A) [16 Tex. Admin. Code § 3.8(d)(6)(A)] states:

*Standards for permit issuance.* A permit to maintain or use a pit for storage of oil field fluids or oil and gas wastes may only be issued if the Commission determines that the maintenance or use of such pit will not result in the waste of oil, gas, or geothermal resources or the pollution of surface or subsurface waters. A permit to dispose of oil and gas wastes by any method, including disposal into a pit, may only be issued if the commission determines that the disposal will not result in the waste of oil, gas, or geothermal resources or the pollution of surface or subsurface water.

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<sup>2</sup> Tr. Vol. 1, pg. 20, lns 7-25.

<sup>3</sup> Tr. Vol. 1, pg. 19, lns 9-25; pg. 20 lns 16. 4HC Exs. 4 and 5; 4HC closing, pg. 2

<sup>4</sup> Tr Vol. 1, pg. 9, lns10-16.

## **DISCUSSION OF THE EVIDENCE**

### **APPLICANT'S EVIDENCE**

#### **Facility Design:**

A final facility design was not submitted. 4HC's engineer, Michael Stewart, stated that the submitted diagrams showing the facility design are all marked Not For Construction, and the diagrams are for design purpose only.<sup>5</sup> Alan Kane, 4HC's facility design engineer, testified that 4HC had based berm heights and stormwater management volume calculations on USGS topographic information and that an actual ground survey was not performed. Mr. Kane 4HC's design engineer testified *that "if we go to construction, there will be a true survey done."* He also stated *"once we have a true survey, the adjustment would be made on berm height, again, to contain that (stormwater) volume. This (Plate 4-3) is for design purposes only. On construction, the same process will be used to determine height of berm, all this. If we have to adjust it, we will."*<sup>6</sup>

According to the application, the 8-acre site will be a commercial recycling facility for RCRA exempt oil and gas (O&G) wastes. The proposed facility includes:

- A single berm around the facility constructed of general fill found on site;
- One 150 cubic yard receiving pit (CN 12526-R);
- One truck washout pad (CN-012430);
- Six 22' x 8' x 8' steel rolloff boxes (E-12523 A-F) for waste treatment, on the east side of the treatment area;
- Six 22' x 8' x 8' steel rolloff boxes (W-12524 A-F) for waste treatment, on the west side of the treatment area;
- One staging pit for road base (CN- 12525);
- One staging pit for recycled product (CN-12553);
- Six liquid storage tanks;
- Two 500 barrel storage tanks for contact stormwater;

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<sup>5</sup> Tr. Vol. 1, pg. 119, lns 1-25; pg. 119, lns 3-9. Tr. Vol. 3, pg. 20, lns 21-22; pg. 118, lns 18-25; pg. 119 lns 1-6; pg. 120, lns 2-24. 4HC Ex. 4, construction plates 1-8. 4HC Closing.

<sup>6</sup> Tr. Vol. 2, pg. 17, lns 1-25; pg. 18, lns 1-12.

- Four tanks for freshwater that 4HC stated will be used in the bioremediation process; and
- One 55 gallon used oil/recycled hydrocarbon drum.

The facility does not have a stormwater retention pond for noncontact stormwater or a contact water collecting pit to contain stormwater that comes into contact with waste.

### Site Characterization:

The proposed site consists primarily of gently rolling pastureland and is covered in brush. The proposed recycling operation (CN-120) would occupy 8.0 acres of a 568-acre lease in McMullen County approximately 21 miles south of Tilden. The terrain is typical South Texas brush country and is primarily used for ranching and hunting. There are no residences within three miles of the proposed recycling facility. The 8-acre recycling site lies within a 568-acre assemblage of tracts leased by 4HC for the purpose of conducting recycling operations. The site elevation ranges from about 340 feet above mean sea level (amsl) in the northwest to 300 feet amsl to the southeast. The land slopes gently to the northeast corner of the 8-acre site. All facility site elevations were determined by USGS topographic maps; no on-the-ground surveying has been performed on the site, so actual elevations are not known.<sup>7</sup>

The facility will be operated by 4HC. The facility will accept non-hazardous RCRA exempt oil and gas exploration and production waste under the jurisdiction of the Commission.

### Site Geology:

In its application, 4HC identified the "Frio Clay" as the geological unit immediately underlying the proposed site, relying on a 1965 Texas Water Development Board publication.<sup>8</sup> However, the Texas Water Development Board's current *Geologic Atlas of Texas* identifies the geologic structures underlying the operations site as "Fluviatile Terrace" deposit.<sup>9</sup> 4HC witness Michael Stewart, P.E., C.P.G., testified that he believed the 1965 publication was a "good base" for 4HC's hydrogeologic information but conceded that terrace deposits may be present on the property at shallower depths.<sup>10</sup>

### Soils

4HC plans to use native soils from the site to remediate drill cuttings and other RCRA exempt O&G wastes. Four primary soils were encountered on the site: Clayey Sand (SC), Sandy Clay (CL), Silty Clay (MC) and Sand (S).<sup>11</sup> No fat clay deposits were

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<sup>7</sup> Tr. Vol. 1, pg. 17, lns 1-9.

<sup>8</sup> 4HC Ex. 2 at Tab 9 (4HC JN 003019); Tr. Vol. 1, pg. 103, lns 3-18.

<sup>9</sup> Tr. Vol. 2, pg. 75, lns 4-20; MCGG Ex. 2.

<sup>10</sup> Tr. Vol. 3, pg. 116, lns 10-18; pg. 122, lns 4-18.

<sup>11</sup> Tr. Vol. 1, pg. 140, lns 11-16.

found in the borings. Soil boring PB-3 was performed by 4HC. The soils found in PB-3 were classified using visual observation only. Mr. Stewart admitted that to accurately quantify the percentage of clays present in soils or determine the plasticity index or liquid limit of clays, it is necessary to perform laboratory analysis. However, no such laboratory analysis data was run on PB-3.<sup>12</sup>

4HC's laboratory analysis of 13 soil samples from 13 test pits on the site indicate that the native soils onsite have a high Exchangeable Sodium Percentage (ESP), Electrical Conductivity (EC) and Sodium Adsorption Ratio (SAR) values. The laboratory analysis submitted in the application indicates that the native soils 4HC plans to use for remediation have higher SAR, EC, ESP and metals than allowed in either the road base or reusable product. 4HC did not test for SAR in four of the test pits: SSI-4, SSI-5, SSI-6 and SSI 7. 4HC did not test for copper, Molybdenum, Nickel or Zinc as required by the Commission for making road base or reusable product.<sup>13</sup> Mr. Stewart admitted that the soils are salty and have a lot of sodium in them.<sup>14</sup>

#### Groundwater

The Texas Water Development Board's current *Geologic Atlas of Texas* identifies the geologic structures underlying the operations site as "Fluvial Terrace" deposit. Fluvial terrace deposits are associated with rivers or streams that meander back and forth, creating a system of terraces that consist of coarser materials, such as permeable sands and gravels and which can become water-bearing units.<sup>15</sup> The site is underlain by the Yegua-Jackson Formation, a minor aquifer in Texas that extends from the Louisiana border to the border with Mexico (George, et al, 2011). The uppermost aquifer is the Jackson, made up primarily of tuffaceous sand, bentonitic clay and some lignite. The Jackson is between 1,140 and 1,260 feet thick and generally produces only small quantities of slightly to moderately saline water. Below the Jackson lies the Yegua Formation, which consists of gypsum-containing clay, sand and thin lignite beds. Typically, only small quantities of slightly to moderately saline water are produced in the Yegua.

The Carrizo Aquifer is the largest source of groundwater in the county. The Carrizo is made up of medium to fine grained subangular sand and thin shale beds. The thickness of the Carrizo in McMullen County is about 1,300 feet. The depth to the top of the aquifer is approximately 4,500-5,000 feet below ground level (bgl) in the vicinity of the proposed facility.

The Water Information Integration & Dissemination (WIID) database maintained by the Texas Water Development Board (TWDB) shows no water wells that are within two miles of the site.<sup>16</sup>

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<sup>12</sup> Tr. Vol. 1, pg. 140, Ins 11-16; pg. 131, Ins 3-22; Tr. Vol. 2, pg. 84, Ins 12-25; pg. 85, Ins 1-24; pg. 86, Ins 9 – 87, Ins 18; Tr. Vol. 2 pg. 88, Ins 22-25; pg. 90, Ins 1-66. MCGG Ex. 5; MCGG Cross Ex. 2. Tr. Vol. 3, pg. 117, Ins 16-25; pg. 118, Ins 6-25; pg. 119, Ins 15-24; pg. 64, Ins 3-25; pg. 65, Ins 1-3. 4HC Ex. 5 at RRC O&G 03162. MCGG Ex. 8 at 4HC JN 000213.

<sup>13</sup> 4HC Ex. No. 8 RRC Guidance Document, Permit Application for Reusable Product; MCGG Ex No. 6 RRC Permit Requirements for Reusable Product and Road Base.

<sup>14</sup> Tr. Vol. 1, pg. 14, Ins 16-25; pg. 147, Ins 1-25; pg. 148, Ins 1-22; pg. 148, Ins 1-104. HC Ex. 14, pgs. 11 and 12, Geologic-Hydrogeologic Summary.

<sup>15</sup> Tr. Vol. 2, pg. 76, Ins 12-24.

<sup>16</sup> Tr. Vol. 1, pg. 103, Ins 19-25; pg. 104, Ins 1-13. 4HC Ex. 2, Tab 9.



A soil boring, PB-3, was drilled to a depth of 100 feet and was left open for a period of 24 hours. During the 24-hour period no groundwater accumulated in the boring.<sup>17</sup> 4HC then drew a circle around the boring to define the proposed boundaries of the proposed facility.<sup>18</sup>

The applicant's engineer, Mr. Stewart, testified that shallow groundwater was found in four monitor wells on the leased property.<sup>19</sup> MW-1, MW-2, MW-3 and MW-4 are all located downgradient of the proposed treatment facility, and all encountered groundwater.<sup>20</sup> MW-1 is located roughly 700 feet to the northeast (downdip) of the center of the proposed facility.<sup>21</sup> In MW-1, groundwater was encountered at 14 feet below ground level (bgl) at an elevation of 312.4 feet above mean sea level (amsl), 11.36 feet bgl in MW-2, 20.15 feet bgl in MW-3 and 19 feet bgl in MW-4. MW-1 is located adjacent to a surface water pond that is classified as a wetland by the federal government.<sup>22</sup> This wetland area is close to and downgradient from the proposed 4HC site.<sup>23</sup> MW-2a, located approximately 500 feet downgradient (south) of the proposed treatment area, was drilled to a depth of 30 feet (323 feet amsl) and did not reach the depth (312 feet amsl) where groundwater was encountered in MW-1. MW-3a, located approximately 500 feet north of the proposed treatment area, was also drilled to a depth of 30 feet (317 feet amsl). Neither monitor well was drilled to the depth of 312 feet amsl where groundwater was encountered in MW-1. The groundwater sampled from the four monitoring wells had total dissolved solids (TDS) that varied between 31,200 and 44,000 parts per million (ppm).

There are no monitor wells between PB-3 and MW-1 and MW-2, nor were any soil borings or monitor wells completed beneath the waste treatment units or the receiving pit and the staging pads.<sup>24</sup> Michael Stewart, P.E., C.P.G., 4HC's expert witness, testified in the hearing that he did not know where groundwater begins and ends between MW-1 and PB-3. Mr. Stewart also stated that "my understanding is you can petition the Railroad Commission to waive the groundwater monitoring requirements if you have a location that has no free water to 100 feet." Mr. Stewart then testified that he did not think a waiver request was completed and submitted to the Commission.<sup>25</sup> Richard Galloway, 4HC's managing principal, testified that there was no groundwater monitoring proposed for the facility.<sup>26</sup>

## Surface Water

The average annual precipitation at the proposed location for the facility is 25.46 inches, and average annual evaporation is 56.69 inches. The 25-year maximum 24-hour rainfall event is approximately 7.2 inches, as calculated using the TxDOT rainfall intensity-duration-frequency coefficients for McMullen County. A 100-year 24-hour storm event is

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<sup>17</sup> Tr. Vol. 1, pg. 100, Ins 2-17; pg. 51, Ins 22-25; pg. 52, Ins 1-6. 4HC Ex. 2, pg. JN003022, Geologic -Hydrogeologic Summary

<sup>18</sup> Tr. Vol. 1, pg. 52, Ins 1-6.

<sup>19</sup> Tr. Vol. 1, pg. 110, Ins 16-20.

<sup>20</sup> Tr. Vol. 1, pg. 47, Ins 9-19; pg. 110, Ins 15 – pg. 111, ln. 6. 4HC Cross Ex. 1.

<sup>21</sup> Tr. Vol. 1, pg. 50, Ins 6-15. MCGG Cross Ex. 1.

