recognised as a serious threat to the quality of life enjoyed by the larger population.

Noise has been associated with important cardiovascular health problems (Ising et al, 1999). In 1999, the World Health Organization concluded that the available evidence suggested a weak association between long-term noise exposure above 67-70 dB(A) and hypertension (Berglund et al, 1999). More recent studies have suggested that noise levels of 50dbA at night may also increase the risk of myocardial infraction by chronically elevating cortical production (Maschke, 2003; Franssen et al, 2004).

The large minority of today's cars and heavy duty vehicles travel by using internal combustion engines that burn petrol or other fossil fuels. The process of burning petrol to power cars and heavy duty vehicles contributes to air pollution by releasing a variety of emissions into the atmosphere. Emissions that are released directly into the atmosphere from the exhaust pipes of cars and trucks are the primary sources of vehicular pollution. Motor vehicles also pollute the air during the process of manufacturing, refueling, and from the emissions associated with oil refining and distribution of the fuel they burn. Primary pollution from motor vehicles is pollution that is emitted directly into the atmosphere, whereas secondary pollution results from chemical reaction between pollutants after they have been released into the air.

Problem Statement:

At present, not much is known about the overall environmental pollution patterns of Minna and Suleja. Without a doubt, it is now generally accepted that the menace of environmental pollution poses serious risks to the health of the general populace.

Aim of Study:

The research result would be tailored towards general enlightenment whence the government and the general populace would [illegible] of the hazards of environmental pollution in Minna and Suleja towns of Niger State.

Scope of Study:

For this survey, Minna and Suleja were partitioned according to the available cadastral maps. The cadastral maps were procured in sheets, and on each of these sheets the settlements layouts are clearly shown; these sheets formed the basis of the survey guides for the research team members.

Literature Review:

Jonah et al (2008) pointed out that only a limited amount of research works have been carried out in Nigeria with respect to noise level measurements within Nigerian cities. The same argument can also be made for measurements regarding vehicular emission within Nigerian cities. On noise measurements, Abumere et al (1999) carried out a study to investigate noise pollution within Port-Harcourt City. Their research concluded that noise exposure limits in Port-Harcourt City exceeds the value recommended by the International Environmental Protection Agency (IEPA), i.e. 70dB. They suggested some strategies for limiting noise levels in Port-Harcourt city. Menkiti (1976) highlighted the fact that the incidence of impaired hearing in Nigeria could be blamed on exposure to noise (Abumere et al, 1999). Onuu and Menkiti (1993) have analyzed the spectra of road traffic noise for parts of southeastern Nigeria and they concluded that this type of noise dominates the low frequency range, 500-800Hz (Abumere et al, 1999).

In his study of vehicular emission, environmental and health implications, Enemari (2001) pointed out that vehicular emissions in typical urban centres constitute over 60% of the total pollutant emission compared to what anyone will naturally hope, think or assumed. He recommended for proper servicing of vehicles for optimal performance and this should be encouraged. Also, he recommended that the refineries in

the country should be fully evaluated with the aim of redesigning them to produce entirely unleaded petrol in the very near future. Furthermore, the use of catalytic converters in vehicles that uses unleaded petrol to control photochemical seeding was recommended.

Bishop and Stedman (1996) have pioneered and developed an instrument to remotely measure vehicle emissions. In several studies it has been found that about 10% of the fleet generates more than 50% of total emissions of carbon monoxide (CO). Most cars are clean but a small number of malfunctioning or tampered with vehicles produce a major amount of regulated and un-regulated emissions. Idle tests are generally known to be a poor indicator of true emissions.

The Microsoft Encarta (2008) stated that most hearing loss occurs in workplaces. Workers may be unable to avoid unhealthy noise, and where exposure may continue for years. Factory workers, construction workers, farmers, military personnel, police officers, firefighters, and musicians all have reason to be concerned about their occupational exposure to noise. Even at levels below those that cause hearing loss, noise pollution produces problems. Noise makes conversation difficult, interferes with some kinds of work, and disturbs sleep. As a source of stress, it can promote high blood pressure and other cardiovascular problems, as well as nervous disorders. Noise also puts stress on domestic animals and wildlife. In remote areas, helicopters and military aircraft often frighten animals. Aircraft noise in Alaska, for example, has been shown to reduce the survival rate of caribou calves. There is concern that increasing noise levels in the oceans may confuse the natural sonar that whales use to navigate, communicate, and locate food.

Ouise (2002) has addressed the negative effects resulting from the exposure to road traffic noise on people's well being. Following observations, the writer said annoyance was one of the first and most direct reaction on environmental noise, and that the continuous exposure of people to road traffic noise lead to suffering from various kinds of discomfort; this he said reduced the number of their well being elements. He also said his conclusion was still determined by non-acoustical factors like sensitivity, socio-economic situation and age. He reported that certain quantitative relationship between the objective quantities characterizing road traffic noise was established. Finally, he pointed out that the importance of these findings could be in more efficient ways of planning road traffic activity, in order to provide some succour.

Shih (1971) saw noise as sound with little or no periodicity, with its essential characteristic of undesirability. He then defined noise as any annoying or unwanted sound. Also, he pointed out that the rapid increase of noise level in the environment was a national public health hazard, and that noise affects man's state of mental, physical and social well-being, saying it was a type of air pollution. The author saw his work as an attempt to arrive at the understanding of the general situation on the problem of noise, being, a rather new subject among other branches of science. His survey consisted of four major parts: the present status of noise pollution, its sources, its effects, and the control.

Field Equipment

Sound Level Meter: The standard Xtech A-weighted noise level meter was used to measure noise levels for the purpose of this research.

Gas Meters: Various gas meters specific to the measurements of gas types like sulphur dioxide (SO_2), carbon monoxide (CO), chlorine (Cl_2), hydrogen cyanide (HCN), nitrogen dioxide (NO_2), ammonia (NH_3), and hydrogen sulphide (H_2S) were used for this project work.

Description of Data Collection Sequences

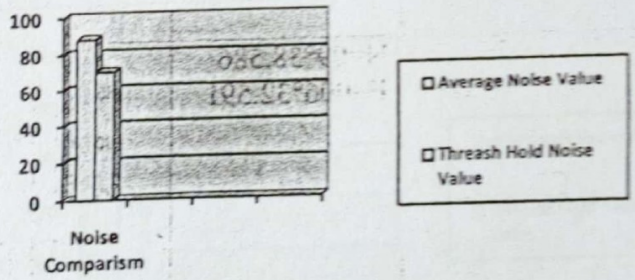
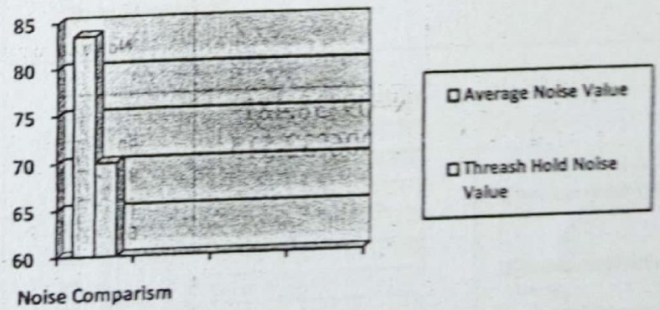
At the commencement of work each member of the study group was guided by at least one cadastral map. The cadastral maps for each person were carefully studied and interpreted before the recording exercise which required the use of hand-held Global Positioning System (GPS) units, noise level meter, and the different gas samplers. Each cadastral map was interpreted carefully and at least fifty (50) data points were collected for each cadastral map.

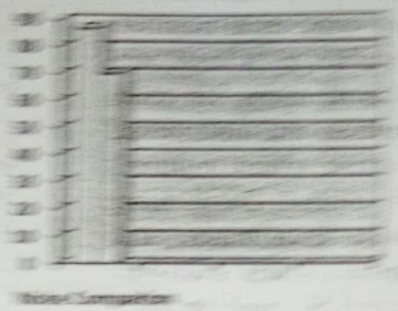
Results and Data Analysis

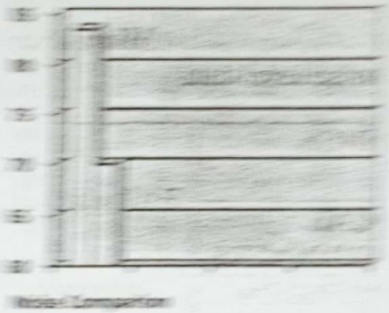
The abridged dataset of some stations of interest for Minna and Suleja are presented in the tables and figures shown hence. Note that for each town, at least 600 stations were established.

