ASARCO EL PASO COPPER SMELTER
PHASE III REMEDIAL INVESTIGATION REPORT
EL PASO, TEXAS

Prepared For:

ASARCO

2301 West Paisano Drive
El Paso, Texas 79922

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REMEDIATION DIVISION
Corrective Action Section

Prepared By:

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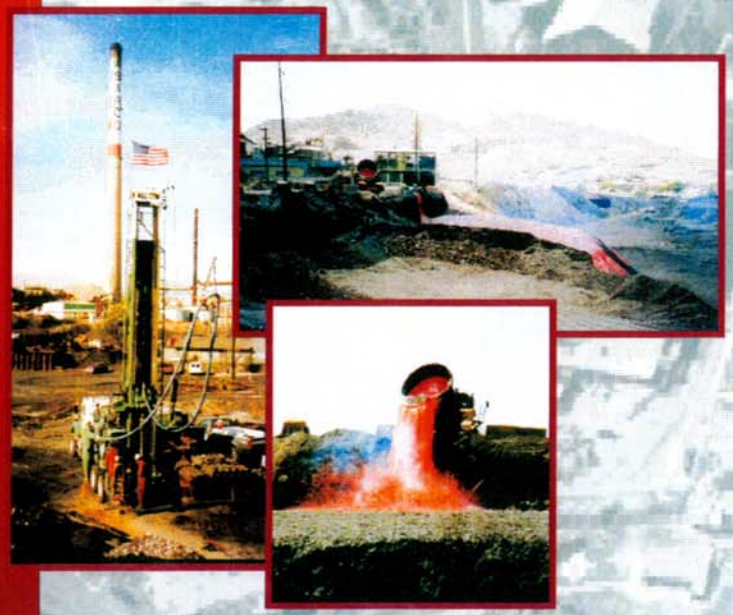
consulting scientists, engineers and contractors



VOLUME
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APPENDIX K

GRAPHS OF SOIL SAMPLE METAL ANALYSIS
CONCENTRATION VERSUS DEPTH

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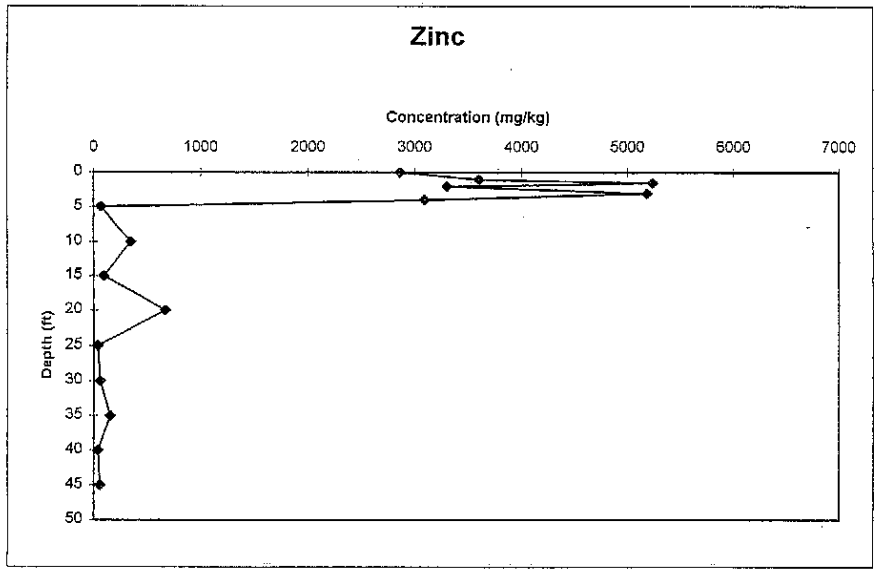
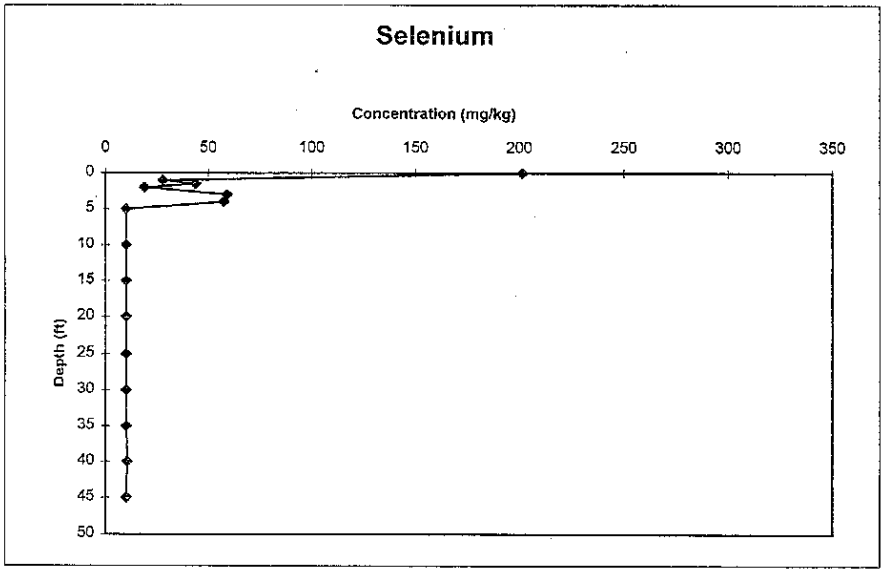
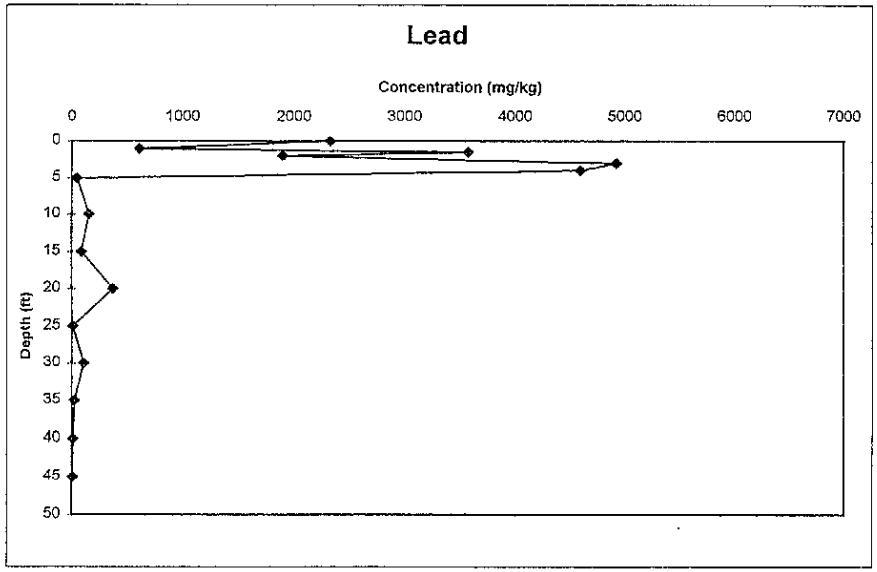
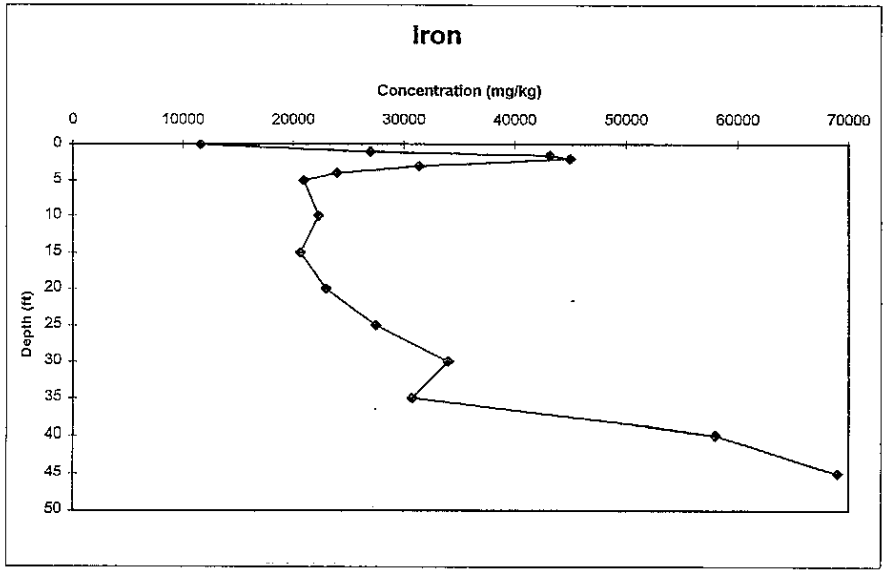
GRAPHS OF SOIL SAMPLE METAL ANALYSIS
CONCENTRATION VERSUS DEPTHS

Average Soil Concentrations by Depth, Investigation Area 1
(Converter Building/Baghouse Area)

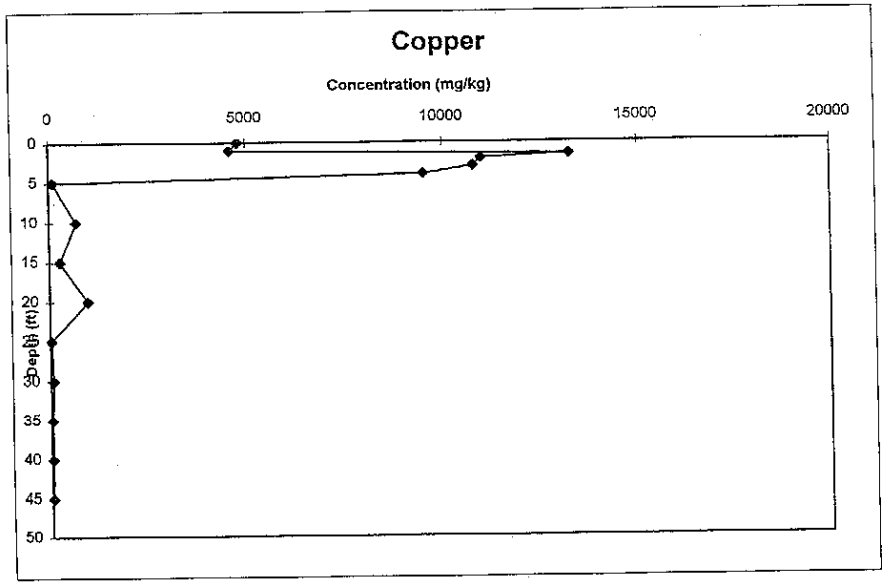


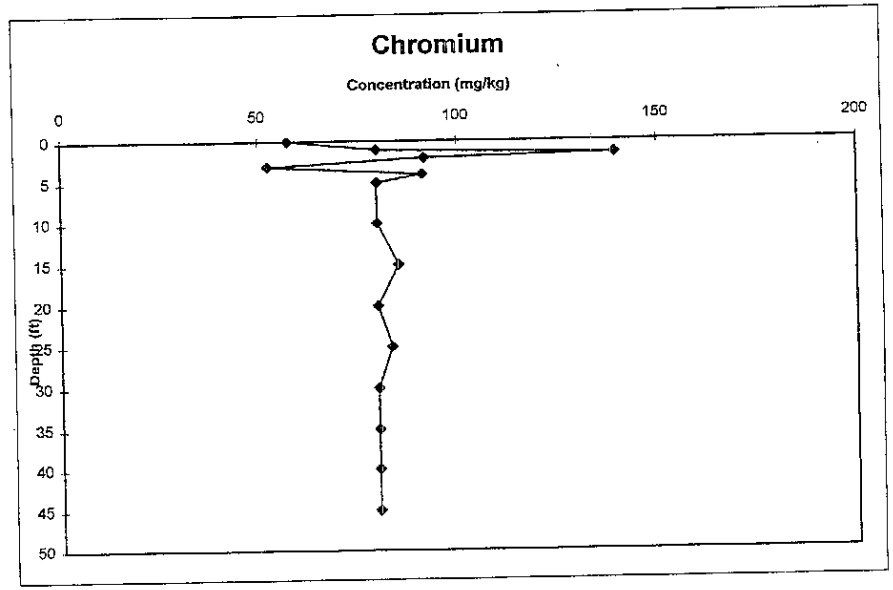


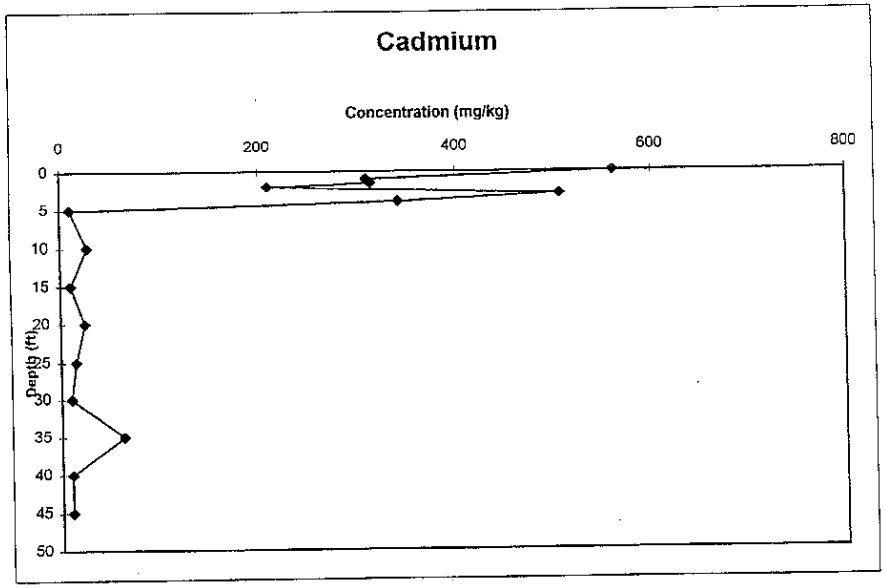


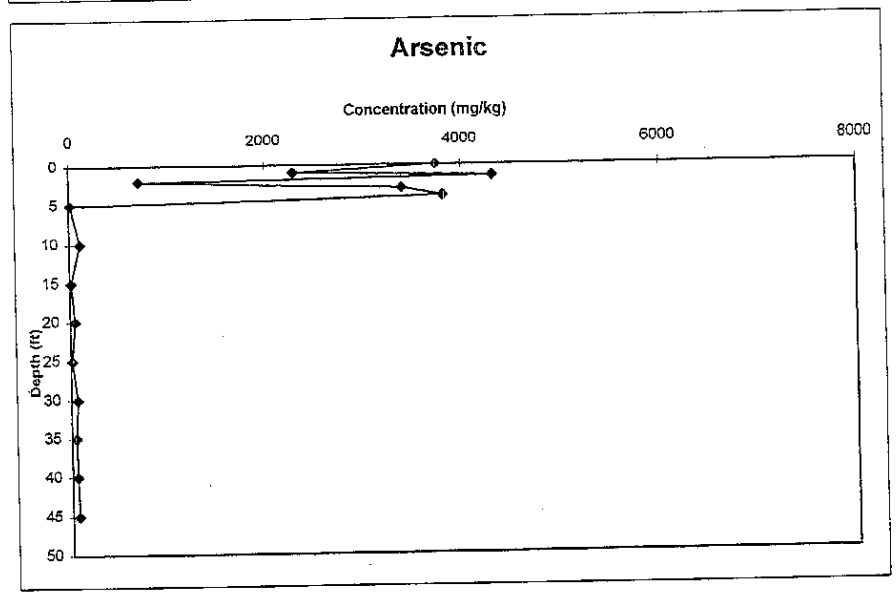


Average Soil Concentrations by Depth, Investigation Area 1
(Converter Building/Baghouse Area)



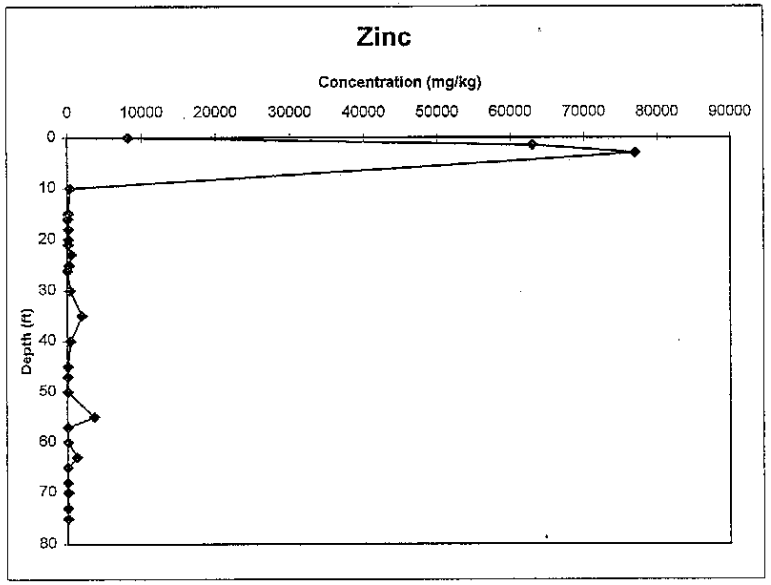


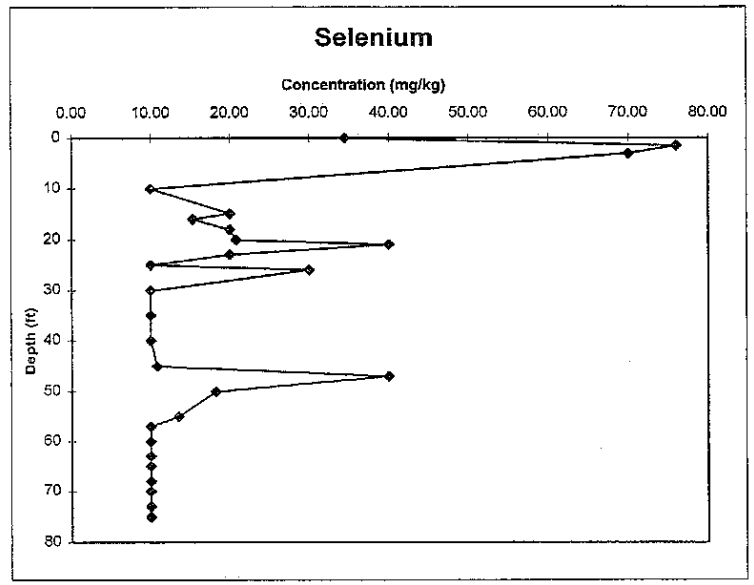


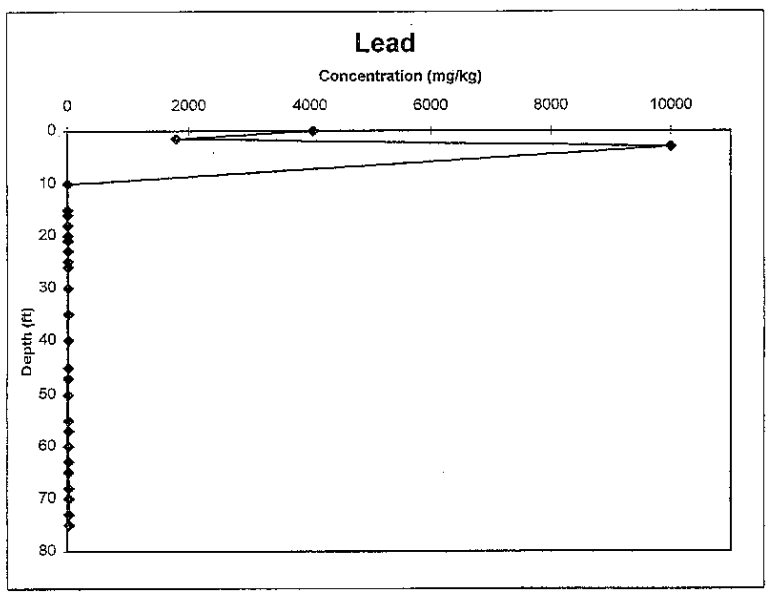


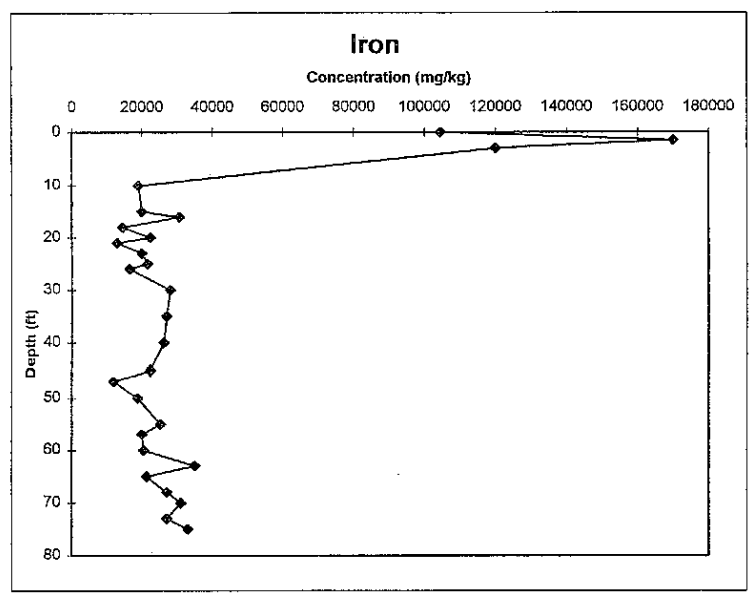
Note: Graphs include soil concentrations for all Phase I and Phase II borings and monitor wells.

Average Concentrations by Depth, Investigation Area 2
(Boneyard/Slag Area)

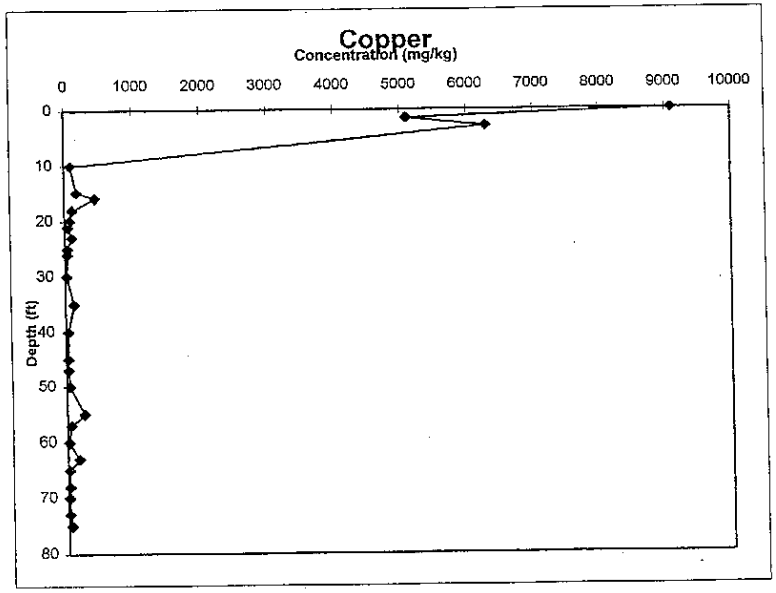


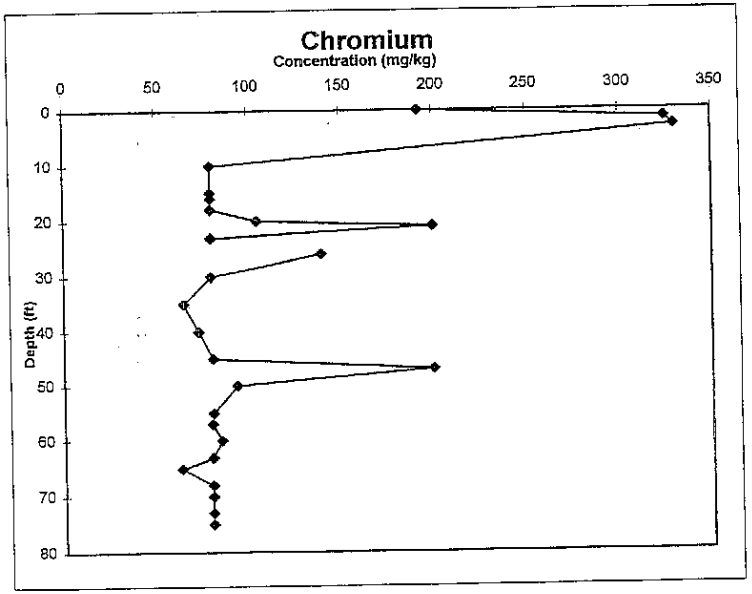


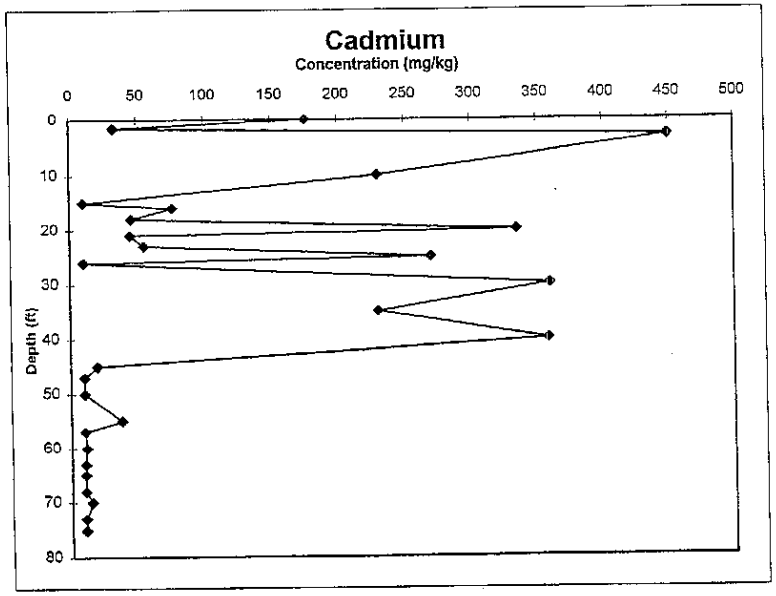


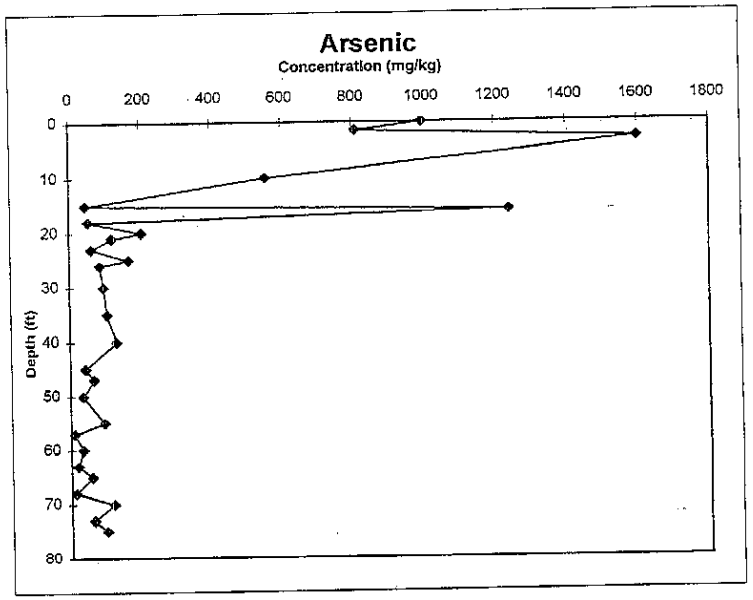


Average Concentrations by Depth, Investigation Area 2
(Boneyard/Slag Area)



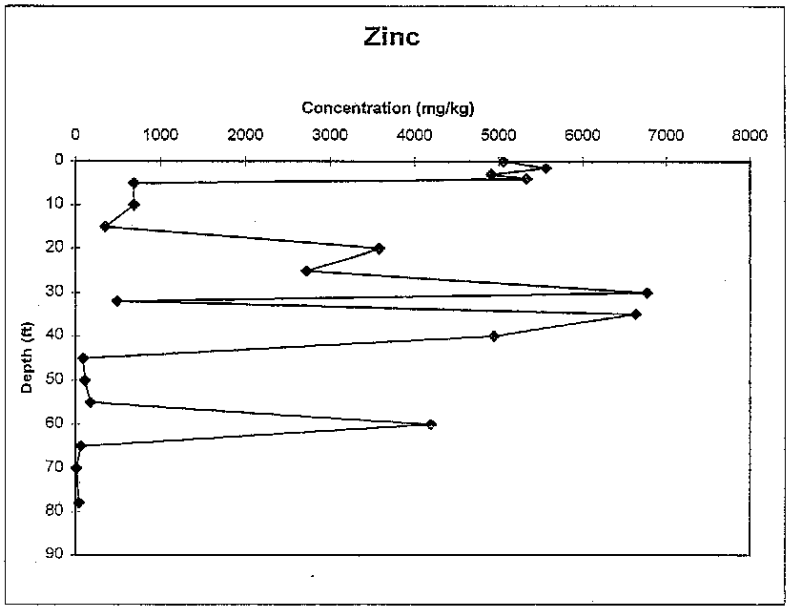


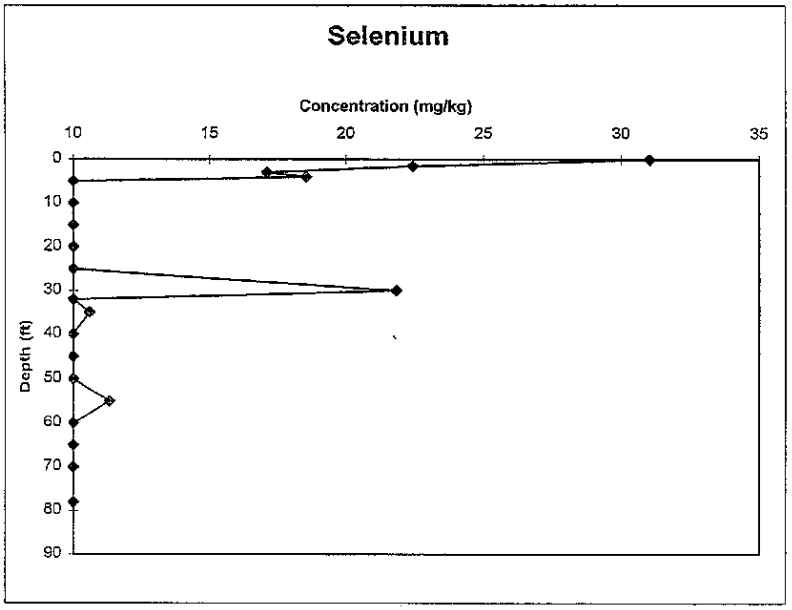


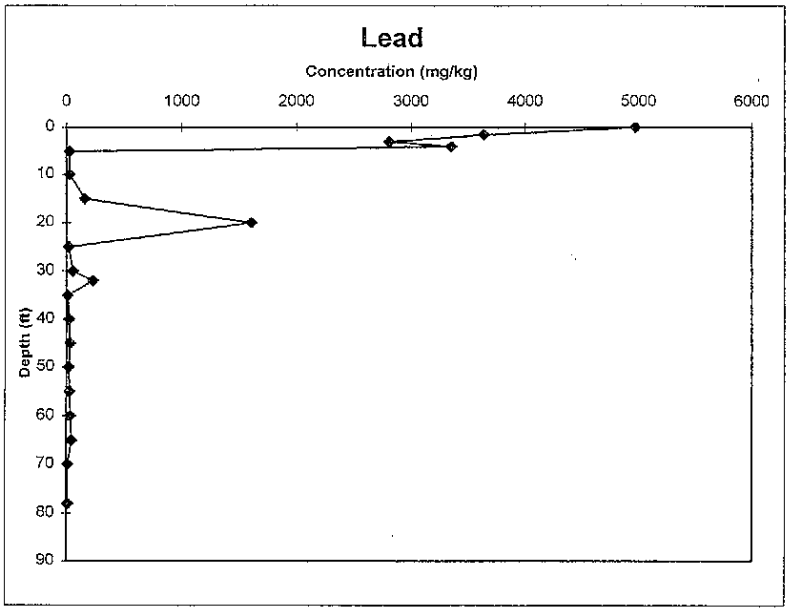


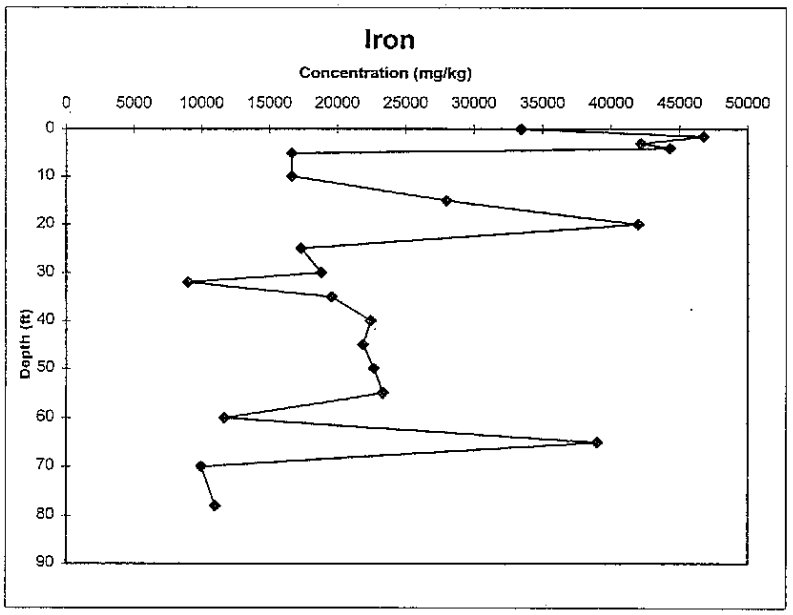
Note: Graphs include soil concentrations for Phase I, Phase II, and Phase III borings and monitor wells.

Average Concentrations . th, Investigation Area 3
(Acid Plants 1 and 2 Area)

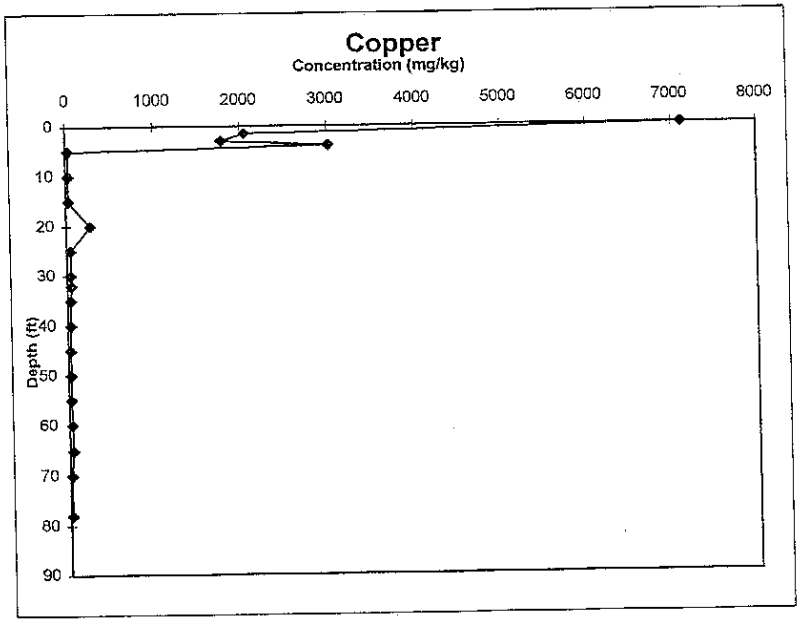


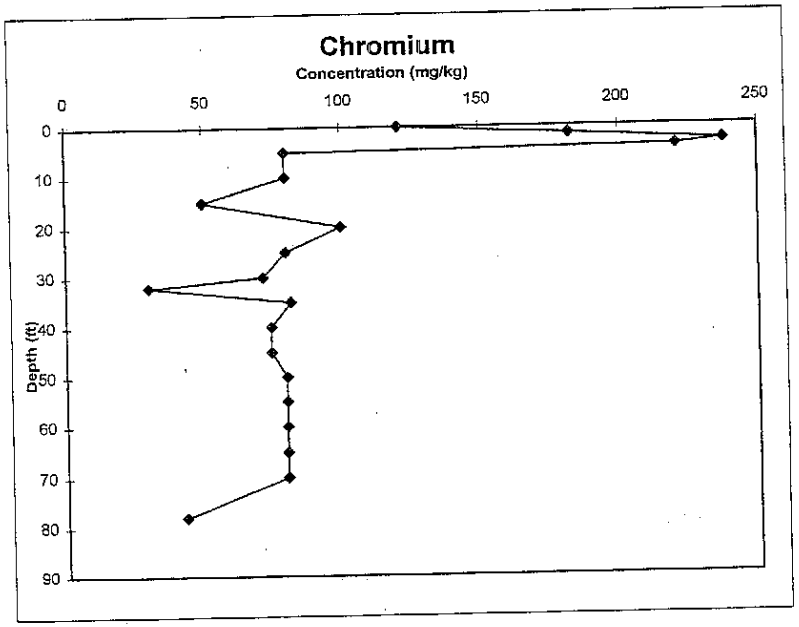


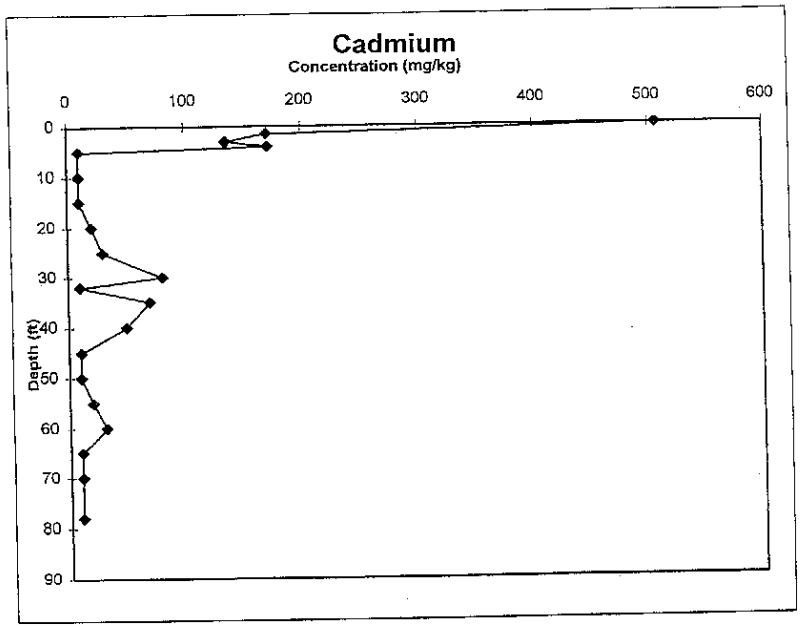


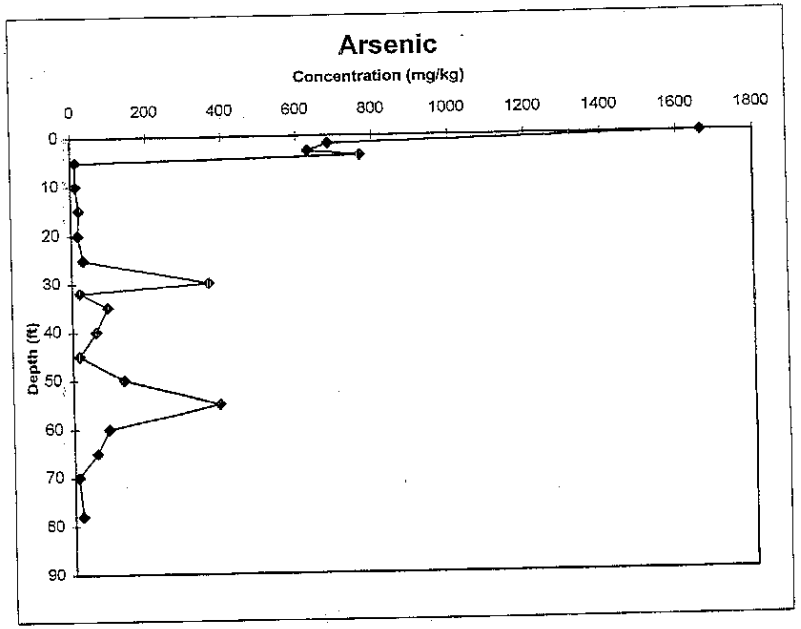


Average Concentrations by Depth, Investigation Area 3
(Acid Plants 1 and 2 Area)



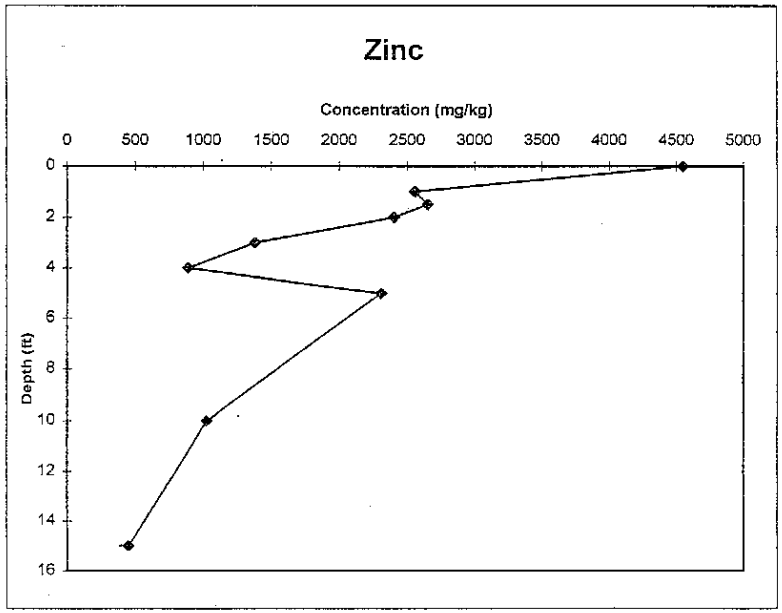


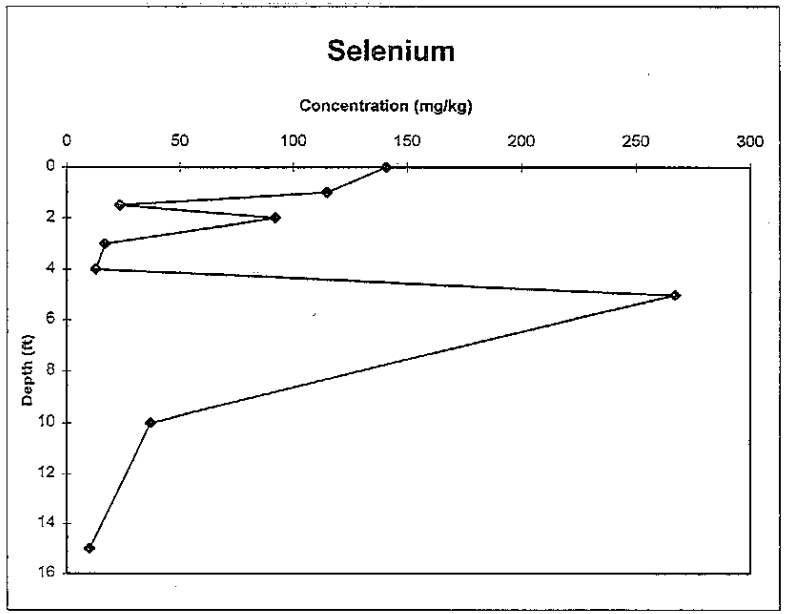


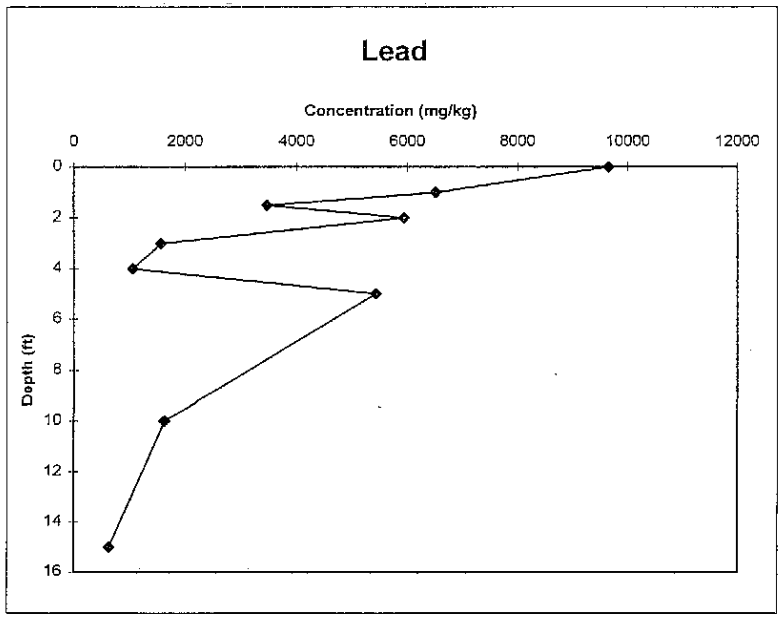


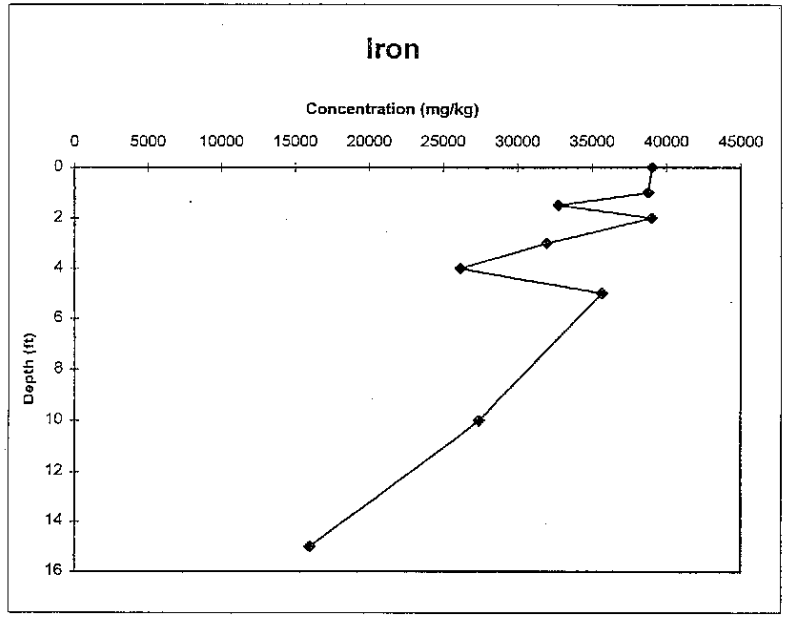
Note: Graphs include soil concentrations for all Phase I and Phase II borings and monitor wells.

Average Concentrations th, Investigation Area 4
(Front Slope/Weste ant Boundary Area)

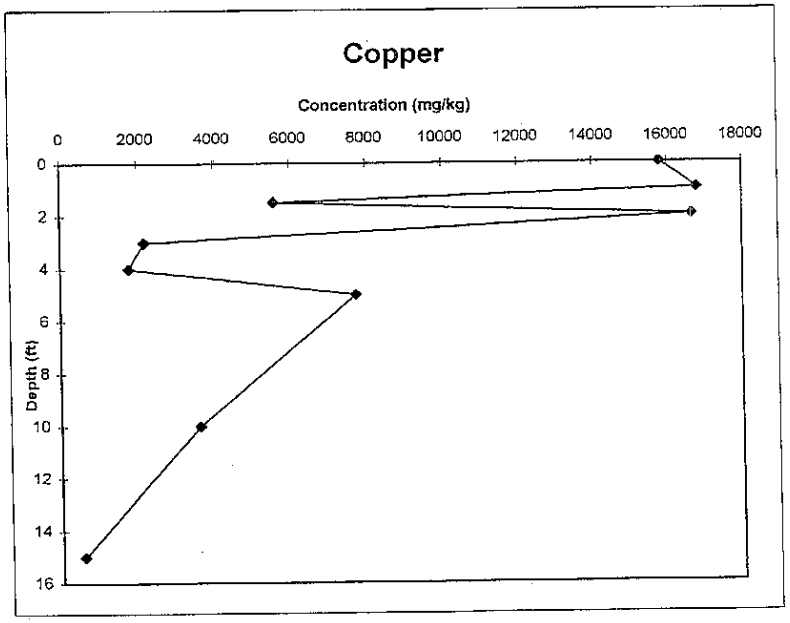


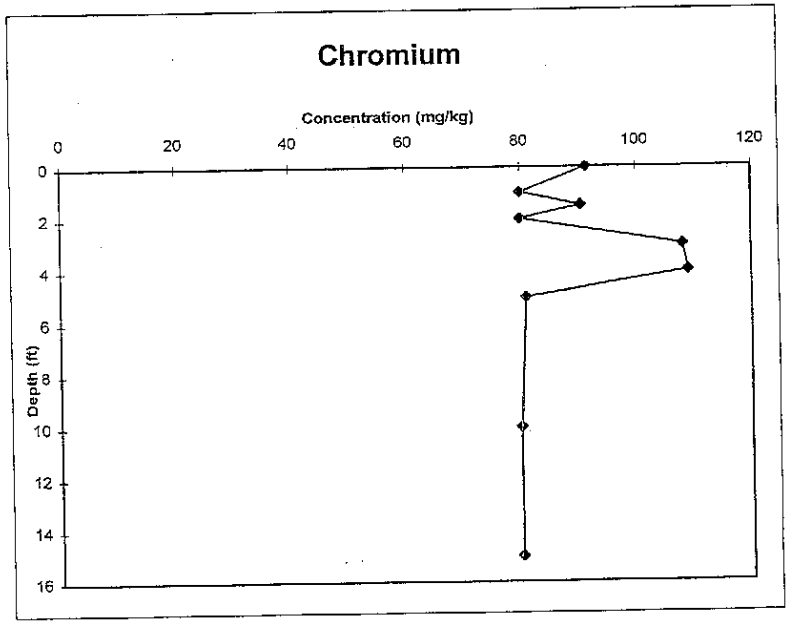


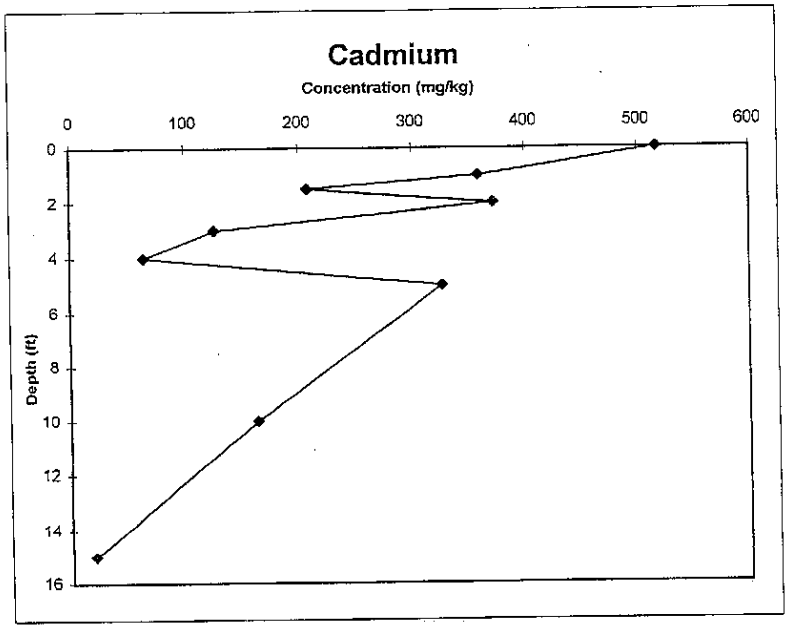


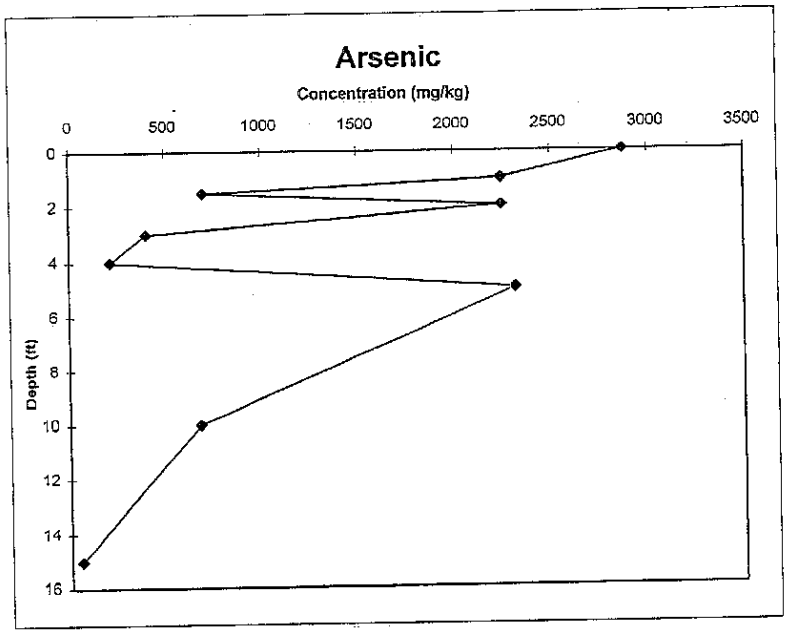


Average Concentrations by Depth, Investigation Area 4
(Front Slope/Western Plant Boundary Area)



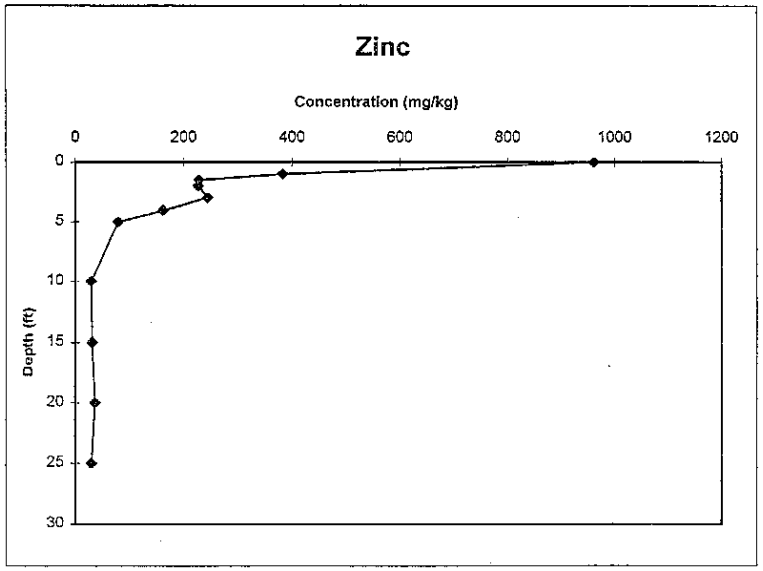


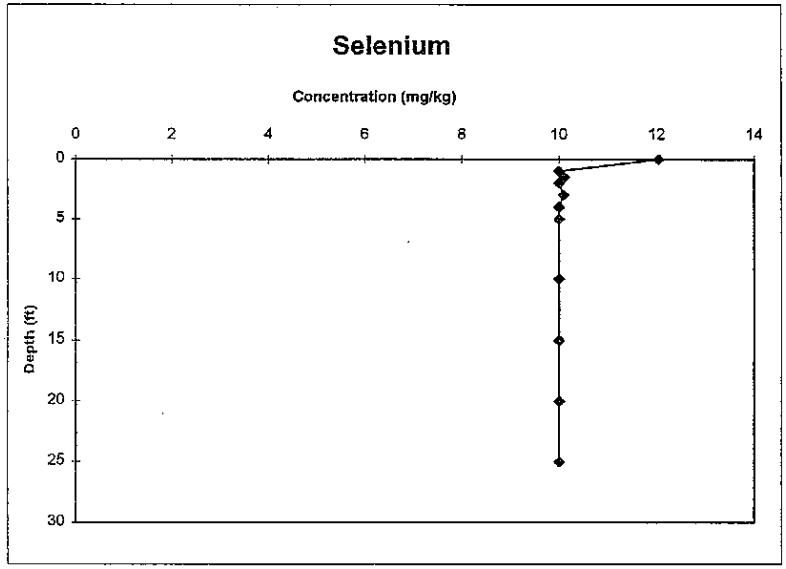


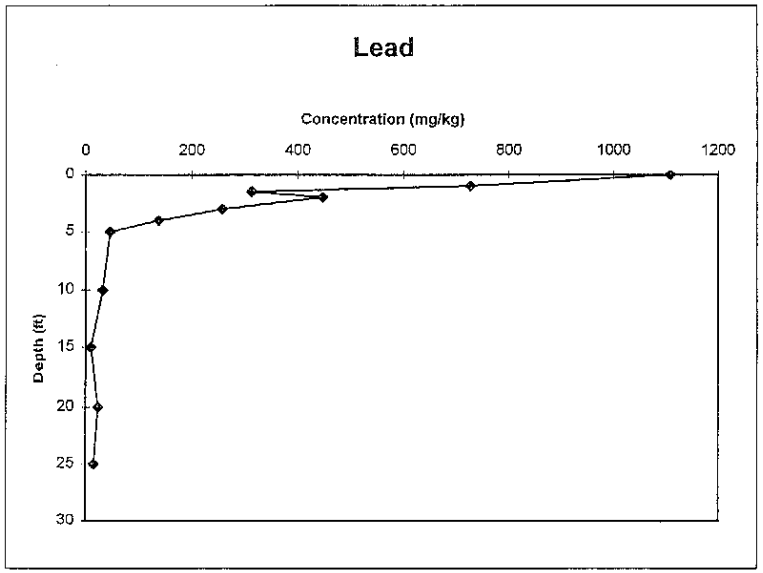


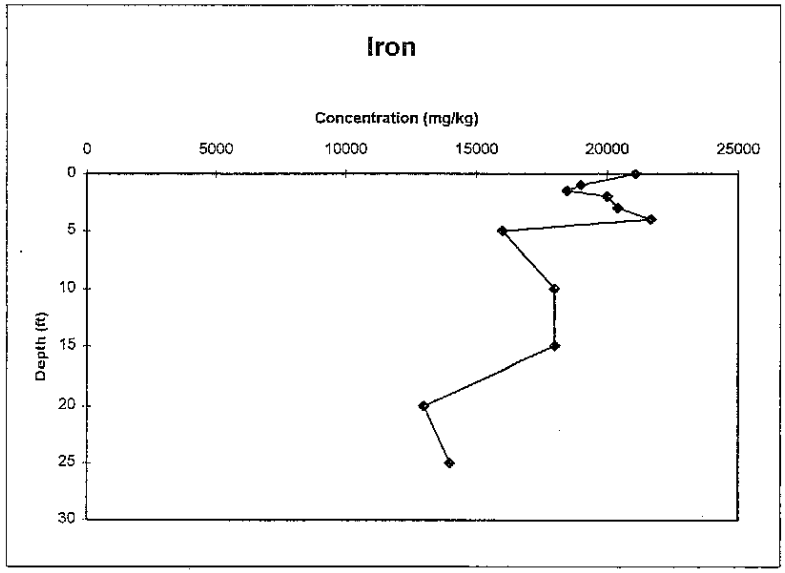
Note: Graphs include soil concentrations for all Phase I and Phase II borings and monitor wells.

Average Concentration by Depth, Investigation Area 5
(Historic Smeltertown Area)

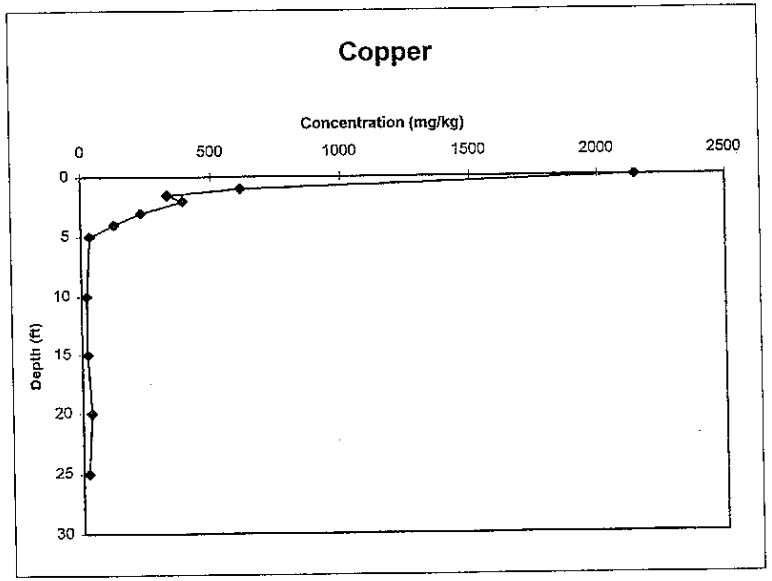


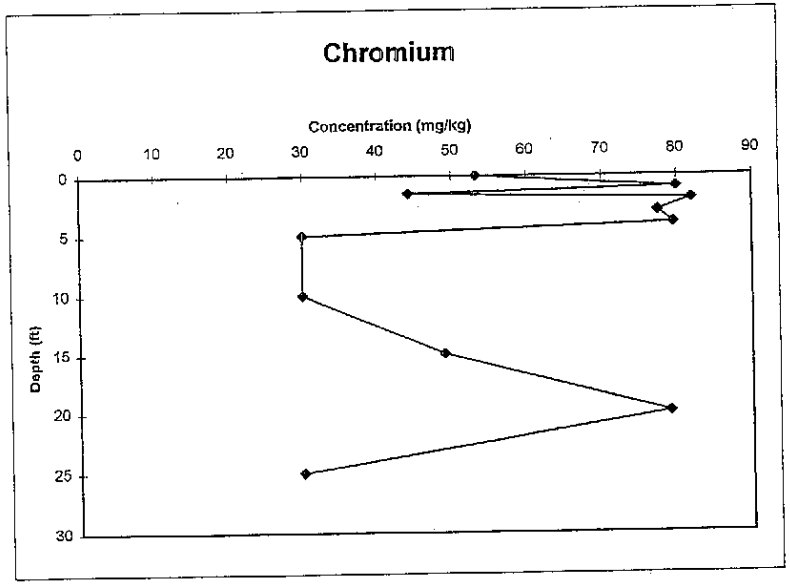


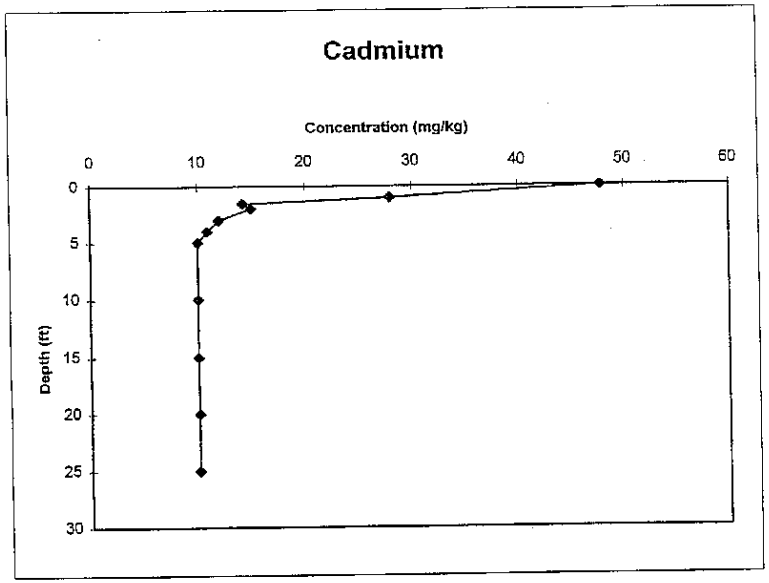


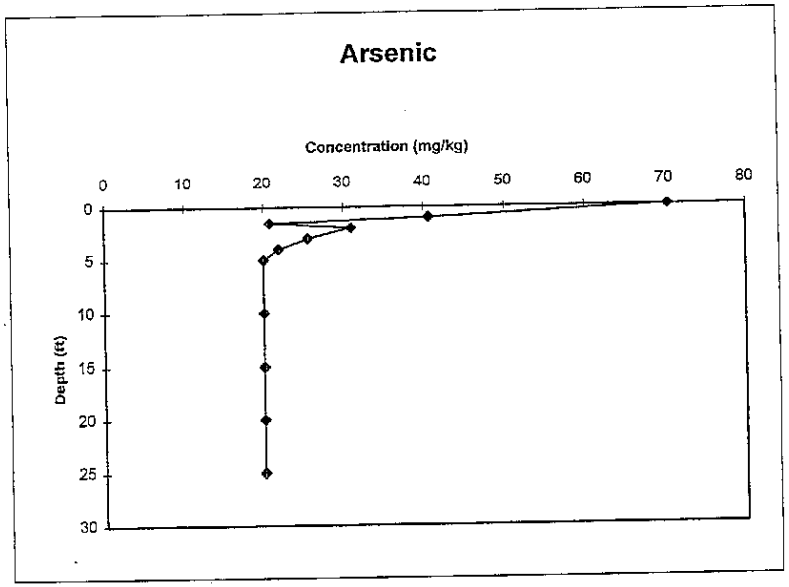


Average Concentration by Depth, Investigation Area 5
(Historic Smeltertown Area)



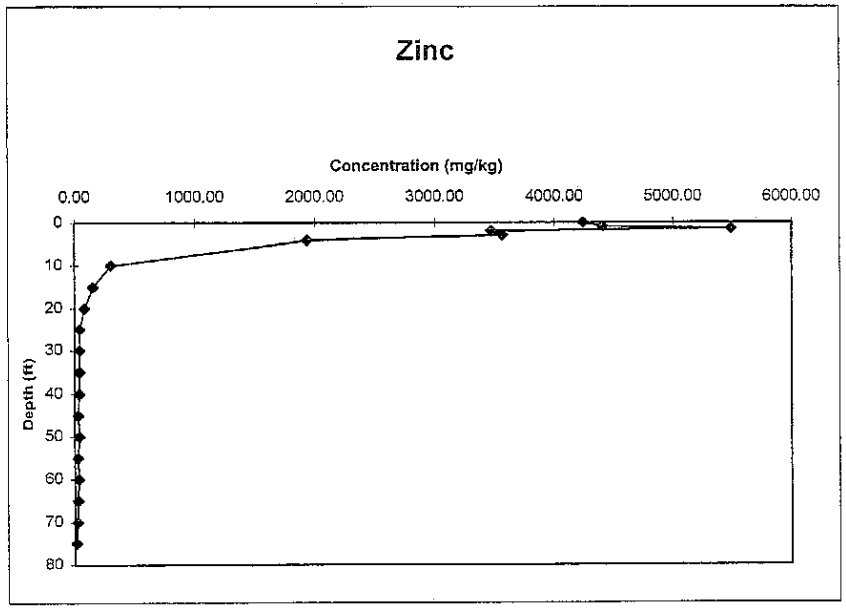


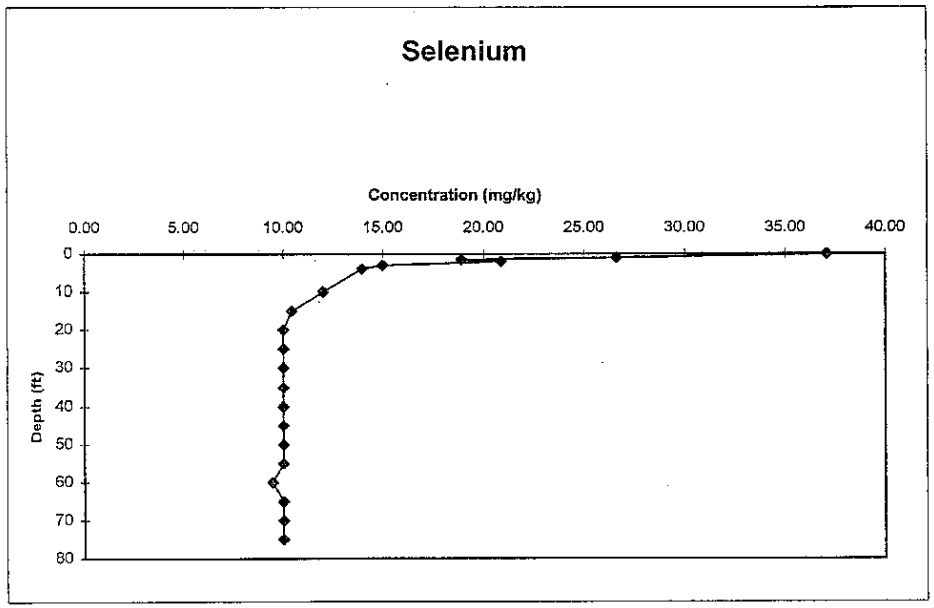


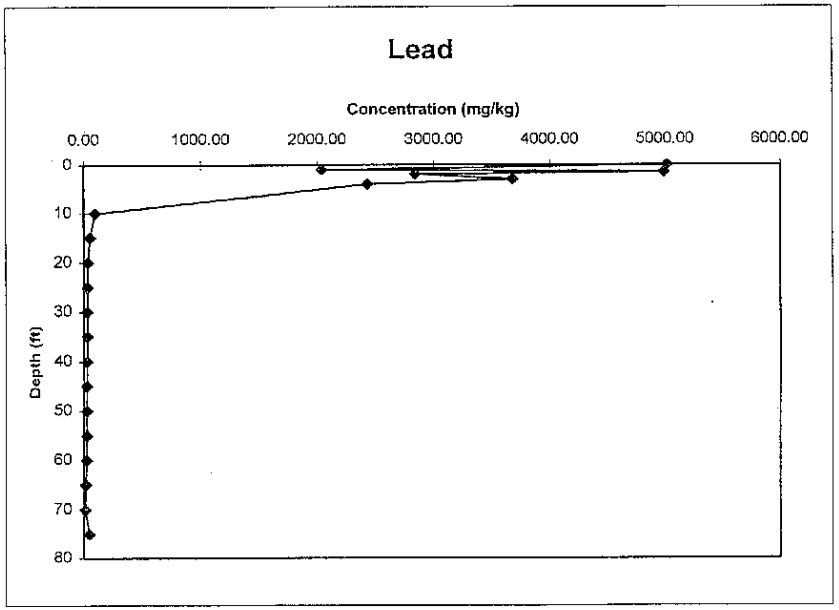


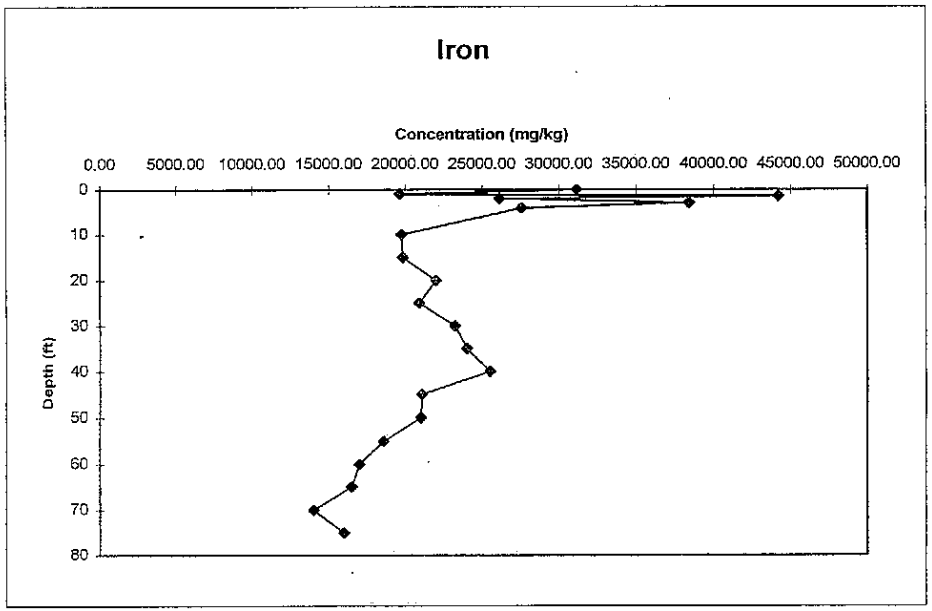
Note: Graphs include soil concentrations for all Phase I and Phase II borings and monitor wells.

Average Concentrations by Depth, Investigation Area 8
(Bedding and Unloading Buildings Area)

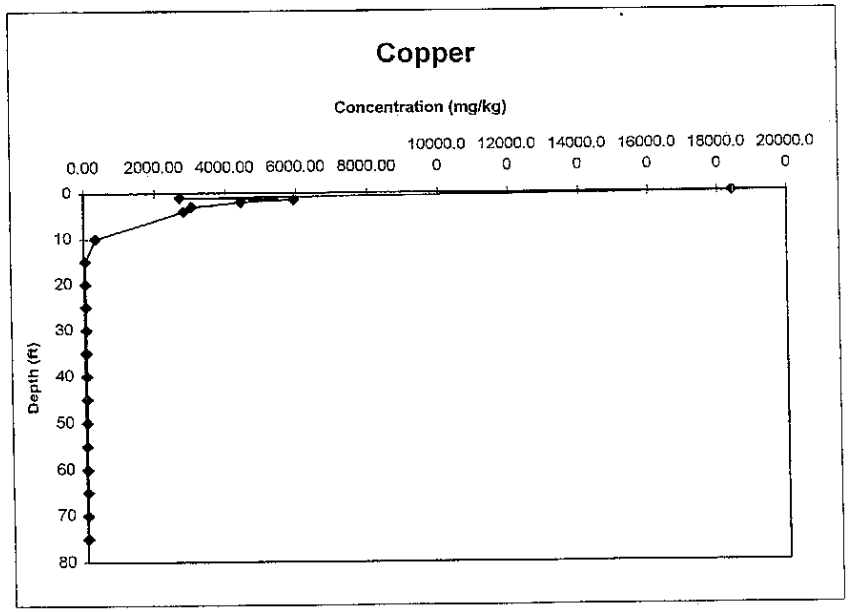


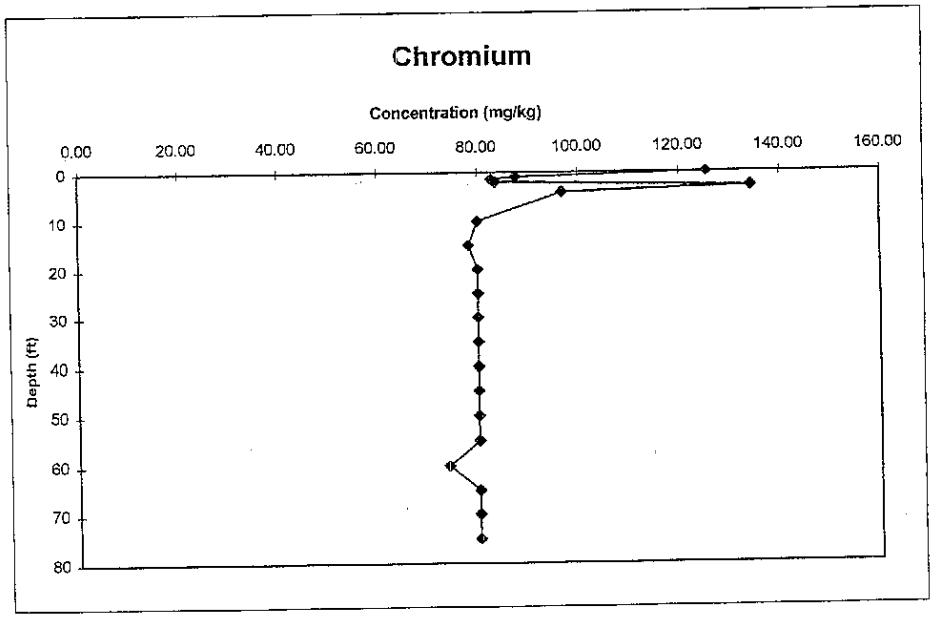


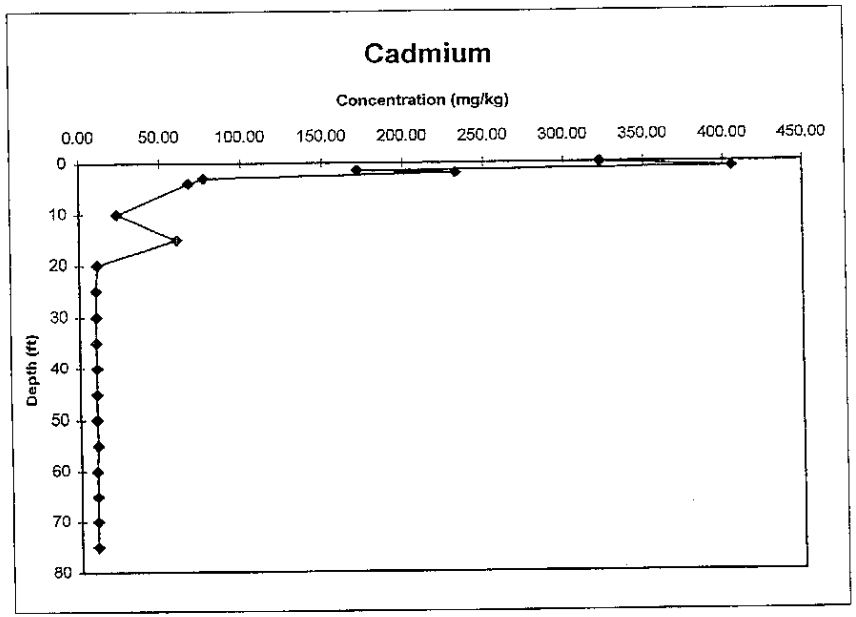


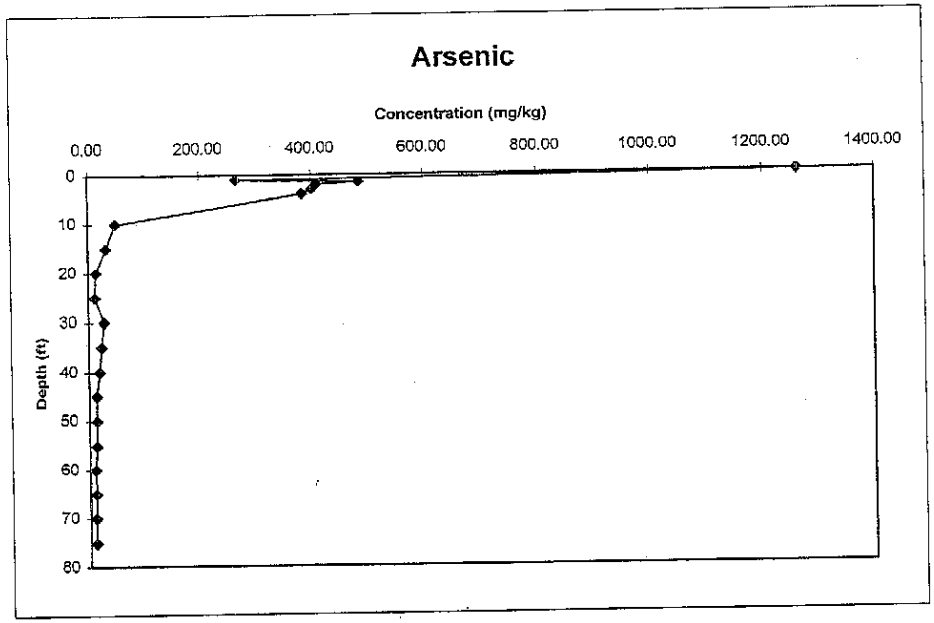


Average Concentrations by Depth, Investigation Area 8
(Bedding and Unloading Buildings Area)



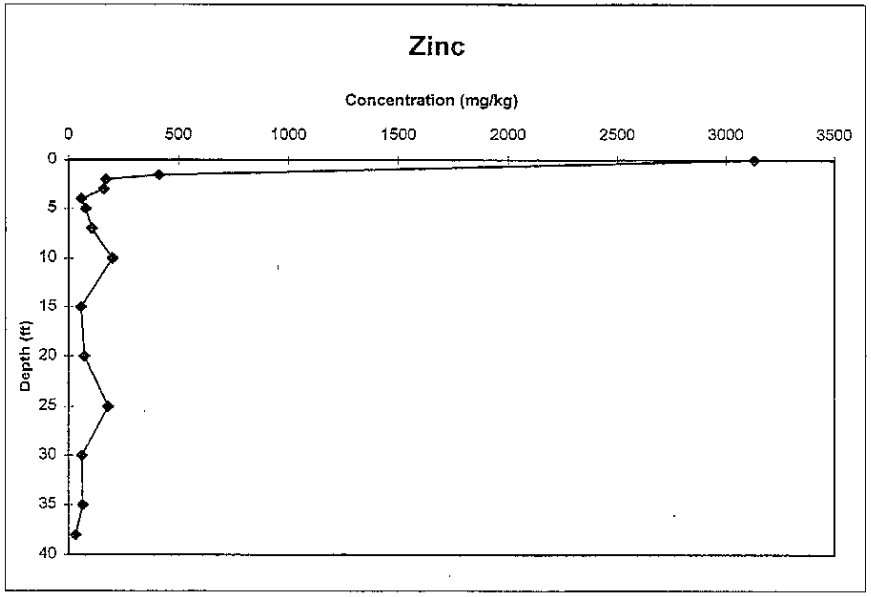


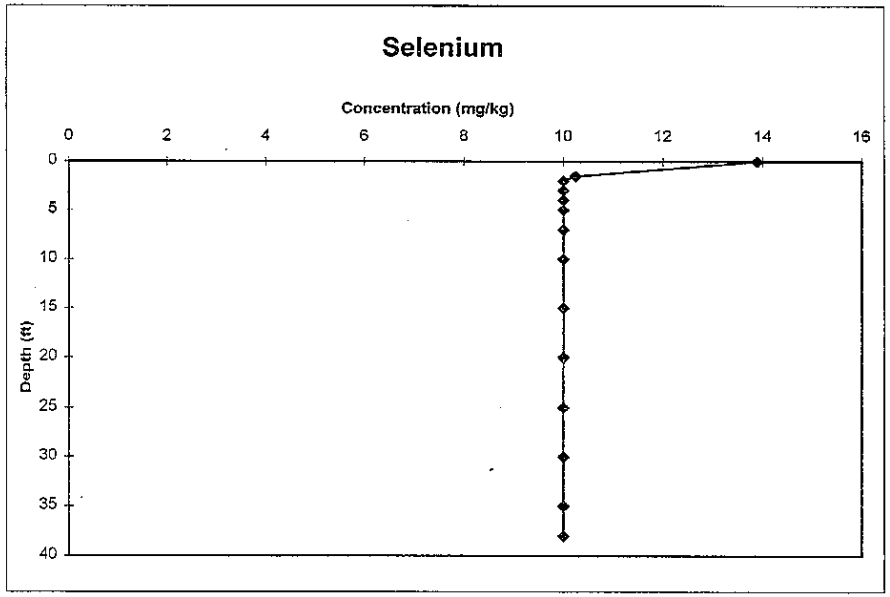


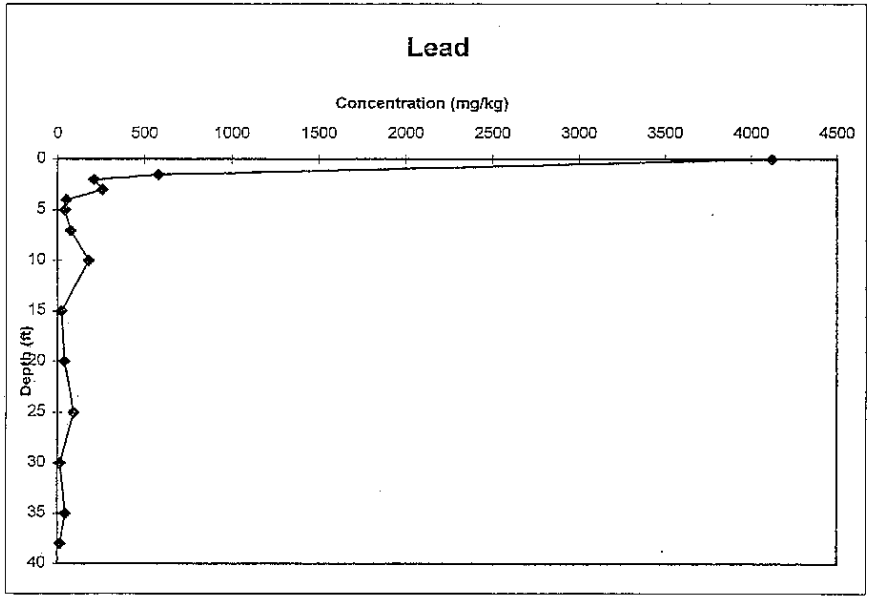


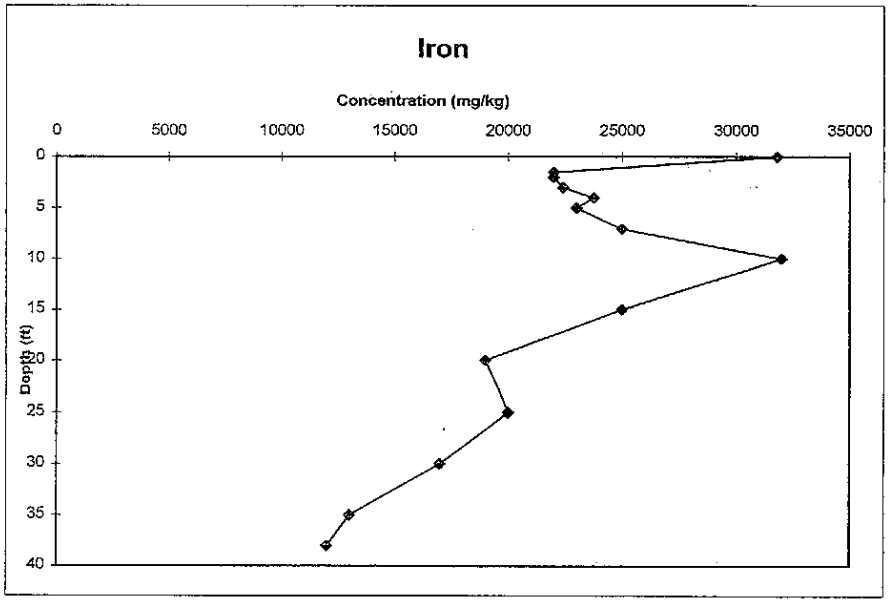
ote: Graphs include soil concentrations for all Phase I and Phase II borings and monitor wells.