<sup>22</sup> Tr. Vol. 1, pg. 110, Ins 24 – pg. 111, ln 1; Tr. Vol. 3, pg. 81, Ins 1-7.

<sup>23</sup> Tr. Vol. 2, pg. 81, Ins 8-22; pg. 166, Ins 25; pg. 167, Ins 1-6.

<sup>24</sup> 4HC Ex. 4-2.

<sup>25</sup> Tr. Vol. 1, pg. 97, Ins 17-25; pg. 98, Ins 1-5.

<sup>26</sup> Tr. Vol. 1, pg. 72, Ins 6-15.

estimated to produce 10.3 inches of rainfall, and a 500-year 24-hour storm event is estimated to produce 12.9 inches of rainfall. There are no surface water features on the proposed 8-acre site. However, there are two stock tanks on the leased property, both of which are located downgradient from the proposed treatment site. One is located to the southeast of the 8-acre treatment site; the other is located in the southeast corner of the leased area.<sup>27</sup>

## Wetlands

There are no wetlands or stream channels on the 8-acre site; however, there are two mapped wetlands, and three riparian drainage ways are shown on the site map of the 568-acre site. The area around the pond to the northeast, approximately 600-700 feet downgradient from the proposed treatment site, is mapped as a wetland feature.<sup>28</sup>

## Facility Features:

### Berms

4HC's engineer, Mr. Stewart, stated that the final berm designs were not submitted in the application or as exhibits during the hearing. Mr. Stewart stated that the submitted diagrams showing the facility design are all marked "Not For Construction," and the diagrams are for design purpose only. He further stated, "What I would say is that once we have a true survey, the adjustment would be made on berm height. This is for design purposes only. On construction, the same process will be used to determine height of berm, all this. If we have to adjust it, we will."<sup>29</sup>

The application states a single berm will surround the 8-acre site. The berms will be constructed of native materials found onsite and general fill materials.<sup>30</sup> Berms using native material and caliche will also be constructed around the two staging pads and the treatment area.<sup>31</sup> 4HC expert witnesses testified that surface materials within the area leased by 4HC will be used to construct the proposed facility berms. 4HC contends the native soils are suitable for berm construction because they are sandy clays and clayey sands with good plasticity indexes.

4HC did not submit any permeability test results for the soils that were to be used as berm material, stating that they did not have to submit permeability tests.<sup>32</sup>

4HC opines that the material suitability for berm construction is demonstrated by the existence of two stock tanks constructed on the 568-acre lease. 4HC contends that the tanks are at least 60 years old and could be as old as 100 years old. According to 4HC, the stock tanks were constructed of berms six and ten feet tall made of soil "*scraped from the surface*". 4HC stated that the berms on these stock tanks have not failed for at

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<sup>27</sup> Tr. Vol. 1 pg. 33, ln 144. HC Ex. 1, pg. 6. HC Ex. 4, plate 1 site map.

<sup>28</sup> Tr. Vol. 1, pg. 99, lns 20-25; pg. 100, ln 1. 4HC Ex. 2, Tab 2, pg. 8, National Wetlands map.

<sup>29</sup> Tr. Vol.1, pg. 118, lns 3-9.

<sup>30</sup> Tr. Vol. 1, pg.117, lns 8-12. 4HC Exhibit No.4, plate 4.2.

<sup>31</sup> Tr. Vol.1, pg. 36, lns 11-25; pg. 37, lns 1-25.

<sup>32</sup> Tr. Vol.1, pg. 37, lns 1-25; pg. 38 lns 1-12; pg. 39, lns 13-20. Staff Ex. 5 RRC Surface Waste Management Manual.

least 60 years. 4HC believes the longevity of these tank berms demonstrates that onsite material is suitable for construction of the berms for the proposed recycling facility.<sup>33</sup> 4HC did not submit evidence into the record to support their claim that the tanks were constructed with scraped soil and have not failed or leaked in 60-100 years. Pit Liners

#### Washout Pad

The washout pad will be constructed of concrete.

#### Receiving Pad

The receiving pad will be concrete.

#### Staging Pads

The two staging pads will have a single 60-millimeter (mil) High Density Poly Ethylene (HDPE) liner beneath the two pits, and the entrance and exit ramps will go over the HDPE liner. There is no secondary liner, leak detection or leachate collection system.

#### Liquid Storage Tanks

4HC did not state in the application the type of liner that would be installed under the six liquid storage tanks, the two 500 barrel contact stormwater tanks or the fuel tanks. However, during the hearing, 4HC stated that there would be a single 60-mil HDPE liner beneath the tanks with no secondary liners, leak detection or leachate collection system.

#### Receiving Pit

The proposed facility has a single concrete receiving "pad" or "pit" for incoming waste. The receiving pit has a maximum capacity of 150 cubic yards ("cyds") of waste. The receiving pit is wedge-shaped and slopes from ground level at one end to its maximum proposed depth of five feet at the other end and is surrounded by a concrete "apron" three feet in width. The top of this concrete apron extends six inches above the ground surface.<sup>34</sup>

#### Treatment Area

The treatment area consists of a series of twelve "roll-off" boxes (dumpsters) staged in two rows of six boxes, with a raised road running between the two rows of boxes.<sup>35</sup> The six treatment cells for reusable product and six boxes for road base will consist of 40-cyd steel roll-off boxes placed within earthen berms constructed from native soils found onsite. The treatment pit berms will be lined with a single 60-mil synthetic HDPE liner extending up the berms. A foot of soil will be placed over the liner to anchor the liner and provide protection. In addition, a foot of structural fill material (caliche) will

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<sup>33</sup> Tr. Vol. 1, pg. 33, Ins. 5-25; pg. 114, Ins. 22 -25; pg. 116, ln 1; pg. 33; pg.114, Ins. 3-9. 4HC Closing, pg. 10, Ins 4-7. 4HC Reply to Protestants' Closing, pg. 7, Ins 5-11.

<sup>34</sup> Tr. Vol. 1: pg. 257, Ins 5-16; pg. 258, Ins 11-20. 4HC Ex. 4-7. Staff Cross Ex. 1.

<sup>35</sup> Tr. Vol. 1, pg. 56, Ins 23-25; pg. 57, Ins 1-18.

be placed over the protective soil in the base of the pad to further protect the liner. The liner will be exposed on the berms between roll-off boxes. The construction diagrams show that 1.5 feet of freeboard instead of the required 2 feet of freeboard will be maintained in all pits, and each pit will be surrounded by an earthen berm constructed of native soils.<sup>36</sup> Berm dimensions submitted in the draft facility design indicate the berms around each roll-off box will be 28 feet wide and 29 feet long with a sloped design from the access road, beginning at a height of 8 feet and sloping to a height of 4 feet. This design has a central utility road between each product stream to facilitate equipment access.<sup>37</sup> The central utility road between the treatment pits is not lined. As with the other pits with a single 60-mil HDPE liner, 4HC contends that a secondary liner, leachate collection system and a leak detection system beneath the single 60-mil HDPE liners are not needed and will not be installed.<sup>38</sup>

### Staging Pad

The two staging areas are designed to hold 2,000 cyds of both road base and reusable product for a total of 4,000 cyds. Each side of the staging area will be lined with a single 60-mil synthetic liner extending up the berms and with a foot of protective soil anchoring and protecting the liner throughout. A foot of "suitable road base" material will be placed over the protective soil in the base of the pad to further protect the liner during continuous use. Each pad will have crushed concrete access ramps.<sup>39</sup> As with the other pits with a single 60-mil HDPE liner, 4HC contends that a secondary liner, leachate collection system and a leak detection system beneath the single 60-mil HDPE liners are not needed and will not be installed.<sup>40</sup>

4HC did not explain in the application or hearing how liner leaks would be detected under the staging pads or how the leakage would be remediated.

### **Stormwater Management:**

4HC did not submit a detailed stormwater management plan in the application. At the hearing Mr. Stewart was asked under cross examination if he was *"aware of any plan 4HC has to get rid of the contact or noncontact stormwater during a major precipitation event."* He replied, *"I am not aware of any plans."*<sup>41</sup>

To prevent stormwater from leaving the 8-acre site, the site is surrounded by a single perimeter berm to be constructed of native soils found onsite. Stormwater will accumulate at the perimeter berm on the northeast corner of the site due to the site sloping downwards to the northeast.<sup>42</sup> Mr. Stewart testified that there were no specifications or requirements in the application for where the fill comes from.

<sup>36</sup> 4HC Ex. 2, Tab 10, P. 003095 and 003150; Ex. 4-4 and 4-a; Tr. Vol. 1. pg. 188, Ins 15 -25; pg. 189, Ins 19-25.

<sup>37</sup> Tr. Vol. 1, pg. 247, Ins13-15. 4HC Ex. 4, plate 4-4.

<sup>38</sup> Tr. Vol.1, pg. 72, Ins 1-5.

<sup>39</sup> 4HC Ex. 2, Tab 3, pg. 002965-002966; 4HC Ex. 4-5a.

<sup>40</sup> Tr. Vol. 1, pg. 72, Ins 1-5.

<sup>41</sup> Tr. Vol. 1, pg. 152, Ins 6-10.

<sup>42</sup> Tr. Vol. 2, pg. 106, Ins 11-16; pg. 107, Ins 16-25; pg. 108, Ins 1-9. 4HC Ex. 4-2. MCCG Cross Ex. 1.

During the hearing Mr. Kane testified that 4HC had based berm heights and stormwater management volume calculations on USGS topographic information and an actual ground survey was not performed. Mr. Kane testified that "if we go to construction, there will be a true survey done." He also stated "once we have a true survey, the adjustment would be made on berm height, again, to contain that (stormwater) volume. This (Plate 4-3) is for design purposes only. On construction, the same process will be used to determine height of berm, all this. If we have to adjust it, we will."<sup>43</sup>

Mr. Kane stated that additionally, Plate 4-3 shows the areas of the facility inundated by noncontact stormwater by the 25-year 24-hour precipitation event. However, according to Mr. Kane, Plate 4-3 shows the receiving pit as being inundated with noncontact stormwater. Mr. Kane testified that any water falling in the receiving pad will come into contact with waste waiting for treatment, so the water in the receiving pad is in fact contact stormwater and therefore Plate 4-3 is not accurate.

### *Liners*

MCCG has concerns about the liners. They contend that the proposed facility includes structures that will handle wastes or recycled materials including: (1) a washout pit; (2) a receiving pit; (3) a series of treatment cells; and (4) two staging pits for recycled materials.<sup>44</sup> 4HC is proposing to construct the washout pit and receiving pit out of concrete and utilize single 60-millimeter HDPE liners under the staging pits and treatment cells. The remainder of the 4HC facility will be completely unlined. Mr. Galloway testified that there is no leak detection system under any of the HDPE liners nor any leachate collecting systems if the HDPE liners were to leak and that no groundwater monitoring is proposed for the facility.<sup>45</sup>

Mr. Kane was asked if the two 500 barrel storage tanks dedicated to holding the contact stormwater collected from the site had enough capacity to hold the contact stormwater. He replied that they did not have the capacity. Mr. Kane said that their plan is to use vacuum trucks if possible to remove the contact stormwater from the receiving, and staging pads and treatment area. If trucks were not able to access the site, he said there were three options: they could shut down the site until the water evaporates, or they would either have an opportunity to apply for a Texas general noncontact stormwater discharge permit or a site-specific stormwater discharge permit, but that 4HC has not applied for the discharge permits.<sup>46</sup>

Mr. Kane did not provide any details about how the contact water will be removed from the solid waste in the pits or the contaminated water that would remain in the 2 feet of fill beneath the roll-off boxes.

4HC contends that secondary liners, leachate collection systems and leak detection systems beneath the single 60-mil HDPE liners on the site are not necessary. 4HC stated in the hearing that all contact stormwater will be removed from within the pits

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<sup>43</sup> Tr. Vol. 2, pg. 17, Ins 1-25; pg. 18, Ins 1-12.

<sup>44</sup> 4HC Ex. 4-2.

<sup>45</sup> Tr. Vol.1, pg. 72, Ins 1-5.

