



QUARTERLY REPORT BOTTLED WATER QUALITY (January-March, 2010)



PAKISTAN COUNCIL OF RESEARCH IN WATER RESOURCES
Ministry of Science & Technology
Khyban-e-johar, H-8/1, Islamabad.
www.pcrwr.gov.pk

January-March, 2010



INTRODUCTION

Drinking water quality is deteriorating continually due to biological contamination from human waste, chemical pollutants from industries and agricultural inputs. Piped water also gets contaminated because pipes are laid very close to sewerage lines or open drains and cause many serious water borne diseases. It was found that 45% of infant deaths have been attributed to diarrhea and about 60% to overall infectious waterborne diseases in Pakistan. According to the World Health Organization (WHO) 25-30% of the diseases are gastro-intestinal in nature. The poor quality of drinking water has forced a large cross-section of citizens to buy bottled water. As a consequence of this expanding market a mushroom growth of bottled water industry in the country is witnessed during the last five years. However, many of the mineral water companies were found selling contaminated water. To monitor and improve the quality of bottled water, the government of Pakistan has designated the PCRWR as focal point agency.

1. Ministry of Science & Technology informed PCRWR Vide U.O. No. 5(21)/2004-ATA-II dated 17.10.2005 that the Cabinet in its meeting under the chairmanship of Prime Minister directed Ministry of Science & Technology to undertake regular survey/samples of bottled/mineral water at source of production publicize the results on a quarterly basis and follow up with punitive/legal action.
2. Ministry of Science & Technology has assigned the task of quality monitoring of bottled water and publicize the results to PCRWR Vide U.O. No.1(1)/2005-Secy (MoST) dated 8.12.2005.

PCRWR SAMPLING METHODOLOGY

No. of brands collected	63
No. of cities targeted	9 (Islamabad, Rawalpindi, Lahore, Bahawalpur, Multan, Peshawar, Quetta, Karachi and Hyderabad)
Composition of sampling Team	One Research Officer and Two Laboratory Assistants
Sampling Procedure	Samples of sixty three commercially available brands of mineral/bottled water were collected from eight cities of four Provinces of Pakistan These samples were collected by the senior staff members of Head Office and Regional Offices of PCRWR in January, 2010. A set of four bottles of each brand was collected and sealed on site.
Transparency	One out of these four sealed bottles was handed over to shopkeeper at the time of sample collection; second sample was preserved in the National Water Quality Laboratory of PCRWR, Islamabad for future record, and rest of the samples were used for analysis. Identification codes were allotted to all the brands according to PCRWR Bottled Water Classification System.

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PCRWR BOTTLED WATER CLASSIFICATION SYSTEM

Sr. No	Brand Name	PCRWR Code	City	Date Collected	Claimed Bottled Water Type	Container Size	Manufacturer
1	Gourmet	BWK-01	Islamabad	23-01-10	-	1.5 Liter	Gourmet Foods 1.5 Sunder Industrial Estate Lahore
2	Berg	BWK-02	Islamabad	23-01-10	-	1.5 Liter	M-1851/2 St # 12, Iqbal Pura, Mitter pura Rawalpindi
3	Nectar	BWK-03	Islamabad	23-01-10	-	1.5 Liter	Necter Water Plot # 14, Hotel Al-Umar Markaz G-7 Islamabad,
4	Nestle	BWK-04	Islamabad	23-01-10	-	1.5 Liter	Nestle Pakistan Ltd. 308 upper Mall, Lahore-54000 Pakistan.
5	Aquafina	BWK-05	Islamabad	23-01-10	Natural mineral water	0.6 Liter	Haideri Beverages Pvt Ltd, CDA Industrial Triangle, Kahuta Road, Islamabad
6	Ripple	BWK-06	Islamabad	23-01-10	-	1.5 Liter	Main Mirpur Road-AI Noor Colony Sector # 3 Behind Fazal Colony Rawalpindi
7	Elan	BWK-07	Islamabad	23-01-10	-	0.6 Liter	Q.G International Mangla
8	Vey	BWK-08	Tando Jam	10-01-10	-	0.6 Liter	Fluid Technology Intel(pvt) 424, Bayani Center, Block M, North Nazimabad Karachi, 7400, Pakistan.
9	Sprinkle	BWK-09	Tando Jam	10-01-10	-	0.6 Liter	Al Habib Enterprise 143, Rio Center Sadder Karachi
10	Sparkletts	BWK-10	Tando Jam	10-01-10	-	0.6 Liter	64 Khayaban-e- Suhwardy, G-6/4, Islamabad, Pakistan
11	Legend	BWK-11	Tando Jam	10-01-10	-	0.6 Liter	Multi Food Industries, Plot # D-92, Malir Industrial Area, Malir Karachi
12	Alfa	BWK-12	Tando Jam	10-01-10	Natural Drinking Water	0.6 Liter	Biorem Laboratories, Pakistan, F/11, S.I.T.E, Hyderabad.
13	First Water	BWK-13	Tando Jam	10-01-10	-	1.5 Liter	First Water Company (pvt) Ltd. D-038, S.I.T.E, Karachi, 75700.
14	Snow Mountain	BWK-14	Tando Jam	10-01-10	-	1.5 Liter	6 km from GT Road Lahore Pakistan
15	Pakola Vital	BWK-15	Tando Jam	10-01-10	-	1.5 Liter	Mahran Bottlers Pvt Ltd C/5-A S.I.T.E Karachi
16	Meme	BWK-16	Tando Jam	10-01-10	Mineral Water	1.5 Liter	A. Product of ID Water Technology of Pakistan
17	Kinley	BWK-17	Tando Jam	10-01-10	-	0.6 Liter	Coca Cola Beverages Pakistan (Ltd.) Shahzpur Road Rahimyar Khan.
18	Best Water	BWK-18	Karachi	13-01-10	Natural Mineral Water	0.6 Liter	4/33 Sector 21, Korangi Industrial Area, Karachi www.bestwater.com.pk
19	Buxton	BWK-19	Karachi	13-01-10	-	1.5 Liter	Cci Enterprises LA-1/9 F-B Industrial Area Block 22 Karachi, Pakistan
20	Shahi Avisia	BWK-20	Karachi	13-01-10	-	0.6 Liter	Fun Factoryt, C-18, Al-Hilal Society, Karachi.