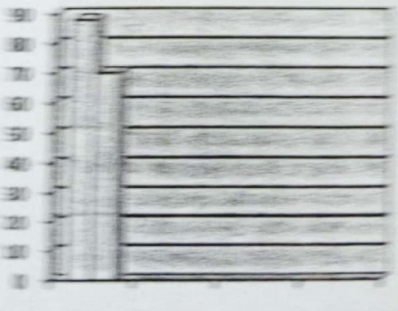
Minna Sheets

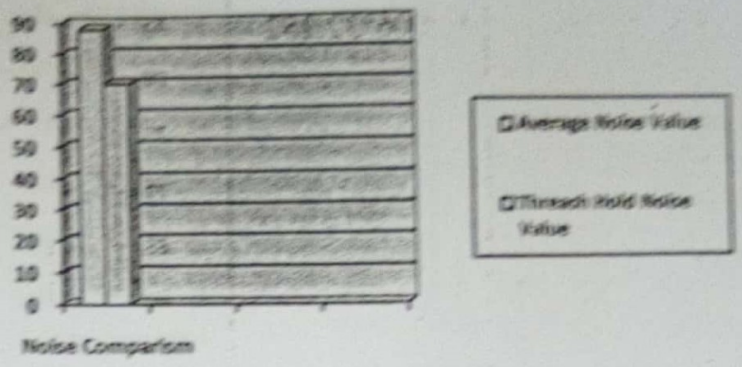
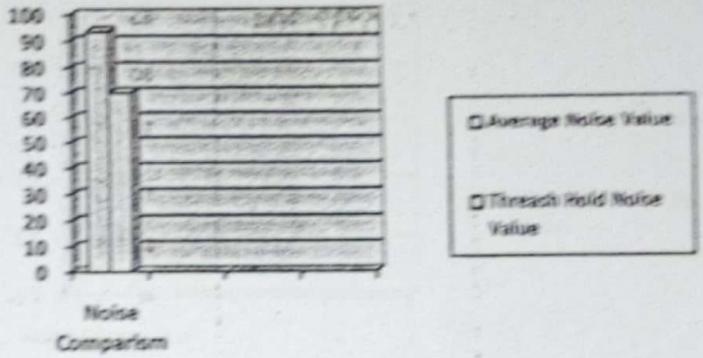
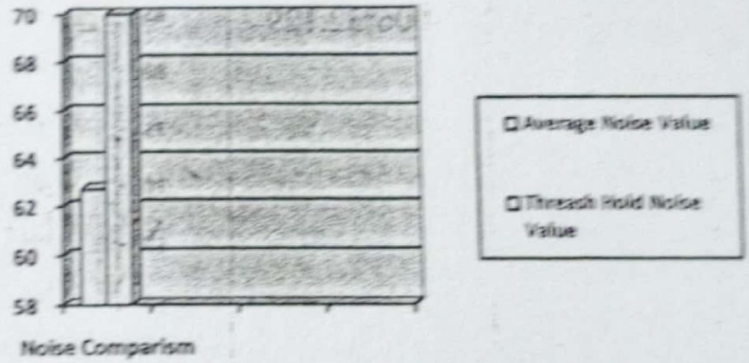
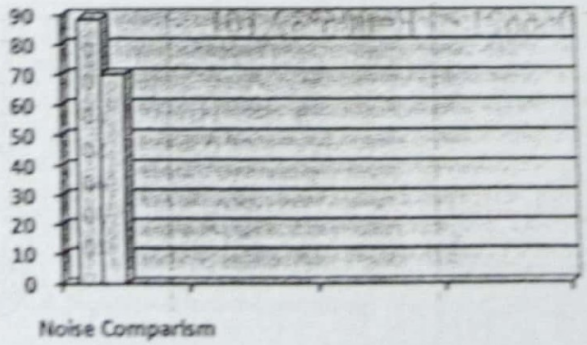
Table 1: Geo-referenced noise level data

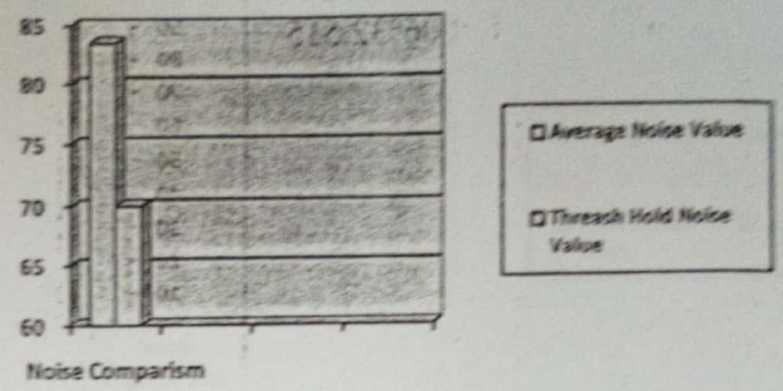
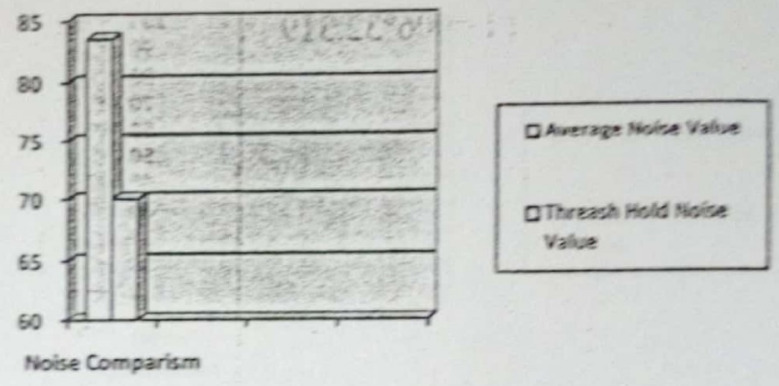
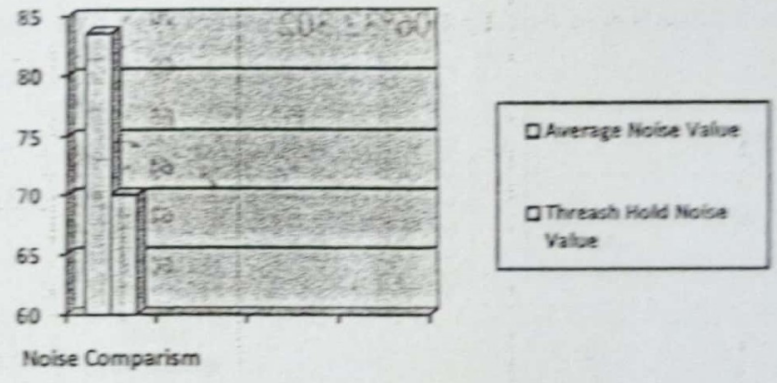
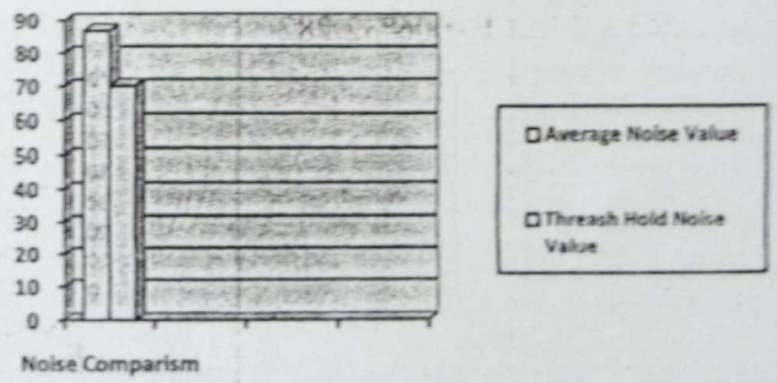
	GPS READINGS		BAR CHARTS
	UTM	LOCAL CORDINATES	
1	X=0230595 Y1066893	N=09°38.624 E=006°32.713	
2	X=0230457 Y=1067067	N=09°38.718 E=006°32.637	