<sup>46</sup> Tr. V1, pg. 39-41, Ins 1-25. 4HC Ex. 4 plate 4-2 and 4-3.

or pit berm containment areas within 48 hours. As a result, 4HC contends leachate collection systems beneath the liners are not necessary.<sup>47</sup>

Mr. Galloway testified that there are:

- no HDPE secondary liners;
- no leak detection system under the liners;
- no groundwater monitoring proposed for the facility; and
- no leachate collecting system to collect leakage.<sup>48</sup>

### **Waste Characterization and Recyclable Material Acceptance Plan:**

4HC stated that all accepted waste will be Exploration & Production-exempt, although 4HC reserves the right to accept all E&P-exempt waste as identified in the Commission's document "Waste Minimization in the Oil Field." Contaminated soils with free liquids, tank bottoms and non-exempt wastes will not be accepted at this facility. However, 4HC stated that they reserve the right to accept E&P-exempt wastes that are not included if the generator can verify their origins and the rationale for why they are exempt.<sup>49</sup>

In the application section titled "Routine Inspection" (Section 3.2.3 of page 5) the applicant states, "When prohibited material is detected by routine screening prior to unloading, the material will be immediately rejected. When detected in the treatment area, the material will be segregated onto Visqueen." The applicant then intends to contact the waste hauler who delivered prohibited waste and have them come back and pick it up for removal.<sup>50</sup>

Incoming waste will be tested for liquid content using the paint filter test. The paint filter is an EPA-approved test method (EPA 9095B) to determine the presence of free liquids in a representative sample of waste. Upon determination that the material passes the paint filter test and is considered solid and non-hazardous, the waste will be placed in the 12 receiving pits. No hazardous waste, as defined by the U.S. Environmental Protection Agency ("U.S. EPA"), may be received for treatment or disposal.<sup>51</sup>

4HC is proposing to remediate the RCRA exempt solid wastes, mainly crude oil impacted soil and drill cuttings, with Total Petroleum Hydrocarbons (TPH) and chloride contaminated wastes to produce road base and reusable product. The distribution of anticipated accepted recyclable materials are:<sup>52</sup>

- Crude oil impacted soil-35%

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<sup>47</sup> 4HC Ex. 2, Tab 6, pg. 002893. Tr. Vol. 3, pg. 79, Ins 1-6. Tr. Vol. 3, pg. 104, Ins. 14-25; pg. 105, ln 11.

<sup>48</sup> Tr. Vol.1, pg. 72, Ins 1-5.

<sup>49</sup> 4HC Ex. 4, Tab 3, pg. 2, Waste Characterization Plan.

<sup>50</sup> 4HC Ex 4, Section 3.2.3 of page 5.

<sup>51</sup> 40 Code of Federal Regulations Part 261. Tr. Vol. 1, pg. 81, Ins 1-25.

<sup>52</sup> 4HC Ex. 4, Tab 3, pg. 2, Waste Characterization Plan.

- Drilling cuttings and associated drilling pit solids-45%
- Produced sand-5%
- Workover wastes (solids associated with blowdown, swabbing and bailing wastes)-10%
- Pigging wastes from producer operated gathering lines-5%

A series of twelve (12), 40 cyd capacity roll-off boxes will be used as treatment cells for the incoming material. Each box will be dedicated and labeled to produce a specific type of product. The roll-off boxes will be placed within earthen berms lined with single 60-mil synthetic liners extending up all berms and with a foot of protective soil anchoring and protecting the liners beneath roll-off boxes. A foot of structural fill material (caliche) will be placed over the protective soil in the base of the pad to further protect the liner and properly position the boxes.

The liner will be exposed on the berms between each roll-off box. The design will allow a central access road between each product stream to facilitate equipment access. There will be six boxes on each side of the access ramp. There is no liner beneath the treatment area access ramp. The material will be moved from the receiving pit to the roll off boxes using a one cyd wheeled loader. Each of the 12 roll-off boxes will require the loader to make a minimum of 30 round trips per box.<sup>53</sup> The roll-off boxes are approximately 8 to 10 feet from the access ramp, and the top of the roll-off boxes is 6.5 feet above grade. Consequently, each time the waste is deposited in a roll-off box, the loader is going to have to reach out 8-10 feet, and 6.5 feet in the air, to get over the front wall of the roll-off box.<sup>54</sup> The operator will not be able to see the inside of the roll-off box while unloading and mixing the materials.<sup>55</sup>

### Hydrocarbon Remediation

For hydrocarbon impacted materials, 4HC plans to utilize a Carbon:Nitrogen:Phosphorous (C:N:P) ratio of 150:5:1 to promote the enhanced bioremediation process. Nutrients in the form of a readily available balanced fertilizer will be added as necessary. The amount of nitrogen and phosphorous needed to maintain the prescribed C:N:P ratio will be calculated based on the initial TPH analysis. Native soil (typically 15% by volume) will be excavated from the site and transferred to the boxes to add the indigenous microbes. 4HC proposes to use an extended reach backhoe to mix the nutrients and native soil with the untreated material. The backhoe will reach into the roll-off boxes and mix the material with the backhoe bucket. Several parameters including moisture content and pH will be checked and recorded on a weekly basis. A portable moisture content probe will be used to monitor the moisture content. A pH probe will be used to monitor the pH levels. The material will be mixed using the backhoe daily. The pH will be maintained at a range from 6-8.5. If needed, either sulphur will be added to make the soil more acidic, or limestone will be added to raise the pH as necessary. The moisture content will be maintained at a range of 12-30% by volume. Fresh water will be

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<sup>53</sup> Tr. Vol. 1, pg. 59, lns 1-25.

<sup>54</sup> Tr. Vol. 1, pg. 61, lns 16-25; pg. 62, lns 1-16. 4HC Ex.4, plate.

<sup>55</sup> MCGG Cross Ex. 8.

added using a dedicated fresh water truck and pumped into the boxes as necessary based on moisture content.<sup>56</sup>

#### Chloride Remediation

For chloride impacted materials, 4HC proposes to dilute the chloride impacted waste by adding native soils found onsite. No chloride leaching process is proposed.<sup>57</sup>

#### Heavy Metals

4HC did not submit into the record evidence or testimony during the hearing on how metals in the wastes will be remediated to meet Commission standards for road base or reusable product.

#### Incidental Hydrocarbons.

The applicant did not provide a detailed plan in the application for recovering incidental hydrocarbons.

Once the material is treated to Commission standards for road base or recyclable product, 4HC will drive a truck up onto the unlined haul road (ramp) between the roll-off boxes. While the truck sits on the unlined haul road, 4HC will take the same extended reach backhoe used to mix the untreated waste to load the treated material into the truck, one cubic yard per open bucket load. The truck will then be driven down the unlined haul road to the staging area, and the treated materials will be placed on the appropriate staging pad, dependent on the type of material they are producing, either road base or reusable product. The material will then be ready to move off site.

#### Road Base & Reusable Product

4HC proposes to make road base and reusable product. However, 4HC did not explain how the road base would meet the Commission's minimum compressive strength test except to say they would add caliche. 4HC does not plan to use any pozzolonic reaction by use of a binder.

#### Wet Dry Durability Test

There was no evidence submitted as part of the application that dealt with the wet-dry durability requirements. During the hearing, Mr. Kane testified he did not believe a wet-dry durability requirement was necessary by testifying that the Commission issued a permit to CWR Management, LLC, which did not require a wet-dry durability test either "*in the product demonstration phase or the trial run.*"<sup>58</sup> However, the CWR permit

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<sup>56</sup> Tr. Vol. 1, pg. 184, lns 11-19. 4HC Ex. 2, Tab No. 5, pg. 24.

<sup>57</sup> Tr. Vol. 1, pg. 233, lns 1-25; pg. 234, lns 1-25; pg. 238, lns 1-17.

<sup>58</sup> Tr. Vol. 3, pg. 81, lns 12 -25; pg. 82, ln 1. 4HC Ex. 23.



*expressly required the applicant to pass the wet-dry durability test as part of the trial run.*<sup>59</sup> Mr. Kane stated during the hearing that a wet-dry durability test would be run as part of a trial run, but did not provide any details on how the test would be performed.<sup>60</sup> 4HC also did not explain how they would reduce the particle size of the waste for use as road base.

### **Closure Cost Estimate:**

A detailed Closure Cost Estimate (CCE) was not submitted in the application. Mr. Stewart, who prepared and sealed the CCE, stated, "There was an initial closure cost estimate included in the first recycling submittal. But as we went along, that design changed. Until you have a final design, there's really no sense to prepare a closure cost estimate because if you do and the design changes, you have to redo it over and over and over again."<sup>61</sup> The submitted CCE in 4HC Exhibit No. 4 has multiple deficiencies, including inaccurate assumptions, and did not include the necessary calculations.<sup>62</sup>

### **Financial Assurance:**

16 Tex. Admin. Code § 3.78 states "the permittee will maintain financial security in the amount of ,, after the facility has been closed for the post-closure monitoring requirements in accordance with this permit. Technical Permitting reserves the right to revise this amount, as necessary. Prior to closure an updated post-closure cost estimate must be submitted to Technical Permitting in Austin, and any additional financial security must be filed with and approved by the RRC prior to the operating financial security referenced in Permit Condition I.B. will be released." 4HC has an active Organization Report (Form P-5, Operator No. 953537) but no financial assurance.<sup>63</sup>

## **PROTESTANTS' EVIDENCE**

There are two protestants, RRC Technical Permitting Staff ("Staff") and the McMullen County Conservation Group, Inc., ("MCCG"). Both protestants believe the proposed recycling operation will result in the waste of oil and gas or geothermal resources, will cause pollution of surface or subsurface waters, and will pose a threat to public health and safety.

### **Staff Concerns:**

On October 12, 2016, 4HC submitted the initial application. On December 28, 2016, Staff responded with a first administrative denial and request for additional data letter. 4HC submitted additional information on February 27, 2017. Staff addressed the technical deficiencies in this supplemental submission with a letter titled "Second Request for Additional Data" on March 31, 2017. 4HC again responded with supplemental information in a submission dated May 17, 2017. Staff provided a third request for

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<sup>59</sup> Tr. Vol. 3, pg. 83, lns 21-25; pg. 84, lns 1-23; 4HC Ex. 23 at RRC O&G 02919.

<sup>60</sup> Tr. Vol. 3, pg. 85, lns 18-25; pg. 86, lns 1-6.

<sup>61</sup> Tr. Vol. 1, pg. 119, lns 3-9.

<sup>62</sup> Tr. Vol. 3, pg. 39, lns 21-25; pg. 40, ln 125. 4HC Ex 4, Tab 5. 4HC Ex 5, 2<sup>nd</sup> Administrative denial.

<sup>63</sup> 4HC Ex. 10.

additional technical data, noting the applicant's technical deficiencies on June 26, 2017. 4HC submitted another supplemental filing on July 24, 2017. The information submitted still failed to address the technical issues highlighted in Staff's numerous correspondence with the applicant. On September 18, 2017, Staff responded with a second administrative denial.<sup>64</sup>

Staff requests that 4HC's application be denied for the following reasons: <sup>65</sup>

- (1) 4HC failed to submit the minimum required information for a stationary commercial solid oil and gas waste recycling facility in Division 4 of Chapter 4 and pit requirements in §3.8;
- (2) 4HC failed to submit the minimum information to complete their application within two supplemental filings as required by § 1.201(c)(4) and 4.246(c); and
- (3) The application "as it stands" does not show that issuance of the permit will not result in the waste of oil, gas, or geothermal resources, the pollution of surface or subsurface water, nor a threat to the public health or safety.

### Technical Deficiencies:

#### *Berms*

The application states a single berm will surround the 8-acre site. The berms will be constructed of native materials found onsite and general fill materials.<sup>66</sup> Berms using native material and caliche will also be constructed around the two staging pads and the treatment area.<sup>67</sup> 4HC expert witnesses testified that surface materials within the area leased by 4HC will be used to construct the proposed facility berms. 4HC contends the native soils are suitable for berm construction because they are sandy clays and clayey sands with good plasticity indexes. However, the *RRC Surface Waste Management Manual* states in the first sentence in the second paragraph under "Pit Design and Construction" (Bates No. 2160), "All earthen dikes surrounding pits should be constructed of soil material which is capable of achieving a permeability of one times 10 to the minus seven centimeters per second or less when compacted."<sup>68</sup> 4HC did not submit any permeability test results for the soils that were to be used as berm material, stating that they did not have to submit permeability tests.<sup>69</sup>

4HC opines that the material suitability for berm construction is demonstrated by the existence of two stock tanks constructed on the 568-acre lease. 4HC contends that

<sup>64</sup> 4HC Ex 5, 5 *First Administrative Denial*, dated December 28, 2016, p. 2-4; *Request for Additional Data 2*, dated March 31, 2017, p. 3-5; *Request for Additional Data 3*, dated June 26, 2017, p. 2-3; and *Second Administrative Denial*, dated September 18, 2017, p. 2, 4-5.

<sup>65</sup> RRC Staff Closing, pg. 1, paragraph 1.

<sup>66</sup> Tr. Vol. 1, pg.117, Ins 8-12. 4HC Ex.4, plate 4.2

<sup>67</sup> Tr. Vol.1, pg.36, Ins 11-25; pg. 37, Ins 1-25.

<sup>68</sup> Tr. Vol. 3, pg.39, Ins 1-22.