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21	Culligan	BWK-21	Karachi	13-01-10	Pure Drinking Water	1.5 Liter	Culligan Water of Pakistan Johan (pvt) Ltd. F-17/A Hub River Road, SITE Karachi. Ph 2565911
22	Miracle	BWK-22	Karachi	13-01-10	Mineral Water	0.6 Liter	Plot # WSA-23 Bloack-14 F-B, Area, Karachi
23	Aab-e-Sehat	BWK-23	Karachi	13-01-10	Pure Drinking Water	0.6 Liter	S.I.T.E Industrial Area Metrovillo PO Box 75840 Karachi
24	Blue Gold	BWK-24	Karachi	13-01-10	-	0.6 Liter	Business Link International Raffi Pride Jamia Miltia Road, Malir Karachi
25	Keeper	BWK-25	Karachi	13-01-10	-	0.6 Liter	Keeper Distributor Karachi, C-41, Sir Shah Suleman Road Ishaqabad.
26	Spring Fresh	BWK-26	Karachi	13-01-10	-	0.6 Liter	208 Billy Tower, Rashid Minhas Road Karachi 021-6324465
27	DeAar	BWK-27	Karachi	13-01-10	-	0.6 Liter	DeAar Water & Beverage (pvt) Ltd. Plot # B-32, S.I.T.E, Karachi Tel: 111-147-369.
28	Better Life	BWK-28	Karachi	13-01-10	-	1.5 Liter	Faisalabad Oil Refinery Pvt Ltd, Fax 021-4750670
29	Asmo	BWK-29	Karachi	13-01-10	Natural Water	0.6 Liter	Consumer Service A-89/1 Moria Khan Goth, Chota Gate, Apposite Airport Karachi
30	Fresh Lay	BWK-30	Karachi	13-01-10	-	1.5 Liter	Manufactured by Ethmaad Foods Korangi Industrial Area Karachi
31	Max Fresh	BWK-31	Karachi	13-01-10	-	1.5 Liter	MHBS Enterprises A-190 Panama Shopping Center Hasan Square, Karachi
32	Aqua Link	BWK-32	Karachi	13-01-10	Natural mineral water	1.5 Liter	IQRA FINU &CO. Ph: 021-6621429, Cell: 0300-2989066
33	Aqua One	BWK-33	Karachi	13-01-10	-	1.5 Liter	Pure Water Technologies Anum Classic Main Sharah-e-Faisal Karachi.
34	Zinpa	BWK-34	Karachi	13-01-10	-	1.5 Liter	T.S. Enterprises Karachi 74550, Pakistan.
35	Natural	BWK-35	Karachi	13-01-10	-	1.5 Liter	Plot No.9, S.I.T.E, Karachi
36	Fairmount	BWK-36	Karachi	13-01-10	-	1.5 Liter	Marketed by S & Son Group of Companies, Plot No. B-225 Sector 4/F, Al-Wajid Town SITE, Industrial Area Karachi
37	Maza	BWK-37	Karachi	13-01-10	-	1.5 Liter	Popular Food Industries Ltd. Hyderabad Road, Tando Adam, Pakistan.
38	Aspen	BWK-38	Bahawalpur	21-01-10	-	1.5 Liter	Gysing Pak DDR-1 PSIE Bahawalpur
39	Piyaas Plus	BWK-39	Bahawalpur	21-01-10	-	0.6 Liter	Arshad industry mouza zakira, samman satta head office 59-A Grain market Bahawalpur Pakistan.
40	Sufi	BWK-40	Bahawalpur	21-01-10	-	0.6 Liter	Hadayat Food Stuff Industries Pvt. Ltd. 1-B Garden Block Garden Town Lahore
41	Pak Crystal	BWK-41	Bahawalpur	21-01-10	-	1.5 Liter	Pak Taiba Interprizes,157-B, Small Industrial Estate, Sahiwal,

