

INVESTIGATION REPORT FOR RITCO AND BEST AGRICULTURE INDUSTRY

1. DETAILS OF INSPECTION:

1.1 Name and Address of Company: Raja International Trading Company (RITCO) AND Best Agriculture International (BAI)
Mount Barclay, Paynesville, Monrovia Liberia

1.2 Telephone: +231776025097

1.3 Email Address:

1.4 Responsible Representative: Cllr. Joseph W. Blay

1.5 Name of Regulatory Inspectors:

Name	Position
1. Mr. Joseph F. Charles	Laboratory Technician
2. Mr. Stephen Gibson	Industrial Remediation Analyst
3. Mrs. Adama Johnson	Health and Safety Officer
4. Mr. Varney Armah	Radiation Safety Analyst
5. Ms. Nora Innis	Intern
6. Prosper N. Tarley	Environmental Inspector
7. Edwin P. Kezelee	Environmental Inspector

1.6 Date of the previous inspection: January 19, 2023

1.7 Date of current inspection: June 22, 2023

1.8 Type of inspection: Investigation

2. TERMS OF REFERENCE

A team of Environmental Research and Radiation Safety Technicians from the Environmental Protection Agency (EPA) were dispatched to investigate ‘corrosive odor emission’ at RITCO and Best Agriculture Incorporated (BAI) facilities in Mount Barclay, Montserrado County, following a request filed by RITCO management. RITCO operates an alcoholic and other beverage production plant while Best Agriculture operates a used engine oil recycling facility within the Mount Barclay Community, Montserrado County. The team was tasked to conduct detailed investigation by physical observations, water samples collection and air quality readings within selected locations in and around RITCO, BAI and Lofa Community.