Average Soil Concentrations by Depth, Investigation Area 10
(Plant Entrance Area)

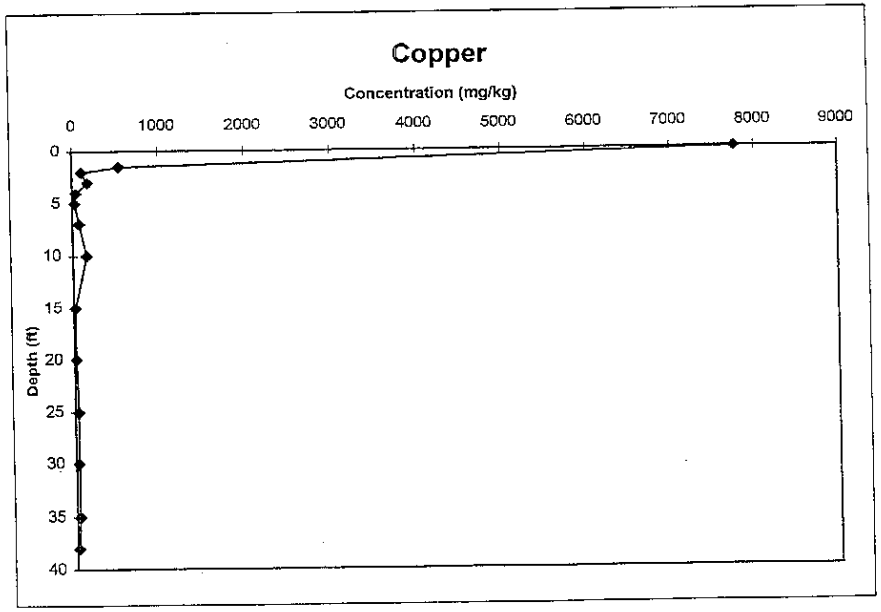


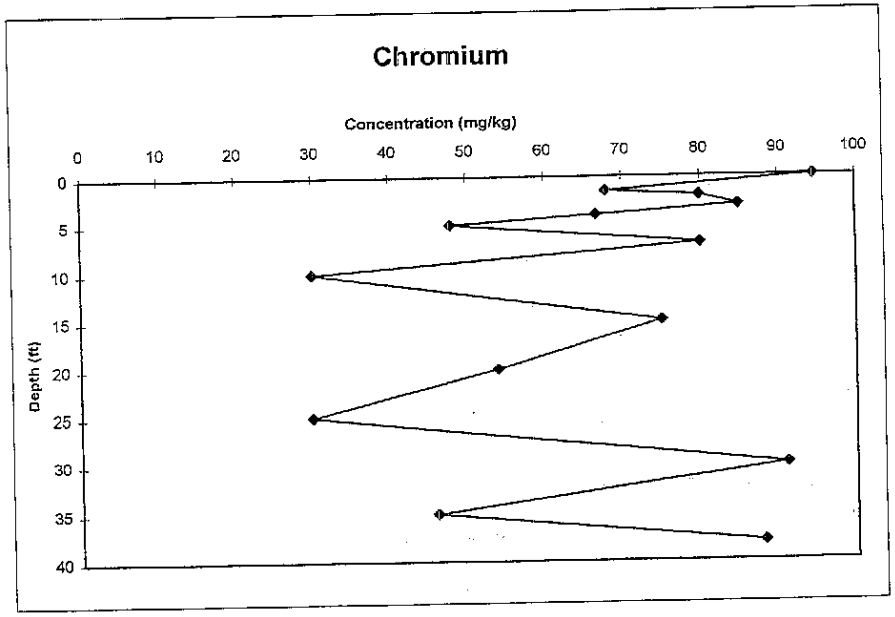


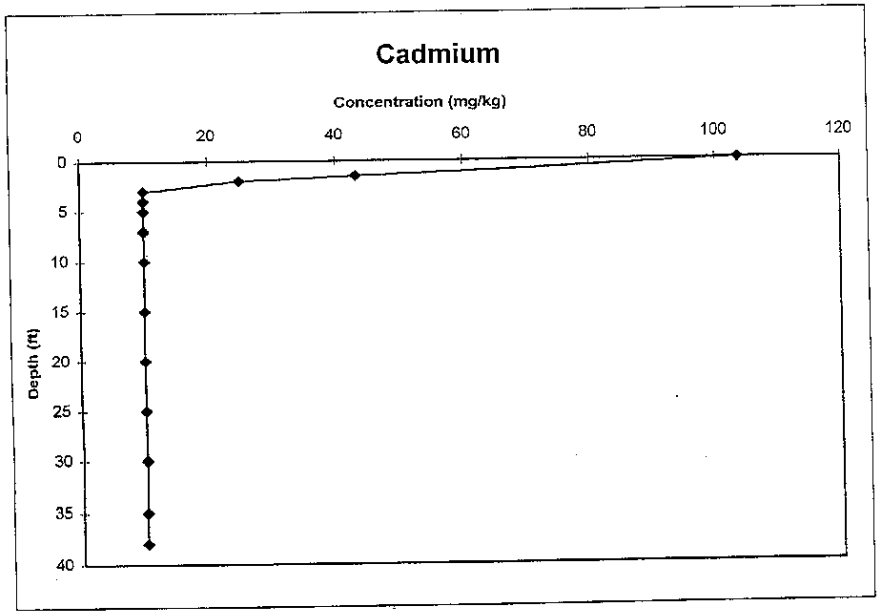


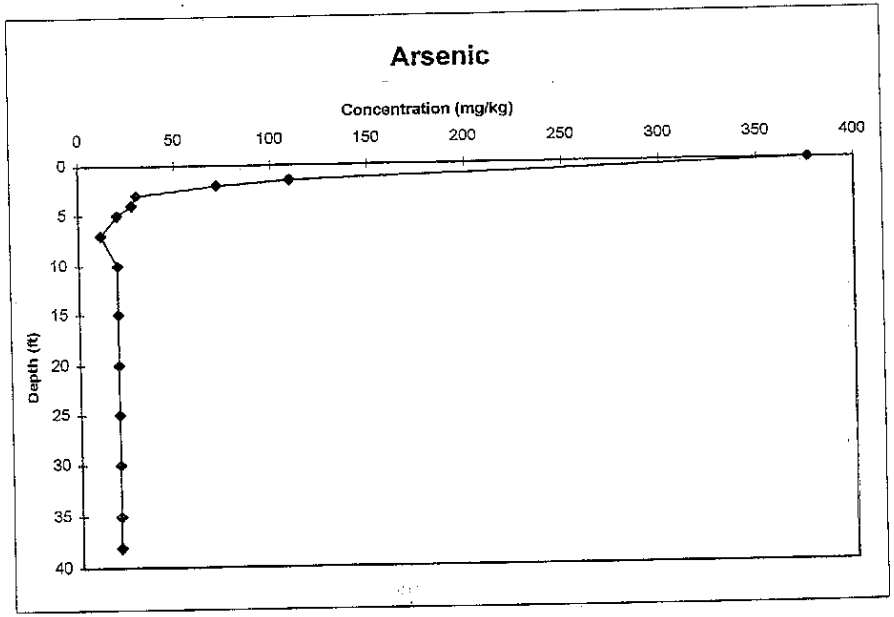


Average Soil Concentrations by Depth, Investigation Area 10
(Plant Entrance Area)



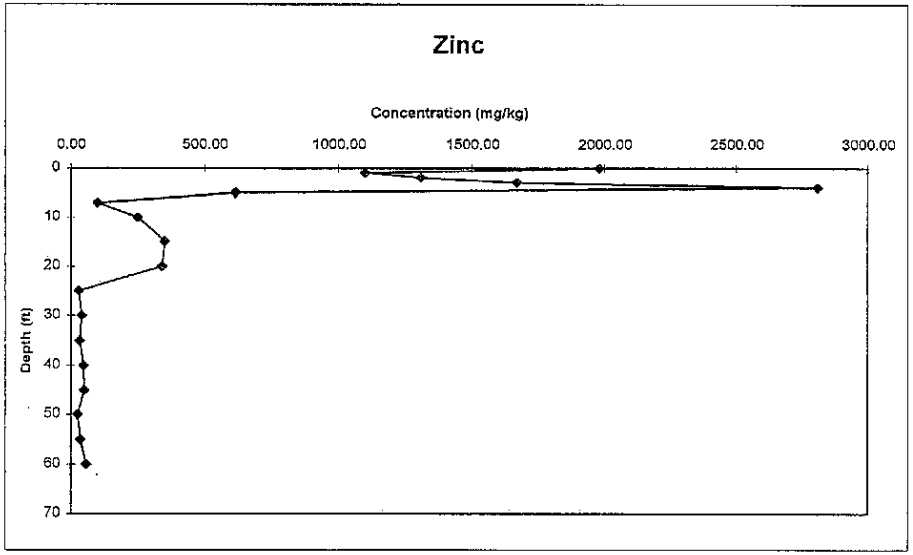


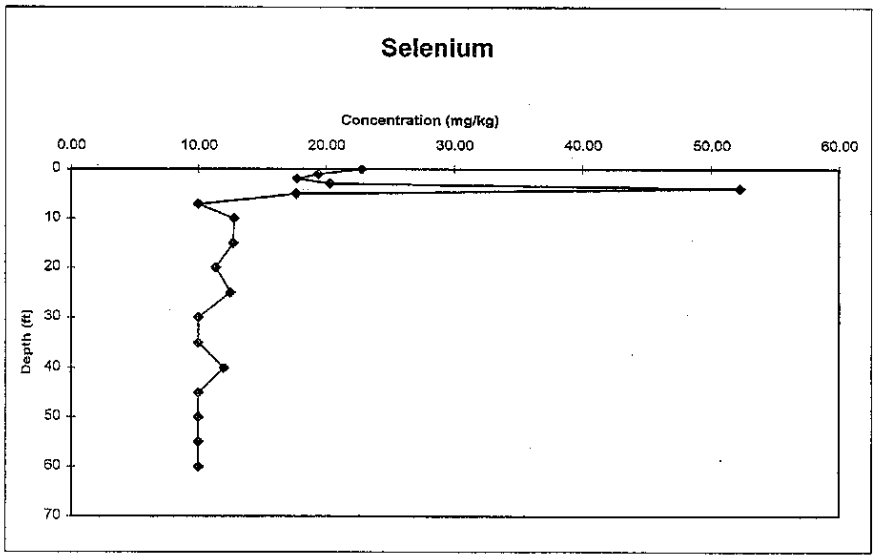


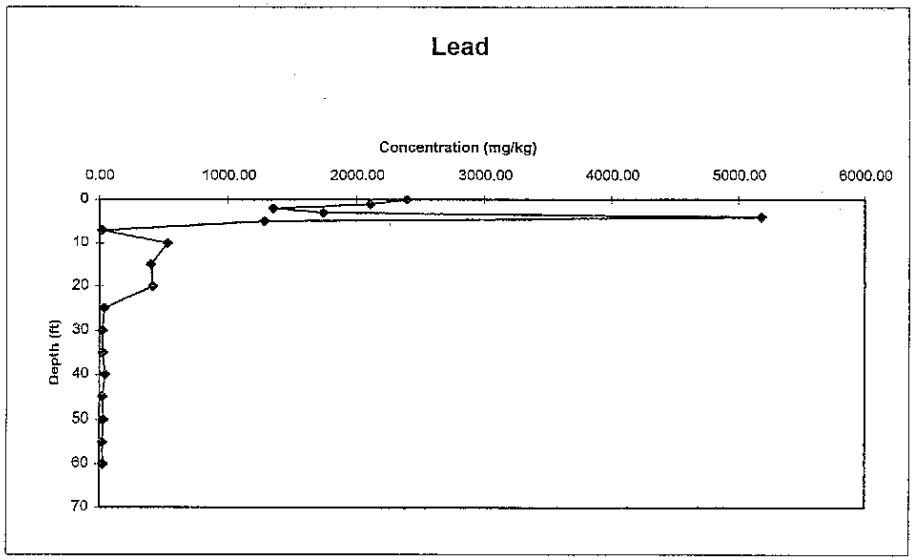


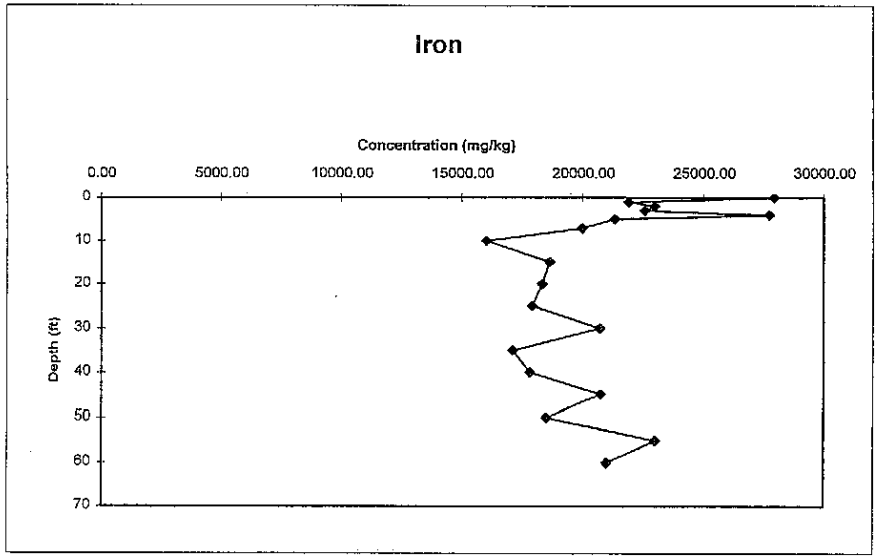
Note: Graphs include soil concentrations for all Phase I and Phase II borings and monitor wells.

Average Concentrations ... Depth, Investigation Area 11
(Sosuthern Arroyo Area)

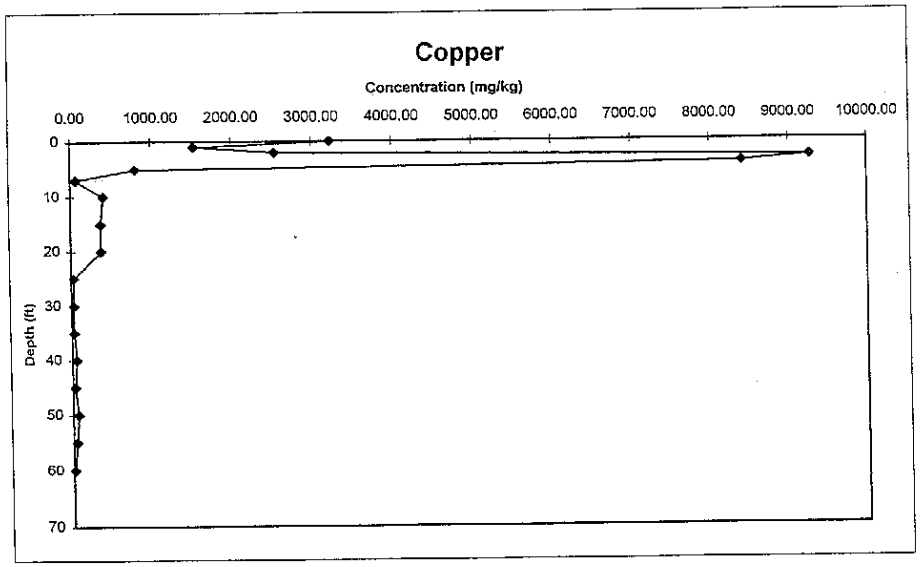


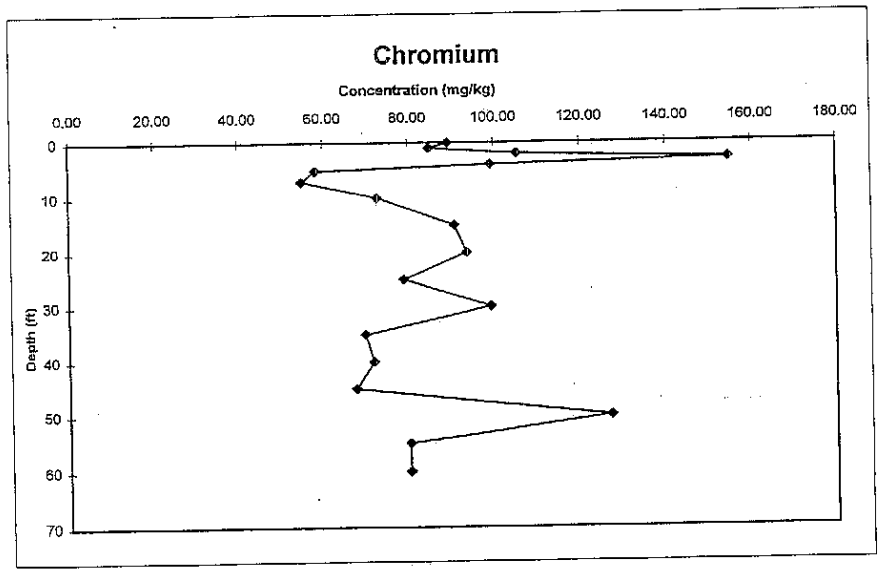


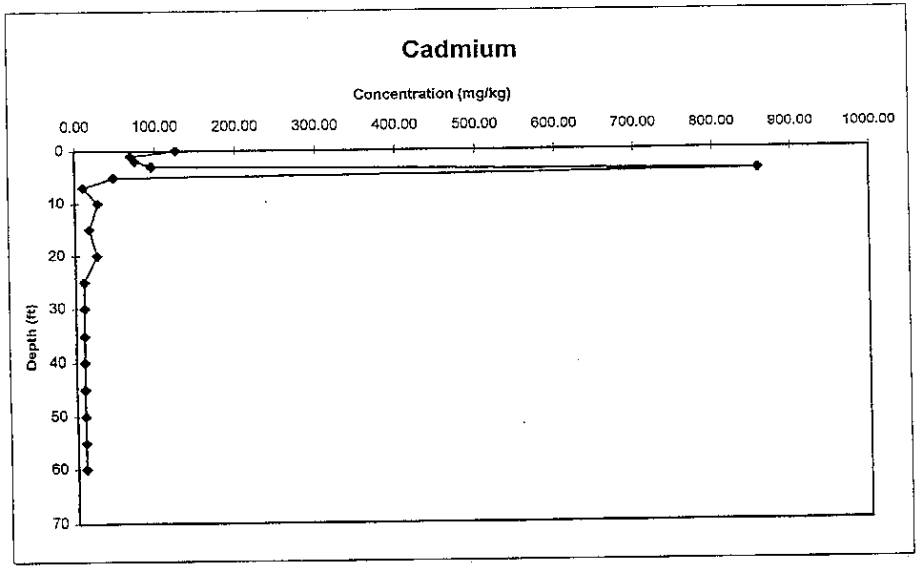


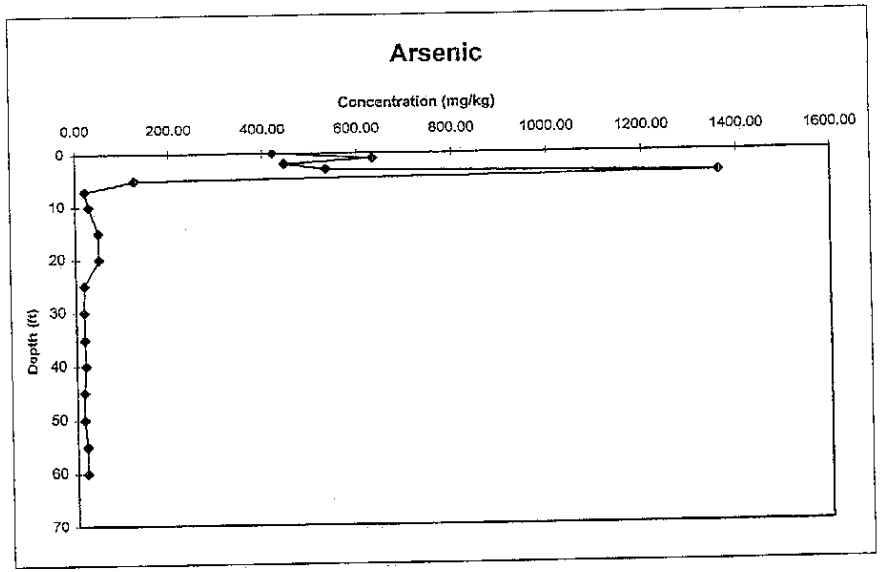


Average Concentrations by Depth, Investigation Area 11
(Sosuthern Arroyo Area)



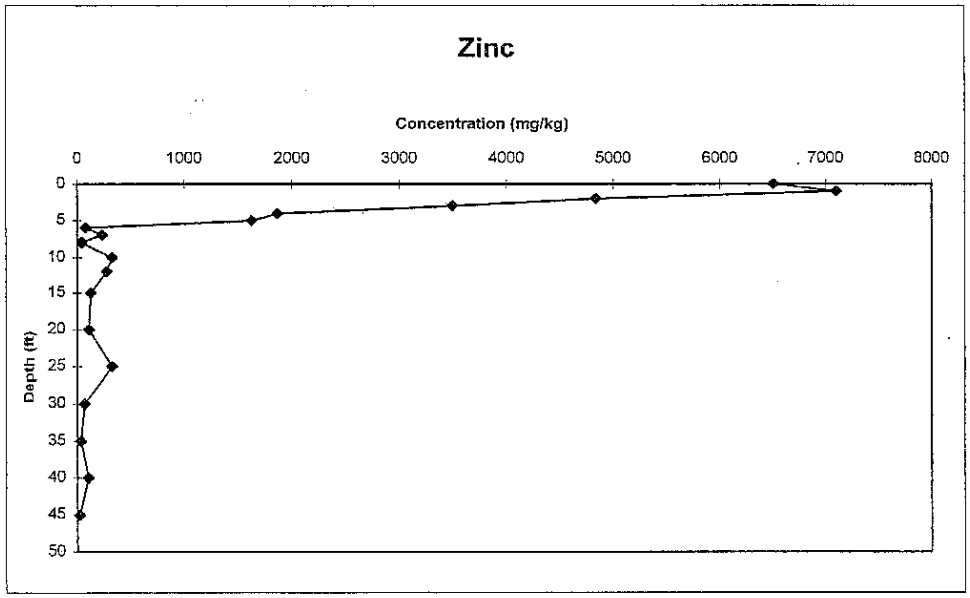


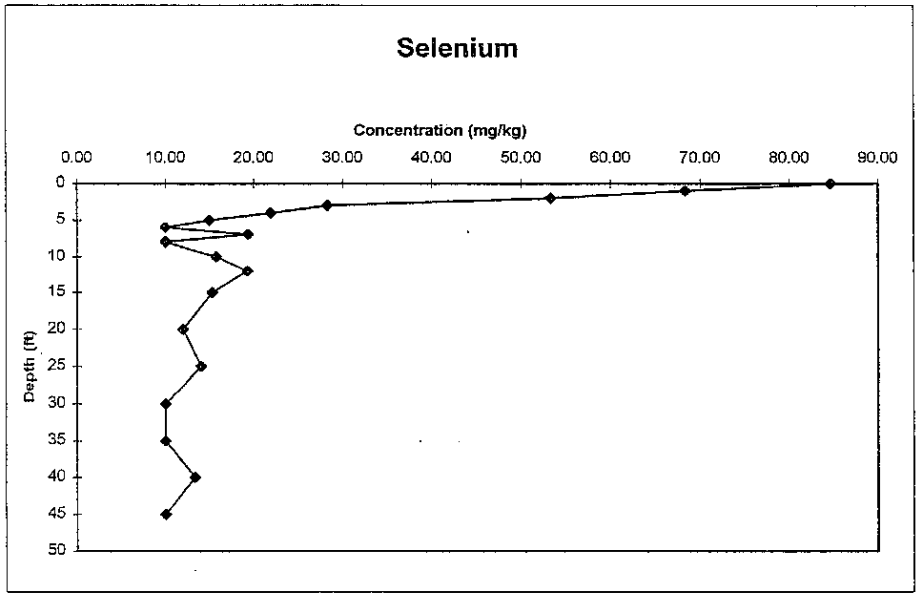


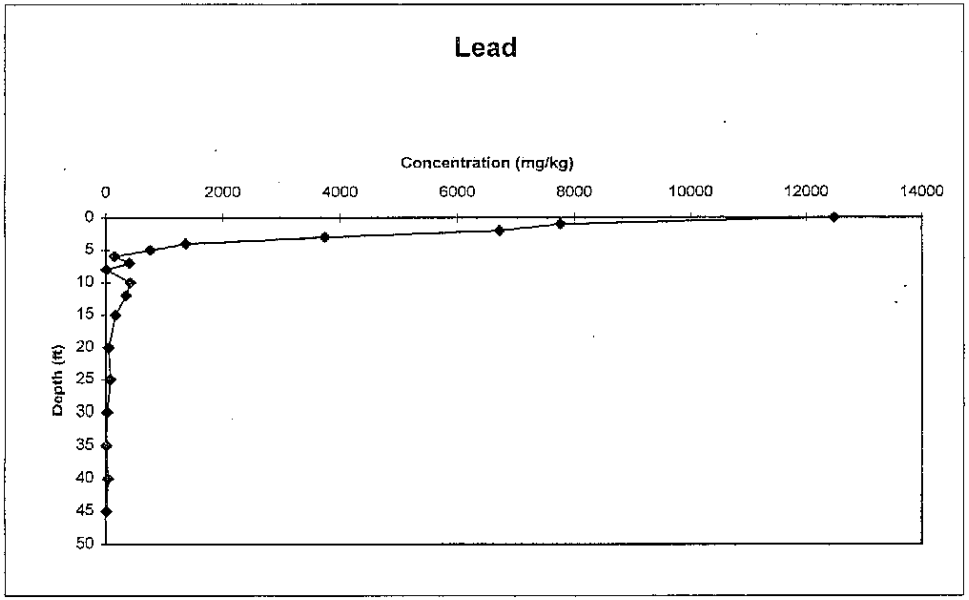


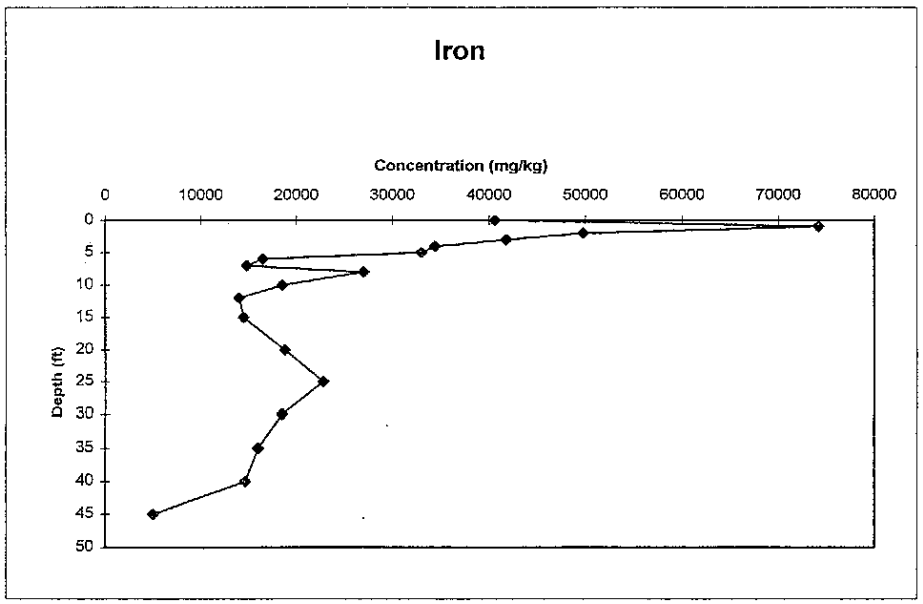
Note: Graphs include soil concentrations for all Phase I and Phase II borings and monitor wells.

Average Soil Concentration: Depth, Investigation Area 12
(Epemeral Pond and Pond Sediment Storage Area)

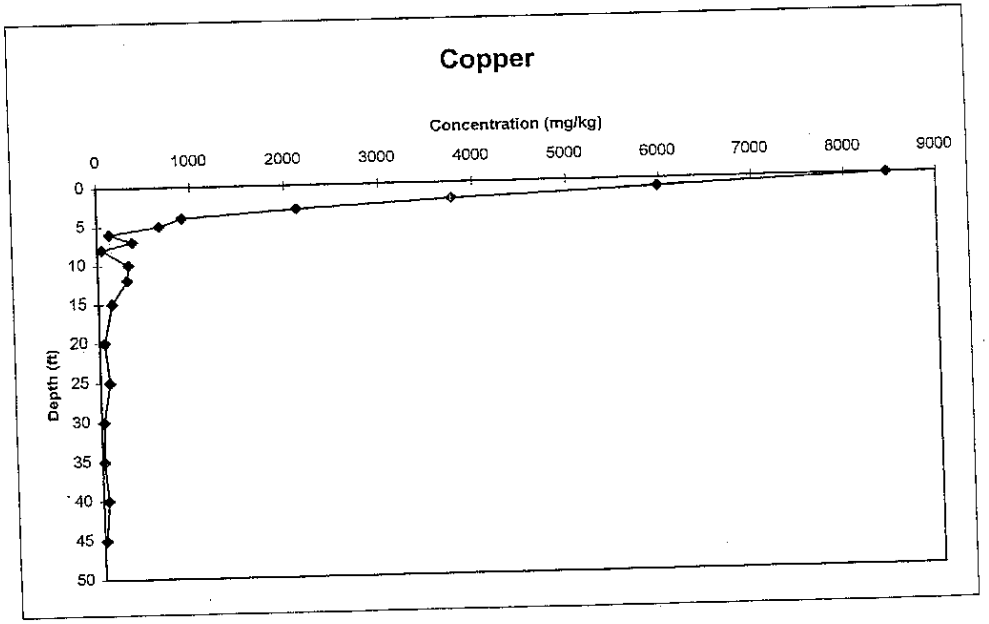


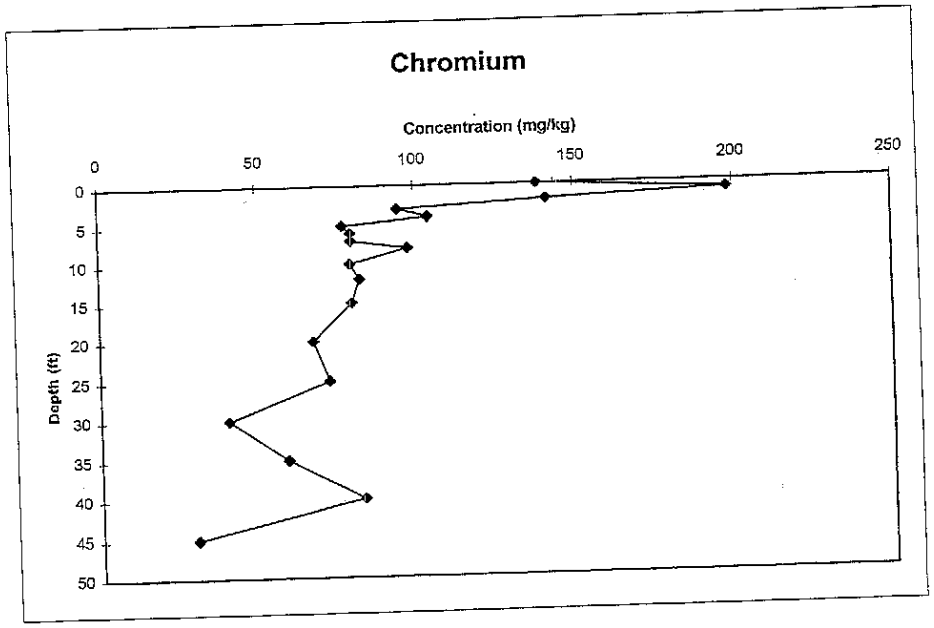


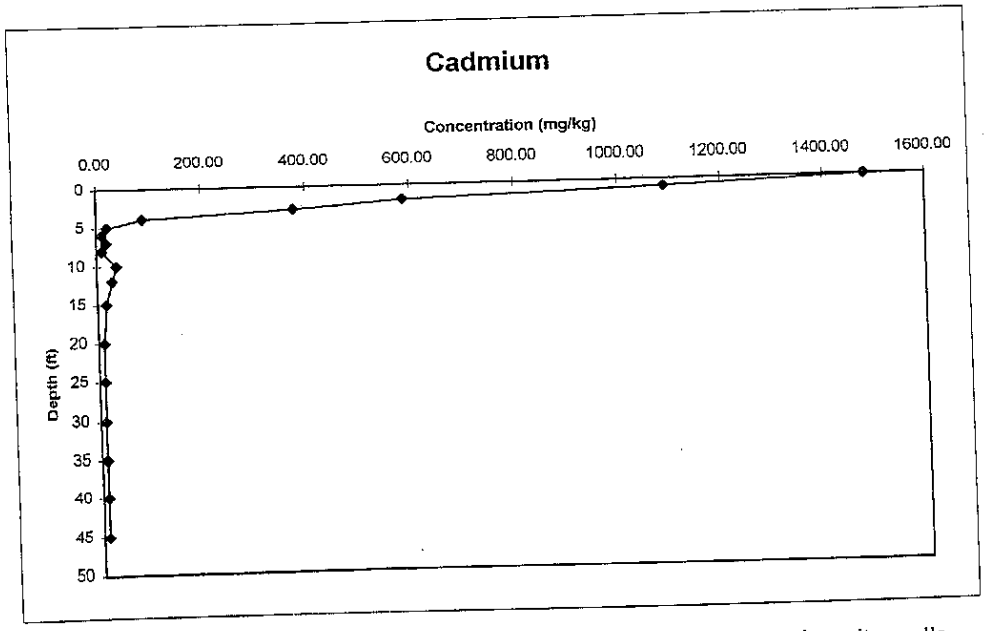


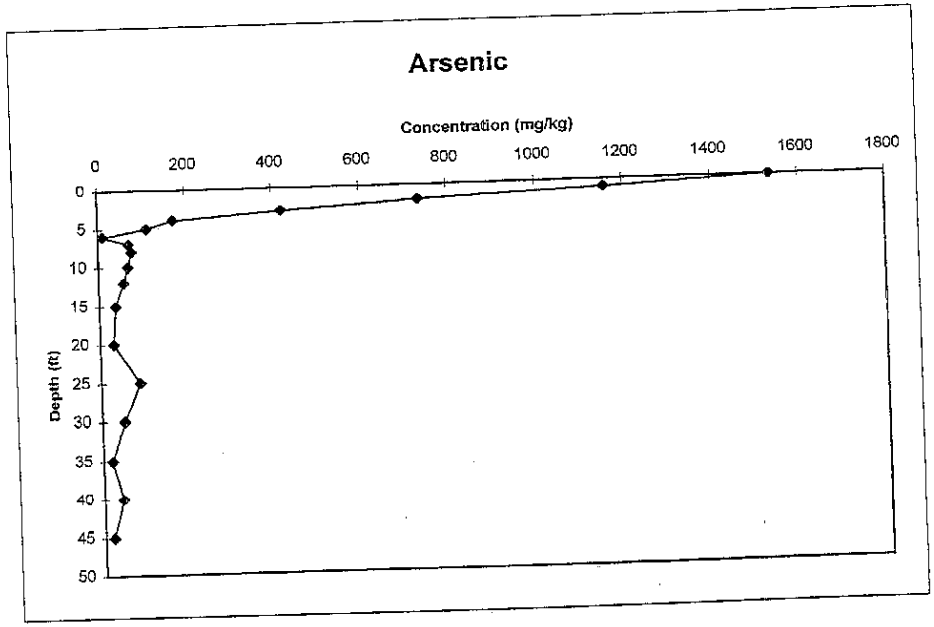


Average Soil Concentrations by Depth, Investigation Area 12
(Epemeral Pond and Pond Sediment Storage Area)



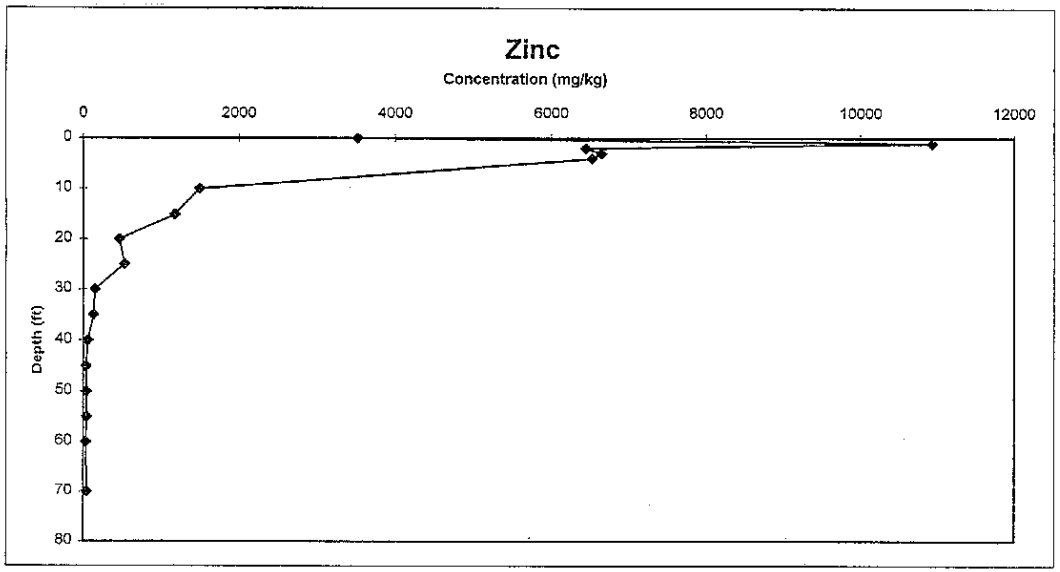


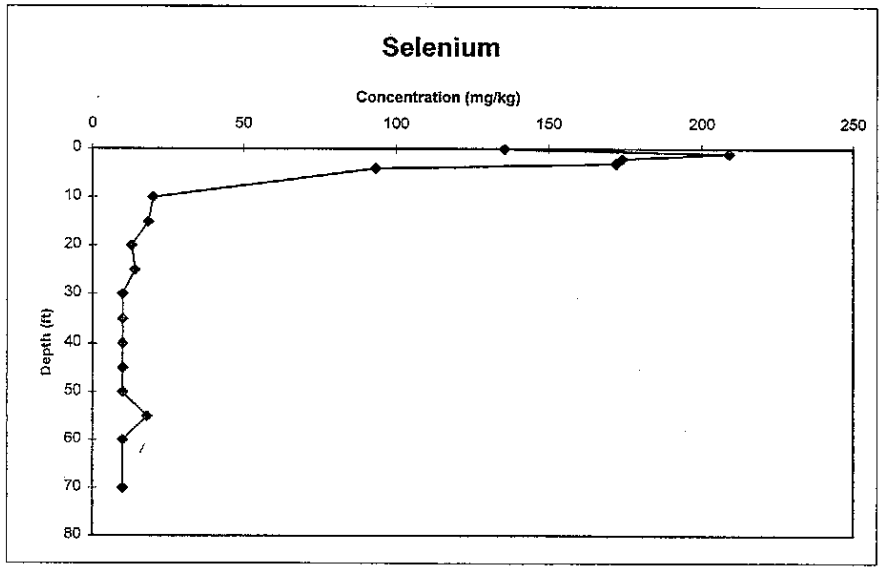


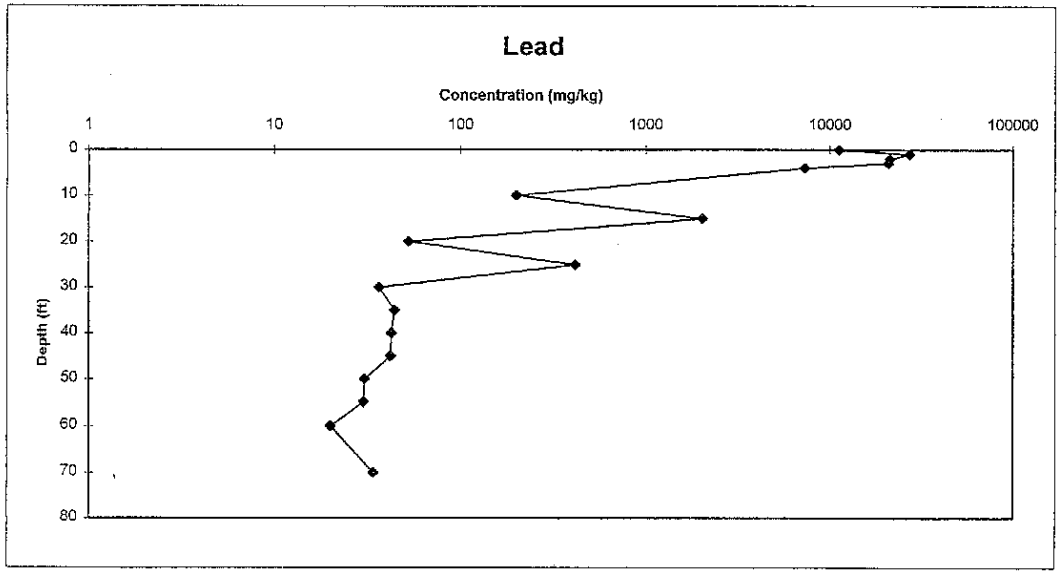


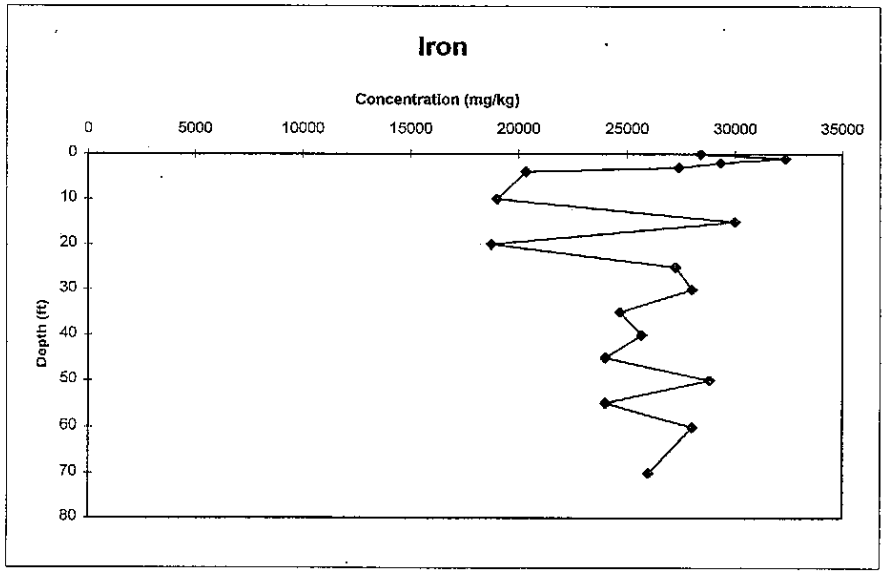
Note: Graphs include soil concentrations for all Phase I and Phase II borings and monitor wells.

Average Concentrations [illegible]th, Investigation Area 13
(Sam[illegible] Area)

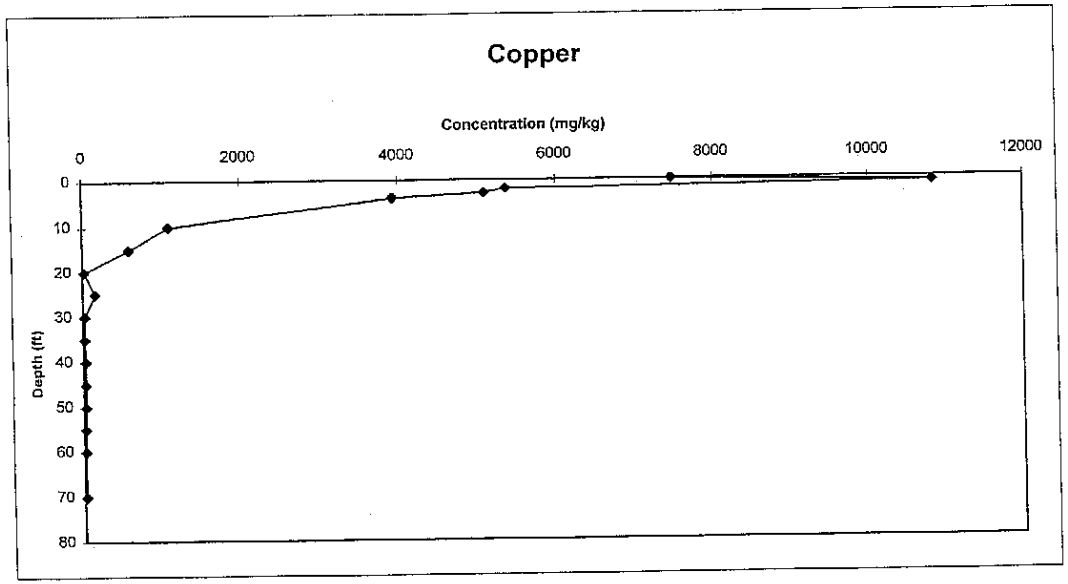


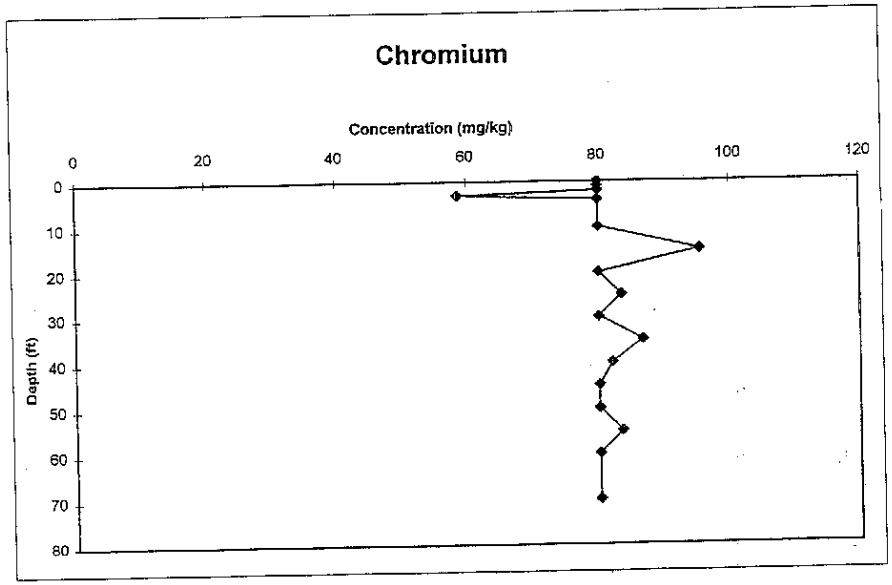


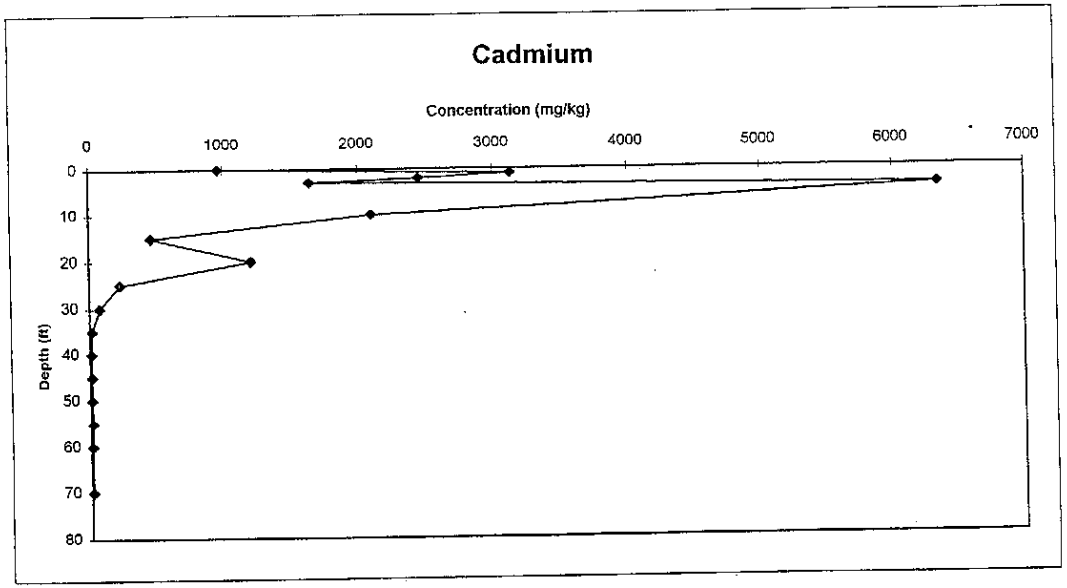


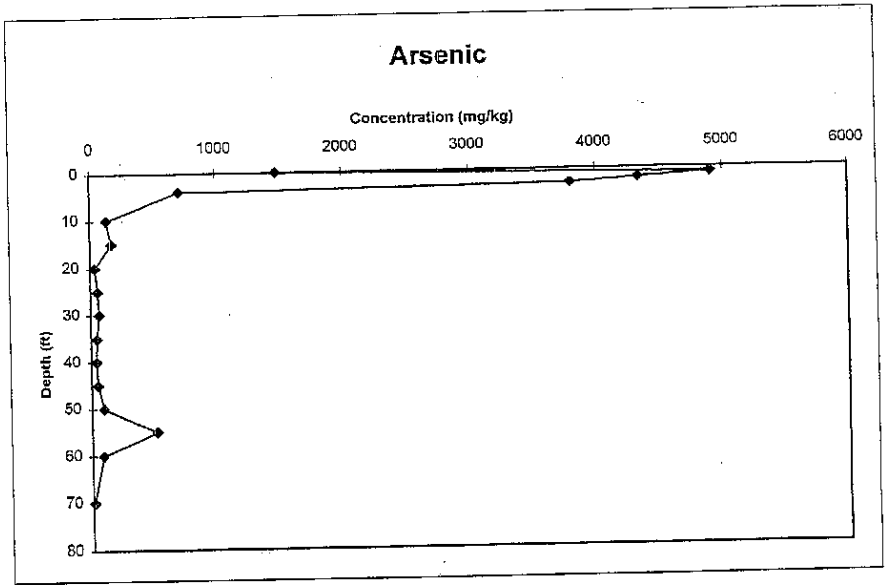


Average Concentrations by Depth, Investigation Area 13
(Sample Mill Area)



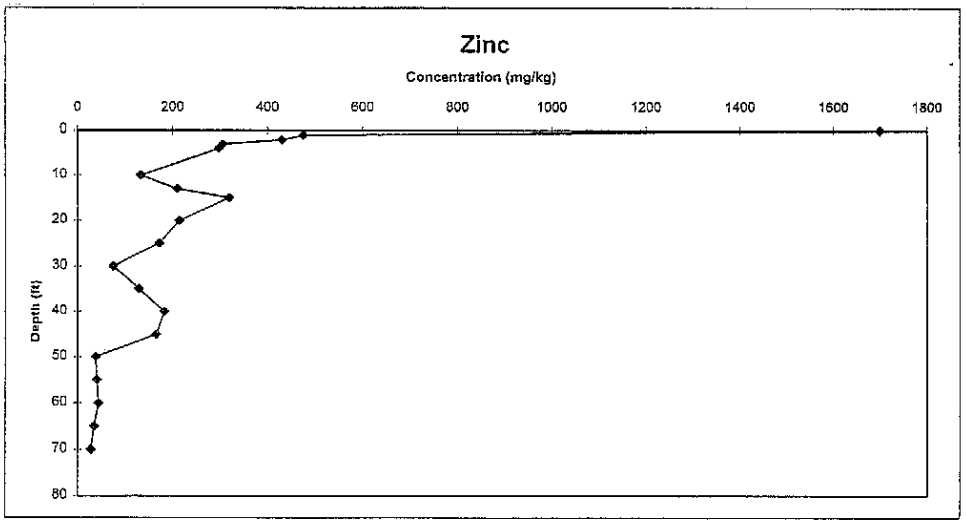


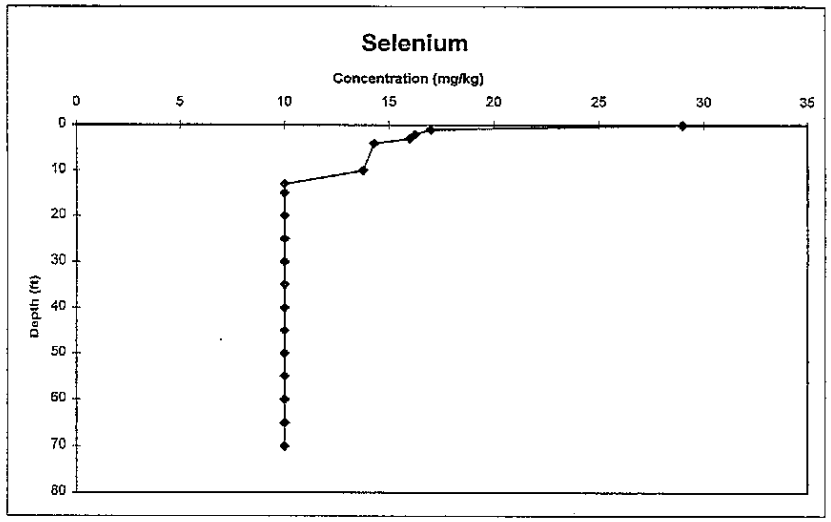


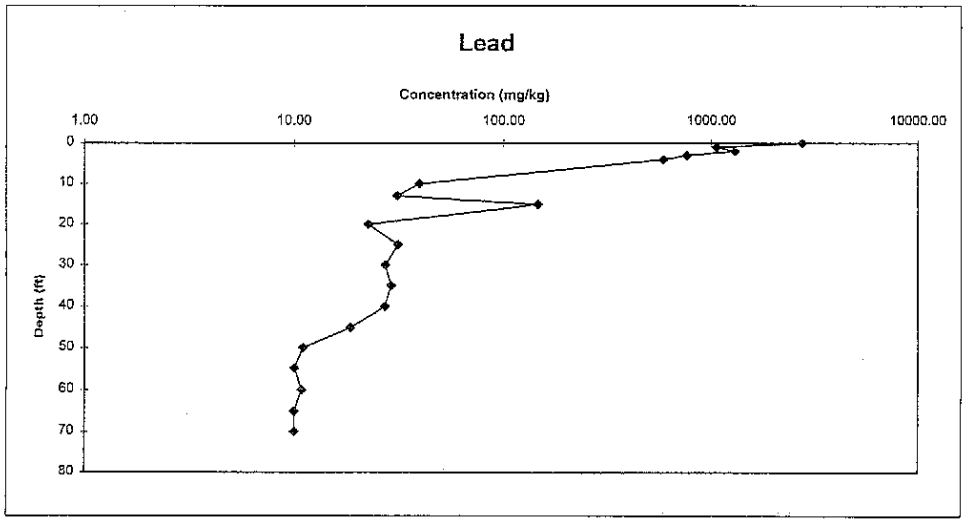


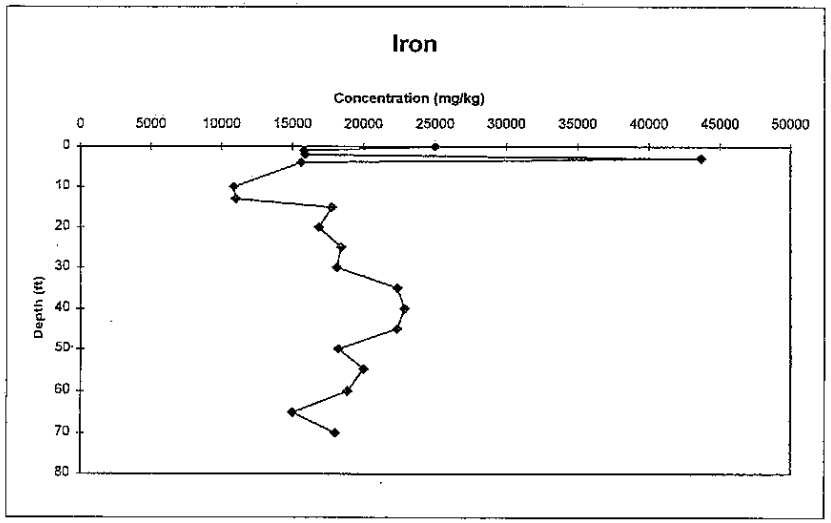
Note: Graphs include soil concentrations for all Phase I and Phase II borings and monitor wells.

Average Concentrations by Depth, Investigation Area 14
(South Staging Area)

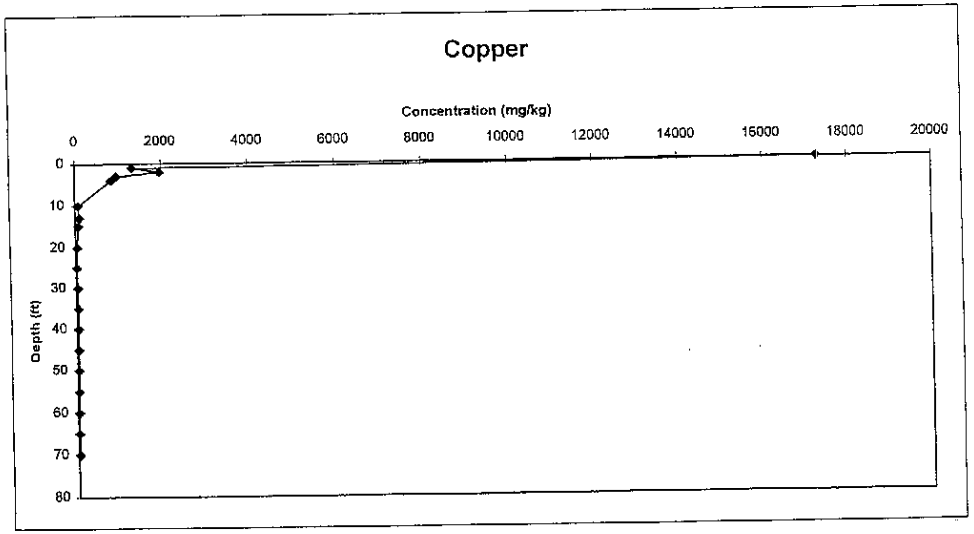


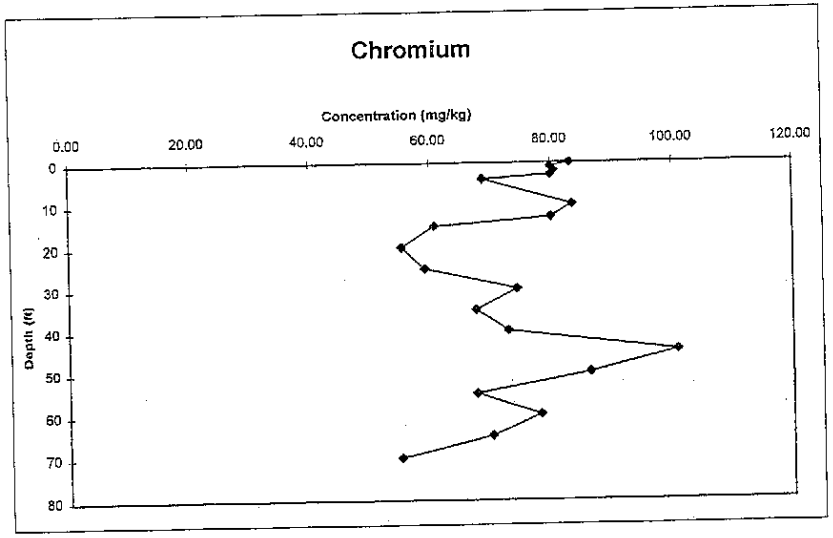


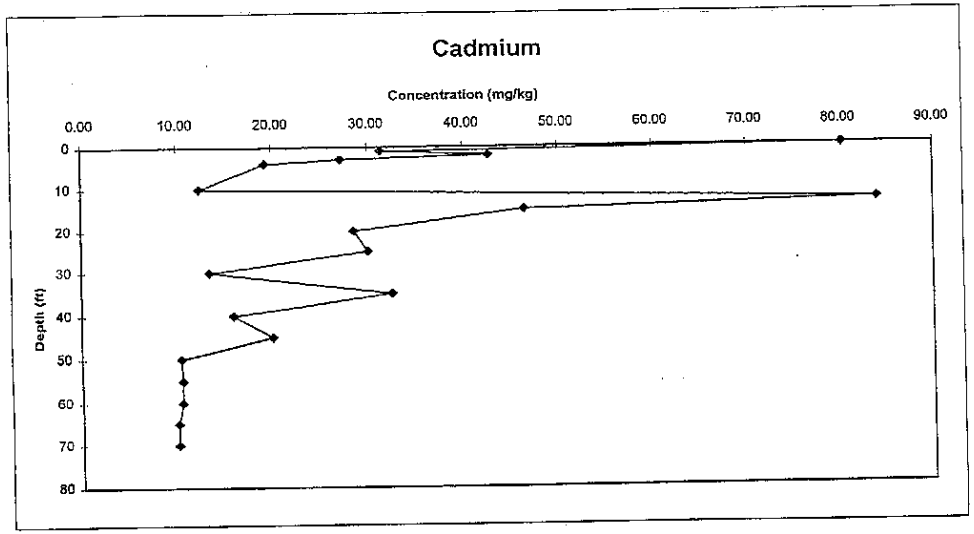


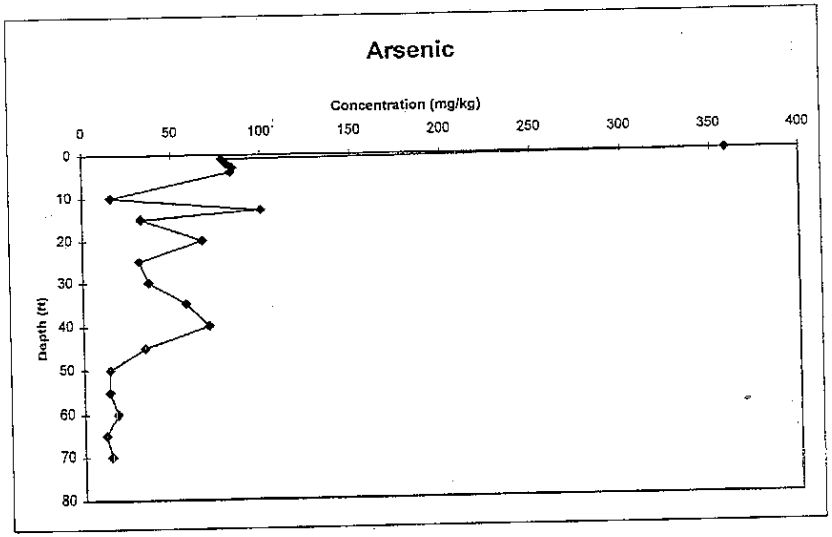


Average Concentrations by Depth, Investigation Area 14
(South Staging Area)

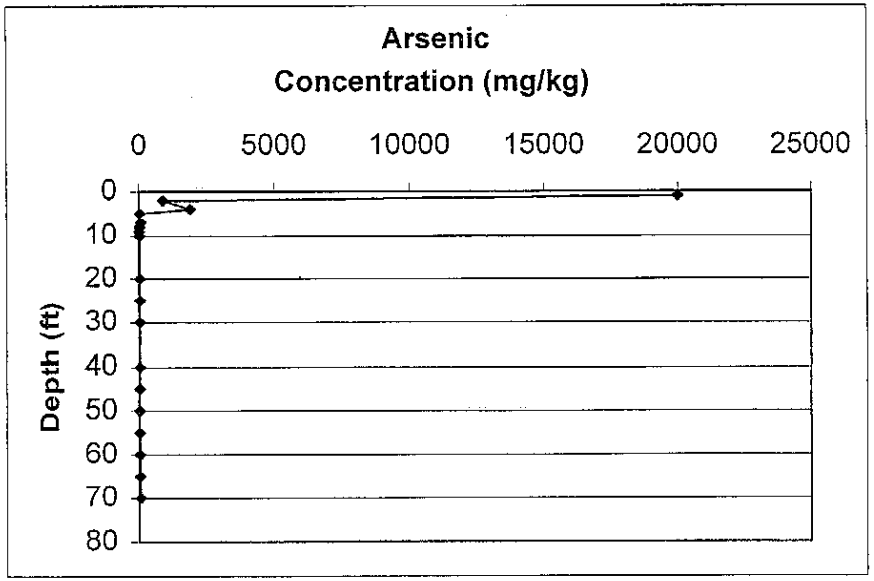


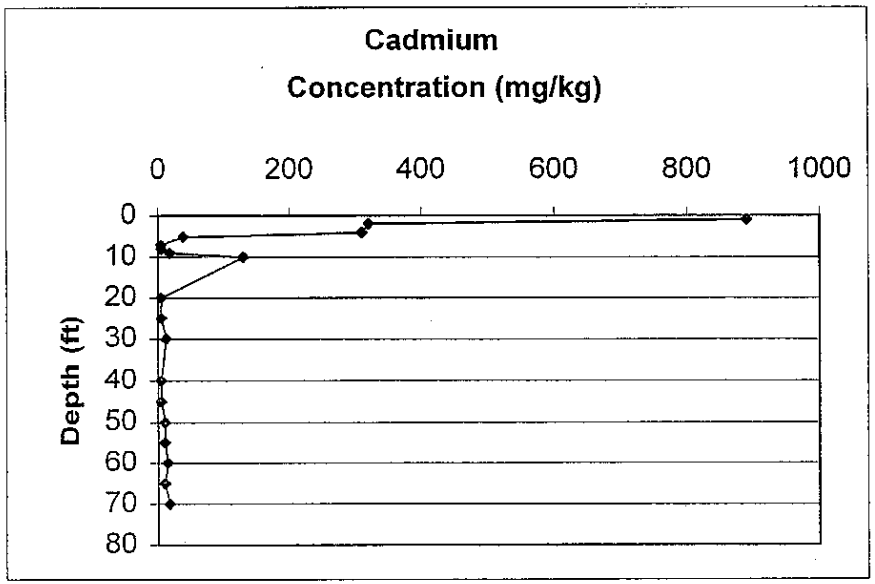


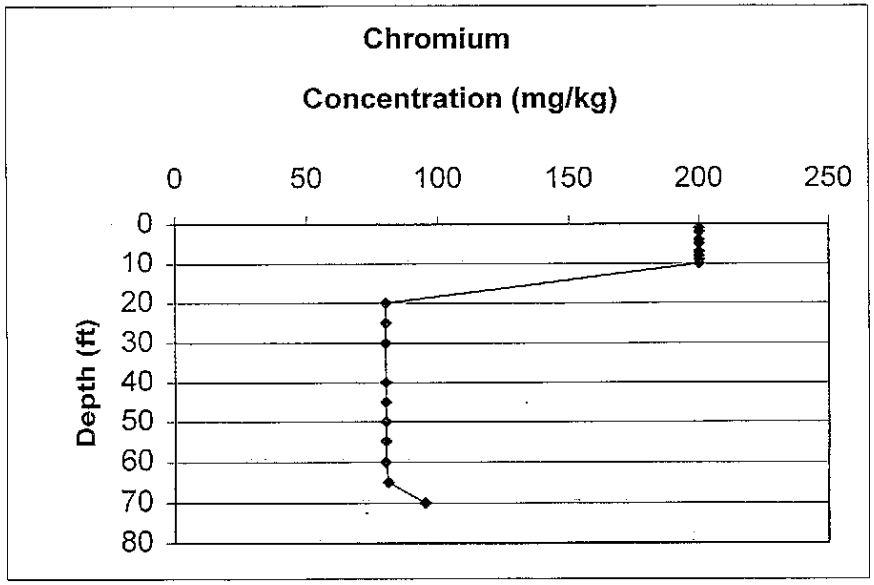


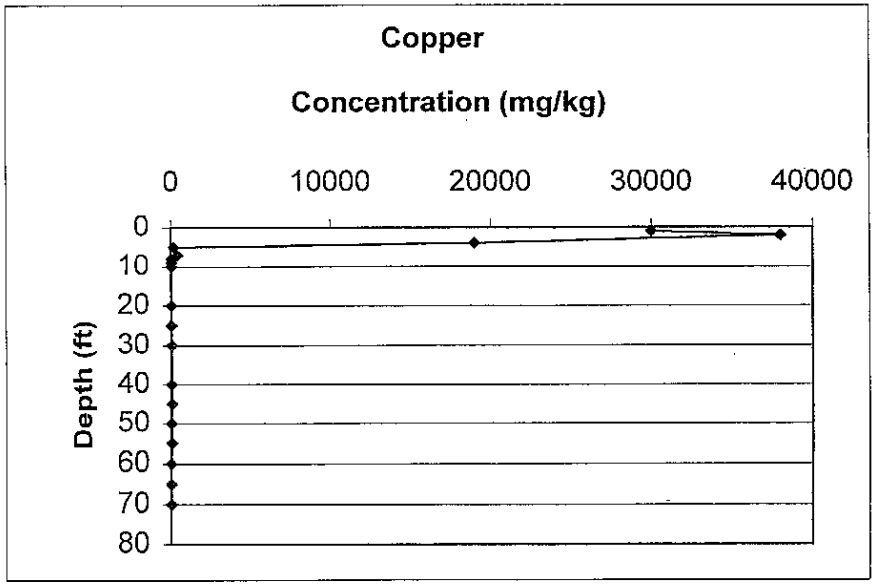


Note: Graphs include soil concentrations for all Phase I and Phase II borings and monitor wells.

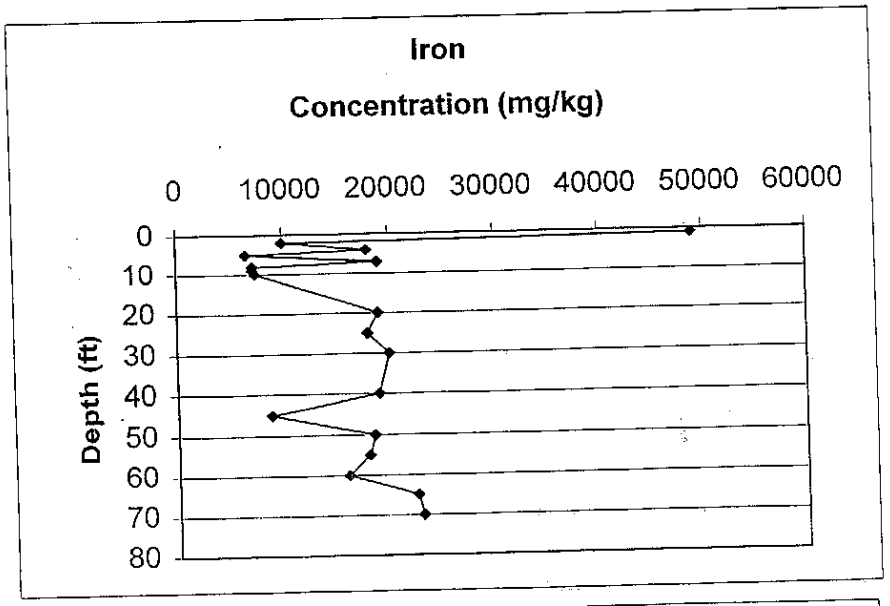

Arsenic
Concentration (mg/kg)
0
5000
10000
15000
20000
25000
Depth (ft)
0
10
20
30
40
50
60
70
80

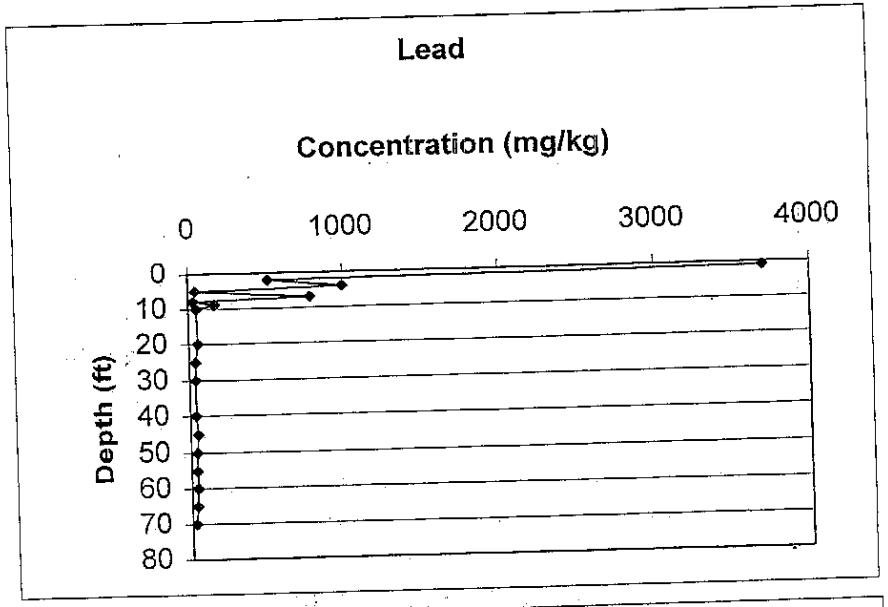

Cadmium
Concentration (mg/kg)
0
200
400
600
800
1000
Depth (ft)
0
10
20
30
40
50
60
70
80

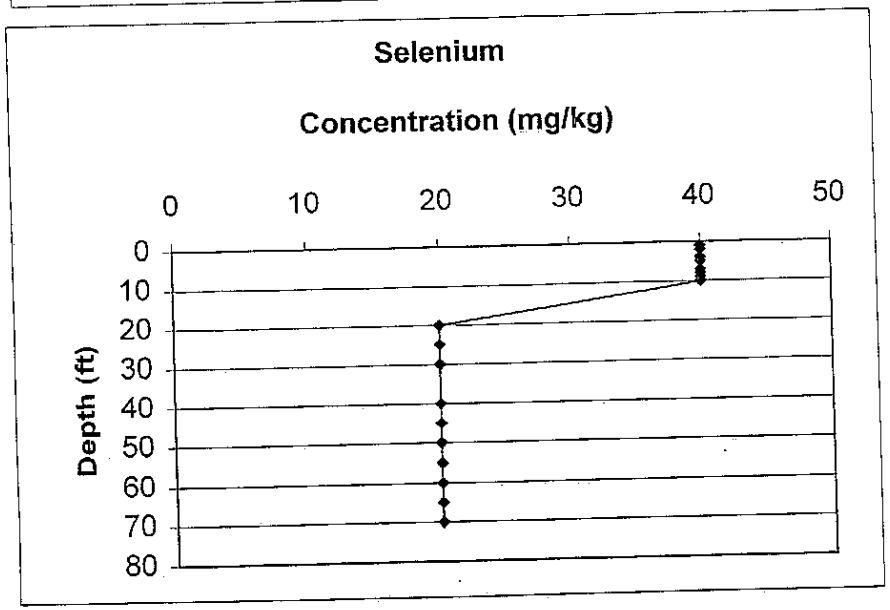

Chromium
Concentration (mg/kg)
0
50
100
150
200
250
Depth (ft)
0
10
20
30
40
50
60
70
80

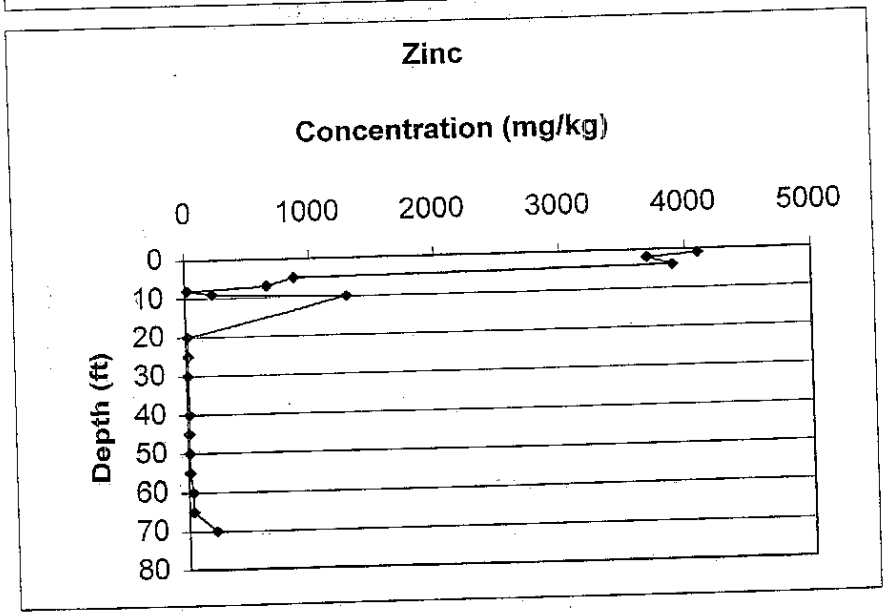

Copper
Concentration (mg/kg)
0
10000
20000
30000
40000
Depth (ft)
0
10
20
30
40
50
60
70
80

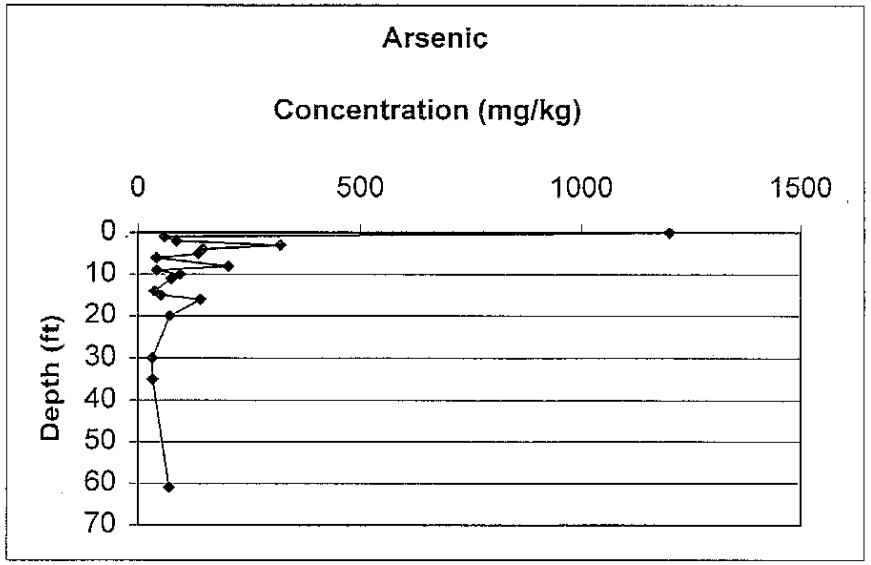
Average Soil Concentration by Depth, Investigation Area-15

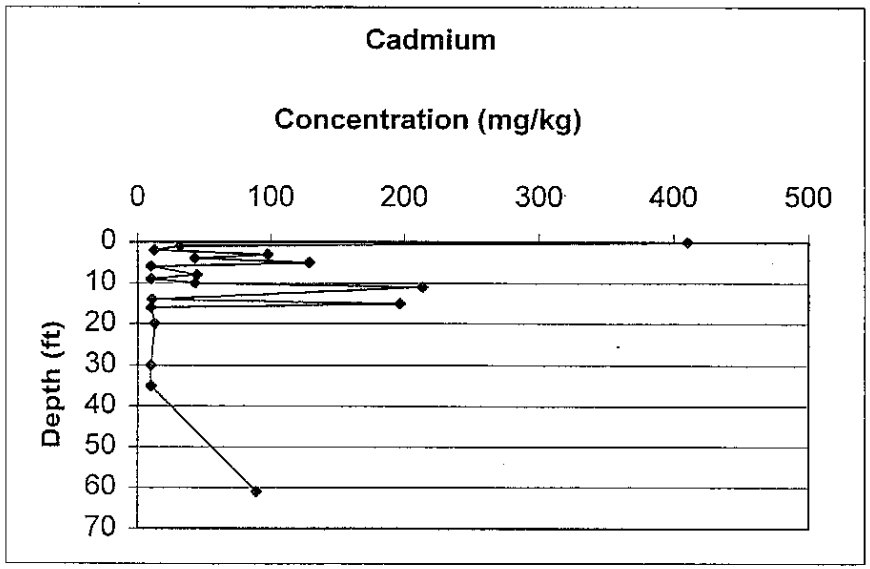


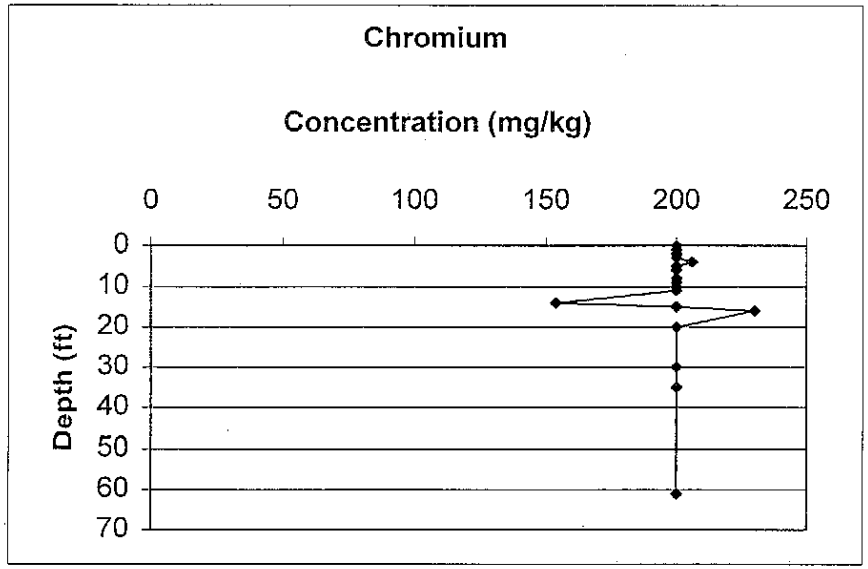


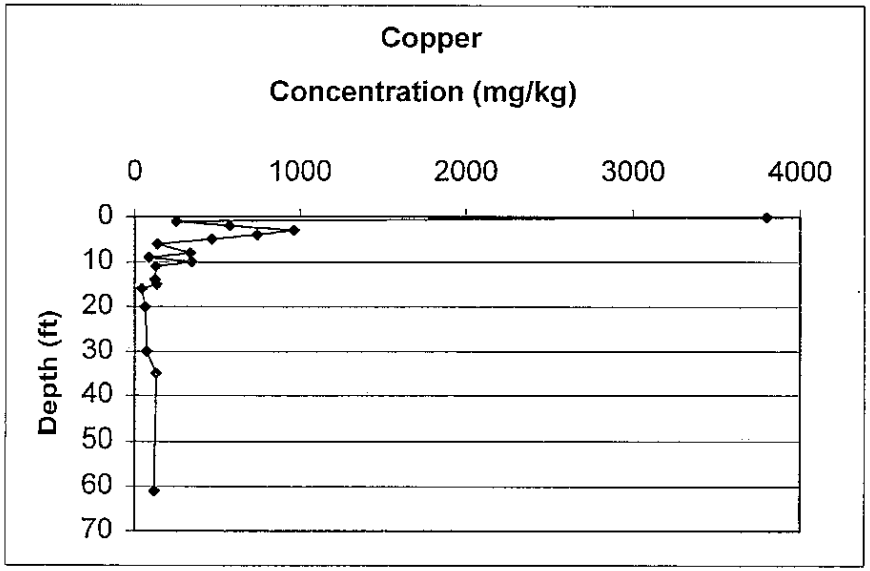




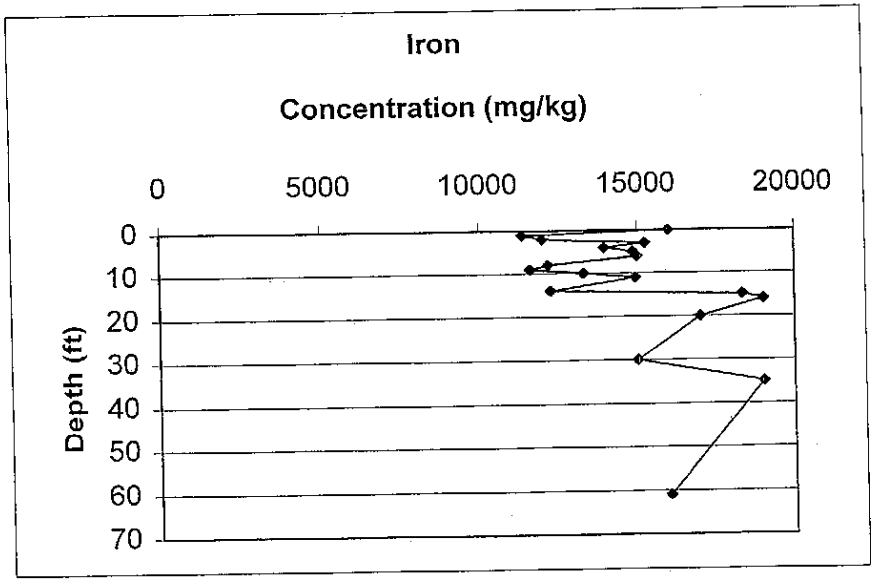

Arsenic
Concentration (mg/kg)
0
500
1000
1500
Depth (ft)
0
10
20
30
40
50
60
70

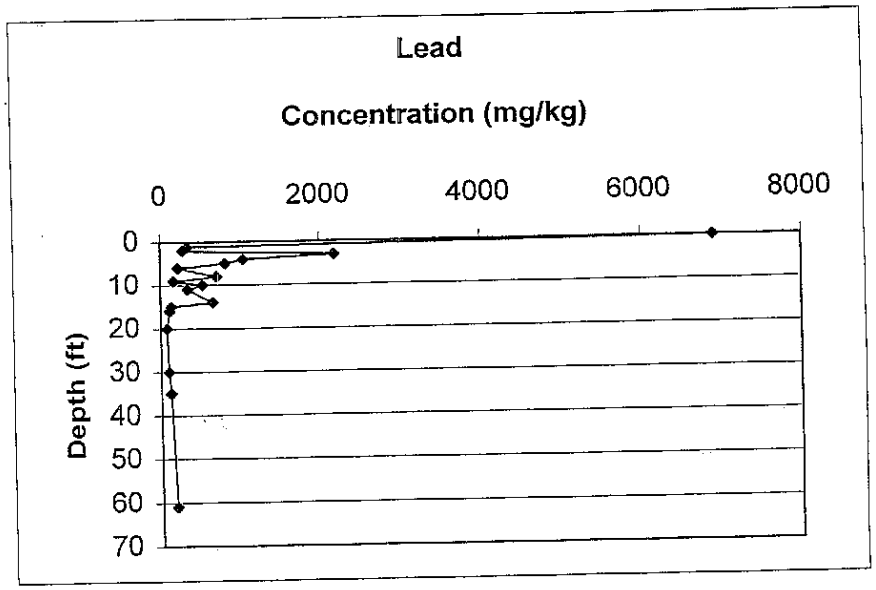

Cadmium
Concentration (mg/kg)
0
100
200
300
400
500
Depth (ft)
0
10
20
30
40
50
60
70

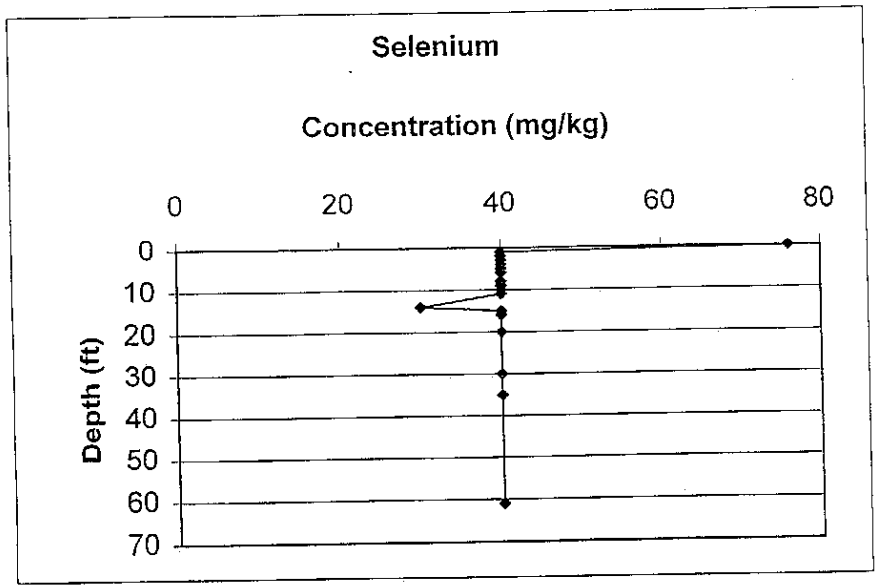

Chromium
Concentration (mg/kg)
0
50
100
150
200
250
Depth (ft)
0
10
20
30
40
50
60
70

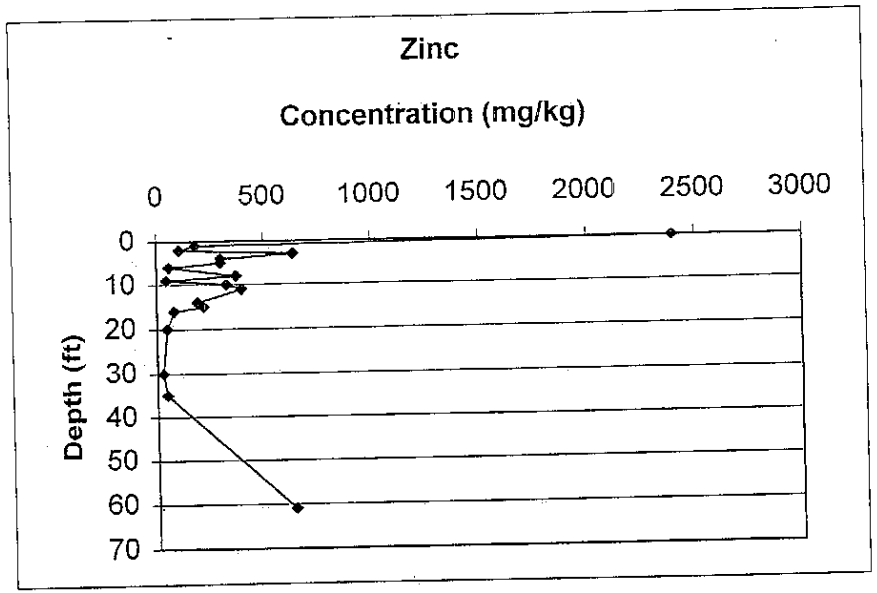

Copper
Concentration (mg/kg)
0
1000
2000
3000
4000
Depth (ft)
0
10
20
30
40
50
60
70