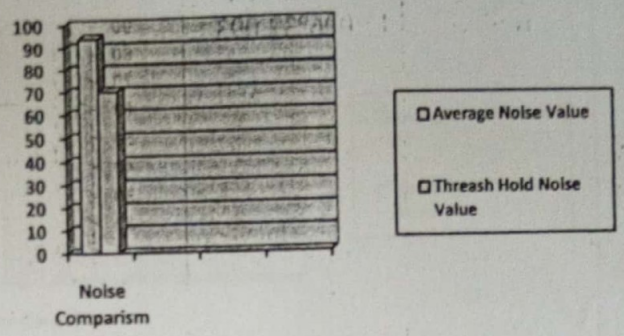
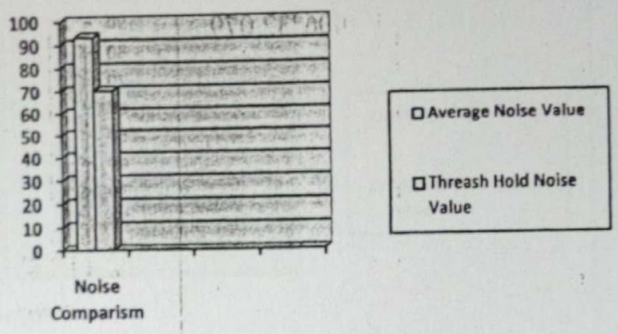
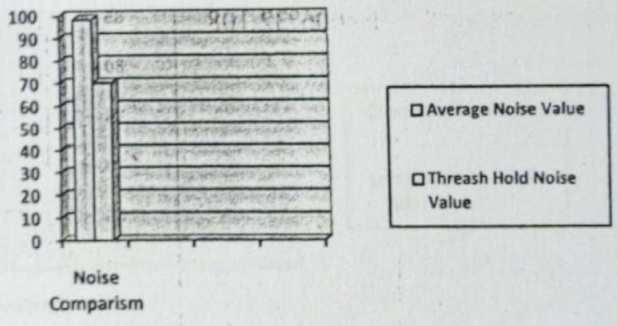
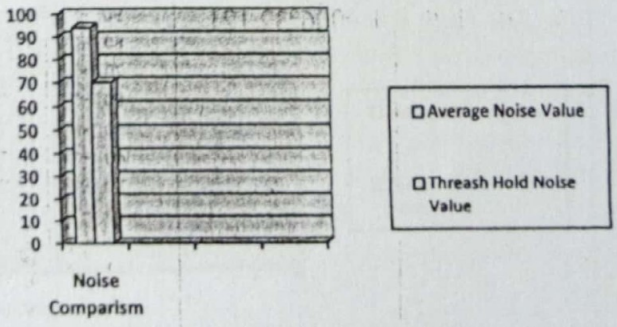


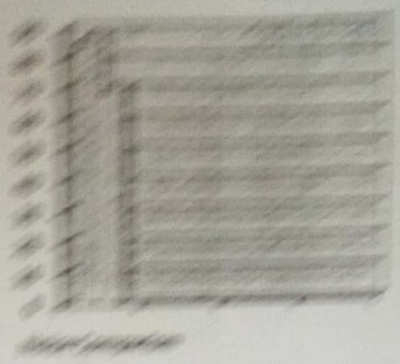


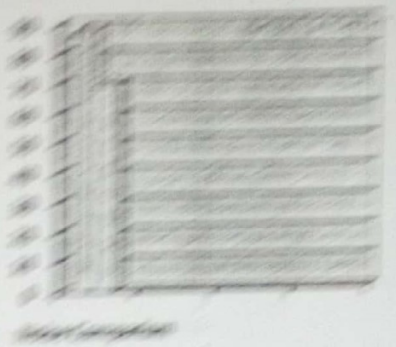


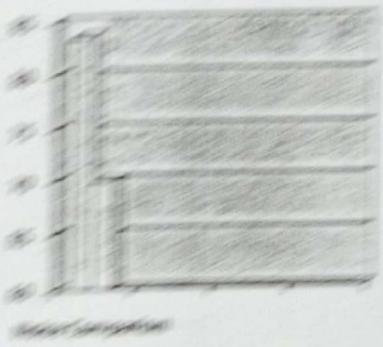
7	X=0230231 Y=1066632	N=09°38.481 E=006°32.515	
8	X=0229872 Y=1066666	N=09°38.498 E=006°32.319	
9	X=0229841 Y=1066642	N=09°38.485 E=006°32.302	
10	X=0229804 Y=1066635	N=09°38.481 E=006°32.282	

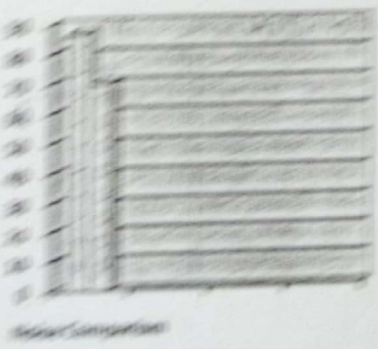
11	X=0229749 Y=1066615	N=09°38.470 E=006°32.252	
12	X=0229661 Y=1066603	N=09°38.463 E=006°32.204	
13	X=0229524 Y=1066631	N=09°38.478 E=006°32.129	
14	X=0229473 Y=1066621	N=09°38.472 E=006°32.101	

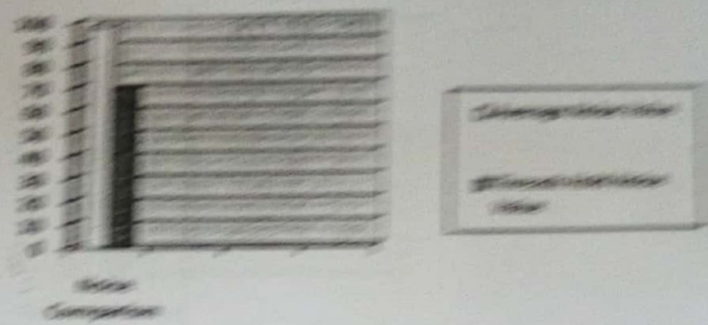
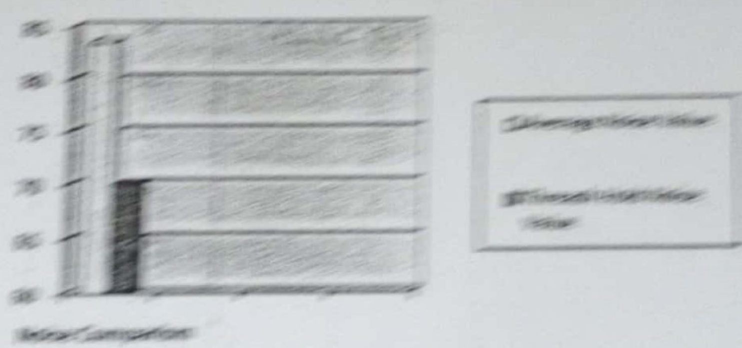
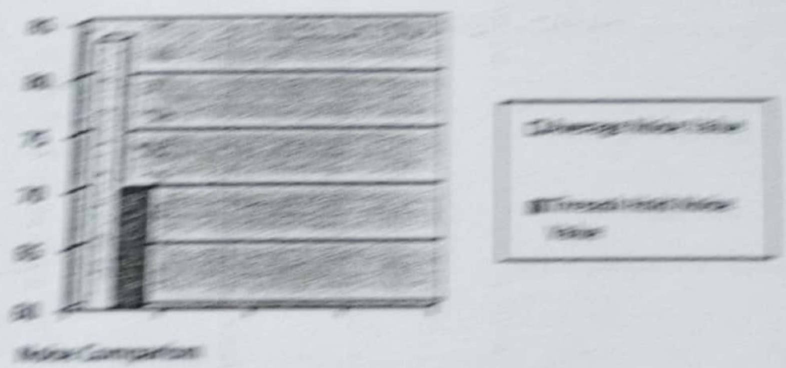
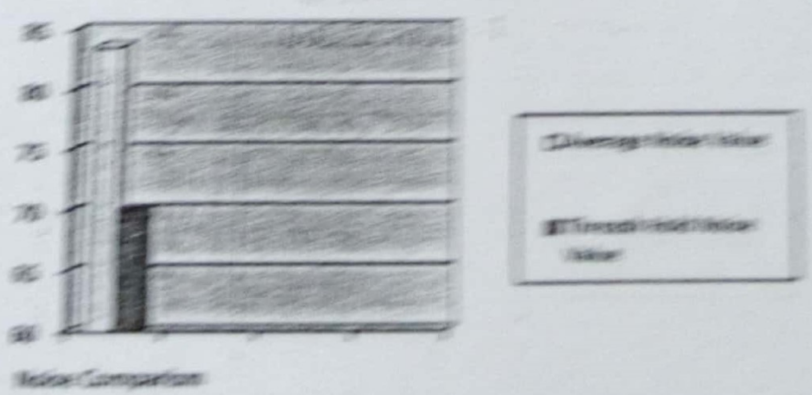
15	X=0229438 Y=1066617	N=09°38.470 E=006°32.082	
16	X=0229391 Y=1066745	N=09°38.581 E=006°32.056	
17	X=0229377 Y=1066739	N=09°38.536 E=006°32.048	
18	X=0229467 Y=1066886	N=09°38.616 E=006°32.097	