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							Pakistan.
42	Classic	BWK-42	Bahawalpur	21-01-10	Natural water	0.6 Liter	Classic needs Pakistan Pvt(Ltd), 35-N Industrial Areas Gulberg-II Lahore
43	Nation	BWK-43	Lahore	30-01-10	-	0.6 Liter	Hamza Brothers 9 km GT Road Rachana Town Shahdara Lahore
44	Avion	BWK-44	Lahore	30-01-10	Mineral Water	0.6 Liter	Giani Industries Ph. 0423-6120036
45	Active	BWK-45	Lahore	30-01-10	-	1.5 Liter	Ali Enterprises, 160-E Plastic Dana Market, Shah Alam Market Lahore
46	Unipak Healthy Life	BWK-46	Lahore	30-01-10	Natural Mineral water	0.6 Liter	Unipak Food Product Pvt Ltd, 304 Sufi Chambers Mcleoad Road, Lahore
47	Clean Plus	BWK-47	Lahore	30-01-10	-	1.5 Liter	Clean Foods Pvt Ltd, 46-J, Gulberg III, Lahore
48	Voila	BWK-48	Lahore	30-01-10	-	0.6 Liter	47 Km Multan Road Lahore contact@viola.com
49	Aqua Clear	BWK-49	Lahore	30-01-10	-	0.6 Liter	Idaara-e-Kissan 40-Walton Road, Lahore
50	Pacific	BWK-50	Lahore	30-01-10	-	0.6 Liter	R &H Food Industries 120-Temple Road, 1 st Floor Ghous Bakers, Lahore
51	Pak Pure	BWK-51	Lahore	30-01-10	-	0.6 Liter	Hamza Brothers 9 km GT Road Rachana Town Shahdara Lahore
52	Cool	BWK-52	Lahore	30-01-10	-	1.5 Liter	M.T Mineral Water Company Lahore Pakistan
53	Aqua Save	BWK-53	Lahore	30-01-10	Mineral Water	1.5 Liter	SFS Mineral Water Company Wazirabad Road, Jalianwala Ugoki, Sialkot
54	Bake Master	BWK-54	Lahore	30-01-10	-	0.6 Liter	Customer Service 0342-6661666, 0333-8656666
55	Isberg	BWK-55	Lahore	30-01-10	-	0.6 Liter	Premier Water Refining Company, Sialkot, Pakistan
56	Snow Cap	BWK-56	Lahore	30-01-10	-	0.6 Liter	GM Enterprises
57	Himaliyan	BWK-57	Lahore	30-01-10	Natural Mineral Water	0.6 Liter	Saban and Company
58	Kinza	BWK-58	Peshawar	17-02-10	-	1.5 Liter	Wily Food (Pvt) Ltd, 150 Phase V Industrial Estate Hattar NWFP Pakistan
59	Khyber Aqua	BWK-59	Peshawar	17-02-10	-	0.6 Liter	Biokon Moya Services Hospital Road Peshawar
60	Aqwah Water	BWK-60	Peshawar	17-02-10	Natural Water	0.6 Liter	R&G Enterprises Nasir Bagh, University Road Peshawar
61	Golden	BWK-61	Quetta	16-02-10	Mineral Water	1.5 Liter	Golden Mineral Water Food Industry Lahore
62	Droplet	BWK-62	Quetta	16-02-10	Mineral Water	1.5 Liter	WHOLSOME Pakistan
63	Aqua Hygienic	BWK-63	Quetta	16-02-10	-	1.5 Liter	Zauhras Pvt Ltd A one City Street # 7 Brewery Road Quetta

WATER QUALITY PARAMETERS AND METHODS USED FOR ANALYSIS

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Sr. #	PARAMETERS	ANALYTICAL METHOD
1.	Alkalinity (m.mol/l as CaCO ₃)	2320, Standard method (1992)
2.	Arsenic (ppb)	AAS Vario 6, Analytik Jena AG
3.	Bicarbonate	2320, Standard method (1992)
4.	Calcium (mg/l)	3500-Ca-D, Standard Method (1992)
5.	Carbonate (mg/l)	2320, Standard method (1992)
6.	Chloride (mg/l)	Titration (Silver Nitrate), Standard Method (1992)
7.	Color (TCU)	Sensory Test
8.	Conductivity (µS/cm)	E.C meter, Hach-44600-00, USA
9.	Hardness (mg/l)	EDTA Titration, Standard Method (1992)
10.	Magnesium (mg/l)	2340-C, Standard Method (1992)
11.	Nitrate Nitrogen (mg/l)	Cd. Reduction (Hach-8171) by Spectrophotometer
12.	Odor	Sensory Test
13.	pH	pH Meter, Hanna Instrument, Model 8519, Italy
14.	Potassium (mg/l)	Flame photometer PFP7, UK
15.	Sodium (mg/l)	Flame photometer PFP7, UK
16.	Sulfate (mg/l)	SulfaVer4 (Hach-8051) by Spectrophotometer
17.	Phosphate (mg/l)	8190 and 8048 (Hach)
18.	Taste	Sensory Test
19.	TDS (mg/l)	2540C, Standard method (1992)
20.	Turbidity (NTU)	Turbidity Meter, Lamotte, Model 2008, USA
21.	Fluoride (mg/l)	4500-F C. ion-Selective Electrode Method Standard method (1992)
22.	Iron (mg/l)	FerroVer method (HACH Cat. 21057-69)
23.	Total Coliform (MPN/100ml,	9221-B, Multiple tube fermentation Technique, Standard Methods for the Examination of Water and Waste Water
24.	E. Coli (MPN/100ml)	9221-E, Multiple tube fermentation Technique, Standard Methods for the Examination of Water and Waste Water
25.	Total Plate Count (TPC) (CFU/ml)	9215-B, Heterotrophic Plate Count. Standard Methods for the Examination of Water and Waste Water