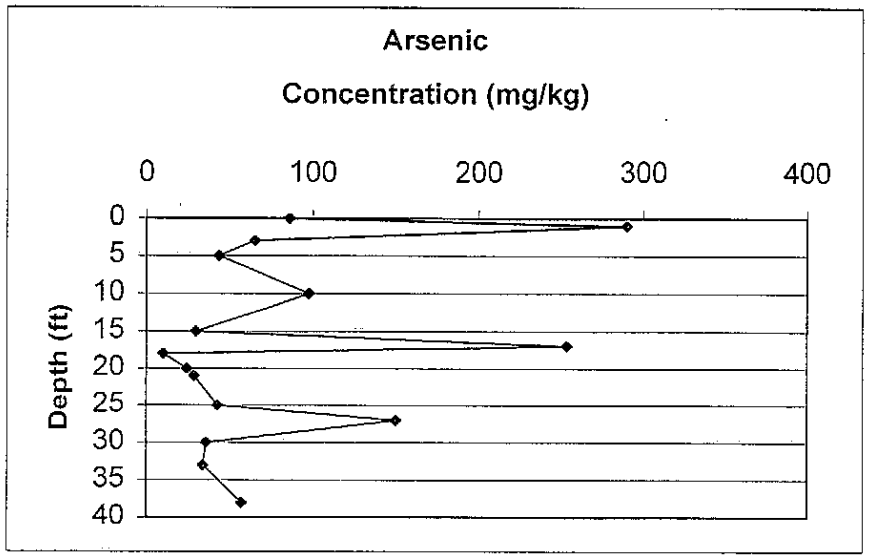
Average Soil Concentration by Depth, Investigation Area-16

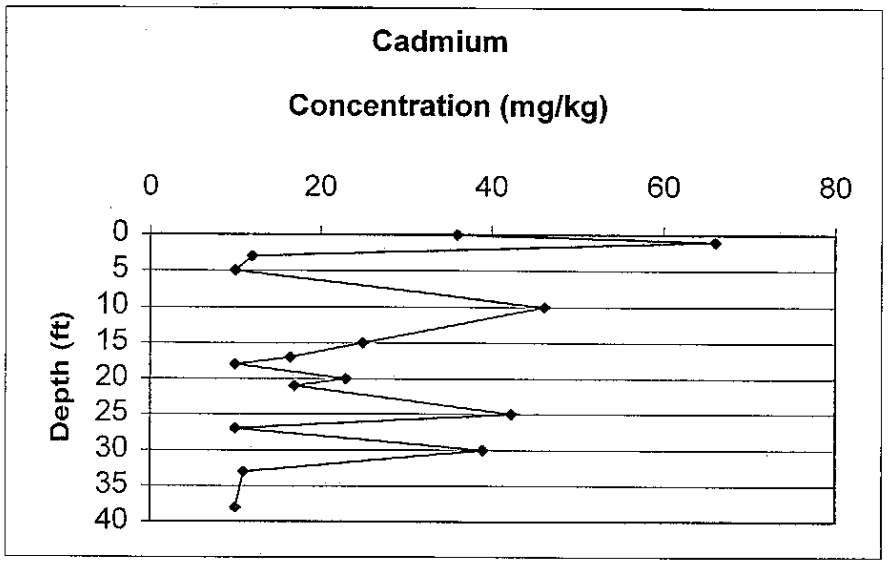


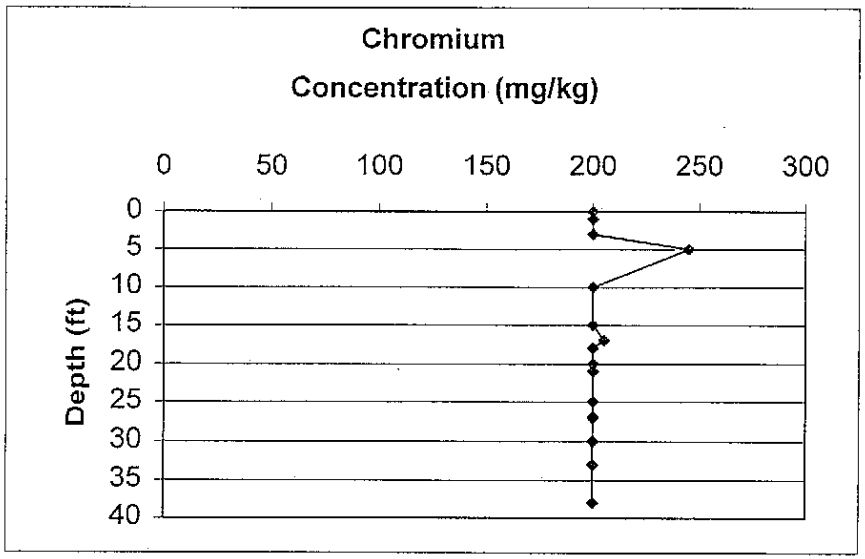


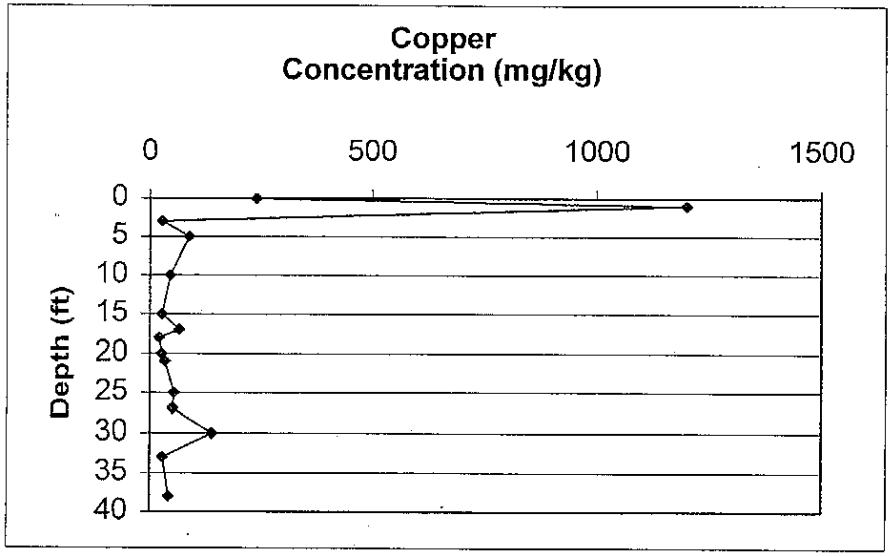


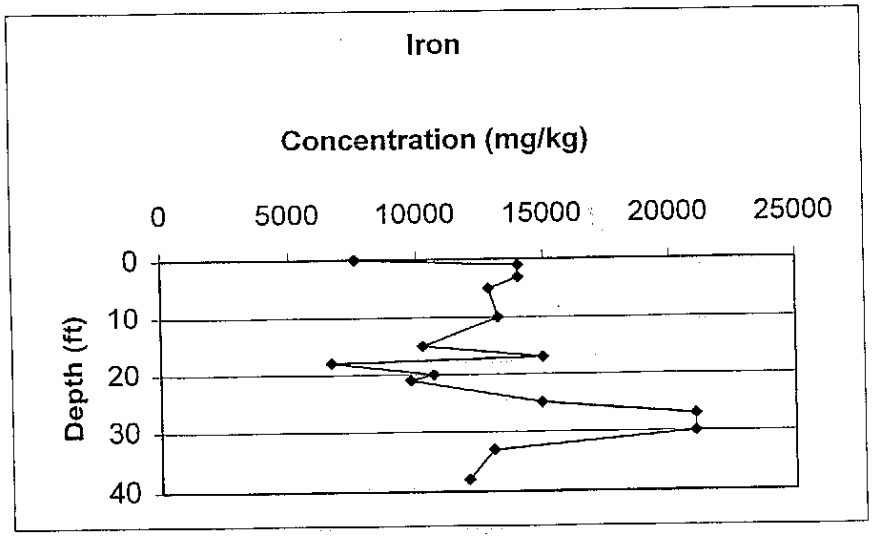


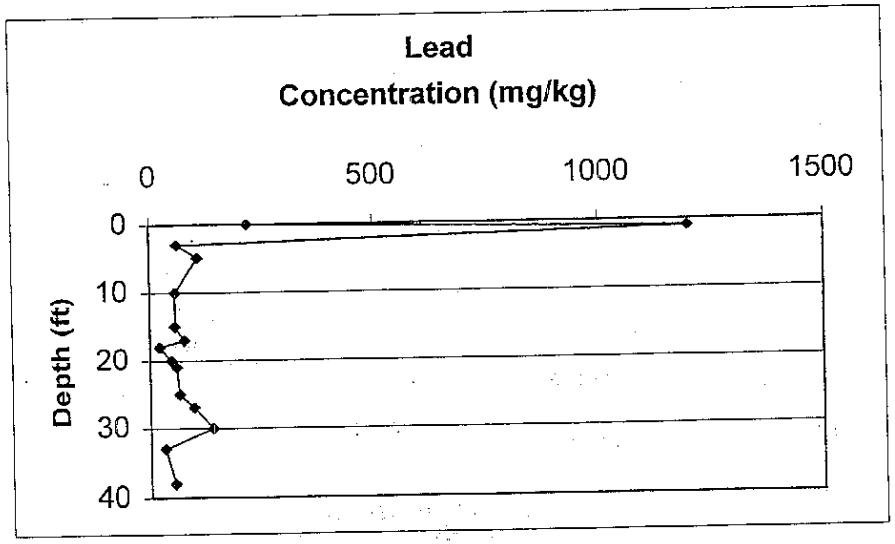

Arsenic
Concentration (mg/kg)
0
100
200
300
400
Depth (ft)
0
5
10
15
20
25
30
35
40

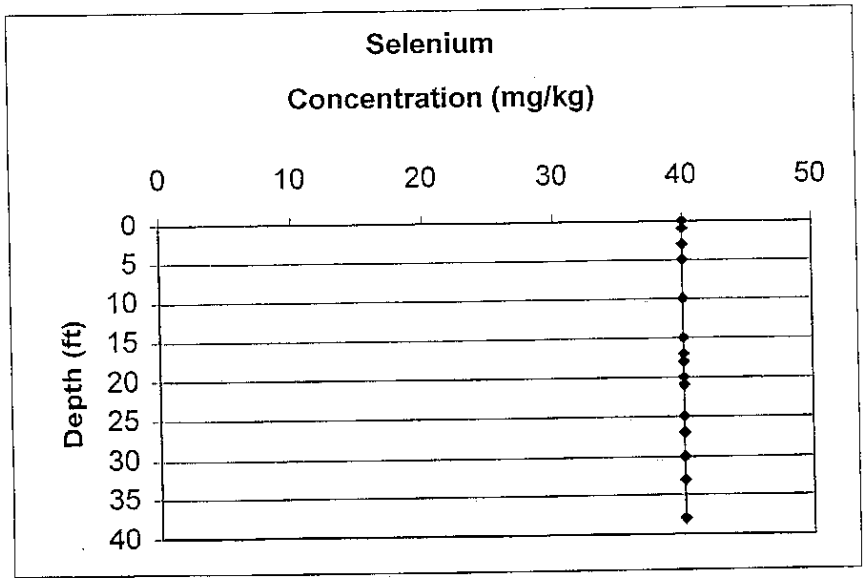

Cadmium
Concentration (mg/kg)
0
20
40
60
80
Depth (ft)
0
5
10
15
20
25
30
35
40

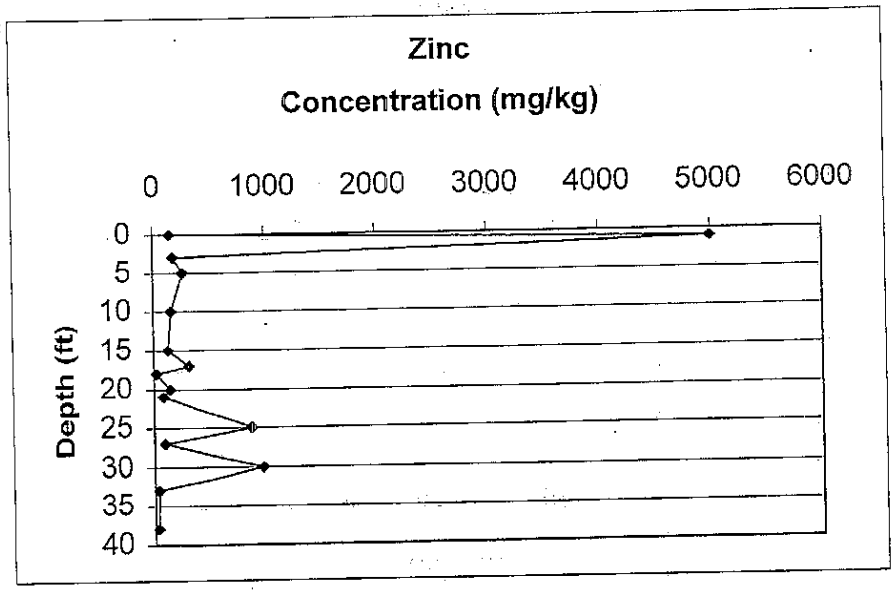

Chromium
Concentration (mg/kg)
0
50
100
150
200
250
300
Depth (ft)
0
5
10
15
20
25
30
35
40


Copper
Concentration (mg/kg)
0
500
1000
1500
Depth (ft)
0
5
10
15
20
25
30
35
40

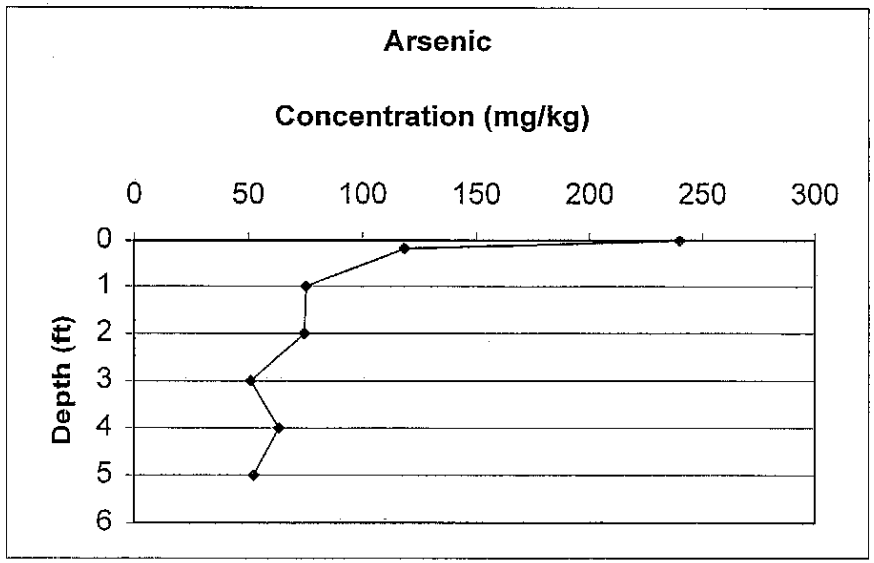

Iron
Concentration (mg/kg)
0
5000
10000
15000
20000
25000
Depth (ft)
0
10
20
30
40

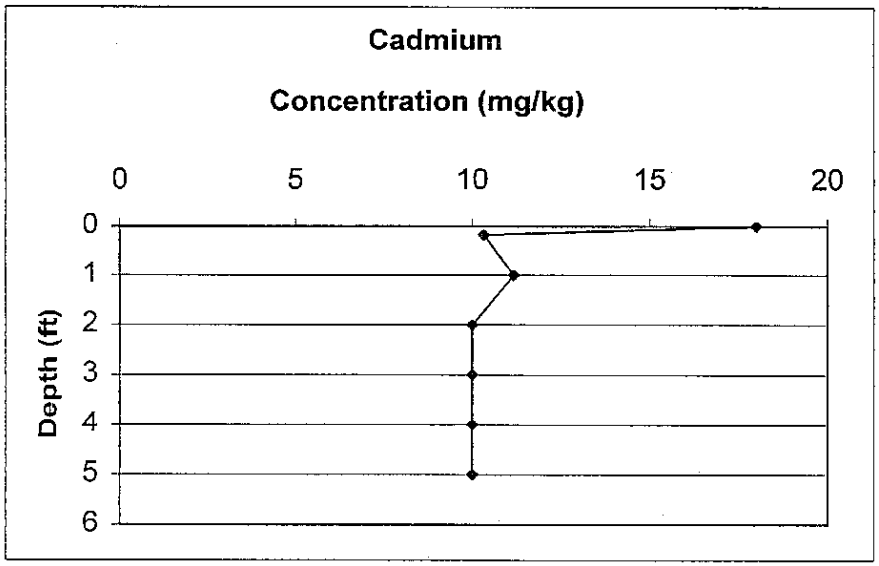

Lead
Concentration (mg/kg)
0
500
1000
1500
Depth (ft)
0
10
20
30
40

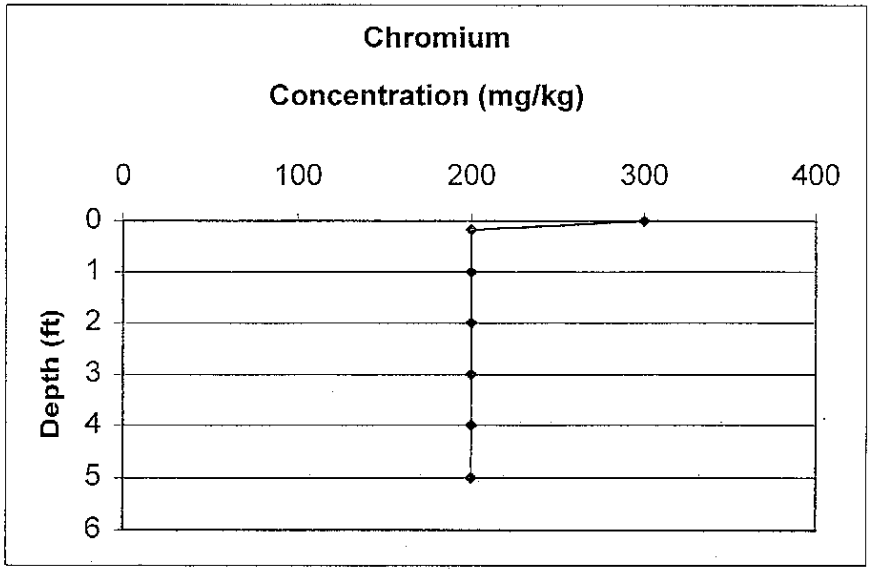

Selenium
Concentration (mg/kg)
0
10
20
30
40
50
Depth (ft)
0
5
10
15
20
25
30
35
40

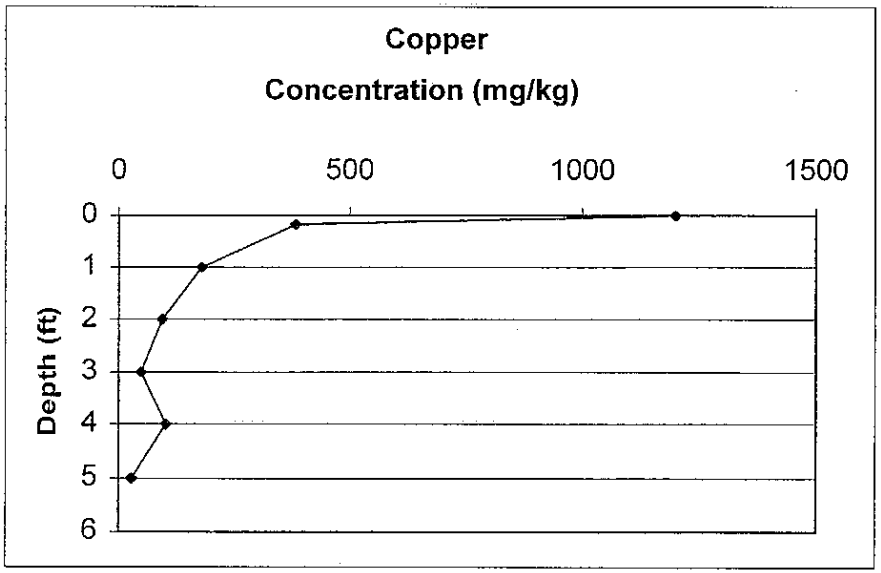

Zinc
Concentration (mg/kg)
0
1000
2000
3000
4000
5000
6000
Depth (ft)
0
5
10
15
20
25
30
35
40

Average Soil Concentration epth, Investigation Area 18

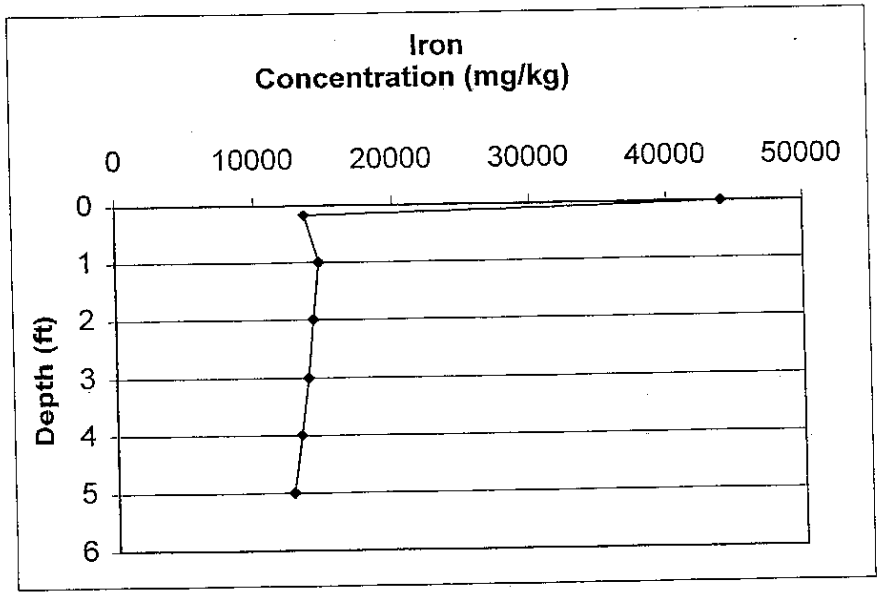


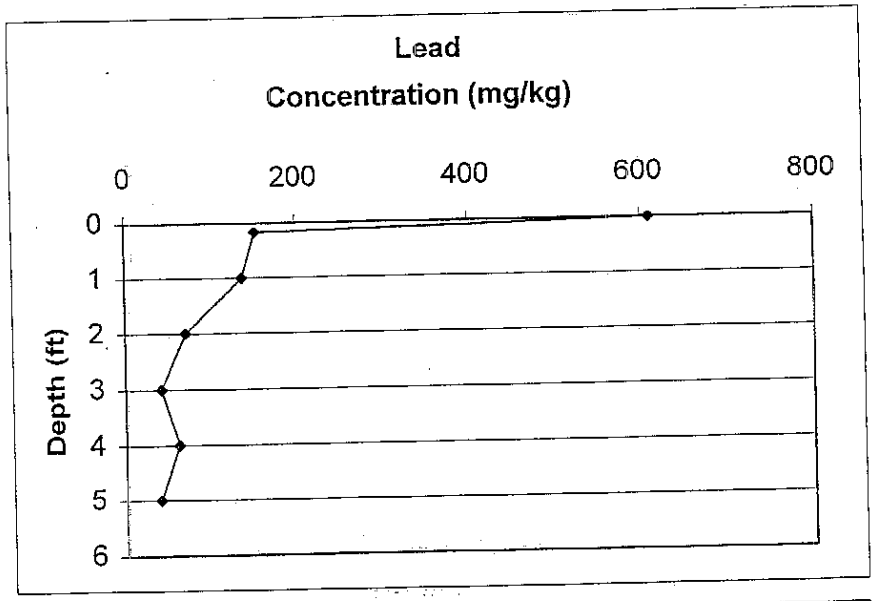


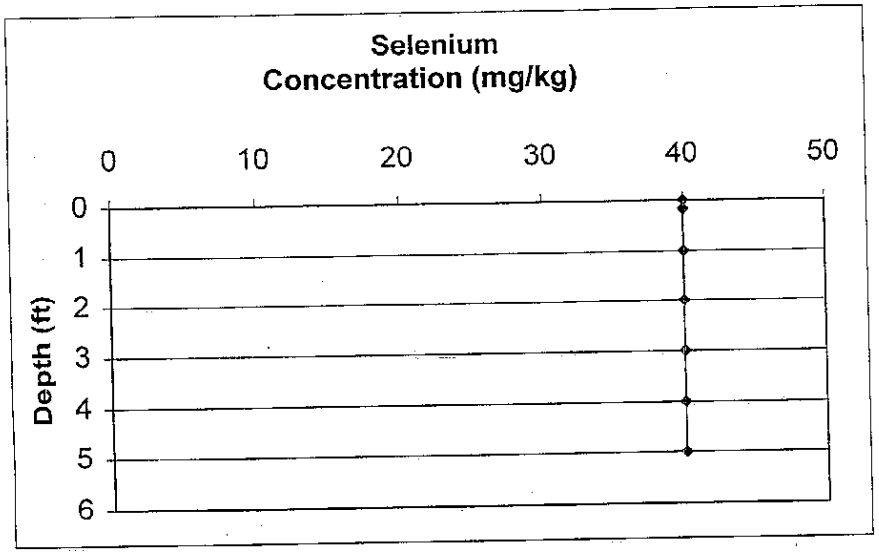


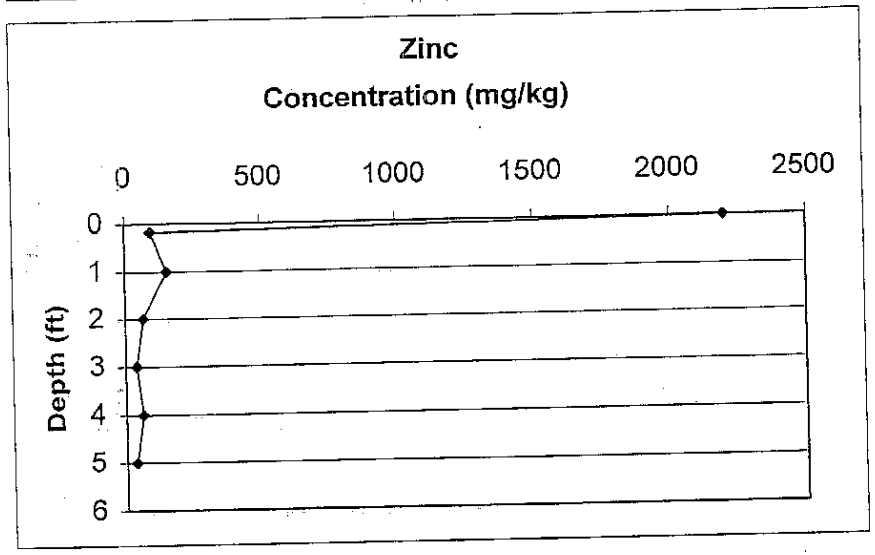


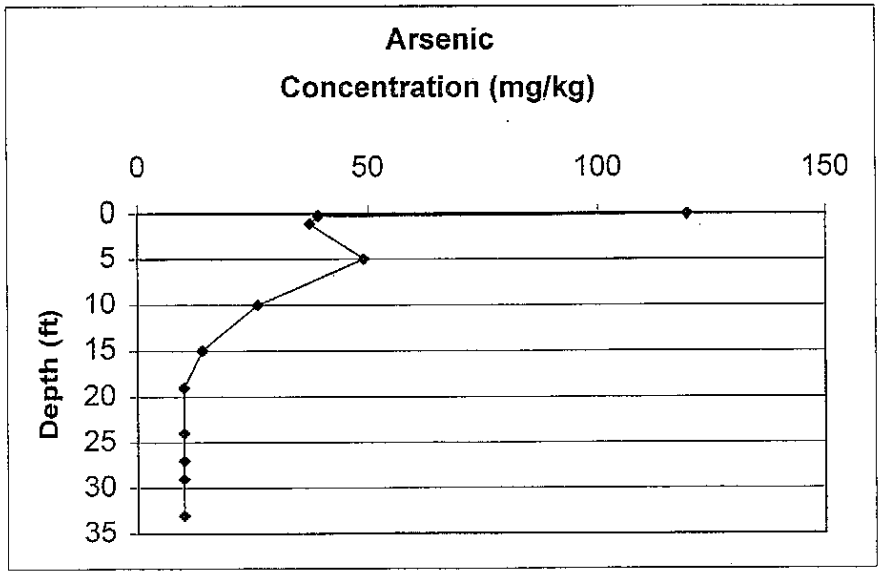
Average Soil Concentrations by Depth, Investigation Area 18

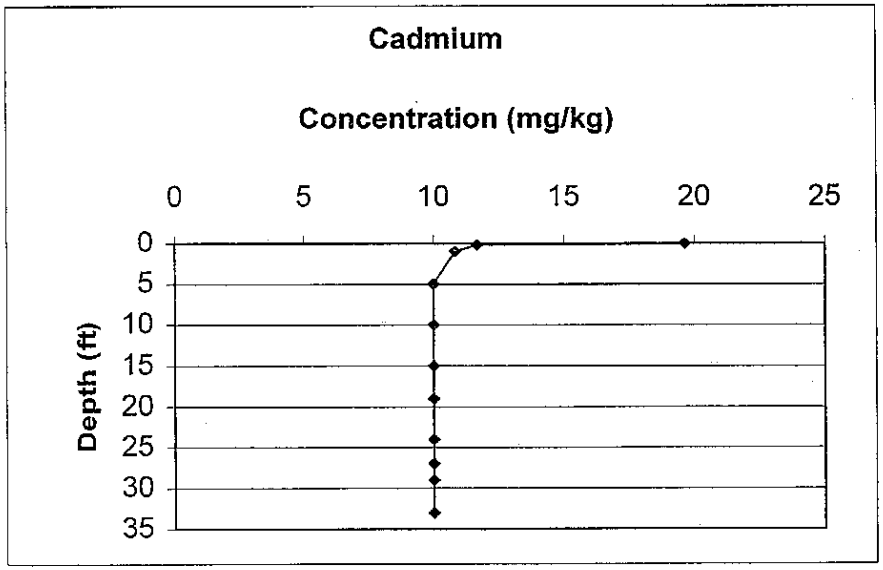


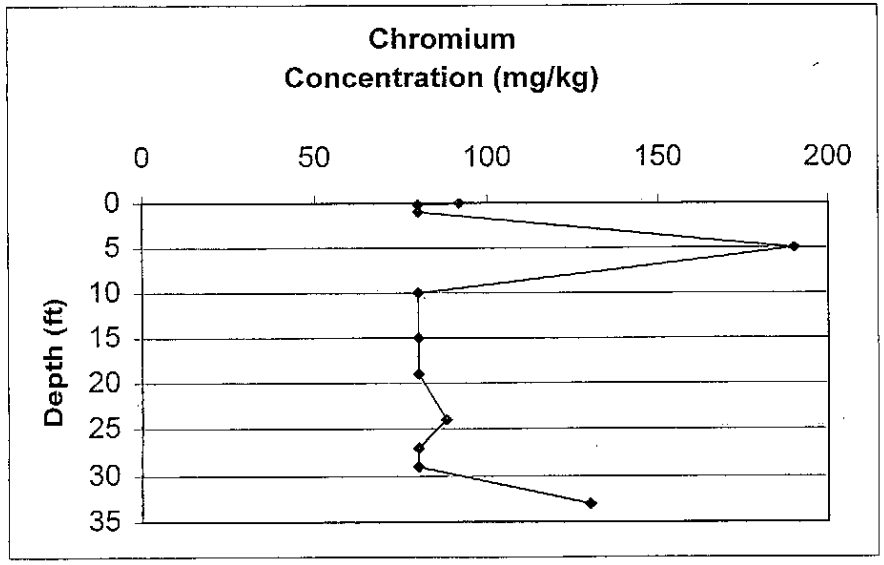


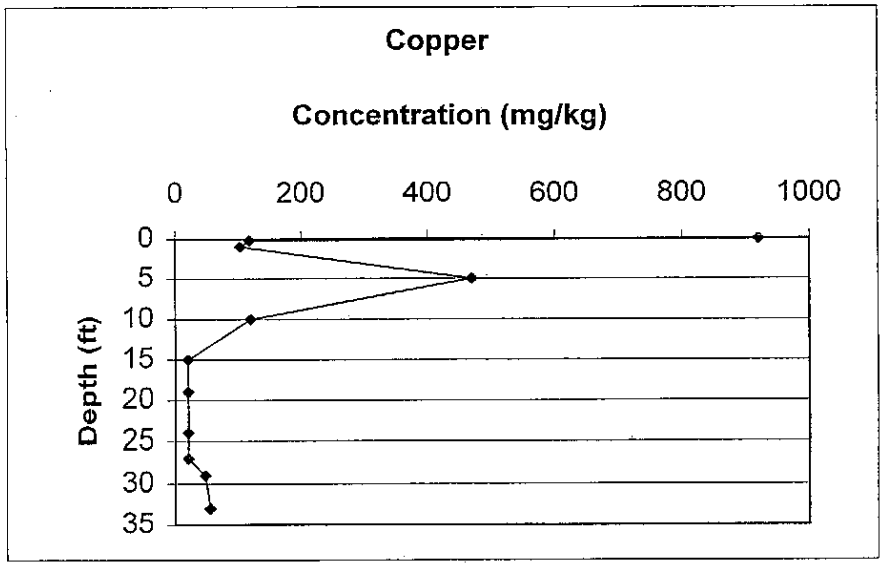




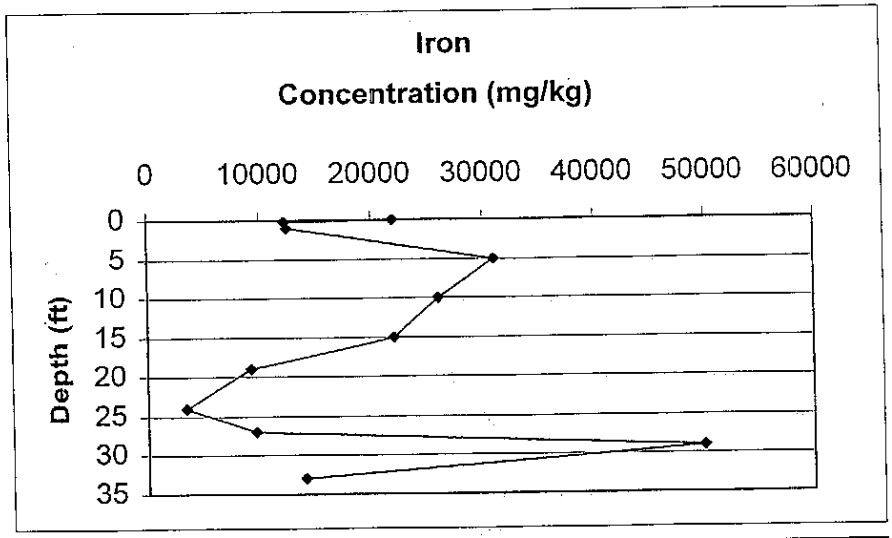

Arsenic
Concentration (mg/kg)
0
50
100
150
Depth (ft)
0
5
10
15
20
25
30
35

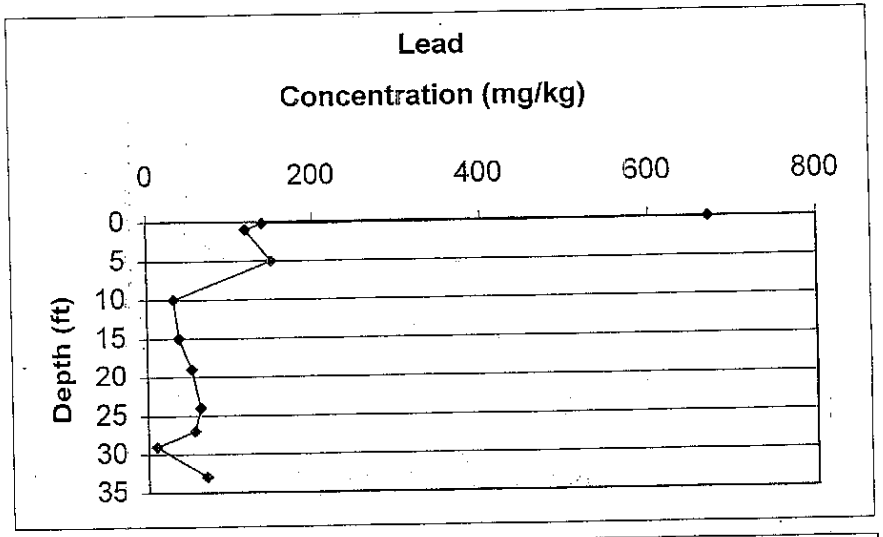

Cadmium
Concentration (mg/kg)
0
5
10
15
20
25
Depth (ft)
0
5
10
15
20
25
30
35

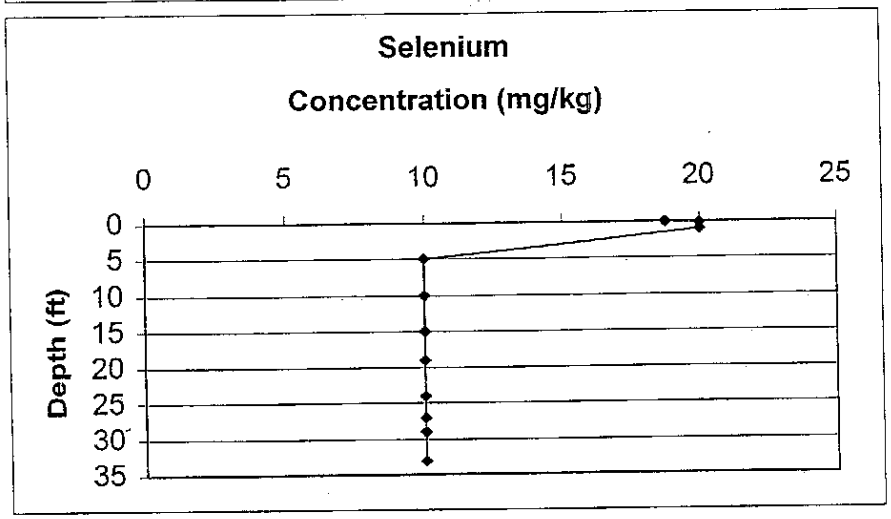

Chromium
Concentration (mg/kg)
0
50
100
150
200
Depth (ft)
0
5
10
15
20
25
30
35

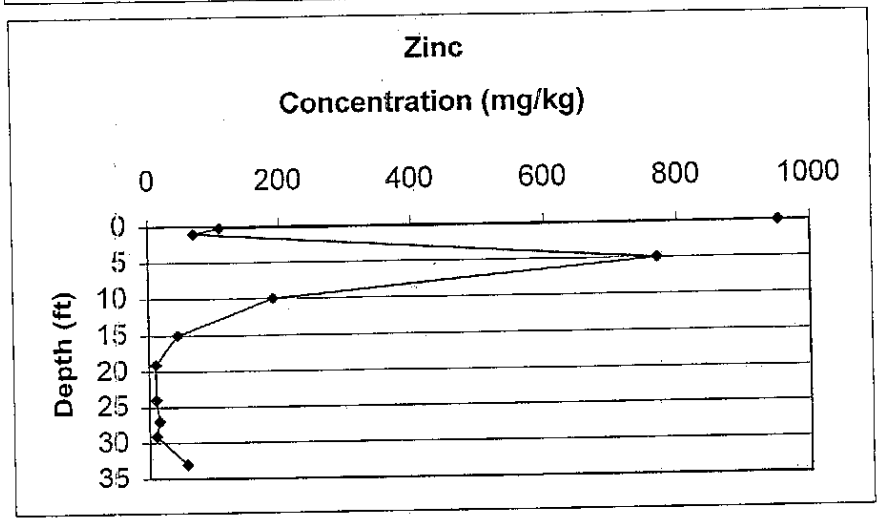

Copper
Concentration (mg/kg)
0
200
400
600
800
1000
Depth (ft)
0
5
10
15
20
25
30
35

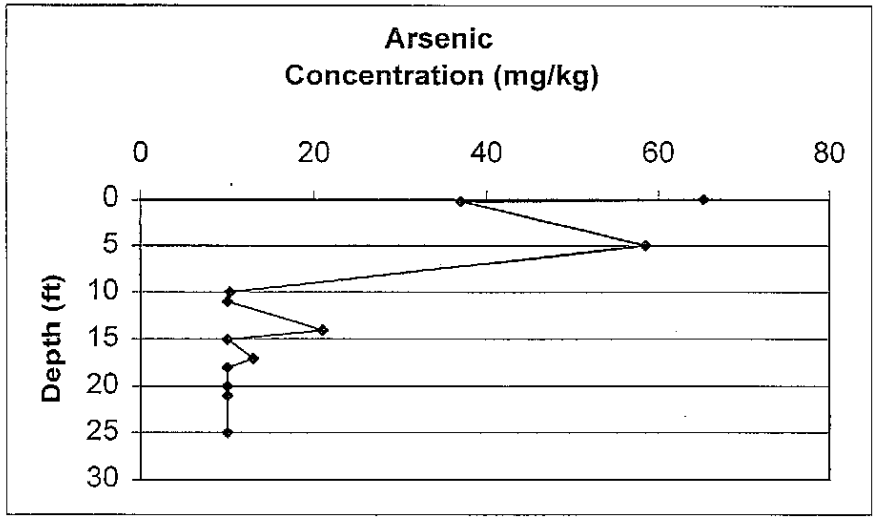
Average Soil Concentration by Depth, Investigation Area-19