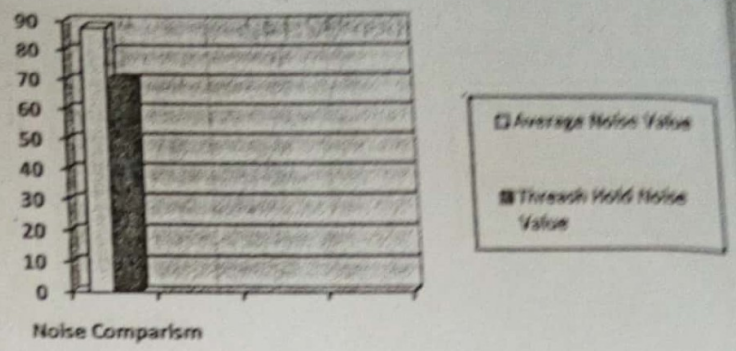
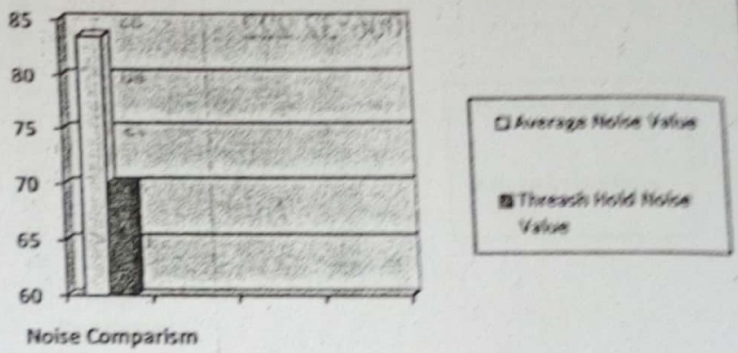
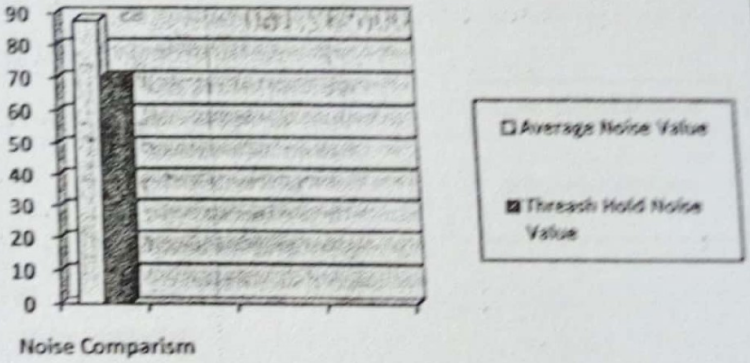
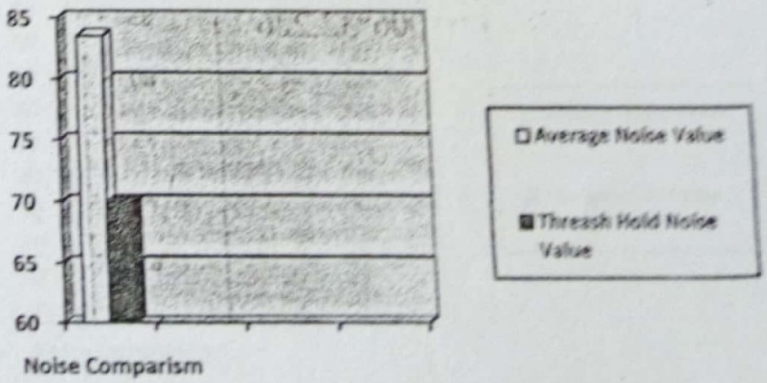


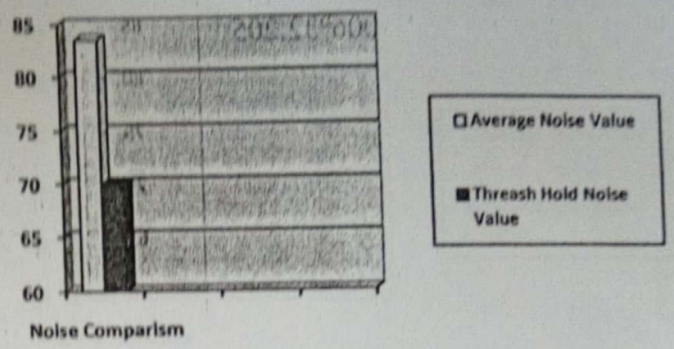
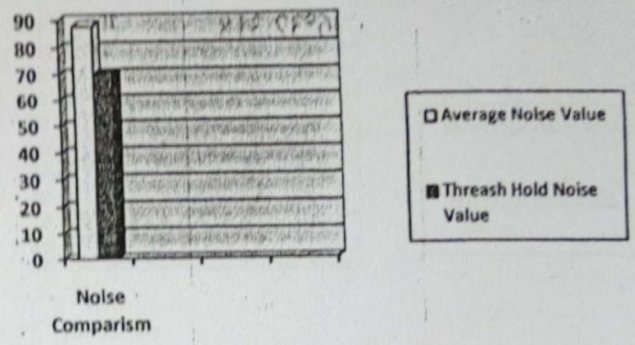
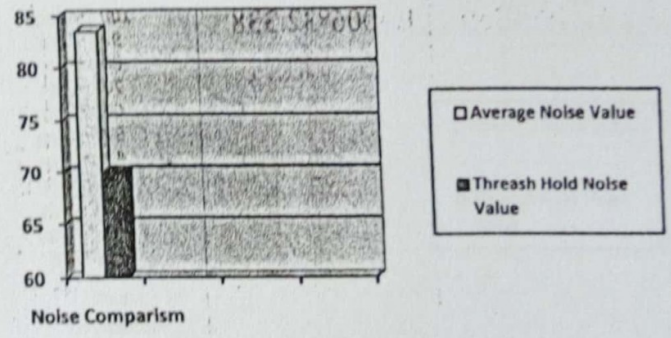
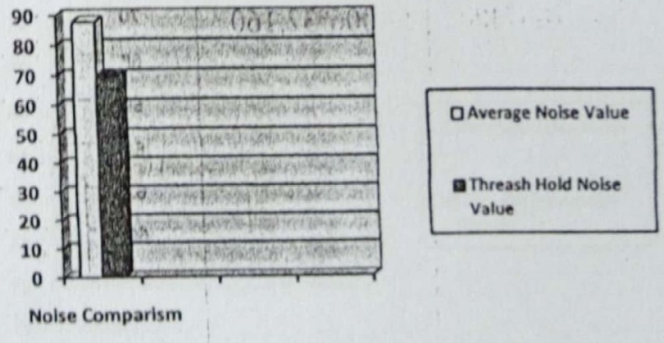


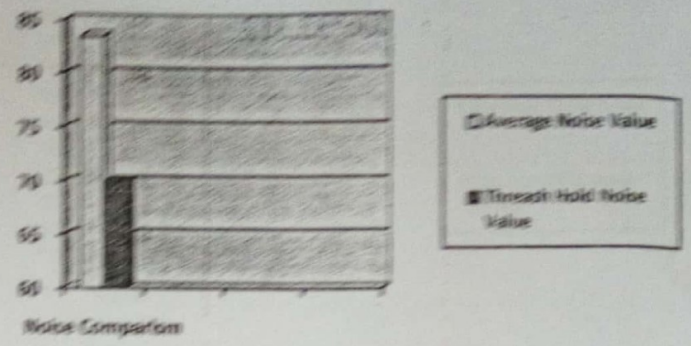
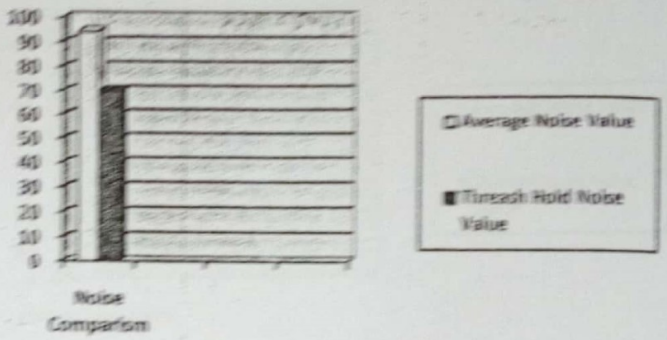
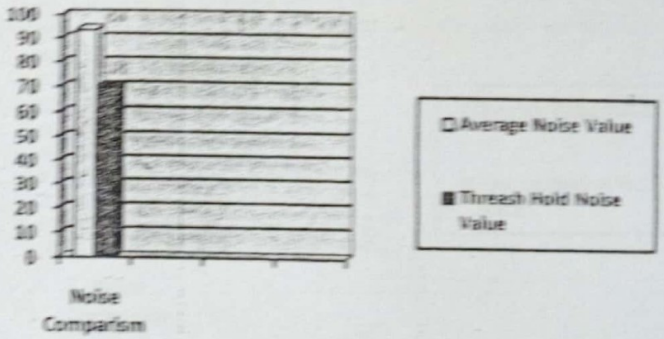
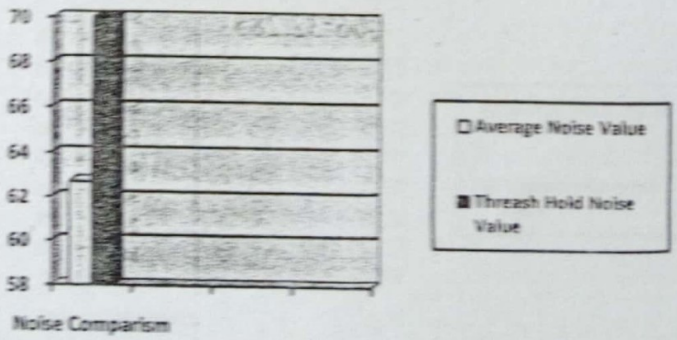