WATER QUALITY PERMISSIBLE LIMITS FOR BOTTLED WATER

Sr. #	Parameter	Units	Permissible Limits		
			WHO	IBWA	PSQCA
1.	Alkalinity	(m.mol/l)	NGVS	NGVS	NGVS
2.	Bicarbonate	(mg/l)	NGVS	NGVS	NGVS
3.	Calcium	(mg/l)	NGVS	NGVS	100
4.	Carbonate	(mg/l)	NGVS	NGVS	NGVS
5.	Chloride	(mg/l)	250	250	250
6.	Co lour	(TCU)	15	NGVS	5
7.	Conductivity	(µS/cm)	NGVS	NGVS	NGVS
8.	Fluoride	(mg/l)	1.5	3	0.7
9.	Hardness	(mg/l)	NGVS	NGVS	NGVS
10.	Iron	(mg/l)	0.3	0.3	0.3
11.	Magnesium	(mg/l)	NGVS	NGVS	50
12.	Odor	-	Odorless	NGVS	Unobjectionable
13.	Nitrate-N	(mg/l)	10	10	10
14.	pH	-	6.5-8.5	NGVS	6.5-8.5
15.	Potassium	(mg/l)	NGVS	NGVS	10
16.	Sodium	(mg/l)	200	NGVS	50
17.	Sulfate	(mg/l)	250	250	250
18.	Taste	-	Unobject.	NGVS	Unobjectionable
19.	TDS	(mg/l)	1000	500	500
20.	Turbidity	(NTU)	5	NGVS	0.5
21.	Phosphate	(mg/l)	NGVS	NGVS	NGVS
22.	Arsenic	ppb	10	10	10
23.	Total Coliform	MPN/100ml	0	0	0
24.	E-Coli	MPN/100ml	0	0	0
25.	Total Plate Count	CFU/ml	-	-	At 22°C= <100/ml At 35°C=< 20/ml

WHO World Health Organization
IBWA International Bottled Water Association
PSQCA Pakistan Standards and Quality Control Authority



SUMMARY OF RESULTS OF PCRWR MONITORING

CONTAMINANTS OF POTENTIAL CONCERNS FOUND IN BOTTLED WATER BRANDS

ARSENIC				
Sr. No	Brand Name	Code	Unit	Level of Contamination
				Analytical Results
1.	Pak Crystal	BWK-41	ppb	25.1
2.	Classic	BWK-42	ppb	33.9
3.	Nation	BWK-43	ppb	49.5
4.	Avion	BWK-44	ppb	20.2
5.	Active	BWK-45	ppb	25.2
6.	Clean Plus	BWK-47	ppb	21.4
7.	Aqua Clear	BWK-49	ppb	19.7
8.	Pacific	BWK-50	ppb	18.5
9.	Cool	BWK-52	ppb	31.4

SODIUM				
Sr. No	Brand Name	Code	Unit	Level of Contamination
				Analytical Results
1.	Classic	BWK-42	ppm	86
2.	Nation	BWK-43	ppm	57
3.	Avion	BWK-44	ppm	200
4.	Clean Plus	BWK-47	ppm	98
5.	Aqua Clear	BWK-49	ppm	64
6.	Droplet	BWK-62	ppm	58

POTASSIUM				
Sr. No	Brand Name	Code	Unit	Level of Contamination
				Analytical Results
1.	Alfa	BWK-12	ppm	11
2.	Bake Master	BWK-54	ppm	11.3
3.	Isberg	BWK-55	ppm	13.5

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FLOURIDE				
Sr. No	Brand Name	Code	Unit	Level of Contamination
				Analytical Results
1.	Max Fresh	BWK-31	ppm	0.92
2.	Droplet	BWK-62	ppm	1,50

TOTAL DISSOLVED SOLIDS (TDS)				
Sr. No	Brand Name	Code	Unit	Level of Contamination
				Analytical Results
1.	Avion	BWK-44	ppm	676