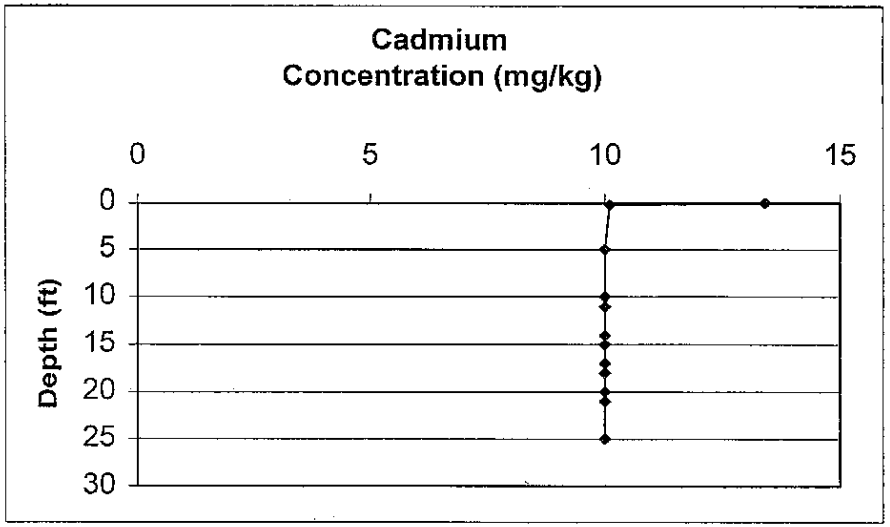


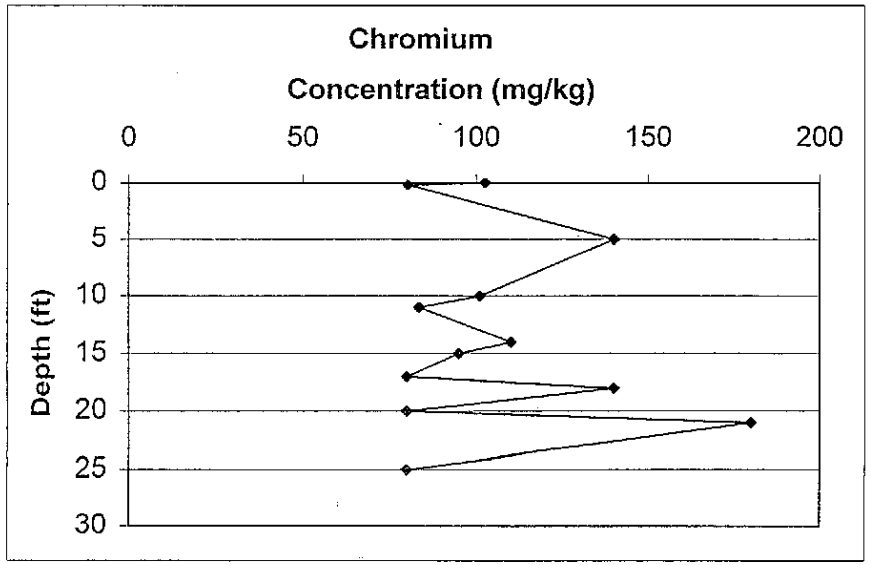


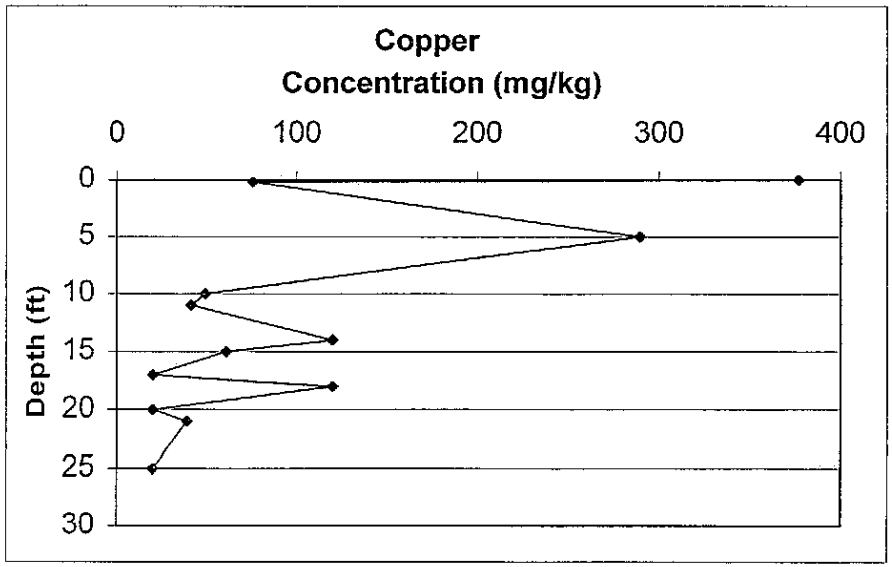




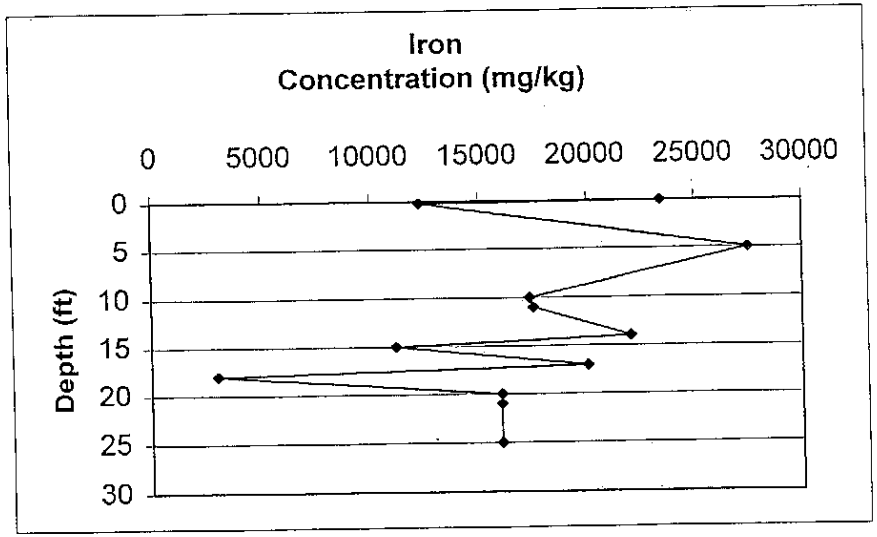

Arsenic
Concentration (mg/kg)
0
20
40
60
80
Depth (ft)
0
5
10
15
20
25
30

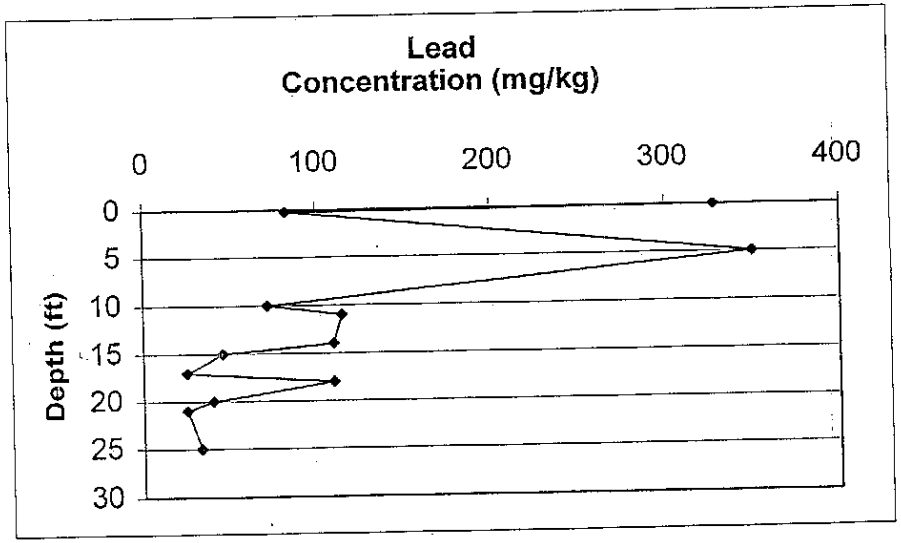

Cadmium
Concentration (mg/kg)
0
5
10
15
Depth (ft)
0
5
10
15
20
25
30

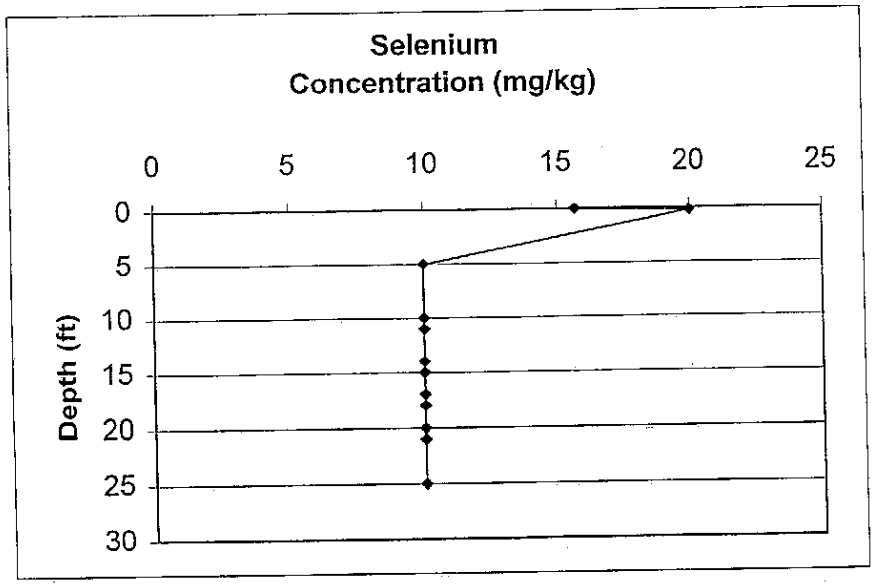

Chromium
Concentration (mg/kg)
0
50
100
150
200
Depth (ft)
0
5
10
15
20
25
30

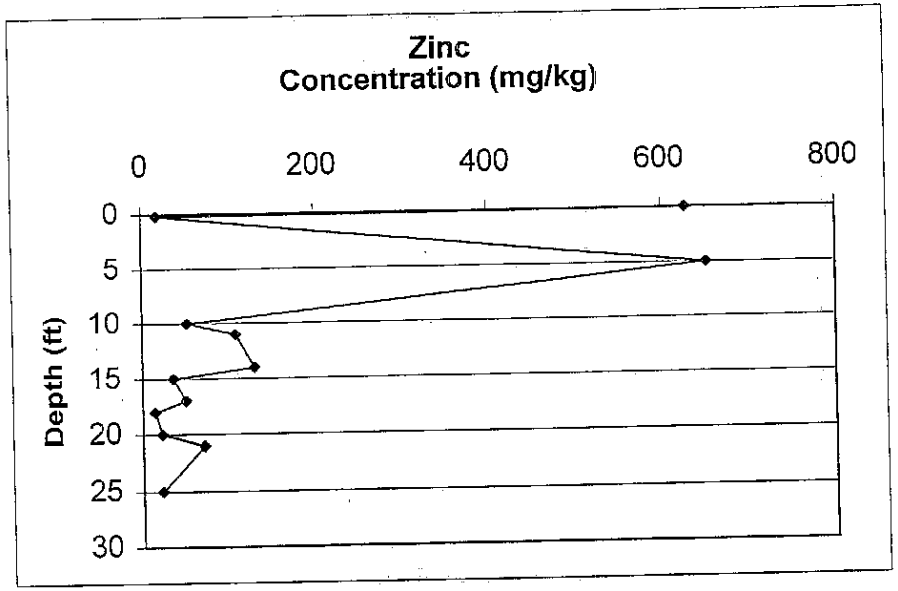

Copper
Concentration (mg/kg)
0
100
200
300
400
Depth (ft)
0
5
10
15
20
25
30

Average Soil Concentration by Depth, Investigation Area-20









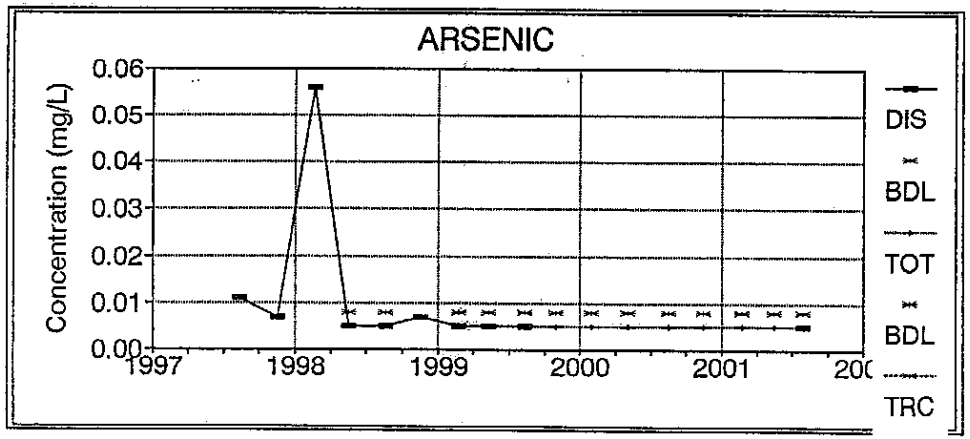
APPENDIX L

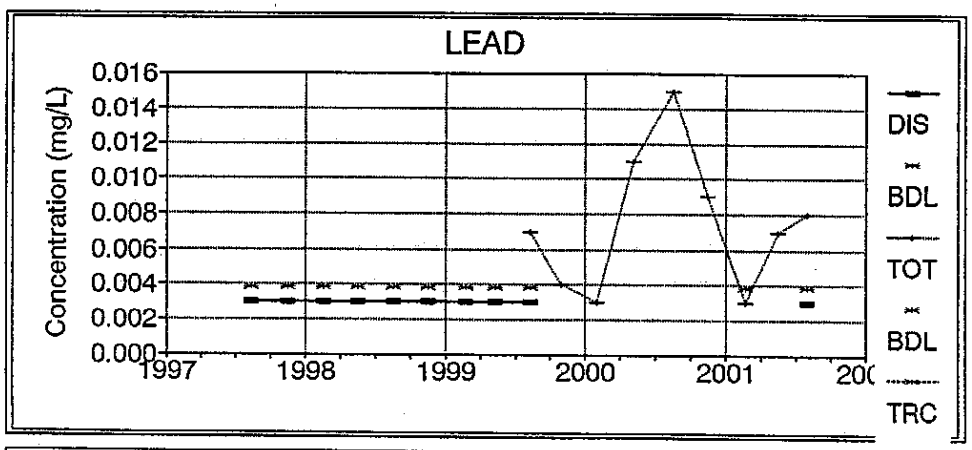
GRAPHS OF TOTAL AND DISSOLVED METALS CONCENTRATIONS IN GROUNDWATER VERSUS TIME

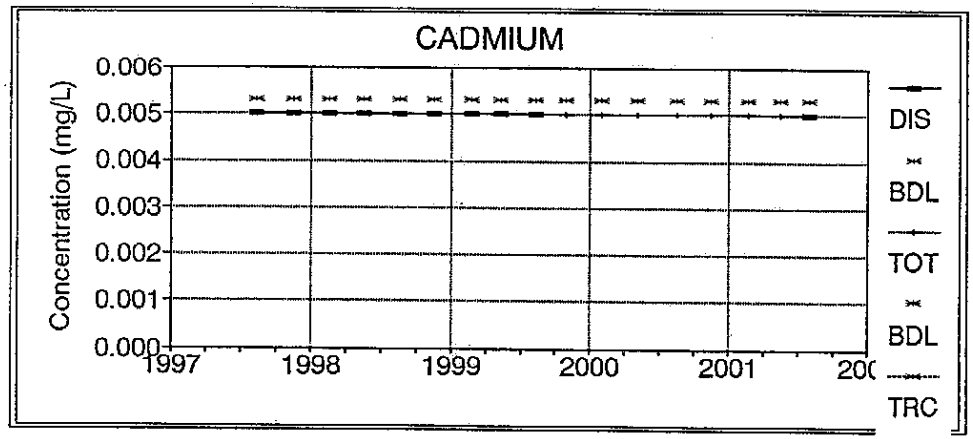
APPENDIX L

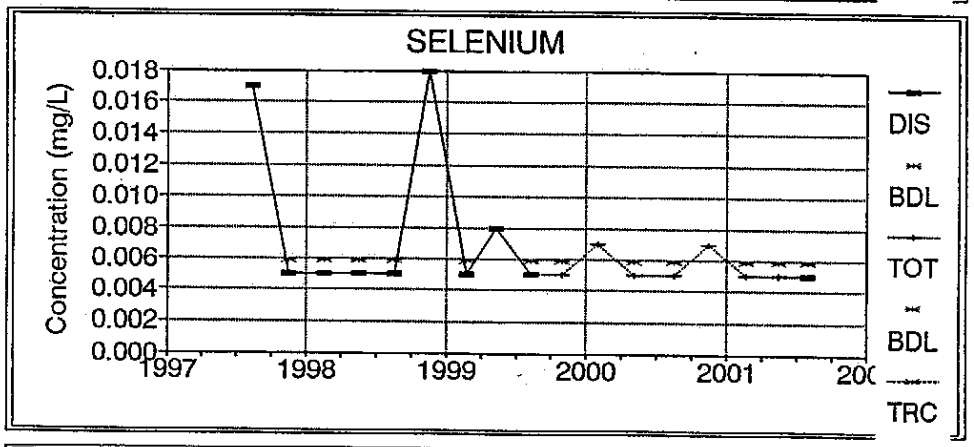
GRAPHS OF TOTAL AND DISSOLVED METALS CONCENTRATIONS IN GROUNDWATER VERSUS TIME

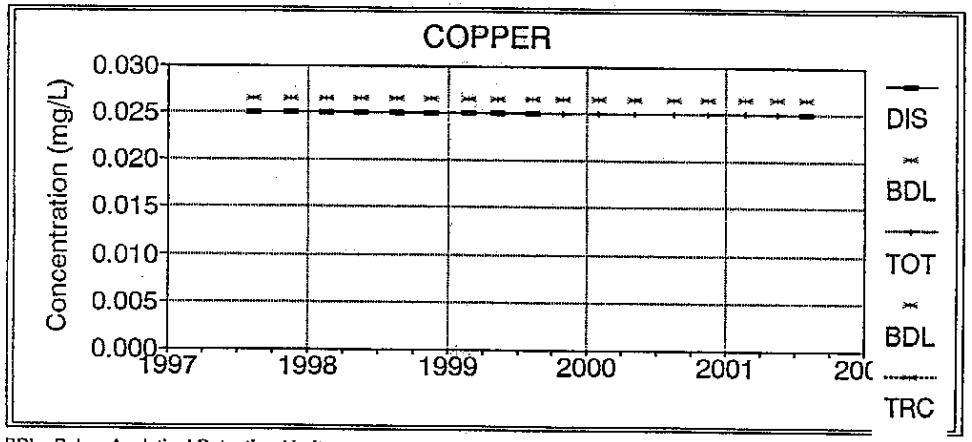
EM-1

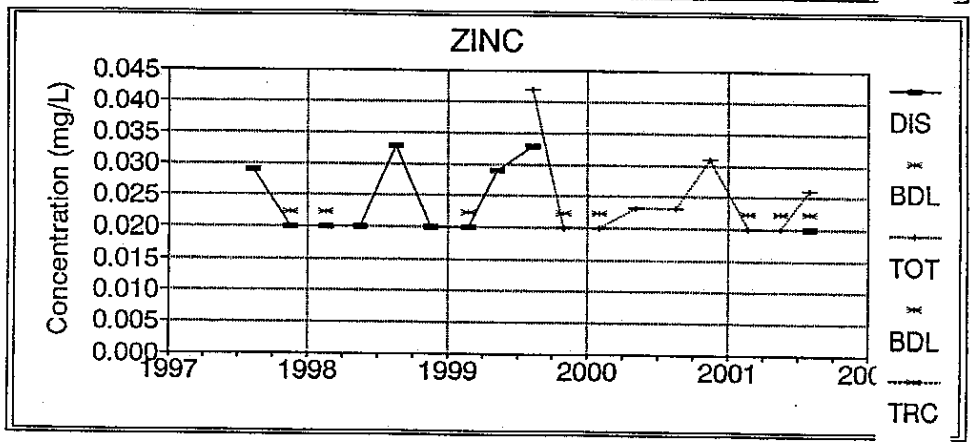






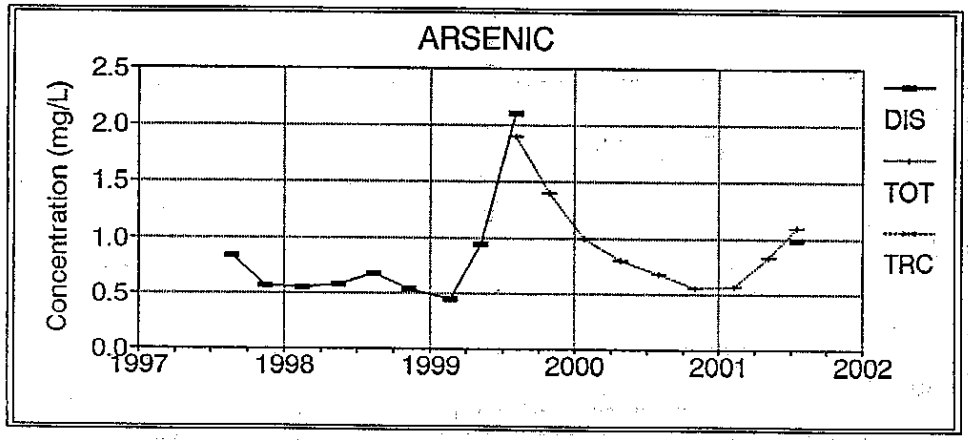


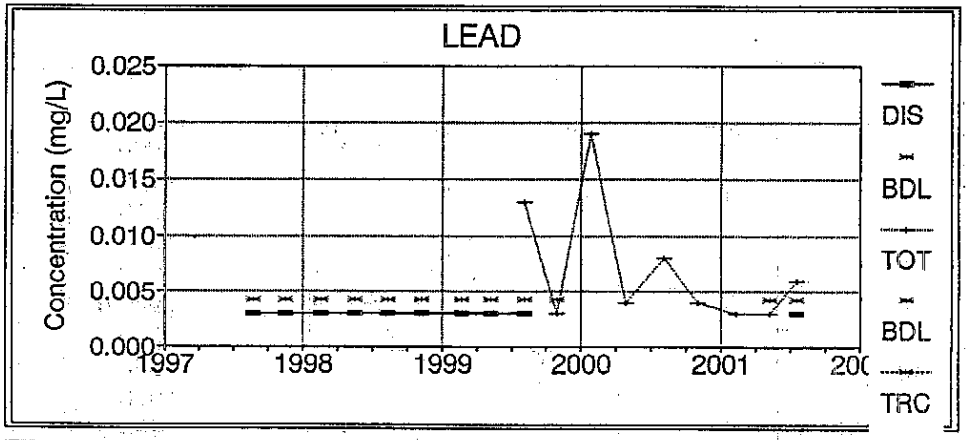


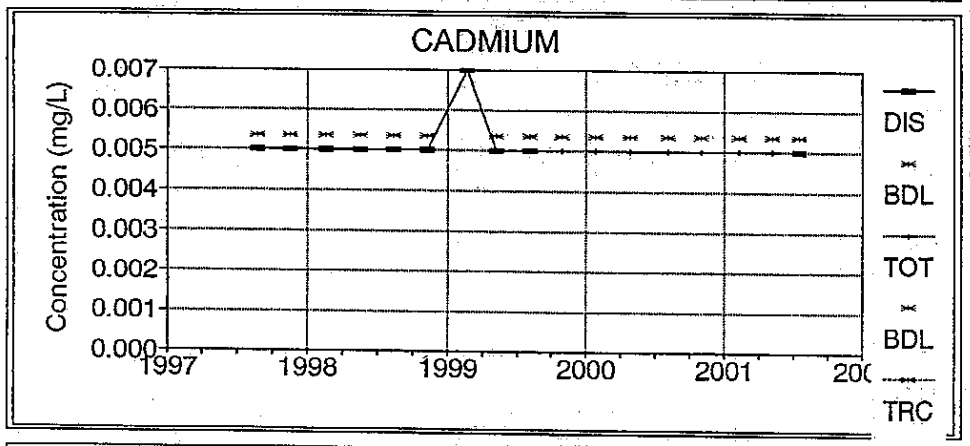


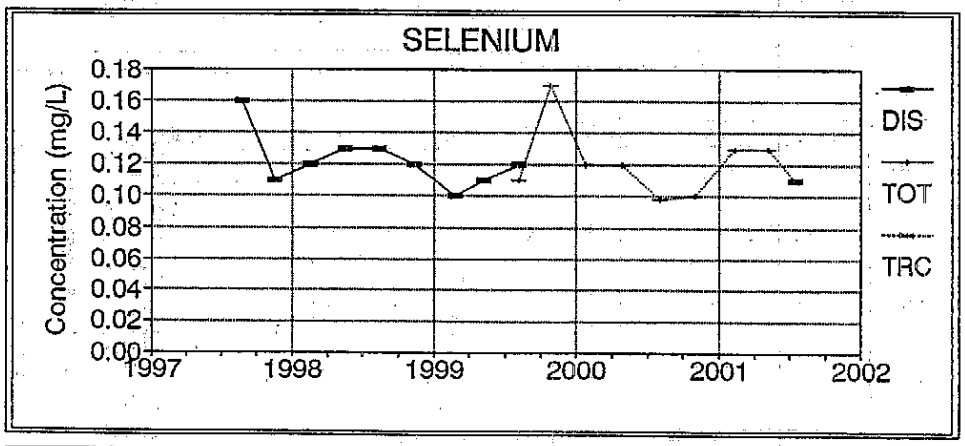
BDL - Below Analytical Detection Limit

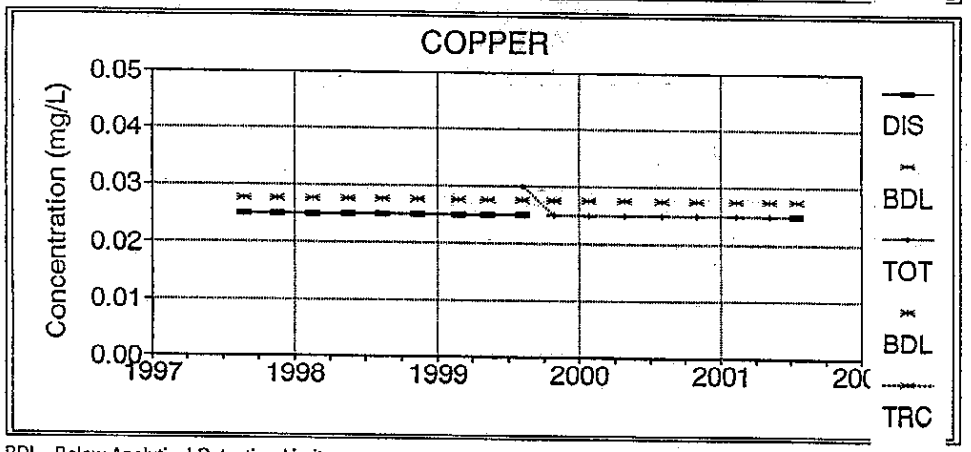
EM-2

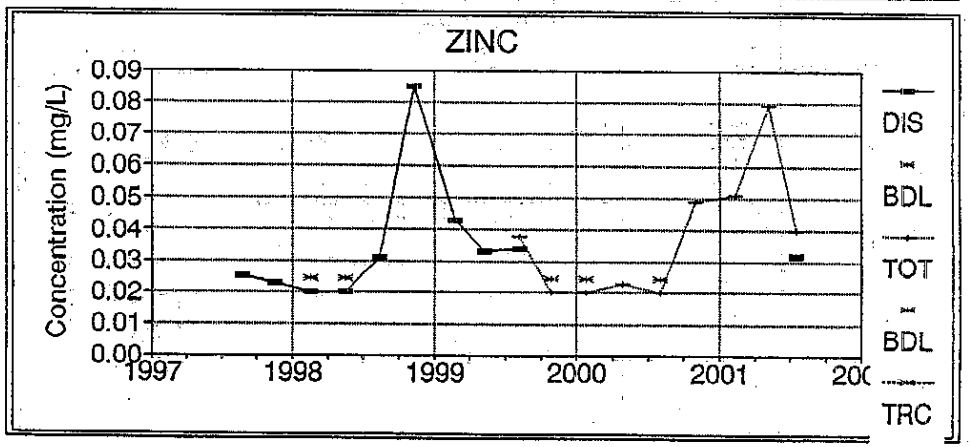












BDL - Below Analytical Detection Limit

EM-3

ARSENIC

No Data Available

N/A

LEAD

No Data Available

N/A

CADMIUM

No Data Available

N/A

SELENIUM

No Data Available

N/A

COPPER

No Data Available

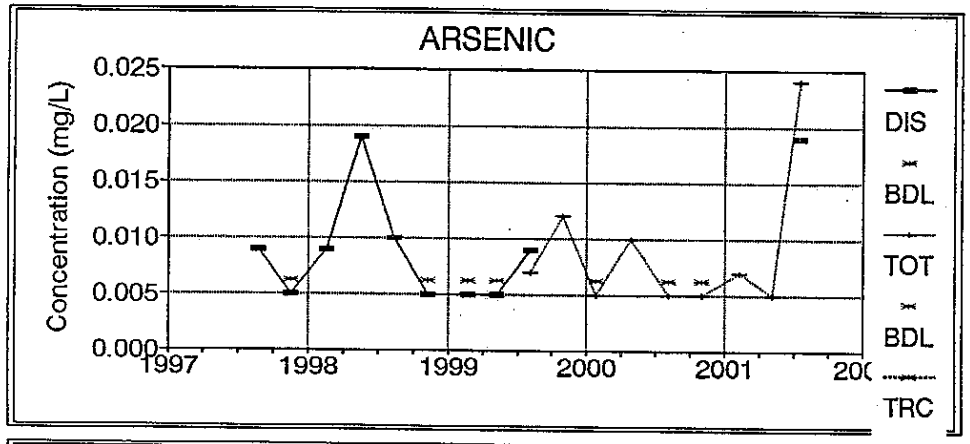
N/A

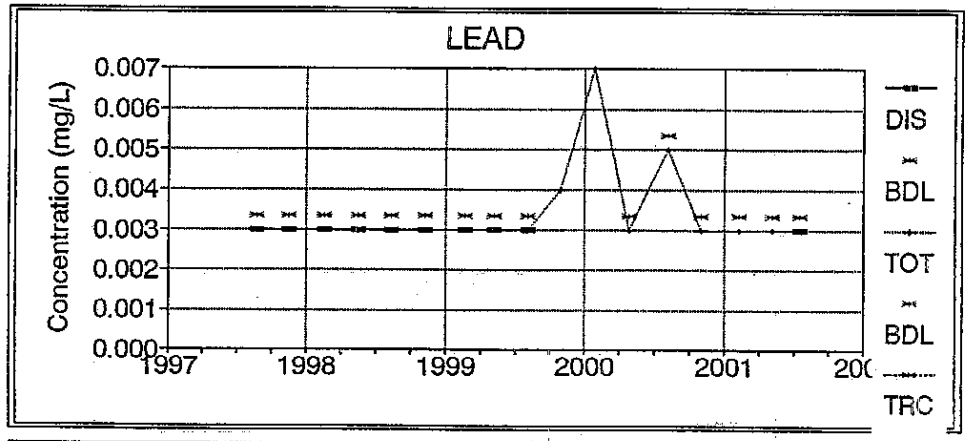
ZINC

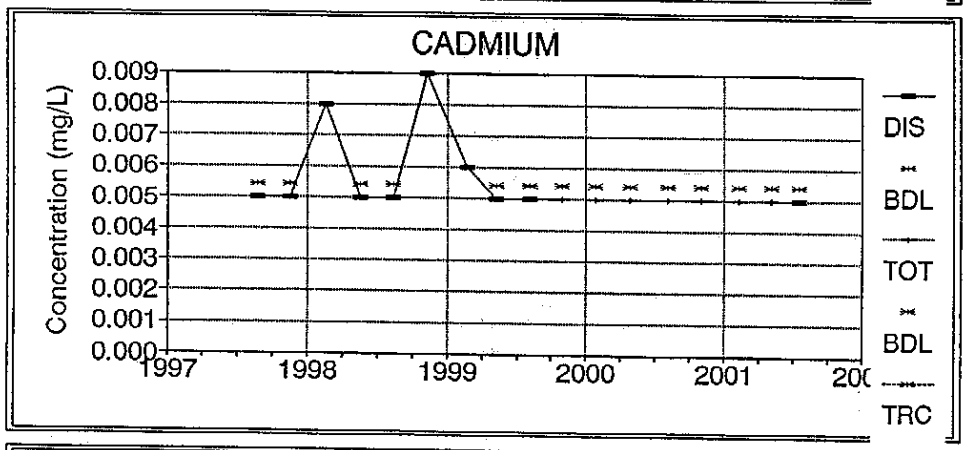
No Data Available

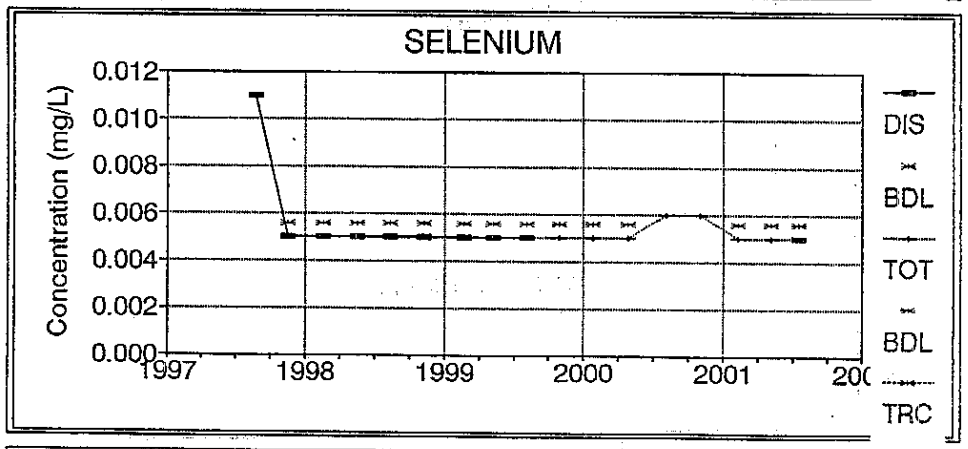
N/A

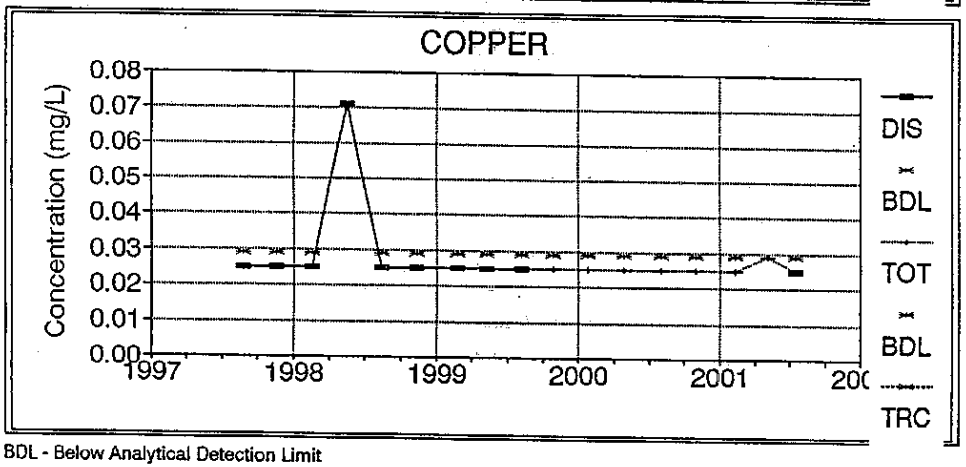
EM-4

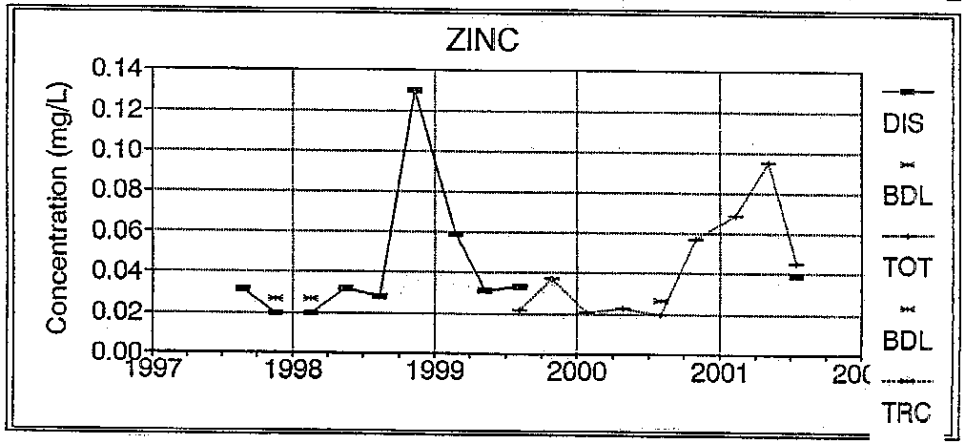






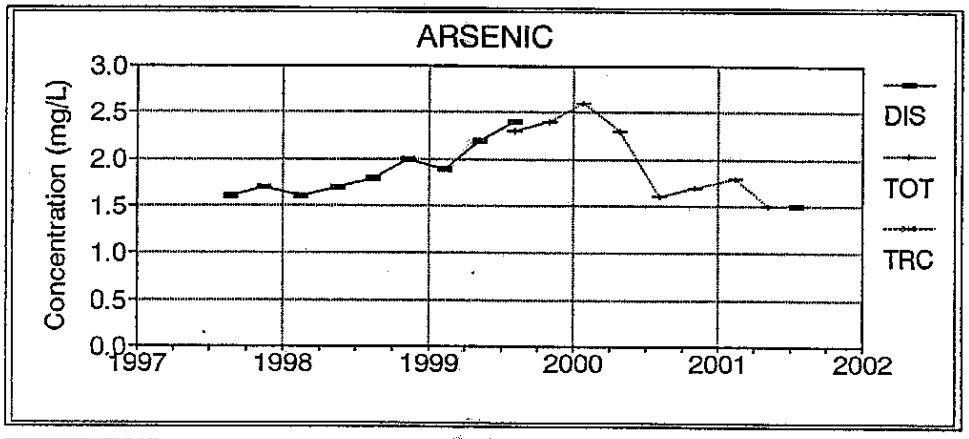


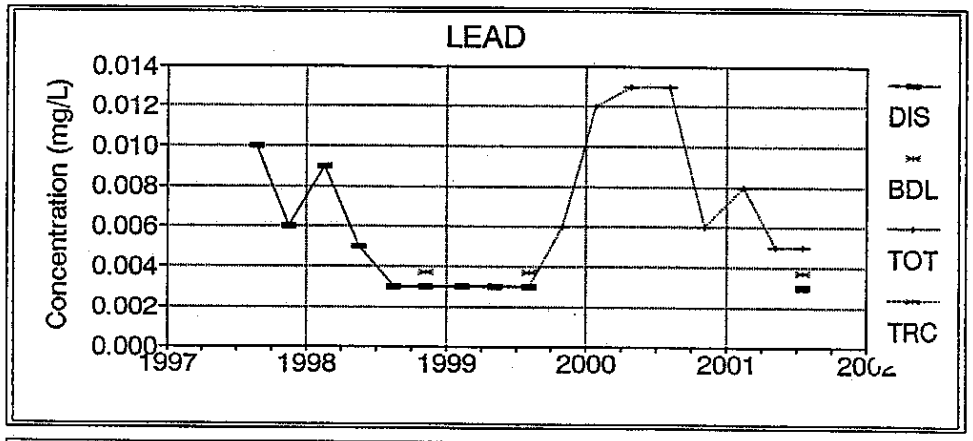


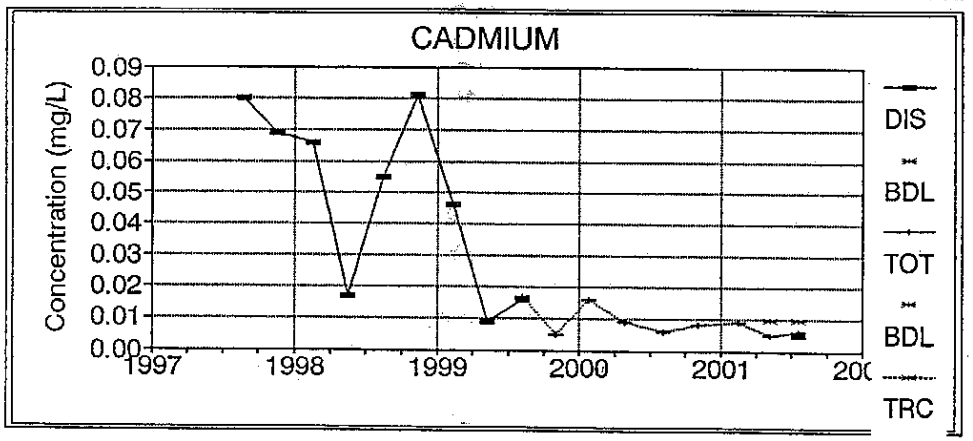


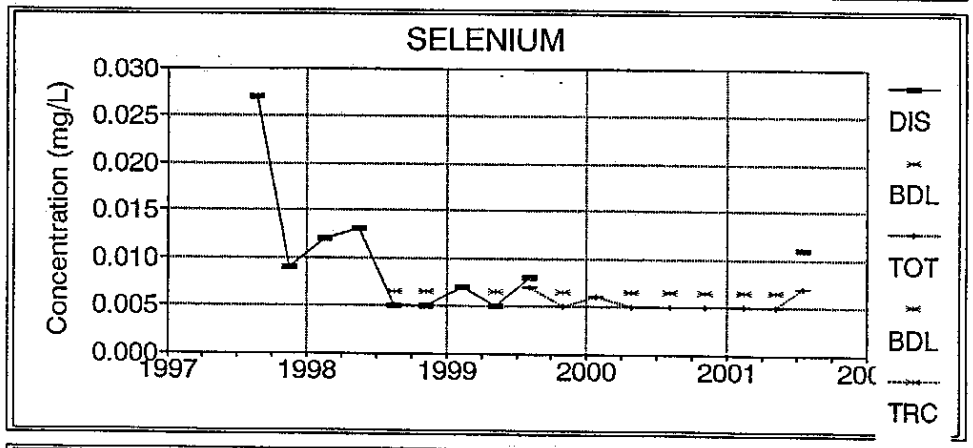
BDL - Below Analytical Detection Limit

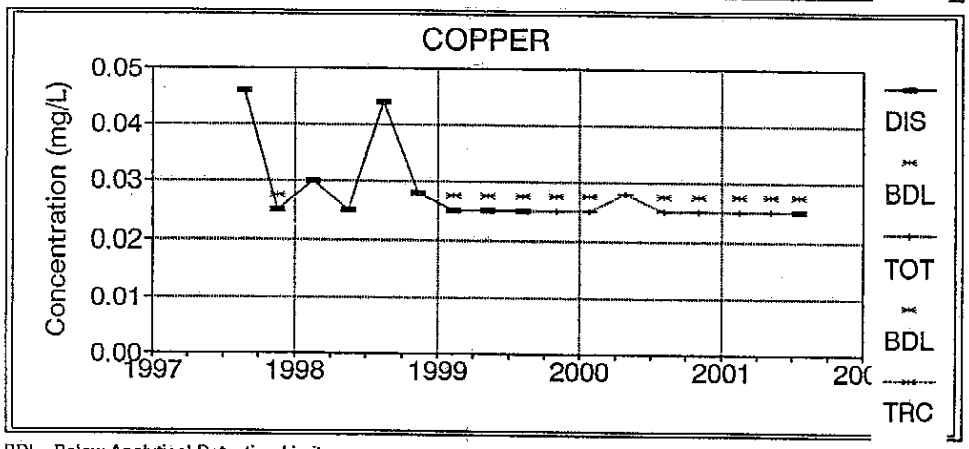
EM-5

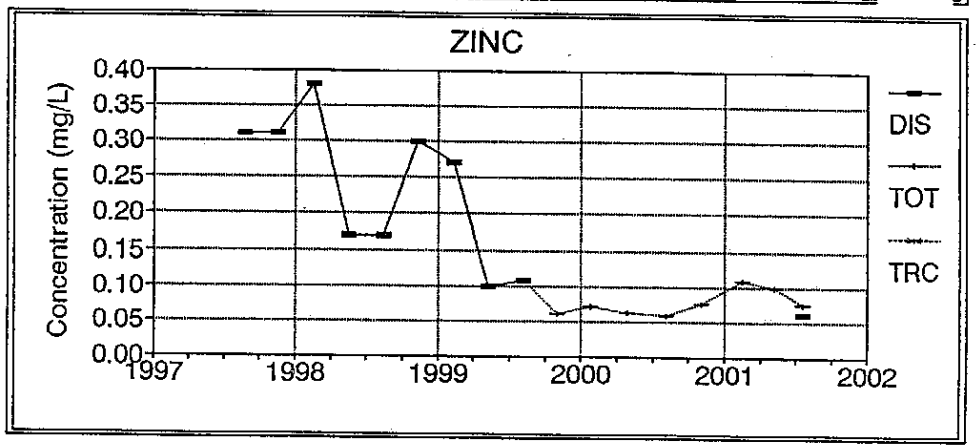






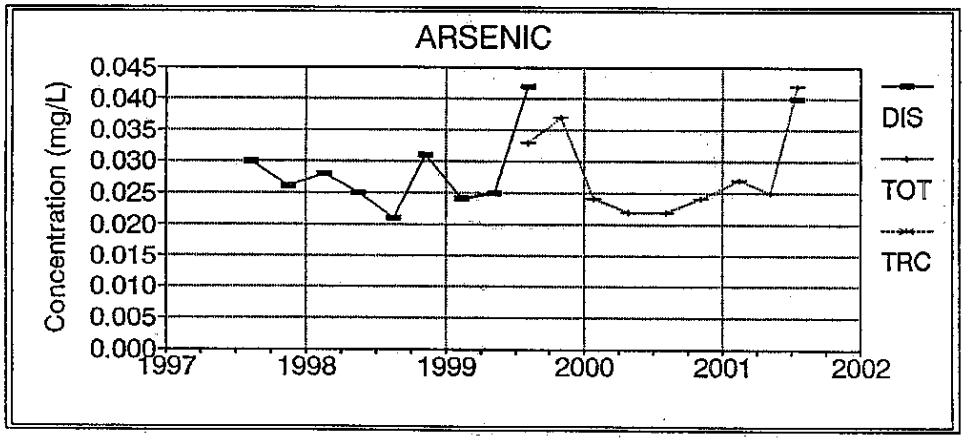


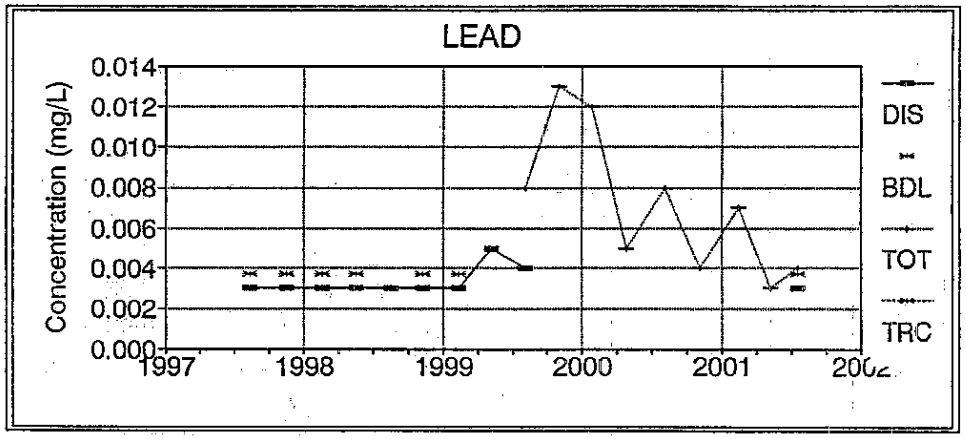


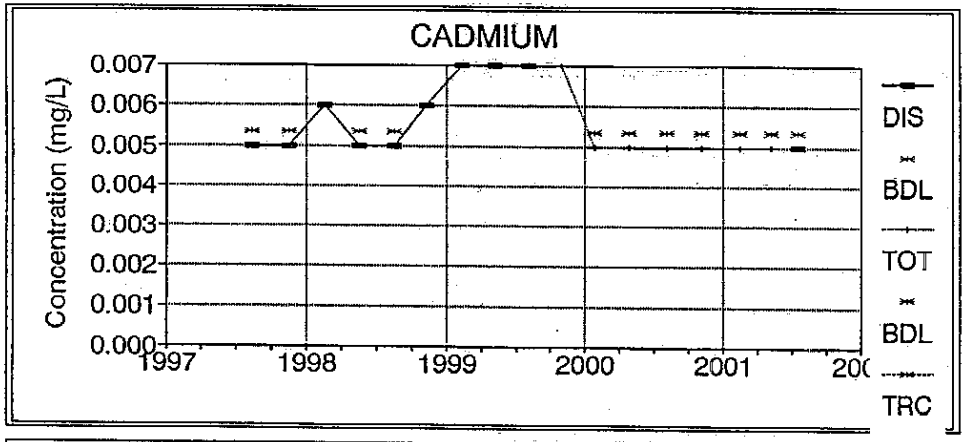


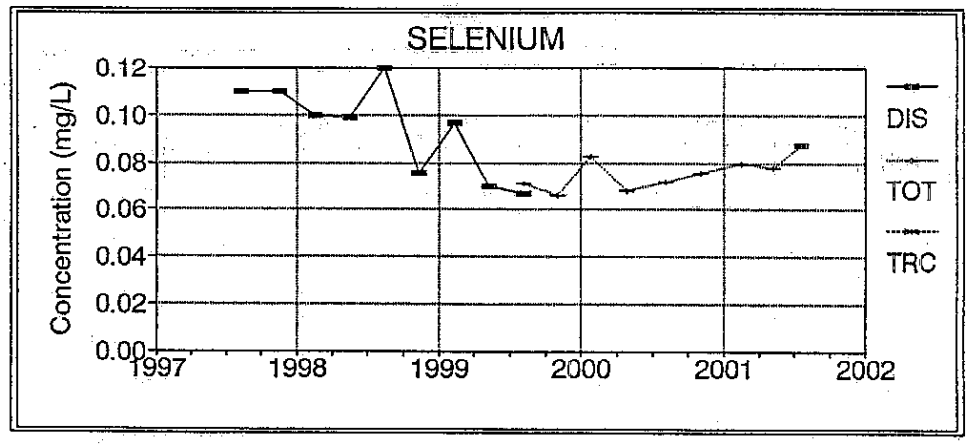
BDL - Below Analytical Detection Limit

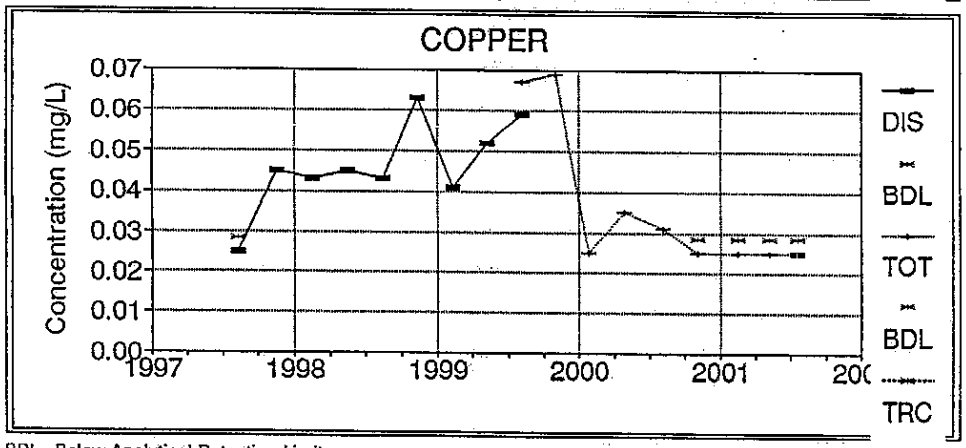
EM-6

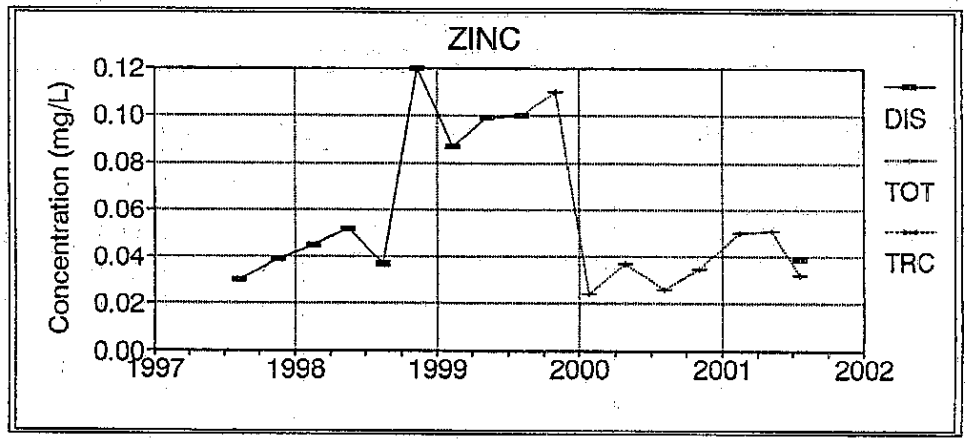






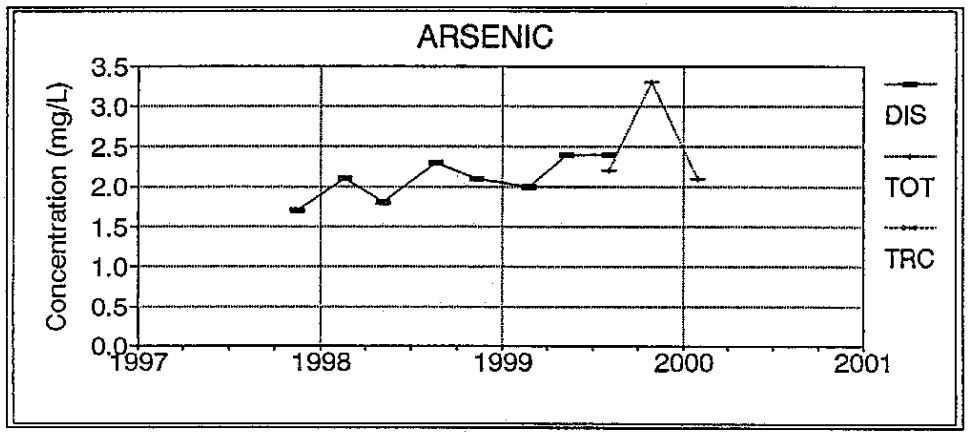


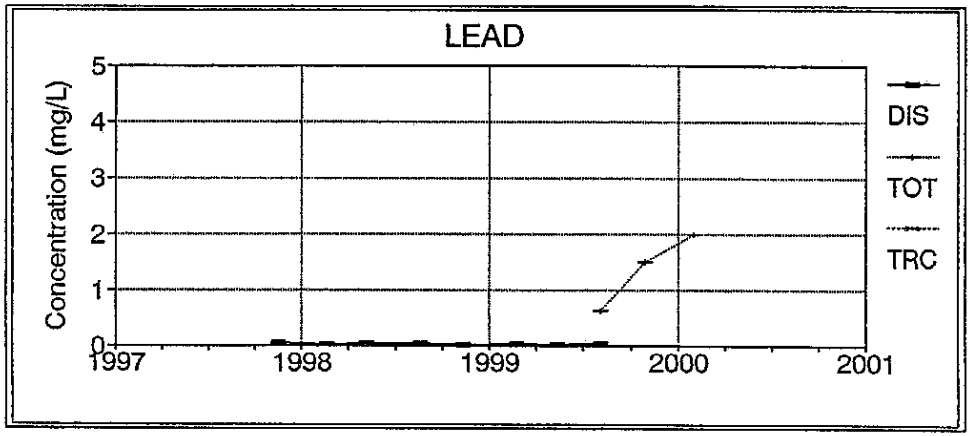


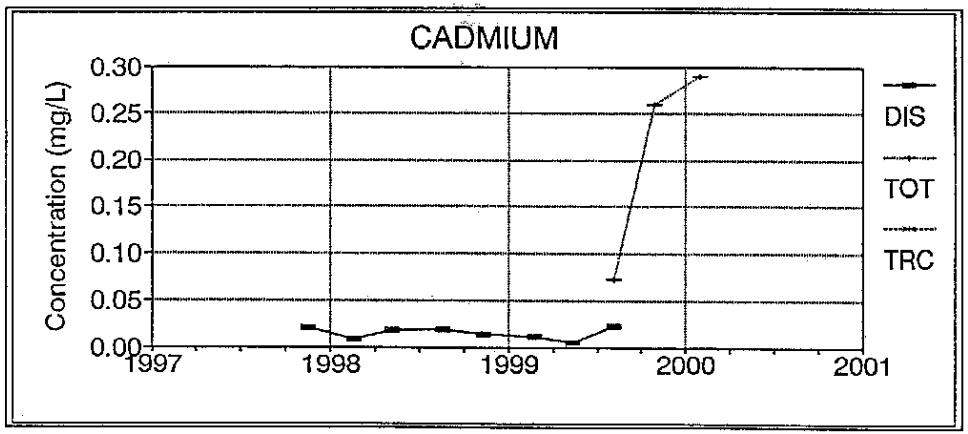


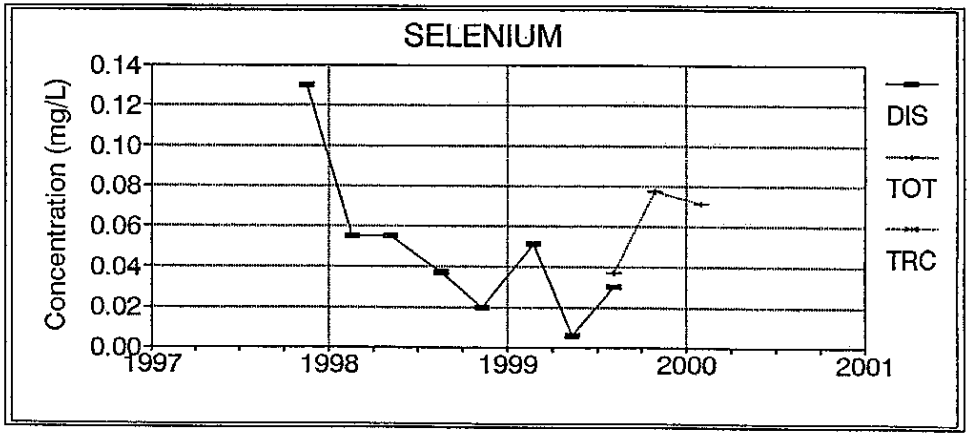
BDL - Below Analytical Detection Limit

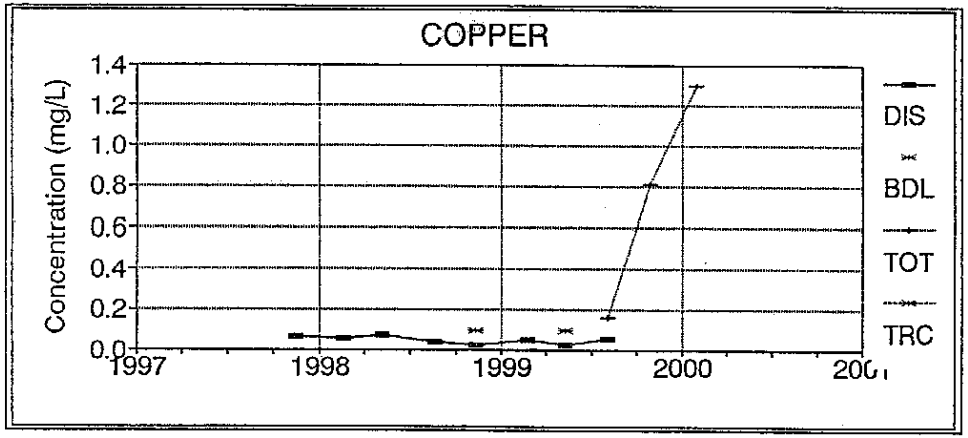
EM-7

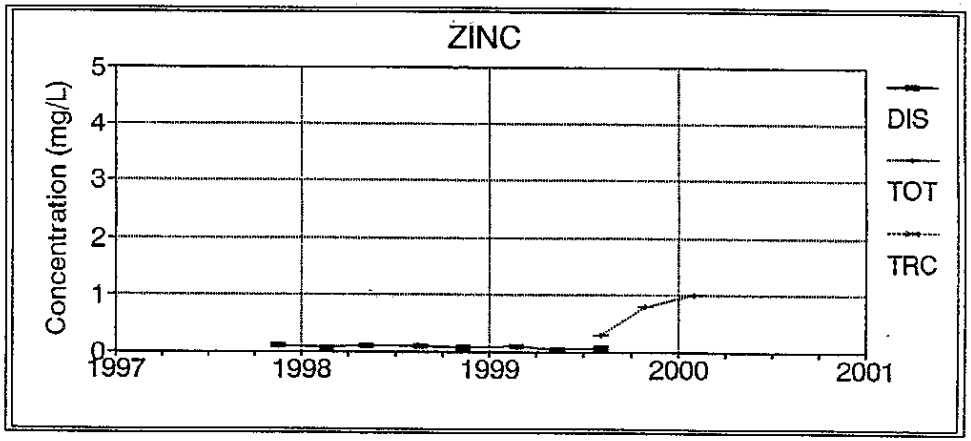












BDL - Below Analytical Detection Limit

EM-8

ARSENIC

No Data Available

N/A

LEAD

No Data Available

N/A

CADMIUM

No Data Available

N/A

SELENIUM

No Data Available

N/A

COPPER

No Data Available

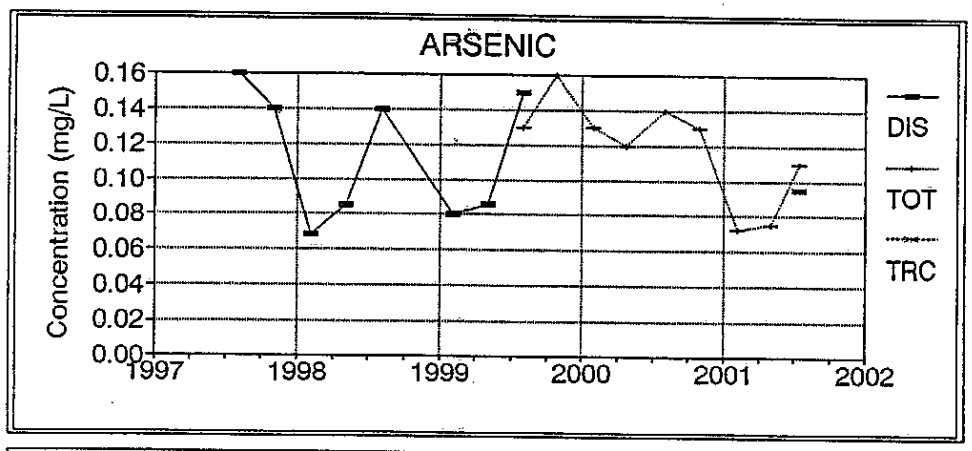
N/A

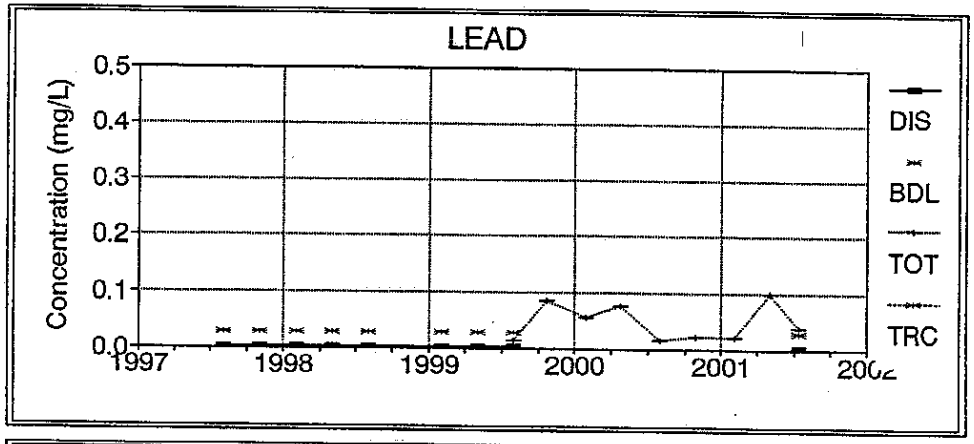
ZINC

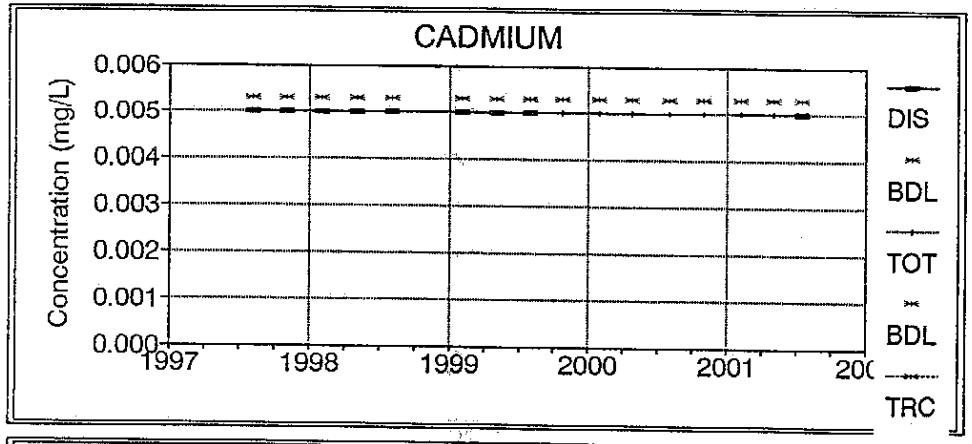
No Data Available

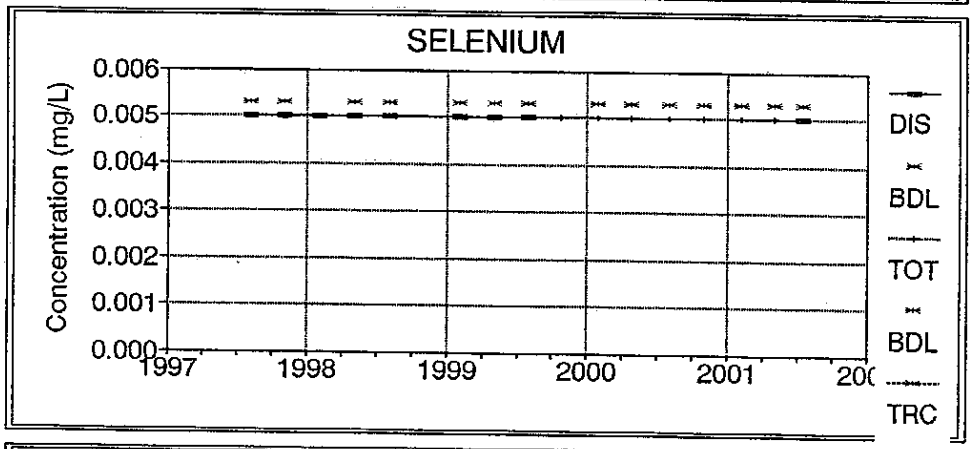
N/A

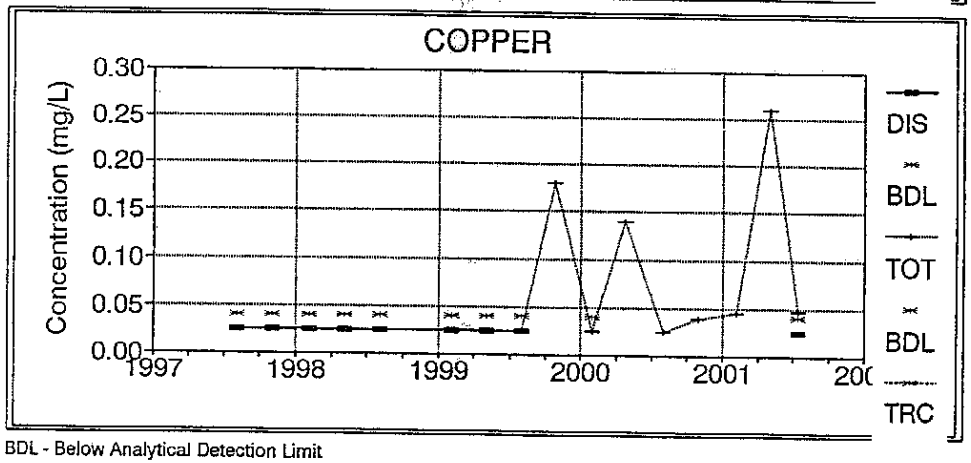
EP-4

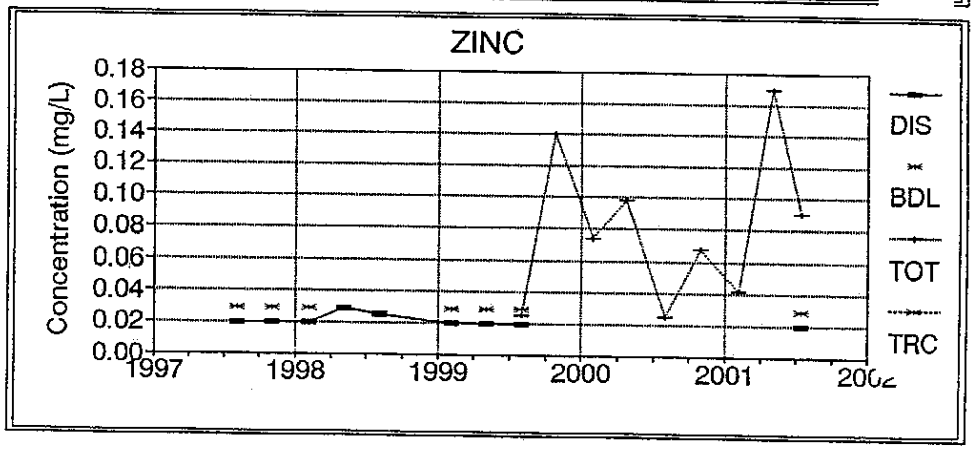






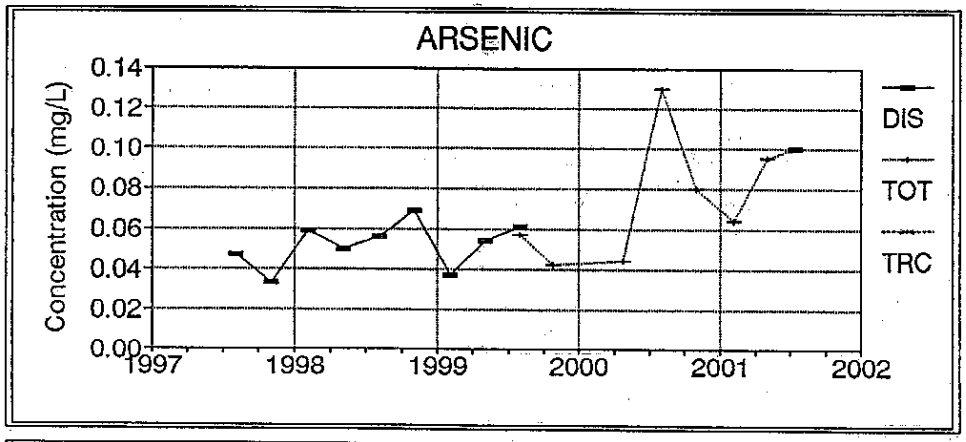


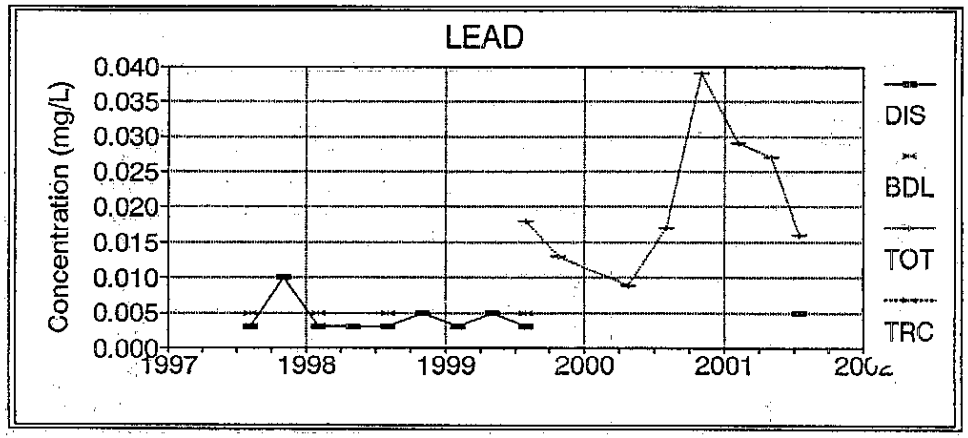


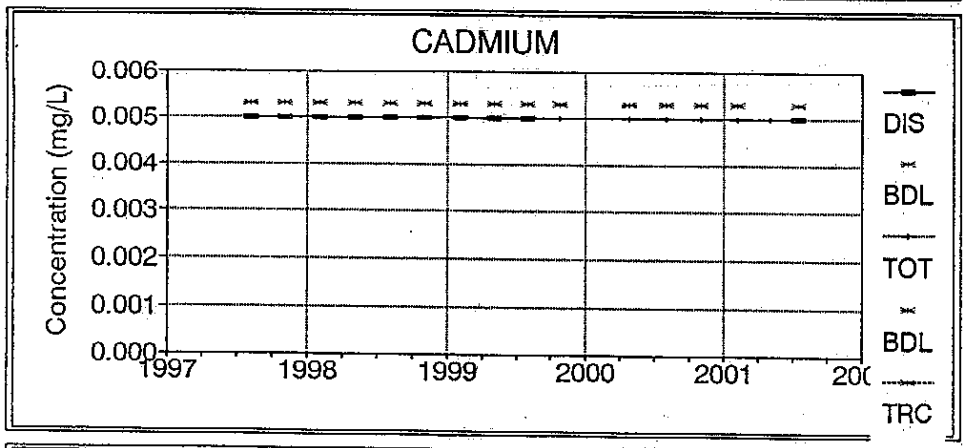


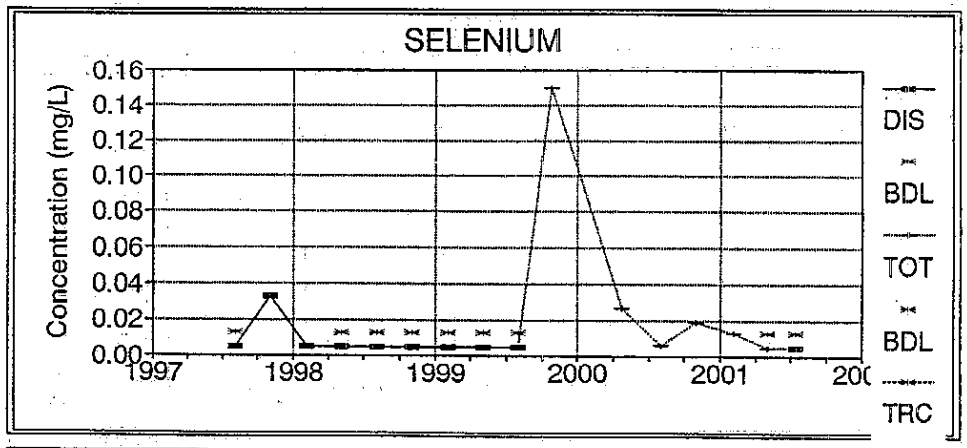
BDL - Below Analytical Detection Limit

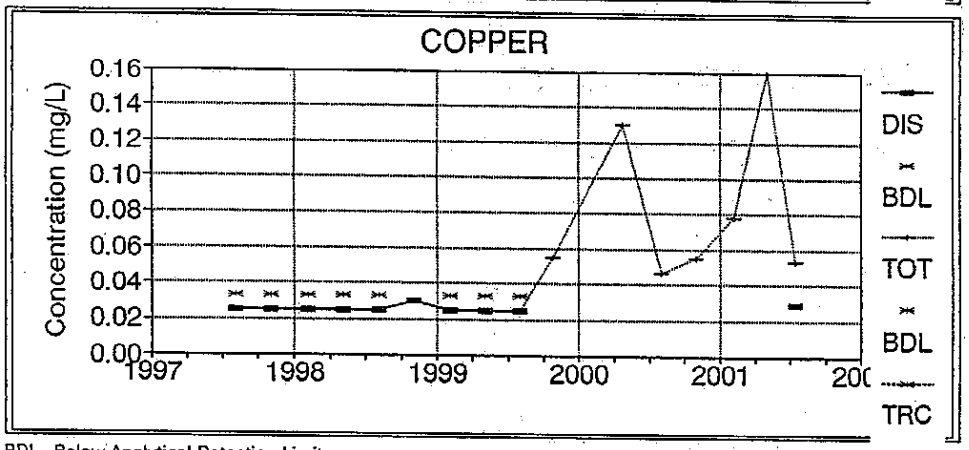
EP-5

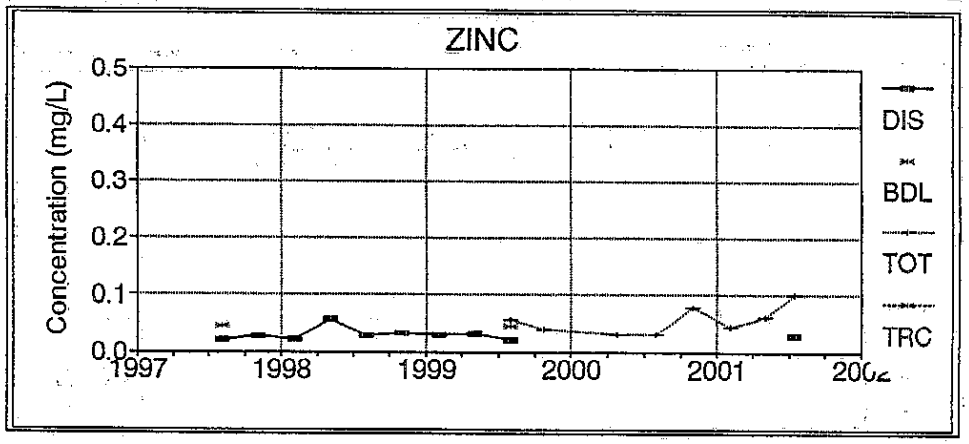






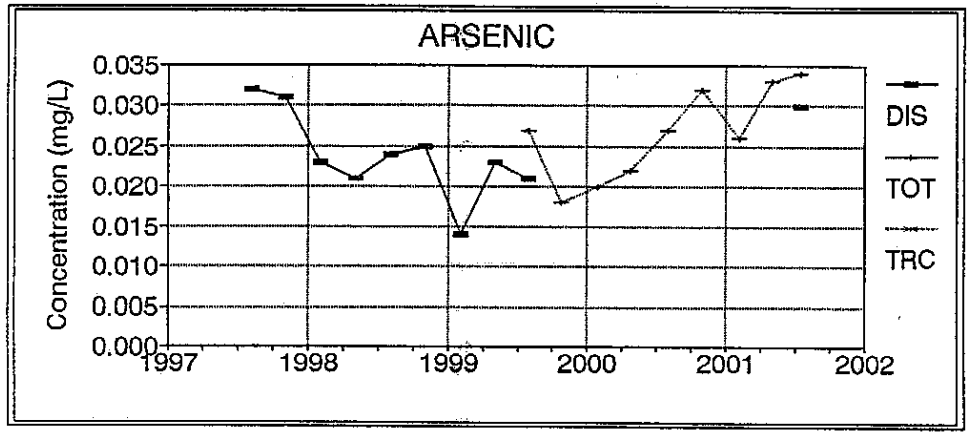


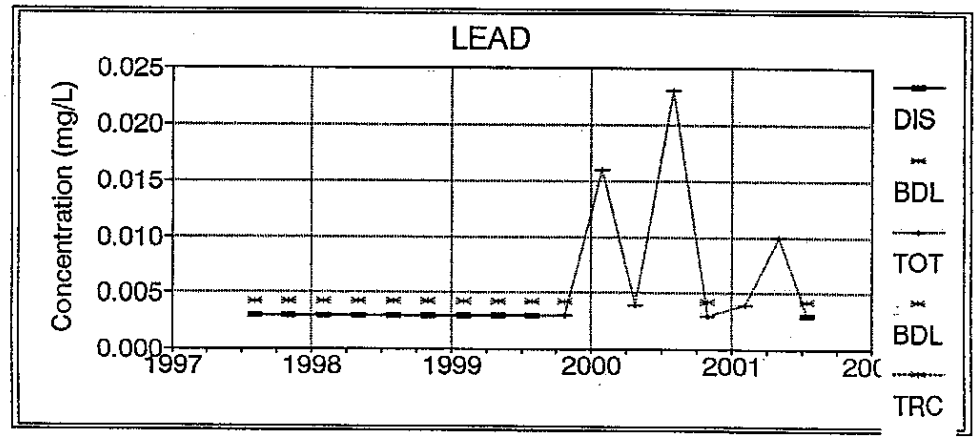


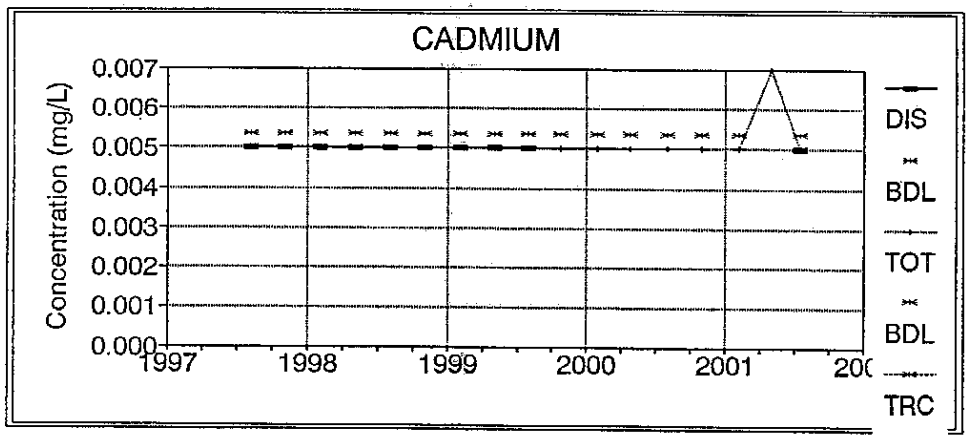


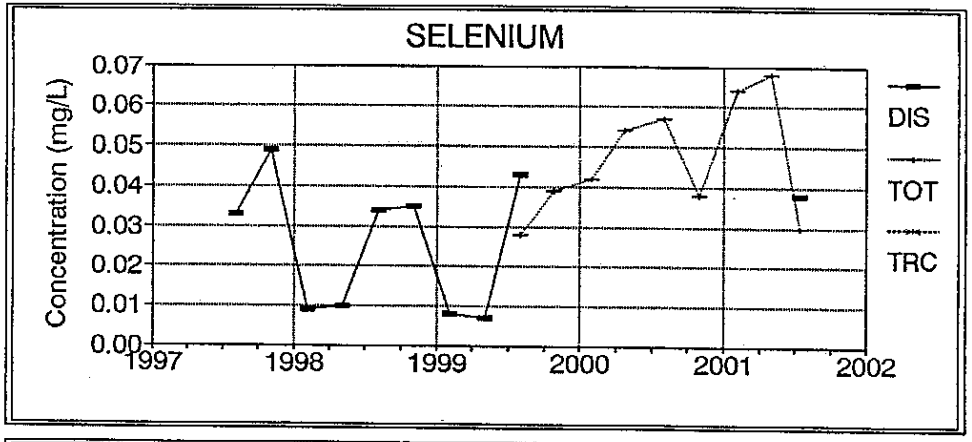
BDL - Below Analytical Detection Limit

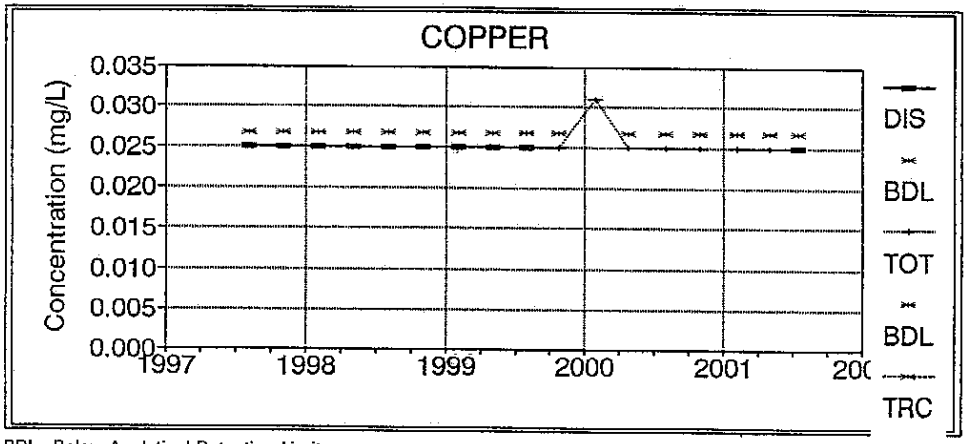
EP-

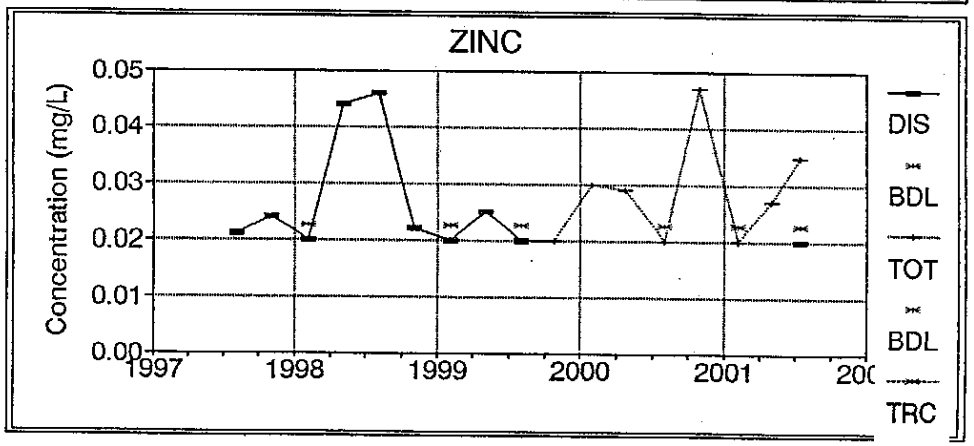






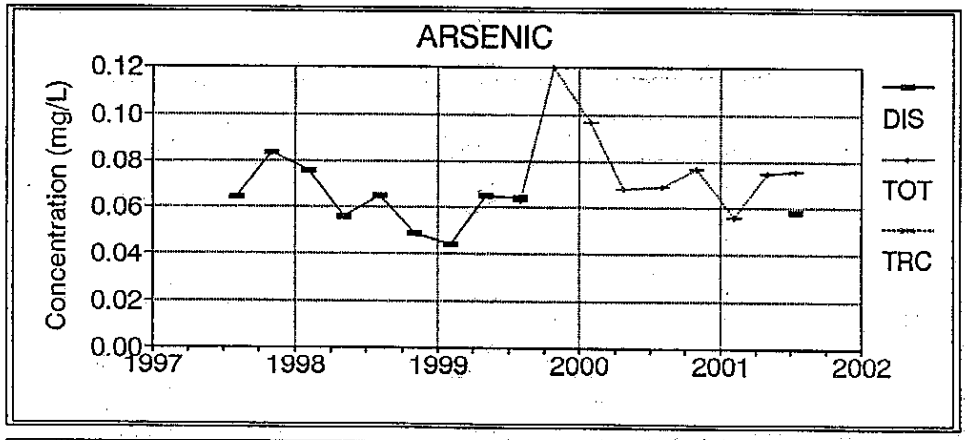


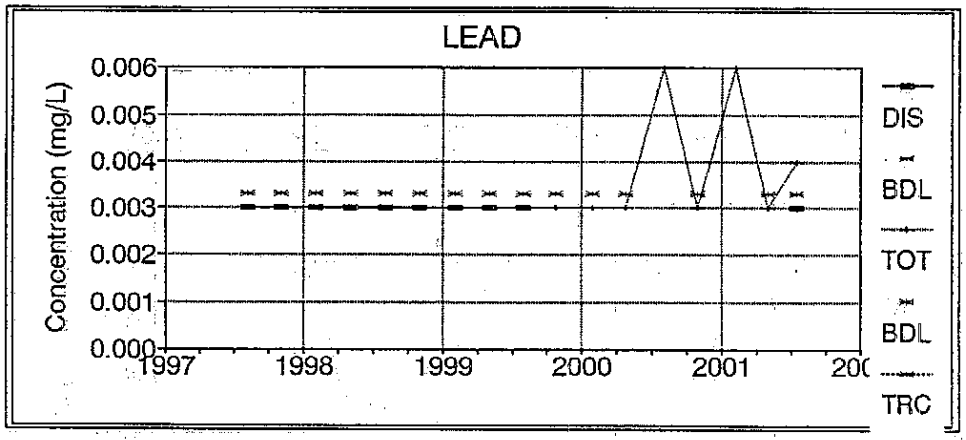


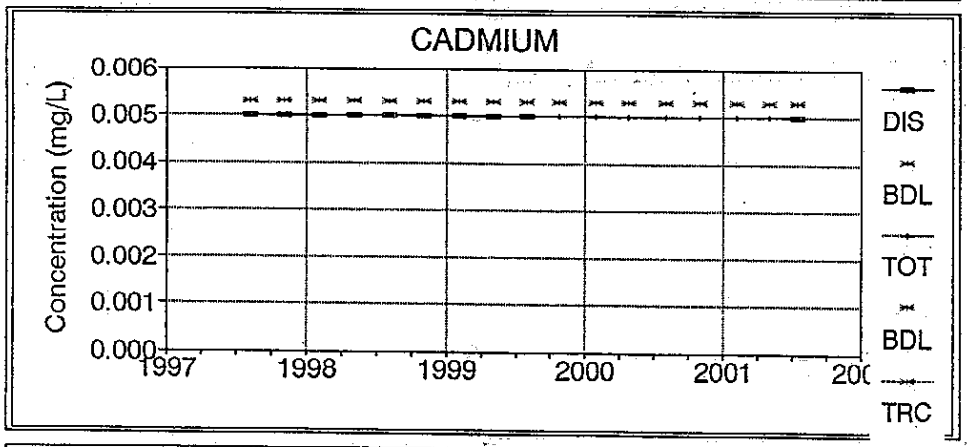


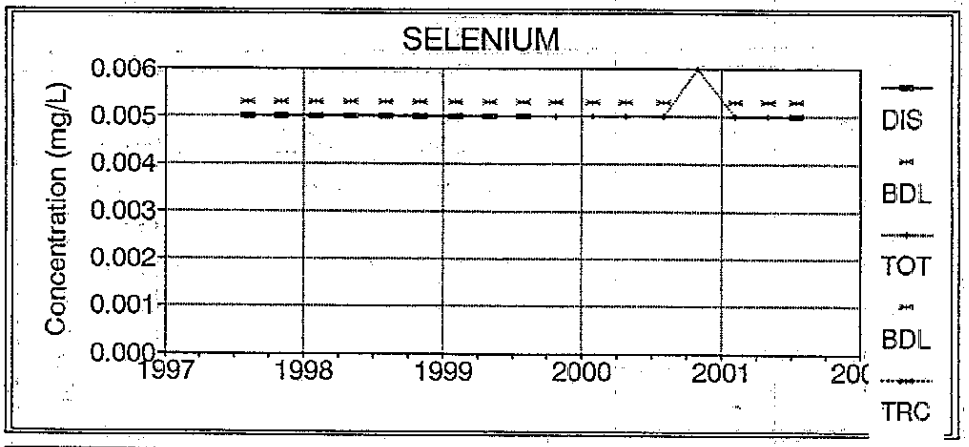
BDL - Below Analytical Detection Limit

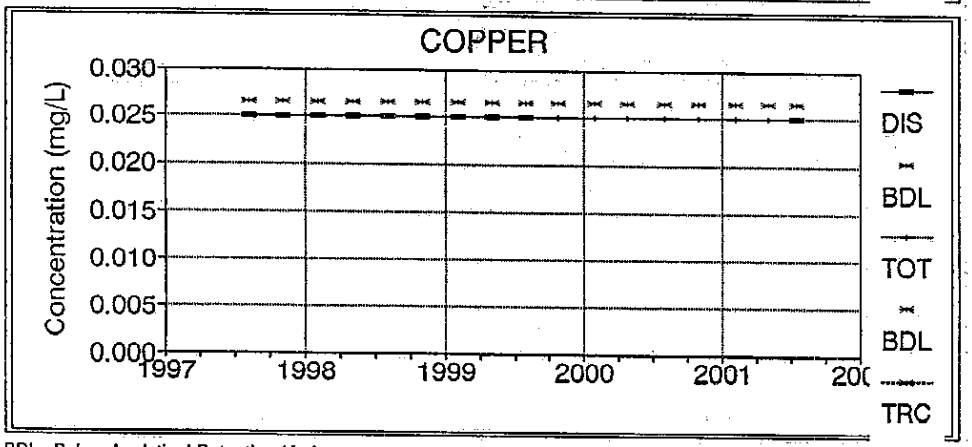
EP-7

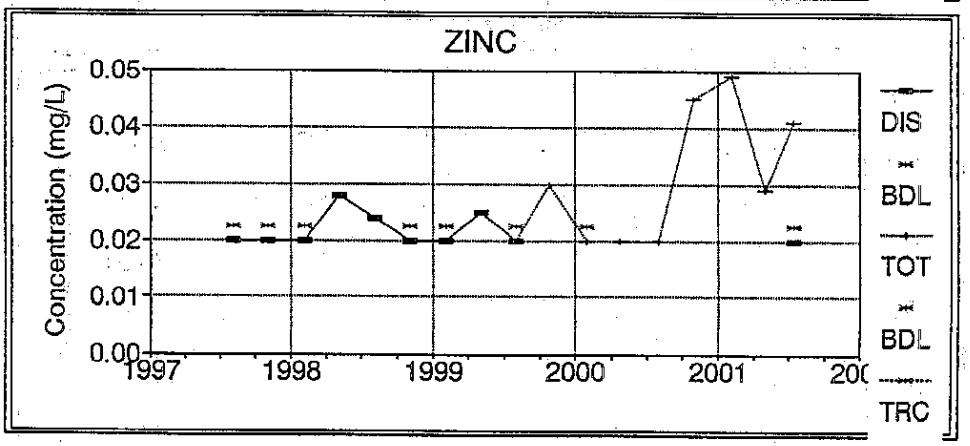






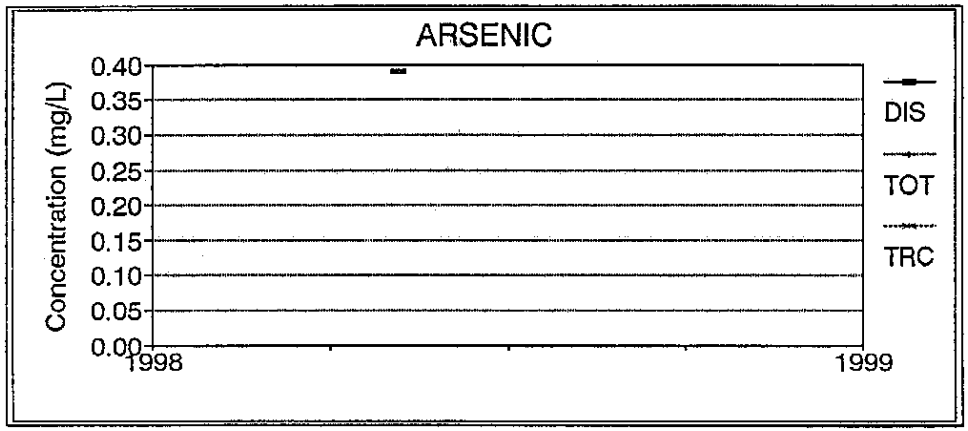