<sup>69</sup> Tr. Vol.1, pg. 37, Ins 1-25; pg.38 Ins 1-12; pg. 39, Ins 13-20. Staff Ex. 5 RRC Surface Waste Management Manual.

the tanks are at least 60 years old and could be as old as 100 years old. The stock tanks were constructed of berms six and ten feet tall made of soil "*scraped from the surface*". 4HC stated that the berms on these stock tanks have not failed for at least 60 years. 4HC believes the longevity of these tank berms demonstrates that onsite material is suitable for construction of the berms for the proposed recycling facility.<sup>70</sup> 4HC did not submit evidence into the record to support their claim that the tanks were constructed with *scraped* soil and have not failed or leaked in 60-100 years.

The site has no stormwater collecting pits, so the perimeter berm will serve as the stormwater collecting pond. The site dips to the northeast, so all the noncontact stormwater will drain to the northeast corner of the facility.

### *Groundwater Monitoring Plan*

Richard Galloway, 4HC's managing principal, testified that there was no groundwater monitoring proposed for the facility.<sup>71</sup> Michael Stewart, P.E., C.P.G., 4HC's expert witness, testified in the hearing that he did not know where groundwater begins and ends between MW-1 and PB-3. Mr. Stewart also stated that "my understanding is you can petition the Railroad Commission to waive the groundwater monitoring requirements if you have a location that has no free water to 100 feet." Mr. Stewart then testified that he did not think a waiver request was completed and submitted to the RRC.<sup>72</sup>

Based on review of soil boring PB-3, Staff concluded that confining or "fat" clays were not present at the site of the proposed 4HC facility to prevent fluids from permeating vertically into the soil and migrating into shallow groundwater. MCCGs' expert witness, Craig Kissock, agreed with Staff that confining clays are not present at the site to prevent the vertical migration of fluids into the subsurface. Mr. Kissock opined that, given the lack of laboratory analysis and other problems with PB-3, 4HC improperly relied on PB-3 to characterize subsurface conditions under the entire 4HC facility area.

Staff concluded in their closing that "Section 4.250(b)(5) states that a permit application for a commercial solid oil and gas waste facility shall include "a plan for the installation of monitoring wells at the facility." According to Staff, a groundwater monitoring plan is necessary to satisfy the minimum permit provisions for design and construction required in §4.257(b)(5), which requires a permittee to "install monitoring wells in accordance with 16 Texas Administrative Code, Part 4, Chapter 76, relating to Water Well Drillers and Water Well Pump Installers." Staff states that an applicant can request a groundwater monitoring plan waiver under § 4.257(d) and that the procedure for requesting an exception is stated in § 4.205 as "an applicant or permittee may request an exception to the provisions of this subchapter by submitting to the director a written request and demonstrating that the requested alternative is at least equivalent in the protection of public health and safety, and the environment, as the provision of this subchapter to which the exception is requested." According to Staff, 4HC did not submit either a waiver, waiver request, or a groundwater monitoring plan.<sup>73</sup>

<sup>70</sup> Tr. Vol. 1, pg. 33, Ins. 5-25; pg. 114, Ins. 22-25; pg. 116, ln 1; Tr. Vol. 1, pg. 33; pg. 114, Ins. 3-9. 4HC closing, pg. 10, Ins 4-7. 4HC Reply to Protestants' Closing, pg. 7, Ins 5-11.

<sup>71</sup> Tr. Vol. 1, pg. 72, Ins 6-15.

<sup>72</sup> Tr. Vol. 1, pg. 97, Ins 17-25; pg. 98, Ins 1-5.

<sup>73</sup> Tr. Vol. 1, pg. 97, Ins 17-25; pg. 98, Ins 1-5.

The Second Administrative Denial dated September 18, 2017, states, "The Railroad Commission of Texas (RRC) has reviewed 4 Halfcircle Remediation LLC's application to receive, store and recycle oil and gas wastes received on October 12, 2016, and the subsequent responses providing additional information received on February 27, 2017, May 17, 2017 and July 24, 2017. This application cannot be administratively approved as presented in the supplemental responses received by Technical Permitting." The application still has:

- (1) several schematic diagrams that contain errors and that are incomplete.
- (2) The treatment process is inadequate and incompatible with incoming wastes streams.
- (3) Construction details are insufficient with inadequate secondary containment structures.

Each of the three deficiencies are addressed below.

#### *Inaccurate Schematic diagrams*

Section 4.250(b)(3) requires a permit application for a commercial solid oil and gas waste recycling facility to include "a map and two perpendicular cross-sectional views of pits and/or storage areas/cells to be constructed, showing the bottom, sides, and dikes, showing the dimensions of each."

Mr. Kane was asked about 4HC's Exhibit 4, Plate 4-3, which shows the area of the receiving pad which is inundated and marked as noncontact stormwater. He was asked if it rained on the pad would the water become contact stormwater. He replied that it would be contact stormwater. He was then asked if 4-3 showed a six-inch lip above the ground surface. He replied that it does have a six-inch lip. Mr. Kane was then asked if it were possible that the depth of stormwater around the receiving pad could exceed six-inches. Mr. Kane replied that *"The volumes that we've calculated, again with the hundred-year 24-hour event, will allow for approximately an inch or more of freeboard. Based on the 25-year 24-hour calculations, we've got about four and a half inches of freeboard."*<sup>74</sup>

Mr. Kane was then asked if the calculations were in the application. He replied that the calculations were not in the application or provided to Staff or MCCG for their review.<sup>75</sup>

Mr. Kane was asked, *"When you're determining how much freeboard you would have at this specific portion where this receiving pad is, you'd have to know the actual ground level elevation of that receiving pad, wouldn't you?"* He replied, "Yes, sir." He then admitted that 4HC hadn't performed an on-the-ground survey.<sup>76</sup>

<sup>74</sup> Tr. Vol. 2, pg. 19, lns 1-25. 4HC Ex. 4, Plate 4-3.

<sup>75</sup> Tr. Vol. 2, pg. 20, lns 1-13.

<sup>76</sup> Tr. Vol. 2 pg. 20, lns 14-22. 4HC Exhibit 4, Plate 4-3.

Staff reviewed 4HC's Exhibit No 4, Plate 7, and contends the Plate contains errors that result in the failure to show the dimensions of the receiving pad/pit to be constructed at the facility. The cross-section A – A' prime shown on Plate 7 does not indicate where the ground surface is located on the east side of the receiving pad (i.e., natural grade) and does not illustrate where the 3-foot concrete apron is located on the east side. Additionally, Plate 7 (4HC Exhibit 4-7) indicates the shallow west end of the pit will have a depth of 5 feet, which is inaccurate if the pit is constructed with a sloped design as shown.<sup>77</sup> 4HC in their final submission included an amended pit design and provided a diagram titled "Section G: Pit Design Calculations."<sup>78</sup> Staff found that the pit design and calculations diagram were not drawn to scale. Therefore, Staff was unable to accurately measure the height of the berms shown on Plate 7. Additionally, Staff found that there was also no indication that there is any portion of the concrete retaining wall above grade, and the pit apron is missing. As a result, Staff was unable to tell from Plate 7 or Cross Exhibit 1 what the actual final design of the receiving pit is going to be. Due to the inaccuracy of the diagrams, Staff could not ensure that the pit would not overflow and cause pollution of surface and groundwater.<sup>79</sup>

Mr. Kane admitted under cross that Plate 7 does not accurately indicate the design of the receiving pad.<sup>80</sup>

When questioned about the lack of design detail on the submitted Plates, Mr. Stewart testified that "my first response is every plate that's in this application says "Not for construction because I don't want somebody to go out there and try to construct off of this plate. The next step in this would be to write some kind of construction quality assurance plan, along with a grading plan, that would do things like lay out the lines and grades of the berm, specify the materials, specify what types of testing you're going to do to, so that when your field people go out, they make sure that the berms are constructed to the proper elevations and that the materials are compacted in the proper fashion."<sup>81</sup>

Mr. Baab asked Mr. Stewart if there were certain data that should be obtained in construction to evaluate whether a berm will hold water and whether without the specifications there's nothing in the application record for Staff to evaluate. Mr. Stewart replied, "The answer to your question is no, that information is not on there."<sup>82</sup>

Staff concluded that "Failure to provide minimum pit dimensions for the receiving pad as required by §4.250(b)(3) makes it difficult, if not impossible, for a technical reviewer to verify that 4HC's operation plan to stage waste in the receiving pad does not compromise the required two feet of freeboard."<sup>83</sup>

Staff concluded that "without a corrected Plate 7, or additional information that can be relied upon to clarify errors or confusion in 4HC's diagrams, the application fails to

<sup>77</sup> Staff Cross Ex. 1. Included in Applicant's July 24, 2017 Request for Additional Data (RAD) 3 response.

<sup>78</sup> Staff Cross Ex. 1.

<sup>79</sup> Tr. Vol. 1, pg. 17, Ins 10-25; pg.18, Ins16-25; pg.19, Ins,1-15. Staff Cross Ex.1. 4HC Ex 4 plate 7, 4HC Ex 5 Administrative denial letters.

<sup>80</sup> Tr. Vol. 3, p. 221, ln 25 through pg. 222, Ins, 1-15.

<sup>81</sup> Tr. Vol. 3, pg. 118, Ins 18-25; pg. 119, Ins 1-6.

<sup>82</sup> Tr. Vol. 3, pg. 120, Ins 1-24. 4HC Ex 4. Plates 4-1 through Plate 4-8, marked Not for Construction.

<sup>83</sup> RRC Staff Closing, pg. 13 1<sup>st</sup> paragraph.

contain information necessary to initiate the final review as required by §4.246(c). 4HC failed to provide the minimum information as required by §§ 4.246(c), 4.250(b)(3), and 4.257(a)(1) within two supplemental filings, which results in 4HC's failure to complete the application pursuant to §1.201."<sup>84</sup>

Ms. Humberson testified that, because of 4HC's failure to specify how wastes will be staged in the receiving pit, Staff could not verify that the receiving pit complies with the Commission's two-foot freeboard requirement for pits.<sup>85</sup>

In the second RAD letter dated March 31, 2017, in Item No. 21, Staff told 4HC to submit new Form H-11's for each treatment tank (roadbase material and reusable product). The dimensions and capacity of the "pits" should be the capacity of the tanks that will be used to contain and treat the wastes. The dimensions submitted on Form H-11's are for the inside dike dimensions with a height of 3 feet. Staff noted, "The waste is contained in the tanks not between the secondary containment berms. In Item 22, 4HC was told to provide the calculations for the remaining capacity between the secondary containment berms minus the volume of the tank. This capacity must be able to contain the contact stormwater generated in the 25-year, 24-hour rainfall event. Ms. Humberson testified that 4HC replied in an email, but the calculations were not provided as hard copy. 4HC witness Alan Kane claimed that the pit calculations were supplied by an email to Tiffany Humberson dated April 13, 2017. However, the calculations in the email do not utilize a depth of 1.5 feet (i.e., the actual maximum depth within the berms), but rather a 36-inch depth. Furthermore, the volume calculations supplied are simple volume calculations for a rectangular box with three dimensions, whereas the geometric space within the berms is a truncated pyramid with slopes on all four sides transitioning from the top of the berm to a maximum depth of 1.5 feet. Ms. Humberson was asked if the calculations for the volume of the cell around the roll-off box lists a depth of 36 inches for their calculation. She replied that it did. She was then asked if on 4HC Exhibit 4-4, the depth around that is not 36 inches, is it? She replied "No, Sir."

Ms. Humberson was then asked, "So with regard to the information you requested in Item 22 of the March 31st letter, did they provide correct calculations reflecting what you requested?" Ms. Humberson replied, "They did not provide a correct calculation."<sup>86</sup>

#### *Inaccurate Flow Diagram*

Staff contends that 4HC failed to provide a complete flow diagram. 16 Tex. Admin. Code § 4.251(6) states that permit shall include "flow" diagram showing the process and identifying *all* equipment and chemicals or additives (e.g., asphalt, emulsion, quicklime, Portland cement, fly ash, etc.) to be used in the process. According to Staff, the only flow diagram provided, which is included in 4HC's initial application submission from October 2016 (4HC Exhibit 1), fails to show the complete process and identify all equipment. Staff asserts that the diagram does not identify the process flow for recovered hydrocarbons, what equipment will be utilized to recover hydrocarbons, nor where recovered hydrocarbons will be stored. According to Staff, without a complete process flow diagram,

<sup>84</sup> Staff Closing, pg. 15, 2<sup>nd</sup> paragraph.

<sup>85</sup> Tr. Vol. 3, pg. 21, lns 23-25; pg. 22, lns 1-17.

<sup>86</sup> Tr. Vol. 3, pg. 59, lns 20-25; pg.60, lns 1-25, pg.61 ; 4HC Ex. 22.

the application fails to contain information necessary to initiate the final review as required by 16 Tex. Admin. Code § 4.246(c). Staff contends that 4HC failed to provide the minimum information, as required by 16 Tex. Admin. Code §§ 4.246(c) and 4.251(6) within two supplemental filings, which shows 4HC's ultimate failure to complete the application pursuant to §1.201.