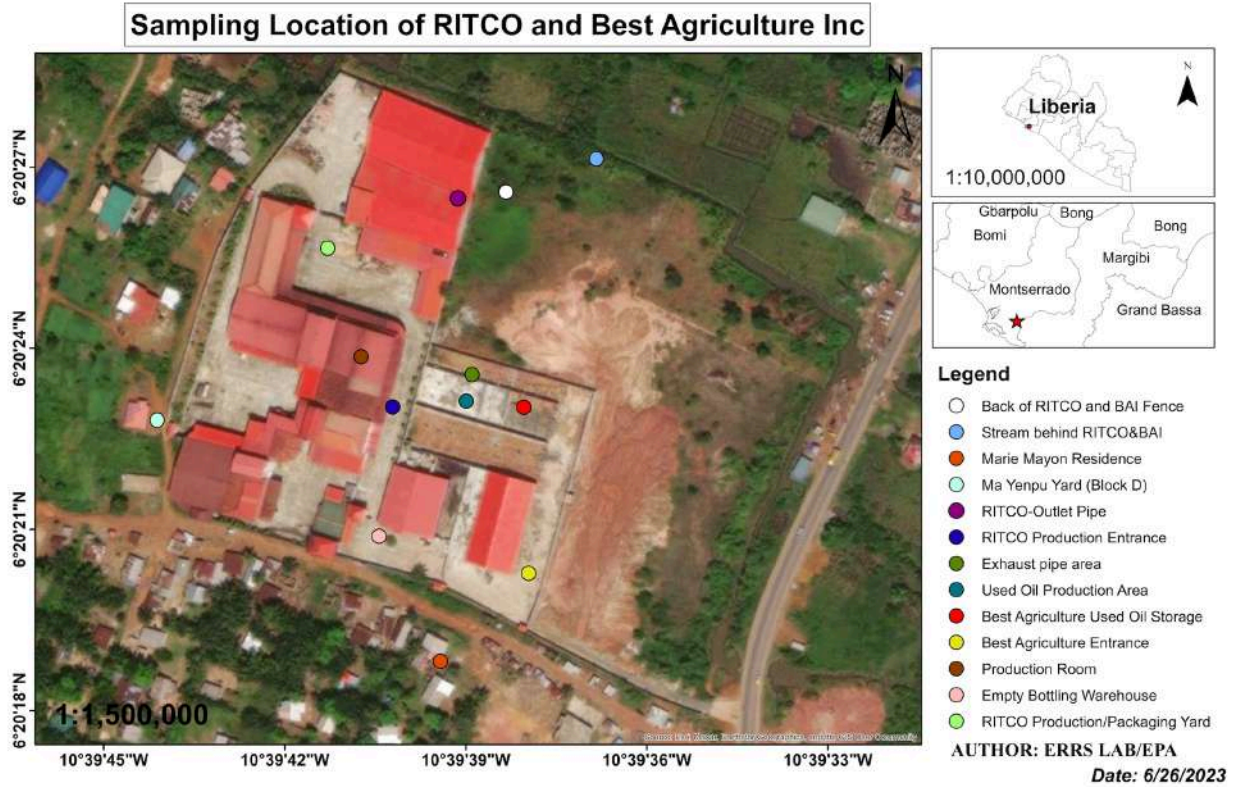


Figure 1: Ariel Map of Study area

3. ENTRANCE BRIEFING

A briefing was held at the facility to highlight, investigation purpose, and expectations. In attendance were the following:

Name	Position
Mr. Joseph F. Charles	Laboratory Technician
Mr. Stephen Gibson	Industrial Remediation Analyst
Mrs. Adama Johnson	Health and Safety Officer
Mr. Varney Armah	Radiation Safety Analyst
Ms. Nora Innis	Intern

Prosper N. Tarley	Environmental Inspector
Edwin P. Kezelee	Environmental Inspector
Augustus G. Charlie	Chairman, Lofa Community
James T. Kollie	Chairman, Block C
Junior M. Model	Acting Youth Co-Chair
Elijah Z. Cooper	Youth Chair
Abraham O.N. Freeman	Youth Advisor
Beauty Pewee	Youth
Abraham Y. Mator	Youth Secretary
Oretha Dorlan	RITCO Staff
Andrew S. Massaley	Resident, Lofa Community
Arthur B. Vaye	Elder
Marie T.S. Mayon	Resident, Lofa Community
Att. Joseph W. Blay	Legal counsel, RITCO
Adam B. Fahnbullah	Liberian National Police
James Gaye	Liberian National Police

4. INVESTIGATION FINDINGS

4.1 Key Points from Opening Meeting

OBSERVATIONS:

RITCO

1. Protesters (mostly youth) from Lofa Community were found at the entry of RITCO and Best Agriculture facilities.
2. RITCO and BAI met with the community in a meeting in Clara Town and an understanding was reached to invite EPA to independently probe the matter.
3. There is a standing unresolved conflict between community and RITCO.
4. There was a wastewater channel observed at the back of RITCO-discharging effluent into nearby stream.
5. Vegetation was dying at the discharged point of the wastewater into the environment.

BAI

6. BAI has started full operation about six months ago.
7. Used oil recycling Factory is fully operational that produced wastewater with a frantic odor.
8. Wastewater from the production process is stored in an empty tank inside of the operation, but no management procedure in place at the moment.
9. Used oil was found spilled in storage area but covered with saw dust.

COMMUNITY

10. Community began to experience the frantic odor emanating from RITCO and BAI since August 2022
11. Smoke was seen coming from the exhaust from the factory of Best Agriculture that produced a very bad odor in the evenings more than what had been experienced in 2022.
12. The odor causes community members not to breathe freely and some experienced eyes problems, sore throat, and red eyes.
13. Surface water in the community located at the back of RITCO facility used by community made users to have itchy skin, and peeling hands.
14. Lofa community wrote RITCO management a letter for a meeting, but the letter was denied.
15. The same odor was noticed since May 2023
16. Community later wrote RITCO management giving a seven-day ultimatum to provide solution to the problem.