MICROBIOLOGICAL: MPN & APC				
Sr. No	Brand Name	Code	Level of Contamination (Analytical Results)	
			Total Coliforms (MPN/100ml)	Total Plate Count CFU/ml
1.	Elan	BWK-07	0	TNTC
2.	Sprinkle	BWK-09	0	79
3.	Legend	BWK-11	0	44
4.	Alfa	BWK-12	0	45.5
5.	Shahi Avisa	BWK-20	0	TNTC
6.	Miracle	BWK-22	0	29
7.	Aab-e-Sehat	BWK-23	0	172
8.	Keeper	BWK-25	0	TNTC
9.	Spring Fresh	BWK-26	0	42.5
10.	DeAar	BWK-27	0	TNTC
11.	Asmo	BWK-29	0	55
12.	Fresh Lay	BWK-30	0	TNTC
13.	Aqua One	BWK-33	0	TNTC
14.	Zinpa	BWK-34	0	56.5
15.	Maza	BWK-37	0	TNTC
16.	Aspen	BWK-38	0	29.5
17.	Piyaas Plus	BWK-39	0	88.5
18.	Pak Crystal	BWK-41	0	43
19.	Classic	BWK-42	0	TNTC
20.	Aqua Save	BWK-53	0	76.5
21.	Khyber Aqua	BWK-59	0	36.5
22.	Aqua Water	BWK-60	0	36.5

TNTC: Too Numerous To Count

PCRWR QUARTERLY REPORT-BOTTLED WATER QUALITY



PCRWR TESTING: SAFE BRANDS

Sr. No	Brand Name	Code	Quality (Safe/Unsafe)	
			Chemical	Microbiological
1.	Gourmet	BWK-01	Safe	Safe
2.	Berg	BWK-02	Safe	Safe
3.	Nectar	BWK-03	Safe	Safe
4.	Nestle	BWK-04	Safe	Safe
5.	Aquafina	BWK-05	Safe	Safe
6.	Ripple	BWK-06	Safe	Safe
7.	Vey	BWK-08	Safe	Safe
8.	Sparkletts	BWK-10	Safe	Safe
9.	First Water	BWK-13	Safe	Safe
10.	Snow Mountain	BWK-14	Safe	Safe
11.	Pakola Vital	BWK-15	Safe	Safe
12.	Meme	BWK-16	Safe	Safe
13.	Kinley	BWK-17	Safe	Safe
14.	Best Water	BWK-18	Safe	Safe
15.	Buxton	BWK-19	Safe	Safe
16.	Culligan	BWK-21	Safe	Safe
17.	Blue Gold	BWK-24	Safe	Safe
18.	Better Life	BWK-28	Safe	Safe
19.	Aqua Link	BWK-32	Safe	Safe
20.	Natural	BWK-35	Safe	Safe
21.	Fairmount	BWK-36	Safe	Safe
22.	Sufi	BWK-40	Safe	Safe
23.	Unipak Healthy Life	BWK-46	Safe	Safe
24.	Voila	BWK-48	Safe	Safe
25.	Pak Pure	BWK-51	Safe	Safe
26.	Snow Cape	BWK-56	Safe	Safe
27.	Hamaliyan	BWK-57	Safe	Safe
28.	Kinza	BWK-58	Safe	Safe
29.	Golden	BWK-61	Safe	Safe
30.	Aqua Hygienic	BWK-63	Safe	Safe



PCRWR TESTING: UNSAFE BRANDS

Sr. No	Brand Name	Code	Quality (Safe/Unsafe)	
			Chemical	Microbiological
1.	Elan	BWK-07	Safe	Unsafe
2.	Sprinkle	BWK-09	Safe	Unsafe
3.	Legend	BWK-11	Safe	Unsafe
4.	Alfa	BWK-12	Unsafe	Unsafe
5.	Shahi Avisa	BWK-20	Safe	Unsafe
6.	Miracle	BWK-22	Safe	Unsafe
7.	Aab-e-Sehat	BWK-23	Safe	Unsafe
8.	Keeper	BWK-25	Safe	Unsafe
9.	Spring Fresh	BWK-26	Safe	Unsafe
10.	DeAar	BWK-27	Safe	Unsafe
11.	Asmo	BWK-29	Safe	Unsafe
12.	Fresh Lay	BWK-30	Safe	Unsafe
13.	Mxa Fresh	BWK-31	Unsafe	Safe
14.	Aqua One	BWK-33	Safe	Unsafe
15.	Zinpa	BWK-34	Safe	Unsafe
16.	Maza	BWK-37	Safe	Unsafe
17.	Aspen	BWK-38	Safe	Unsafe
18.	Piyaas Plus	BWK-39	Safe	Unsafe
19.	Pak Crystal	BWK-41	Unsafe	Unsafe
20.	Classic	BWK-42	Unsafe	Unsafe
21.	Nation	BWK-43	Unsafe	Safe
22.	Avion	BWK-44	Unsafe	Safe
23.	Active	BWK-45	Unsafe	Safe
24.	Clean Plus	BWK-47	Unsafe	Safe
25.	Aqua Clean	BWK-49	Unsafe	Safe
26.	Pacific	BWK-50	Unsafe	Safe
27.	Cool	BWK-52	Unsafe	Safe
28.	Aqua Save	BWK-53	Safe	Unsafe
29.	Bake Master	BWK-54	Unsafe	Safe
30.	Isberg	BWK-55	Unsafe	Safe
31.	Khyber Aqua	BWK-59	Safe	Unsafe
32.	Aqua Water	BWK-60	Safe	Unsafe
33.	Droplet	BWK-62	Unsafe	Safe