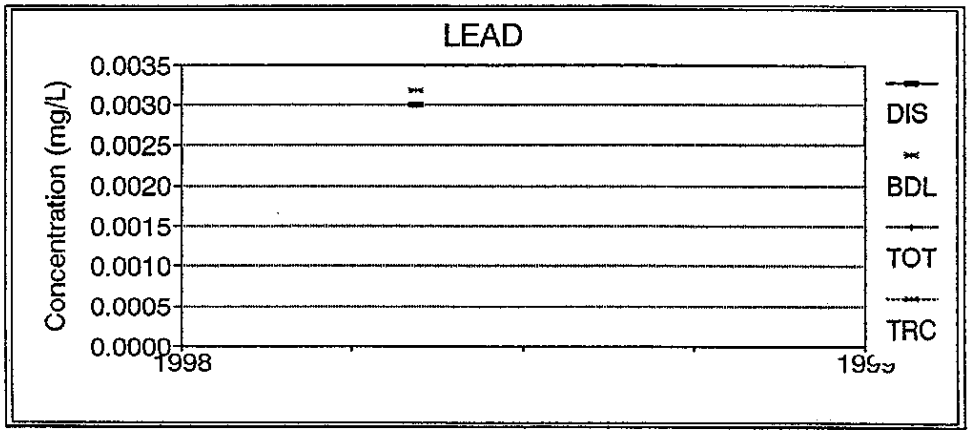


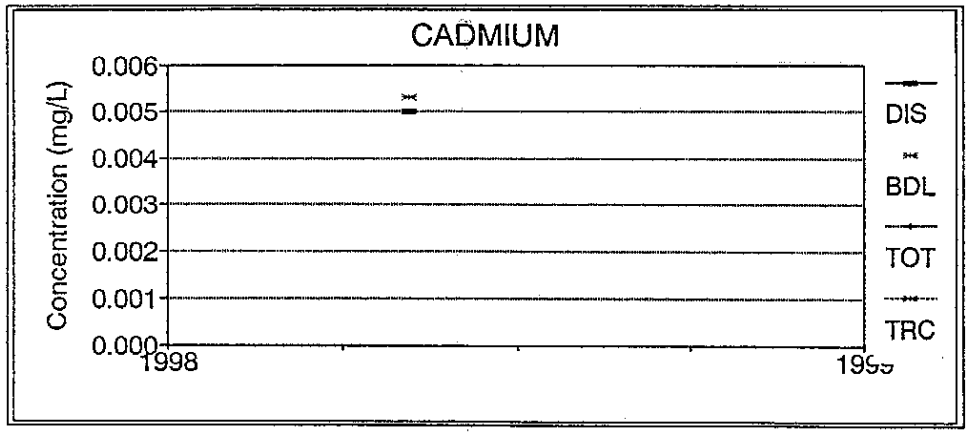


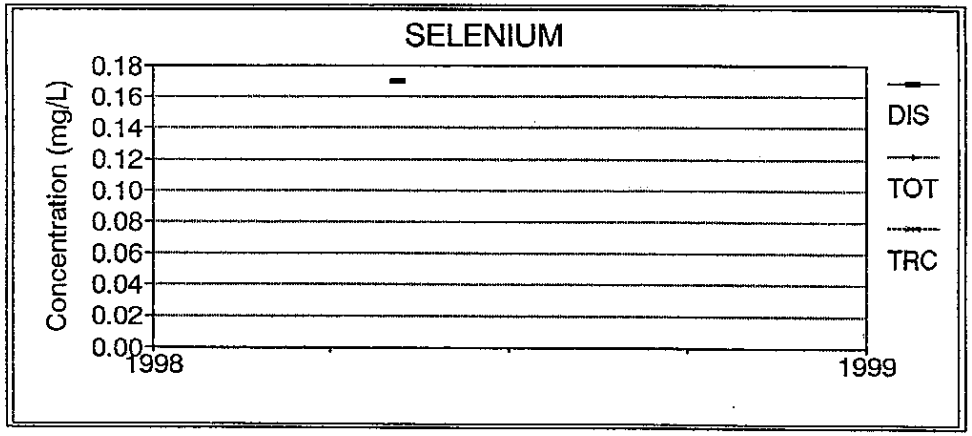
BDL - Below Analytical Detection Limit

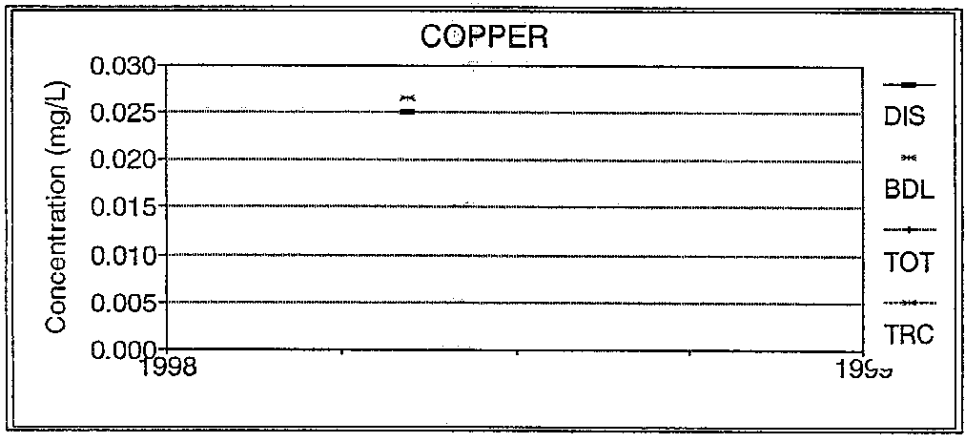
EP-9

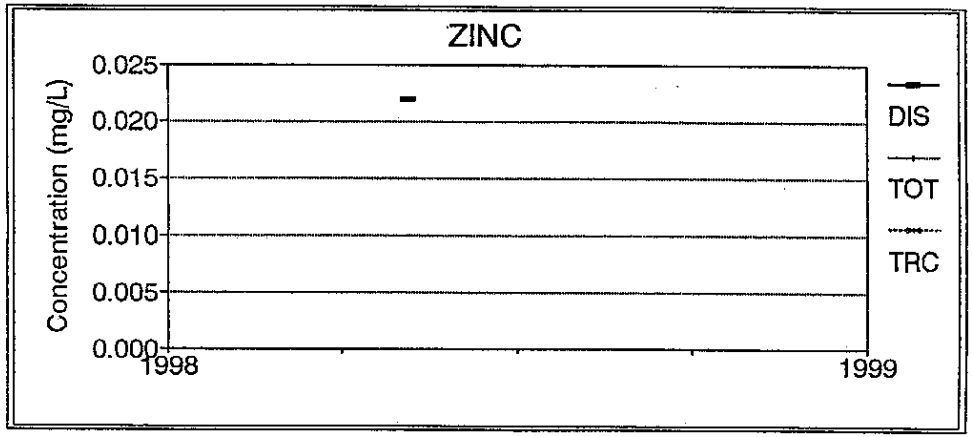






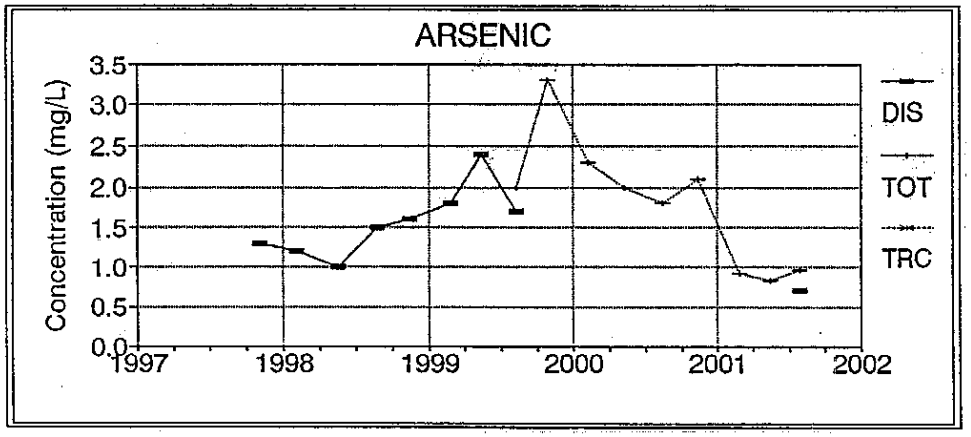


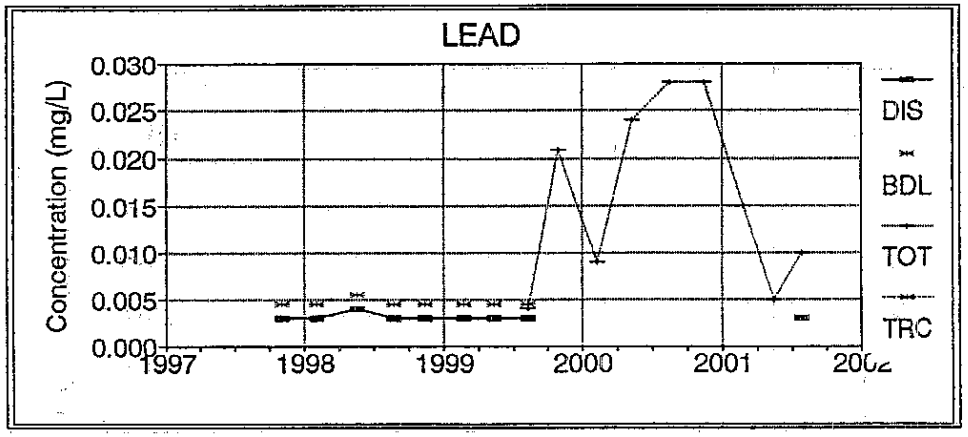


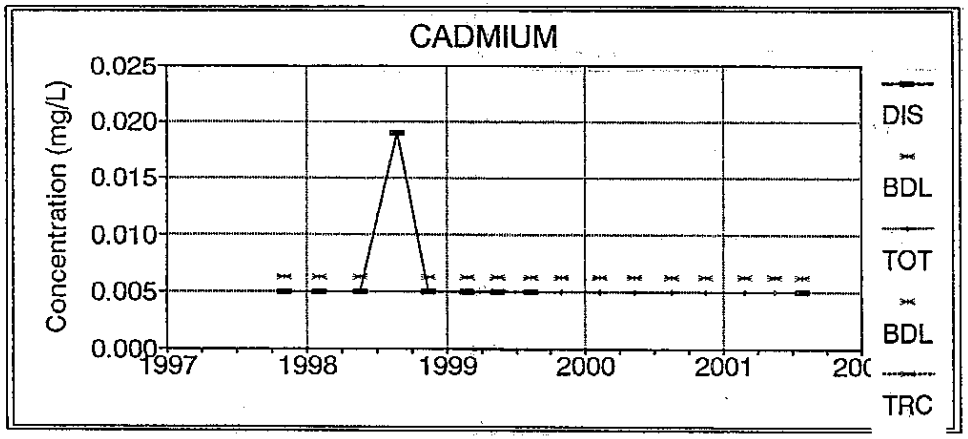


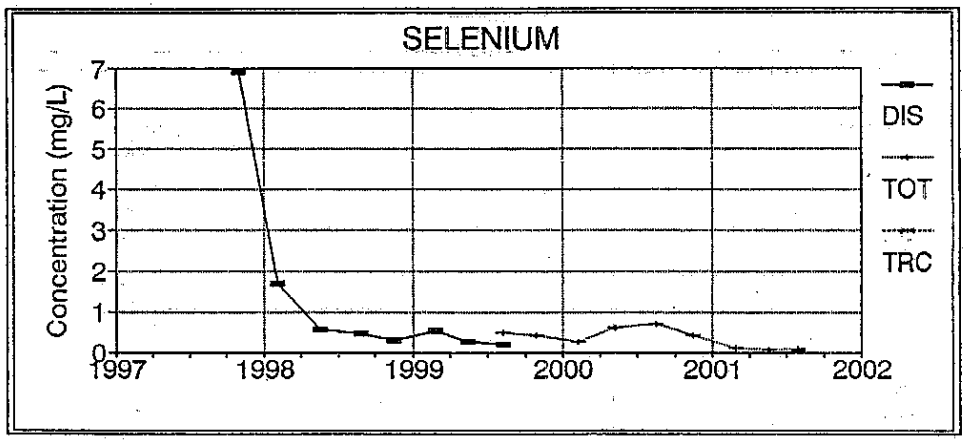
BDL - Below Analytical Detection Limit

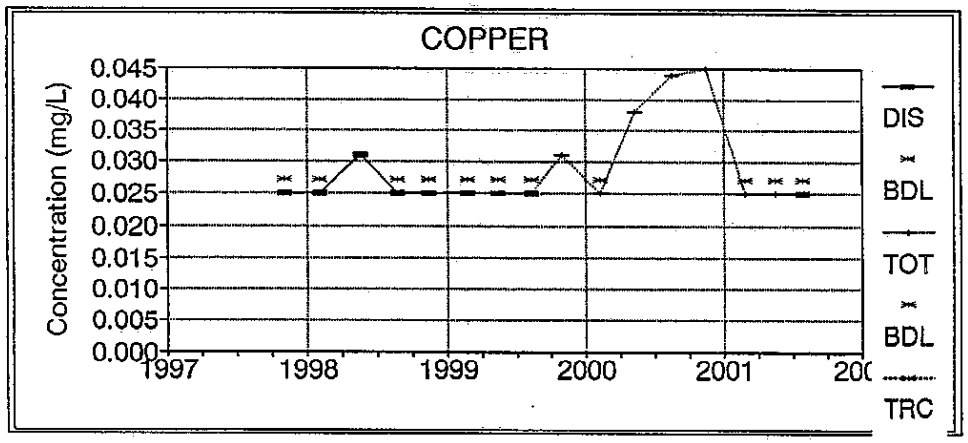
EP-12

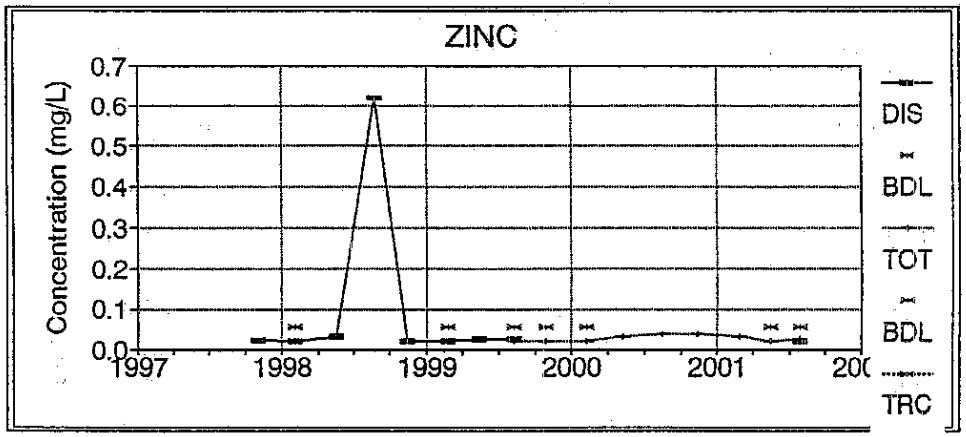






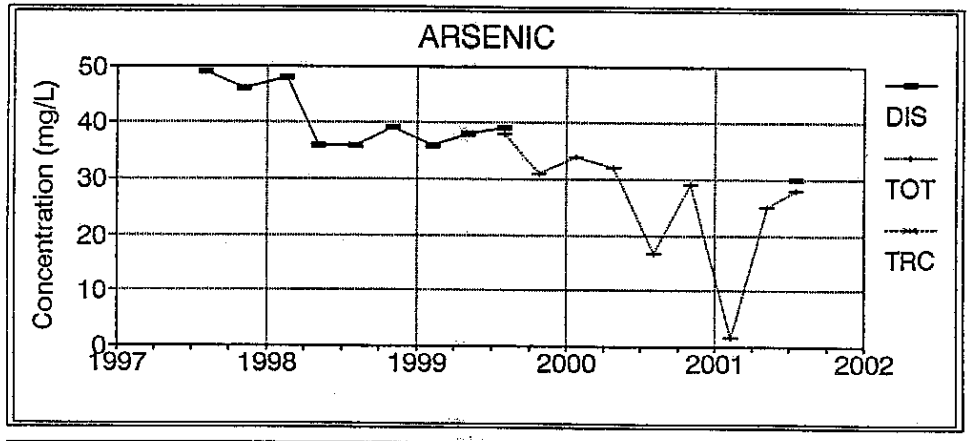


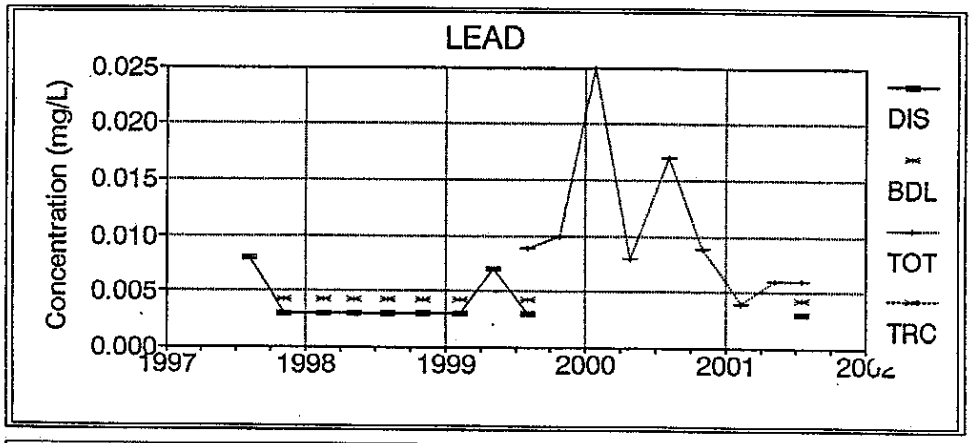


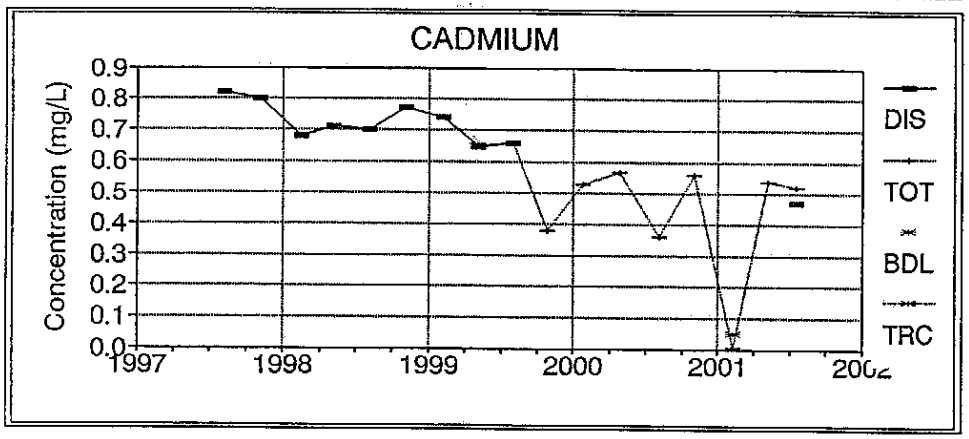


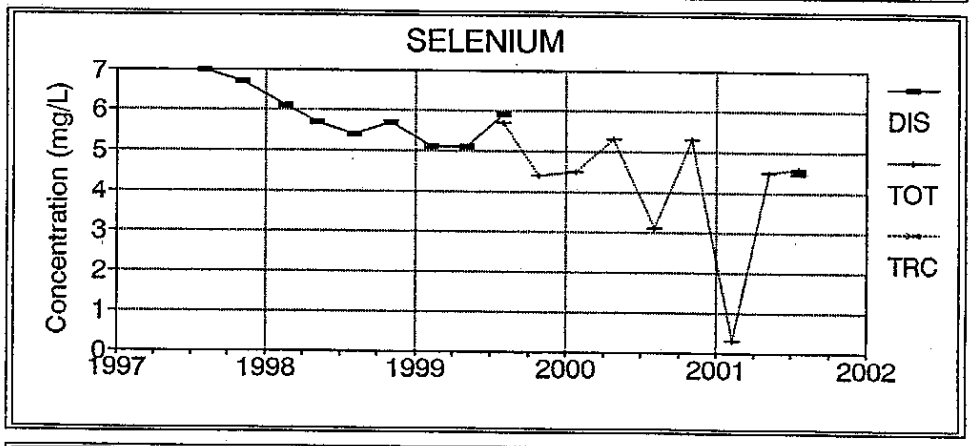
BDL - Below Analytical Detection Limit

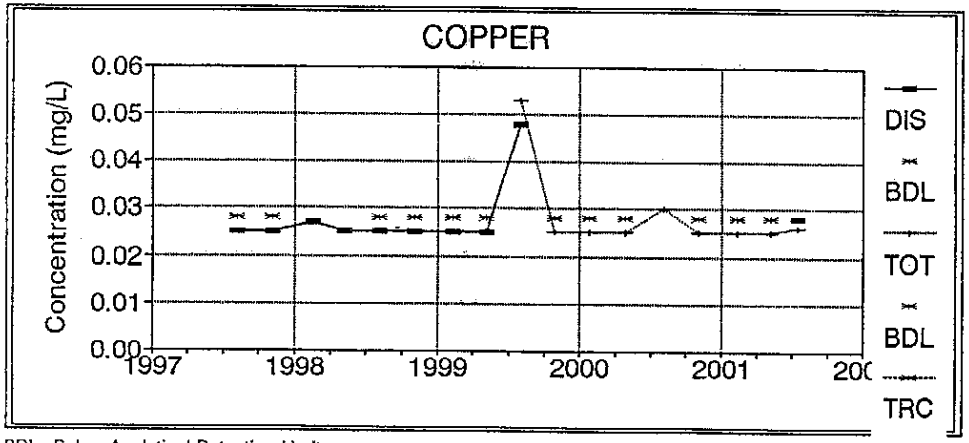
EP-1

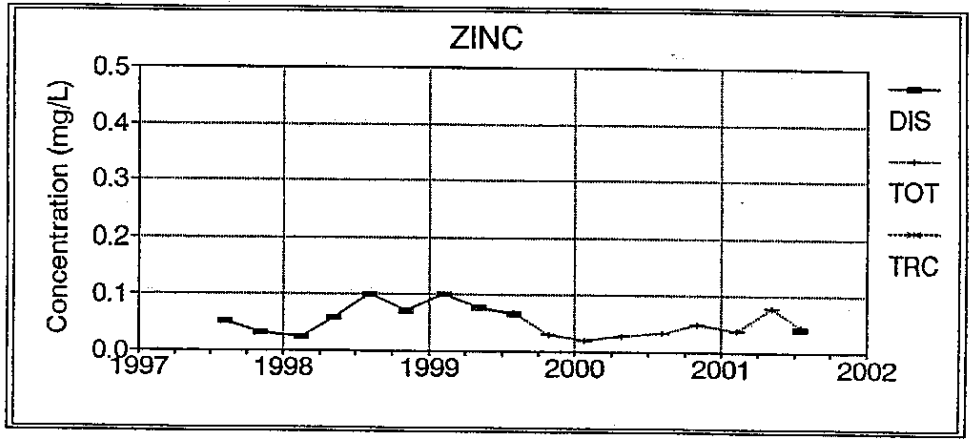






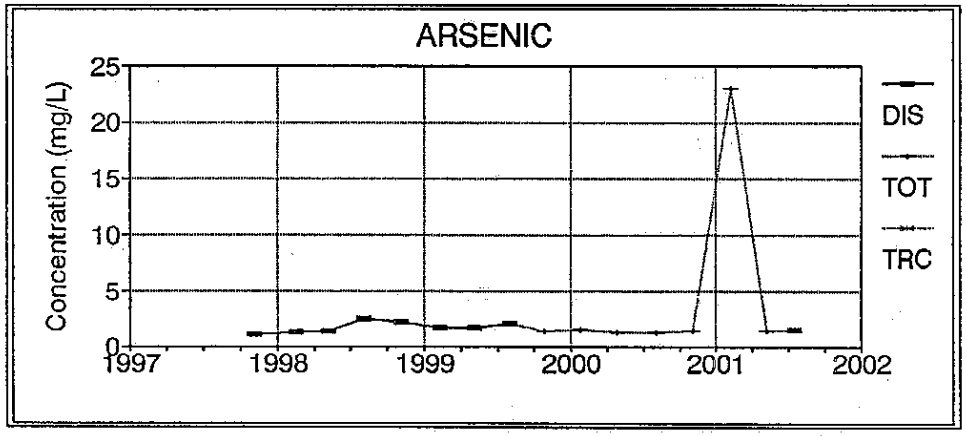


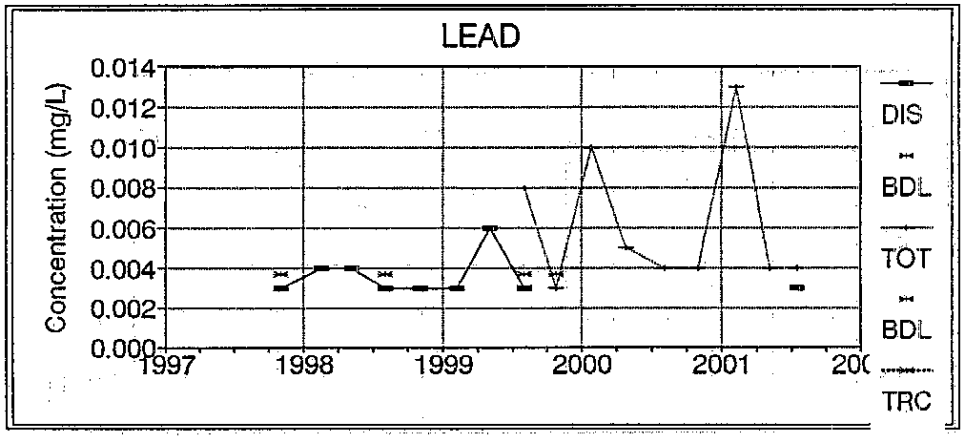


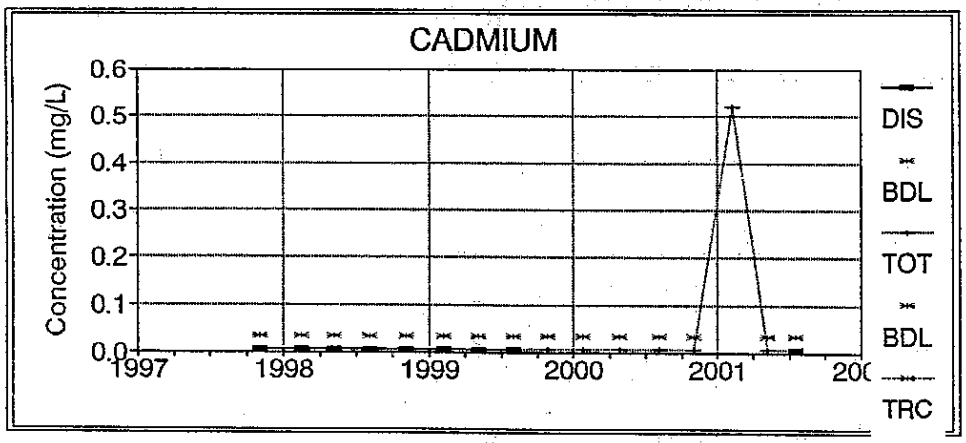


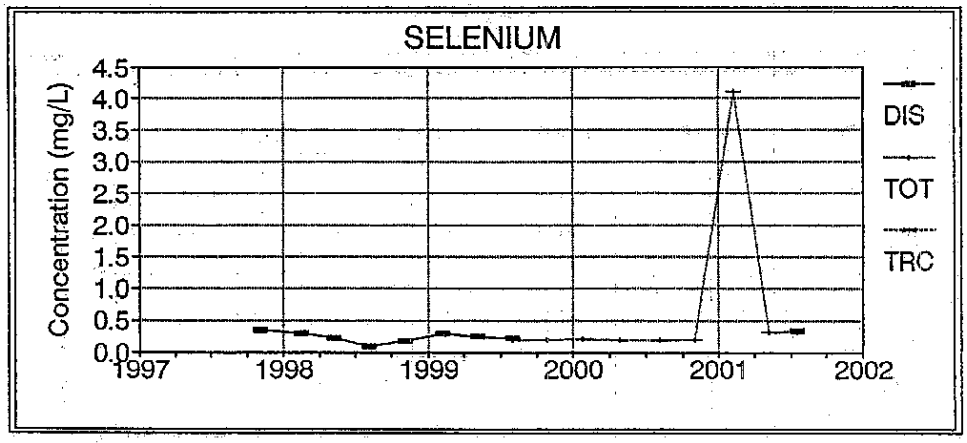
BDL - Below Analytical Detection Limit

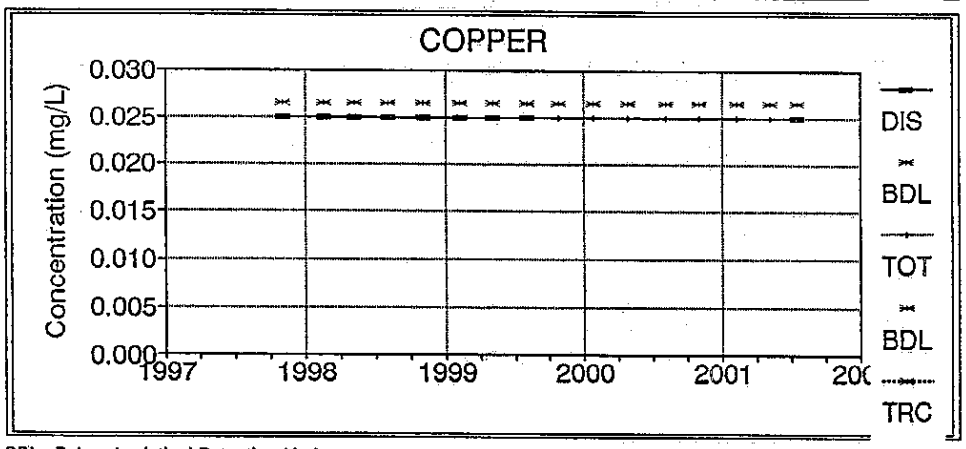
EP-14

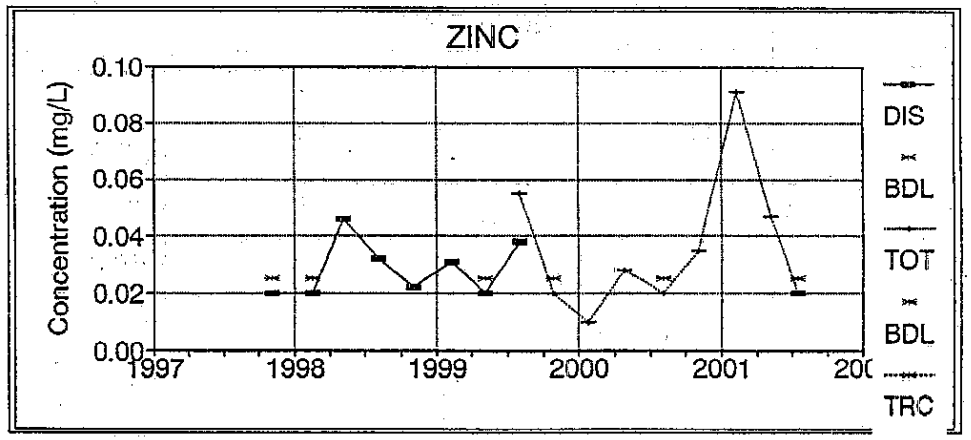






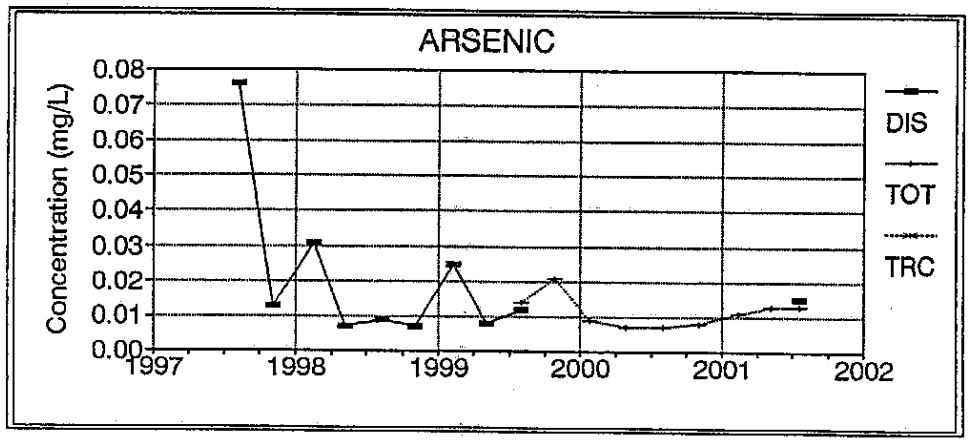


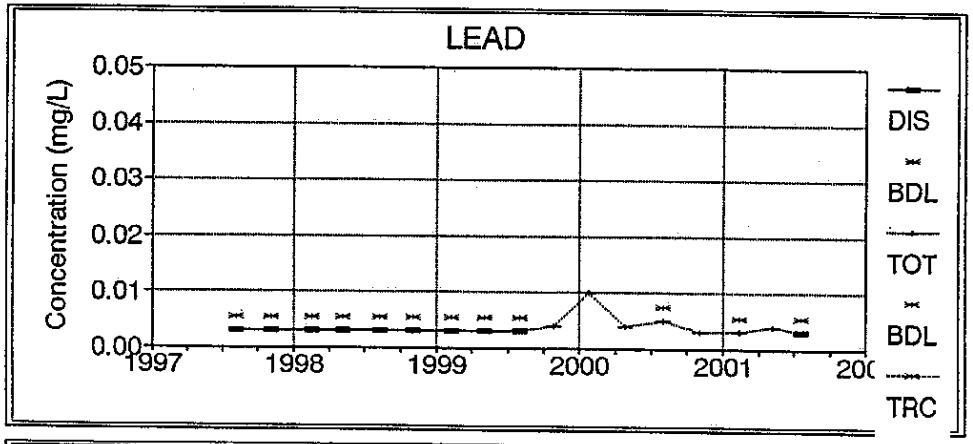


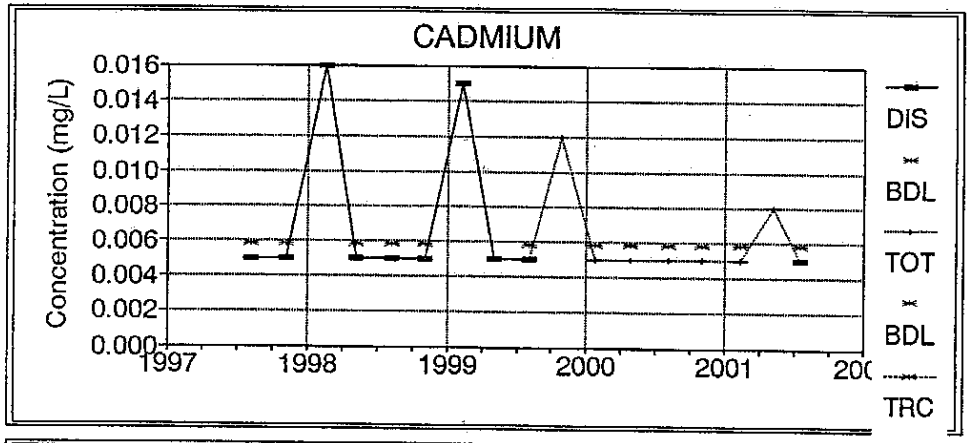


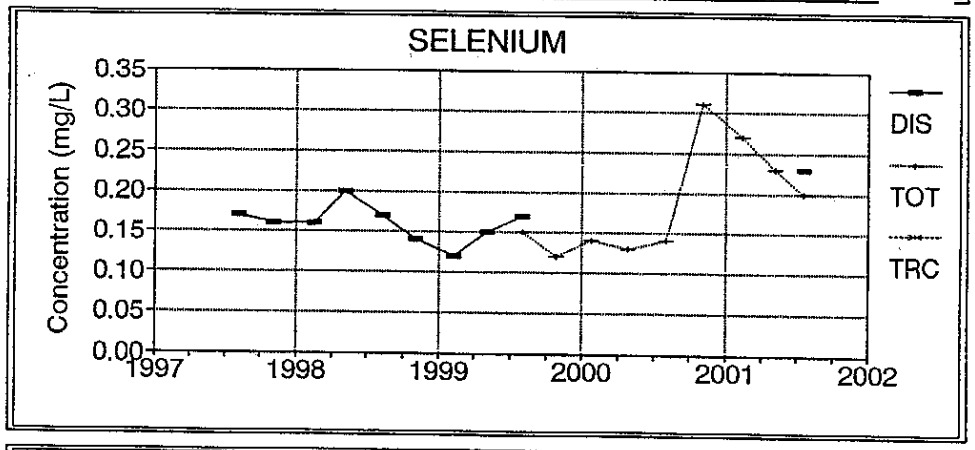
BDL - Below Analytical Detection Limit

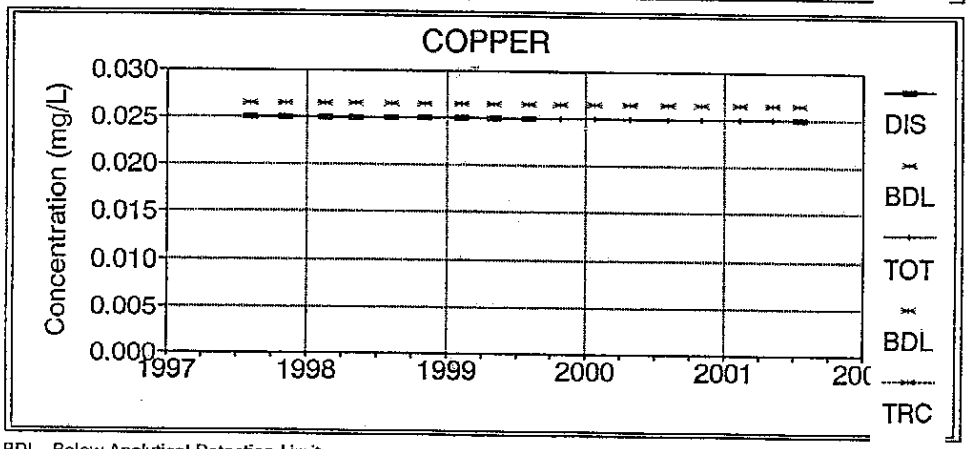
EP-1

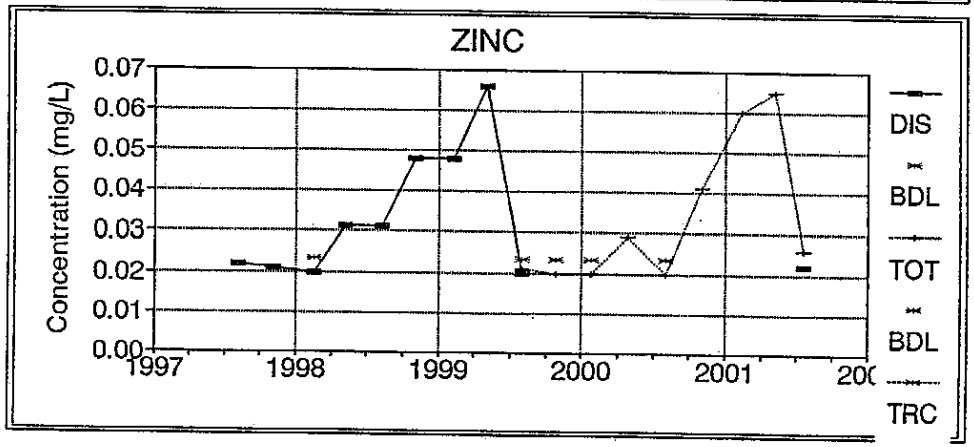






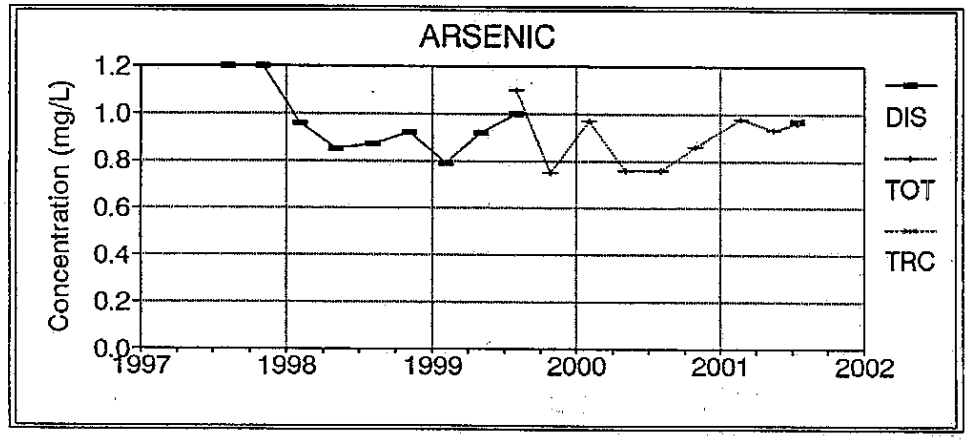


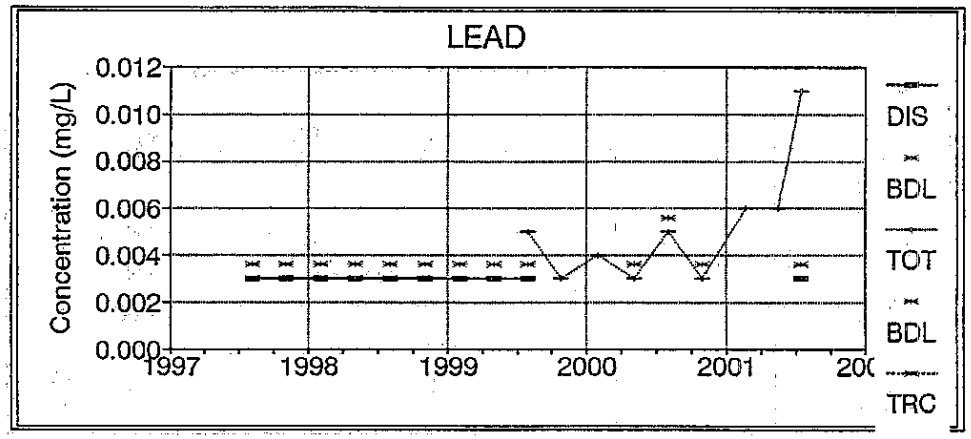


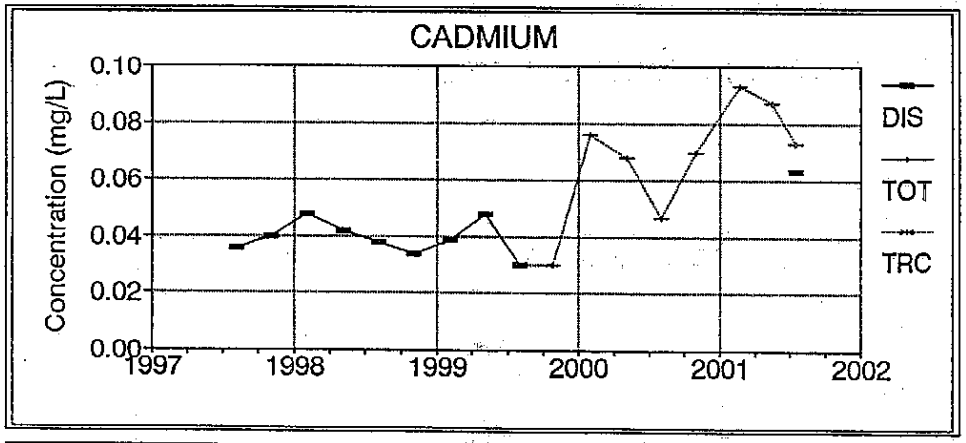


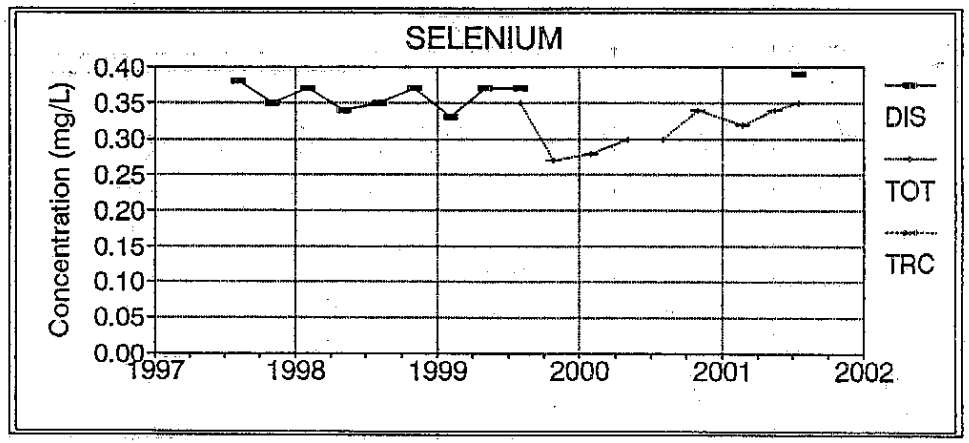
BDL - Below Analytical Detection Limit

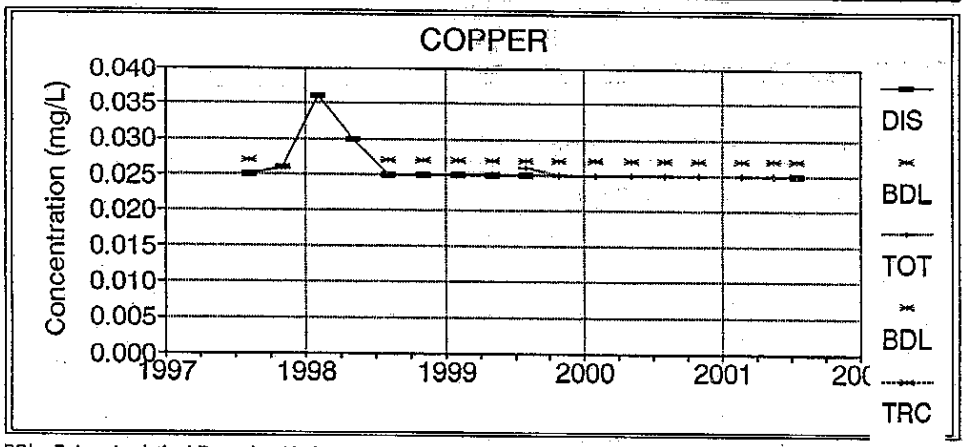
EP-20

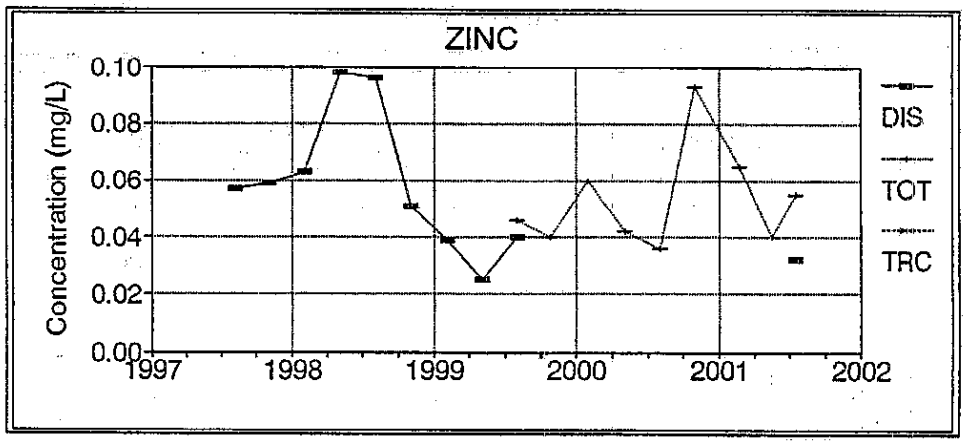






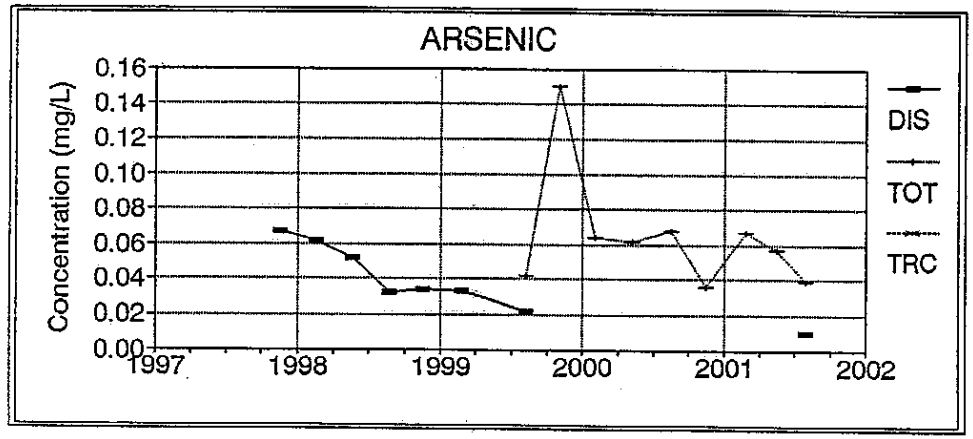


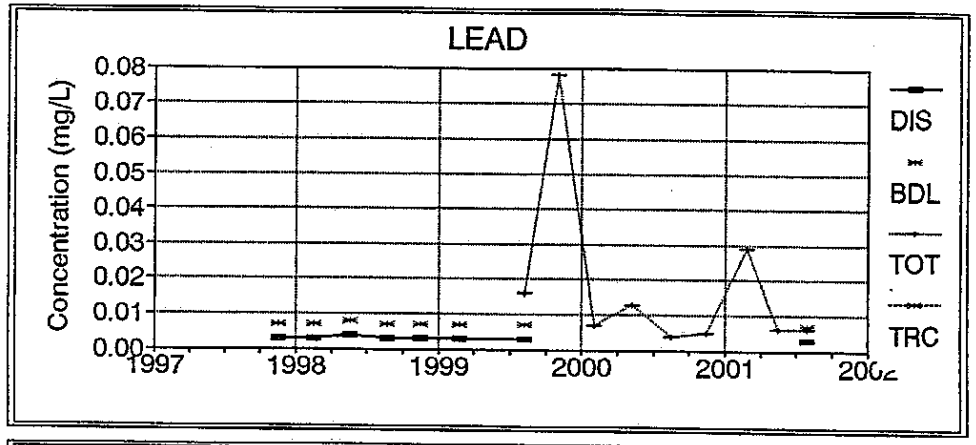


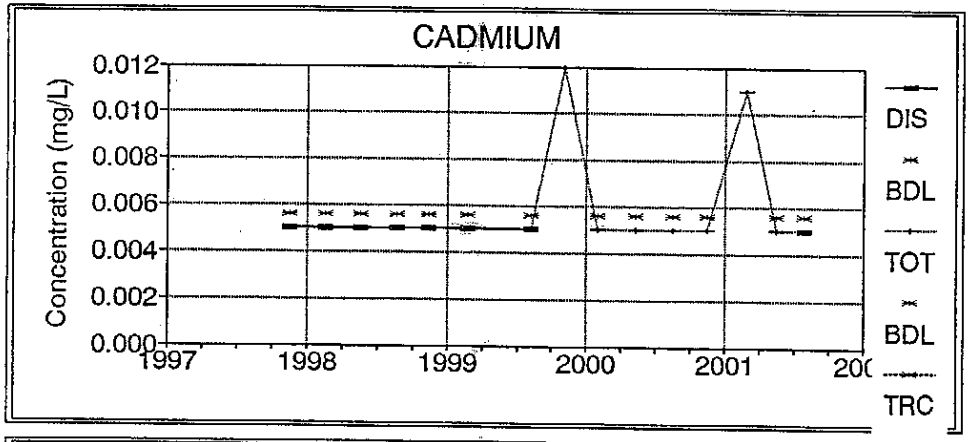


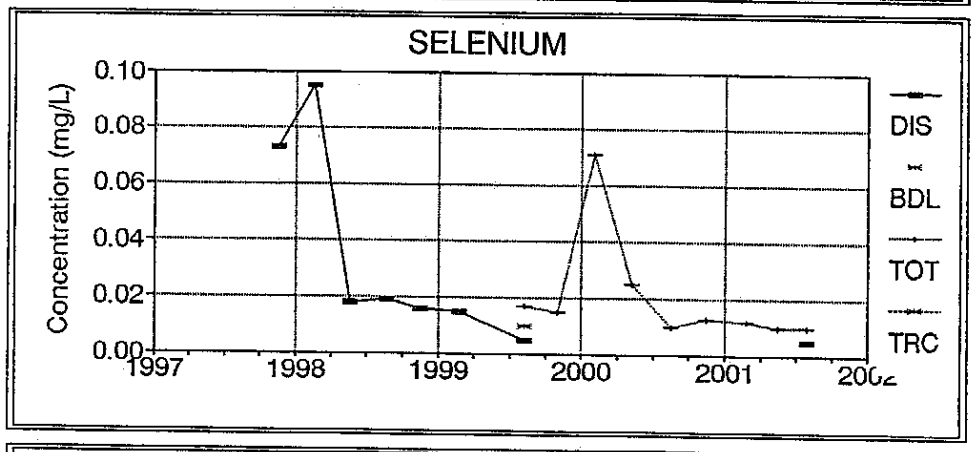
BDL - Below Analytical Detection Limit

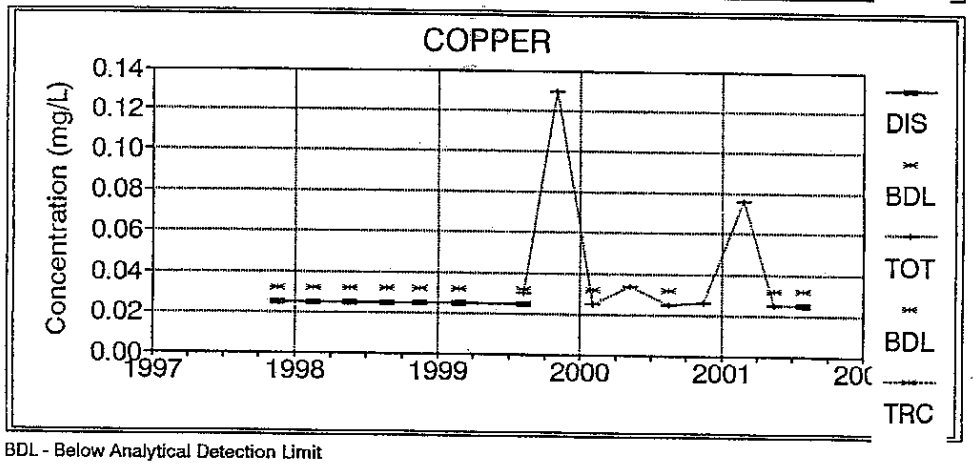
EP-2

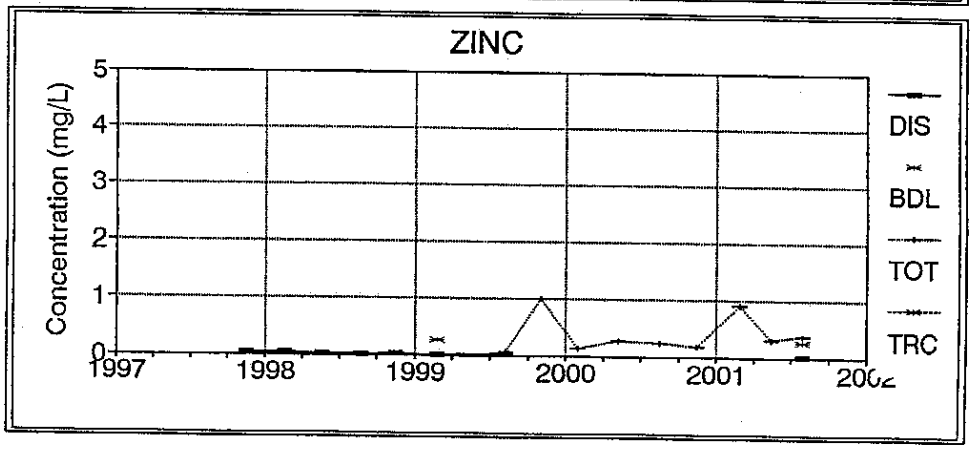






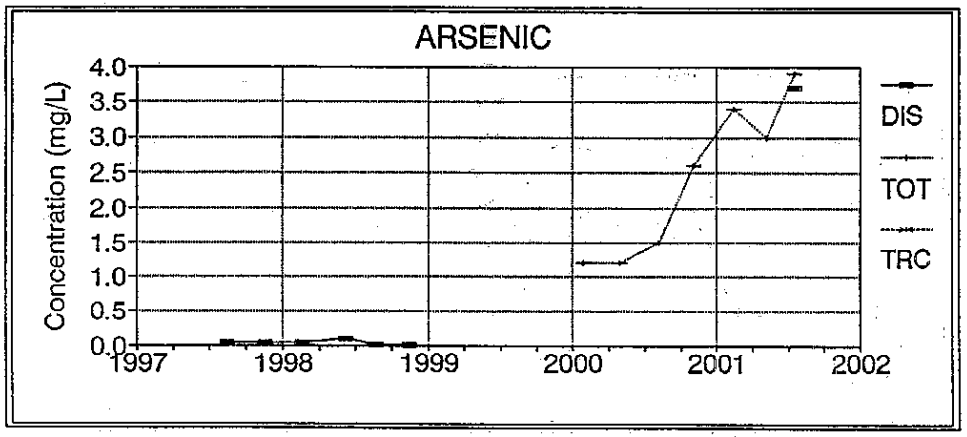


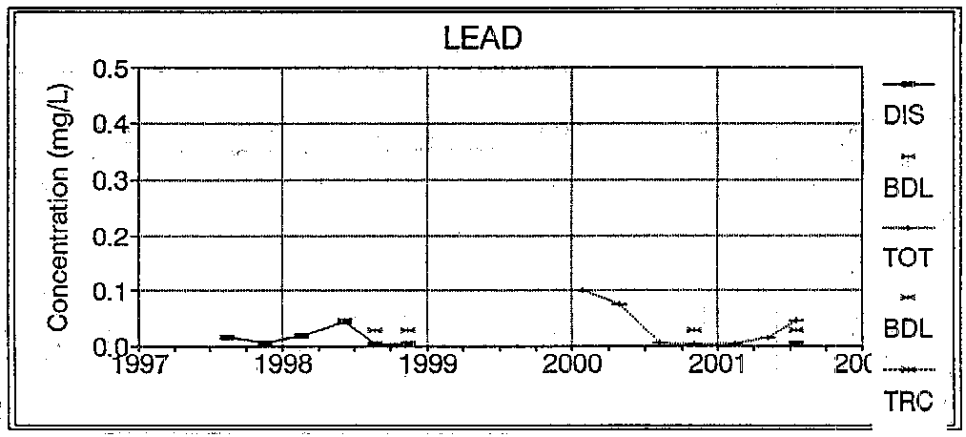


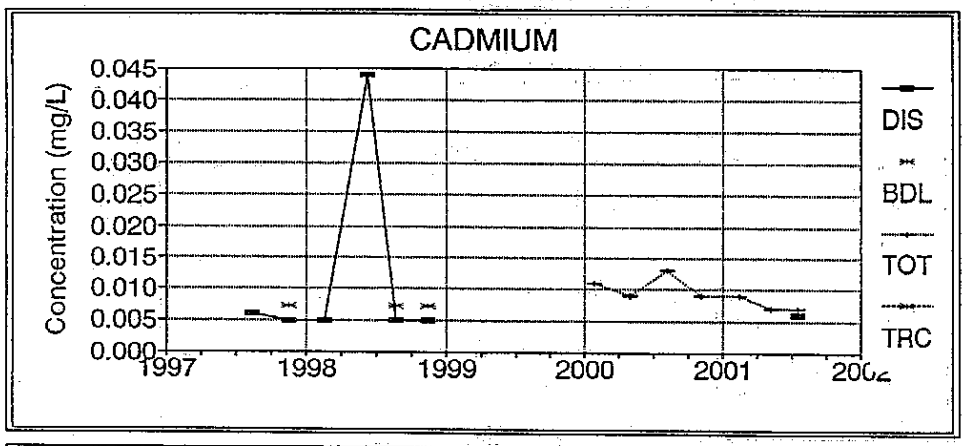


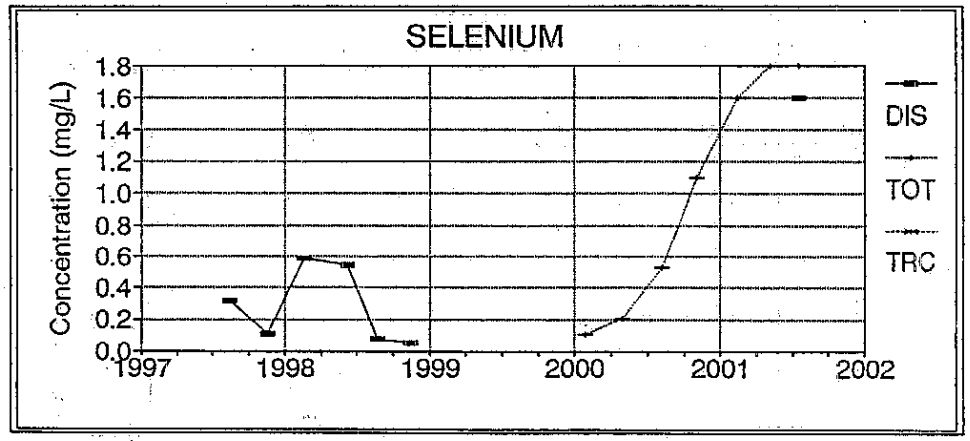
BDL - Below Analytical Detection Limit

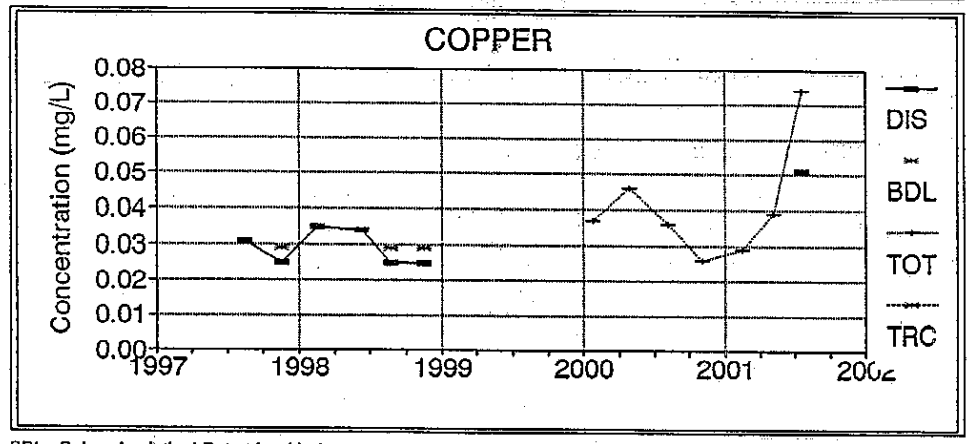
EP-22

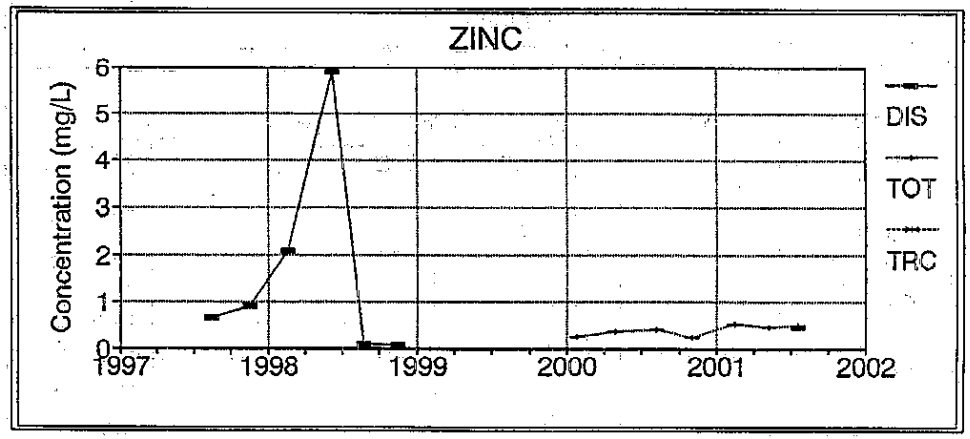






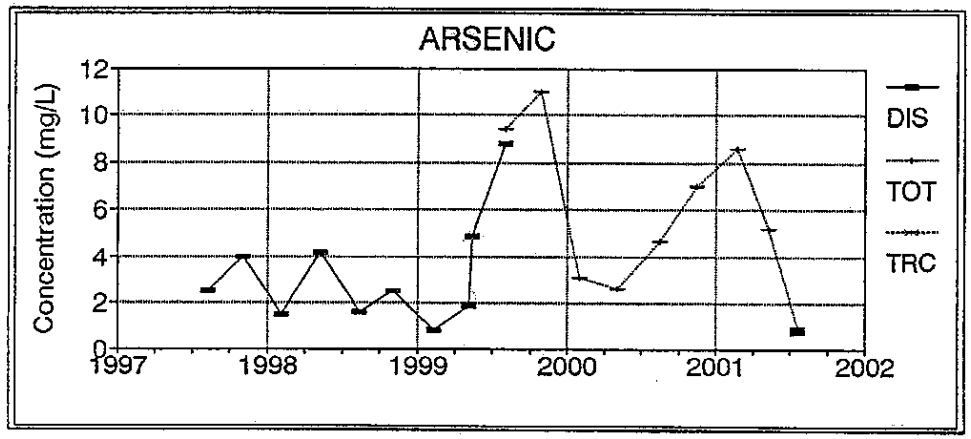


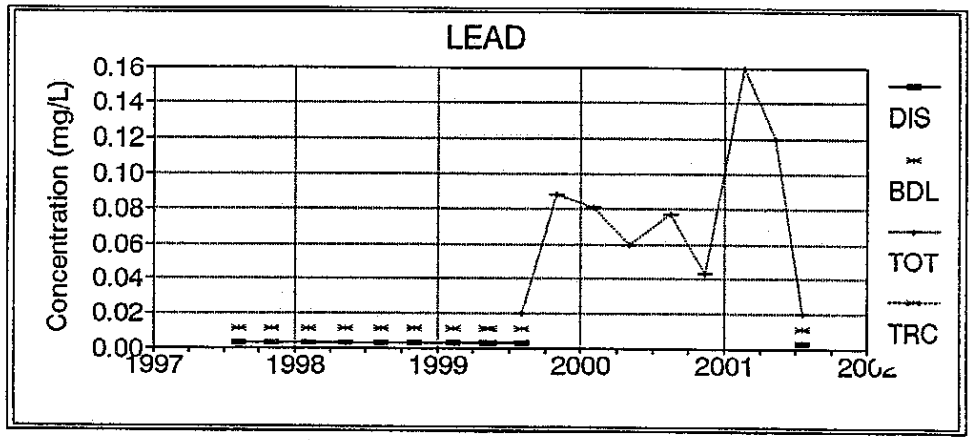


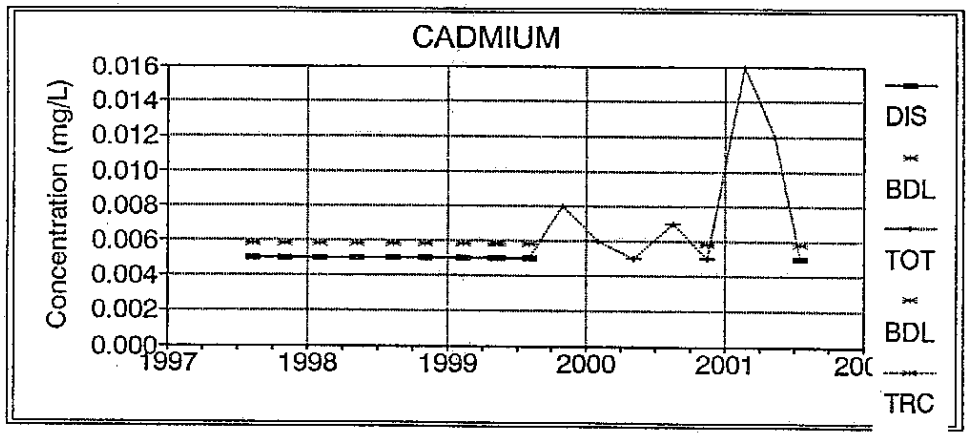


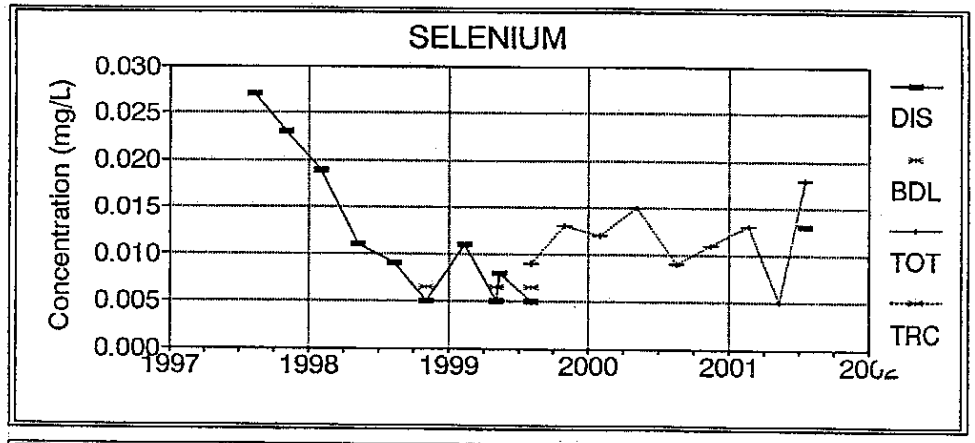
BDL - Below Analytical Detection Limit

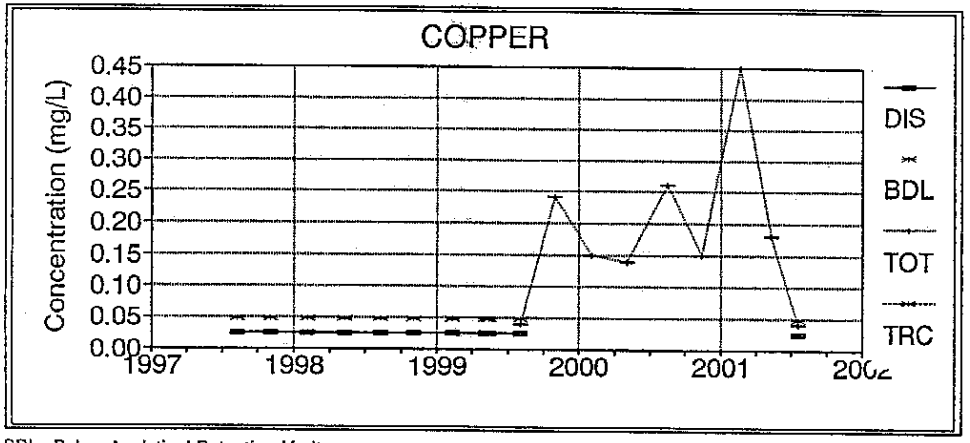
EP-2

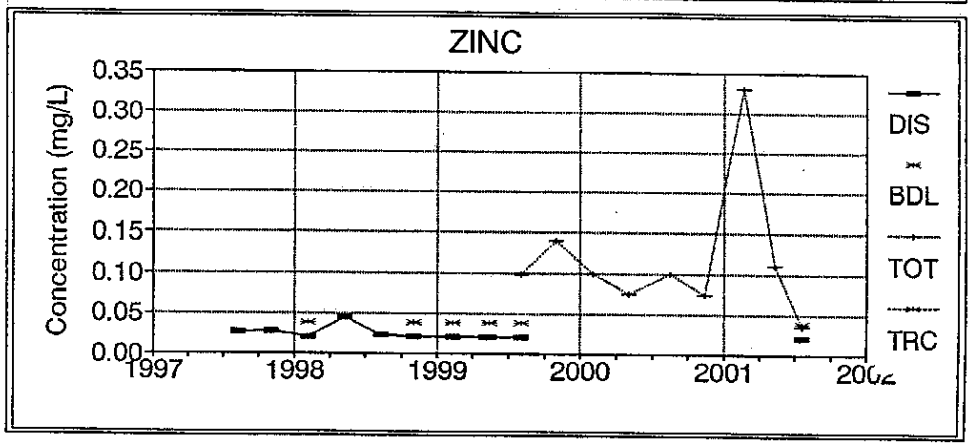






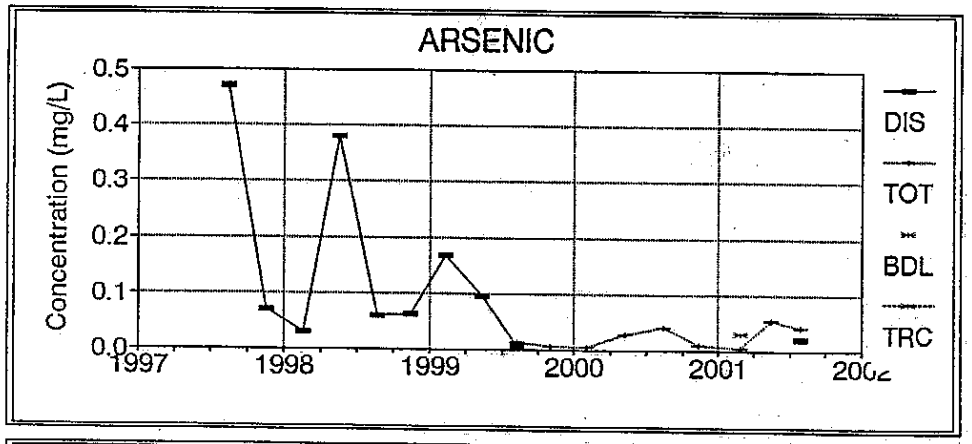


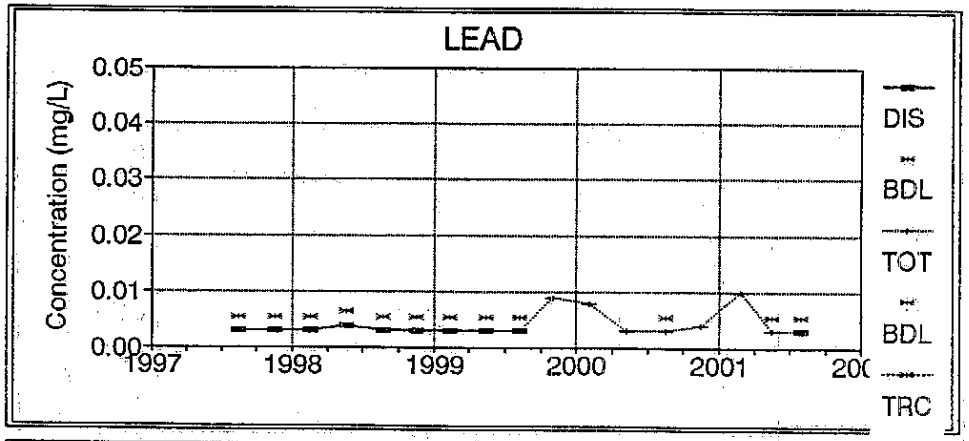


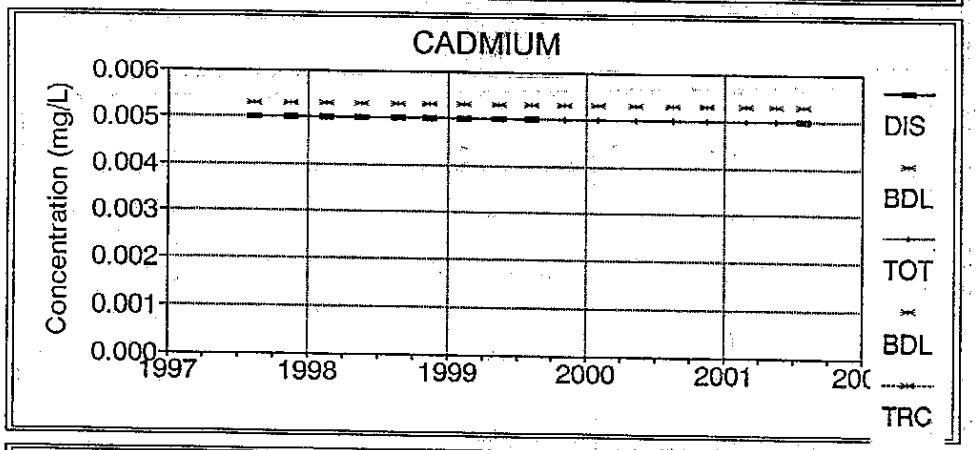


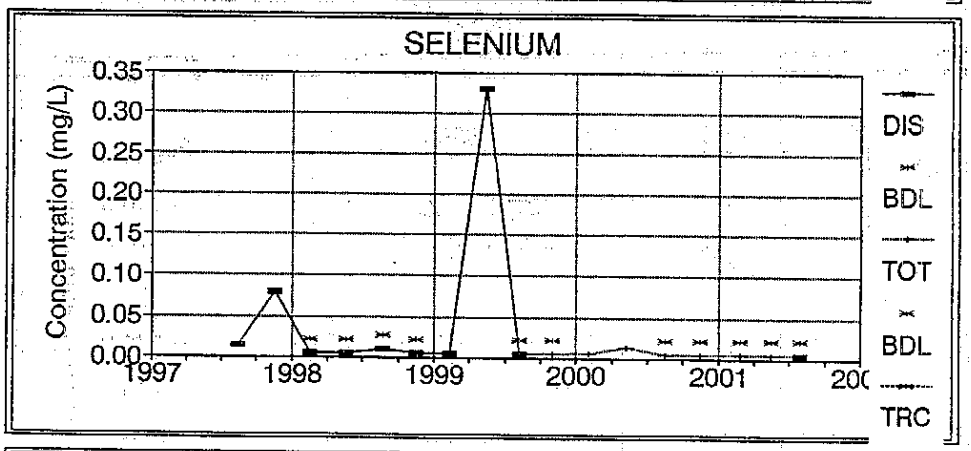
BDL - Below Analytical Detection Limit

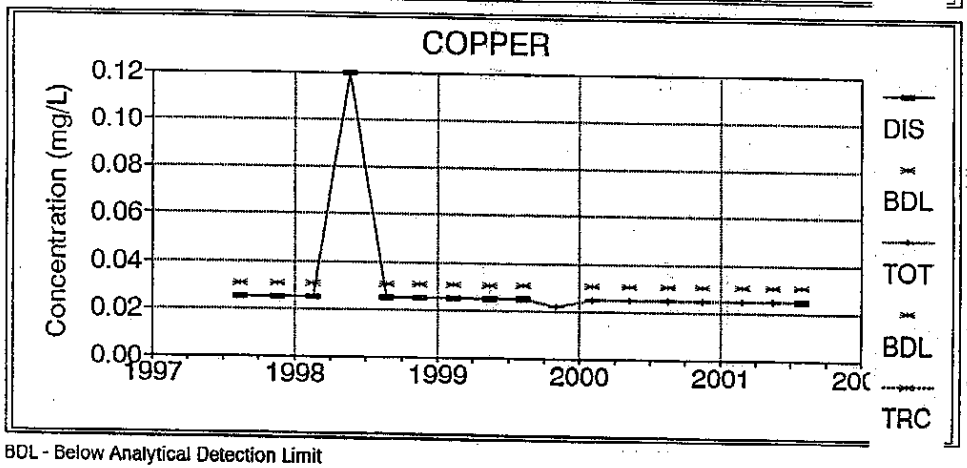
EP-24

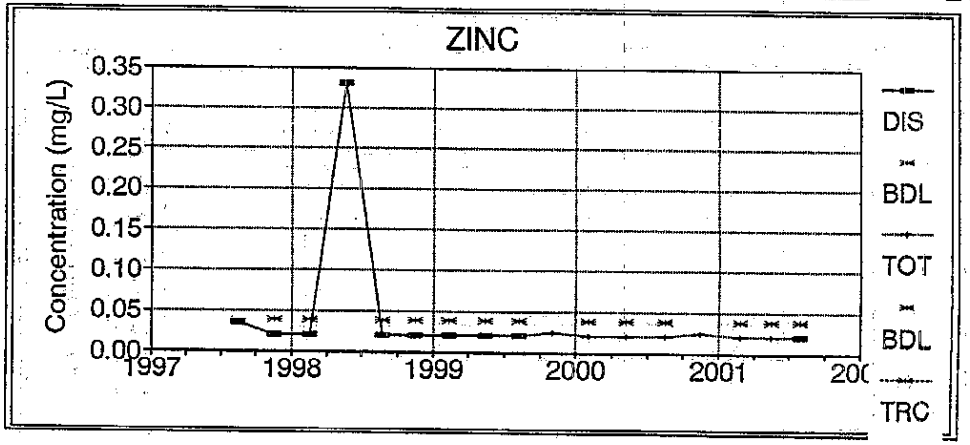






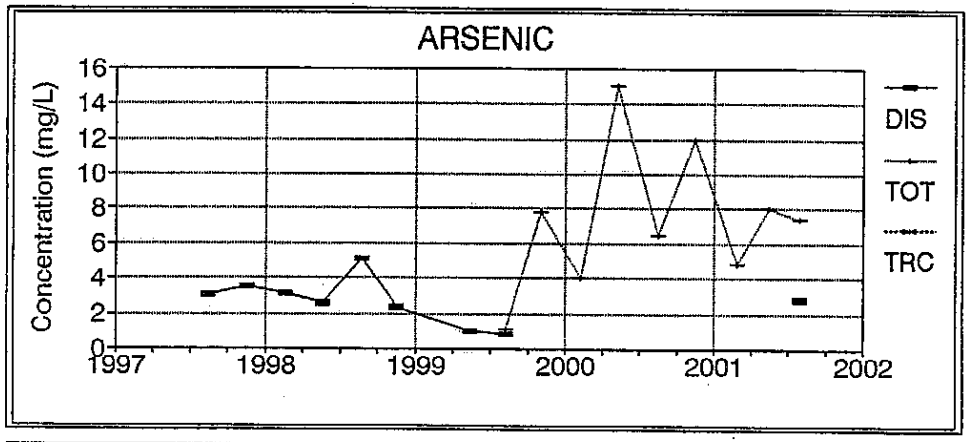


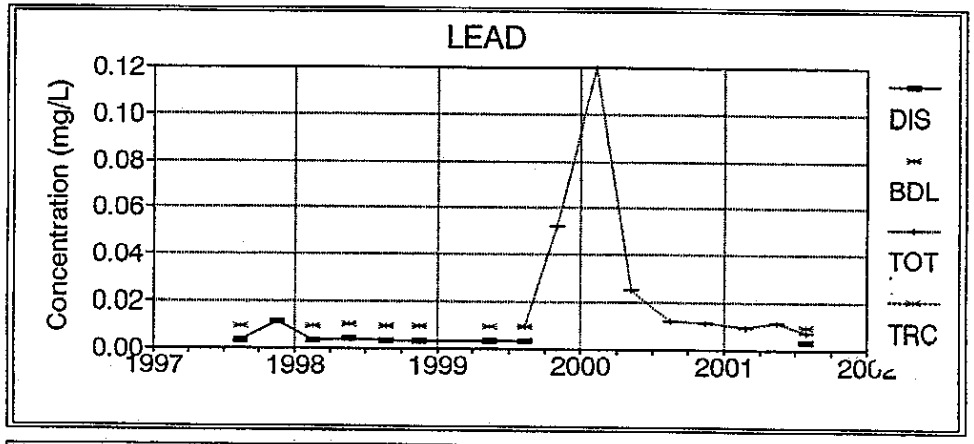


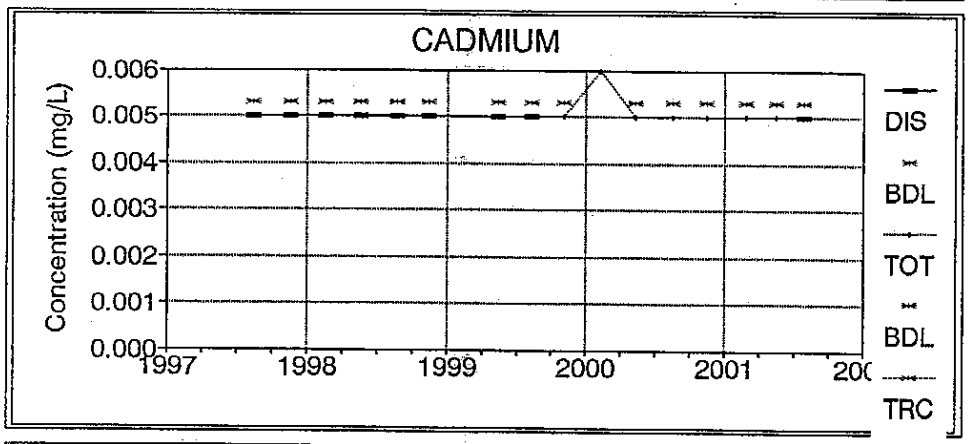


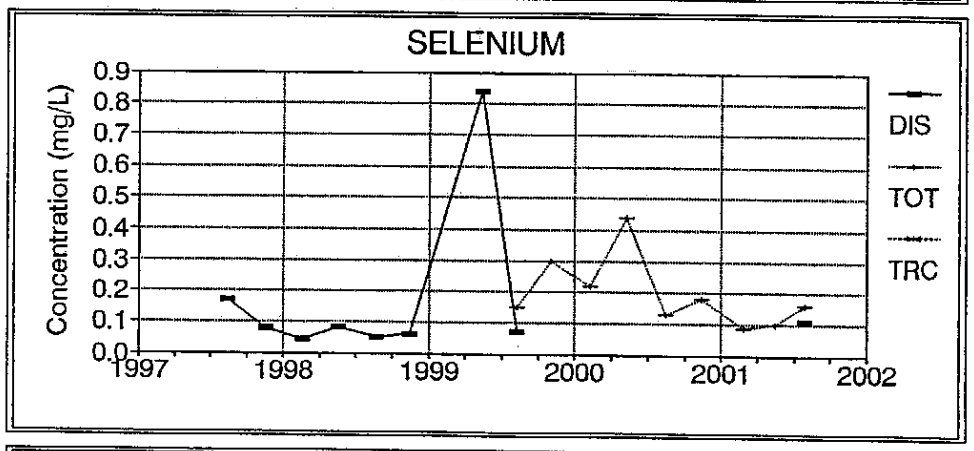
BDL - Below Analytical Detection Limit

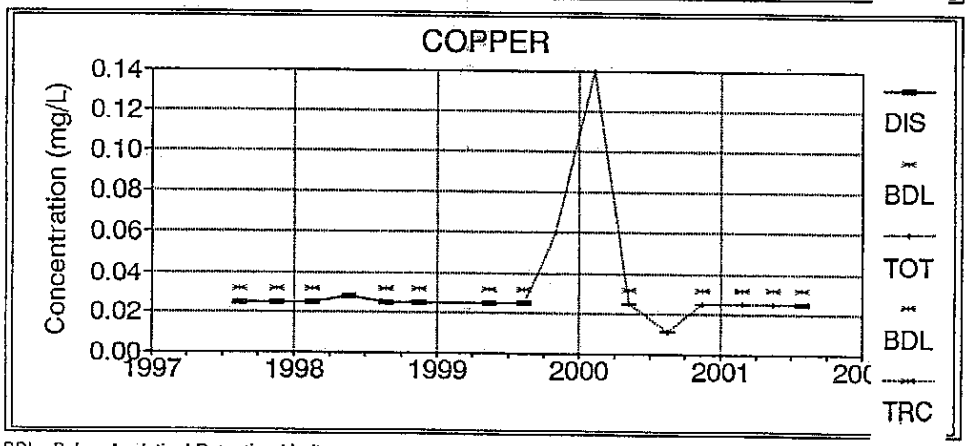
EP-2

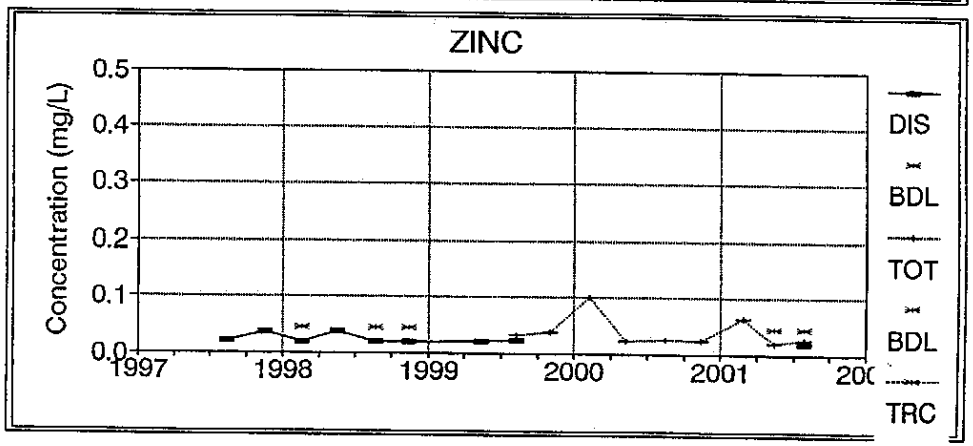






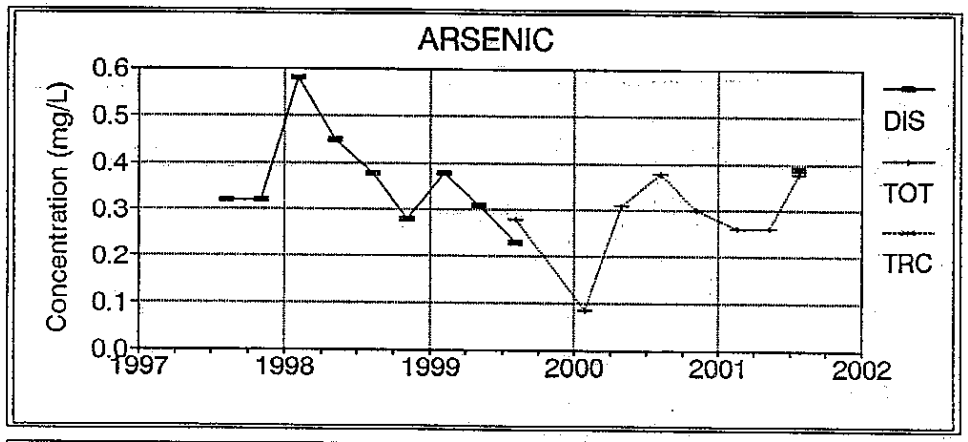


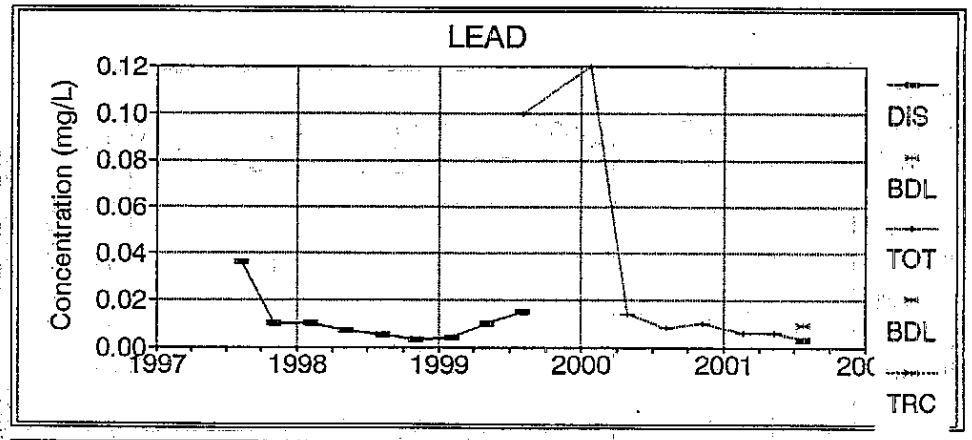


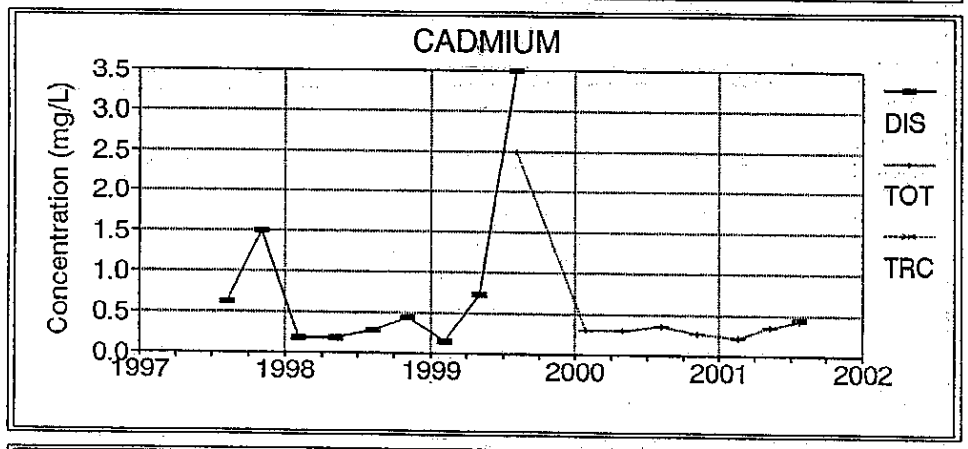


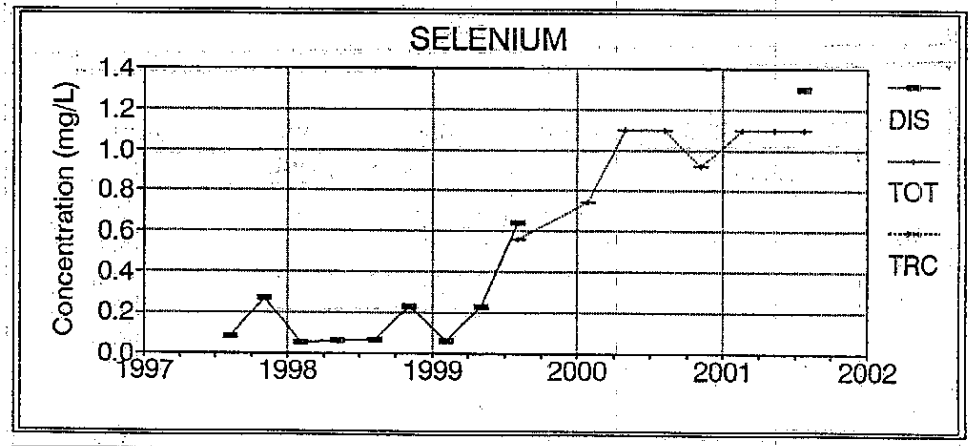
BDL - Below Analytical Detection Limit

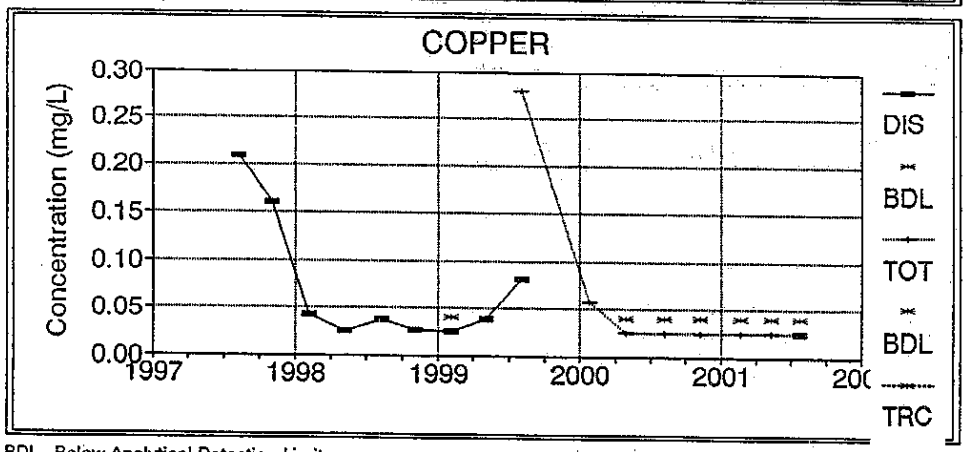
EP-26

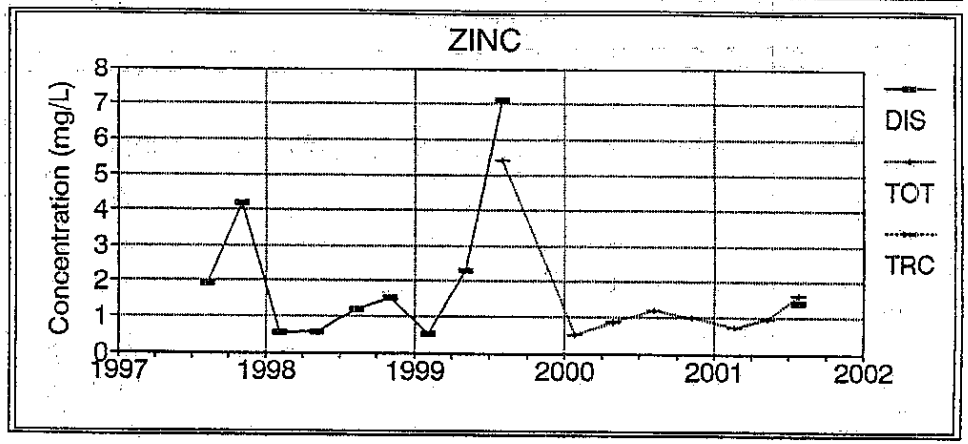






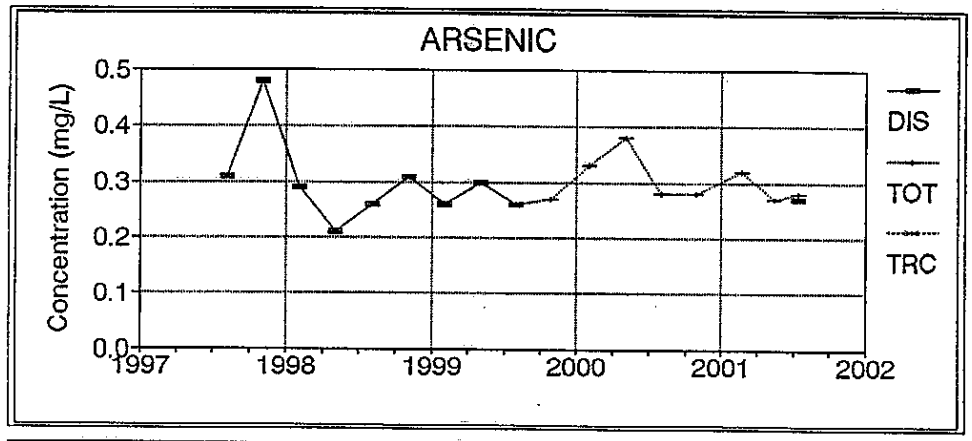


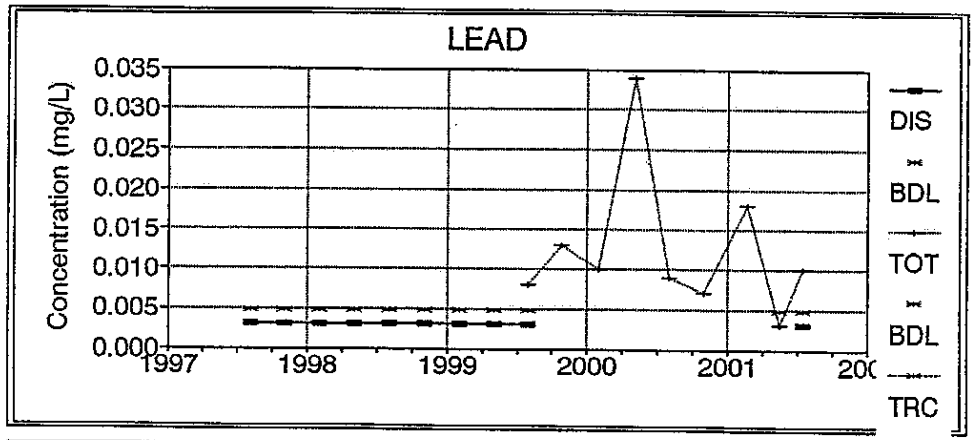


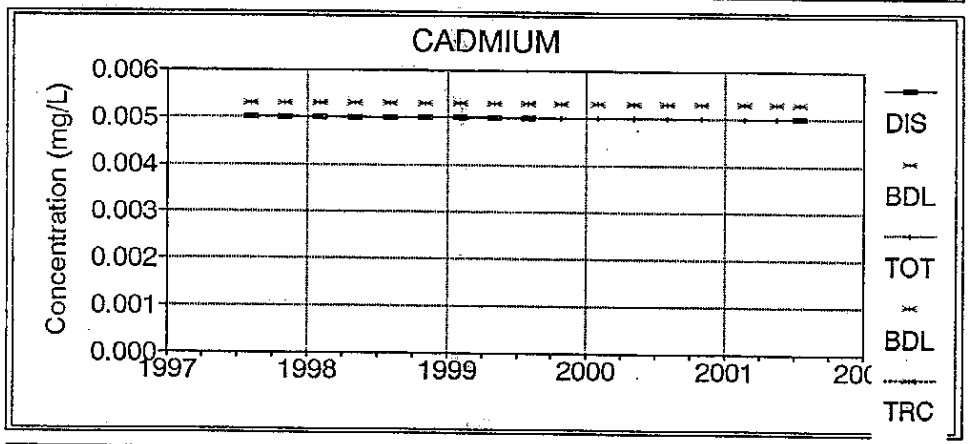


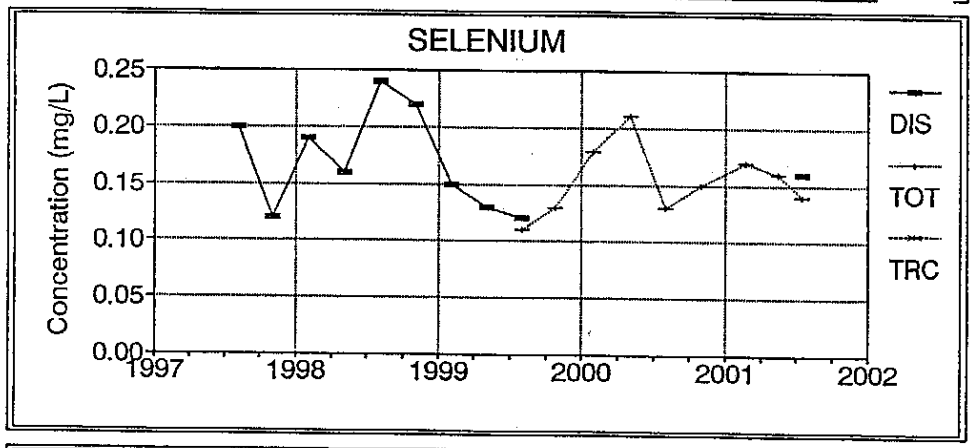
BDL - Below Analytical Detection Limit

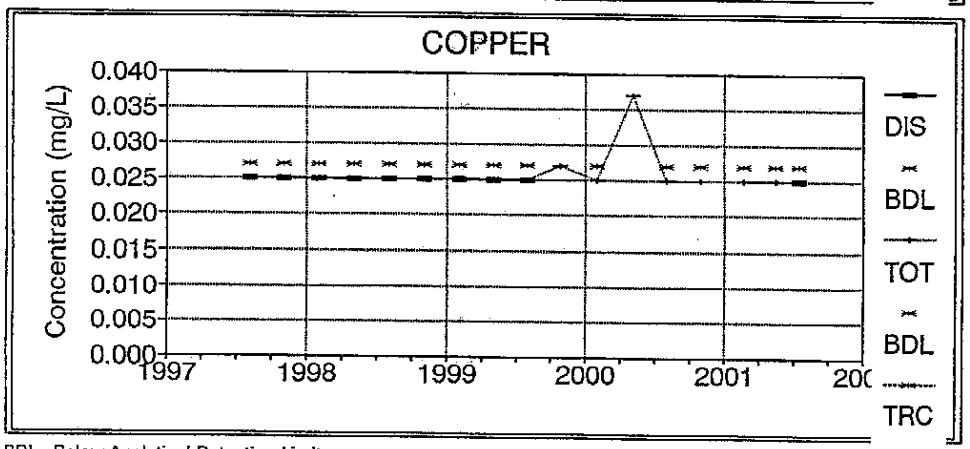
EP-2

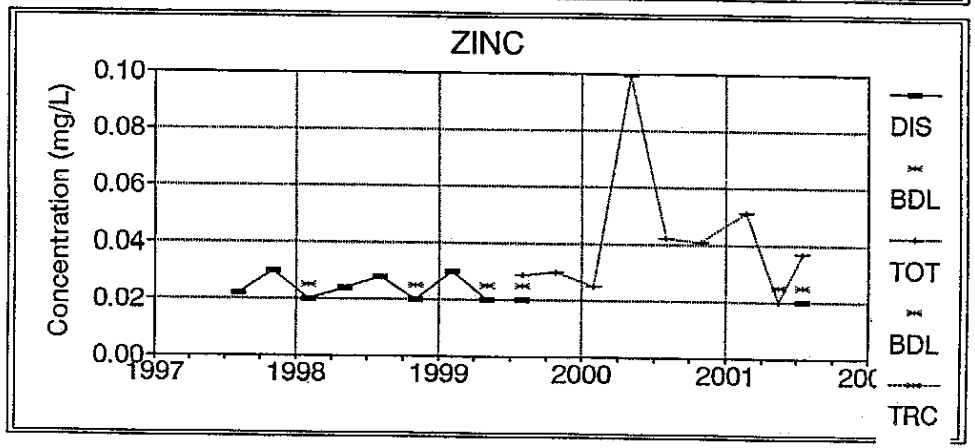






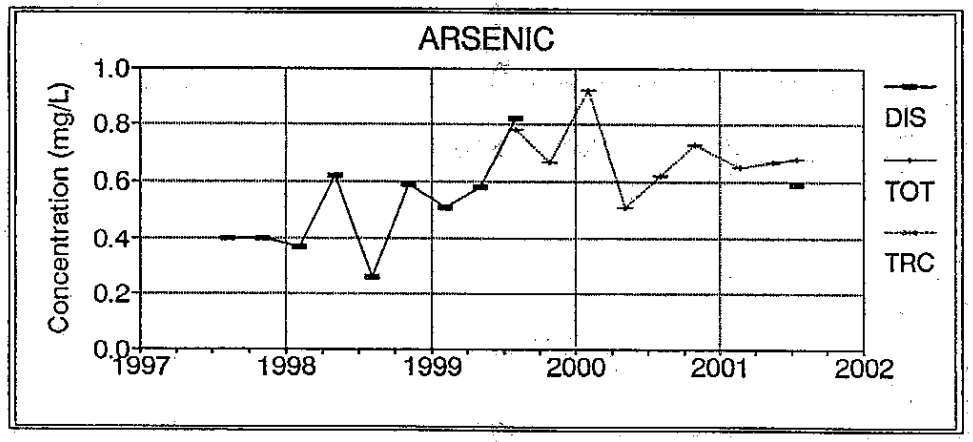


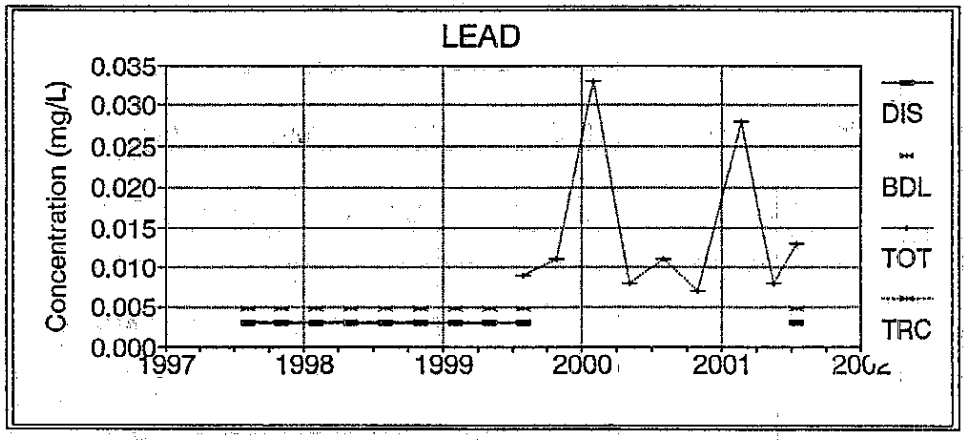


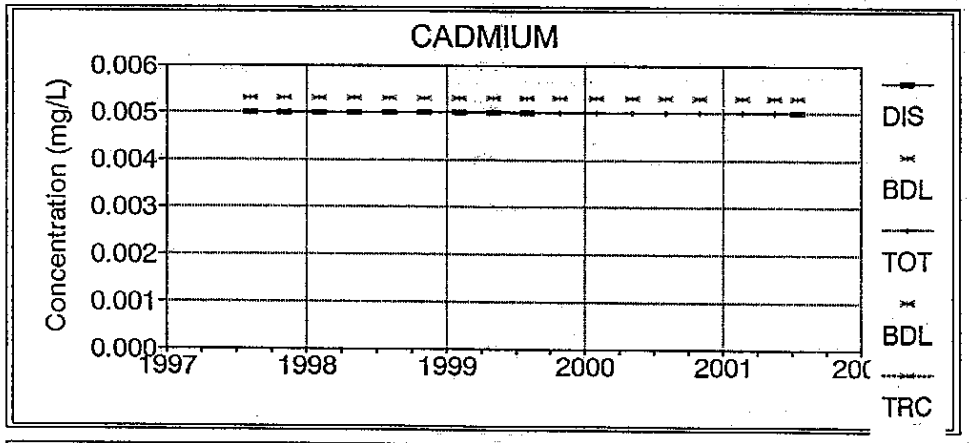


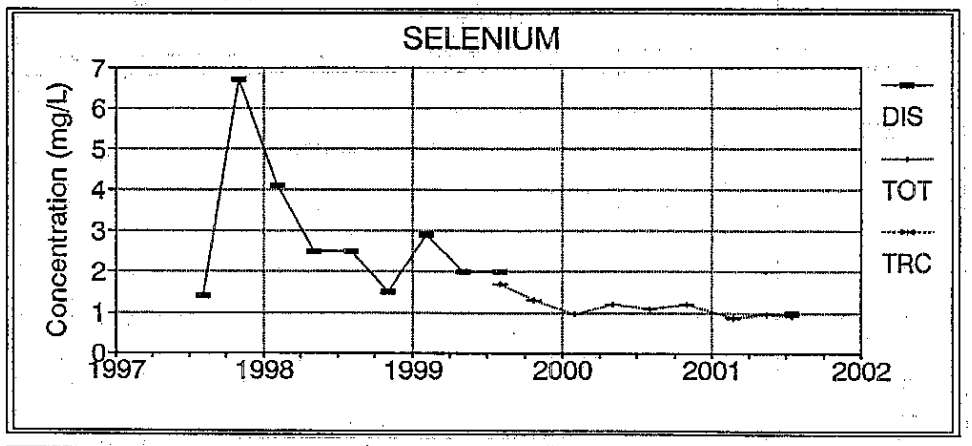
BDL - Below Analytical Detection Limit

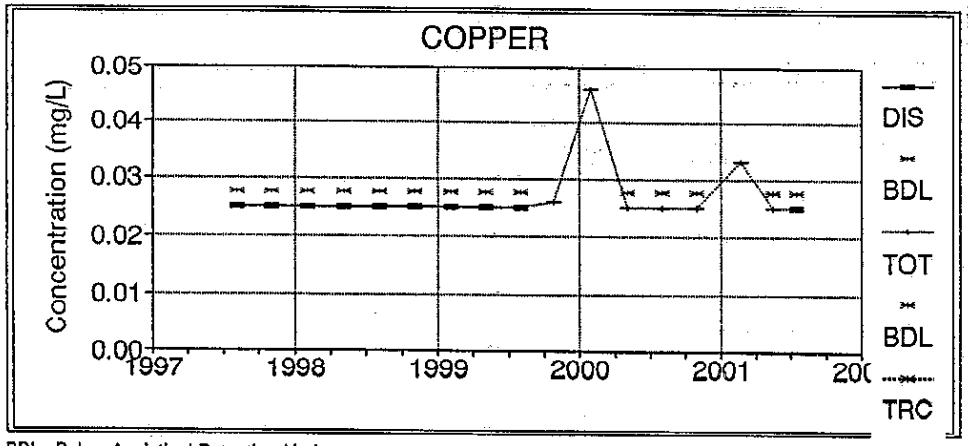
EP-35

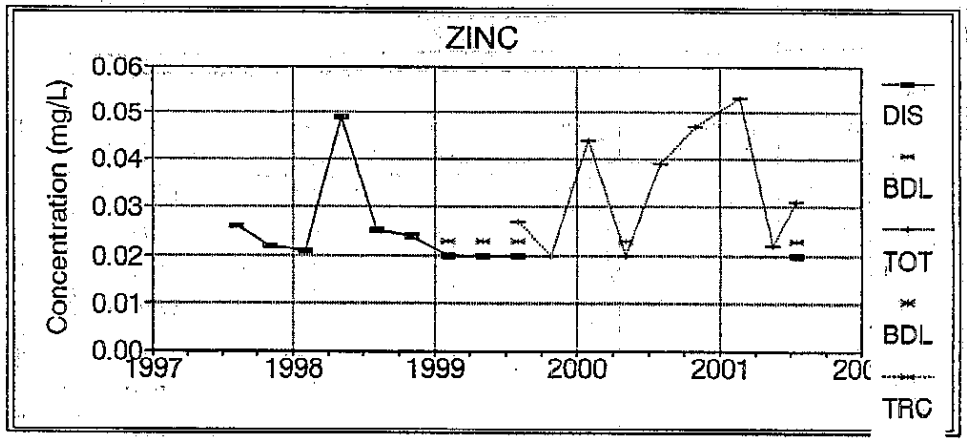






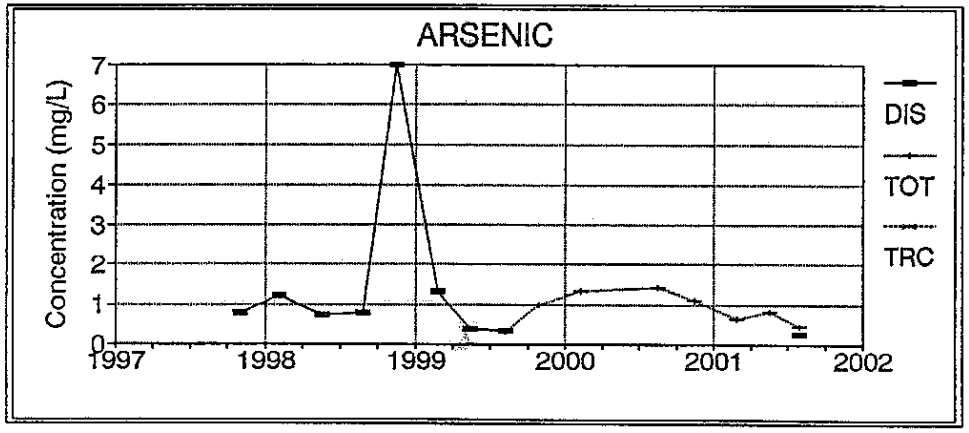


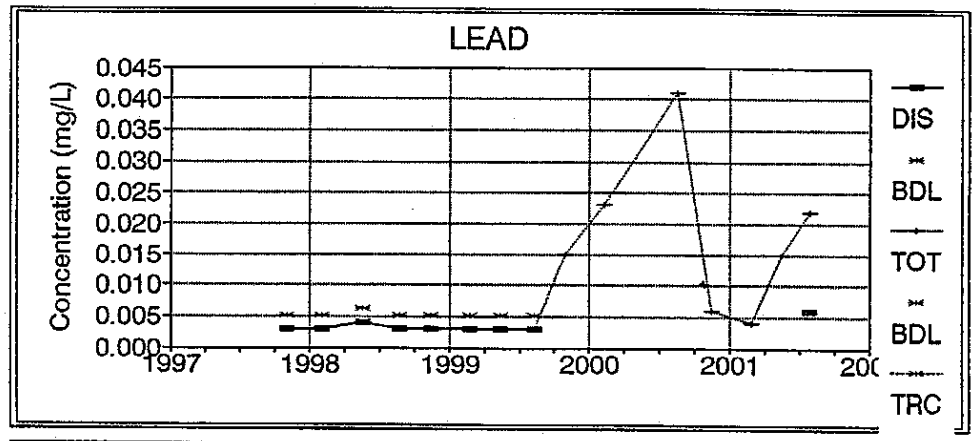