R1	Recommendation: EPA engages the parties involved to amicably resolve the matter
R2	Recommendation: RITCO upgrades its storm and wastewater management plan and submit same to the EPA
R3	Recommendation: BAI develops and submits to the EPA emission management plan for the used oil factory

R4	Recommendation: BAI obtains effluent discharge license for wastewater generated in the production plant
R5	Recommendation: BAI Upgrades pollution control measures to minimize emissions of pollutants into the air
R6	BAI Implements regular monitoring and maintenance programs to ensure that emissions from the factory are minimized

5. GEO-REFERENCED POINTS OF AIR AND WATER QUALITY SAMPLINGS

GPS coordinates were collected from all locations where air and water sampling were conducted. Below are details

Table 1: GPS coordinates of all locations where air and water sampling were conducted.

Sample ID	Northings	Eastings	Location
RITCO_AQ1	06.33895	-10.66141	Empty Bottling Warehouse
RITCO_AQ2	06.340461	-10.661469	Production and Packaging Compound
RITCO_AQ3	06.339961	-10.661315	Production Room
BAI_AQ4	06.33878	-10.66074	Best Agriculture Entrance
BAI_AQ5	06.339655	-10.660591	Best Agriculture Used Oil Storage Area
BAI_AQ6	06.33948	-10.66091	Used Oil Production Area
BAI_AQ7	06.33967	-10.66089	Exhaust pipe area
BAI_AQ8	06.33973	-10.66117	Best Agriculture Storage Tanks area
RITCO_AQ9	06.34069	-10.66087	Back of RITCO and BAI Fence
LC_AQ10	06.33989	-10.66247	Ma Yenpu Yard (Block D)
LC_AQ11	06.338560	-10.660950	Marie Mayon Residence (Lofa Community)
LC_WQ1	06.3408720	-10.6602320	Stream behind RITCO and BAI
LC_WQ2	06.3407190	-10.6606480	Outlet Pipe from RITCO

Table 2: Air quality results from monitoring points within and around BAI and RITCO

Location	Air Quality Readings							
	CO ₂ (ppm)	CO (ppm)	SO ₂ (ppm)	NO ₂ (ppm)	TVOC (mg/m ³)	HCHO (mg/m ³)	PM 10 (µg/m ³)	PM 2.5 (µg/m ³)
RITCO_AQ1	231.25	-	0.00	0.01	0.02	0.03	002	002
RITCO_AQ2	487.00	-	0.00	0.00	0.03	0.05	003	003
RITCO_AQ3	532.50	-	0.02	0.03	0.94	0.77	003	003
BAI_AQ4	543.00	-	0.00	0.00	1.09	1.81	004	004
BAI_AQ5	539.00	-	0.00	0.00	9.77	9.89	005	006
BAI_AQ6	673.65	-	5.23	6.37	10.23	11.01	008	007
BAI_AQ7	923.23	-	6.75	6.12	12.76	11.76	1.79	1.98
BAI_AQ8	823.12	-	5.23	5.72	10.66	9.99	1.12	1.09
RITCO_AQ9	723.32	-	4.22	4.12	7.23	6.99	004	006
LC_AQ10	127.72	-	0.00	0.00	0.03	0.02	008	007
LC_AQ11	289.38	-	1.23	1.34	2.80	2.75	009	008
OSHA limits	1000	500.0	5.00	5.00	0.75	0.75	150	35

The findings from the sampling shows that all points were within the acceptable limits recommended by the Occupational Safety and Health Administration (OSHA) for the parameters analyzed; however the RITCO Production Room (RITCO_AQ3) reported higher values of TVOC (**0.94 mg/m³**) and HCHO (**0.77 mg/m³**); Best Agriculture Entrance (BAI_AQ4) reported higher values TVOC (**1.09 mg/m³**) and HCHO (**1.81 mg/m³**); the Best Agriculture Used Oil Storage Area (BAI_AQ4) recorded higher values of TVOC (**9.77 mg/m³**) and HCHO (**9.89 mg/m³**);