MARKET CONSISTENCY IN TWO NEIGHBORING QUARTERS

Sr. No	Consistent Brands	New Brands	Unavailable Brands
1.	Nestle	Berg	Osloplus
2.	Kinely	Ripple	Hydropsy
3.	Vey	Sprinkle	Bio
4.	Gourmet	Legend	Taiba
5.	Nectar	Snow Mountain	Mark Refresh
6.	Aquafina	Pakola Vital	Shine
7.	Elan	Meme	Dot
8.	Sparklets	Best Water	Premier
9.	ALFA	Buxton	Standard
10.	Blue Gold	Culligan	Zindagi
11.	Spring Fresh	Miracle	National
12.	De Aar	Aab-e-Sehat	Life
13.	Better Life	Keeper	Top Mountain
14.	Fresh Lay	Asmo	Hydrate
15.	Aqualink	Aqua One	
16.	Zinpa	Fairmount	
17.	Natural	Aspen	
18.	Maza	Classic	
19.	Piyaas	Max Fresh	
20.	Sufi	Avion	
21.	Pak Crystal	Unipak Healthy Life	
22.	Khyber Aqua	Clean Plus	
23.	Aqwah Water	Voila	
24.	Golden	Aqua clear	
25.	Avisa	Bake Master	
26.	Nation	Pacific	
27.	First Water	Aqua Save	
28.	Active	Cool	
29.	Pak Pure	Isberg	
30.		Snow Cap	
31.		Himaliyan	
32.		Kinza	
33.		Droplet	
34.		Aqua Hygienic	



DISEASE POTENTIAL FROM CONTAMINATED BOTTLED WATER

Sr. No	Contaminant	Diseases Impacts
1.	Bacteriological Contamination	Cholera, Diarrhea, Dysentery, Hepatitis, Typhoid
2	Arsenic	Cancer (lungs, bladder, skin, prostate, kidney, nose and liver), diabetes kidney diseases, hypertension, heart diseases, birth defects, black foot diseases.
3.	Potassium	Lung cancer, Hyperkalemia, Abnormal breakdown of protein
4.	Fluoride	Skeletal and dental fluorosis
5.	Sodium	Hypertension

CONCLUSIONS

Sr. No	Item	Conclusion	
		No.	% age
1.	Total No. Brands Collected	63	-
2.	Overall safe brands	30	48
3.	No. of overall unsafe brands	33	52
4.	No. of Chemically safe brands	49	78
5.	No. of Chemically unsafe brands	14	22
6.	No. of Microbiologically safe brands	41	65
7.	No. of Microbiologically unsafe brands	22	35
8.	No. of Consistent brands in Market	29	46
9.	No. of brands disappeared from market	14	22
10.	No. of new brands	34	54

Detailed Water quality status of each bottled water brand is available at Annexure-1