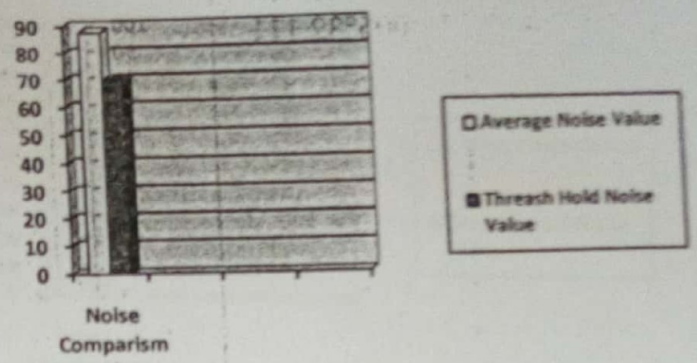
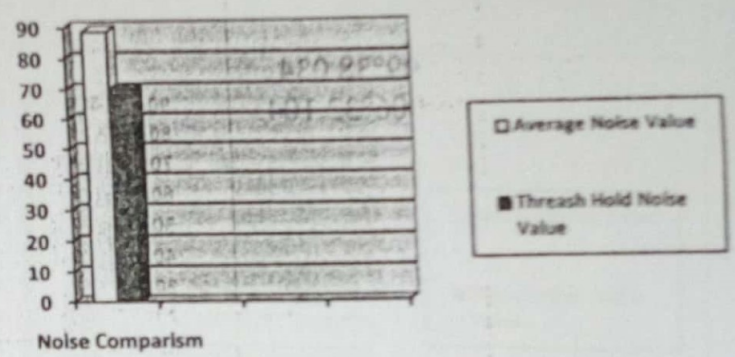
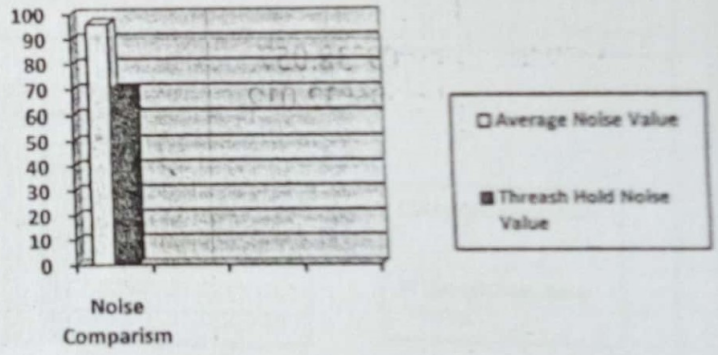
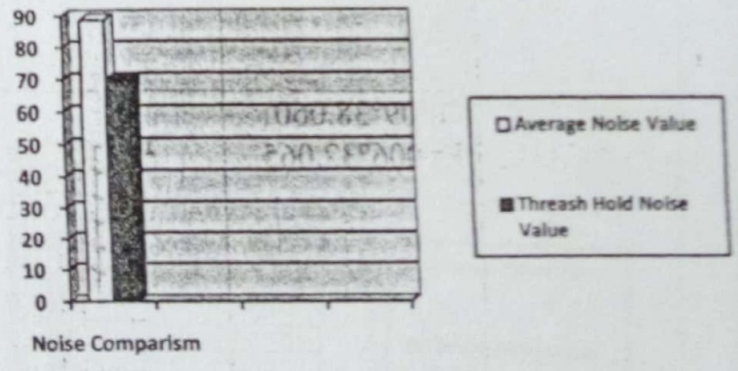


23	X=0229552 Y=1067540	N=09°38.754 E=006°32.142	
24	X=0229698 Y=1067139	N=09°38.754 E=006°32.222	
	X=0229585 Y=1067149	N=09°38.759 E=006°32.160	
	X=0229705 Y=1067128	N=09°38.748 E=006°32.226	

27	X=0229709 Y=1067109	N=09°38.738 E=006°32.228	
28	X=0229725 Y=1067078	N=09°38.721 E=006°32.237	
29	X=0229714 Y=1067032	N=09°38.696 E=006°32.231	
30	X=0228766 Y=1066990	N=09°38.672 E=006°32.260	

31	X=0229862 Y=1066990	N=09°38.674 E=006°32.312	
32	X=0229775 Y=1066936	N=09°38.644 E=006°32.265	
33	X=0229862 Y=1066990	N=09°38.674 E=006°32.312	
34	X=0229812 Y=1067024	N=09°38.692 E=006°32.285	

35	X=0229787 Y=1065967	N=09°38.119 E=006°32.205	
36	X=0229874 Y=1067123	N=09°38.746 E=006°32.318	
37	X=0229919 Y=1067250	N=09°38.815 E=006°32.338	
38	X=0229586 Y=1067400	N=09°38.895 E=006°32.160	

39	X=0229577 Y=1067372	N=09°38.880 E=006°32.155	
40	X=0229618 Y=1067455	N=09°38.925 E=006°32.177	
41	X=0229592 Y1067472	N=09°38.934 E=006°32.163	
42	X=0229631 Y=1067590	N=09°38.957 E=006°32.184	

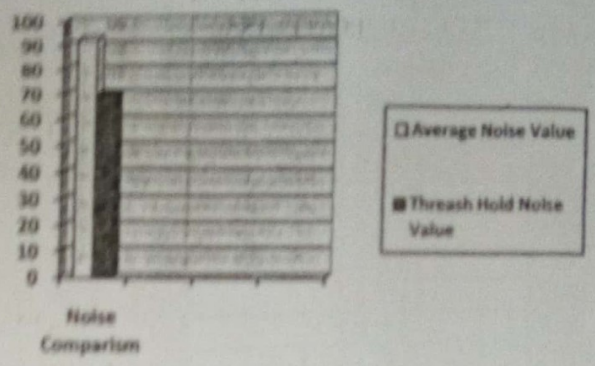
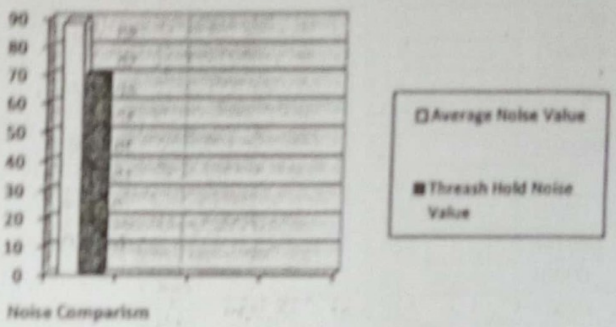
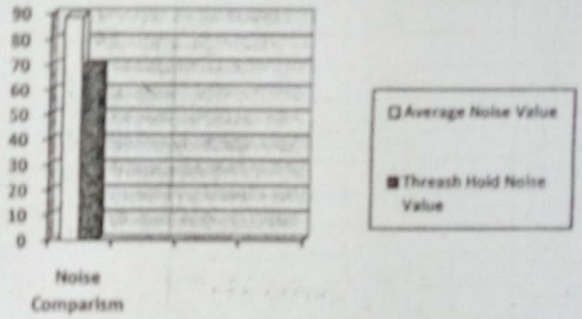
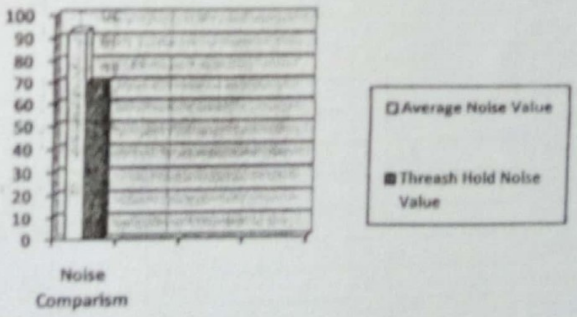
43	X=0229498 Y=10675813	N=09°38.998 E=006°32.111	
44	X=0229472 Y=1065813	N=09°38.034 E=006°32.104	
45	X=0229304 Y=1065856	N=09°38.057 E=006°32.012	
46	X=0229401 Y=1065861	N=09°38.060 E=006°32.065	