Best Agriculture Used Oil Production Area (BAI_AQ6) recorded higher values of SO₂ (**5.3ppm**), NO₂ (**6.37ppm**), TVOC (**10.23 mg/m³**) and HCHO (**11.01 mg/m³**); Best Agriculture exhaust area (BAI_AQ7) recorded higher values of SO₂ (**6.75ppm**), NO₂ (**6.12ppm**), TVOC (**12.76 mg/m³**) and HCHO (**11.76 mg/m³**); Best Agriculture Storage Tank Area (BAI_AQ8) recorded higher values of SO₂ (**5.23ppm**), NO₂ (**5.73ppm**), TVOC (**10.66 mg/m³**) and HCHO (**9.99 mg/m³**); Behind RITCO and BAI Fence (RITCO_AQ9) reported higher values of TVOC (**7.23 mg/m³**) and HCHO (**6.99 mg/m³**); and the Marie Mayon Residence in Lofa Community (LC_AQ11) recorded higher values of TVOC (**2.80 mg/m³**) and HCHO (**2.75 mg/m³**) as well.

Table 3: Parameters and Analytical Methods considered.

Parameter (Unit)	Analytical Method (Instrumentation)
pH	Colorimetry
Turbidity (NTU)	Turbidity Method
Nitrate (mg/l)	Cadmium Reduction Method
Nitrite (mg/l)	Ferrous Sulfate Method
Phosphate (mg/l)	PhosVer 3 Method
Sulfate (mg/l)	SulfaVer 4 Method
Copper (mg/l)	Porphylin Method
Iron (mg/l)	Ferro Mo Method
Chromium, hexavalent (mg/l)	Colorimetry
Cadmium (mg/l)	Spectrophotometry

Table 4: Analytical Results for Water Samples, Mount Barclay, Montserrado, County (June 2023)

Parameter (Unit)	LC_WQ1	LC_AQ11	Class I	Class II
pH	6.15	5.54	6.5- 8.0	6.0 - 9.0
Turbidity (NTU)	12.08	10.39	5.0	10.0
Nitrate (mg/l)	50.3	63.33	≤ 40.0	≤ 60.0
Nitrite (mg/l)	1.40	2.60	≤ 0.1	≤ 0.5
Phosphate (mg/l)	7.02	8.86	≤ 0.01	≤ 0.02
Sulfate (mg/l)	335.23	375.72	≤ 150.0	≤ 200.0
Copper (mg/l)	0.003	0.01	≤ 0.1	≤ 0.1
Iron (mg/l)	1.03	1.06	≤ 0.1	≤ 1.5
Chromium, hex. (mg/l)	0.05	0.04	≤ 0.05	≤ 0.1
Cadmium (mg/l)	ND	ND	ND	≤ 0.001

The water quality results were compared against the Liberia Water Quality Standards (Class I and Class II). Class I of the Standards is for drinking water whilst Class II is for domestic purposes.

Generally, the results showed elevated levels or out of range values for all parameters analyzed for the two sampling points except copper and cadmium suggesting that the water from the sampling points is not suitable for human consumption and domestic purposes.

6. EXIT BRIEFING

An exit briefing was conducted to discuss the investigation findings to highlight areas requiring urgent attention.

The exit briefing was attended by the following:

Name	Position
Mr. Joseph F. Charles	Laboratory Technician
Mr. Stephen Gibson	Industrial Remediation Analyst
Mrs. Adama Johnson	Health and Safety Officer
Mr. Varney Armah	Radiation Safety Analyst
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James Gaye	Liberian National Police

7. ACTION NOTICES

The company should implement all the recommendations within **seven days** of receiving this report, and the representatives shall notify the EPA with evidence of those implementations.

1. ANNEX

Pictorial View



Plate 1: EPA Technician collecting water samples at the Back of RITCO in Lofa Community



Plate 2: Investigation team along with RITCO, BAI and Community Representatives during investigation at BAI Used Oil storage Area



Plate 3: Effluent discharge point at the Back of RITCO and BAI



Plate 4: EPA investigation team conducting air quality reading at Ma Yunpu Residence, Block C, Lofa Community