Chemical and Microbiological Quality of Bottled/Mineral Water Brands

Annexure-1

Brand Name	Brand Code	Turbidity	pH	EC	TDS	Ca	Mg	Hard	HCO ₃	Cl	Na	F	PO ₄	Fe	K	NO ₃	SO ₄	As	Total Coliforms	E.Coli	Total Plate Count
PSQCA Bottled Water Standards	-	0.5	6.5 - 8.5	NGVS	500	100	50	NGVS	NGVS	250	50	0.7	NGVS	0.3	10	10	250	10	0/100 ml	0/100 ml	<20 at 37°C
Detection Limits	-	0.2	0.02	0.287	-	2	1	5	5	2	1	0.03	0.03	0.03	0.2	0.06	0.4	0.1	-	-	-
Units	-	NTU		µS/cm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppb	MPN /100ml	MPN /100 ml	CFU/ml
Gourmet	BWK-01	BDL	6.75	402	221	38	15	155	65	61	23	0.1	0.05	BDL	0.3	BDL	43	0.68	00	00	10
Berg	BWK-02	BDL	6.78	313	172	38	11	140	40	63	3	BDL	BDL	BDL	0.2	0.4	5	BDL	00	00	16.5
Nectar	BWK-03	BDL	6.85	415	228	60	11	195	190	7	11	0.17	BDL	BDL	0.8	1.5	1	BDL	00	00	20
Nestle	BWK-04	BDL	7.27	326	179	40	5	120	40	72	12	0.38	BDL	BDL	0.3	BDL	9	BDL	00	00	0
Aquafina	BWK-05	BDL	6.95	208	114	4	17	80	10	35	10	0.04	0.03	BDL	0.9	BDL	37	BDL	00	00	10
Ripple	BWK-06	BDL	7.69	301	166	30	12	125	35	66	10	BDL	BDL	BDL	1.0	0.2	5	BDL	00	00	5
Elan	BWK-07	BDL	6.99	222	122	22	13	110	40	20	4	BDL	0.07	BDL	0.3	0.2	37	BDL	00	00	TNTC
Vey	BWK-08	BDL	7.05	309	170	44	7	140	25	68	3	BDL	BDL	BDL	6.0	0.3	14	BDL	00	00	7
Sprinkle	BWK-09	BDL	7.05	499	274	40	11	145	120	66	39	0.29	BDL	BDL	3.6	4	29	BDL	00	00	79
Sparkletts	BWK-10	BDL	7.25	301	166	42	4	120	130	3	10	0.09	BDL	BDL	0.7	2	17	BDL	00	00	19
Legend	BWK-11	BDL	6.90	303	167	32	5	100	22	68	9	BDL	BDL	BDL	2.6	2	6	BDL	00	00	44
Alfa	BWK-12	BDL	7.05	297	163	40	2	110	25	57	3	BDL	0.10	BDL	11.0	0.3	18	BDL	00	00	45.5
First Water	BWK-13	BDL	6.95	350	193	42	7	135	30	76	4	BDL	0.06	BDL	6.4	0.3	19	BDL	00	00	02
Snow Mountain	BWK-14	BDL	6.55	267	147	40	7	130	30	67	8	BDL	BDL	BDL	0.2	BDL	10	1.11	00	00	17
Pakola Vital	BWK-15	BDL	6.75	488	268	38	11	140	100	56	43	BDL	0.03	BDL	3.3	5	39	BDL	00	00	8.5
Meme	BWK-16	BDL	7.01	360	198	38	6	120	70	25	21	0.24	BDL	BDL	3.1	0.6	45	0.22	00	00	13
Kinley	BWK-17	BDL	6.54	517	284	44	10	150	20	124	27	BDL	BDL	BDL	1.8	BDL	22	BDL	00	00	1
Best Water	BWK-18	BDL	6.89	450	248	18	15	100	85	67	48	0.04	BDL	BDL	2.8	4	9	BDL	00	00	19.5
Buxton	BWK-19	BDL	7.65	236	130	10	9	60	50	38	30	0.20	BDL	BDL	0.4	2	8	BDL	00	00	17.5
Shahi Avisa	BWK-20	BDL	7.25	289	159	42	0	105	15	73	2	BDL	BDL	BDL	4.1	0.1	4	BDL	00	00	TNTC
Culligan	BWK-21	BDL	6.79	295	162	36	1	95	30	68	8	BDL	BDL	BDL	6.6	1	BDL	BDL	00	00	0
Miracle	BWK-22	BDL	7.00	342	188	36	5	110	50	53	14	0.03	0.04	BDL	5.7	0.2	25	BDL	00	00	29