Table 2: Corresponding Gas Data Log

	GPS VALUES		GAS SAMPLES	MEAN GAS VALUES (ppm)	MEAN GAS VALUES ($\mu g/m^3$)
	UTM VALUE	LOCAL COORDINATE			
1	X=0230595 Y1066893	N=09°38.624 E=006°32.713	SO2	0.0727	72700
			CO	0.0051	5100
			CL2	0.0167	16700
			HCN	0.079	79000
			NO2	0.0081	8100
			NH3	0.0133	13300
			H2S	0.095	95000
2	X=0230588 Y1066933	N=09°38.646 E=006°32.709	SO2	1.27	1270000
			CO	0.67	670000
			CL2	0.22	220000
			HCN	0.91	910000
			NO2	0.77	770000
			NH3	0.13	130000
			H2S	0.34	340000
3	X=0230457 Y=1067067	N=09°38.718 E=006°32.637	SO2	0.0125	12500
			CO	0.21	210000
			CL2	0.00	0.00
			HCN	0.0015	1500
			NO2	0.501	501000
			NH3	0.01	10000
			H2S	0.015	15000
4	X=0230365 Y=1066981	N=09°38.671 E=006°32.587	SO2	0.0127	12700
			CO	0.047	47000
			CL2	0.25	250000
			HCN	0.3	300000
			NO2	0.027	27000
			NH3	0.073	73000
			H2S	0.062	62000
5	X=0230400 Y=1066820	N=09°38.584 E=006°32.607	SO2	0.0125	12500
			CO	0.21	210000
			CL2	0.00	0.00
			HCN	0.0015	15000
			NO2	0.501	501000
			NH3	0.01	10000
			H2S	0.015	15000
6	X=0230371 Y=1066819	N=09°38.583 E=006°32.591	SO2	0.0125	12500
			CO	0.21	210000
			CL2	0.00	0.00
			HCN	0.0015	1500
			NO2	0.501	501000
			NH3	0.01	10000
			H2S	0.015	15000
7	X=0230211 Y=1066766	N=09°38.554 E=006°32.504	SO2	0.0127	12700
			CO	0.047	47000
			CL2	0.25	250000
			HCN	0.3	300000
			NO2	0.027	27000
			NH3	0.073	73000
			H2S	0.067	62000
8	X=0230231 Y=1066632	N=09°38.481 E=006°32.515	SO2	0.0727	72700
			CO	0.0051	5100

			CL2	0.0167	16700
			HCN	0.079	79000
			NO2	0.0081	8100
			NH3	0.0133	13300
			H2S	0.095	95000
9	X=0230231 Y=1066632	N=09°38.498 E=006°32.437	SO2	0.00833	8300
			CO	1.0533	105300
			CL2	0.27	270000
			HCN	0.0026	2600
			NO2	0.01846	18460
			NH3	0.04	40000
			H2S	0.0074	7400
10	X=0229749 Y=1066615	N=09°38.470 E=006°32.252	SO2	0.0125	12500
			CO	0.21	210000
			CL2	0.00	0.00
			HCN	0.0015	1500
			NO2	0.501	501000
			NH3	0.01	10000
			H2S	0.015	15000
11	X=0229661 Y=1066603	N=09°38.463 E=006°32.204	SO2	0.0125	12500
			CO	0.21	210000
			CL2	0.00	0.00
			HCN	0.0015	1500
			NO2	0.501	501000
			NH3	0.01	10000
			H2S	0.015	15000
12	X=0229473 Y=1066621	N=09°38.472 E=006°32.101	SO2	1.27	1270000
			CO	0.07	70000
			CL2	0.022	22000
			HCN	0.91	910000
			NO2	0.77	770000
			NH3	0.01	10000
			H2S	0.07	70000
13	X=0229438 Y=1066617	N=09°38.470 E=006°32.082	SO2	0.0081	8100
			CO	0.007	70000
			CL2	0.003	3000
			HCN	0.0013	13000
			NO2	0.0030	3100
			NH3	0.015	15000
			H2S	0.0022	2200
14	X=0229391 Y=1066745	N=09°38. E=006°32.	SO2	0.0081	8100
			CO	0.007	70000
			CL2	0.003	3000
			HCN	0.0013	13000
			NO2	0.0031	3100
			NH3	0.015	15000
			H2S	0.0022	2200
15	X=0229377 Y=1066739	N=09°38.537 E=006°32.056	SO2	0.083	83000
			CO	0.2	200000
			CL2	0.57	570000
			HCN	0.02	20000
			NO2	0.14	140000
			NH3	0.10	100000
			H2S	0.21	210000
16	X=0229461	N=09°38.616	SO2	0.0081	8100

	Y=1067071	E=006°32.097	CO	0.007	70000
			CL2	0.003	3000
			HCN	0.0013	13000
			NO2	0.0031	3100
			NH3	0.015	15000
			H2S	0.0022	2200
17	X=0229467 Y=1066886	N=09°38.684 E=006°32.093	SO2	1.27	1270000
			CO	0.07	70000
			CL2	0.022	22000
			HCN	0.91	910000
			NO2	0.77	770000
			NH3	0.01	10000
			H2S	0.07	70000
18	X=0229436 Y=1067034	N=09°38.696 E=006°32.079	SO2	0.665	665000
			CO	0.51	510000
			CL2	0.167	167000
			HCN	0.00	0.00
			NO2	0.08	80000
			NH3	0.13	130000
			H2S	0.65	650000
19	X=0229489 Y=1067118	N=09°38.742 E=006°32.108	SO2	0.0125	12500
			CO	0.21	210000
			CL2	0.00	0.00
			HCN	0.0015	1500
			NO2	0.501	501000
			NH3	0.01	10000
			H2S	0.015	15000
20	X=0229513 Y=1067139	N=09°38.753 E=006°32.121	SO2	1.27	1270000
			CO	0.07	70000
			CL2	0.022	22000
			HCN	0.91	910000
			NO2	0.77	770000
			NH3	0.01	10000
			H2S	0.07	70000
21	X=0229552 Y=1067140	N=09°38.754 E=006°32.142	SO2	0.083	83000
			CO	0.2	200000
			CL2	0.57	510000
			HCN	0.02	20000
			NO2	0.14	140000
			NH3	0.10	10000
			H2S	0.21	210000
22	X=0229585 Y=1067140	N=09°38.759 E=006°32.160	SO2	0.0125	12500
			CO	0.21	210000
			CL2	0.00	0.00
			HCN	0.0015	1500
			NO2	0.501	501000
			NH3	0.01	10000
			H2S	0.015	15000
23	X=0229698 Y=1067139	N=09°38.754 E=006°32.222	SO2	0.00	0.00
			CO	0.21	210000
			CL2	0.00	0.00
			HCN	0.0015	1500
			NO2	0.501	501000
			NH3	0.01	10000
			H2S	0.015	15000

24	X=0229705 Y=1067128	N=09°38.748 E=006°32.226	SO2	0.0125	12500
			CO	0.21	210000
			CL2	0.00	0.00
			HCN	0.0015	1500
			NO2	0.501	501000
			NH3	0.01	10000
			H2S	0.015	15000
25	X=0229709 Y=1067109	N=09°38.738 E=006°32.228	SO2	0.072	72000
			CO	0.513	513000
			CL2	0.167	167000
			HCN	0.00	0.00
			NO2	0.081	81000
			NH3	0.13	130000
			H2S	0.065	65000
26	X=0229725 Y=1067078	N=09°38.721 E=006°32.237	S02	0.0125	12500
			CO	0.21	210000
			CL2	0.00	0.00
			HCN	0.0015	1500
			NO2	0.501	501000
			NH3	0.01	10000
			H2S	0.015	15000
27	X=0229714 Y=1067032	N=09°38.696 E=006°32.231	SO2	0.072	72000
			CO	0.513	513000
			CL2	0.16	167000
			HCN	0.00	0.00
			NO2	0.0081	81000
			NH3	0.01	130000
			H2S	0.065	65000
28	X=0229766 Y=1066987	N=09°38.672 E=006°32.260	SO2	0.0125	12500
			CO	0.21	210000
			CL2	0.00	0.00
			HCN	0.0015	1500
			NO2	0.501	501000
			NH3	0.01	10000
			H2S	0.015	15000
29	X=0229775 Y=1066936	N=09°38.644 E=006°32.265	SO2	0.072	72000
			CO	0.513	513000
			CL2	0.016	167000
			HCN	0.00	0.00
			NO2	0.0081	81000
			NH3	0.01	130000
			H2S	0.065	65000
30	X=0229862 Y1066990	N=09°38.674 E=006°32.312	SO2	0.0125	12500
			CO	0.21	210000
			CL2	0.00	0.00
			HCN	0.015	1500
			NO2	0.501	501000
			NH3	0.01	10000
			H2S	0.015	15000
31	X=0229812 Y=1067024	N=09°38.692 E=006°32.285	SO2	0.072	72000
			CO	0.513	513000
			CL2	0.016	167000
			HCN	0.00	0.00
			NO2	0.0081	81000

			NH3	0.01	130000
			H2S	0.065	65000
2	X=0229812 Y=1065967	N=09°38.746 E=006°32.318	SO2	0.072	72000
			CO	0.513	513000
			CL2	0.016	167000
			HCN	0.00	0.00
			NO2	0.0081	81000
			NH3	0.01	130000
			H2S	0.065	65000
3	X=0229921 Y=1067095	N=09°38.731 E=006°32.344	SO2	0.12	
			CO	0.37	
			CL2	0.27	
			HCN	0.04	
			NO2	0.07	
			NH3	0.01	
			H2S	0.0069	
34	X=0229577 Y=1067372	N=09°38.880 E=006°32.155	SO2	0.072	72000
			CO	0.513	513000
			CL2	0.016	167000
			HCN	0.00	0.00
			NO2	0.0081	81000
			NH3	0.01	130000
			H2S	0.065	65000
35	X=0229592 Y=1067471	N=09°38.934 E=006°32.163	SO2	0.083	83000
			CO	0.2	200000
			CL2	0.57	570000
			HCN	0.02	20000
			NO2	0.14	140000
			NH3	0.10	100000
			H2S	0.21	210000
36	X=0224210 Y=1065861	N=09°38.066 E=006°32.065	SO2	0.00833	8300
			CO	1.0533	1053300
			CL2	0.27	270000
			HCN	0.0026	2600
			NO2	0.0186	18600
			NH3	0.04	40000
			H2S	0.0074	7400