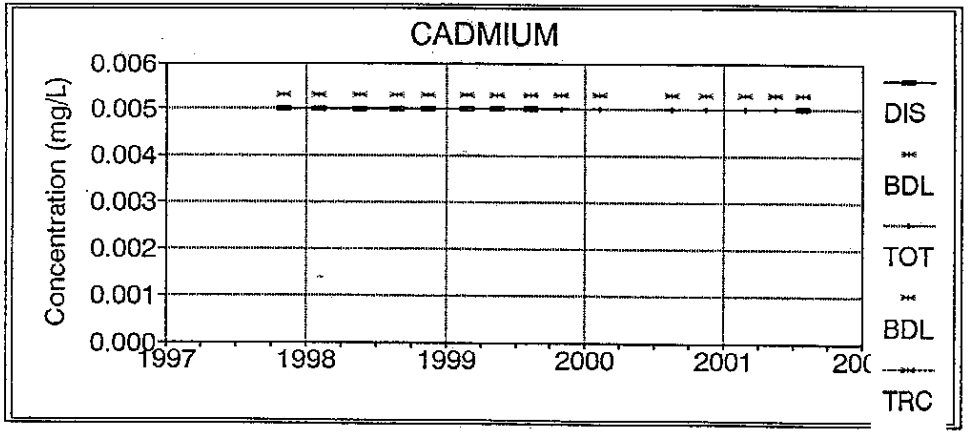


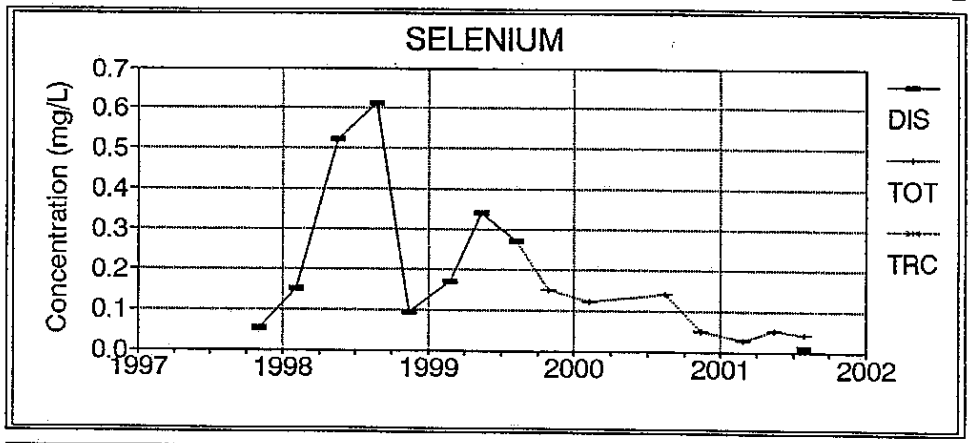
BDL - Below Analytical Detection Limit

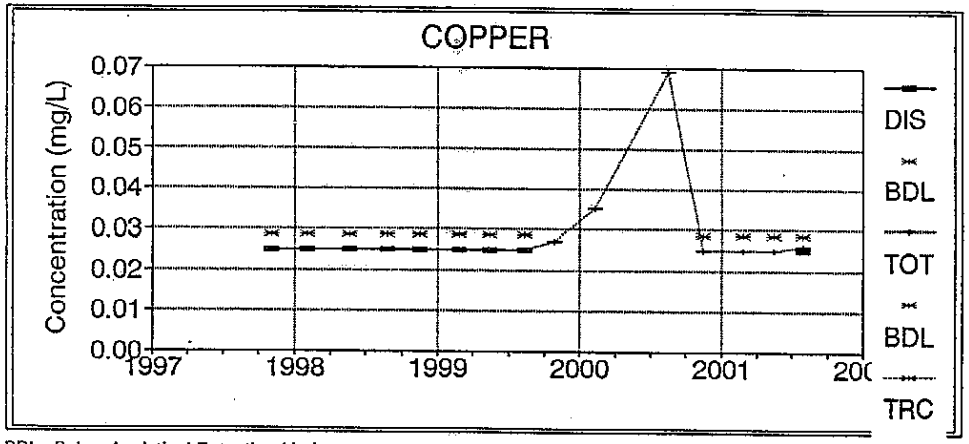
EP-4

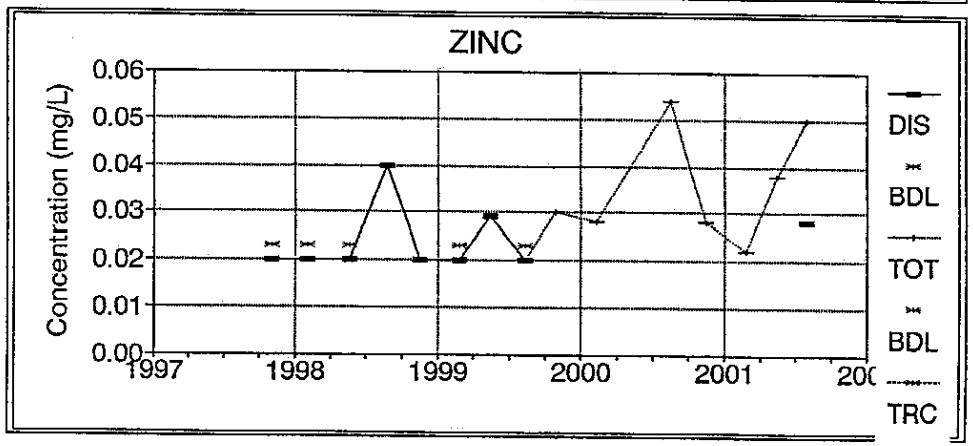






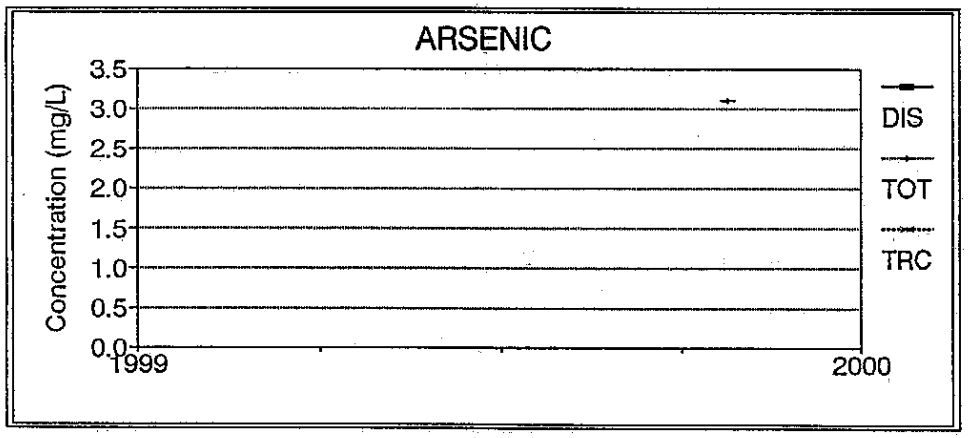


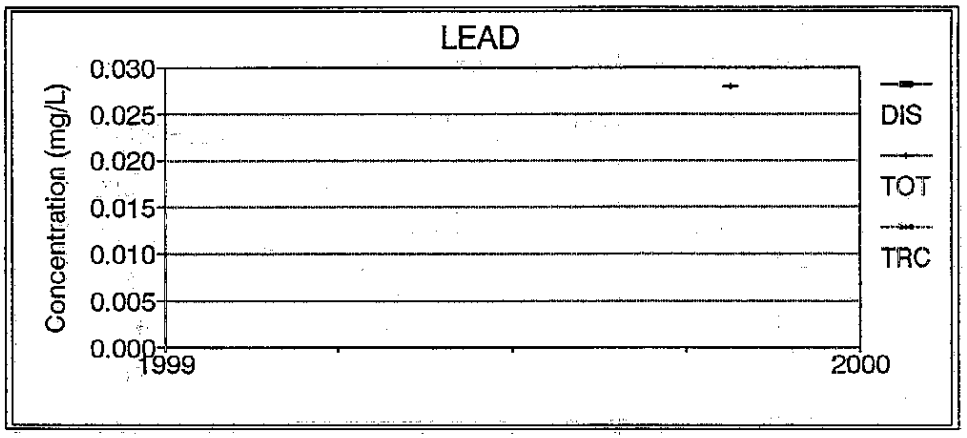


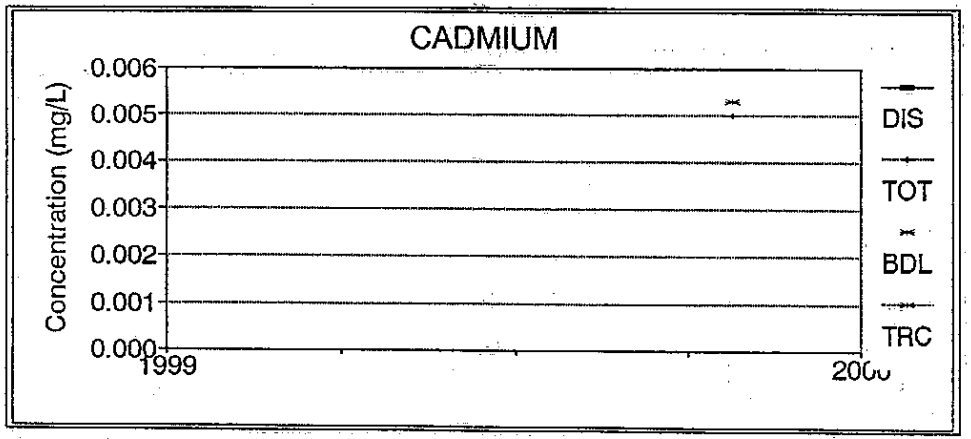


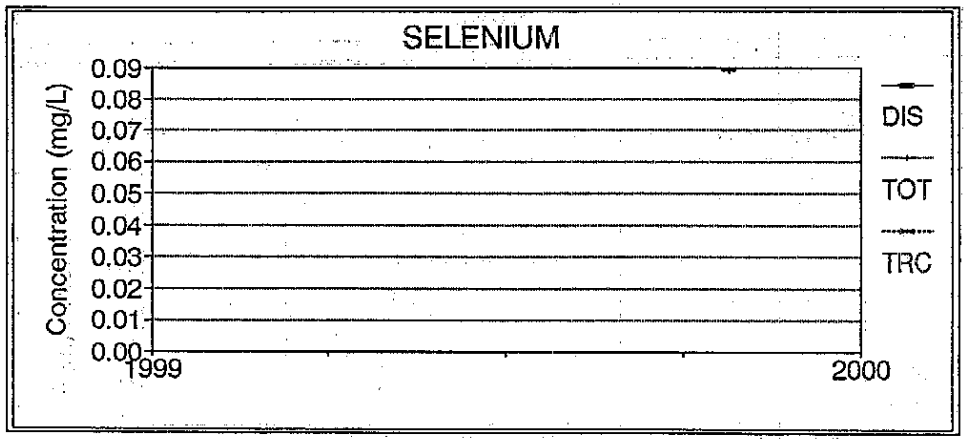
BDL - Below Analytical Detection Limit

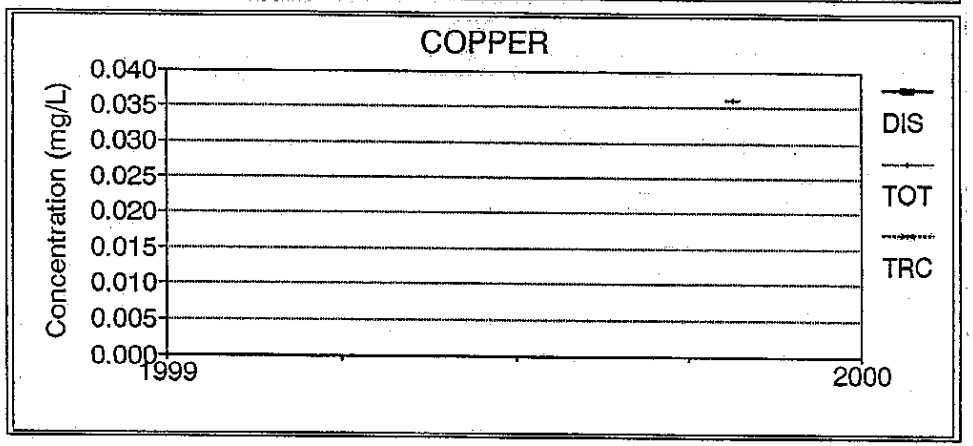
EP-44

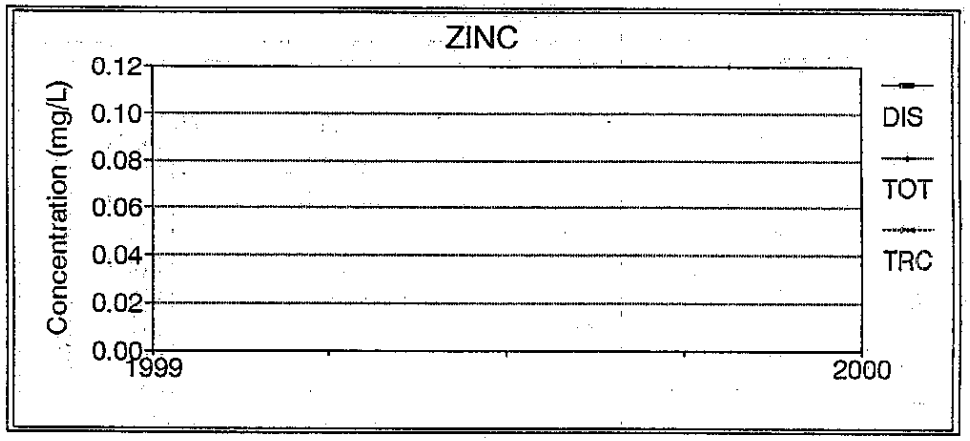






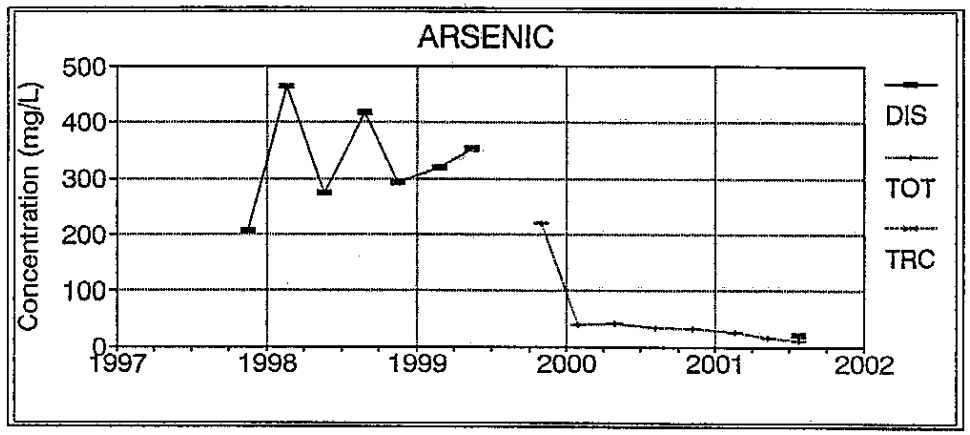


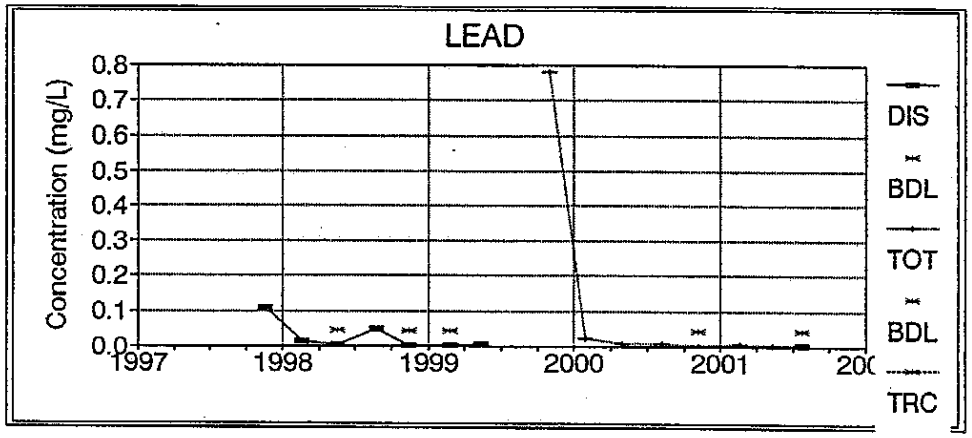


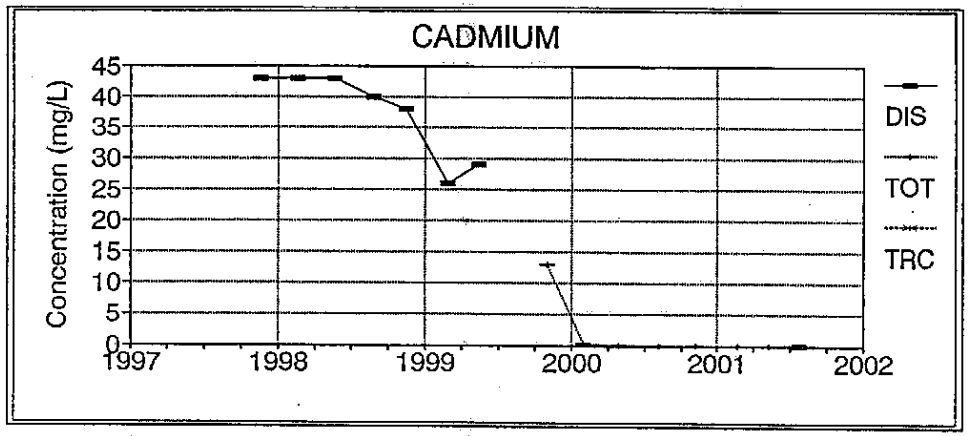


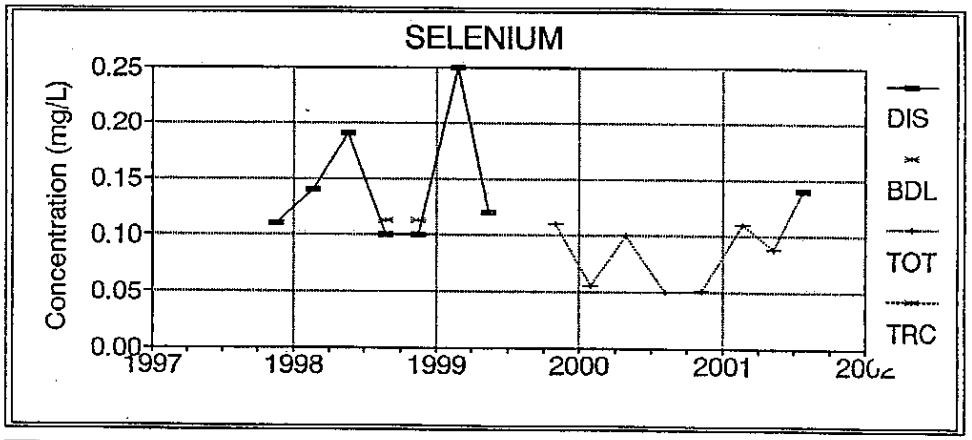
BDL - Below Analytical Detection Limit

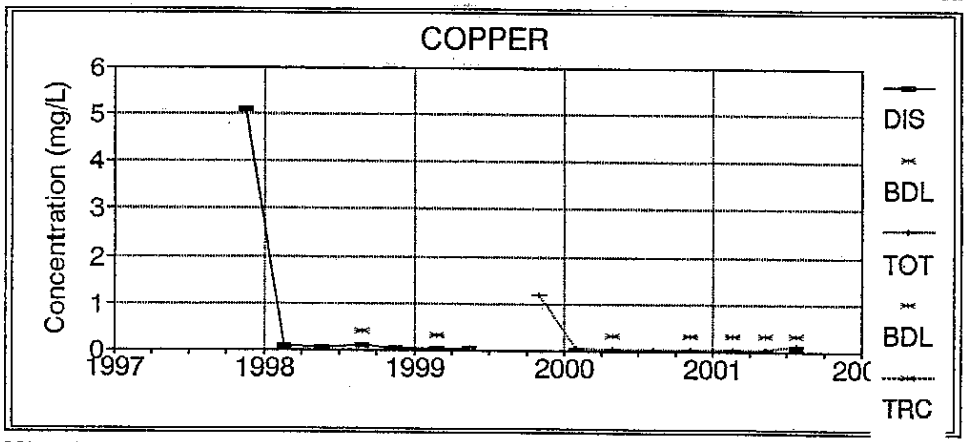
EP-4

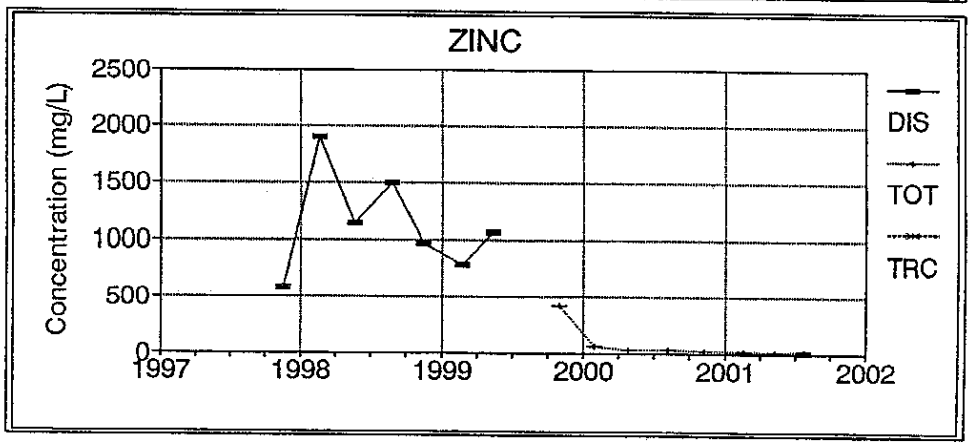






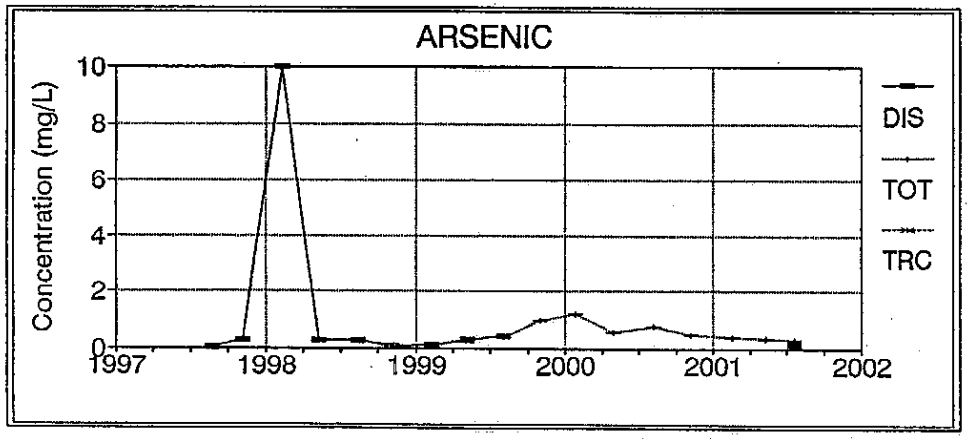


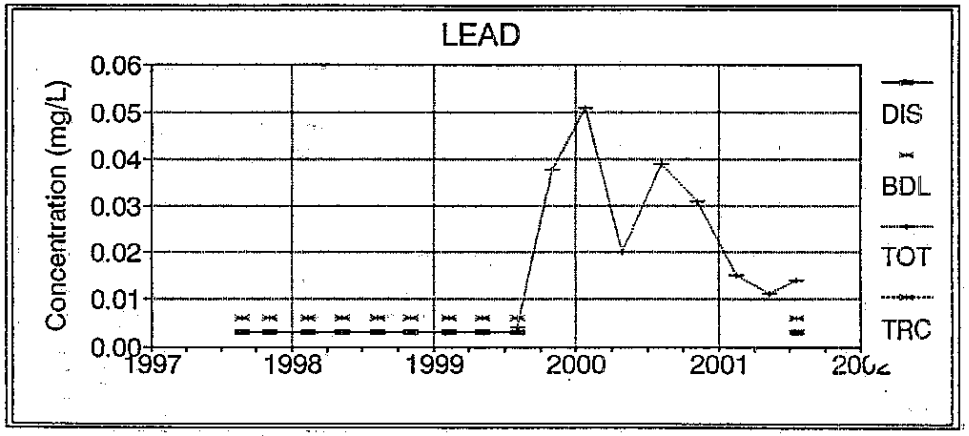


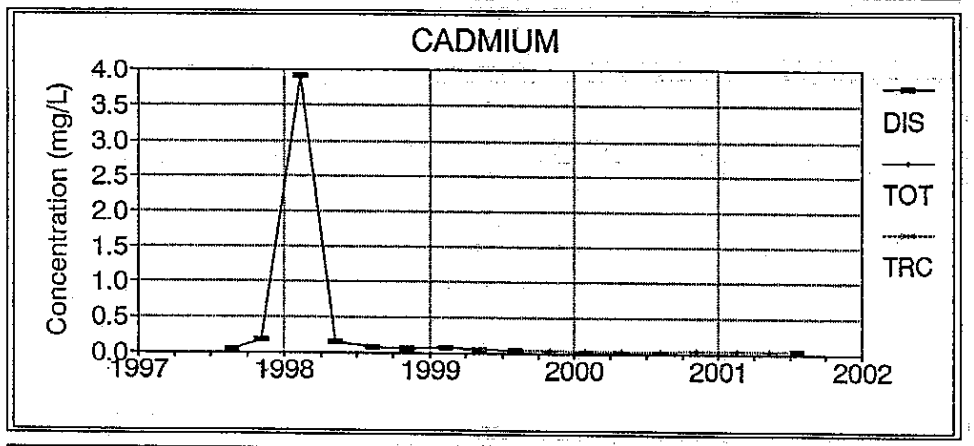


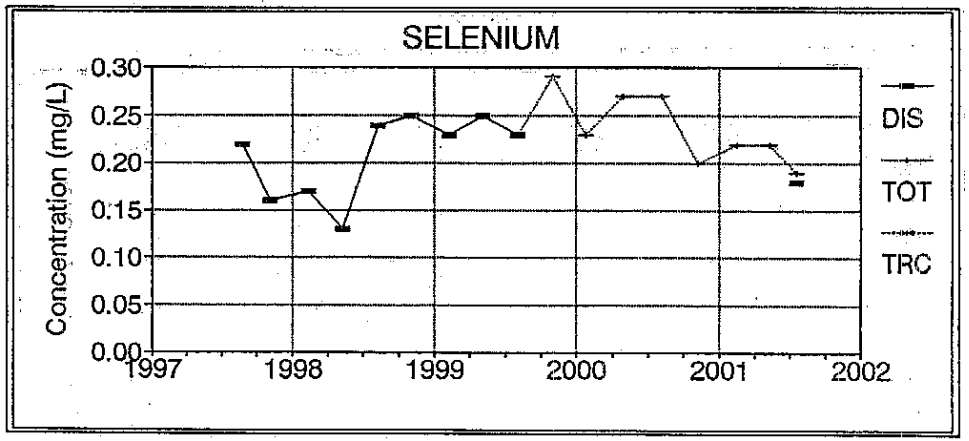
BDL - Below Analytical Detection Limit

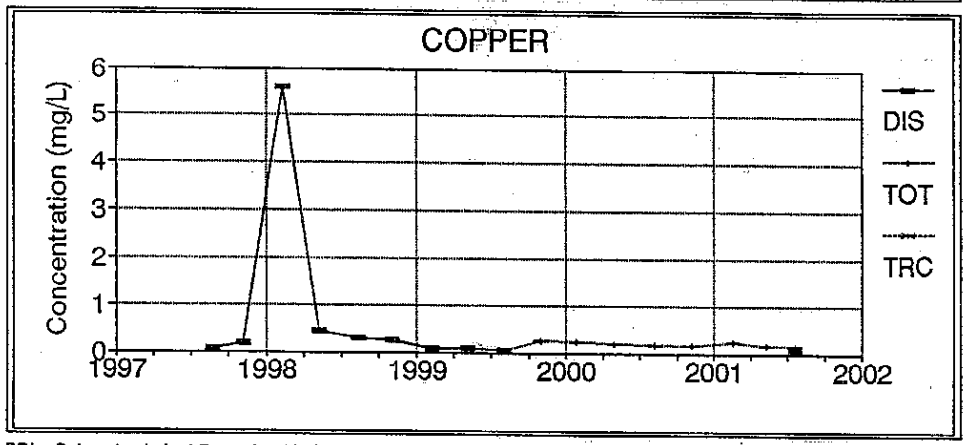
EP-51

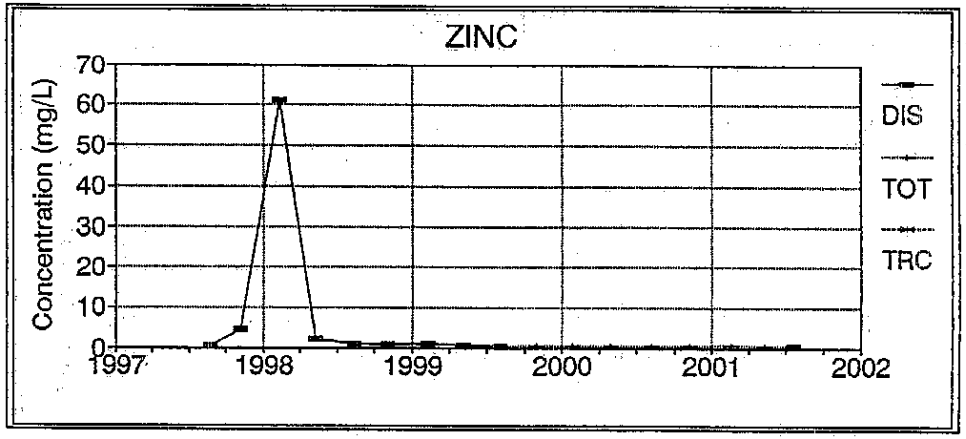






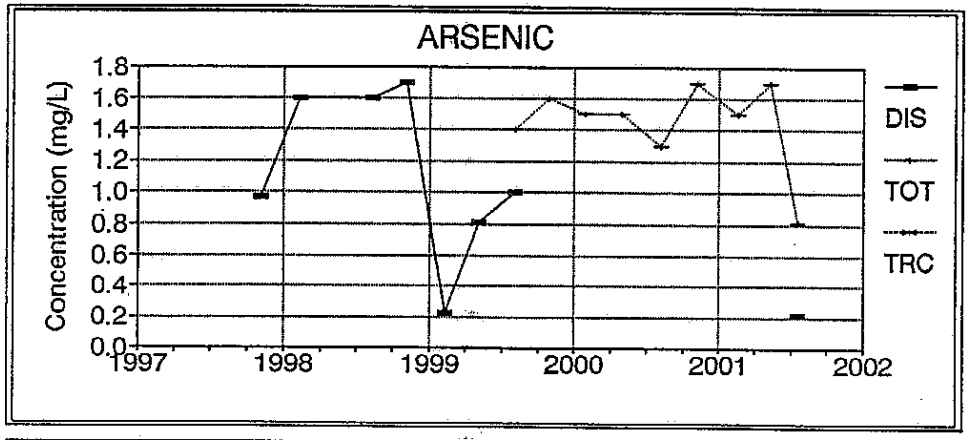


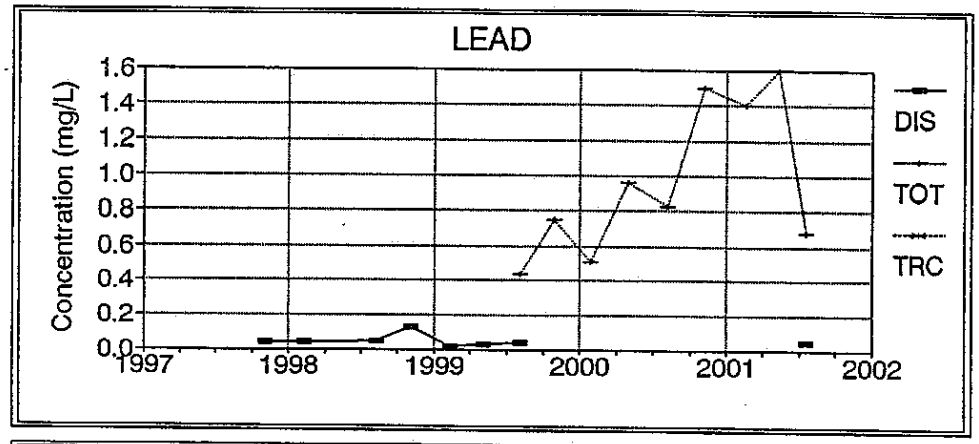


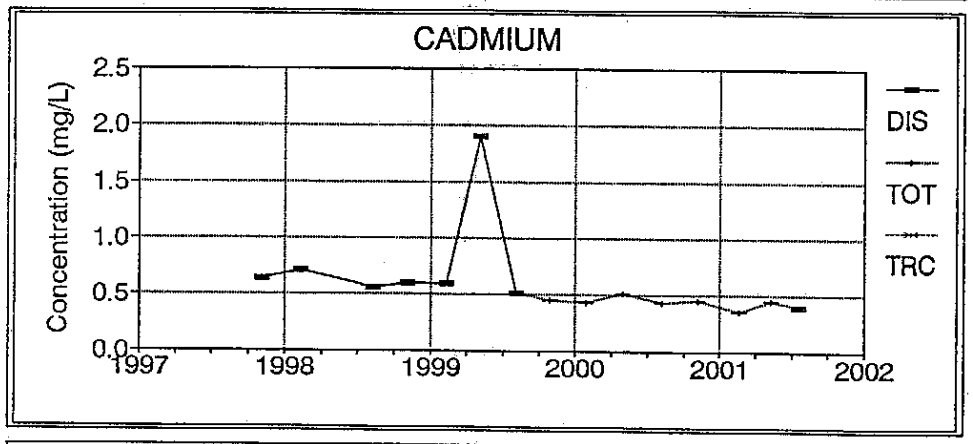


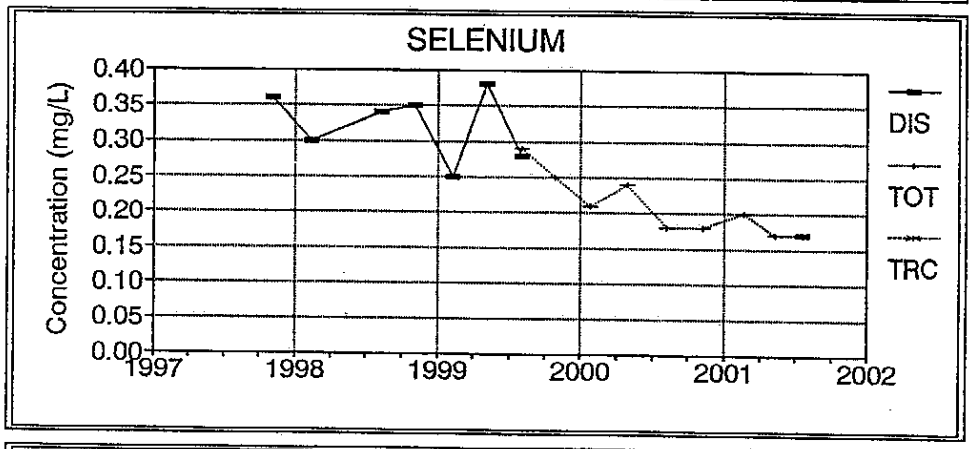
BDL - Below Analytical Detection Limit

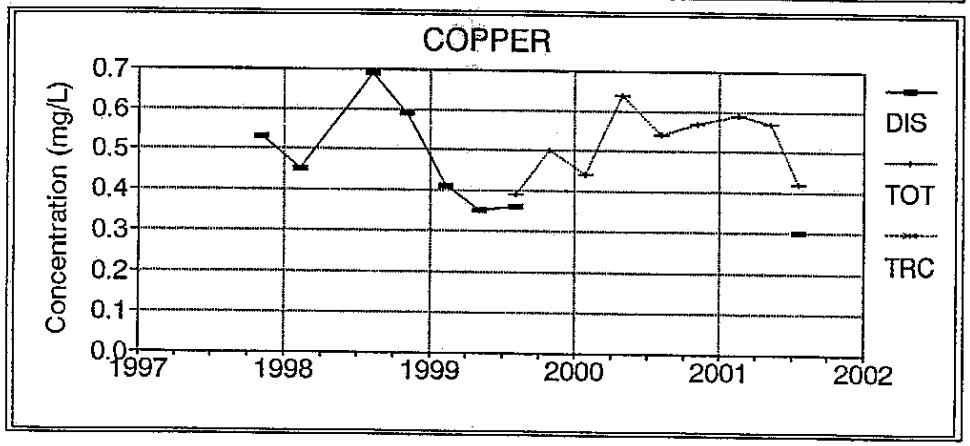
EP-5

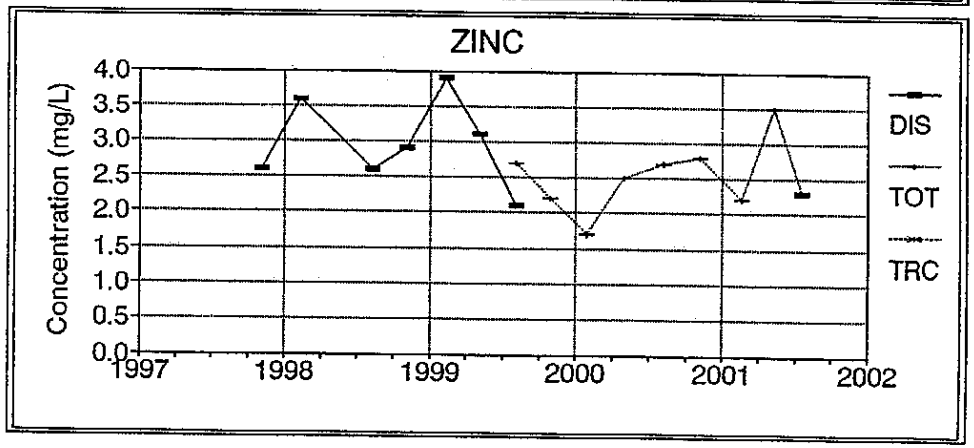

ARSENIC
Concentration (mg/L)
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1997
1998
1999
2000
2001
2002
DIS
TOT
TRC


LEAD
Concentration (mg/L)
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1997
1998
1999
2000
2001
2002
DIS
TOT
TRC

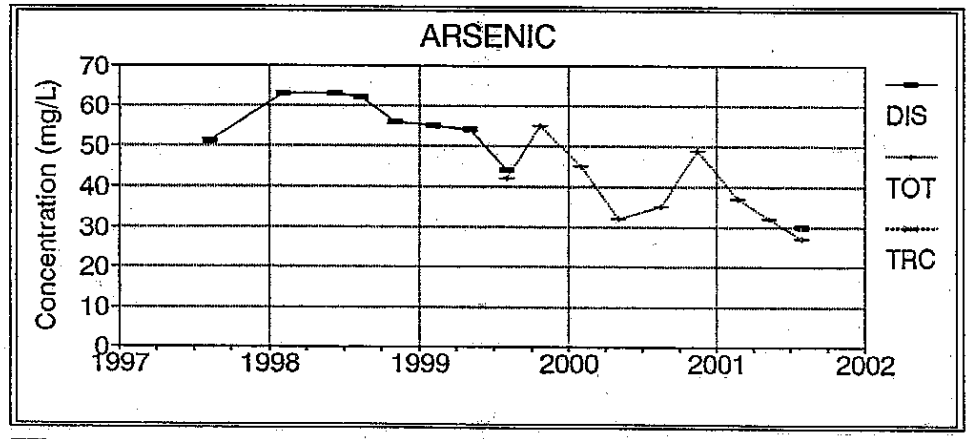

CADMIUM
Concentration (mg/L)
2.5
2.0
1.5
1.0
0.5
0.0
1997
1998
1999
2000
2001
2002
DIS
TOT
TRC

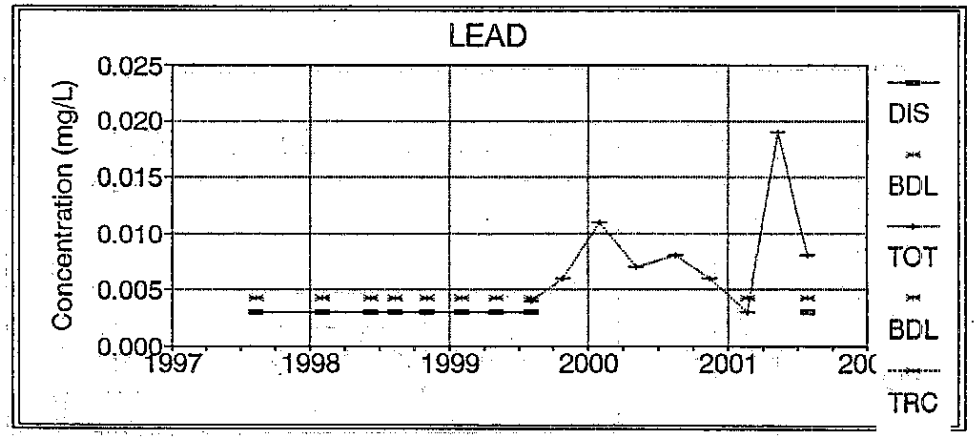

SELENIUM
Concentration (mg/L)
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
1997
1998
1999
2000
2001
2002
DIS
TOT
TRC

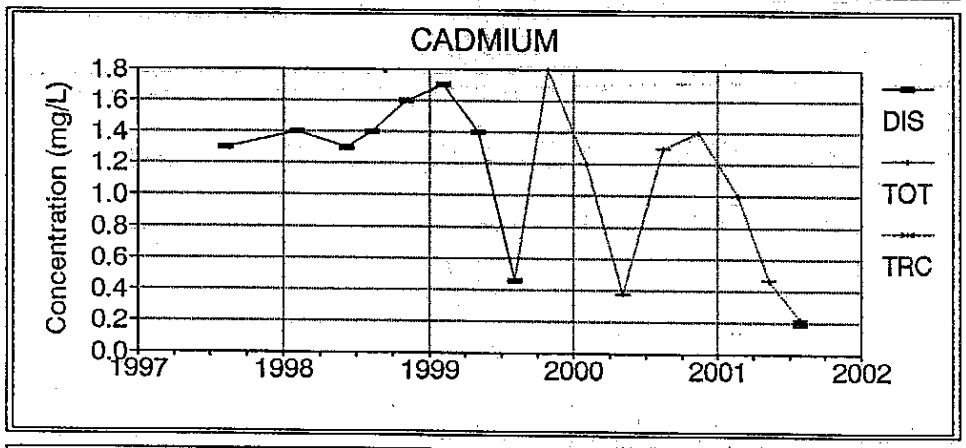

COPPER
Concentration (mg/L)
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
1997
1998
1999
2000
2001
2002
DIS
TOT
TRC

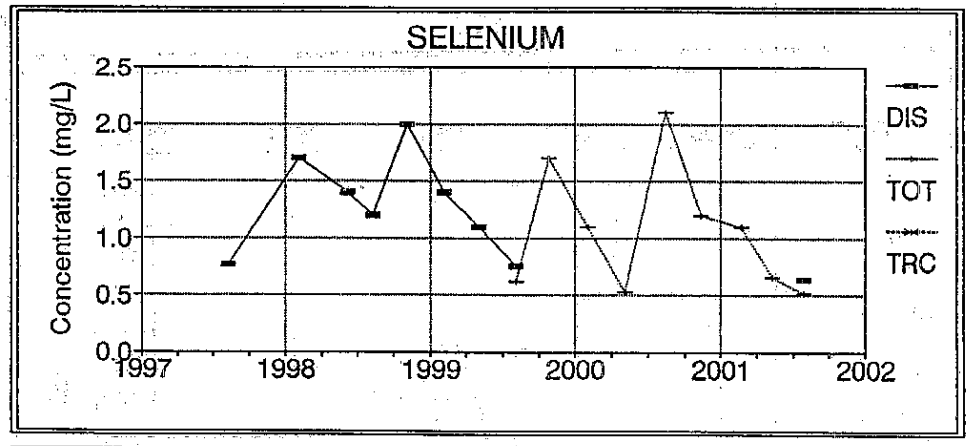

ZINC
Concentration (mg/L)
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1997
1998
1999
2000
2001
2002
DIS
TOT
TRC

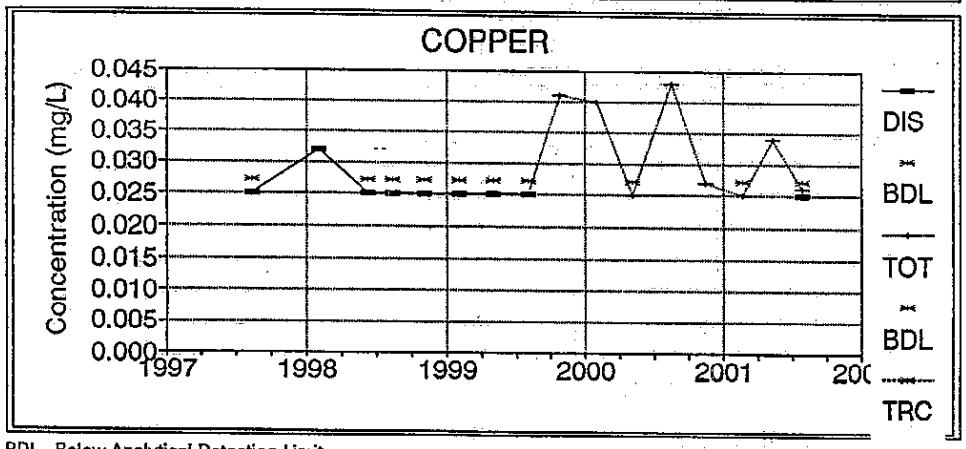
EP-53

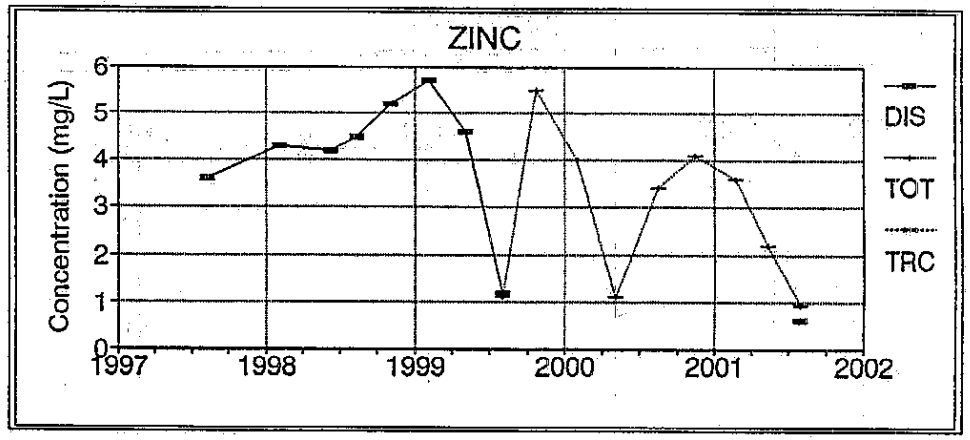






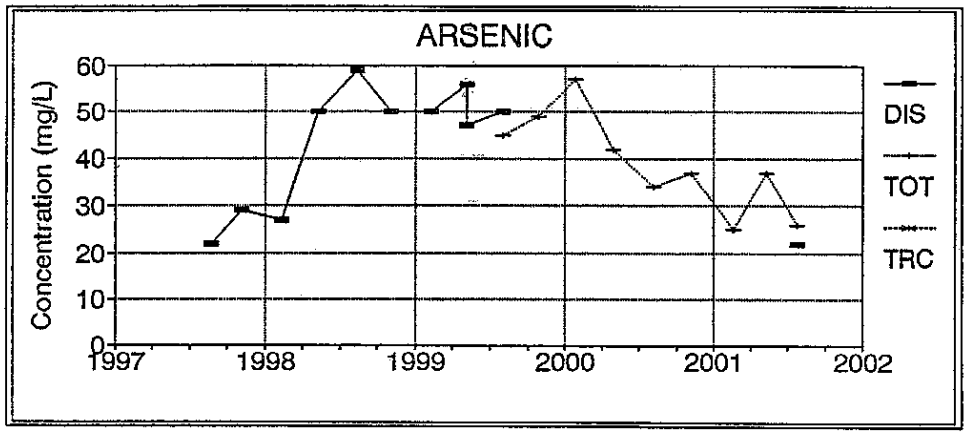


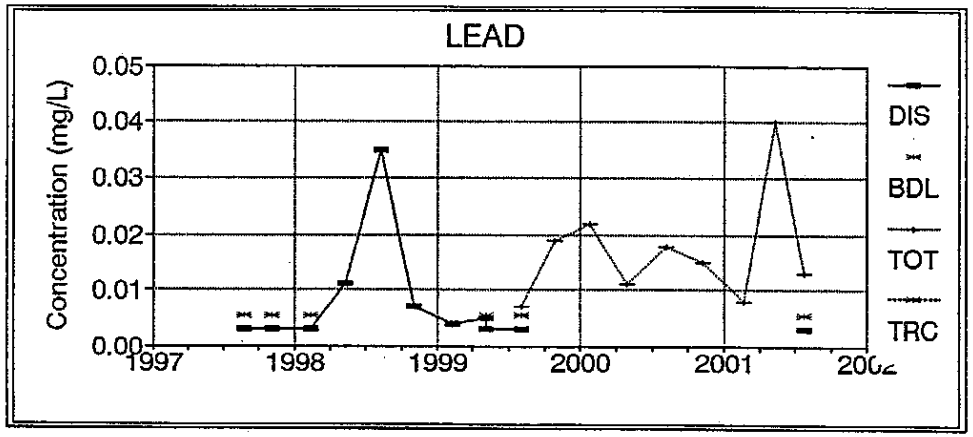


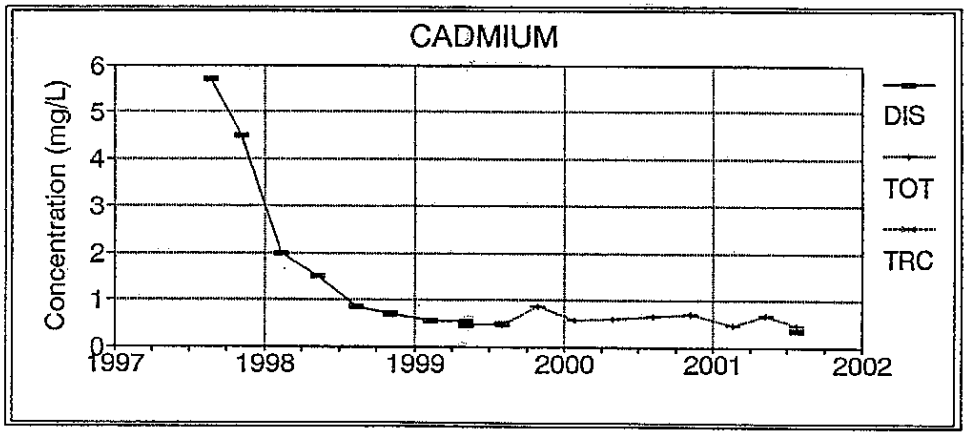


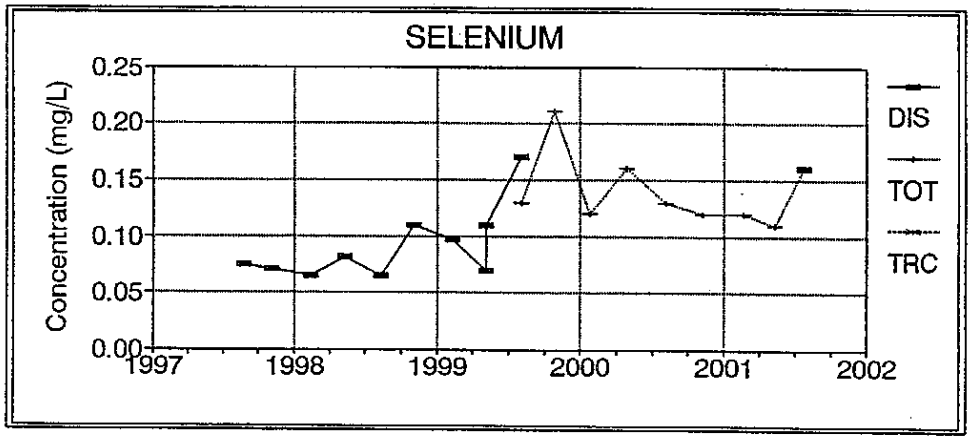
BDL - Below Analytical Detection Limit

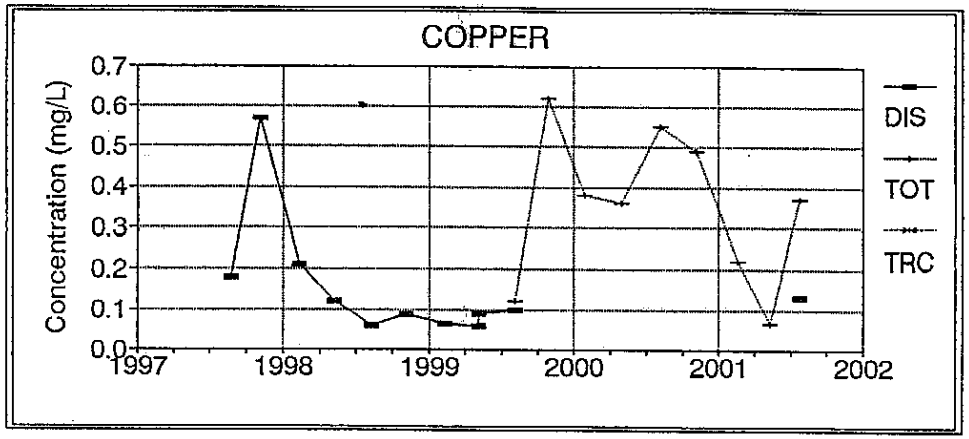
EP-5

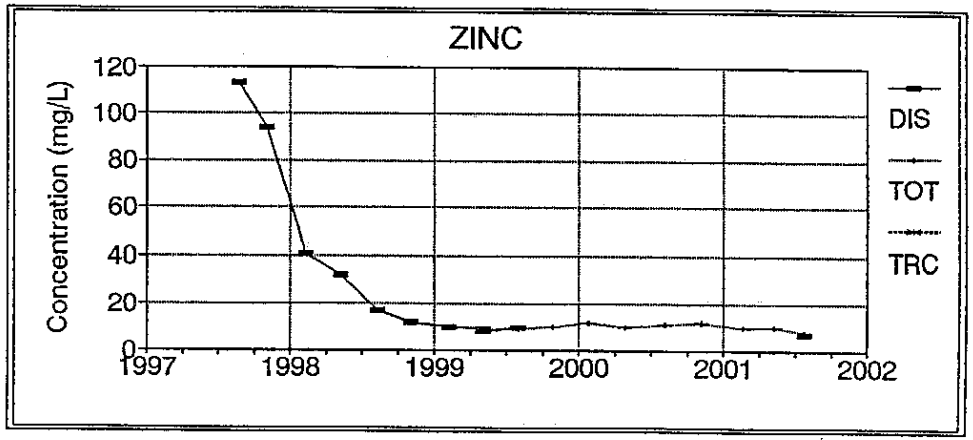






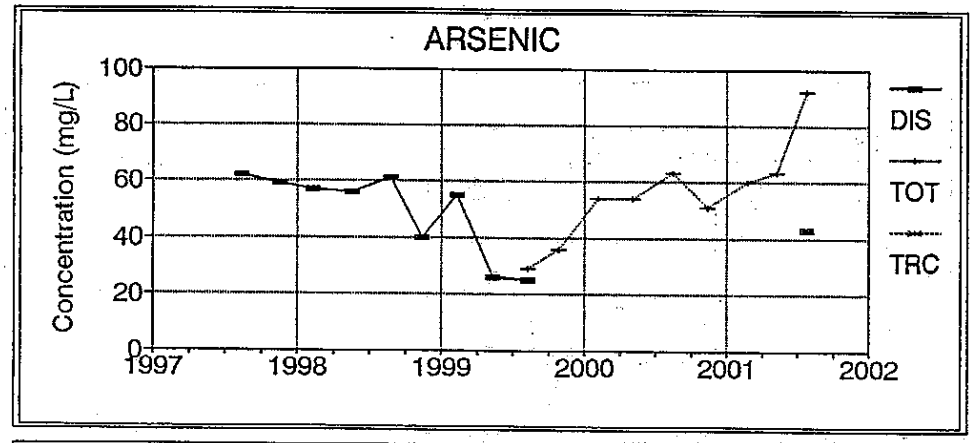


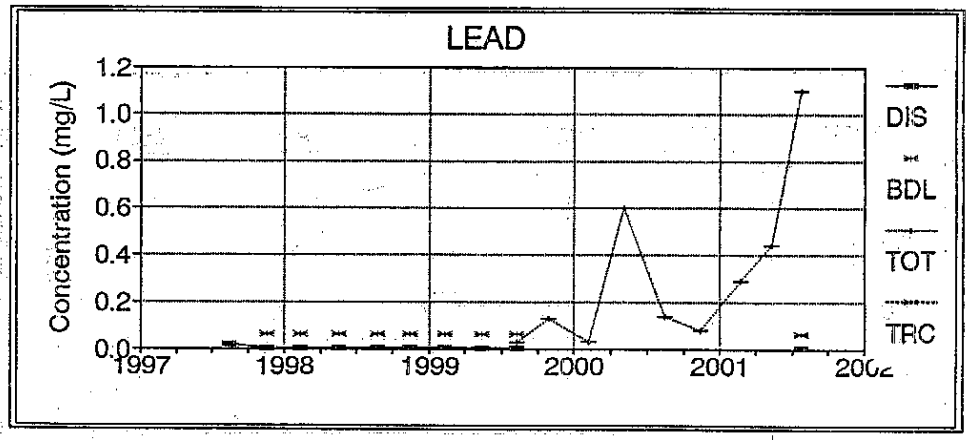


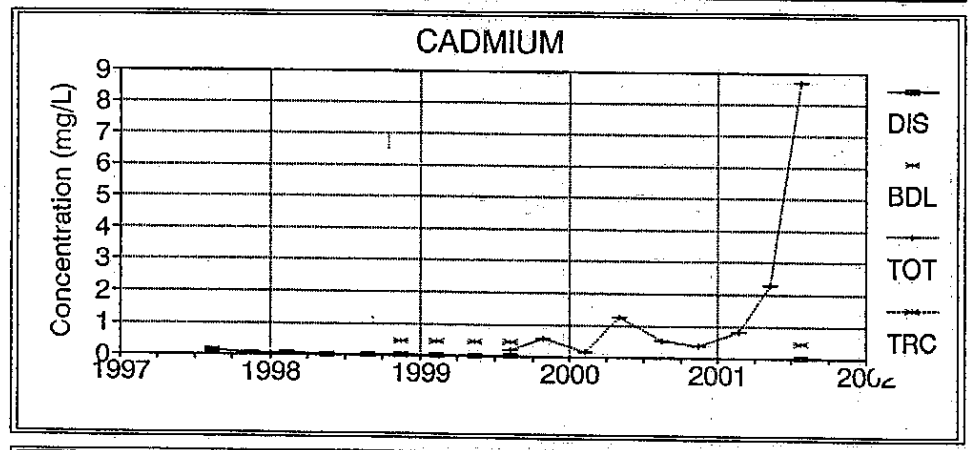


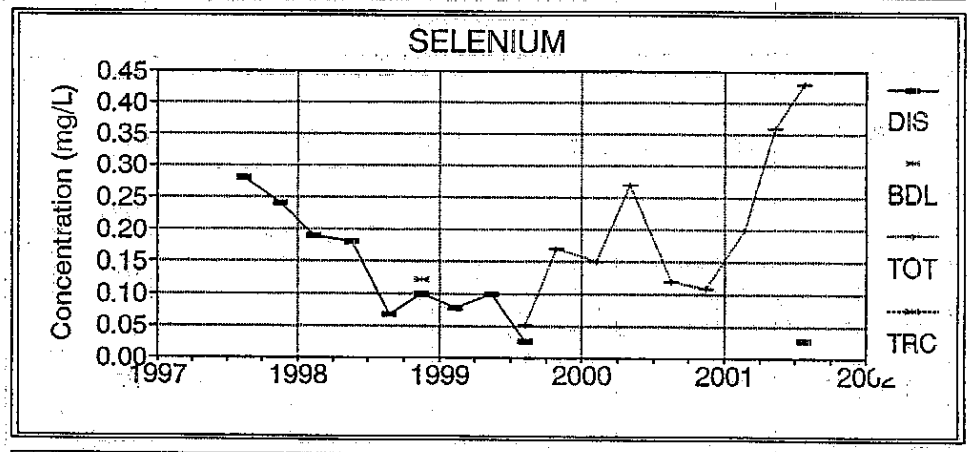
BDL - Below Analytical Detection Limit

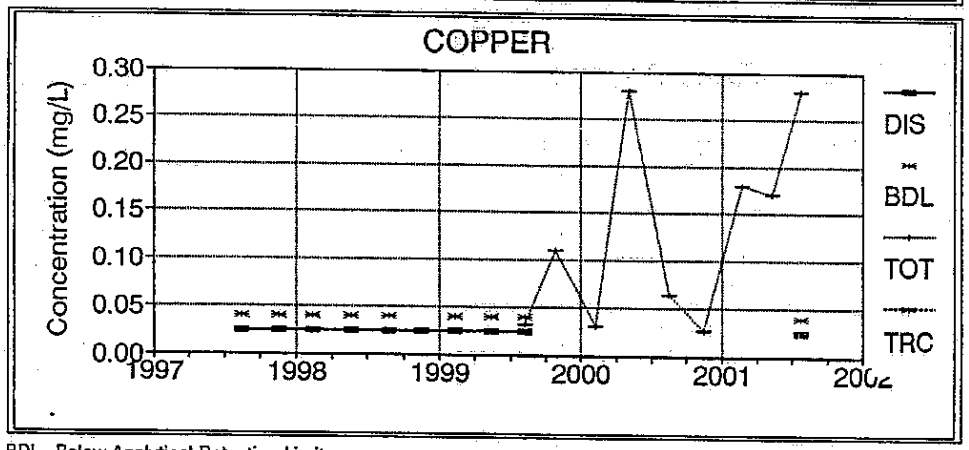
EP-55

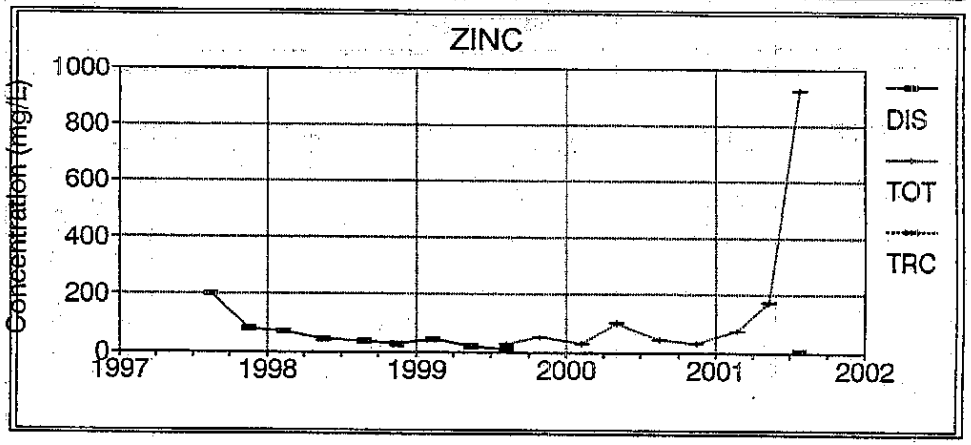






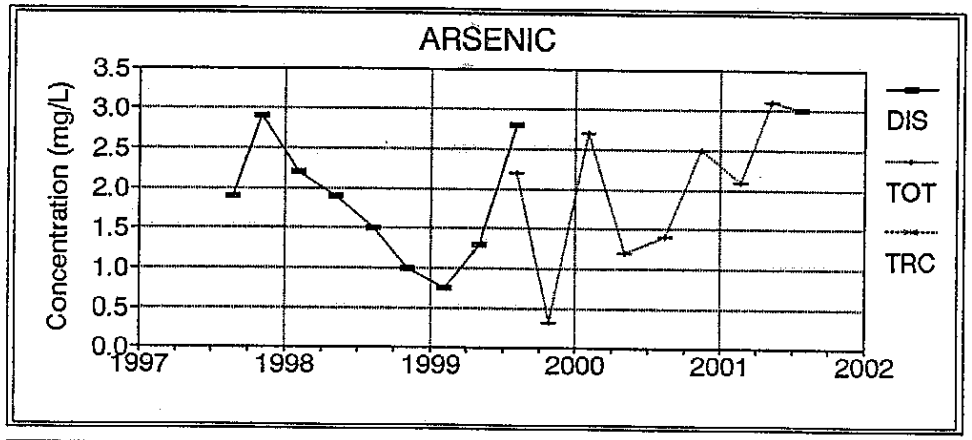


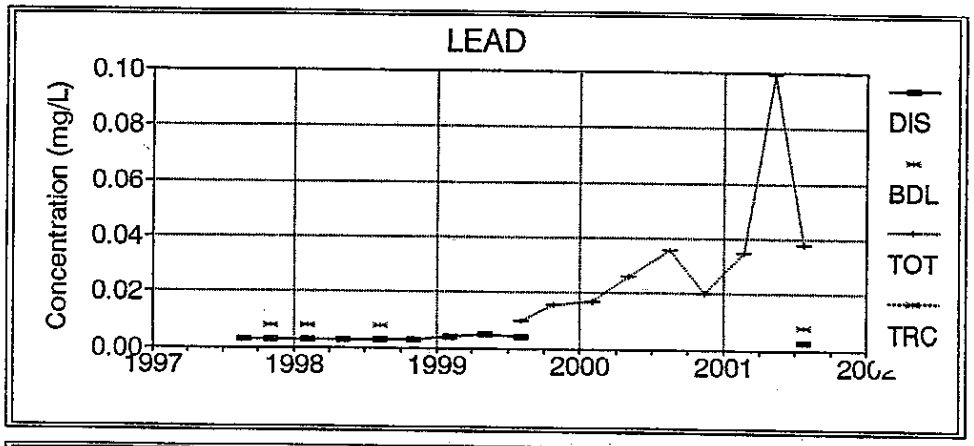


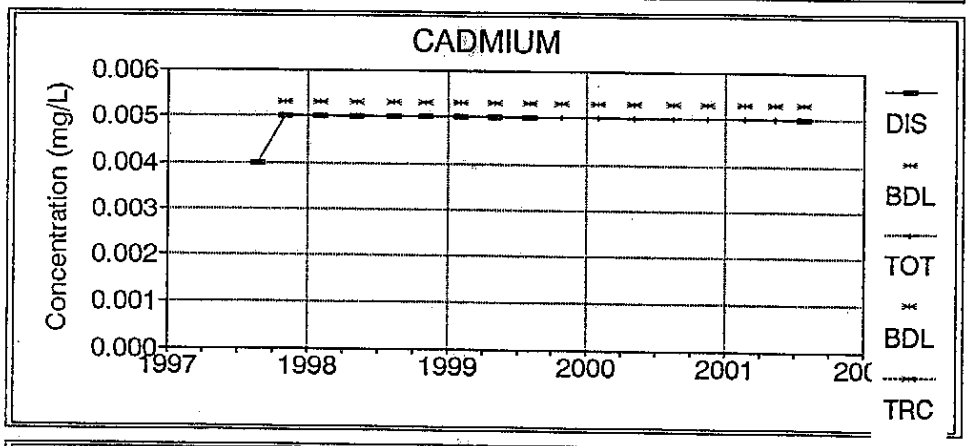


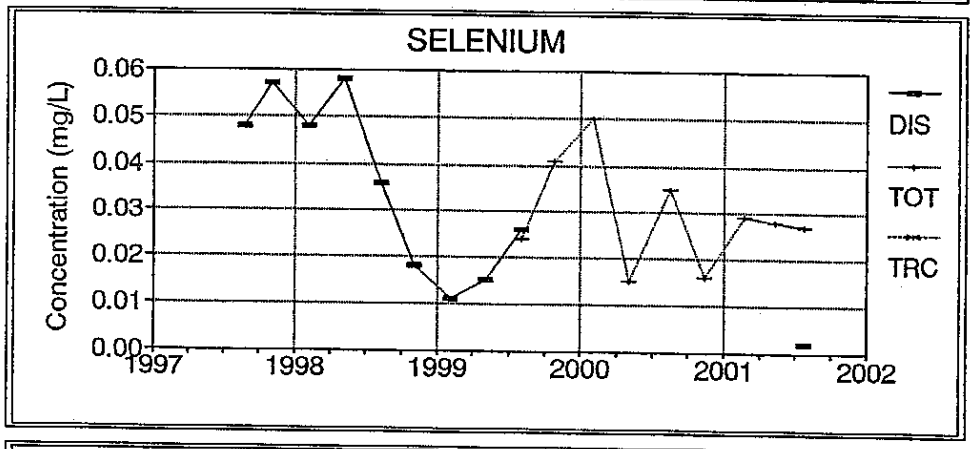
BDL - Below Analytical Detection Limit

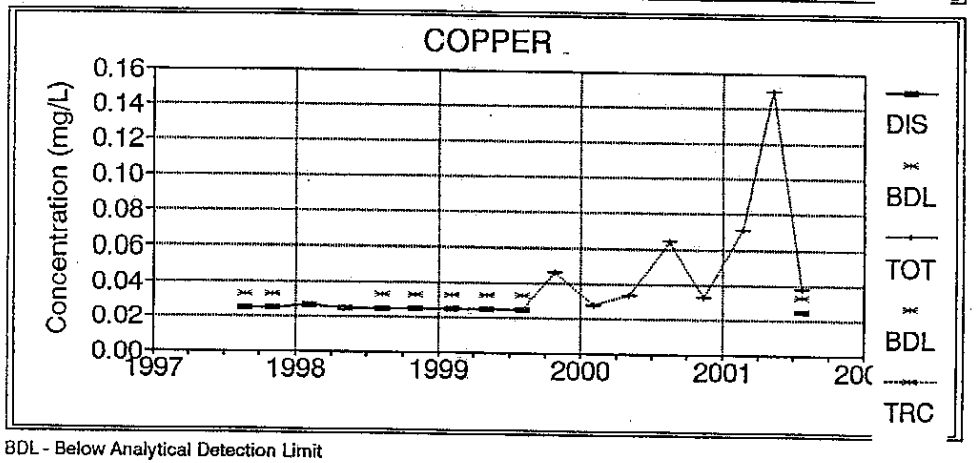
EP-5

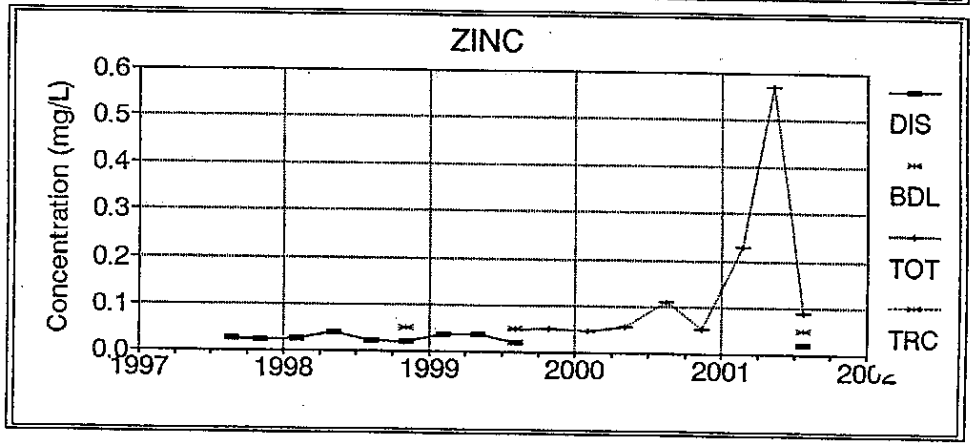






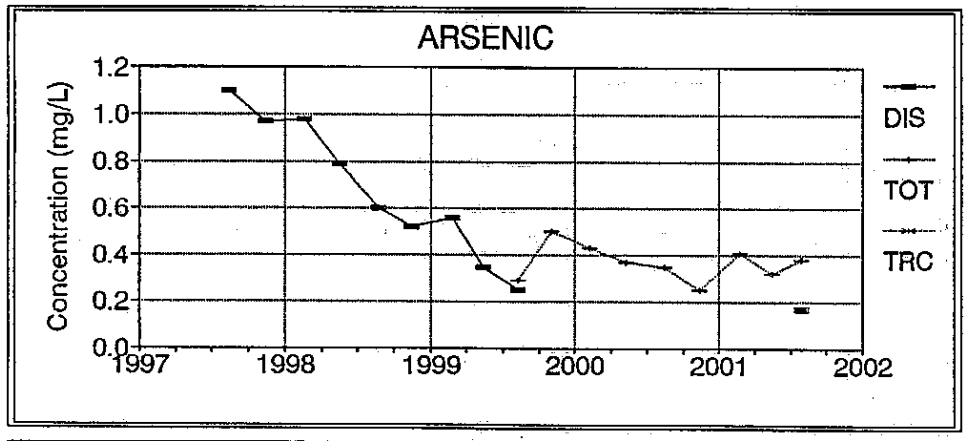


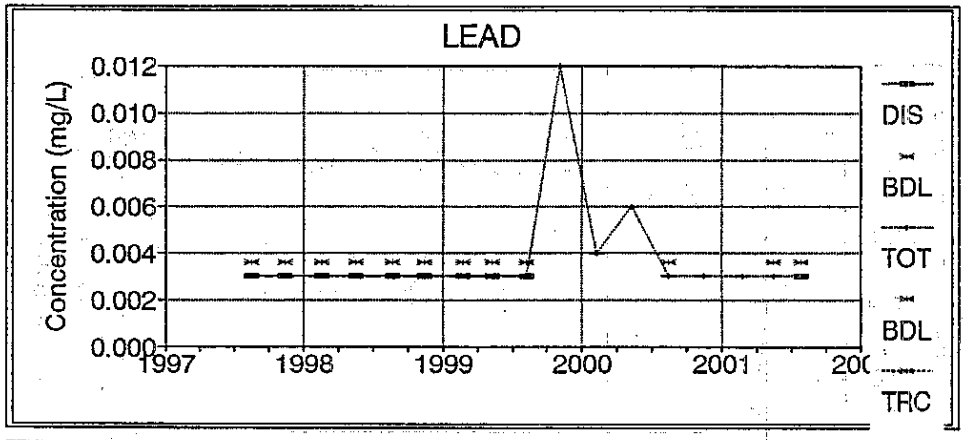


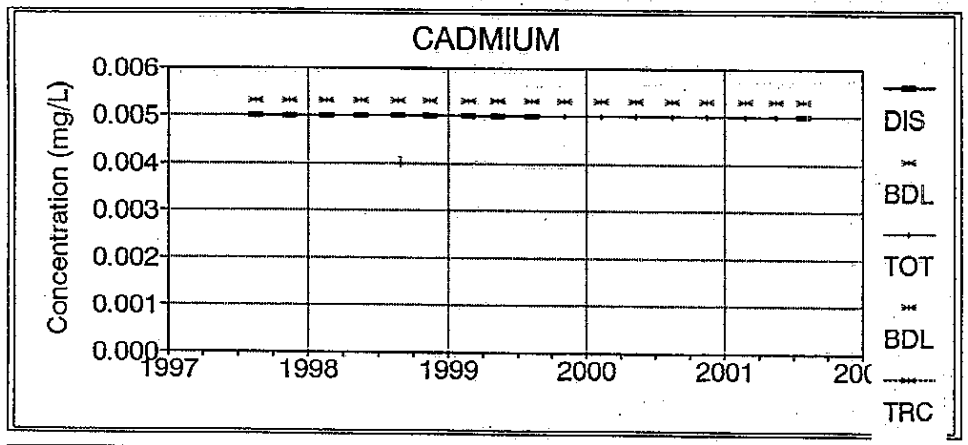


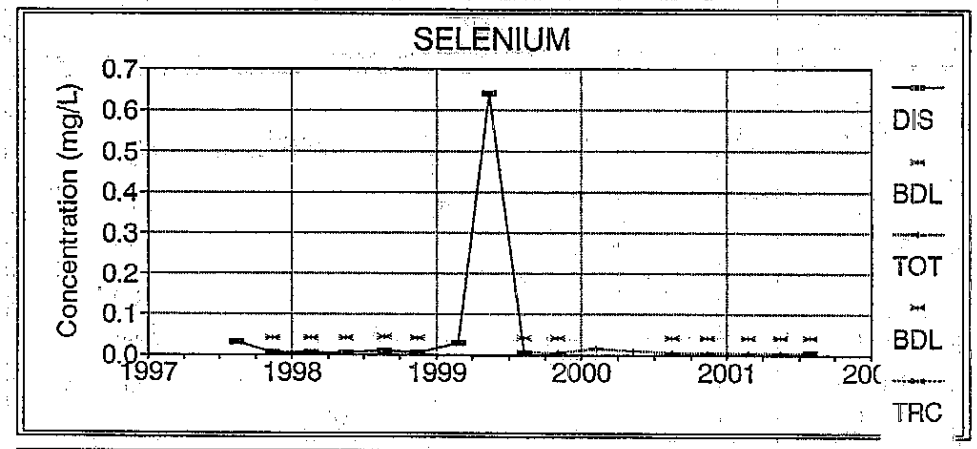
BDL - Below Analytical Detection Limit

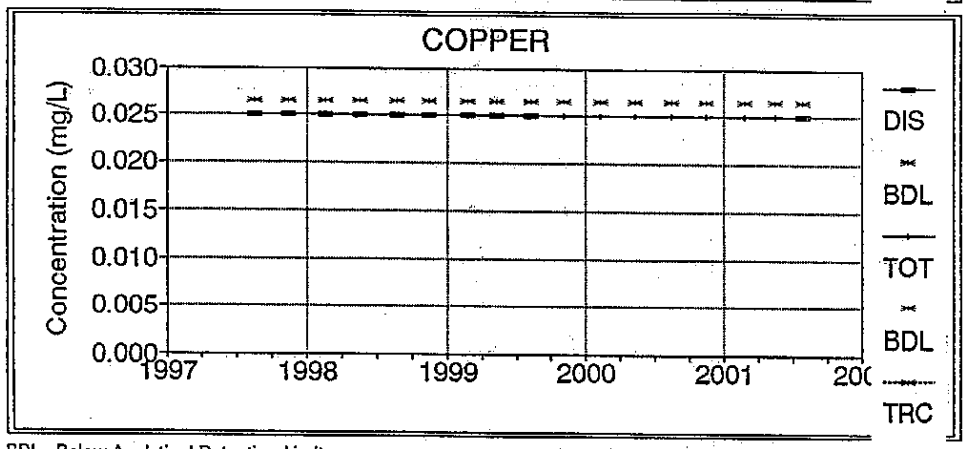
EP-57

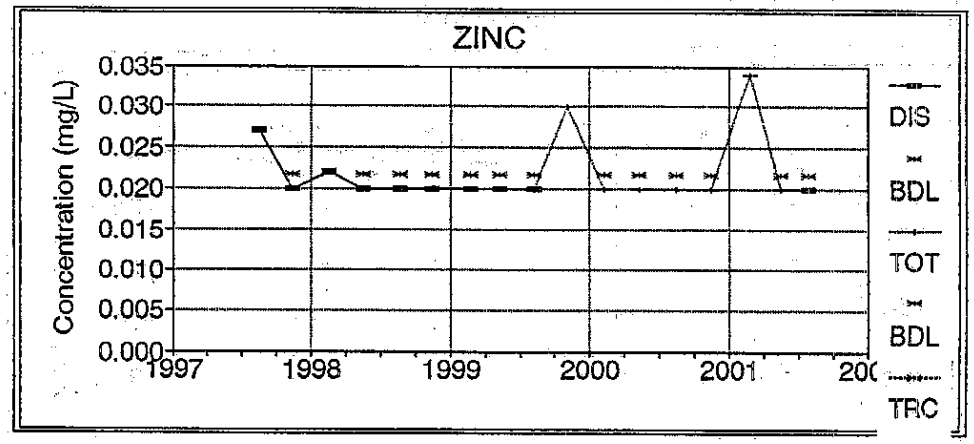






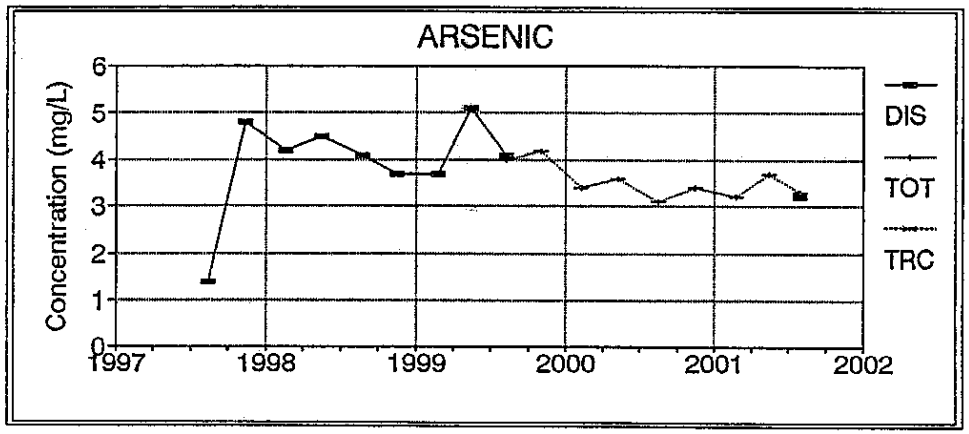


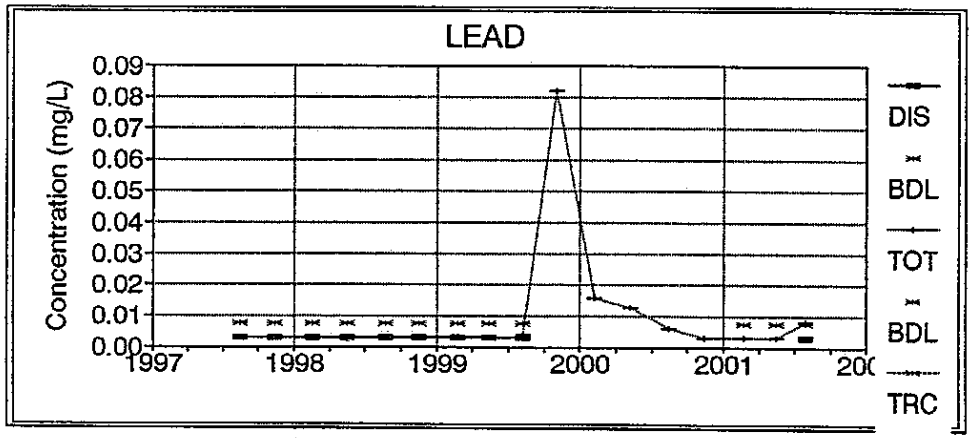


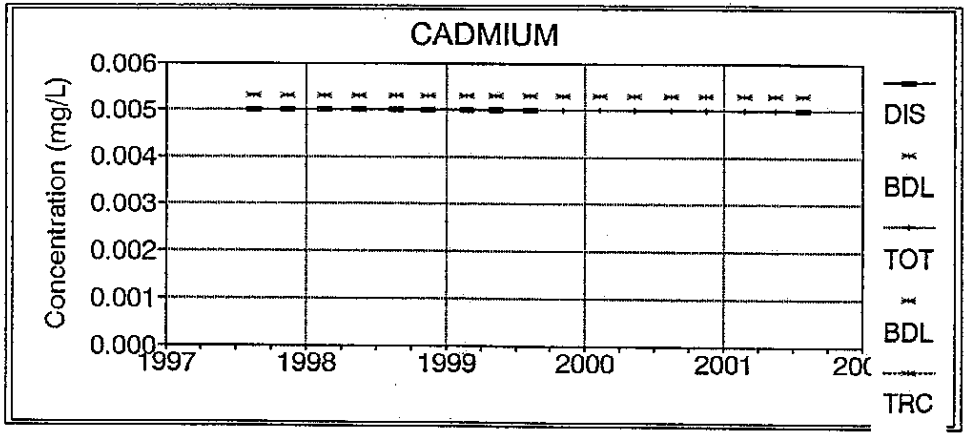


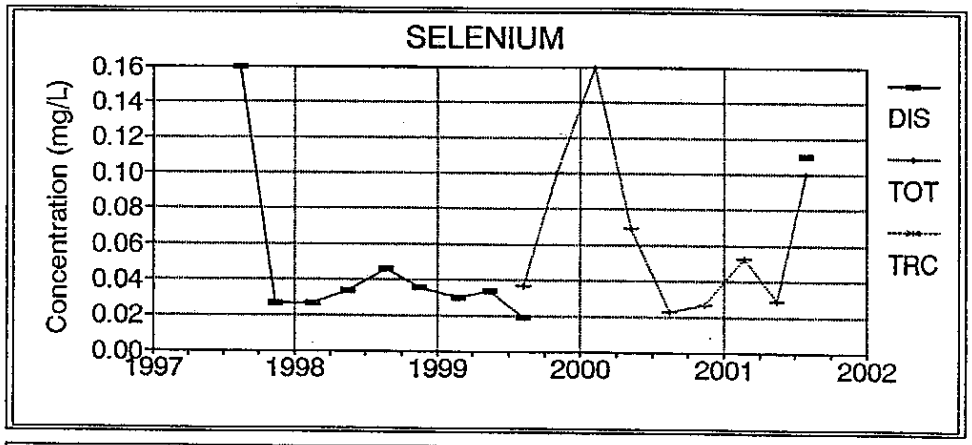
BDL - Below Analytical Detection Limit

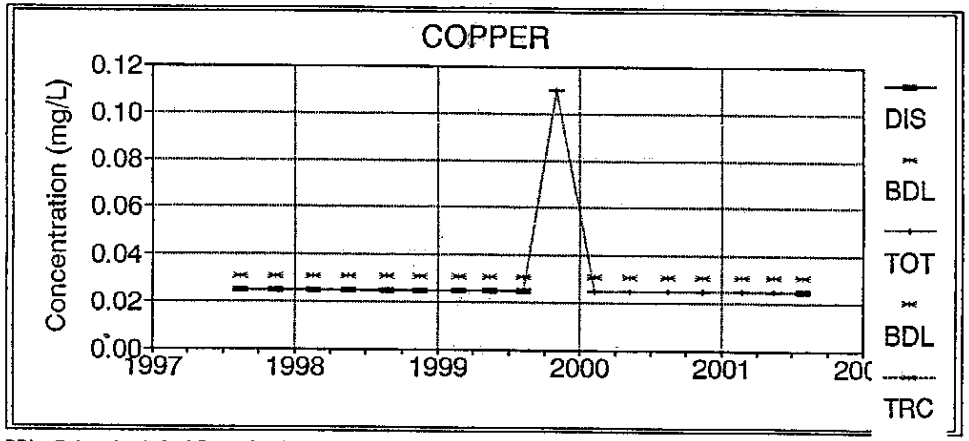
EP-5

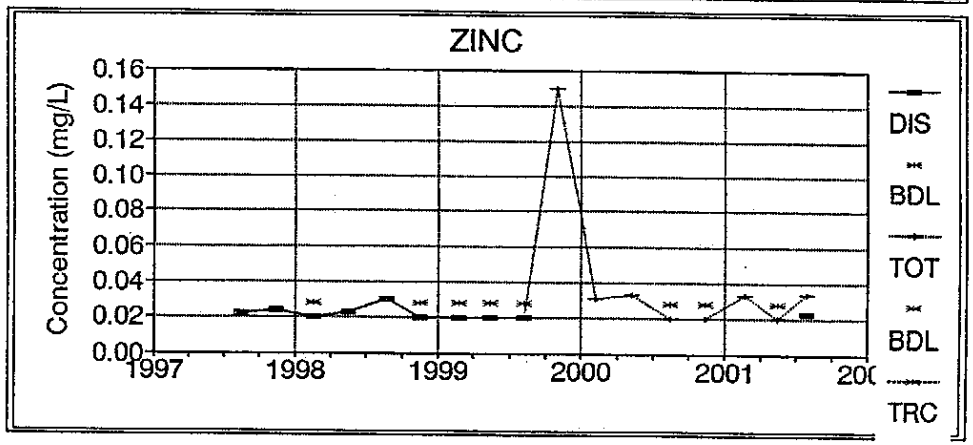












BDL - Below Analytical Detection Limit

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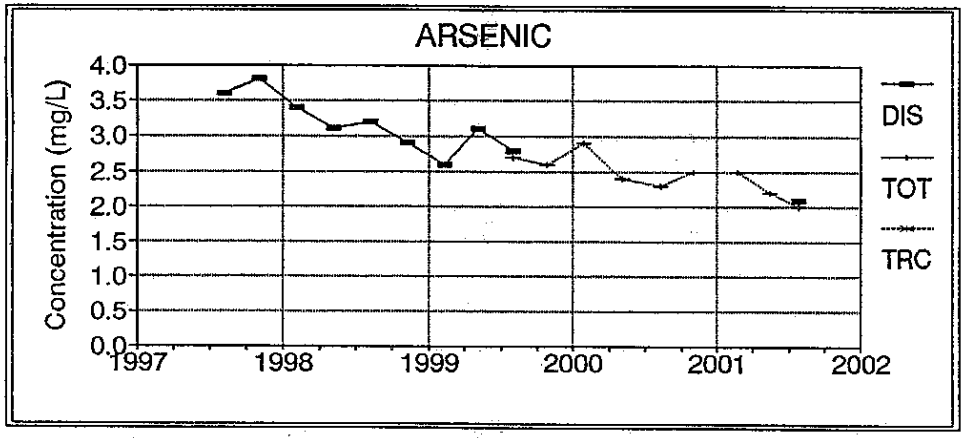
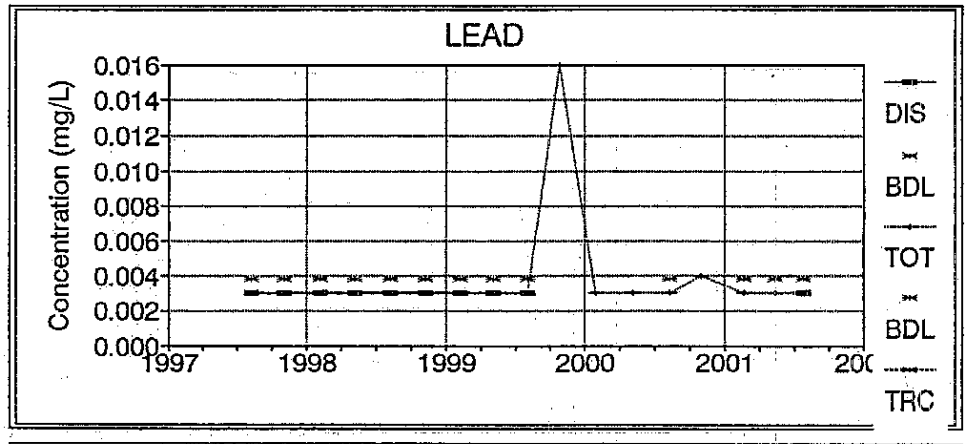
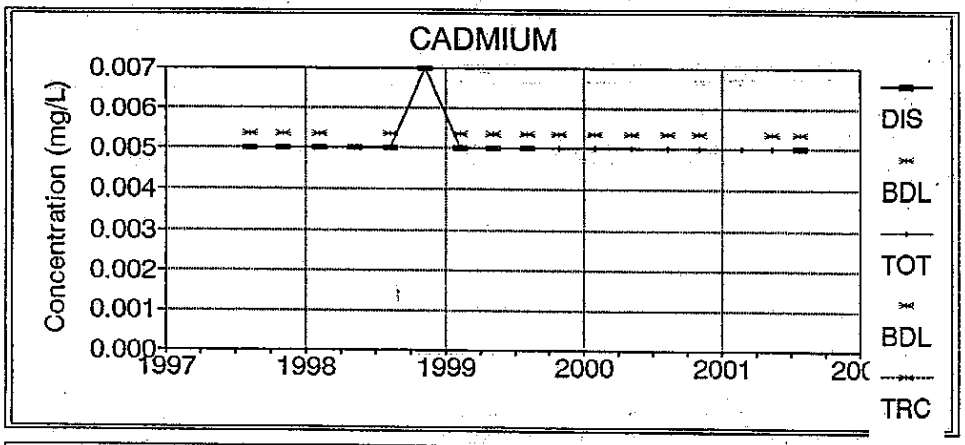
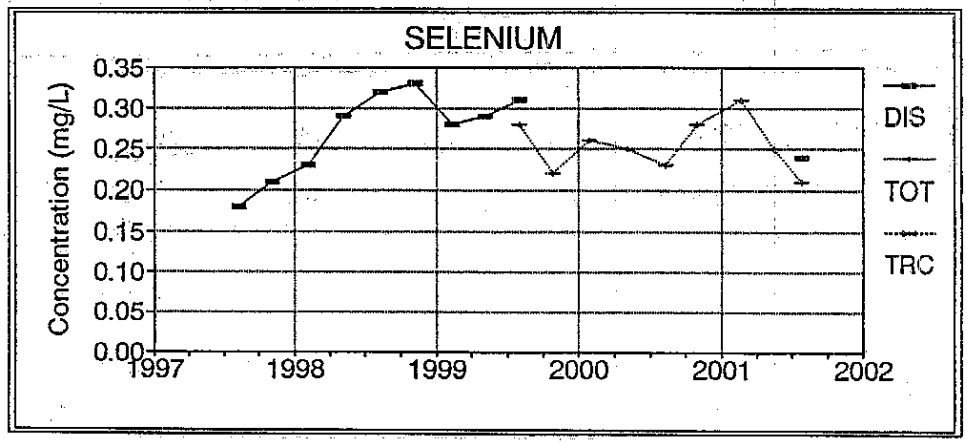
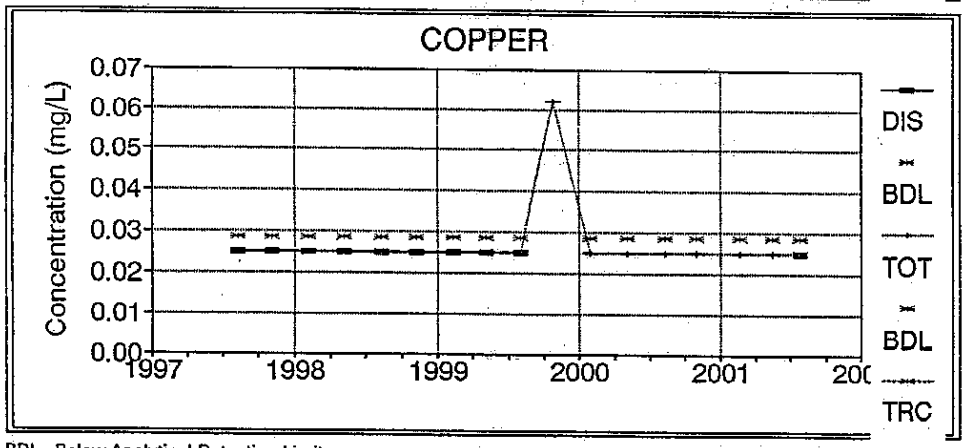
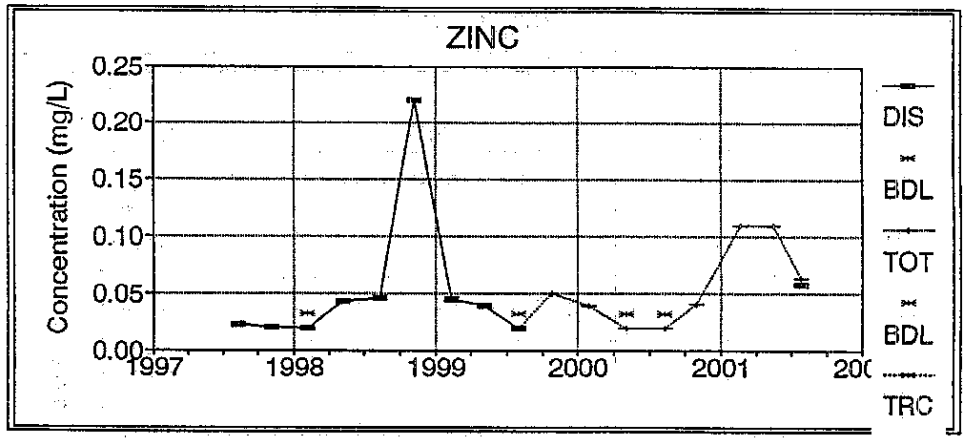