Form H-11

Staff states in their closing that 4HC failed to prove a complete Form H-11 for treatment pit CN-012524A. According to Staff, the H-11 provided in the applicant's final submission did not contain a signature as required in the instructions for Form H-11. Staff asserts that Rule 3.8(d)(6)(B) covers pit permit applications and states, "When a commission prescribed form exists, an applicant shall make application on the prescribed form *according to the instruction on such form.*" Staff contends that the applicant failed to meet the minimum permit application requirements for CN-012524A and that without a complete Form H-11, the application fails to contain information necessary to initiate the final review as required by 16 Tex. Admin. Code § 4.246(c).

***2. The treatment process is inadequate and incompatible with incoming wastes stream***

Staff stated in the September 18, 2017 Second Administrative Denial, pages 3-5, that "in the original application, the proposed incoming waste streams included the entire list of wastes (RCRA exempt and nonexempt) allowed by the RRC. However, the facility does not provide for mechanical, chemical, or thermal separation of the incoming wastes, and several of the wastes streams could not be stored or processed on-site." Correspondence from the Commission dated March 31, 2017, stated: "The application proposes to receive several types of oil and gas solid wastes and treat the solids by adding fertilizer, native soils and mixing with a backhoe to meet analytical requirements. This is not a suitable treatment process.<sup>87</sup> The facility does not propose the use of separation equipment that will actively recover the hydrocarbons in crude oil contaminated soil and spill impacted soils, which is prohibited and may cause a violation of Railroad Commission of Texas (RRC) rules. Facilities that recycle oil and gas wastes are required to recover hydrocarbons from all incoming waste streams prior to processing or disposal and must have procedures in place to ensure that the proposed activities will not result in the waste of oil, gas, or geothermal resources and will not cause or allow the pollution of surface or subsurface waters in the state." In addition, Item 5 of the correspondence requested an amended treatment process be submitted for the recovery of hydrocarbons for the incoming waste streams.

4HC's response received on May 17, 2017, states, "*No amended treatment process is to be proposed with the intention to make no changes in accepted materials.*" Correspondence from the RRC dated June 26, 2017, requested an amended incoming waste stream list that is compatible with the treatment process proposed at the facility."

4HC's response received on July 24, 2017, states, *"All accepted waste will be E&P-exempt. Although 4 Halfcircle reserves the right to accept all E&P- exempt wastes as identified in the Railroad Commission of Texas document 'Waste Minimization in the Oilfield'".* The application later states, *"E&P-exempt wastes that are not included may also be accepted if the generator can verify their origin and the rationale for why they are exempt."* Staff responded in the letter, *"It is Technical Permitting's understanding that the only waste streams that the applicant is not proposing be accepted at the facility are free hydrocarbon liquids and tank bottoms."* During the hearing 4HC stated that the facility would only accept solid wastes.

4HC did not submit into the record a plan to address how metals in the incoming waste will be remediated. The metals in the native soils that 4HC proposes to use in their remediation process are on the average higher than RRC permit requirements for road base and reusable products.<sup>88</sup>

***3. Construction details are insufficient with inadequate secondary containment structures (liners)***

4HC contends secondary liners, leachate collection systems and leak detection systems beneath the single 60-mil HDPE liners on the site are not necessary. 4HC stated in the hearing that all contact stormwater will be removed from within the pits or pit berm containment areas within 48 hours. As a result, 4HC feels leachate collection systems beneath the liners are not necessary.<sup>89</sup> Mr. Galloway testified that there is no leak detection system under any of the liners, no groundwater monitoring proposed for the facility, and no leachate collecting system if those liners were to leak.<sup>90</sup>

Item 23 in the second RAD letter required 4HC to submit an amended anchoring design for the 60-mil High Density Polyethylene (HDPE) liner that will be installed under the treatment pits. The submitted design states that the liner will be anchored by cover material, and additional details that are provided on Plate 3; however, Plate 3 does not provide such additional information. The cover material will not provide an adequate anchor for the liner.

Staff concluded 4HC failed to provide the minimum design and construction information for certain liners at the facility. 16 Tex. Admin. Code § 4.250(b)(1) states that a permit application for a commercial solid oil and gas waste facility shall include "a description of the type and thickness of liners (e.g., fiberglass, steel concrete), if any, for all tanks, silos, pits, and storage areas/cells." This information is also required on page 4 of the Commission Guidance Document titled "Permit Application for Reusable Product." The applicant did not include a description of the type and thickness of liners used under the area labeled "liquid storage tanks" on Plate 8 and CCE page 4 in 4HC's Exhibit 4. In the hearing, 4HC confirmed there is an HDPE liner under the liquid storage tanks, but this information is not stated anywhere in the materials submitted by 4HC.<sup>91</sup>

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<sup>88</sup> 4HC Ex. 14, pg. 11, Table 3, Test Pit Chemistry. MCGG Ex. 6, RRC Permit Requirements for Road Base & Reusable Product.

<sup>89</sup> 4HC Ex. 2, Tab 6, pg. 002893; Tr. Vol. 3, pg. 79, Ins 1-6. Tr. Vol. 3, pg. 104, Ins. 14-25; pg. 105, In. 11.

<sup>90</sup> Tr. Vol.1, pg. 72, Ins 1-5.

<sup>91</sup> Tr. Vol. 3, p. 96, Ins 1-25, pg. 97, Ins 1-25. 4HC Ex. CCE, pg. 4.



Ms. Humberson was asked if 4HC met the requirement in Rule 4.250 for liners. She answered, "No."<sup>92</sup>

Staff concluded, "Without the required liner system information, or credible geologic data showing a liner system is not necessary to be protective of groundwater, the application fails to contain information necessary to initiate the final review as required by §4.246(c). 4HC failed to provide the minimum information as required by §§ 4.246(c) and 4.250(b)(1) within two supplemental filings, which results in 4HC's failure to complete the application pursuant to §1.201."

### Prohibited Wastes

Item Number 6 on page 3 of the September 18, 2017, second Administrative Denial Letter states, "In the application section titled Routine Inspection (Section 3.2.3 of page 5) 4HC states, *"When prohibited material is detected by routine screening prior to unloading, the material will be immediately rejected. When detected in the treatment area, the material will be segregated onto Visqueen."* The applicant then intends to contact the waste hauler who delivered prohibited waste and have them come back and pick it up for removal. Under the proposed plan, the potentially prohibited waste will be placed outside of the treatment areas and in areas without proper containment or approved liner systems.<sup>93</sup>

Staff determined that Visqueen is not an approved liner for waste management units due to the material being of insufficient thickness and of limited durability. During the hearing Ms. Humberson was asked if Visqueen is an approved liner. She replied *"Visqueen is not an approved liner system. It is essentially a Hefty bag. 4HC makes no reference on the facility diagram about where they would be staging segregated material. They also don't qualify it with any sort of volumes."* She said that 4HC did not quantify if they are going to empty the entire treatment tank and that 4HC did not define routine screening. She was then asked if putting waste on Visqueen could cause a potential for pollution. She replied, *"This creates a huge potential for pollution". Under no circumstances can waste be removed from a permitted area onto a piece of Visqueen on the ground.*<sup>94</sup>

The Examiners asked Ms. Humberson if there were any containment berms proposed around the Visqueen. She replied that it's not included in the application. She also restated that there is no secondary containment reference either.<sup>95</sup> Ms. Humberson also testified, *"There's no indication how long the waste is going to sit there either because they're going to contact the hauler who may or may not come and pick it up. And if it's in the treatment area, they're not actually going to be able to identify where it came from or which hauler is responsible."*<sup>96</sup>

<sup>92</sup> Tr. Vol. 3, pg. 34, lns 15-25; pg. 35, lns 1-25. 4HC Ex. 4-8.

<sup>93</sup> Tr. Vol. 3, pg. 32, lns 11-25; pg. 33, lns 1-25; pg. 34, lns 1-8.

<sup>94</sup> Tr. Vol. 3, pg.32, lns 19-25; pg. 1-25.

<sup>95</sup> Tr. Vol. 3, pg. 34, lns 4-6.

<sup>96</sup> Tr. Vol. 3, pg. 34, lns 8-14.

During the hearing Mr. Kane testified, *"The only time we would ever use Visqueen it would only occur inside the receiving pad. If we were to unload some waste, have it tested, and if it failed the paint filter test for liquid or if it failed any of the other parameters, we would place that material on Visqueen inside the receiving pad to segregate it from the other waste that we have that could be very well acceptable. It would never be portrayed that we'd ever leave that until it's acceptable waste and allowed to go to the treatment area."* He did not explain how the prohibited materials on the Visqueen would be prevented from contaminating the acceptable waste also stored in the receiving pit during a precipitation event or if the waste contained incidental hydrocarbon liquids.<sup>97</sup>

### Cost Closure Plan

A detailed Cost Closure Estimate (CCE) was not submitted in the application. Mr. Stewart, who prepared and sealed the CCE, stated, "There was an initial closure cost estimate included in the first recycling submittal, but as we went along, that design changed. Until you have a final design, there's really no sense to prepare a closure cost estimate because if you do and the design changes, you have to redo it over and over and over again."<sup>98</sup> The submitted CCE in 4HC Exhibit No. 4 has multiple deficiencies, including inaccurate assumptions and did not include the necessary calculations.<sup>99</sup>

Staff concluded that 4HC failed to meet minimum requirements in 16 Tex. Admin. Code §§ 4.246(c), 4.250(a), 4.250(b)(1), 4.250(b)(5), 4.251(6) and 3.8(d)(6)(A), which are necessary to satisfy minimum permit provisions required by 16 Tex. Admin. Code §§ 4.256–4.259. Staff argues that the applicant consistently failed to address ongoing deficiencies throughout the technical review process and that 4HC failed to show their application is complete. Staff concludes that 4HC's failure to provide minimum information required by rule means that 4HC cannot demonstrate that the application will not result in waste or pollution.<sup>100</sup>

## McMULLEN COUNTY CONSERVATION GROUP, INC.

### Perimeter Berm Construction

MCCG has concerns with the soils to be used for the perimeter berm. The berm diagrams call for "general fill" material and contain no other specifications as to source or quality of the construction materials.<sup>101</sup> The diagrams state the berms will be constructed utilizing "maximum 12-inch compacted lifts" and compacted to at least 95 percent of the Standard Proctor maximum dry density, but fail to specify how 4HC proposes to meet that standard. Additionally, Mr. Stewart testified that 4HC did not perform permeability tests on the material to be used in berm construction.<sup>102</sup> MCCG asserts that the native soils 4HC is proposing to use as berm material are dispersive soils that will fail during rainfall events. 4HC engineer Mr. Stewart and MCCG witness Mr. Kisson agreed the majority of

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<sup>97</sup> Tr. Vol. 3, pg. 78.

<sup>98</sup> Tr. Vol. 1, pg.119, lns 3-9.

<sup>99</sup> Tr Vol. 3, pg. 39, lns 21-25; pg. 40, ln 125. 4HC Ex 4, Tab 5. 4HC Ex 5, 2<sup>nd</sup> Administrative denial.

<sup>100</sup> Staff Closing, pg. 22, lns 1-13.

<sup>101</sup> Tr. Vol. 1, pg.124, lns 15-22.