Table 5: Pie chart representation of the noise level characteristics of neighbourhoods: Minna Ma

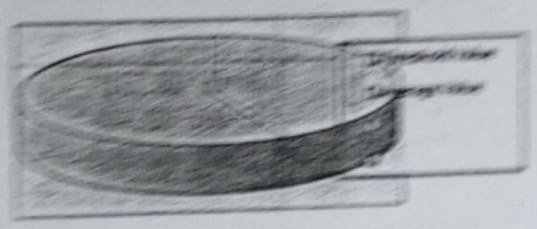
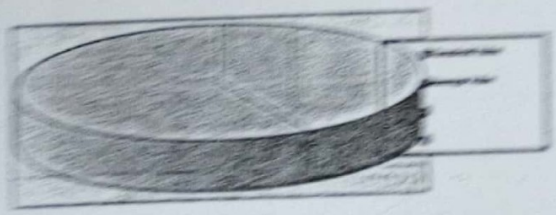
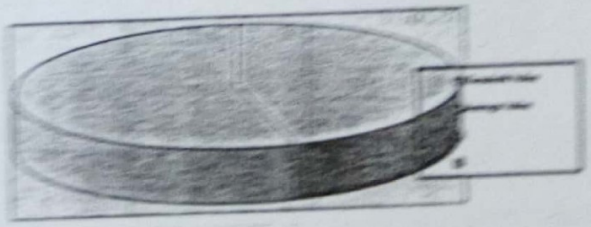
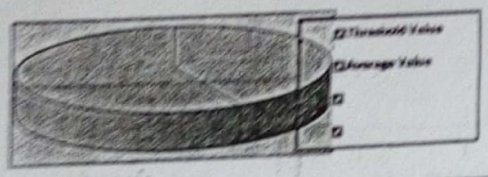
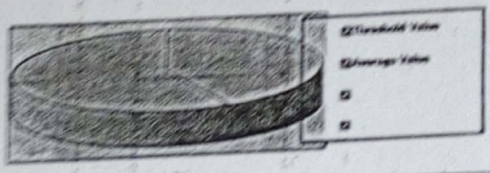
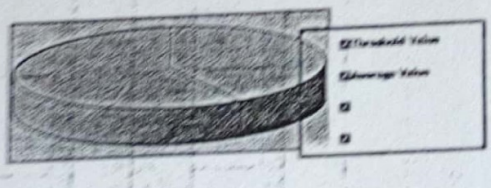
Neighbourhoods	Discrete sources of noise in the neighbourhoods	Pie chart representation
Commissioners Quarters and environs	Generator Welding machine Vulcanizing machine	
Central Mosque and environs	Generator Grinding machine Welding machine Vulcanizing machine	
Dr. Umaru Faruk Road and environs	Generator	

Table 4: Pie Chart Representation of the Noise Level Characteristics of neighbourhoods: Minna Sheet 23

Neighbourhoods	Discrete sources of noise in the neighbourhoods	Pie chart representation
Sabon Gari market	Generator Grinding Machine Welding Machine Vulcanizer	
MOPOL base	Generator Grinding Machine Welding Machine Vulcanizer	
Railway Club	Generator Grinding Machine Welding Machine	

Bar Chart Representation of the Values of the Sources of Noise: Minna Sheet 18

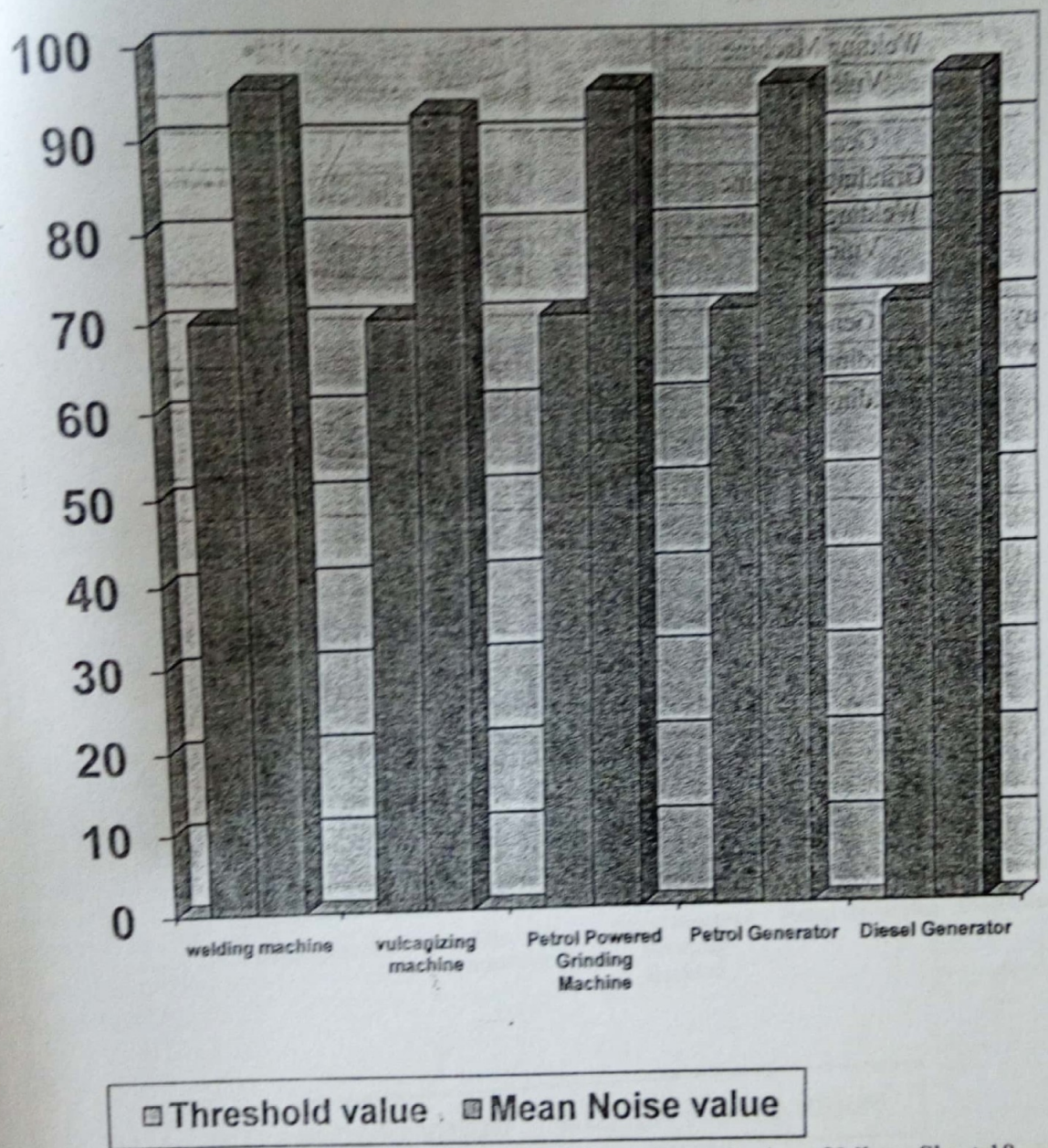


Fig.1: Bar chart representation of the values of the sources of noise of Minna Sheet 18. Unit of vertical axis in dBA.