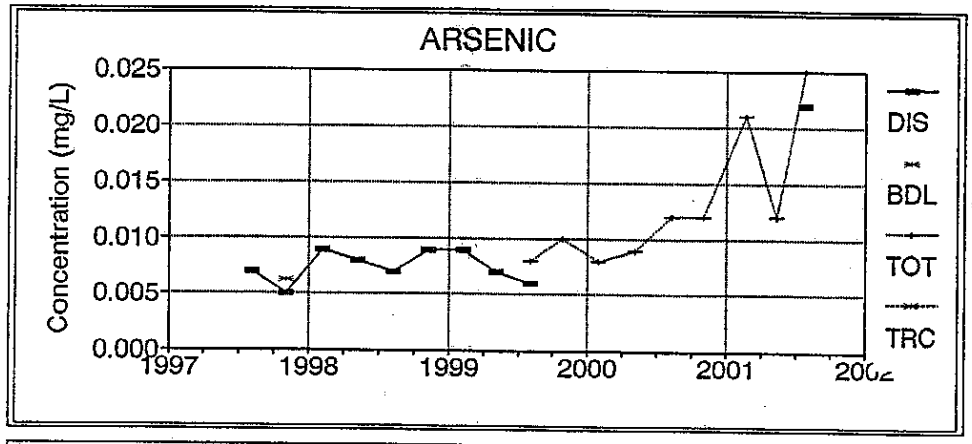


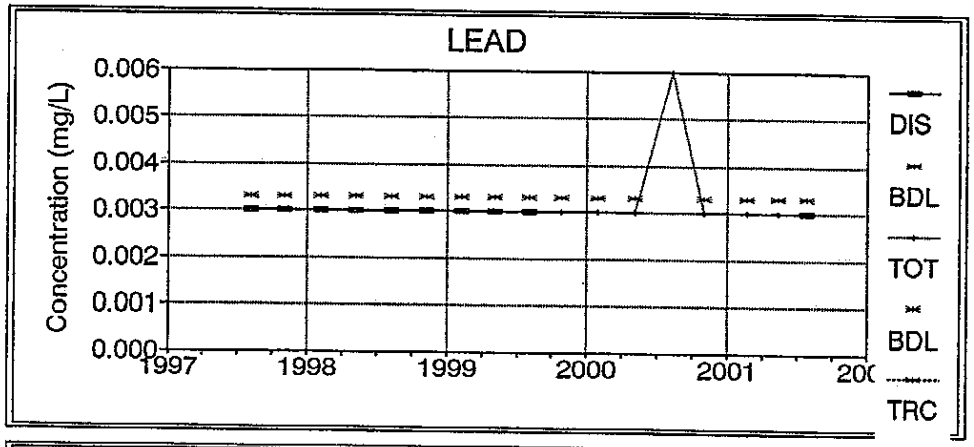


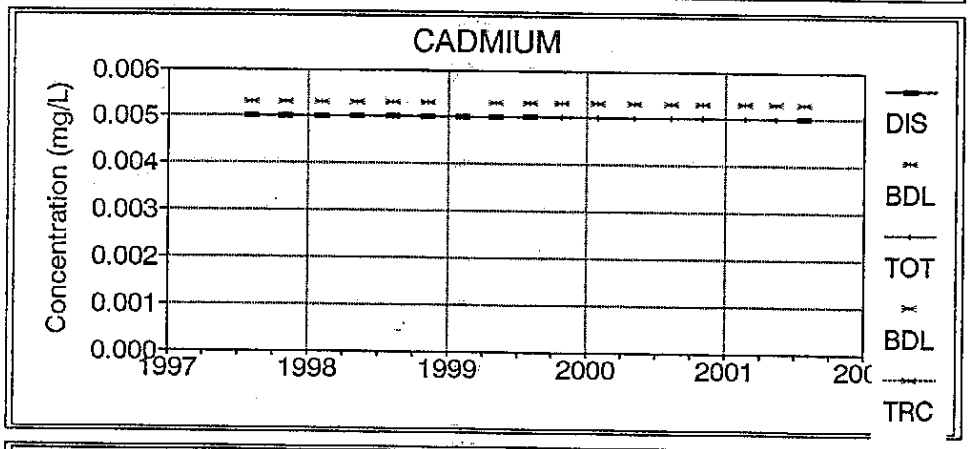


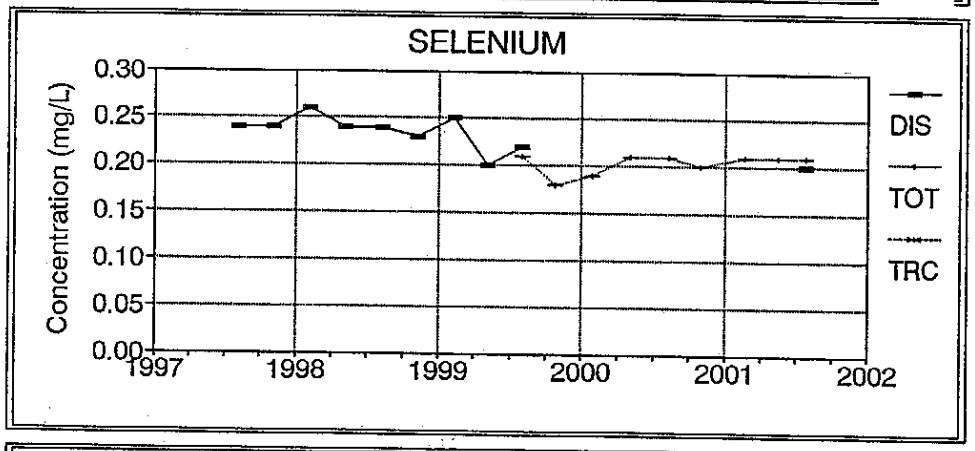
BDL - Below Analytical Detection Limit

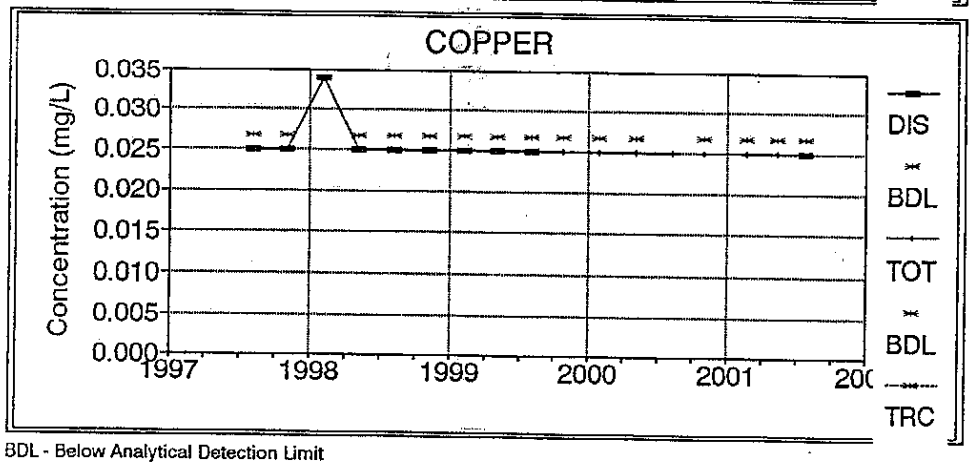
EP-C

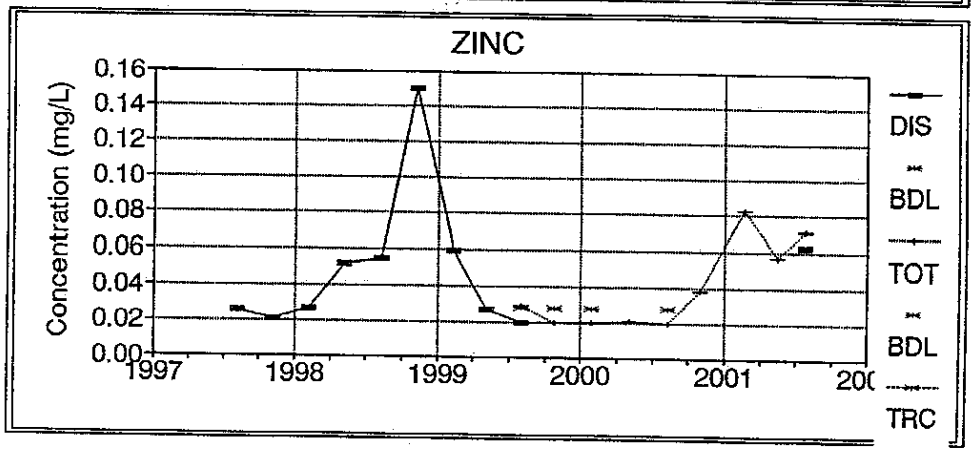






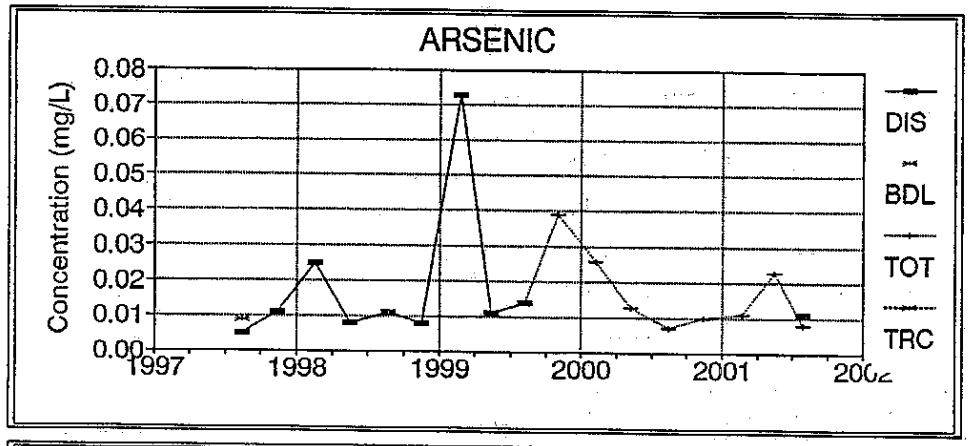


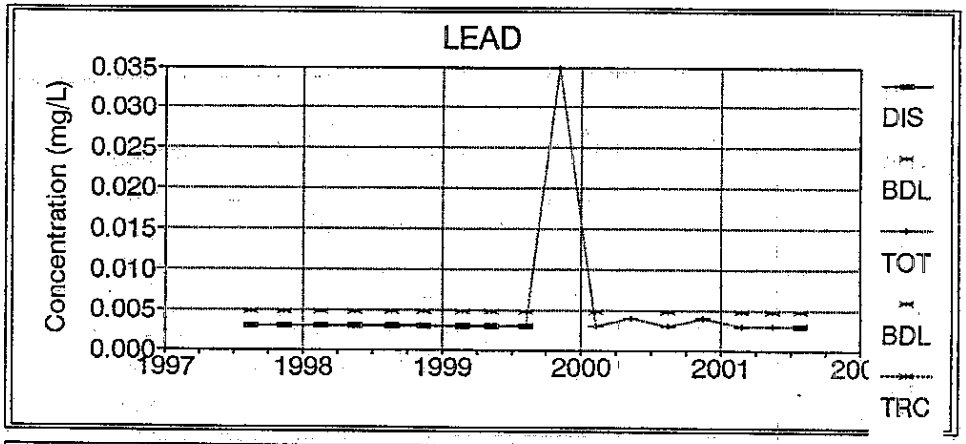


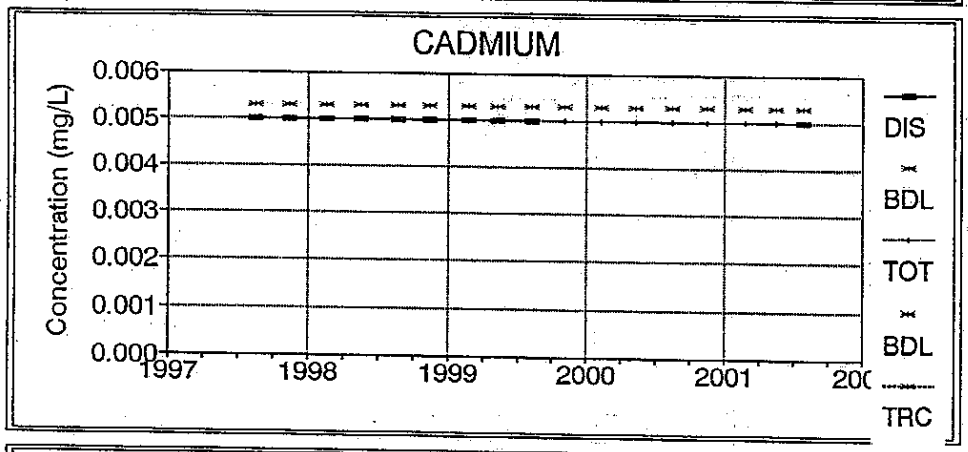


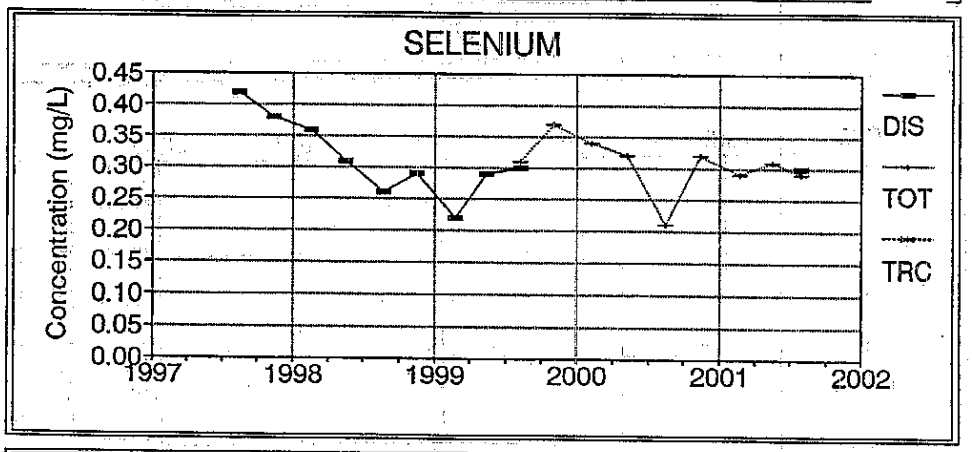
BDL - Below Analytical Detection Limit

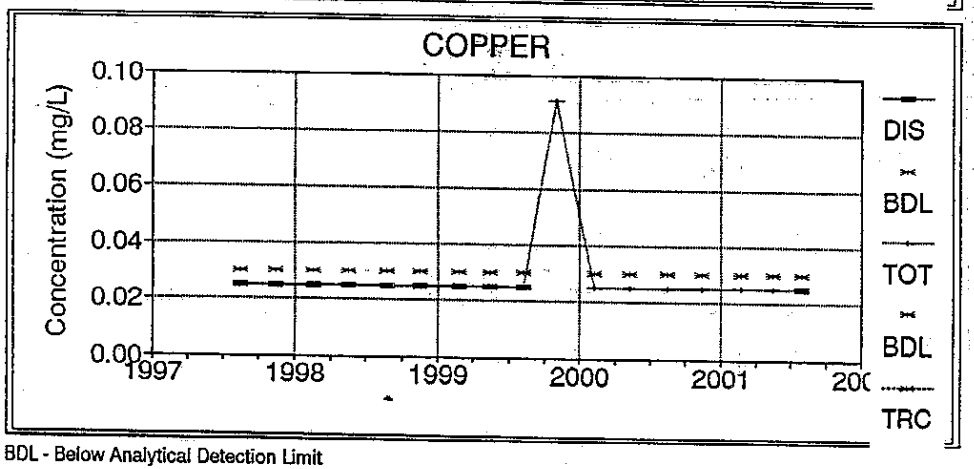
EP-61

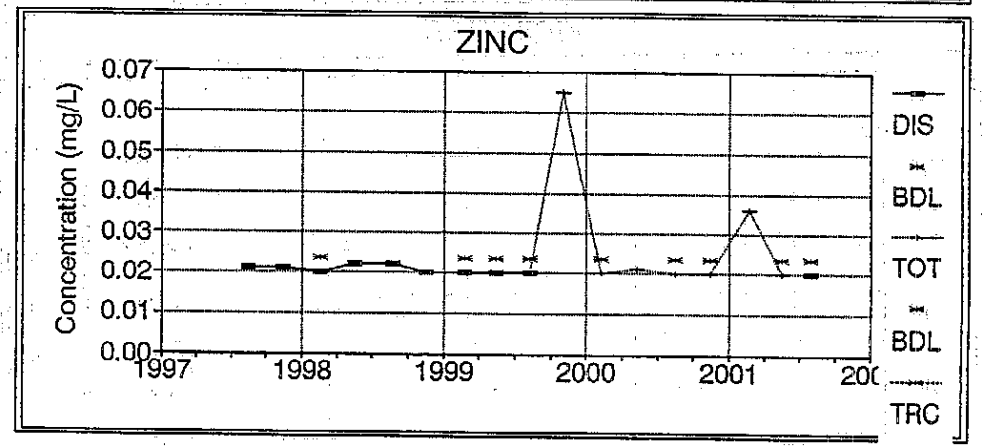






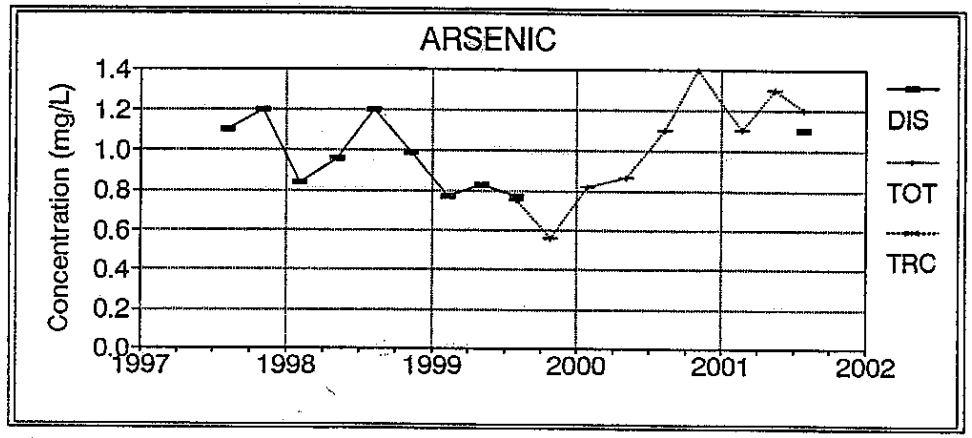


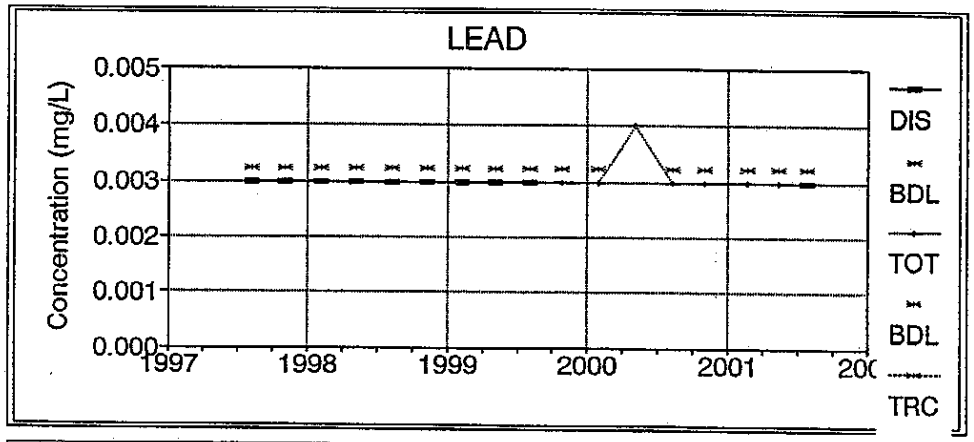


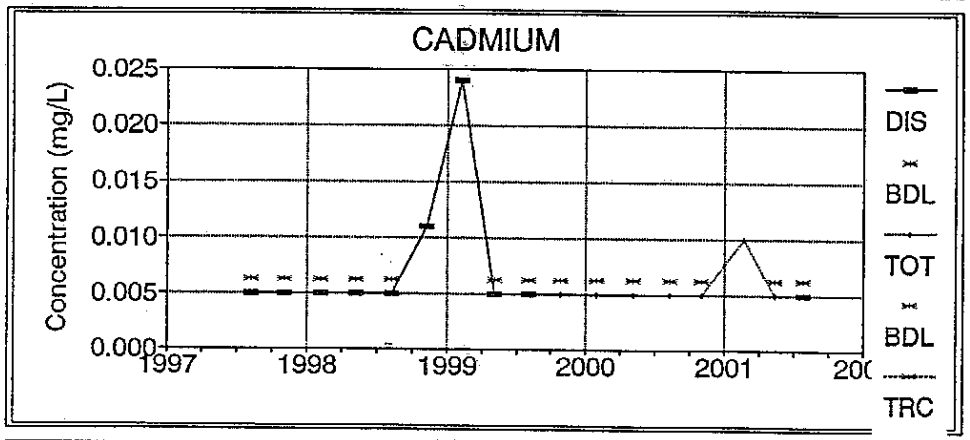


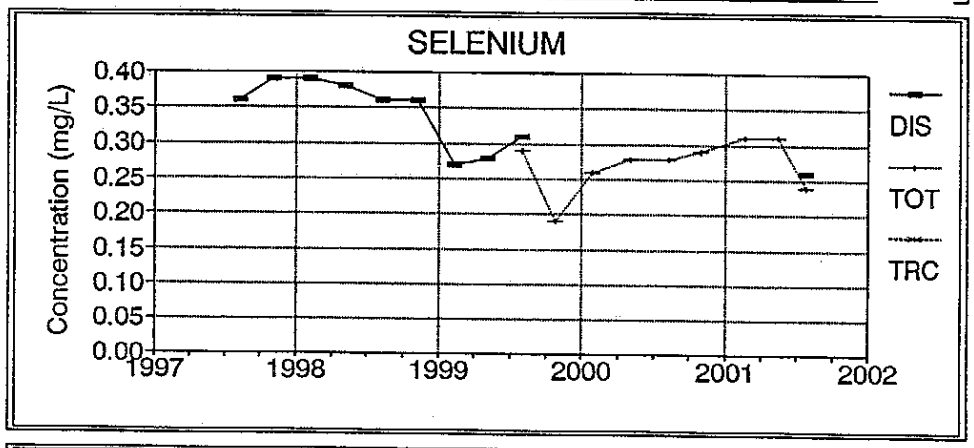
BDL - Below Analytical Detection Limit

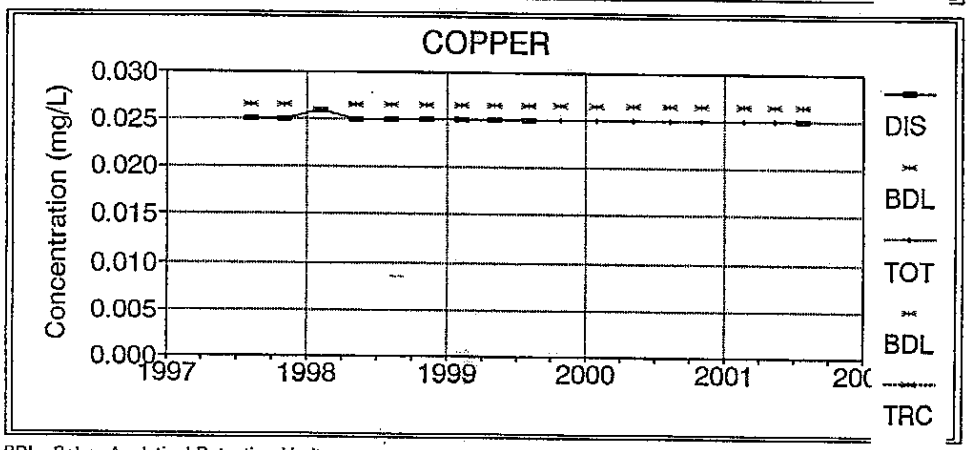
EP-6

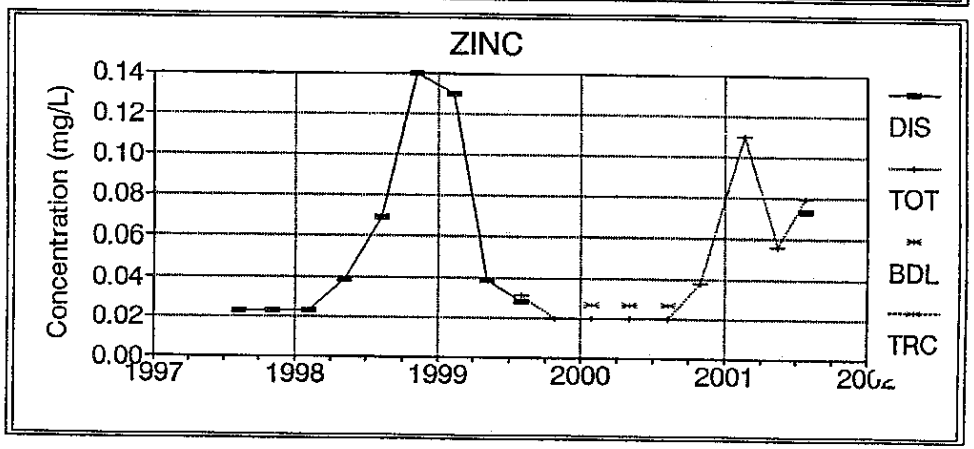






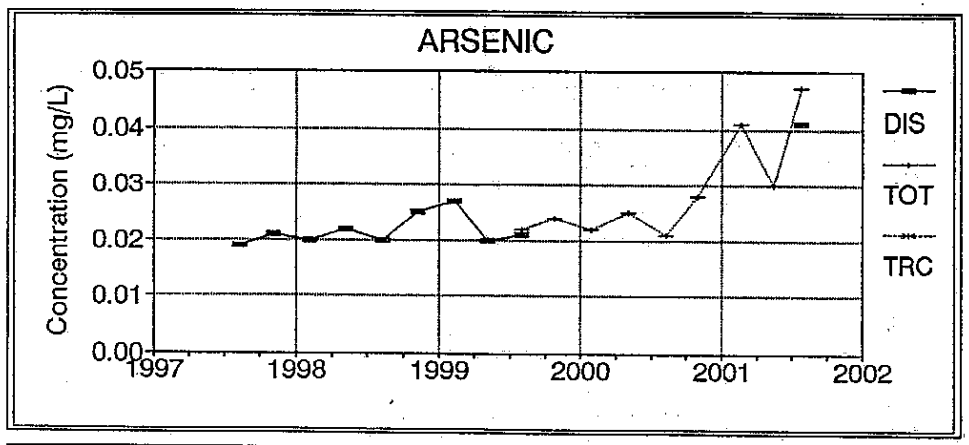


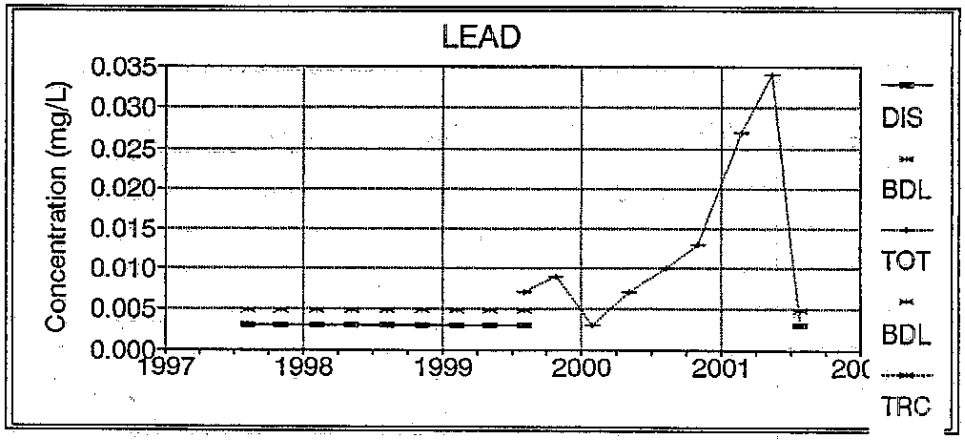


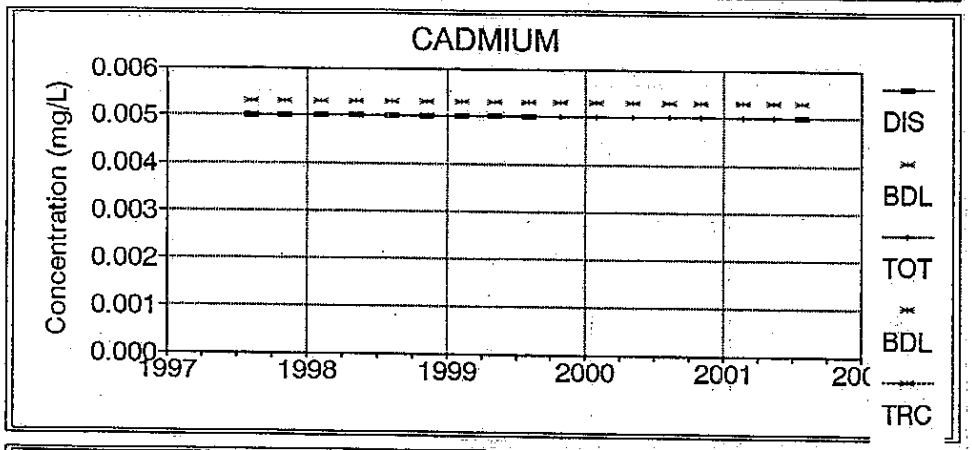


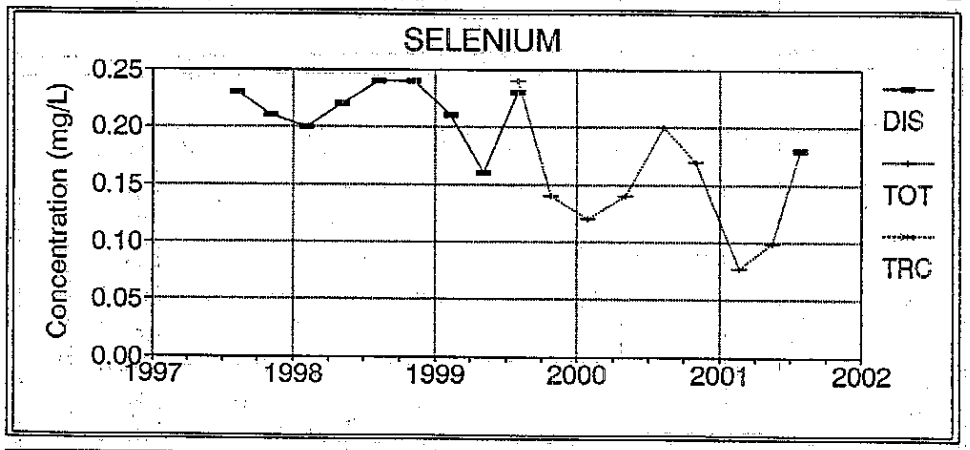
BDL - Below Analytical Detection Limit

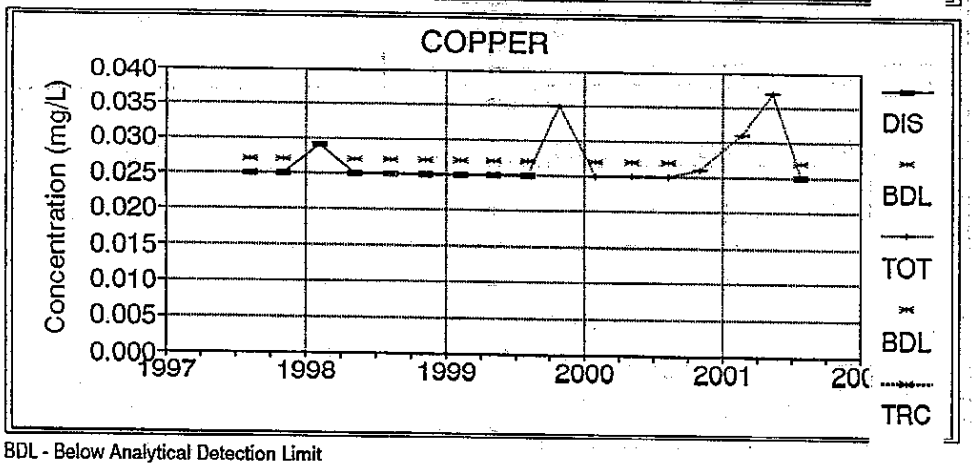
EP-63

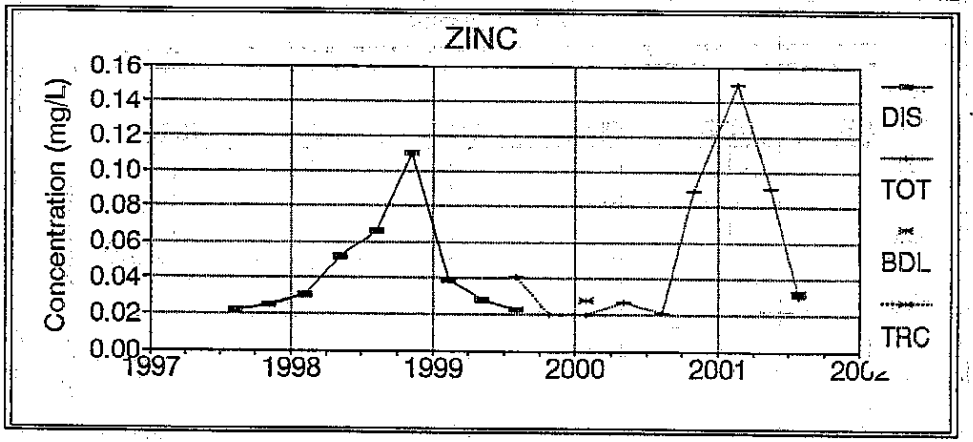






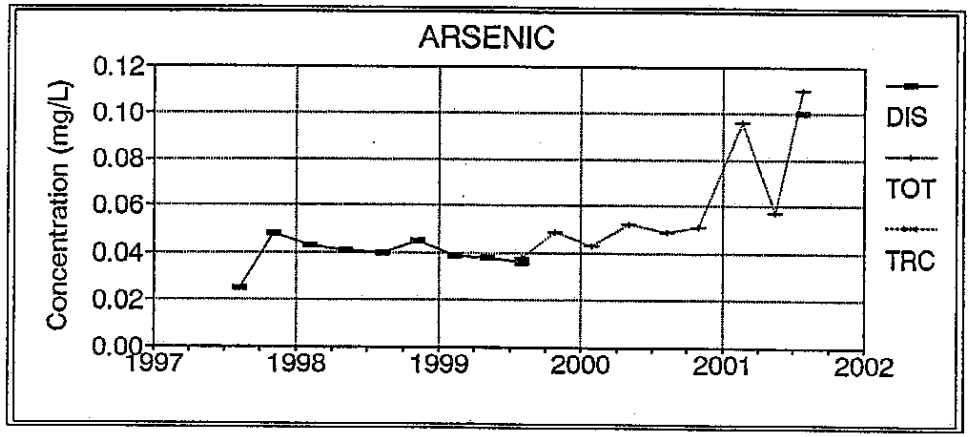


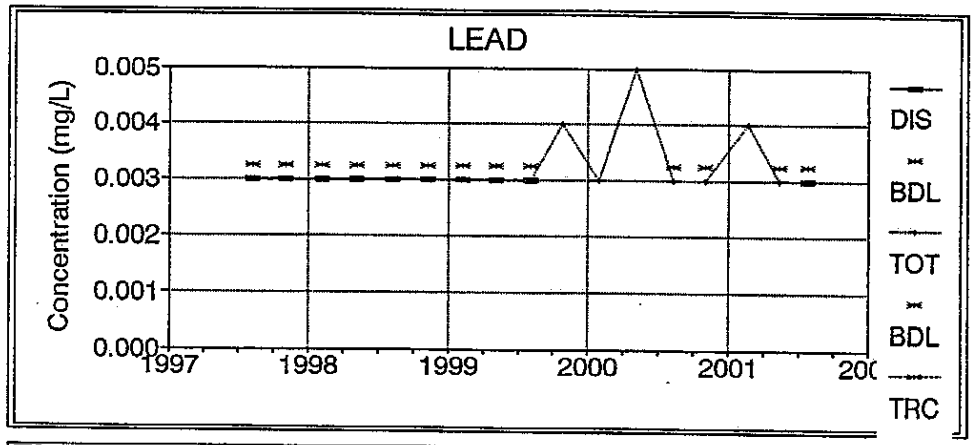


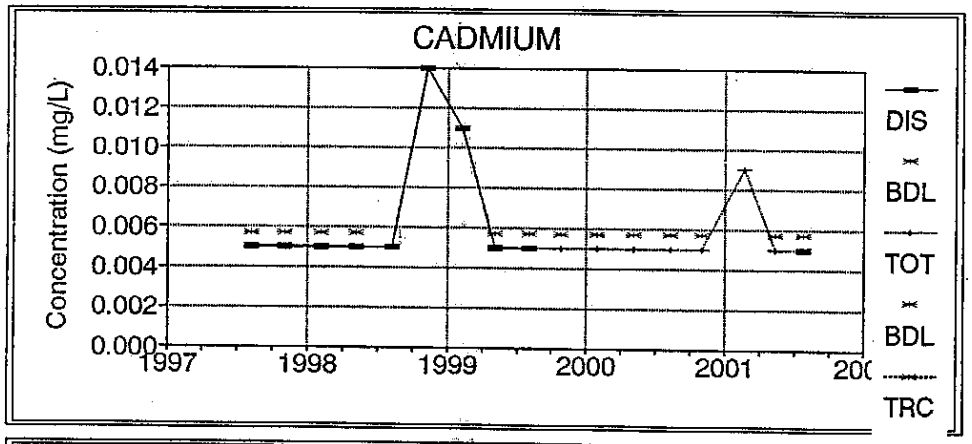


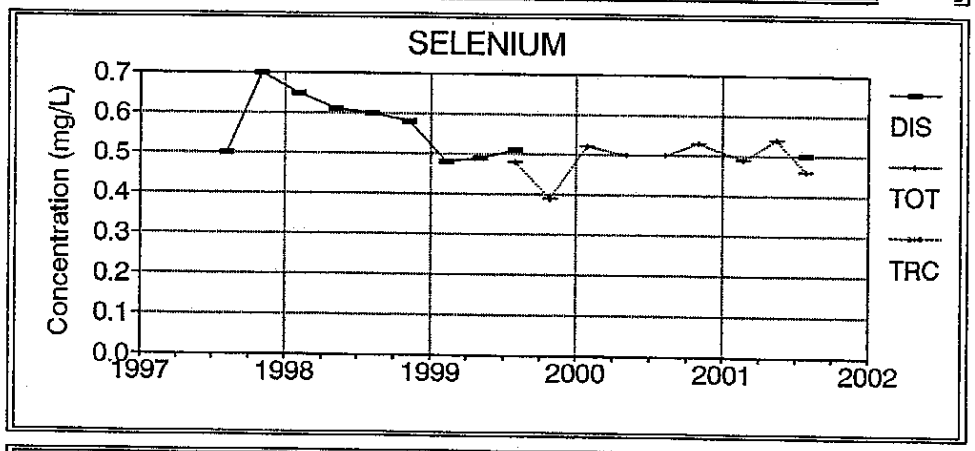
BDL - Below Analytical Detection Limit

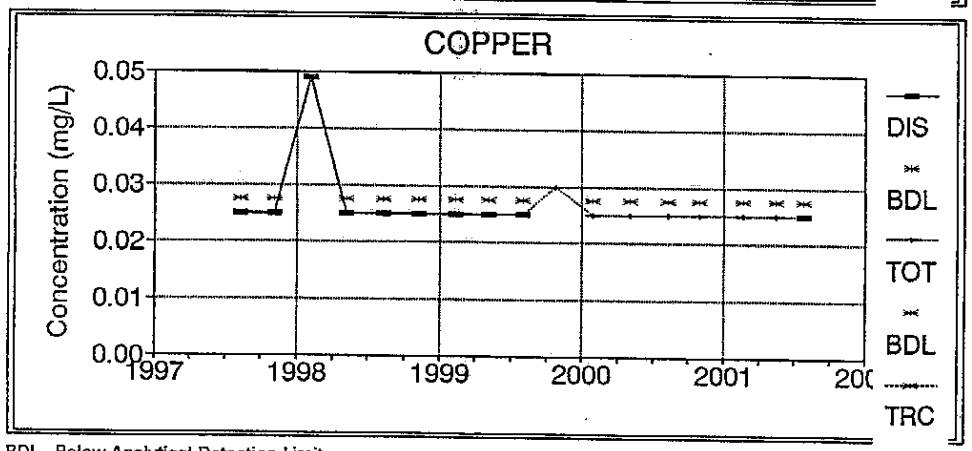
EP-

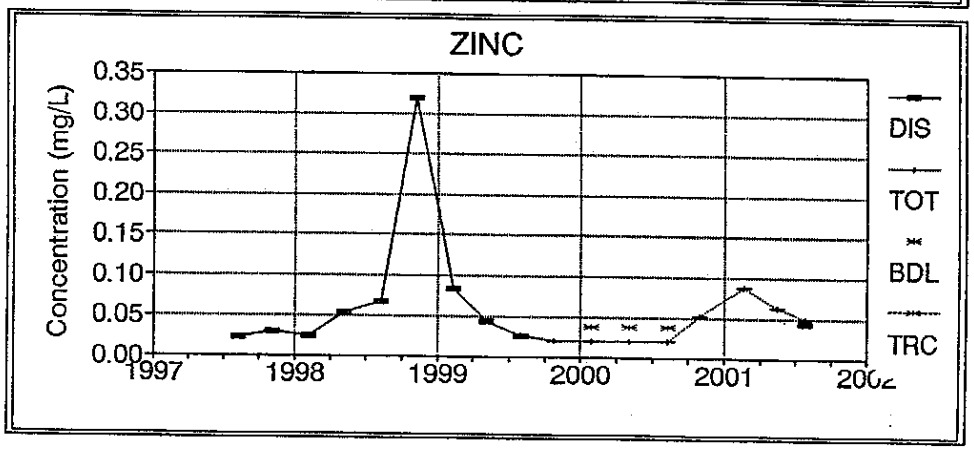






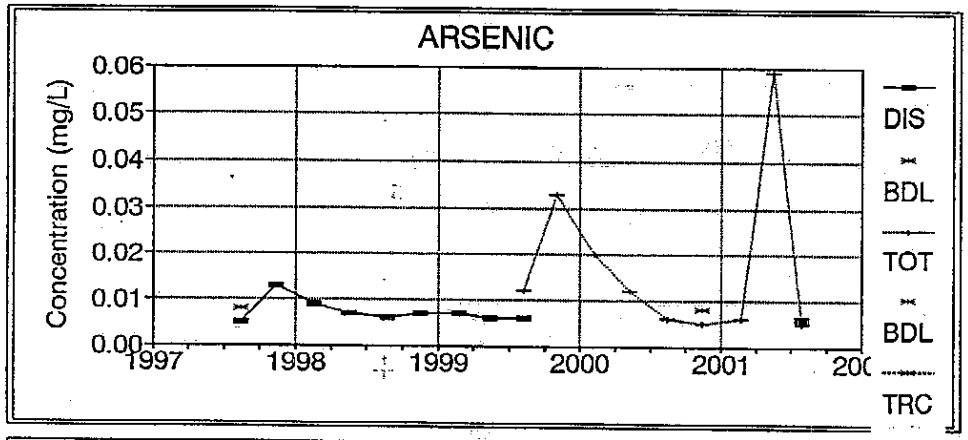


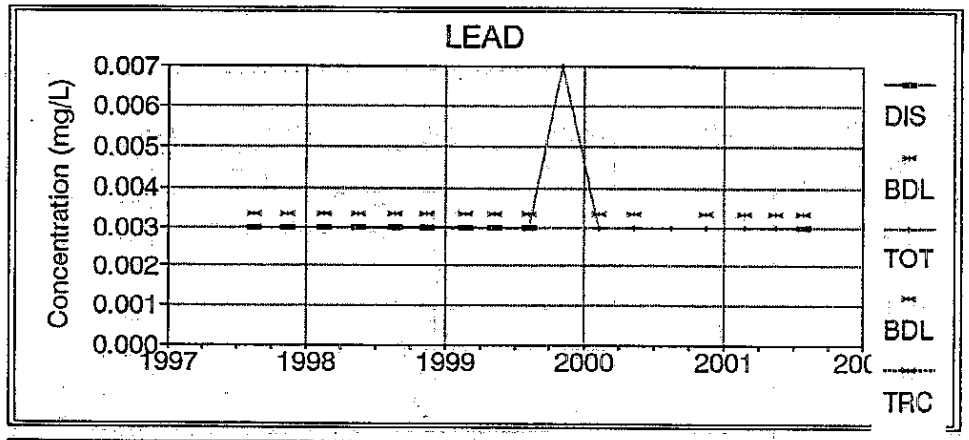


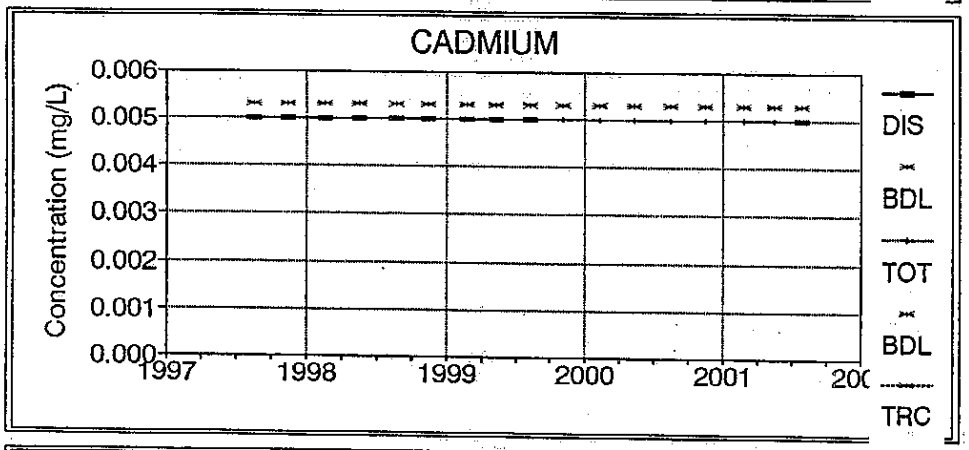


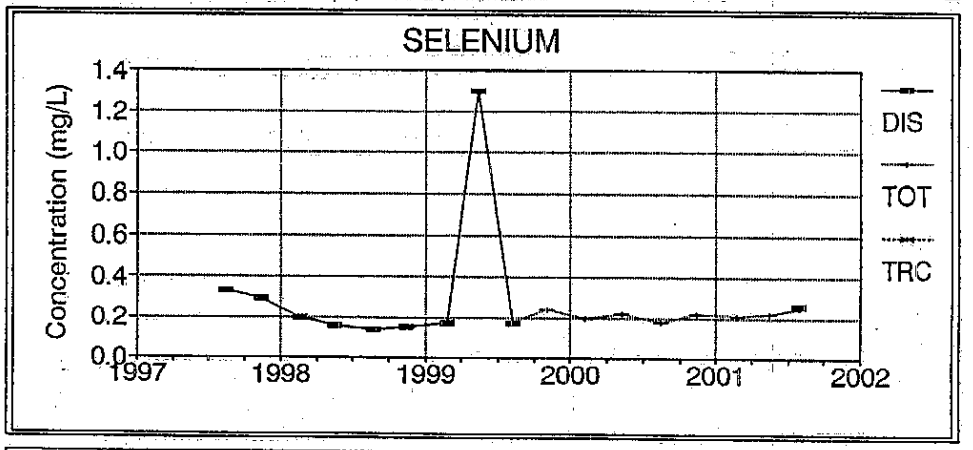
BDL - Below Analytical Detection Limit

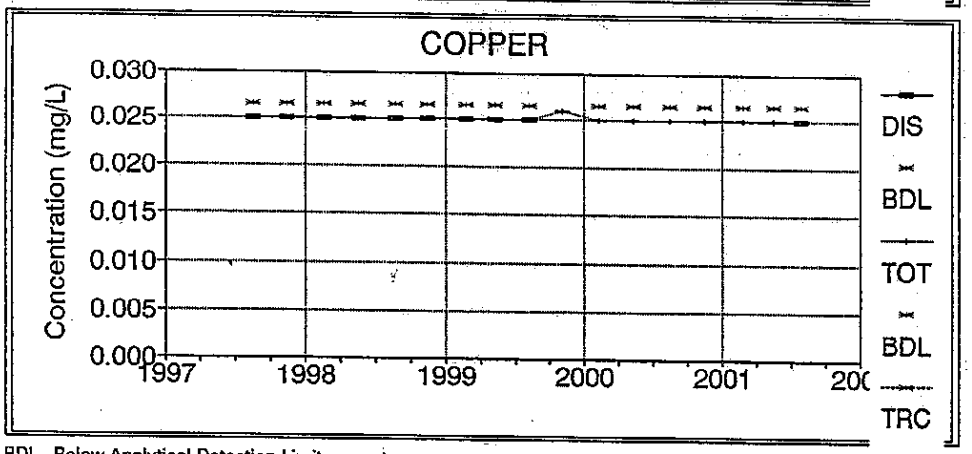
EP-65

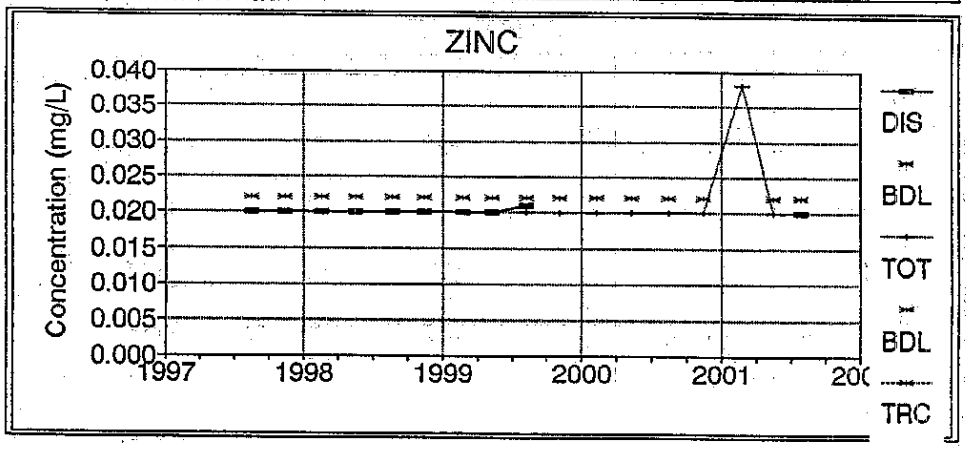






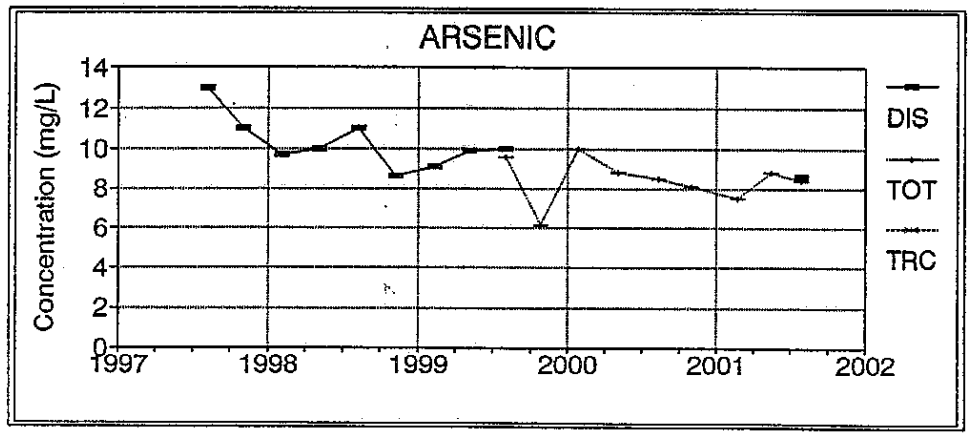


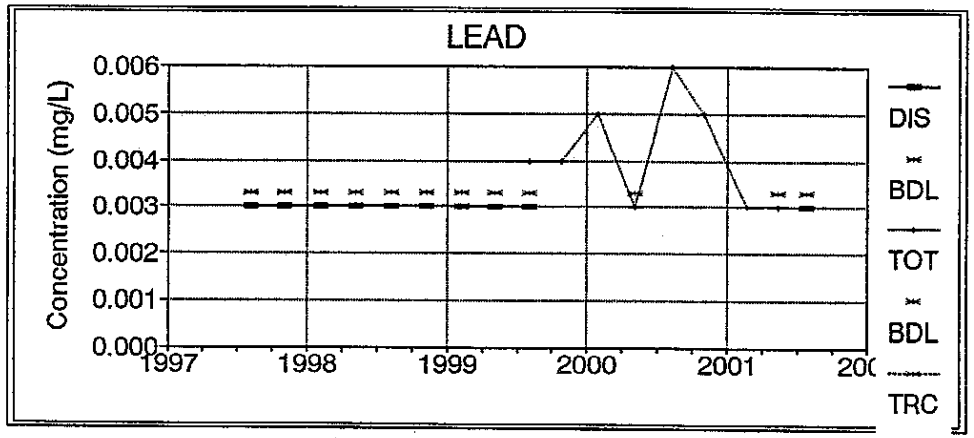


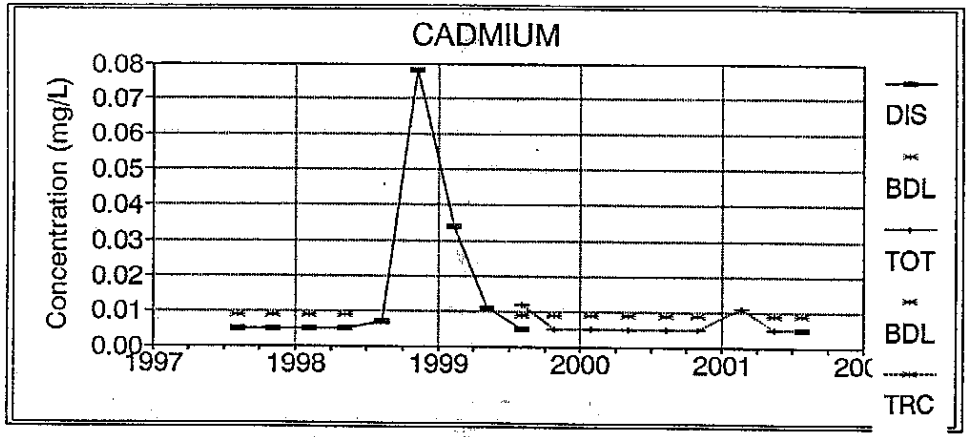


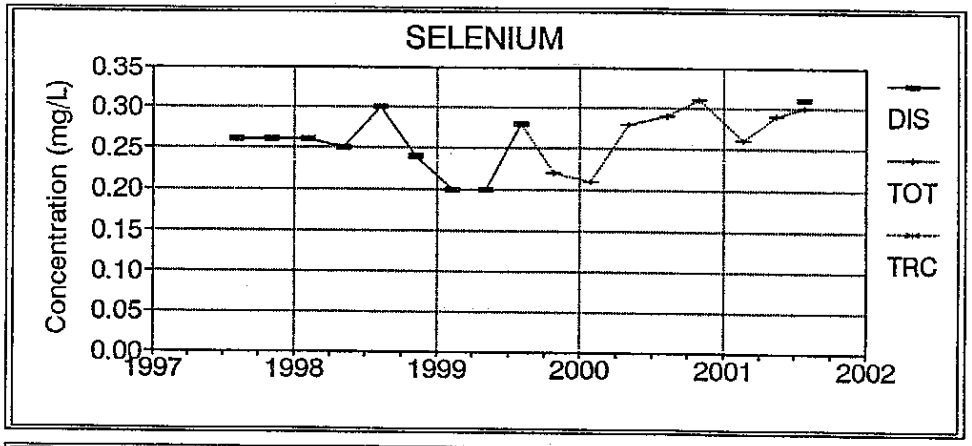
BDL - Below Analytical Detection Limit

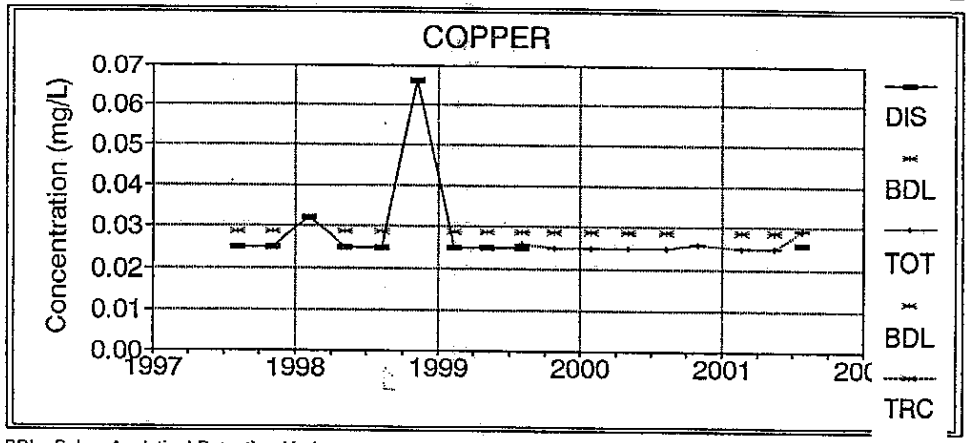
EP-6

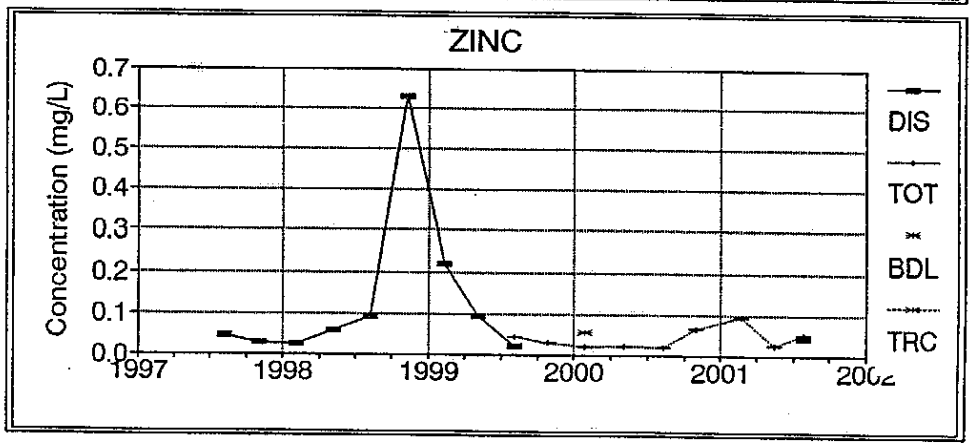






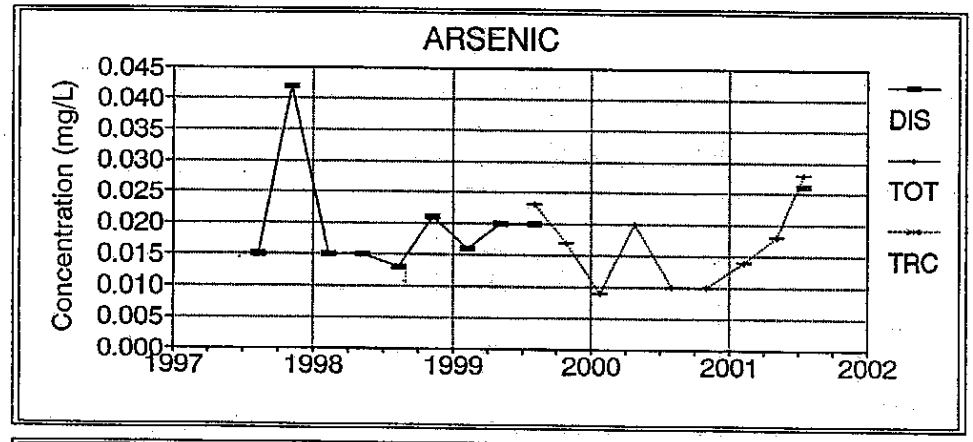


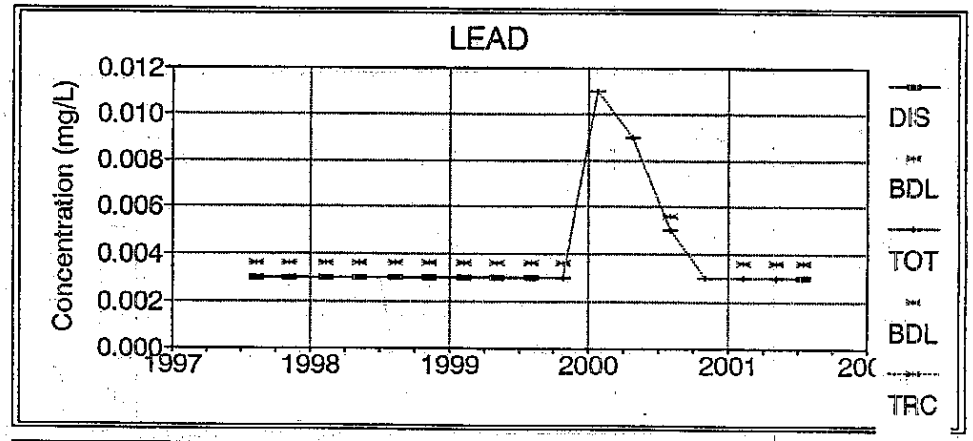


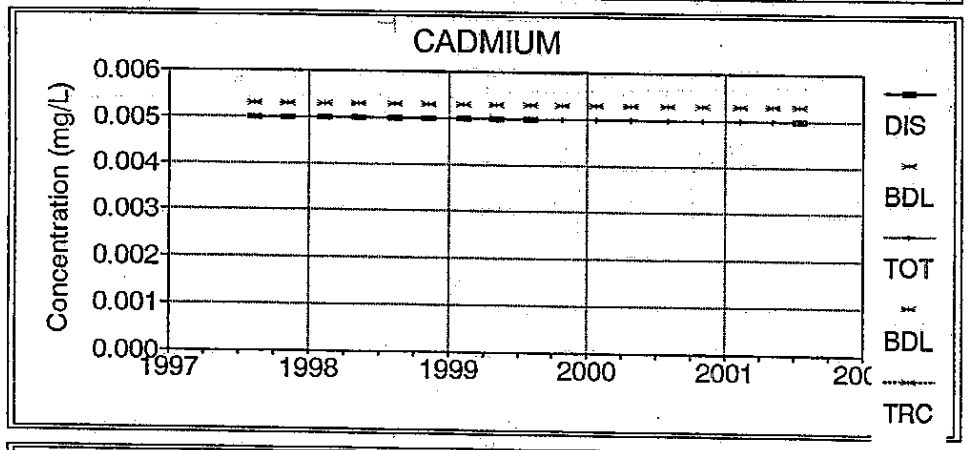


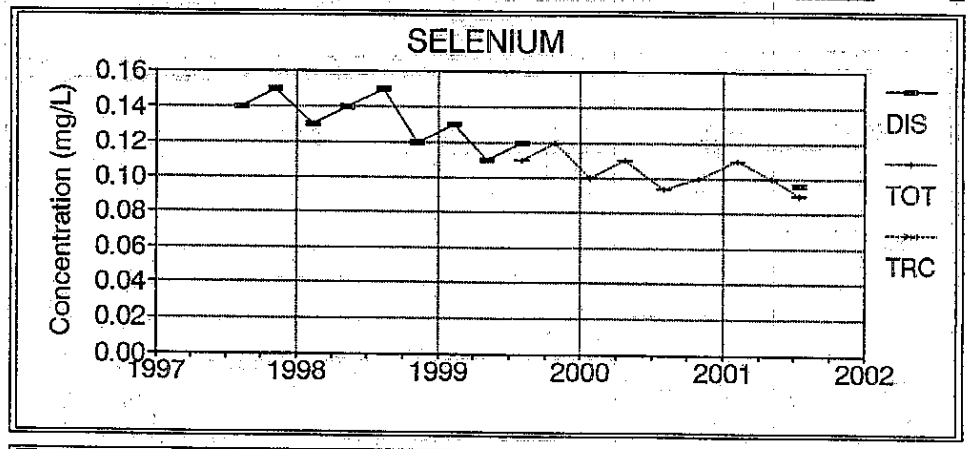
BDL - Below Analytical Detection Limit

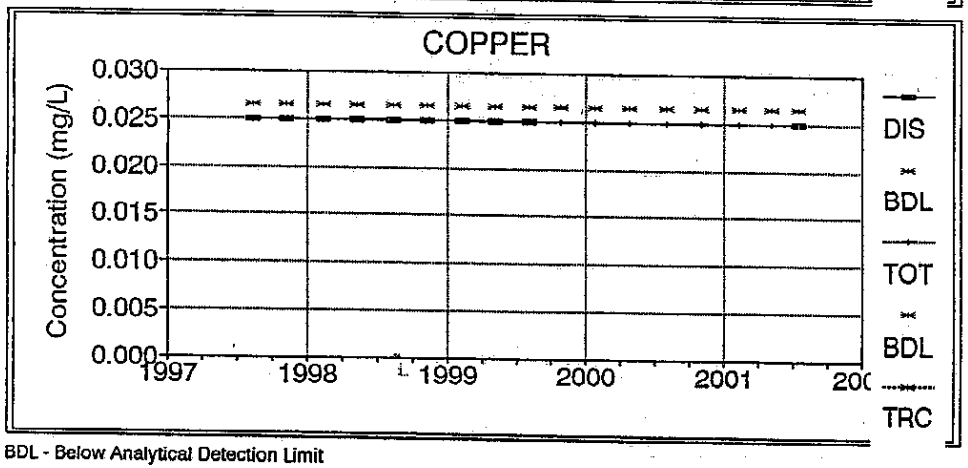
EP-67

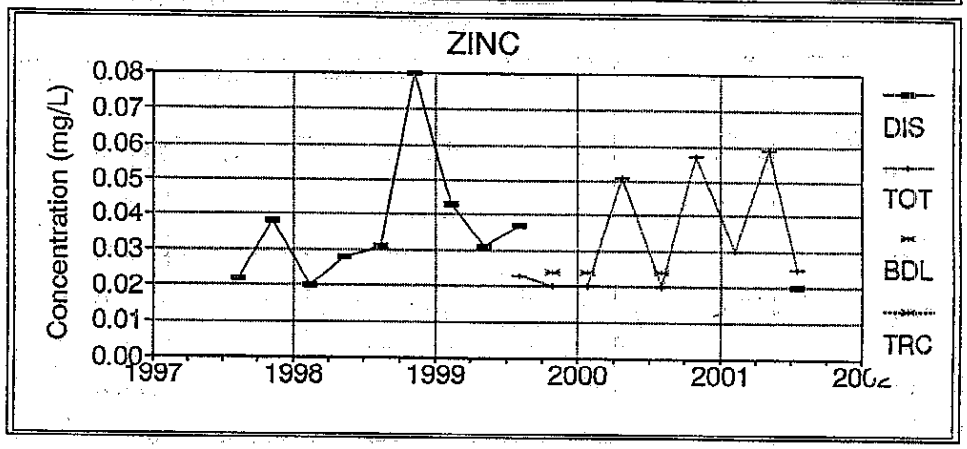






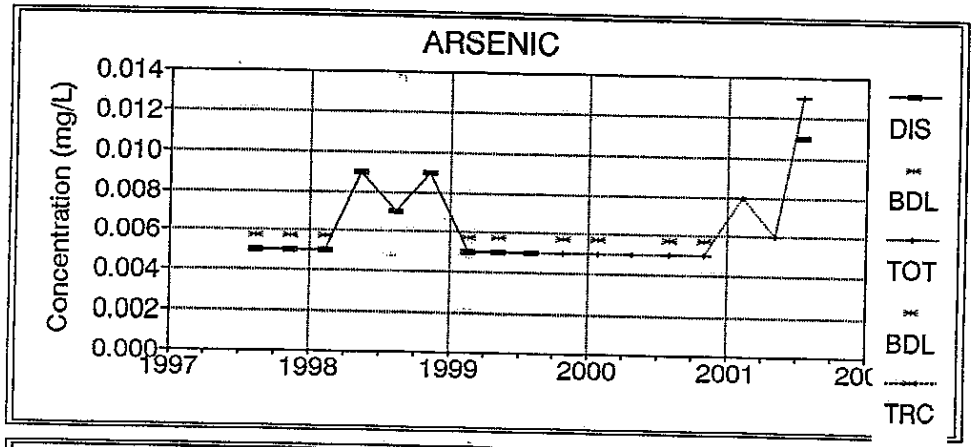


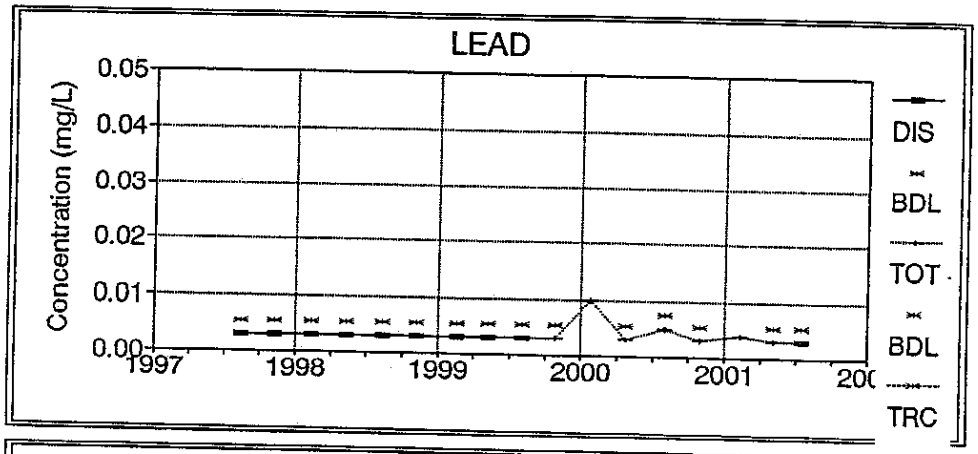


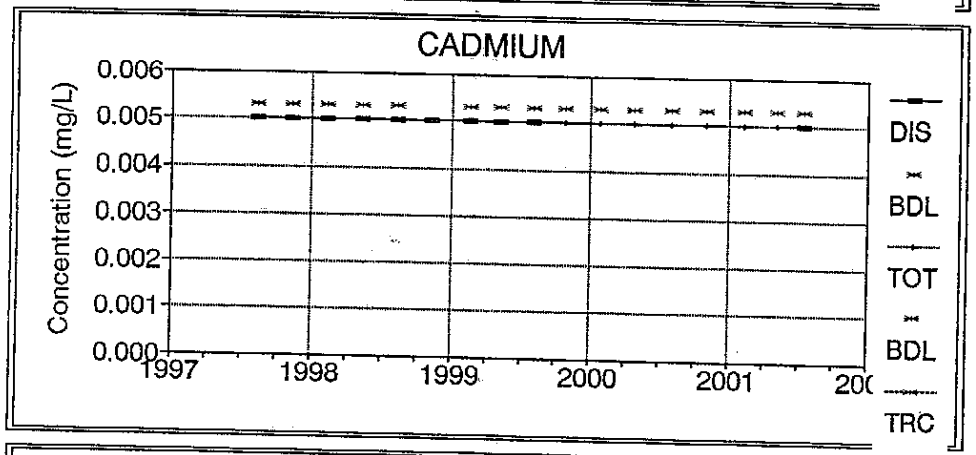


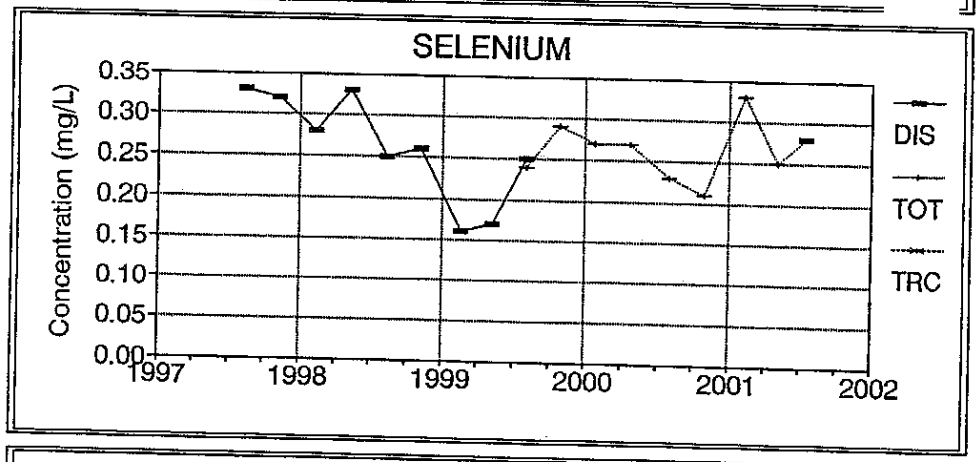
BDL - Below Analytical Detection Limit

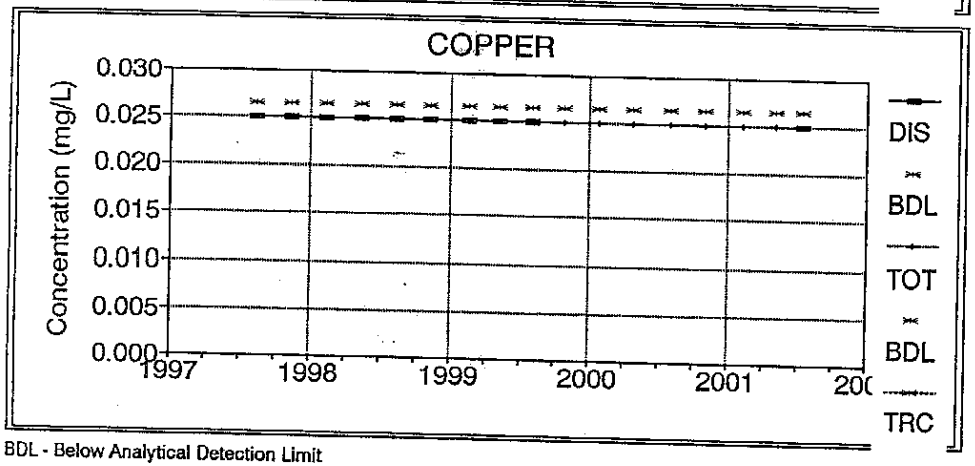
EP-(

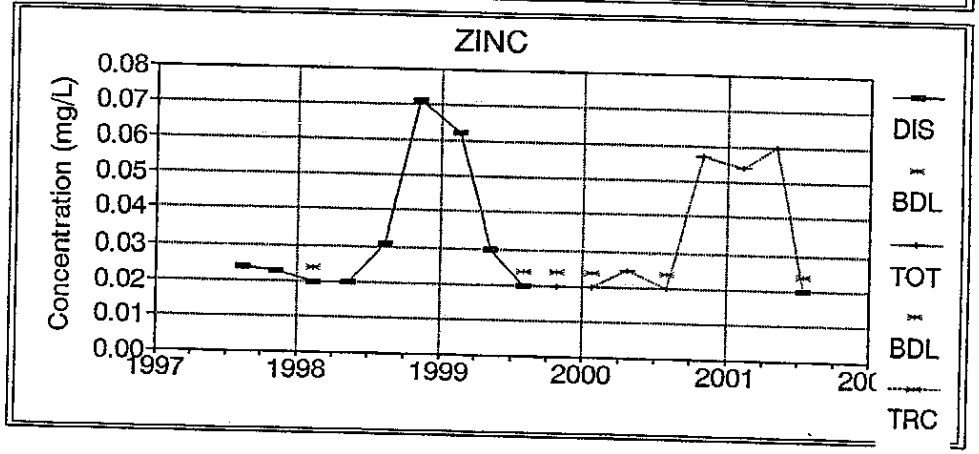












BDL - Below Analytical Detection Limit

EP-69

ARSENIC

No Data Available

N/A

LEAD

No Data Available

N/A

CADMIUM

No Data Available

N/A

SELENIUM

No Data Available

N/A

COPPER

No Data Available

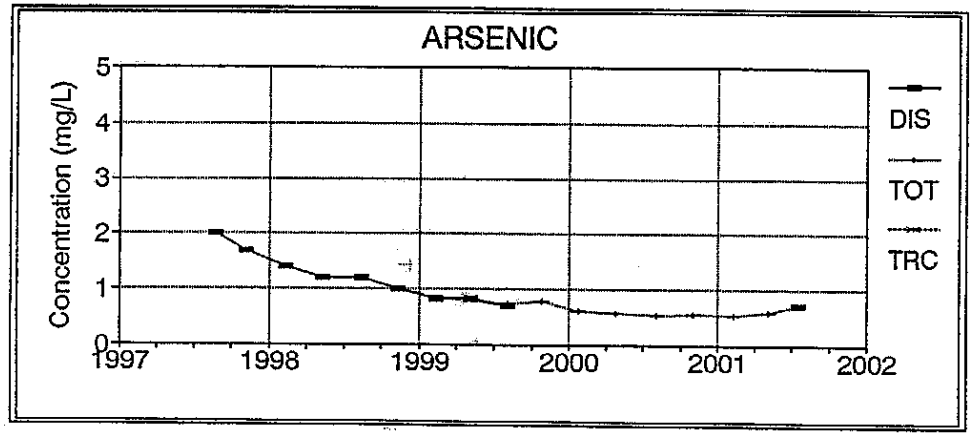
N/A

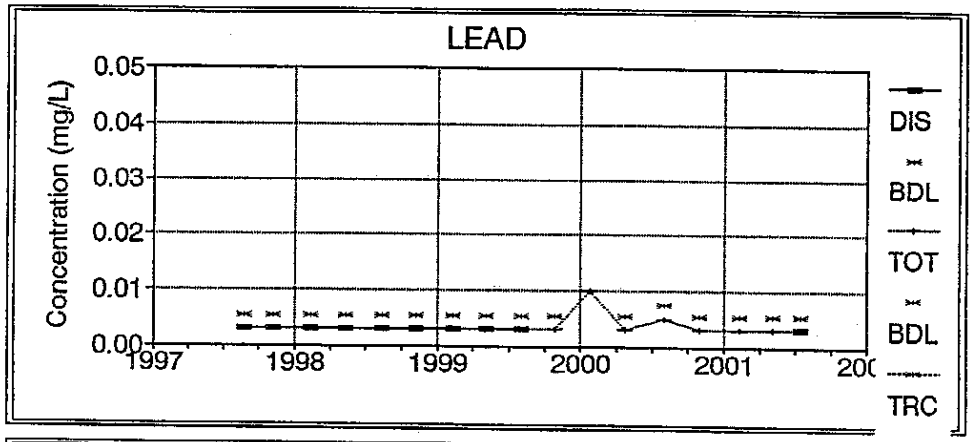
ZINC

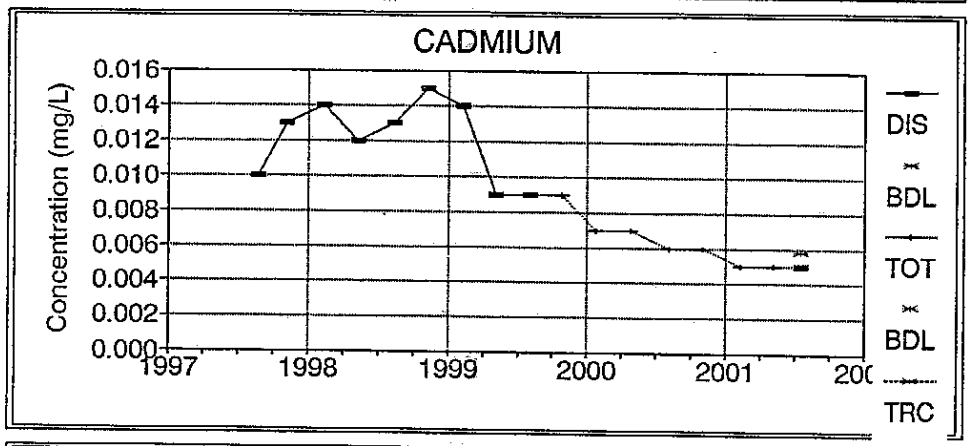
No Data Available

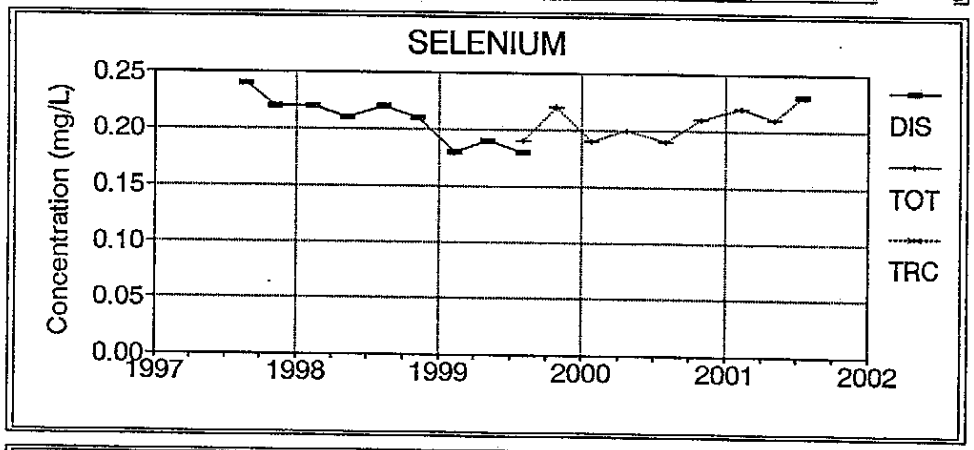
N/A

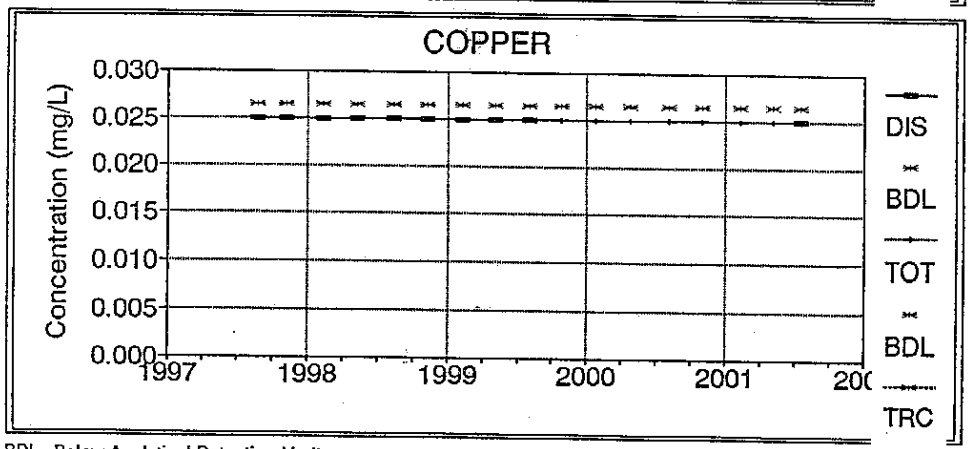
EP-7

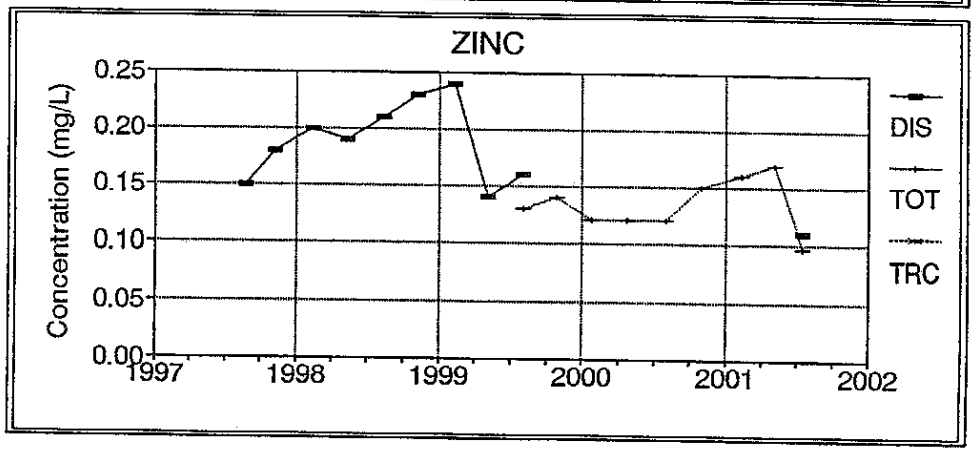












BDL - Below Analytical Detection Limit

EP-70R

ARSENIC

No Data Available

N/A

LEAD

No Data Available

N/A

CADMIUM

No Data Available

N/A

SELENIUM

No Data Available

N/A

COPPER

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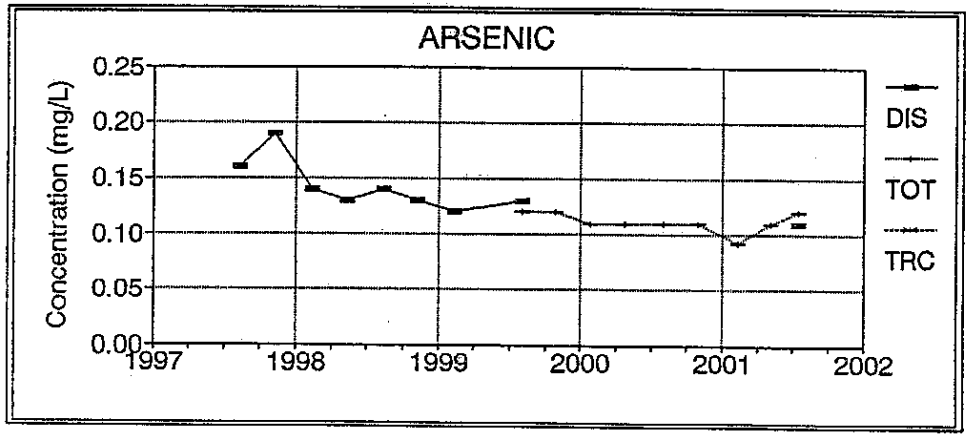
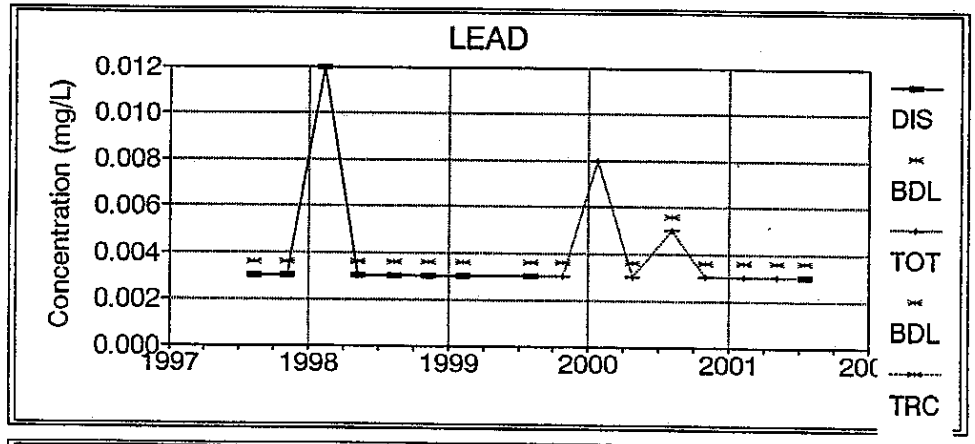
ZINC