<sup>102</sup> Tr. Vol. 1, pg. 106, lns 1-10. 4HC Ex. 4-2.

shallow soils at the 4HC site are very salty, exhibiting high SAR, EC and ESP values.<sup>103</sup> Soils are considered sodic when the ESP is greater than 6 and highly sodic when the ESP is greater than 15.<sup>104</sup> The native soils 4HC is proposing to use as berm material have an average ESP value of 43.7, with values as high as 175, and a minimum value of 21.8.<sup>105</sup> The native soil values are higher than the Commission's permit requirements for road base or reusable product.<sup>106</sup>

During the hearing Mr. Kissock testified that soils with high SAR and ESP values, such as the soils found at the proposed facility for berm construction, may become dispersive and fail over time, particularly when exposed to rainfall. 4HC engineer Mr. Stewart admitted in his testimony that having a high level of salts in soils can make them prone to erosion. However, Mr. Stewart admitted that he did not evaluate that issue in this case.<sup>107</sup>

Mr. Kissock cited a Colorado State University Extension publication entitled *Managing Sodic Soils*, which states in the first paragraph, "Sodic soils tend to develop poor structure and drainage over time because sodium ions on clay particles cause the soil particles to deflocculate or disperse." Mr. Kissock further testified that the use of such dispersive soils is associated with a rash of documented embankment failures.<sup>108</sup> He testified that having sodic/dispersive soil on site is a problem "because if you use those same materials to construct the berms, then we've had a rash of problems through the 50s, '60s, '70s and '80s on embankments failing due to this specific issue, dispersive soils and either severe erosion and/or piping that created holes going right through berms, and the structures failed."<sup>109</sup>

Mr. Kissock said that he also had serious concerns about the physical construction of the perimeter berm. He testified that these specifications are grossly inadequate to ensure that there won't be problems with the berms and/or potential failure.<sup>110</sup> Mr. Kissock stated that in addition to the dispersive soils being used in berm construction there is no information in the application on how the berms will be tied into the underlying soils. He testified that *"it's also important that not only do you key it in, whether it's a key way or whether it's the full width, but it's important to, in this case, if you've got a lot of roots, you're probably gonna have to basically dig roughly three feet of material, screen it, come back, put suitable material and compact it, and basically build the berm up from there so it is tied into underlying impermeable soils."*<sup>111</sup>

He also testified that there is no information in the application that mentions scarification to interconnect the lifts and no mention of any moisture control. He stated

<sup>103</sup> Tr. Vol. 1, pg. 147, Ins 6-23; Tr. Vol. 2, pg. 121, line 3-pg. 122, line 5; 4HC Ex. 14 at 4HC-000754

<sup>104</sup> MCGG Ex. 13, Farmnote Identifying dispersive soils. Pg. CK-007511

<sup>105</sup> 4HC Ex 14, Table No. 3 Test Pit Chemistry

<sup>106</sup> 4HC Ex.14, pg. 11, Table 3, Test Pit Chemistry. MCGG Ex. 6, RRC Permit Requirements for Road Base & Reusable Product.

<sup>107</sup> Tr. Vol. 1, pg. 148, Ins 16-22.

<sup>107</sup> Tr. Vol. 1, pg. 148, Ins 16-22. Tr. Vol. 2, pg. 91, Ins 1-14. Tr. Vol. 2, pg. 88, Ins 22-25. Pg. 90, Ins 1-6. Tr. Vol. 3, pg. 64, Ins 3 – 25. Pg. 65, Ins 1-3. 4HC Ex. 5 at RRC O&G 03162

<sup>108</sup> Tr. Vol. 2, pg.124, Ins 12-19; MCGG Ex. 11.

<sup>109</sup> Tr. Vol. 2, pg. 124. Tr. Vol. 2, pg. 91, Ins 1-14. Tr. Vol. 2, pg. 88, Ins 22-25. Pg. 90, Ins 1-6. Tr. Vol. 3, pg. 64, Ins 3 – 25. pg. 65, Ins 1-3. 4HC Ex. 5 at RRC O&G 03162

<sup>110</sup> Tr. Vol. 2, pg. 153, Ins 4-6.

<sup>111</sup> Tr. Vol. 2, pg. 149, Ins 6-25.

that all 4HC mentions in the application is "a 12-inch compacted lift on the diagrams. However, in this hearing we heard 12-inch loose fill." He went on to say 12-inch loose and 12-inch compacted are two totally different scenarios. Mr. Kissock said that in his experience, "other commercial facilities' construction diagrams that were for permitting purposes, and they specifically laid out the various sequence and alluded to six- to nine-inch compacted lifts maximum. Then it's a function of what kind of equipment you're using, because it's not just important to have a compacted lift. You can invariably have a compacted lift on top of another compacted lift, and yet there's not good integration between those two lifts, so it's like stacking plates on each other. So it's important that one lift gets basically interconnected with the lift below it, and then you build it up from there."<sup>112</sup>

Under cross examination Mr. Stewart was asked by Mr. Baab if he agreed that when constructing a berm it's important that a construction method be used that ties the structure of that berm into the underlying land, such as scarification or "something like that." He replied, "Yes." He then admitted that 4HC did not submit any details in the application on how the lifts will be tied to each other or how the berms will be tied into the underlying soil.<sup>113</sup>

#### Surface Water

Mr. Kissock testified any piping or berm failures will lead to off-site surface water contamination. There is a wetland approximately 700 feet downgradient from the northeast corner of the facility where stormwater will accumulate. A breach in the berm at that point could cause pollution of a wetland.<sup>114</sup> He testified, "So it's absolutely critical how these berms are constructed. And since this whole facility basically is operating within a detention pond and the fact that you're gonna have contact stormwater exposure here, you're gonna have pollutants that are going to be in this water. And if you have berm integrity problems or piping or berm failures, you're gonna end up with off-site surface water contamination. That doesn't address, you know, the potential for vertical migration due to the fact that there's no liners, aside from the actual waste management -- individual waste management units."<sup>115</sup>

#### Groundwater

MCCG contends that based on laboratory analysis, confining or "fat" clays were not present at the site of the proposed 4HC facility to prevent fluids from permeating vertically into the soil and migrating into shallow groundwater. MCCG expert Craig Kissock agreed with Staff that confining clays are not present at the site to prevent migration of fluids. Mr. Kissock testified that, given the lack of laboratory analysis and other problems with PB-3, 4HC improperly relied on PB-3 to characterize subsurface conditions under the entire 4HC facility area.<sup>116</sup>

<sup>112</sup> Tr. Vol. 2, pg. 149, lns 18-25, pg. 150, lns 1-15.

<sup>113</sup> Tr. Vol. 1, pg. 136, lns 13-23.

<sup>114</sup> Tr. Vol. 2, pg. 23-25, pg. 150, lns 23-25, pg. 151, lns 1-5.

<sup>115</sup> Tr. Vol. 2, pg. 150, lns 23-25; pg. 115, lns 1-9.

<sup>116</sup> Tr. Vol. 1, pg. 110, lns 24-25; pg. 111, lns 1-24; pg. 135, lns 15-22. Tr. Vol. 2, pg. 81, lns 8-22; pg. 82, lns 7-11; pg. 166, ln 25; pg. 167, lns 1-3. Tr. Vol. 3, pg. 81, lns 1-7.

<sup>116</sup> Tr. Vol. 1, pg. 110, ln 20, pg. 111, lns 13-22.

4HC contends that, due to the lack of groundwater to a depth of 100 feet in PB-3, it is an appropriate place to locate the facility. MCCG stated that no groundwater was found in PB-3 and that shallow groundwater was found in four (4) monitor wells on 4HC's property: MW-1, MW-2, MW-3 and MW-4. MW-1 is located adjacent to a surface water pond that is classified as a wetland by the federal government. This wetland area is close to, and downgradient from, the northeast corner of the proposed 4HC site. There are no borings or other data points between PB-3 and MW-1. Accordingly, 4HC's expert Michael Stewart, P.E., C.P.G., admitted he does not know where groundwater begins and ends between those two data points.<sup>117</sup> However, Mr. Stewart admitted to the presence of perched lenses of groundwater beneath the site. He testified, "*There is groundwater.*"<sup>118</sup>

Mr. Galloway testified that there is no groundwater monitoring proposed for the facility.<sup>119</sup> Mr. Stewart stated that it is "*my understanding is you can petition the Railroad Commission to waive the groundwater monitoring requirements if you have a location that has no free water to 100 feet.*" Mr. Stewart then testified that he did not think a waiver request was completed and submitted to the Commission.<sup>120</sup>

### Liners

MCCG has concerns about the liners and the lack of liners. They contend that the proposed facility includes structures that will handle wastes or recycled materials including: (1) a washout pit; (2) a receiving pit; (3) a series of treatment cells; and (4) two staging pits for recycled materials.<sup>121</sup> 4HC is proposing to construct the washout pit and receiving pit out of concrete and to utilize single 60-millimeter HDPE liners under the staging pits and treatment cells. The remainder of the 4HC facility will be completely unlined, including the haul roads on which the waste will be transported in a 1 cyd open bucket front end loader. Mr. Galloway testified that there is no leak detection system under any of the HDPE liners nor any no leachate collecting systems if the HDPE liners were to leak and that no groundwater monitoring is proposed for the facility.<sup>122</sup>

MCCG shares Staff's concerns about the accuracy of the facility schematic diagrams of the pit and berm designs. MCCG stated that the proposed facility relies upon a single concrete receiving "pad" or "pit" for incoming waste. MCCG also contends that, in Staff's September 18, 2017 Second Administrative Denial, Staff specifically cited numerous errors in the receiving pit plans and drawings as one basis for denial. The errors included: (1) lack of accurate scale on the receiving pit diagrams; (2) inconsistent cross sections; and (3) lack of information as to how the 150 cyds of waste would be distributed in the pit. In addition, MCCG pointed to Staff witness Tiffany Humberson, who testified that due to the numerous errors in the schematic diagrams for the receiving pit, 4HC failed to provide the minimum design and construction information required under Commission rules. Ms. Humberson also testified that because of 4HC's failure to specify

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<sup>117</sup> Tr. Vol. 1, pg. 110, lns 24-25; pg. 111, lns 1-24; pg. 135, lns 15-22. Tr. Vol. 2, pg. 81, lns 8-22; pg. 82, lns 7-11. pg. 166, ln 25; pg. 167, lns 1-3. Tr. Vol. 3, pg. 81, lns 1-7.

<sup>118</sup> Tr. Vol. 1, pg. 110, ln 20. pg. 111, lns 13-22.

<sup>119</sup> Tr. Vol. 1, pg. 72, lns 1-5.

<sup>120</sup> Tr. Vol. 1, pg. 97, lns 17-25, pg. 98, lns 1-5.

<sup>121</sup> 4HC Ex. 4-2.

<sup>122</sup> Tr. Vol. 1, pg. 72, lns 1-5.

how wastes will be staged in the receiving pit, Staff could not verify that the receiving pit complies with the Commission's two-foot freeboard requirement for pits.<sup>123</sup>

MCCG contends that 4HC's own evidence shows that the receiving pit is within the area of stormwater inundation caused by a 25-year, 24-hour storm. According to MCCG, the application indicates that stormwater may run into the receiving pit and overflow the pit during a significant storm, resulting in a vast dispersion of oil and gas waste and contaminated stormwater throughout the site.<sup>124</sup> Ms. Humberson testified that because of 4HC's failure to specify how wastes will be staged in the receiving pit, Staff could not verify that the receiving pit complies with the Commission's two-foot freeboard requirement for pits.<sup>125</sup>

MCCG states that the berm and liner system for the treatment area pose even greater threats. According to MCCG, the berms allow for a maximum storage depth of only 1.5 feet, instead of the Commission's two-foot freeboard requirement for pits. MCCG maintains 4HC failed to produce any calculations showing these berms can contain a 25-year, 24-hour rainfall event.<sup>126</sup> MCCG stated in their closing that "the berms also need to effectively contain any spilled wastes and any leaks from the roll-off boxes, both of which are certain to occur."<sup>127</sup> On page 23 of MCCG's closing, MCCG states, *"Because 4HC failed to correctly calculate the treatment pit berm volumes, MCCG contends 4HC likewise failed to verify that the berms with their 1.5-foot storage depth have adequate capacity to handle volumes of spilled waste and any leaks from the roll-off boxes, in addition to a significant rainfall event. It appears possible that the berm system around one or more roll-off boxes may overflow with waste or polluted stormwater in the case of major rains, a significant leak in a roll-off box, or a combination of both events."*

MCCG states that the treatment area consists of large areas that are unlined, such as the haul road between the receiving pad and treatment cells, and there are large areas in the treatment area where the liner is exposed. MCCG contends that in some cases spilled wastes will land directly on the liner, and there is no way to remove those wastes without directly contacting the liner and risking damage to it. MCCG contends that if wastes leak through the liner, 4HC has no means of detecting or controlling any such leaks, as the facility design includes no leak detection, monitoring or leachate collection systems.<sup>128</sup>

### Stormwater Control Plan

MCCG concludes that there are problems with the facility's perimeter berm system. The perimeter berm system is designed in such a manner that the facility will suffer a near-total inundation with contact stormwater during a 25-year rainfall event, and an even greater inundation during a 100-year event. A major rainfall will result in the inability to

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<sup>123</sup>Tr Vol. 3:17:720:22, Tr. Vol. 3, pg. 21, lns 23-25; pg. 22, lns 1-17. 4HC Ex. 5 RRC O&G 03160

<sup>124</sup> Tr. Vol. 3 pg. 57, lns:7-18. 4HC Ex. 4-3.

<sup>125</sup> Tr. Vol. 3, pg. 21, lns 23-25; pg. 22, lns 1-17.

<sup>126</sup>Tr. Vol. 1 pg. 248, lns 2-25. Pg. 249, lns 1-22. Tr. Vol. 2, pg. 37, lns 11-24; 4HC Ex. 22, 4HC Ex. 4-4.

<sup>127</sup> Because the berm area lies between the center road of the treatment area and the roll-off-boxes themselves, 4HC will be lifting wastes over the exposed berm areas and dumping waste into the roll-off boxes. 4HC Ex. 4-4.