Bar Chart Representation of the Values of the Sources of Noise: Suleja Sheet 300/015/SE

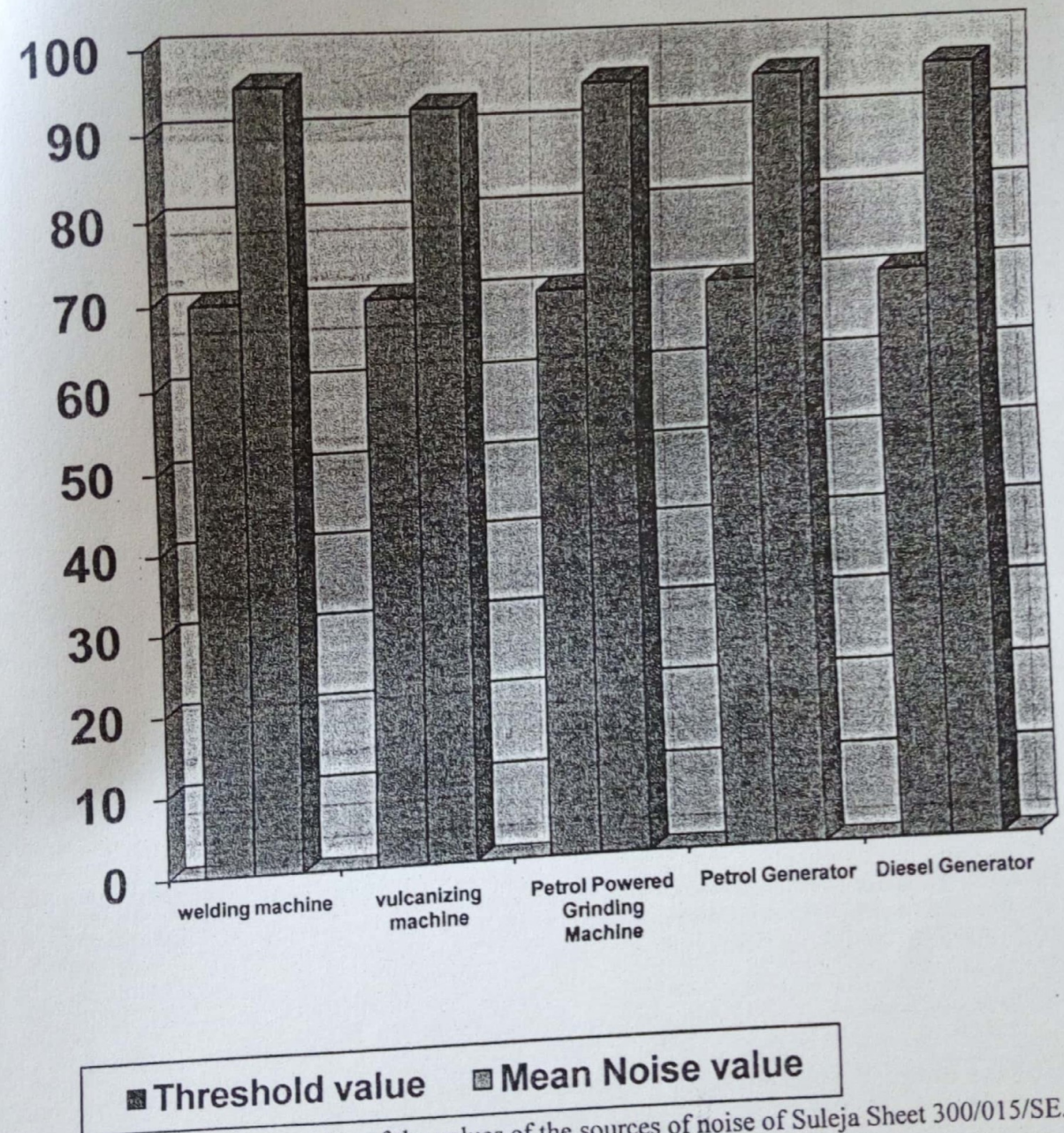
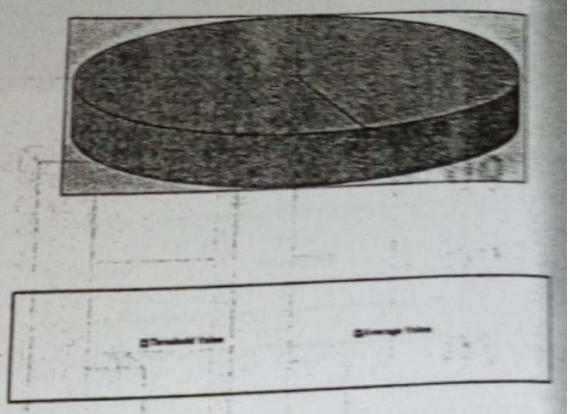
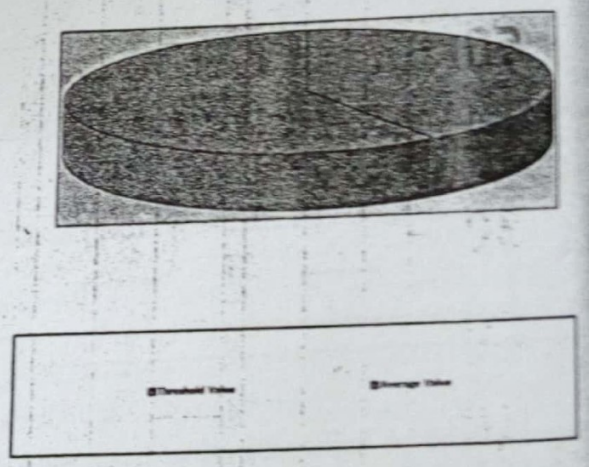
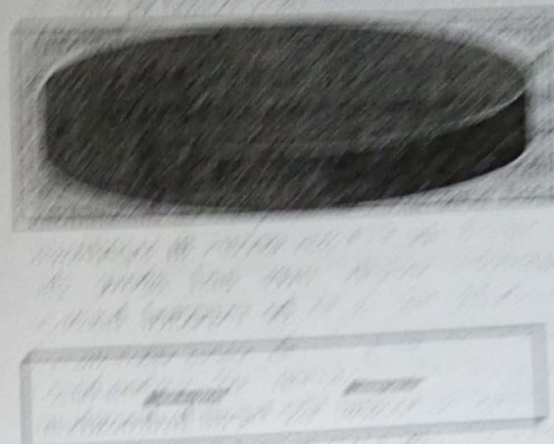
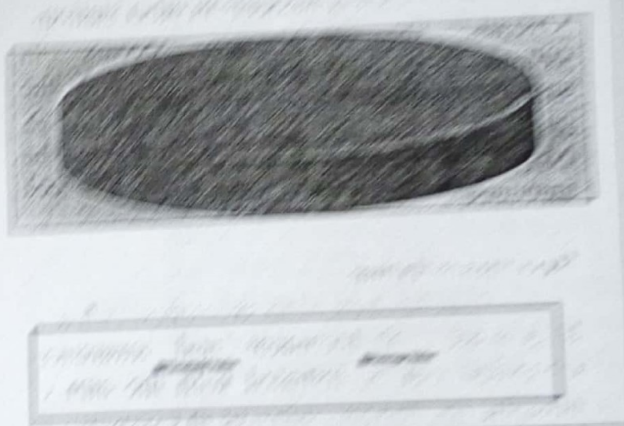


Fig.2: Bar chart representation of the values of the sources of noise of Suleja Sheet 300/015/SE. Unit of vertical axis in dBA.

Table 11: Pie chart representation of the noise level characteristics of neighborhoods: Suleja Sheet 320/0065E

	Neighborhood	Sources of noise	Threshold value	Pie chart
1	Madalla Junction, Suleja.	Power Generators	70	
		Recording Studio	70	

2	Gbagyi settlements, Suleja	Power Generators	70	
		Recording Studio	70	

Discussion and Conclusion

It is seen from the tables for the noise levels of the different GPS points and their corresponding relational plots for Minna and Suleja that the prevailing mean noise values are greater than the internationally recommended value of 70 dB. Also it can be inferred that the various sources of noise identified in this project work emit sounds whose values are generally greater than 70dB, this means that people present in this environment are exposed to noise pollution in varying degrees. On examining the pie chart representation of the noise level characteristics of neighbourhoods we observe all sources of noise identified in this survey are characterized by comparatively high noise values.

The seven gases measured in the course of this project work are sulphur dioxide (SO_2), carbon monoxide (CO), chlorine (Cl_2), nitrogen (IV) oxide (NO_2), hydrogen cyanide (HCN), ammonia (NH_3), hydrogen sulphide (H_2S) and the results of these measurements show appreciable concentration in the different neighbourhoods that were investigated. The various sources of these gases were catalogued and they range from the simple firewood household hearths to industrial power generating plants.

Technical literature points out that exposure to gas concentration above 50 mg/m^3 or 50,000µg/m^3 over a short period of time is injurious to health (personal communication). The incidence of emission of the SO_2 gases varies according the type of source; firewood hearths generally emit comparatively smaller amounts of the SO_2 gases than hydrocarbon-based generators. In nearly all of the stations surveyed, the CO gas occurs in significant quantities usually over and above the threshold; this is to be expected because combustion in all of the cases encountered involved the reaction of carbon-based complex compound like liquid hydrocarbons and wood. The levels of the Cl_2 gas fluctuates from zero in some of the stations surveyed to moderate and lethal amounts in other stations. Overall, the HCN gas occurs in comparatively minor amounts at most of the stations surveyed. The NO_2, NH_3, and H_2S gases occur in varying concentrations, the NH_3 gas occurring in much more reduced amounts.

Recommendation

For the short-term, measures such as a large-scale enlightenment and awareness campaign can be initiated with the aim of bringing the dangers inherent in exposures to high noise levels and toxic effluents to the consciousness of the general population. For the long-term, the database of environmental pollution indices for the areas surveyed should be constantly updated so that effective decisions based on as near to real time dataset as possible can be made with regards to mitigating or eliminating the prevalence of the factors contributing to environmental pollution.

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