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Aab-e-Sehat	BWK-23	BDL	6.81	247	136	38	1	100	10	53	4	BDL	0.03	BDL	0.5	0.2	15	BDL	00	00	172
Blue Gold	BWK-24	BDL	7.45	486	267	40	9	135	60	90	33	0.23	BDL	BDL	10.6	4	15	0.13	00	00	15
Keeper	BWK-25	BDL	7.21	413	227	40	7	130	85	34	27	0.18	BDL	BDL	3.4	3	30	0.46	00	00	TNTC
Spring Fresh	BWK-26	BDL	7.11	461	254	42	11	150	100	56	28	0.28	0.04	BDL	2.6	2	35	0.82	00	00	42.5
DeAar	BWK-27	BDL	6.85	362	174	36	12	140	35	62	9	BDL	BDL	BDL	0.3	1	26	BDL	00	00	TNTC
Better Life	BWK-28	BDL	7.26	668	367	100	9	285	30	170	9	0.07	BDL	BDL	0.4	0.1	11	0.69	00	00	20
Asmo	BWK-29	BDL	6.55	368	202	44	10	150	20	94	9	0.05	BDL	BDL	0.7	0.6	4	BDL	00	00	55
Fresh Lay	BWK-30	BDL	7.15	464	255	44	12	160	100	56	32	0.24	BDL	BDL	4.3	0.5	41	2.32	00	00	TNTC
Max Fresh	BWK-31	BDL	7.51	417	229	24	10	100	105	42	50	0.92	0.03	BDL	2.9	0.3	44	0.19	00	00	16.5
Aqua Link	BWK-32	BDL	7.39	310	171	40	9	135	35	75	2	BDL	BDL	BDL	3.7	BDL	5	BDL	00	00	18
Aqua One	BWK-33	BDL	7.55	304	167	30	15	135	45	53	9	BDL	0.06	BDL	0.3	BDL	30	BDL	00	00	TNTC
Zinpa	BWK-34	BDL	7.55	388	213	40	10	140	15	86	11	BDL	0.04	BDL	0.7	BDL	35	BDL	00	00	56.5
Natural	BWK-35	BDL	7.47	287	158	20	10	90	55	35	24	0.04	BDL	BDL	1.7	BDL	27	0.63	00	00	18.5
Fairmount	BWK-36	BDL	7.59	324	178	24	7	90	50	46	31	0.05	BDL	BDL	2.1	0.2	30	0.51	00	00	16
Maza	BWK-37	BDL	7.49	271	149	36	5	110	50	57	13	BDL	BDL	BDL	2.5	0.2	BDL	BDL	00	00	TNTC
Aspen	BWK-38	BDL	6.95	362	199	42	11	150	20	68	2	BDL	0.05	BDL	3.4	BDL	30	0.98	00	00	29.5
Piyaas Plus	BWK-39	BDL	6.76	430	237	46	9	150	15	119	16	BDL	BDL	BDL	8.8	BDL	12	0.89	00	00	88.5
Sufi	BWK-40	BDL	7.09	371	204	52	9	165	40	73	8	0.03	BDL	BDL	0.2	BDL	25	0.47	00	00	20
Pak Crystal	BWK-41	BDL	7.25	423	233	38	11	140	105	31	27	0.10	0.07	BDL	2.5	BDL	34	25.1	00	00	43
Classic	BWK-42	BDL	7.29	867	477	52	21	215	380	27	86	0.22	BDL	BDL	4.1	0.1	25	33.9	00	00	TNTC
Nation	BWK-43	BDL	7.34	485	267	28	12	120	220	21	57	0.33	BDL	BDL	4.7	0.2	23	49.5	00	00	10
Avion	BWK-44	BDL	7.54	1229	676	42	26	210	557	33	200	0.52	0.05	BDL	4.7	BDL	47	20.2	00	00	2
Active	BWK-45	BDL	7.15	289	164	36	7	120	135	13	16	0.43	BDL	BDL	2.1	0.3	15	25.2	00	00	6
Unipak Healthy Life	BWK-46	BDL	6.63	145	80	18	6	70	40	13	3	0.11	BDL	BDL	0.6	BDL	18	2.13	00	00	14
Clean Plus	BWK-47	BDL	7.61	767	422	40	15	160	350	32	98	0.26	0.11	BDL	3.1	BDL	20	21.4	00	00	0
Voila	BWK-48	BDL	6.95	360	198	52	2	140	35	80	14	0.27	BDL	BDL	1.2	0.2	5	3.71	00	00	0
Aqua Clear	BWK-49	BDL	7.79	420	231	16	10	80	150	15	64	0.21	0.05	BDL	1.1	0.1	39	19.7	00	00	3.5
Pacific	BWK-50	BDL	7.70	351	193	28	7	100	150	6	40	0.36	0.03	BDL	1.1	0.2	14	18.5	00	00	0
Pak Pure	BWK-51	BDL	6.96	303	182	22	21	140	105	25	26	0.15	BDL	BDL	1.0	0.1	18	4.56	00	00	0
Cool	BWK-52	BDL	7.44	305	168	32	11	125	140	2	18	0.33	BDL	BDL	2.7	BDL	24	31.4	00	00	2
Aqua Save	BWK-53	BDL	7.00	450	248	36	29	210	35	113	14	0.07	BDL	BDL	0.4	BDL	BDL	0.66	00	00	76.5
Bake Master	BWK-54	BDL	7.31	326	179	30	18	150	120	28	10	0.60	BDL	BDL	11.3	BDL	10	8.23	00	00	1.5

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Isberg	BWK-55	BDL	7.21	378	208	38	17	165	125	35	10	0.67	0.05	BDL	13.5	BDL	15	8.40	00	00	0
Snow Cap	BWK-56	BDL	7.48	416	229	40	22	190	185	21	23	0.27	0.04	BDL	2.1	BDL	6	0.44	00	00	0
Himaliyan	BWK-57	BDL	7.60	292	161	26	9	100	27	73	13	0.09	BDL	BDL	0.8	BDL	1	BDL	00	00	2
Kinza	BWK-58	BDL	7.15	582	320	60	24	150	130	96	17	0.21	0.04	BDL	1.3	2.3	BDL	0.41	00	00	20
Khyber Aqua	BWK-59	BDL	7.42	461	254	40	29	220	195	14	17	0.12	BDL	BDL	1.9	3.8	19	0.42	00	00	36.5
Aqua Water	BWK-60	BDL	7.05	365	201	32	18	155	165	6	12	0.19	BDL	BDL	1.4	2.5	12	0.55	00	00	36.5
Golden	BWK-61	BDL	7.86	870	479	72	34	320	245	85	48	0.53	BDL	BDL	2.1	3.5	63	BDL	00	00	6.5
Droplet	BWK-62	BDL	8.10	570	314	38	12	145	160	41	58	1.50	0.04	BDL	1.4	2.8	61	0.59	00	00	4.5
Aqua Hygienic	BWK-63	BDL	7.13	287	158	38	7	125	15	62	3	0.03	BDL	BDL	BDL	BDL	20	BDL	00	00	12

NGVS =No Guideline Value Set
 BDL = Below Detection Limits
 TNTC =: Too Numerous To Count