<sup>128</sup> Tr. Vol. 1: 72:6-15, Vol. 1, pg. 252, ln 25, pg. 253, lns 1-11.

operate the facility until large quantities of stormwater evaporate.<sup>129</sup> To control stormwater, 4HC relies upon a single perimeter berm around the facility.<sup>130</sup> 4HC designed this berm to collect and retain stormwater during storm events and asserts that the berms will contain the volume of rainwater from a 100-year, 24-hour rainfall event. In its volume calculations, 4HC relied on USGS elevation data and did not perform any survey to verify the elevations on which it based its calculations were correct.<sup>131</sup> Mr. Kane testified 4HC intends to perform an actual survey before construction, but admitted the application contains no representation that 4HC will do so. 4HC's application materials include a Plate 3 depicting the extent of stormwater inundation during a 25-year, 24-hour storm event.<sup>132</sup> The vast majority of the facility will be inundated with stormwater during a 25-year, 24-hour storm event. The extent of inundation will be even greater during a 100-year storm event.<sup>133</sup> The inundated areas extend to and include portions of the receiving pit, which will hold oil and gas wastes. Staff witness Tiffany Humberson testified that Staff was concerned that during a storm event, rainwaters could overflow into the receiving pit. Likewise, the inundated areas contain numerous areas of the facility, such as the areas between the receiving pit and the treatment cells where oil and gas wastes and/or recycled materials may be spilled or tracked across unlined areas. 4HC did not submit a detailed stormwater management plan in the application.<sup>134</sup>

At the hearing Mr. Stewart was asked under cross examination if he was "aware of any plan 4HC has to get rid of the contact or non-contact stormwater during a major precipitation event." He replied, "I am not aware of any plans."<sup>135</sup> 4HC states in its application that "all the water within the treatment cells and the staging areas will be captured within the respective structures." The water within these structures will be allowed to infiltrate and/or be used for material treatment. All other stormwater inside the facility will be retained by the perimeter berm and it will be allowed to infiltrate and/or be used for material treatment. There are no culverts or other discharges to natural drainage.<sup>136</sup>

Mr. Kane stated during the hearing that all contact stormwater will be containerized and disposed of within 48 hours, but did not explain how the contact stormwater in the treatment pits will be removed from the containers or from the fill below the containers, except to say they would use vacuum trucks. Non-contact stormwater would either be allowed to infiltrate or evaporate or be removed with vacuum trucks or through a NPDES permit.<sup>137</sup> MCCG believes that the facility design will allow wastes to be spilled throughout the site, during the transport of wastes on an unlined haul road from the receiving pad to the treatment area with a frontend loader, allowing the spilled waste to be mixed with non-contact stormwater that will then be allowed to infiltrate or evaporate.

Mr. Kissock was asked if letting the stormwater sit until it evaporates is sound management. He answered that he did not think that it was a sound approach because

<sup>129</sup> Tr. Vol. 2, pg.12, Ins.1-19; pg.13, Ins 7-18; pg.41, Ins19 -25. 4HC Ex. 4-3.

<sup>130</sup> 4HC Ex. 2 at 4HC JN 002968; 4HC Ex. 4-2

<sup>131</sup> Tr. Vol. 2, pg.18, Ins 7-25.

<sup>132</sup> Tr. Vol. 2, pg.12, Ins1-19, 4HC Ex. 4-3

<sup>133</sup> Tr. Vol. 2, pg. 13, Ins 7-18.

<sup>134</sup> Tr. Vol. 2, pg. 157, Ins 18-25; pg.158, Ins, 1-4. Tr. Vol. 3. pg. 57, Ins 7-18. 4HC Ex.4-3.

<sup>135</sup> Tr. Vol. 1, pg. 152, Ins 6-10.

<sup>136</sup> Tr. Vol. 2, pg. 53, Ins 1-8. 4HC Ex. 2, Tab 3, Bates No. 002967. 4HC Ex. No. 5

<sup>137</sup> Tr. Vol. 3, pg. 94, Ins 1-6.

*"You're shut down that entire timeframe and so basically you can't operate. And not only can you not operate while you have (standing) water, but even after the water would evaporate or was removed, you've still got to let those waste management units dry out. Otherwise, you just gonna create massive ruts and, you know, you've got a tracking problem already with waste. So it just exacerbates that problem as well."*<sup>138</sup>

Mr. Kissock also testified that allowing stormwater to sit for extended periods will allow stormwater to infiltrate vertically through surface soils and potentially take contaminants with it. Consequently, Mr. Kissock testified that 4HC's stormwater management plan was a "grossly flawed" approach and that 4HC needed a viable mechanism to remove water from the facility, such as a separate retention pond, injection well or discharge permit.<sup>139</sup> Currently 4HC does not have a retention pond or access to an injection well and has not applied for a NPDES permit.<sup>140</sup>

Mr. Kissock performed volumetric calculations of the stormwater generated during the 25-year and 100-year storm events. He determined that removing stormwater from a 25-year rainfall event requires 349 vacuum truck loads to remove the stormwater, or more than 7 trucks per hour to remove the stormwater within a 48-hour period. The 100-year rainfall event requires 437 truckloads, or over 9 trucks per hour to remove the water within 48 hours. Mr. Kissock further noted that the access road to the 4HC facility is currently totally unimproved and not capable of handling heavy truck traffic, and even ordinary ranch trucks encounter problems during heavy rains. Mr. Kissock testified that in his opinion the facility will have to shut down for an extended period during heavy rains.<sup>141</sup>

### Spills

MCCG has concerns about waste spillage and the lack of a detailed remediation plan. MCCG pointed to 4HC witness Richard Galloway, who claimed that 4HC does not anticipate many spills, but will deal with any spills immediately. However, in an email Mr. Galloway admitted, *"the more the material is handled the more likely spills and accidents are,"* and *"[n]o matter what system we use there will be spills, it's inevitable."*<sup>142</sup> MCCG asserts that Mr. Galloway failed to provide any detail as to how 4HC will ensure spills are cleaned up promptly and thoroughly. Mr. Galloway admitted under questioning by the Examiners that 4HC did not submit a plan in the application to remediate spillage.<sup>143</sup>

<sup>138</sup> Tr. Vol. 2, pg. 157, lns 1-25, pg. 158.

<sup>139</sup> Tr. Vol. 2, pg. 157, lns 7-17; pg. 158, lns 5-17.

<sup>140</sup> Tr. Vol. 1, pg. 152, lns 6-10.

<sup>141</sup> . MCCG Ex. 21; Tr. Vol. 2, pg. 154, lns 1-25; pg. 155, lns 1-25. Tr. Vol. 2 156: 2-17 V2: 107:10-15.

<sup>142</sup> Tr. Vol. 3, pg.124, lns,12-21. MCCG Cross. Ex. 8 at 4HC-003118.

<sup>143</sup> Tr. Vol. 3, pg. 101, lns 1-25; pg. 101, lns 1-9.



Treatment Process

MCCG contends the proposed remediation process will not be effective in remediating hydrocarbon and chloride contaminated waste.

Hydrocarbon Treatment

4HC proposes to treat wastes by applying a bioremediation process by mixing native soils from the 4HC property, fertilizer and indigenous bacteria to treat hydrocarbons. For road base, 4HC intends to add caliche as necessary to meet compressive strength requirements. Mr. Kane admitted that 4HC has not performed any treatability studies of the waste streams, such as drill cuttings that 4HC proposes to accept at the facility, to determine what needs to be done to those waste streams to make the proposed products.<sup>144</sup> He also admitted that he had not tested the native soils for suitable bacteria that could be used to remediate the wastes.<sup>145</sup>

Treatment of Chlorides and Salts

Mr. Kane testified that 4HC proposes to meet the chloride, SAR, ESP and EC standards for road base and reusable product by diluting chloride contaminated wastes with native soils from the 4HC property.<sup>146</sup> Commission permit standards for recycled road base and recycled products have chloride limits of 700 mg/L and 500 mg/L, respectively. The Commission's permit standards for recyclable product additionally include maximum limits for SAR (12); ESP (15); and electrical conductivity, or "EC", of 8.0 mmhos/cm.<sup>147</sup>

Mr. Kissock testified that chlorides are the primary limiting constituent when it comes to oil and gas waste "pretty much across the board."<sup>148</sup> He stated, "It's the problem it's the parameter we have the most problems with in land treatment, in recycling road base and in reusable product."<sup>149</sup> He went on to say, "*These road base and reuse recycling facilities, their primary waste stream turns out to be cuttings, so those cuttings tend to have high salt levels, high chloride levels, and that tends to be the overriding parameter that we have the most trouble working with.*"<sup>150</sup> He stated that in his previous work at Osage Environmental's Rozpal Recycling Facility, he performed chloride sampling of the unprocessed drill cuttings as they were received at the facility. He testified that the chloride levels in the cuttings was 2,800 milligrams per liter (mg/l). He pointed out that the Commission's regulatory limit for chlorides in road base is 700 mg/l and 500mg/l for reusable product.<sup>151</sup>

MCCG noted that 4HC's own analytic data for soil samples show that most of the soil samples from 4HC's property have native ESP and SAR levels that exceed the Commission's maximum allowable levels for reusable product.<sup>152</sup>

<sup>144</sup> Tr. Vol. 1, pg. 238, lns 18-25. pg. 239, lns 1-44; Tr. Vol. 3, pg. 106, lns 23-25. pg. 107, ln 1.

<sup>145</sup> Tr. Vol. 3, pg. 107, lns 2-15.

<sup>146</sup> Tr. Vol. 1, pg. 233, lns 15-25; pg. 234, lns 1-13.

<sup>147</sup> MCCG Exhibit 6.

<sup>148</sup> Tr. Vol. 2, pg. 110, ln 22.

<sup>149</sup> Tr. Vol. 2, pg. 110, lns 20-25.

<sup>150</sup> Tr. Vol. 2, pg. 111, lns 19-24.

<sup>151</sup> Tr. Vol. 2, pg. 112, lns 1-25; pg. 112 lns 1-25, pg. 112, lns 1-25, pg. 114, lns 1-18. MCCG Exhibit 7.

<sup>152</sup> Tr. Vol. 2, pg. 121, lns, 3-25, pg. 122, lns 1-5, 4HC Ex. 14, pg. 12 000754).

Metals

4HC did not submit a treatment plan for metals remediation in the application and did not submit testimony or evidence into the record at the hearing.

Facility Capacity

MCCG expressed concerns that 4HC did not provide information on the anticipated volumes of waste in accordance with 16 Tex. Admin. Code § 4.251(4)(A), which requires an applicant to “identify anticipated volumes” of wastes to be accepted at the facility. MCCG stated that 4HC provided no information in the application stating the anticipated volumes that 4HC proposes to accept at the facility on a monthly or yearly basis.<sup>153</sup>

Mr. Kissock testified that the “anticipated volumes” requirement is a critical requirement because *“Unless you know what the volumes that the facility is going to handle, there's no way to know how to gauge throughput or how large the facility needs to be, how much storage they need, how much treatment capacity and whatnot they need to be able to handle the amount of material that they're planning on receiving.”* Mr. Kissock further testified that there is a serious problem with waste facilities continuing to accept quantities of waste exceeding their storage and throughput capacity.<sup>154</sup>

Reusable Product:

MCCG contends that 4HC's remediation process to produce road base and recyclable product will not meet Commission standards. In MCCG's *Response to 4HC Closing*, MCCG states, “It is undisputed that 4HC has no experience in the recycling business and neither Mr. Kane or Mr. Stewart have any experience in manufacturing road base or reusable product.” MCCG stated the record demonstrates that in designing 4HC's recycling process, 4HC and its experts did not understand the treatment measures required to meet numerous environmental and engineering standards in the Commission's criteria for recycled road base and recycled product.<sup>155</sup>

MCCG asserts that 4HC has no plan to treat chlorides, ESP, SAR and salts. The Commission's chloride limits are 500 mg/l for recyclable product and 700 mg/l for road base. The Commission standards for recyclable product also include limits for SAR (12) and ESP (15%). The treatment process 4HC is proposing for lowering chlorides is to mix the high chloride wastes with native soils.

MCCG contends that the evidence in the record clearly shows that the majority of the native soil samples submitted by 4HC exceed the ESP and the SAR values for recyclable product. 4HC performed SAR analysis on 9 of the 13 soil samples taken by 4HC. The average SAR value is 23.1. Only 2 of the 9 samples had values lower than Commission standards. Test Pit-2 (TP-2) indicated an SAR value of 7.04 at 10 feet bgl. TP-5 showed an SAR value of 5.87 at a depth of 6 feet. Twelve of the 13 soil samples

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<sup>153</sup> Tr. Vol. 1, pg. 264, Ins 11-15.

<sup>154</sup> Tr. Vol. 2, pg. 139, Ins 2-11. pg. 136 Ins 6 -25, pg. 137, Ins 1-21.

<sup>155</sup> MCCG Closing, pg. 36, Section D, paragraph 2. Tr. V1: 44:16-21, 45:3-6, 242:4-9

from the 4HC property exceeded the ESP limits for recyclable product. Native soil ESP averages 43.7%, the limit is 15%. The SAR average in native soils is 23.1, and the limit is 12.<sup>156</sup>

Mr. Kissock testified that 4HC's plan to mix waste with native soils with high SAR and ESP *"will exacerbate the problem and compound the difficulty in trying to meet the reusable product criteria."*<sup>157</sup> Mr. Kissock was asked if he thought 4HC's plan to remediate chlorides by dilution with native soils would work. He replied, *"No. Like I said, I've had operators that were convinced that it would, and it hasn't. I think the literature is pretty clear that you really need to use a leaching process to remove the chlorides effectively."*<sup>158</sup>

Mr. Kane admitted that 4HC has no plans to use a leaching process to reduce the salts and chloride content.<sup>159</sup>

Road Base:

*Wet-Dry Durability Requirements*

MCCG contends that 4HC's process cannot meet the Commission's wet-dry durability requirements. MCCG agrees with Staff that for recycled materials to be used as road base, the Commission requires that the materials pass the ASTM wet-dry durability test.<sup>160</sup> To manufacture a road base meeting this requirement, it is necessary to induce a pozzolonic reaction by use of a binder such as cement, lime or fly ash. It is also necessary to utilize a pug mill or grinder to reduce the particle size of the road base.<sup>161</sup> Mr. Kane was asked on cross, *"When you're treating in this road base process, you don't intend to do anything to induce a pozzolanic reaction in the road base materials, do you?"* Mr. Kane replied, *"I do not."*<sup>162</sup>

Mr. Kane was also asked in cross if he was going to use a pugmill to reduce the particle size of the road base. He replied that he was not going to use a pugmill. Mr. Kane testified that 4HC may use a milling attachment on the backhoe bucket to reduce particle size, but didn't specify what type of milling attachment would be used or how it would be used.<sup>163</sup>

MCCG does not believe 4HC's process will be sufficient to treat the materials to a level that will meet the Commission's ASTM wet-dry durability test as required in 16 Tex. Admin. Code § 4.258(b)(2)(C). There was no evidence submitted as part of the application that dealt with the wet-dry durability requirements. During the hearing Mr.

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<sup>156</sup> 4HC Exhibit No.14, Table 3, Summary of Test Pit Chemistry. 4HC Ex. 8 RRC Permit Requirements for Reusable Product.

<sup>157</sup> Tr. Vol. 2, pg. 122, Ins 6-13.

<sup>158</sup> Tr. Vol. 2, pg. 115, Ins 6-9. pg. 117, Ins 22-25. Pg. 118, Ins 1-19. MCCG Cross-Ex. 5, excerpts from Dr. Lloyd Deuel and Dr. George Holliday's Guidebook for Waste and Soil Remediation and discusses studies assessing problematic salt parameters in samples of solids from drill pit sites. MCCG Cross-Ex. 10.

<sup>159</sup> Tr. Vol. 1, pg. 238, Ins 9-15.

<sup>160</sup> 16 TAC § 4.258(b)(2)(C); Tr. Vol. 3, pg. 61, Ins 7-19.

<sup>161</sup> Tr. Vol. 2, pg. 130 Ins 17-25, pg. 131, Ins 1-22. Pg. 133, Ins 6-12 MCCG Ex. 16, Method for Making a Road Base Material Used in Treated Oil and Gas Waste Material.

<sup>162</sup> Tr. Vol. 1, pg. 241, Ins 3-11.

<sup>163</sup> Tr. Vol. 1, pg. 241, Ins 12-25. Pg. 242, Ins 1-3.

Kane testified that one would be done during the trial run but did not provide any details on how the test would be performed.<sup>164</sup>

*Environmental and Engineering Criteria for Road Base or Recyclable Product.*

MCCG contends 4HC has not performed any treatability studies and did not present any evidence explaining how 4HC plans to treat the waste to achieve Commission criteria for TPH, chlorides, SAR, ESP, EC, metals and wet-dry durability.<sup>165</sup>

*Materials Market*

MCCG asserts that the application and record show that 4HC does not have a market for the products.<sup>166</sup>

*Closure Cost Estimate*

MCCG agrees with Staff that 4HC did not submit an accurate detailed closure plan and cost estimate. 16 Tex. Admin. Code § 4.253 requires that the applicant submit "a *detailed* plan for closure of the facility" that "address[es] *how* the applicant intends to: (1) remove waste, partially treated waste, and/or recyclable product from the facility; (2) close all storage areas/cells; (3) remove dikes; (4) contour and reseed disturbed areas; (5) sample and analyze soil and groundwater throughout the facility; and (6) plug groundwater monitoring wells."

Mr. Kissock testified that the Cost Closure plan submitted in the application is not a viable closure plan as it fails to provide the information necessary to physically close the facility. Mr. Kissock determined that the plan does not meet the Commission's minimum requirements. A closure estimate was submitted in the application; however, Mr. Stewart admitted under cross that the closure cost estimate includes errors, as 4HC used incorrect assumptions regarding the cost of disposal of materials in the roll-off boxes. 4HC incorrectly assumed disposal costs based on 90% liquid waste rather than solid wastes, which are significantly more expensive to dispose of than fluid wastes. Staff specifically cited this error, among others, as a basis for the Commission's September 18, 2017 Second Administrative Denial.<sup>167</sup> Mr. Stewart testified "*there was an initial closure cost estimate included in the first recycling submittal, but as we went along, that design changed. Until you have a final design, there's really no sense to prepare a closure cost estimate because you're just -- if you do and the design changes, you have to redo it over and over and over again.*"<sup>168</sup>

**EXAMINERS' ANALYSIS OF THE EVIDENCE**

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<sup>164</sup> Tr. Vol. 3, pg. 85, lns 18-25, pg. 86, lns 1-6.

<sup>165</sup> Tr. Vol. 3, pg. 107, ln 1.

<sup>166</sup> Tr. Vol. 1, pg. 75, lns 17-25; pg. 76, lns 1-14.

<sup>167</sup> Tr. Vol. 2, pg. 145, lns 3-25; pg. 146, ln 1. Tr. Vol. 2, pg. 160, lns 20-25; pg. 161, lns 1-22. Vol. 3, lns 41:7-25, pg. 44, lns 1-6.

<sup>168</sup> Tr. Vol. 1, pg. 119, lns 3-9.

Due to the multiple technical deficiencies in this application the Examiners recommend that the application be denied. 4HC has not demonstrated that the design of the proposed facility meets Commission standards and that the operation of the proposed stationary recycling facility and associated pits will not harm surface or groundwater resources. 4HC failed to show their application is complete. Moreover, failure to provide minimum information required by rule means that 4HC cannot demonstrate that the proposed operations will not result in the pollution of surface and groundwater or the waste of hydrocarbons.

### **Overall Facility Design:**

The Examiners conclude that a final site design was not submitted into the record. 4HC admits that all calculations were based on USGS data and an actual survey was not performed. Additionally, all facility design schematics in the application are marked as not for construction use and contain design errors.

#### Berms

The Examiners give no weight to 4HC's claim that the suitability of native soils for berm construction is demonstrated by the existence of two stock tanks constructed on the 568 acre lease from native materials or that the "*abstract, theoretical*" arguments made by MCCG about soil chemistry and material suitability deserve no weight and should be ignored.<sup>169</sup>

The Examiners conclude that the native soils are not suitable for use in berm construction and will not be protective of surface or groundwater. The native soils that 4HC plans to use are highly sodic dispersive soils that will erode or collapse during precipitation events.

#### Liners

The Examiners conclude that the use of single layer HDPE liners beneath the treatment area, staging pads, and fluid storage tanks is not protective of groundwater. There are no proposed secondary liners, leak detection systems or leachate collection system under any of the HDPE liners, and no groundwater monitoring is proposed for the facility.

#### Groundwater

Richard Galloway, 4HC's managing principal, testified that there was no groundwater monitoring proposed for the facility. The Examiners conclude the lack of a groundwater monitoring plan is not protective of surface or groundwater.

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<sup>169</sup> Tr. Vol. 1, pg. 33, Ins. 5-25, pg. 114, Ins. 22 -25; pg. 116, ln 1. Tr. Vol. 1, pg. 33, pg. 114, Ins. 3-9. 4HC closing, pg. 10 Ins 4-7. 4HC Reply to Protestants' Closing, pg. 7, Ins 5-11.

### Spills

The Examiners conclude that a spill remediation plan was not submitted in the application or during the hearing.

### **Remediation Plan:**

The Examiners have determined that the proposed remediation plan will not effectively remediate the wastes to Commission standards. The Examiners give little weight to Mr. Kane's claim that the facility design and remediation plan was based on a successful project he completed in East Texas. The Examiners further note that Mr. Kane did not submit into the record any evidence to support his claim.

## **CONCLUSIONS AND RECOMMENDATIONS**

The Examiners recommend that the application be denied. 4HC has not demonstrated that the design of the proposed facility meets Commission standards and the operation of the proposed stationary recycling facility and associated pits will not harm surface or groundwater resources, as required by Statewide Rule 8.

## **FINDINGS OF FACT**

1. Notice of the application was mailed on December 23, 2016, to those on the service list. On June 21, June 28, July 5 and 12, 2017, an amended notice of the application was published in *The Progress*, a newspaper of general circulation in McMullen County.
2. 4HC seeks authority to construct and operate a commercial facility for the treatment of non-hazardous oil and gas waste under the jurisdiction of the Railroad Commission of Texas ("Commission") in McMullen County, Texas.
3. 4HC has a current and active Form P-5 *Organization Report*.
4. The application was twice deemed administratively incomplete, and a draft permit was not issued.
5. The site for the proposed facility is an 8-acre tract out of the 568-acre Lester Powers Ranch in McMullen County, Texas.
6. The Site is located approximately 20 miles south of Tilden, north of FM 624.

7. The application is protested by RRC Staff and the McMullen County Conservation District.
9. The Site consists of rolling pasture land covered with brush and cactus. The site slopes to the northeast.
10. Shallow groundwater occurs beneath the Site at a depth of 12-15 feet beneath the areas of the site.
11. The Carrizo Aquifer is the primary source of fresh water in McMullen County. The top of the Carrizo Aquifer in McMullen County is at depth of 4,000 feet.
12. The facility will accept only RCRA-exempt non-hazardous oil and gas waste and non-hazardous oil and gas waste subject to the Commission's jurisdiction.
13. The facility will consist of:
  - A single berm around the facility constructed of general fill found onsite;
  - One 150 cubic yard receiving pit (CN 12526-R);
  - One truck washout pad (CN-012430);
  - Six 22' x 8' x 8' steel roll-off boxes (E-12523 A-F) for waste treatment, on the east side of the treatment area;
  - Six 22' x 8' x 8' steel roll-off boxes (W-12524 A-F) for waste treatment, on the west side of the treatment area;
  - One staging pit for road base (CN- 12525);
  - One staging pit for recycled product. (CN-12553);
  - Two 500 barrel storage tanks for contact stormwater;
  - Four tanks for freshwater that 4HC stated will be used in the bioremediation process; and
  - One 55 gallon used oil/recycled hydrocarbon drum.
14. All treatment pits, staging pads, and storage tank batteries will be constructed with a single 60-mil High Density Polyethylene (HDPE) liner.
15. No secondary liner, leak detection or leachate collection system are proposed to be installed beneath the HDPE liners.

16. Access to the facility will be restricted by a fence around the entire facility and a gate at the entrance that will be manned 24 hours a day.
17. A detailed stormwater management plan was not submitted.
18. The proposed treatment pits and receiving pit are not designed with sufficient capacity to hold the predicted contact storm water runoff from a 25-year precipitation event with 2 feet of freeboard.
19. The proposed remediation plan will not adequately treat the wastes to Commission treatment standards for road base or reusable product.
20. There is no process to remediate metals.
21. The proposed waste management and recycling operations may result in the pollution of surface or groundwater.
22. Waste of oil, gas or geothermal resources will result from the proposed recycling operation.

#### **CONCLUSIONS OF LAW**

1. Resolution of the subject application is a matter committed to the jurisdiction of the Railroad Commission of Texas. Tex. Nat. Res. Code § 81.051
2. All notice requirements have been satisfied.
3. Ground and surface fresh water will not be adequately protected from pollution. Texas Water Code § 27.051(b)(3).



Based on the above findings of fact and conclusions of law, the Examiners recommend denying the application of 4 Halfcircle Remediation, LLC pursuant to Statewide Rules 4, 8 and 78 for a permit to maintain and operate the commercial stationary treatment facility in McMullen County, Texas.

Respectfully submitted,



Richard Eyster, P. G.  
Technical Examiner



Clayton J. Hoover  
Administrative Law Judge