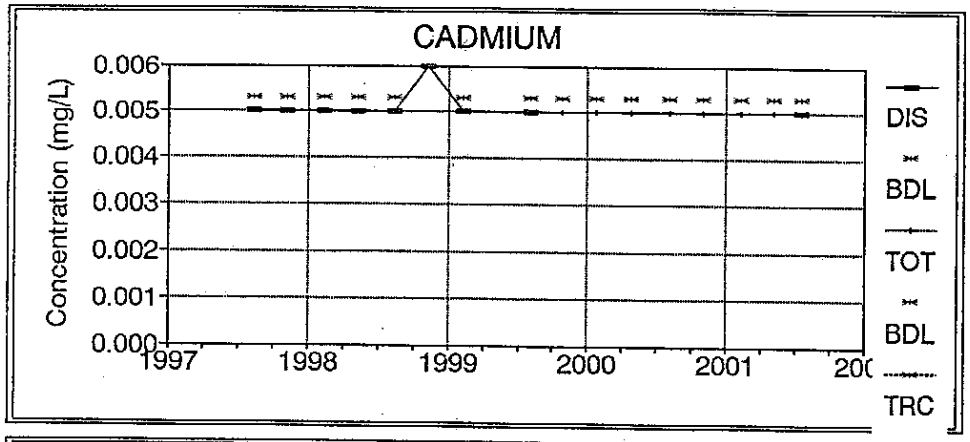
No Data Available

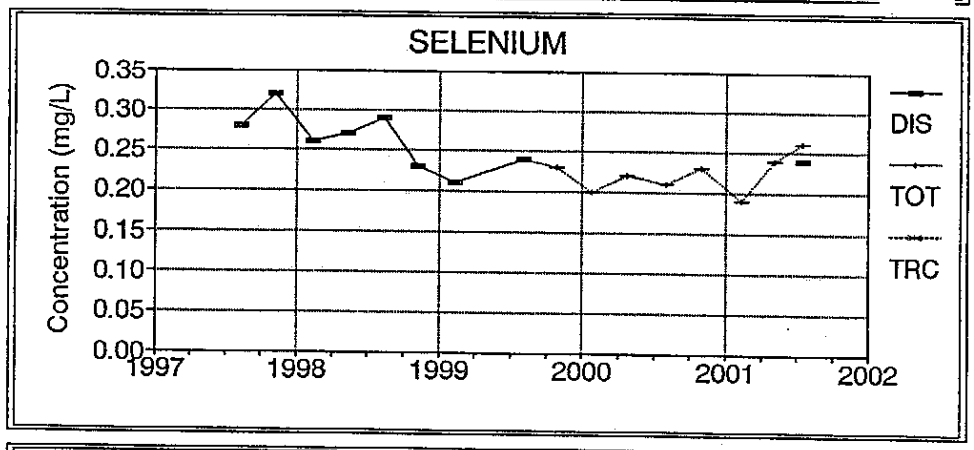
N/A

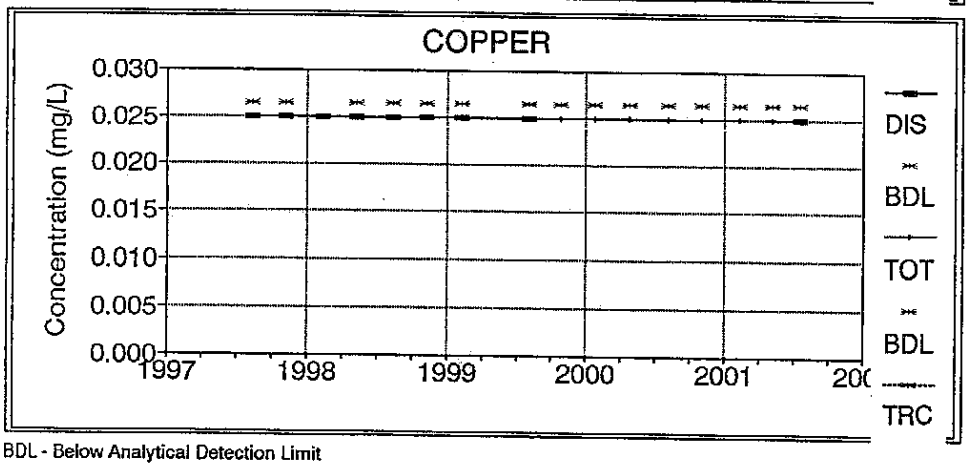
EP-1

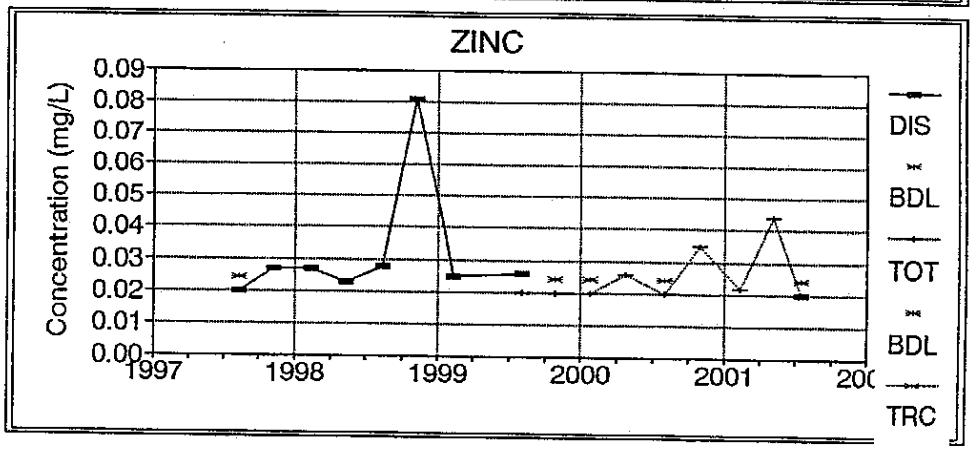












BDL - Below Analytical Detection Limit

EP-71R

ARSENIC

No Data Available

N/A

LEAD

No Data Available

N/A

CADMIUM

No Data Available

N/A

SELENIUM

No Data Available

N/A

COPPER

No Data Available

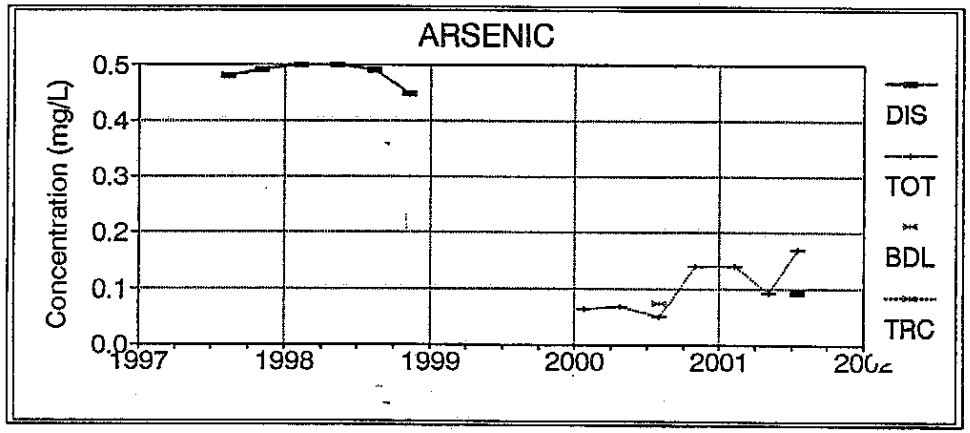
N/A

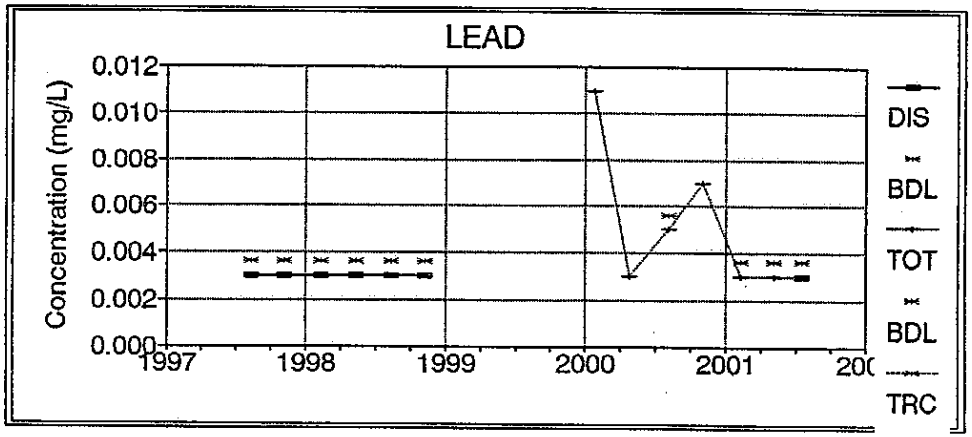
ZINC

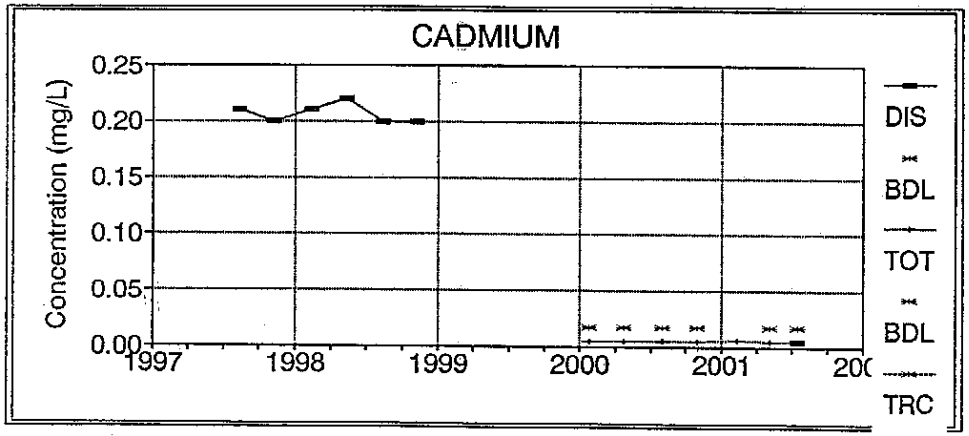
No Data Available

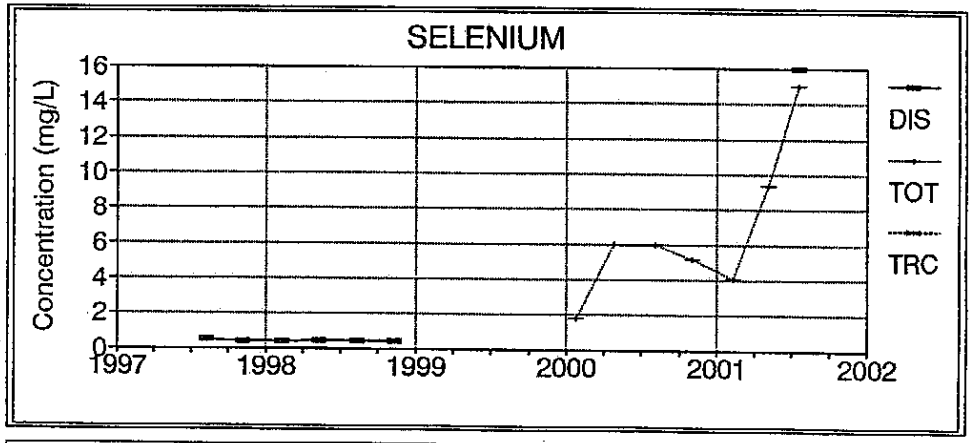
N/A

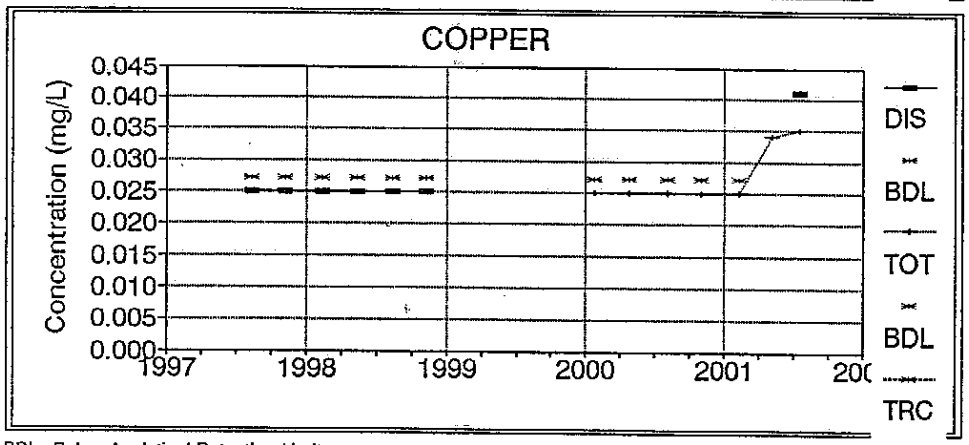
EP-7

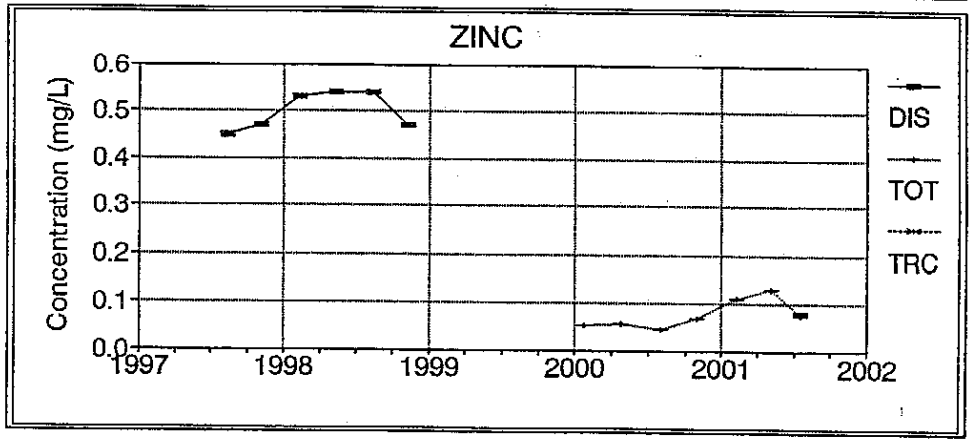






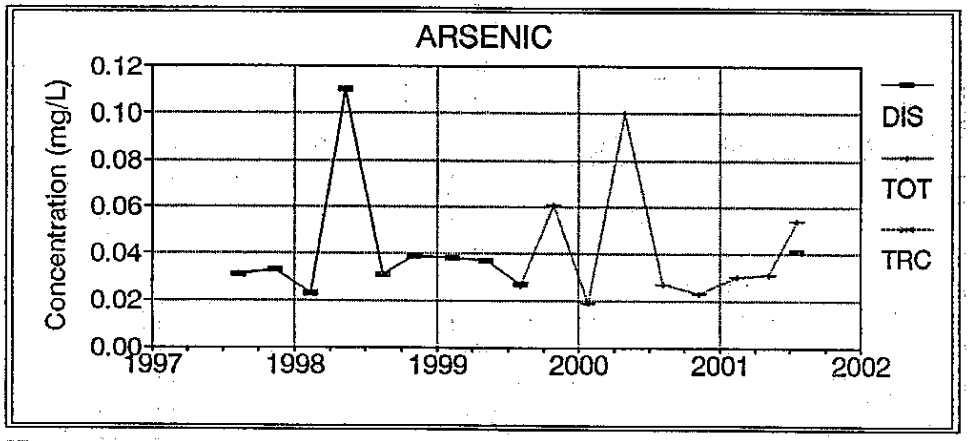


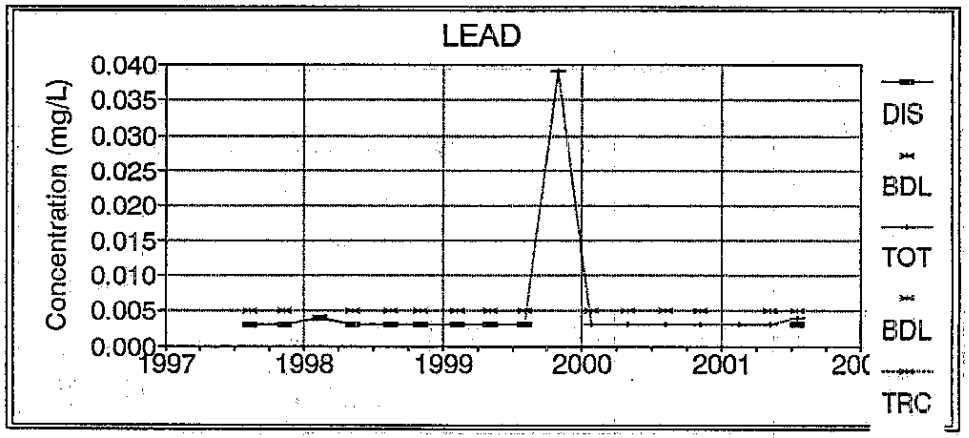


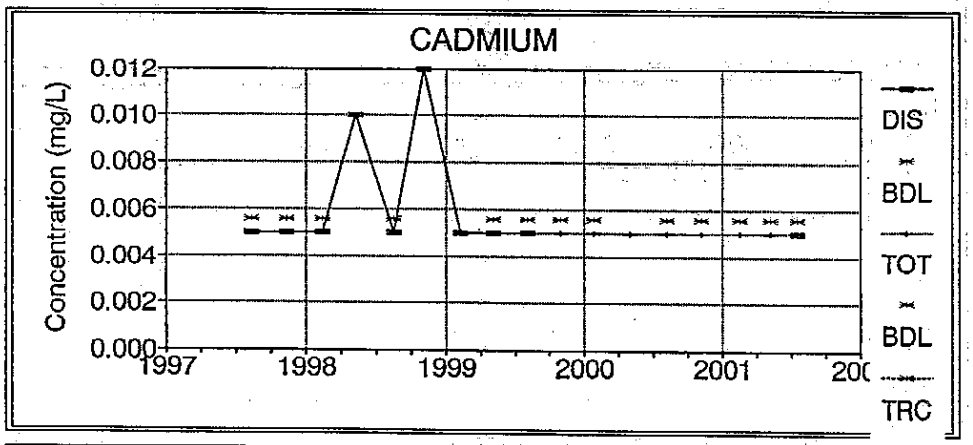


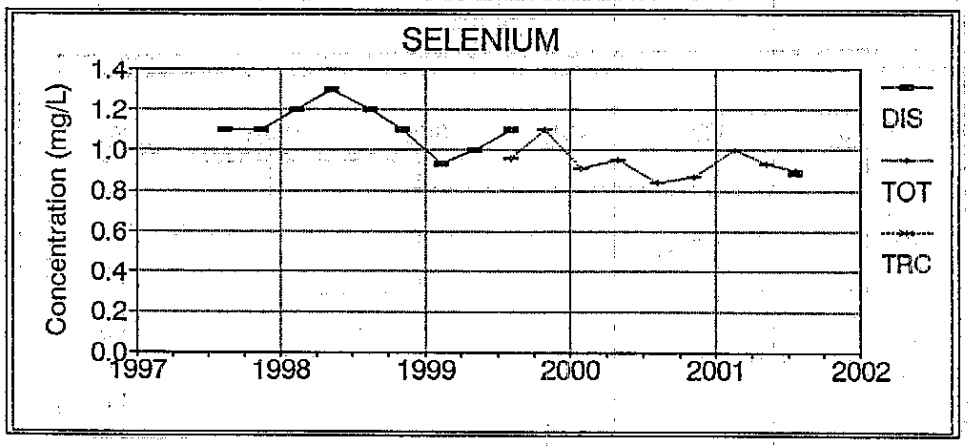
BDL - Below Analytical Detection Limit

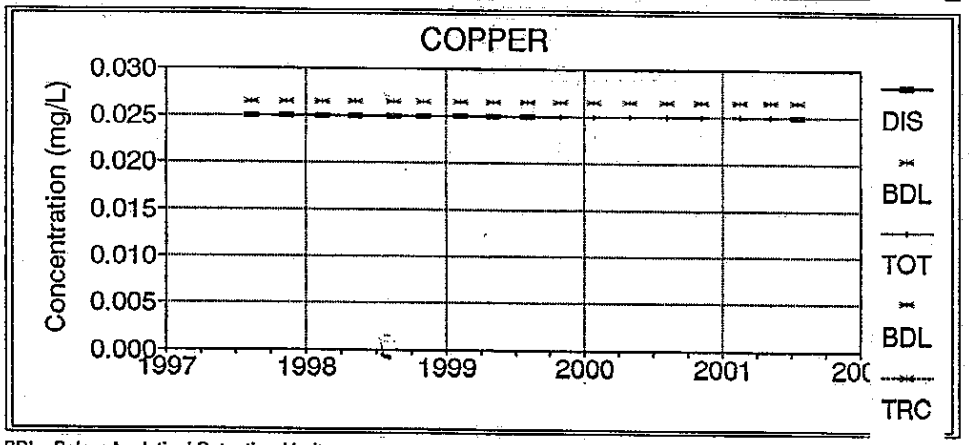
EP-73

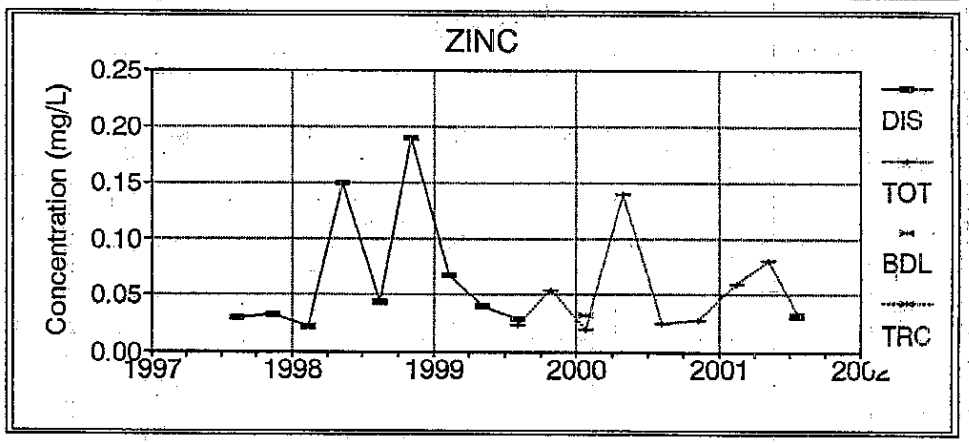






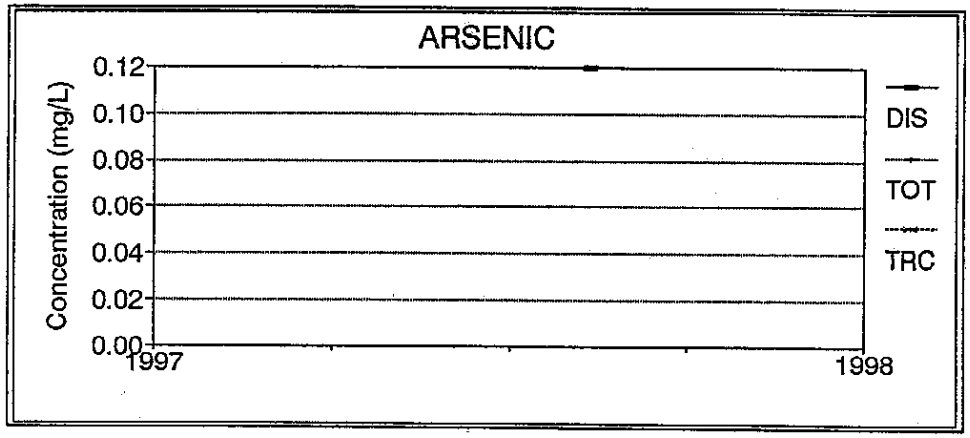


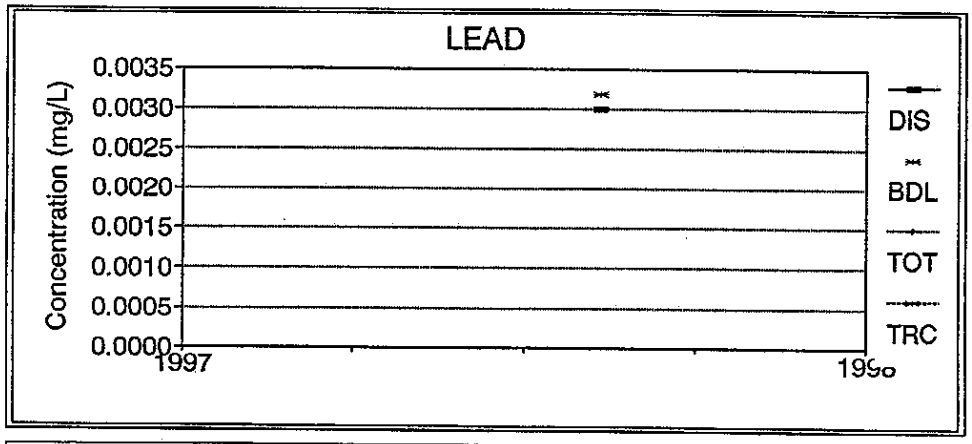


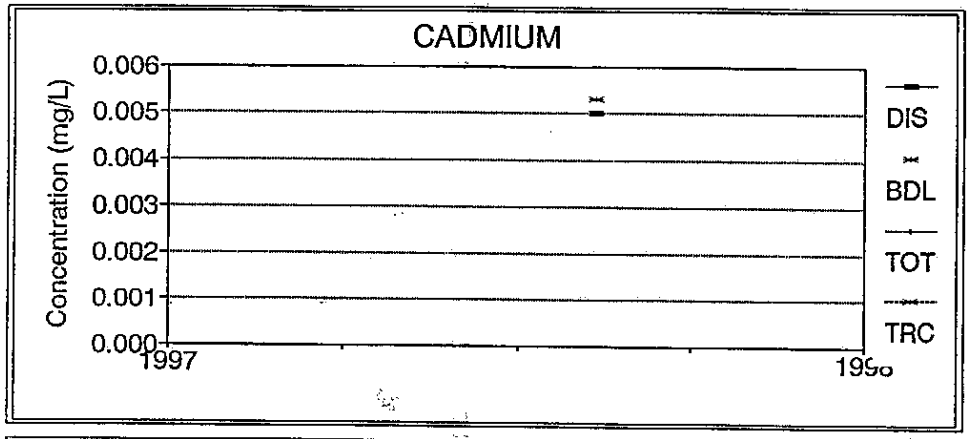


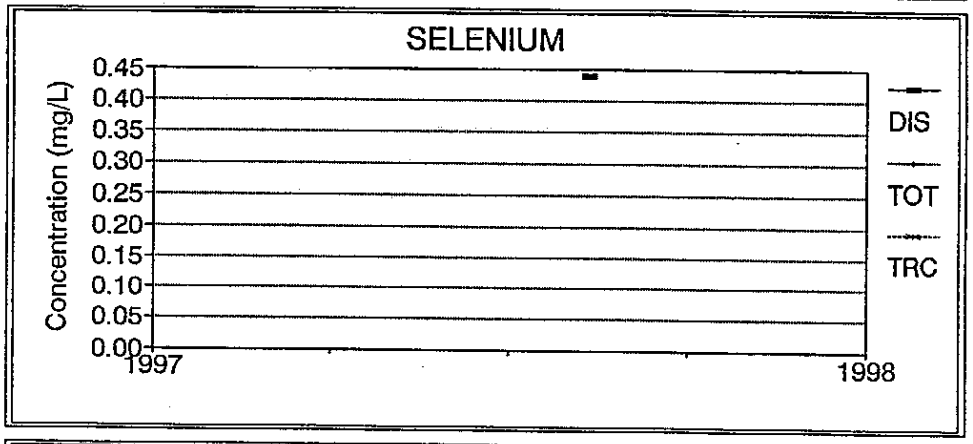
BDL - Below Analytical Detection Limit

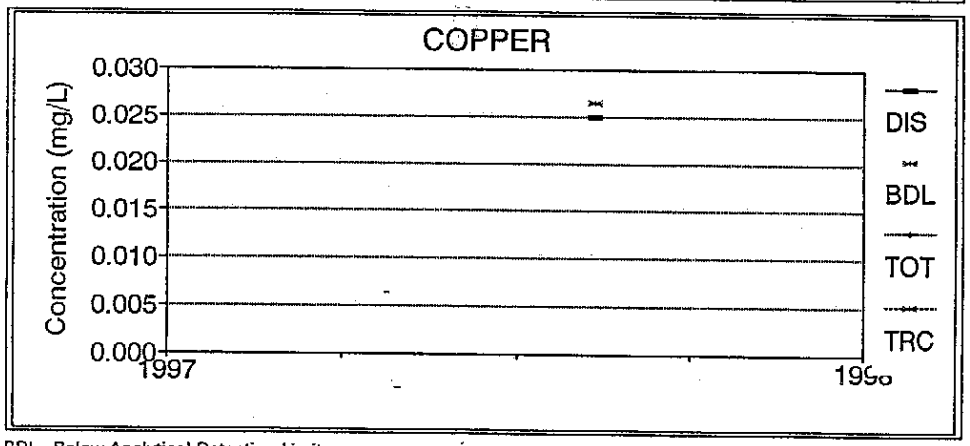
EP-1

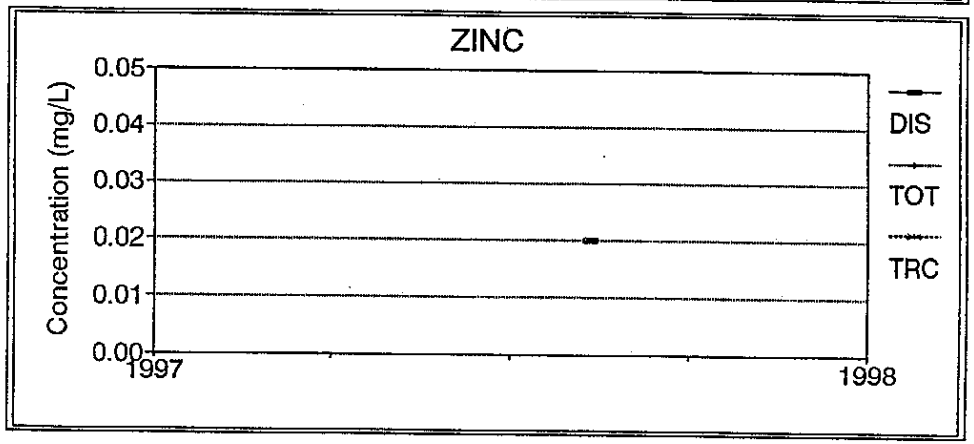






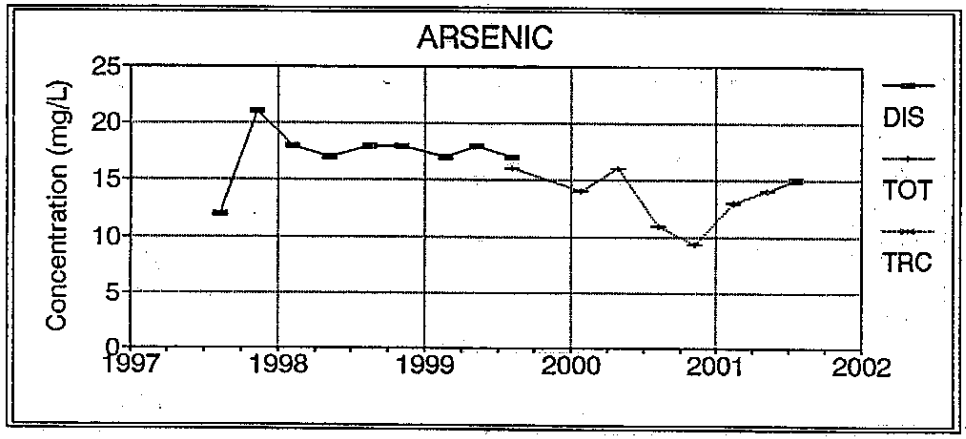


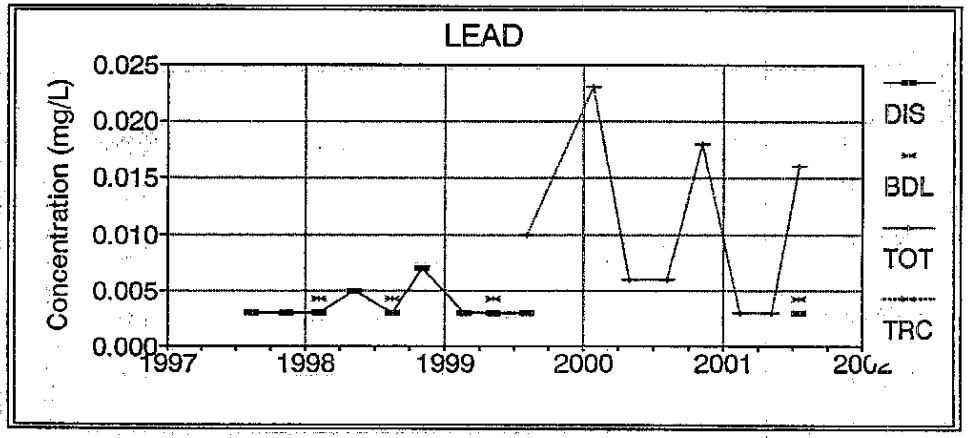


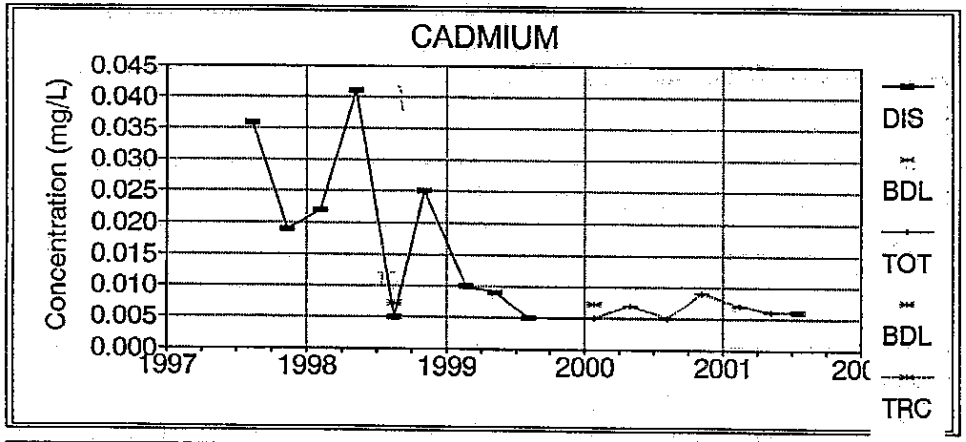


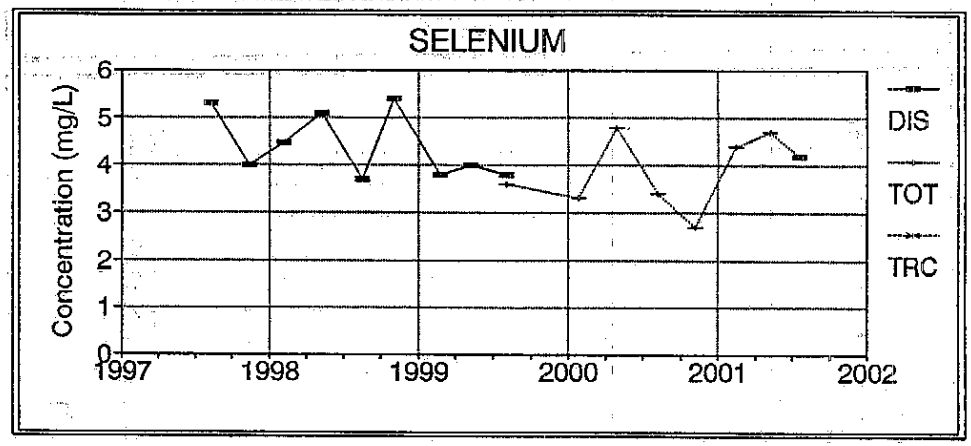
BDL - Below Analytical Detection Limit

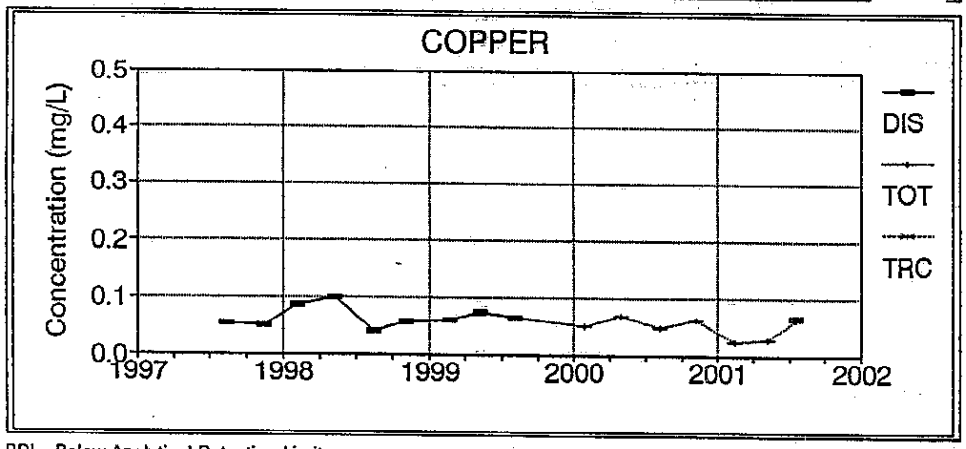
EP-75

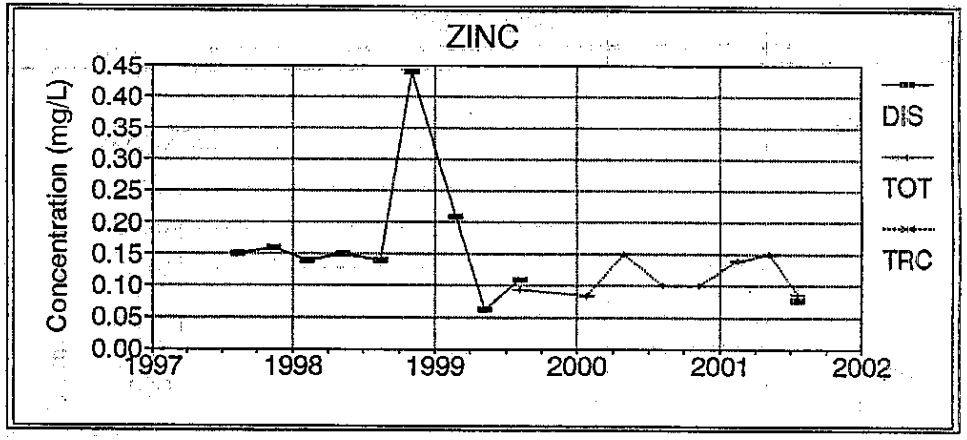






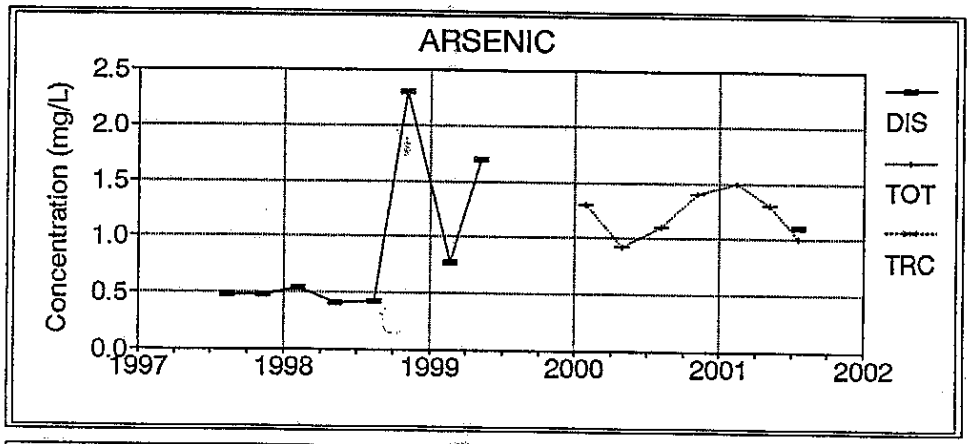


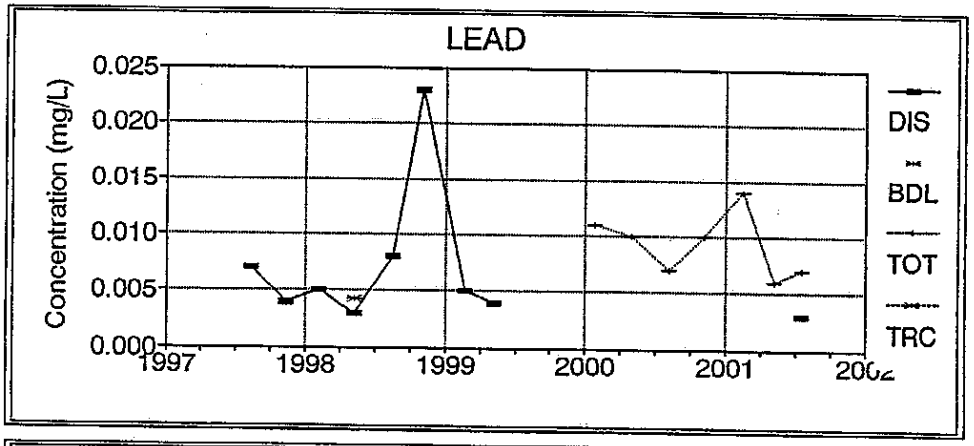


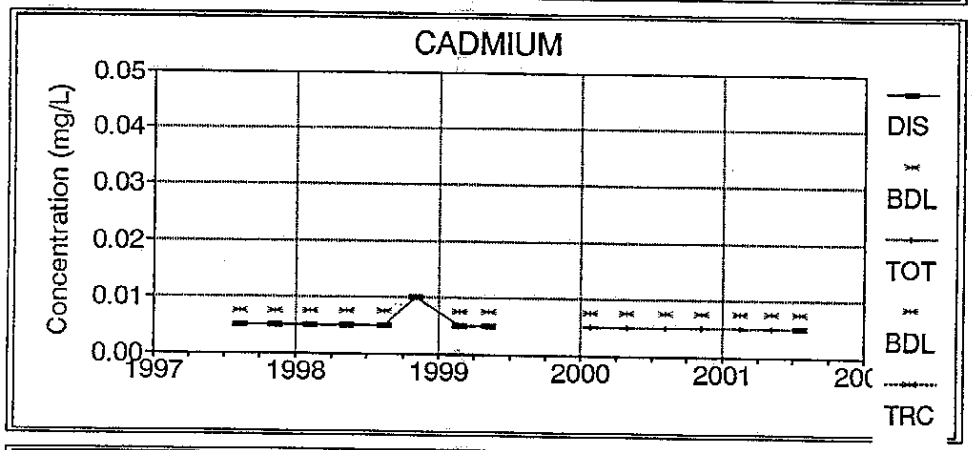


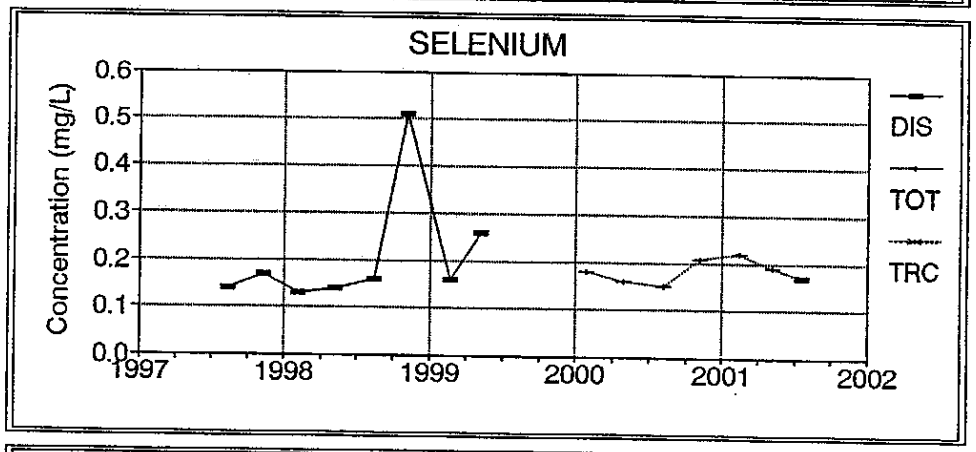
BDL - Below Analytical Detection Limit

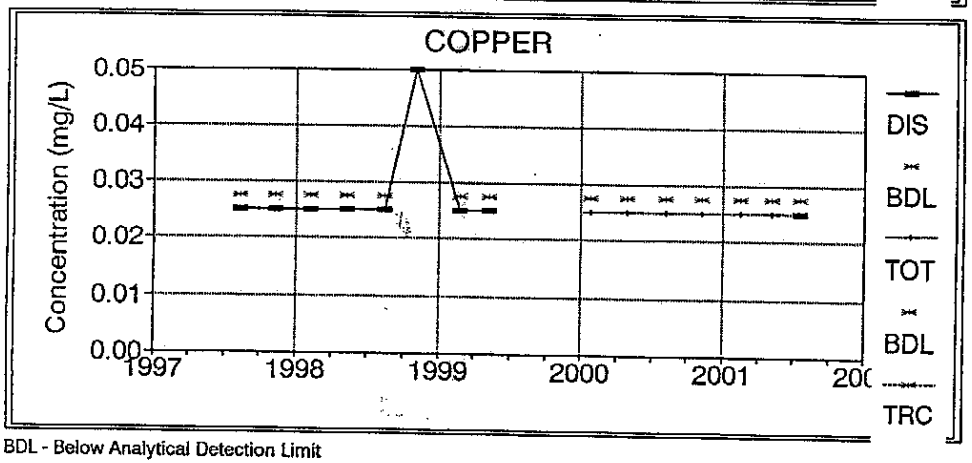
EP-

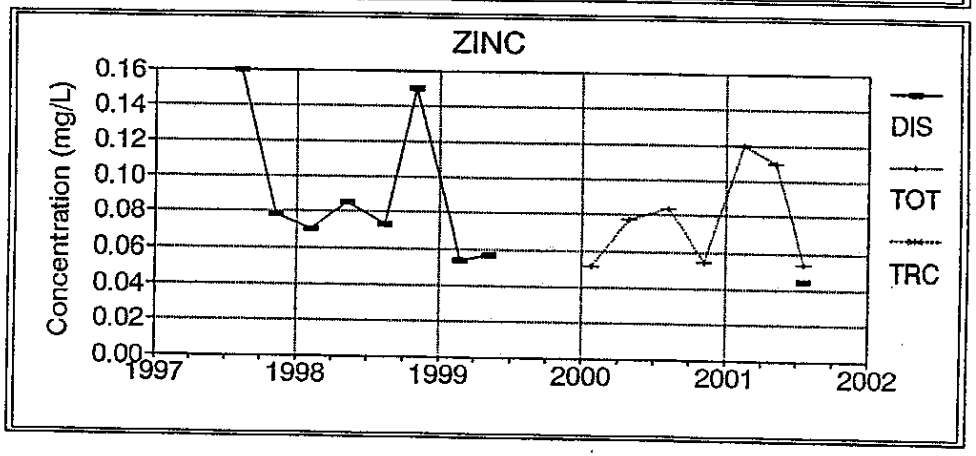






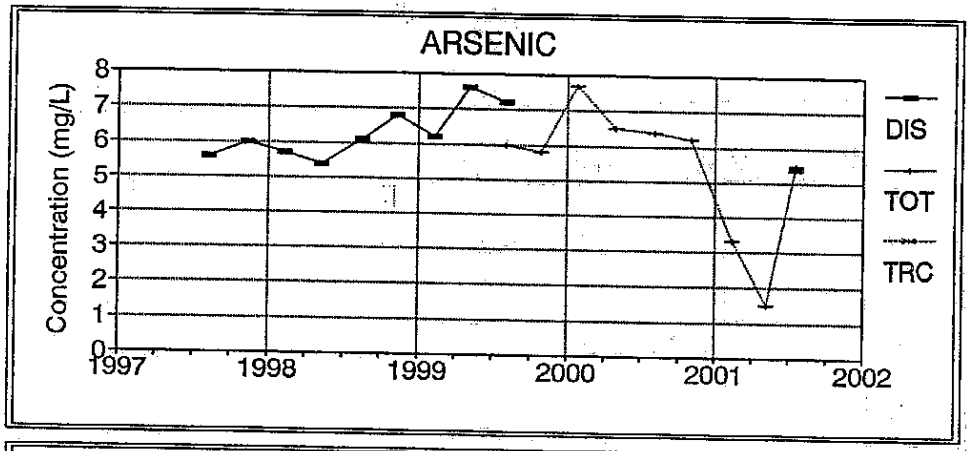


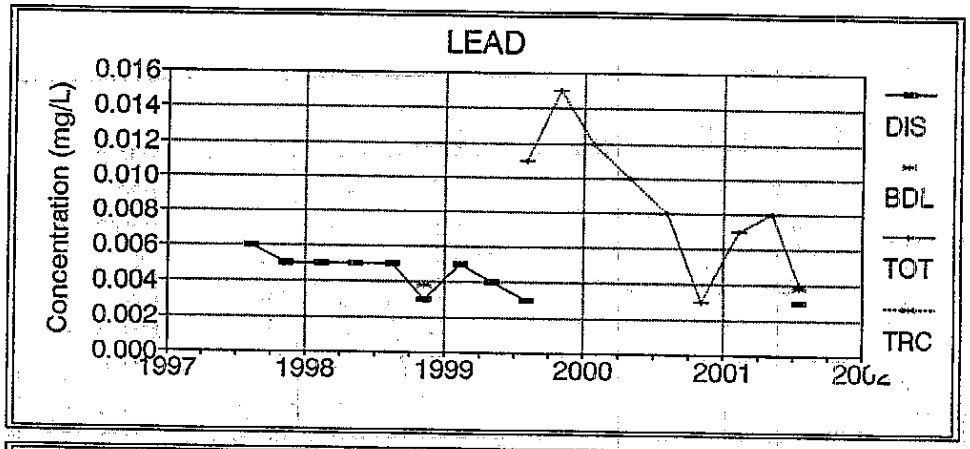


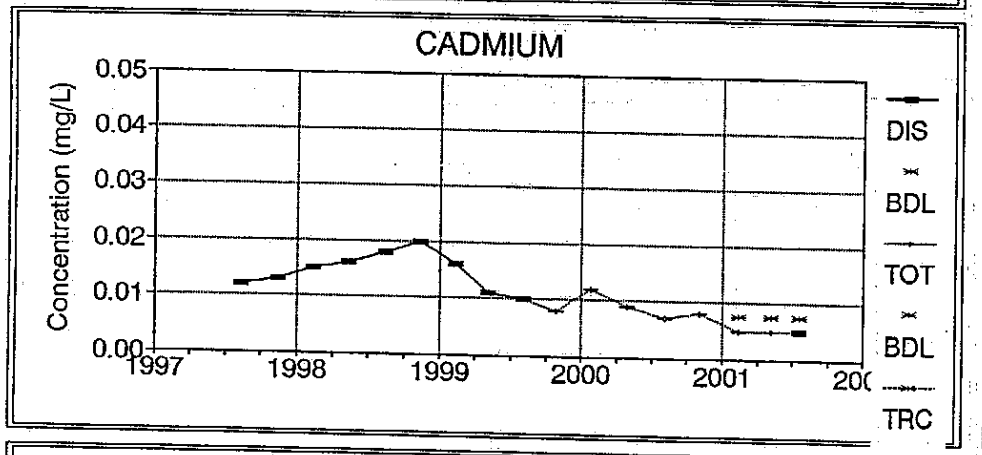


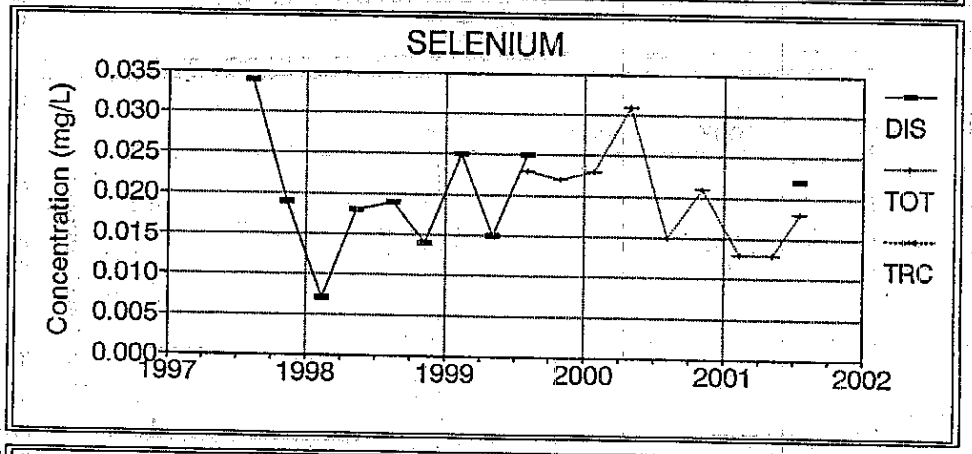
BDL - Below Analytical Detection Limit

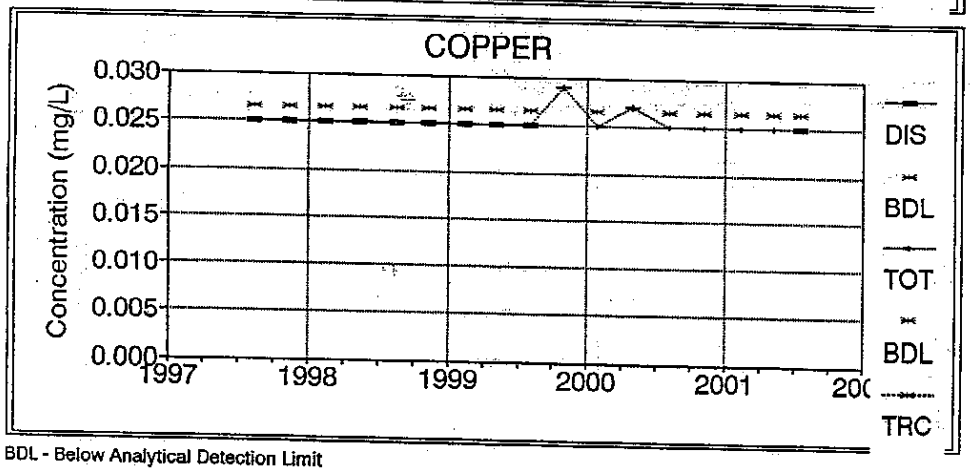
EP-77

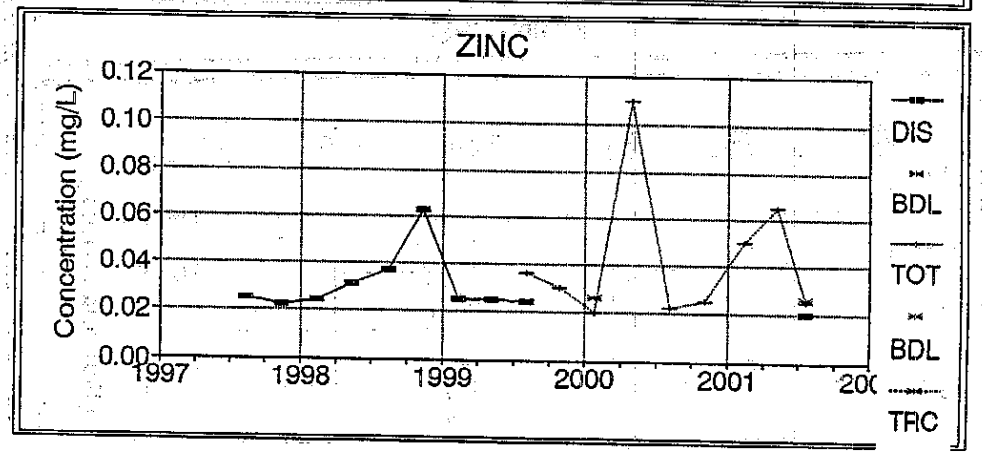






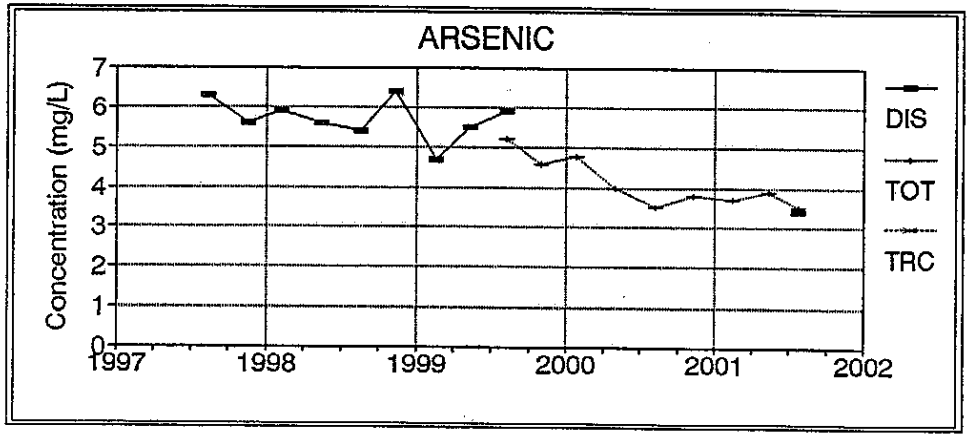


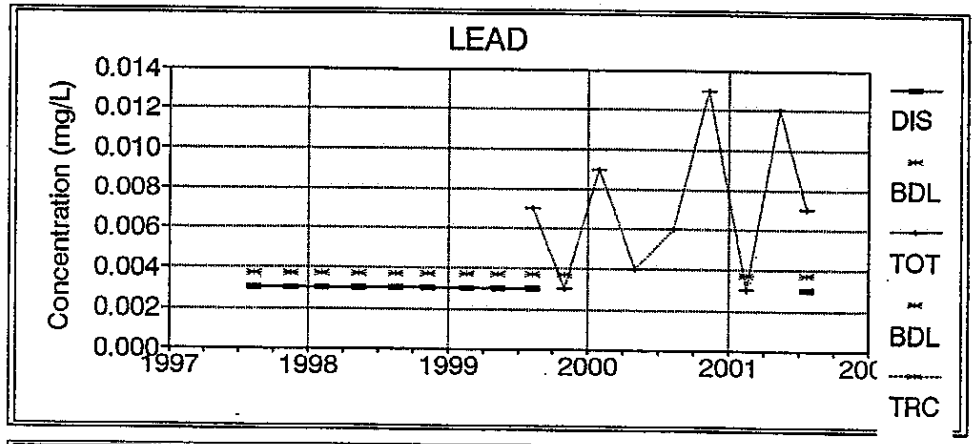


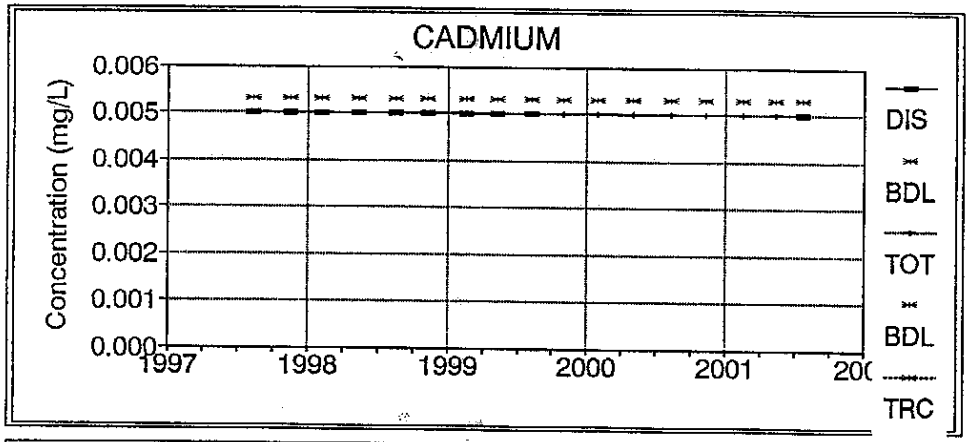


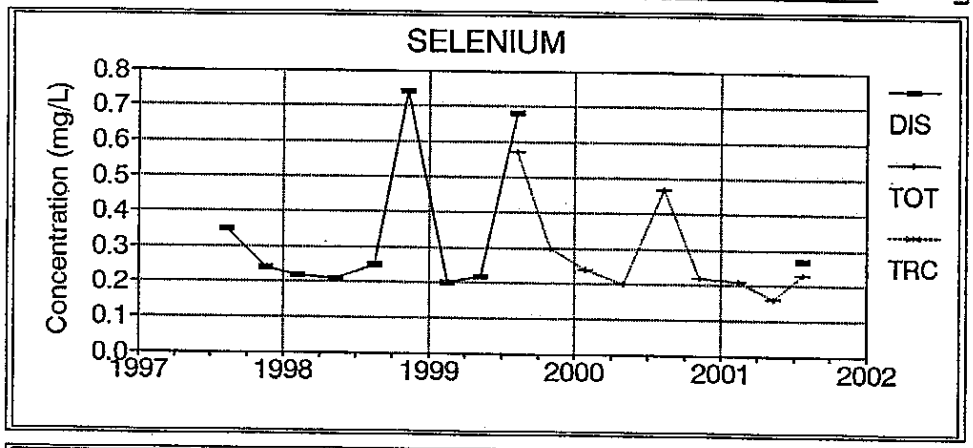
BDL - Below Analytical Detection Limit

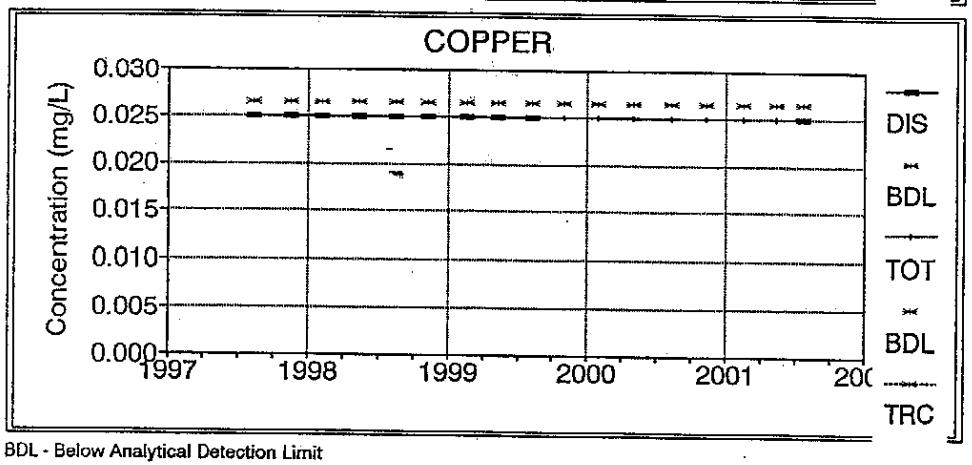
EP-7

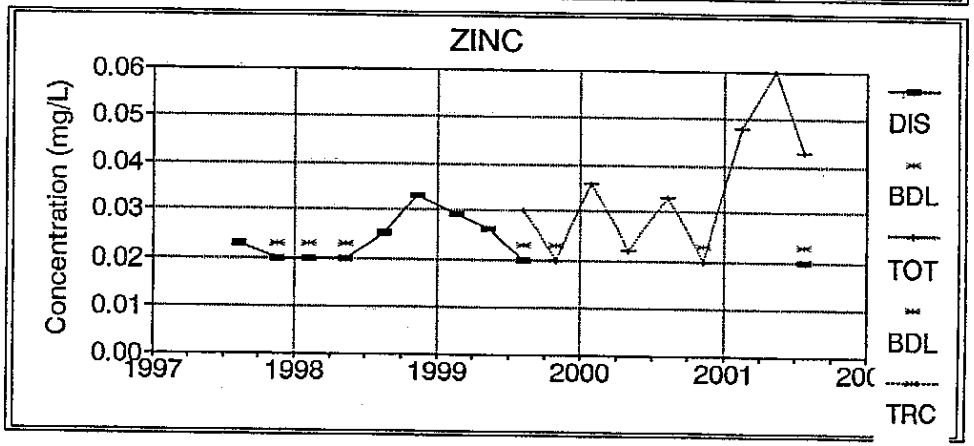






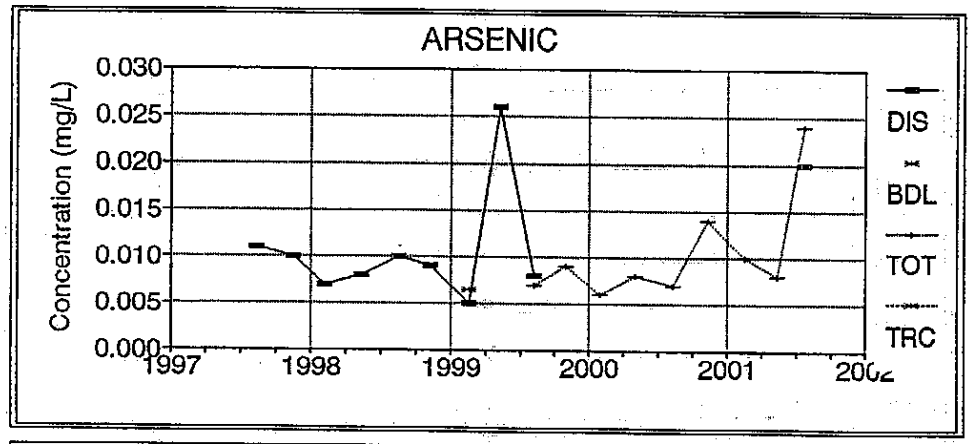


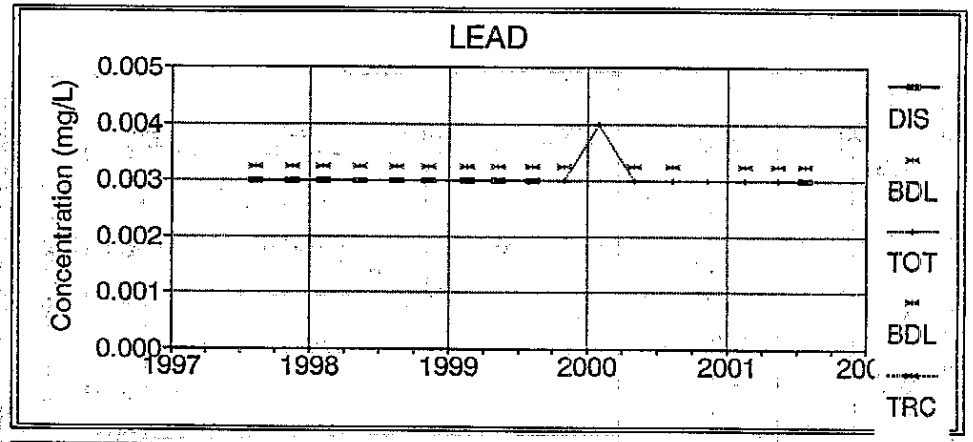


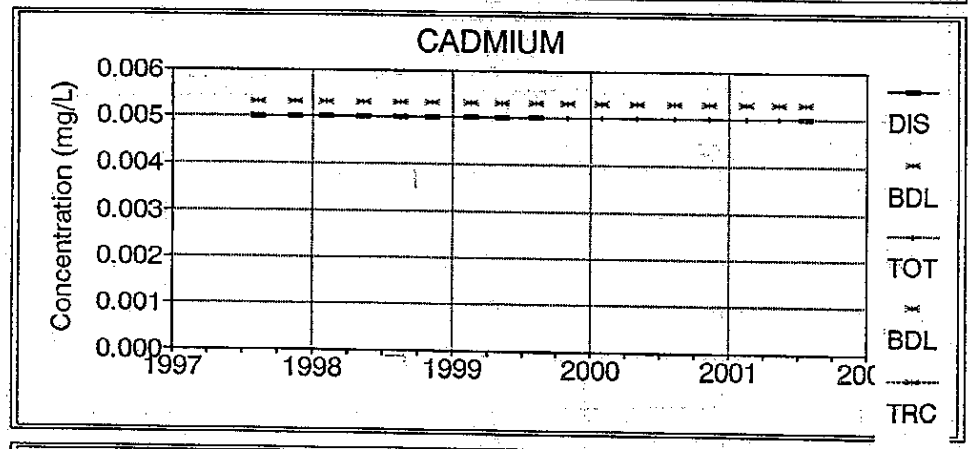


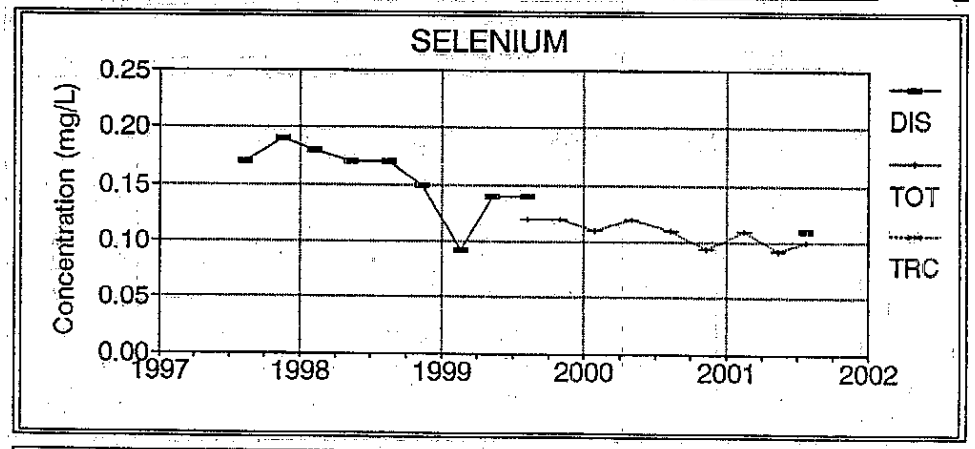
BDL - Below Analytical Detection Limit

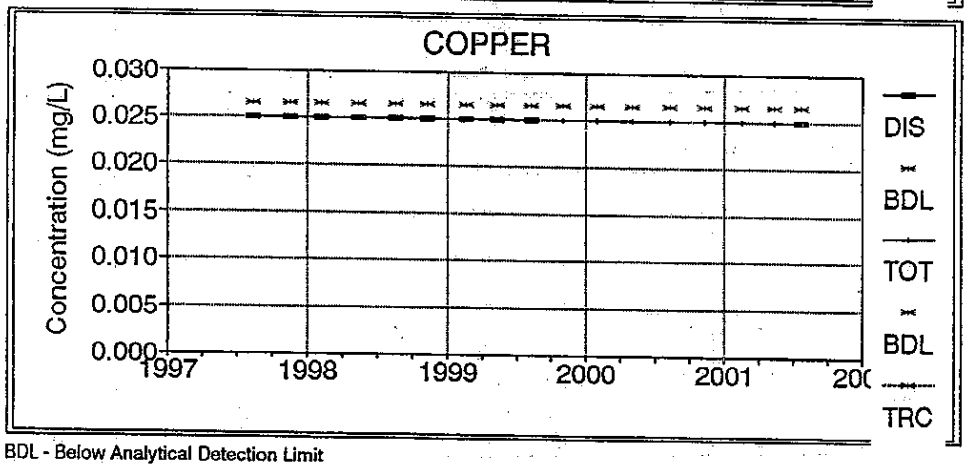
EP-79

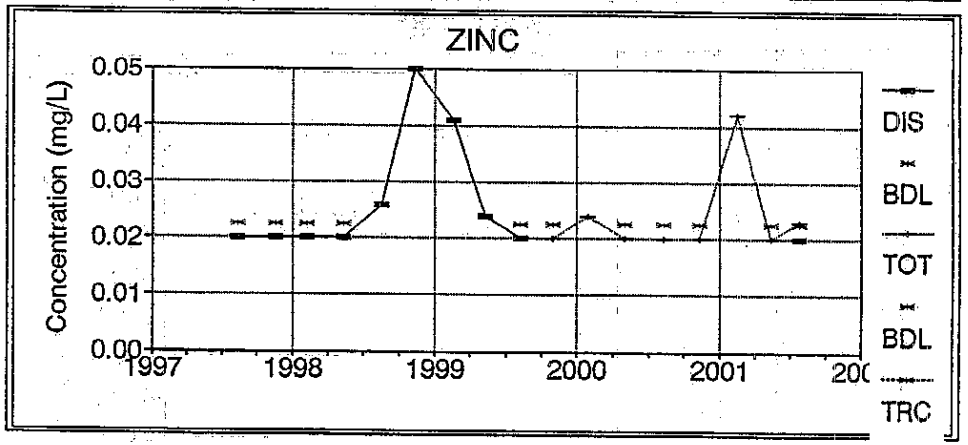












BDL - Below Analytical Detection Limit

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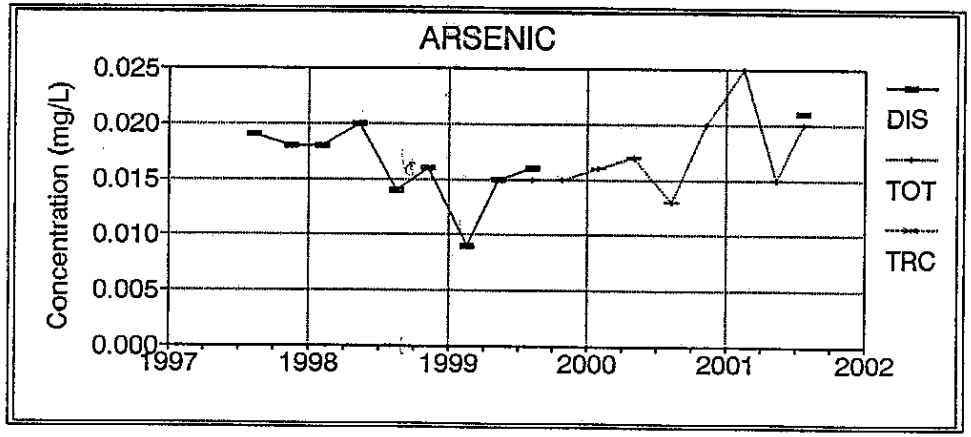

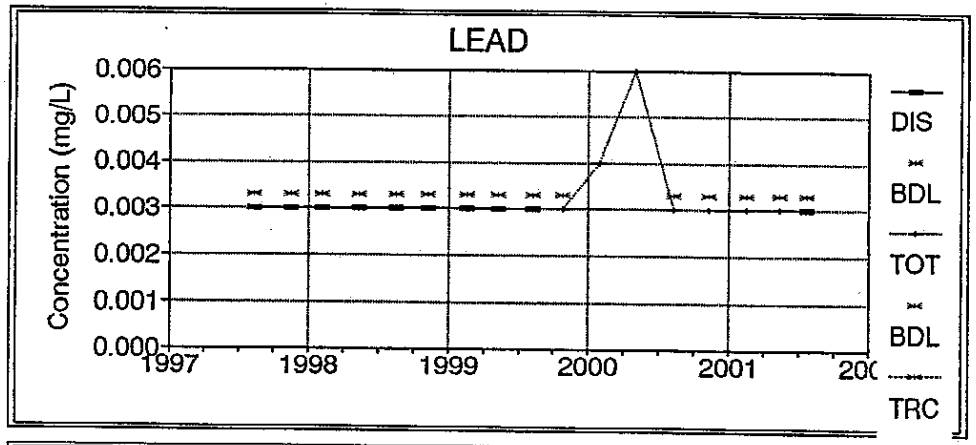

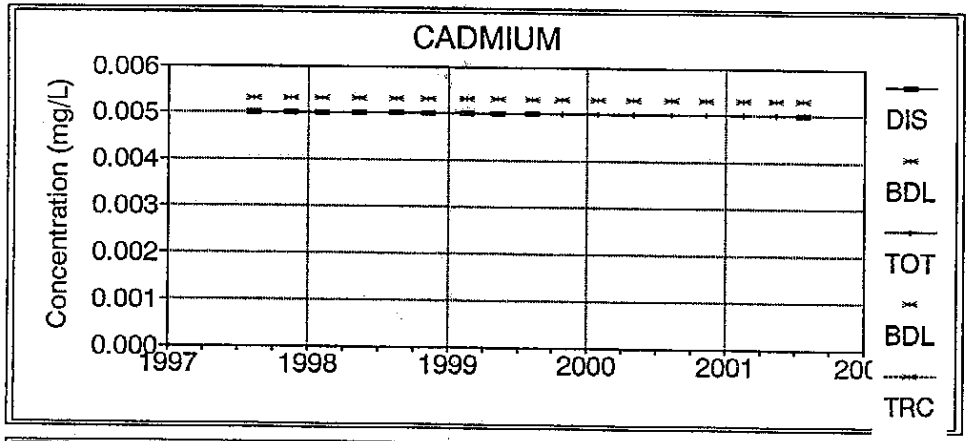

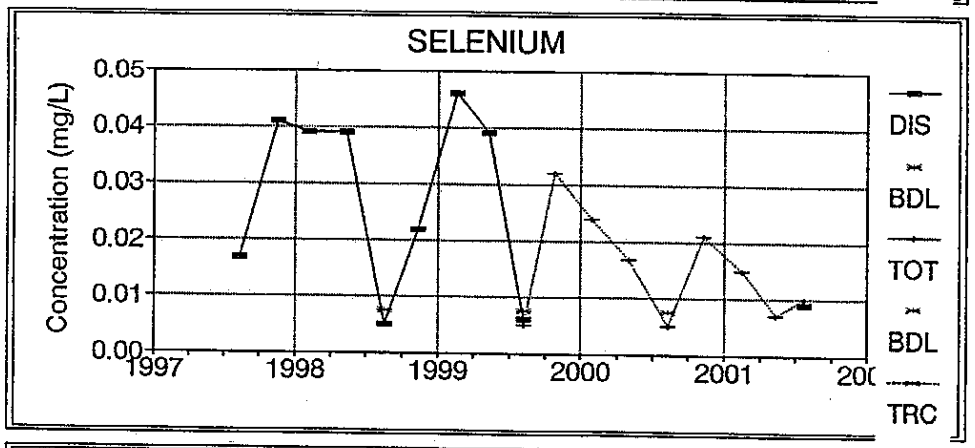

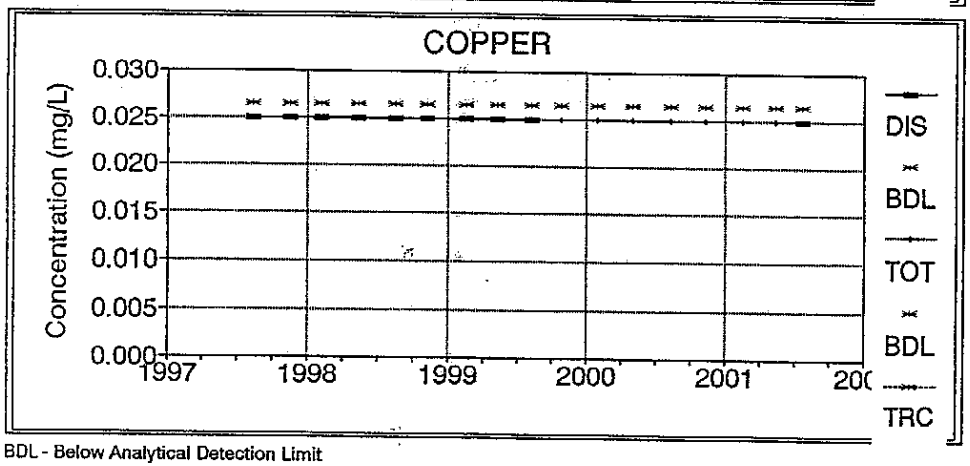

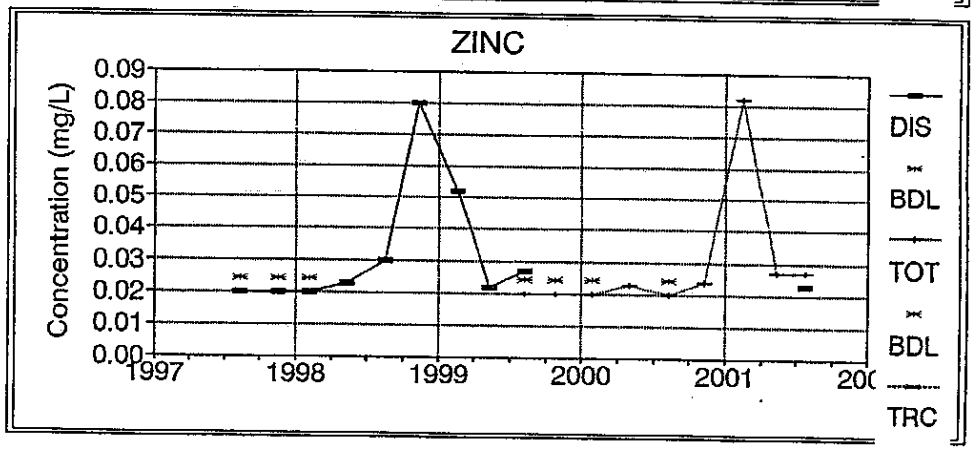

BDL - Below Analytical Detection Limit

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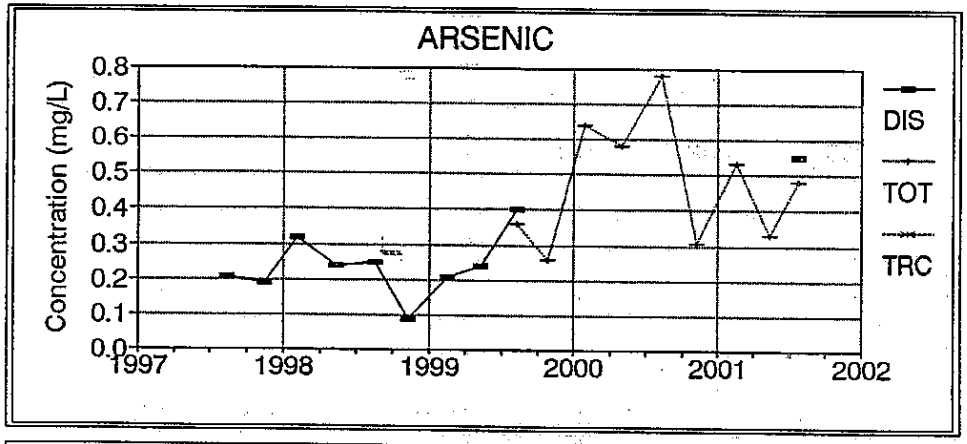

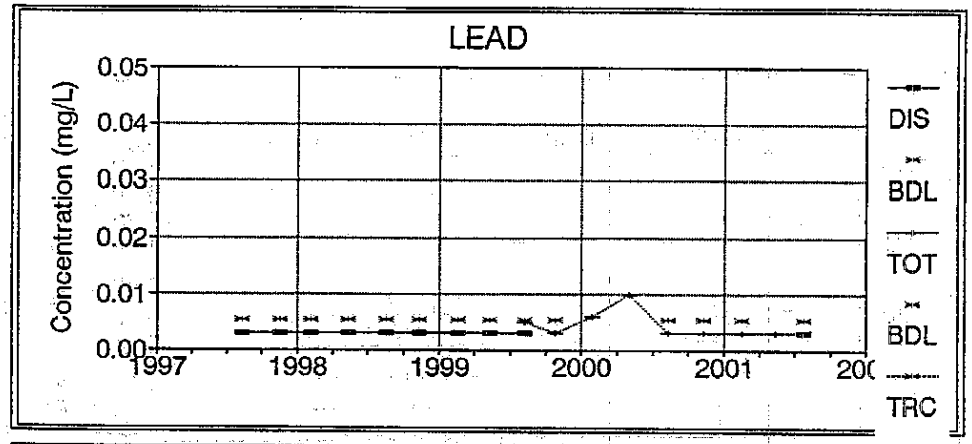

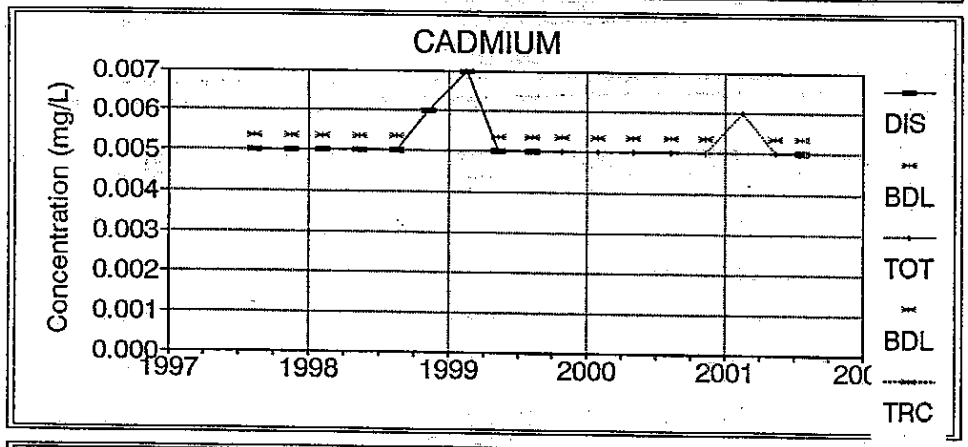

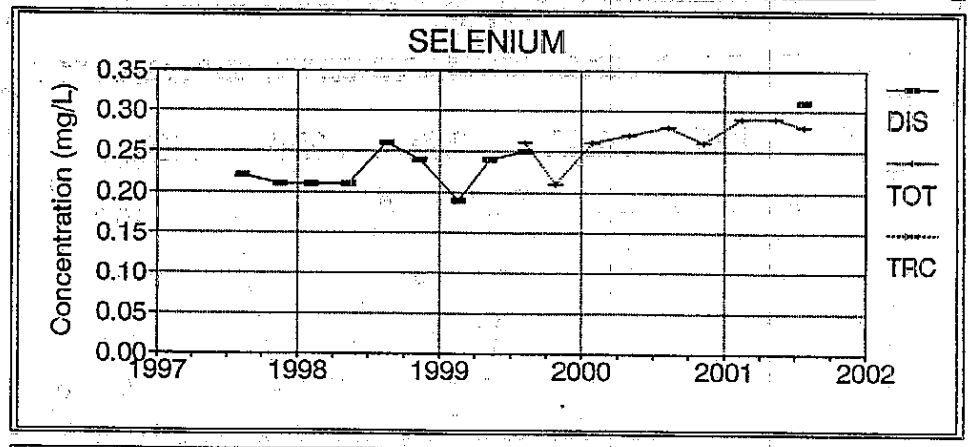

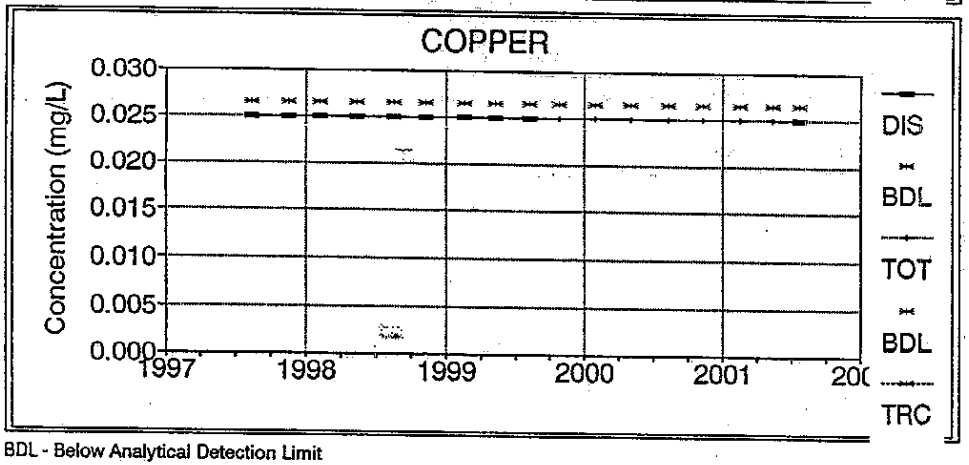

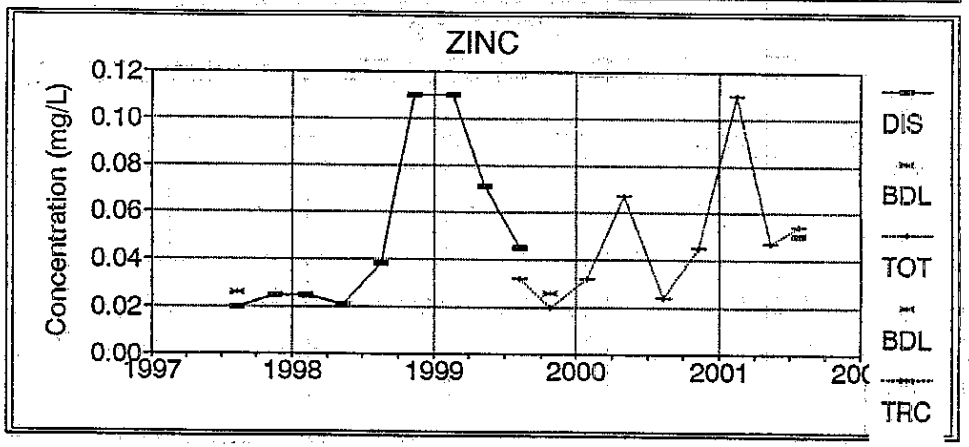

BDL - Below Analytical Detection Limit

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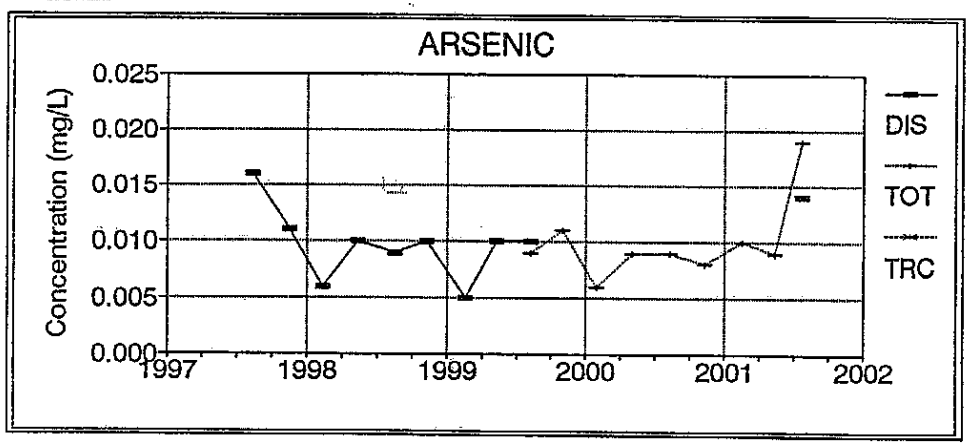

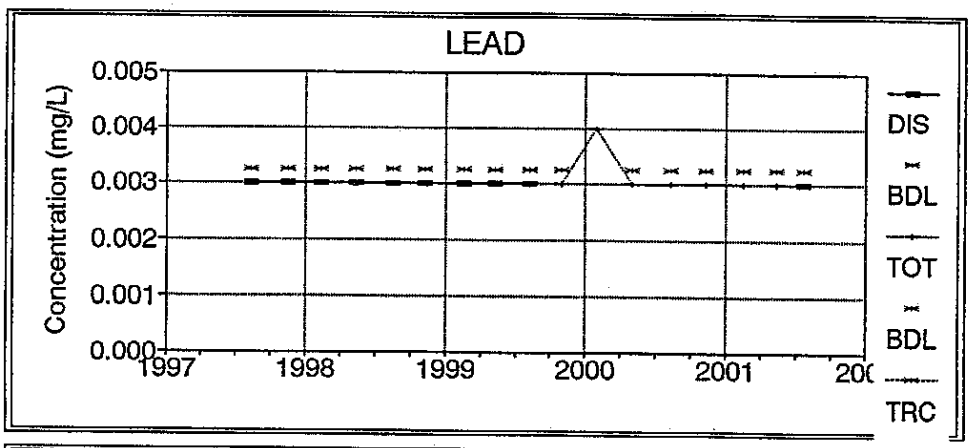

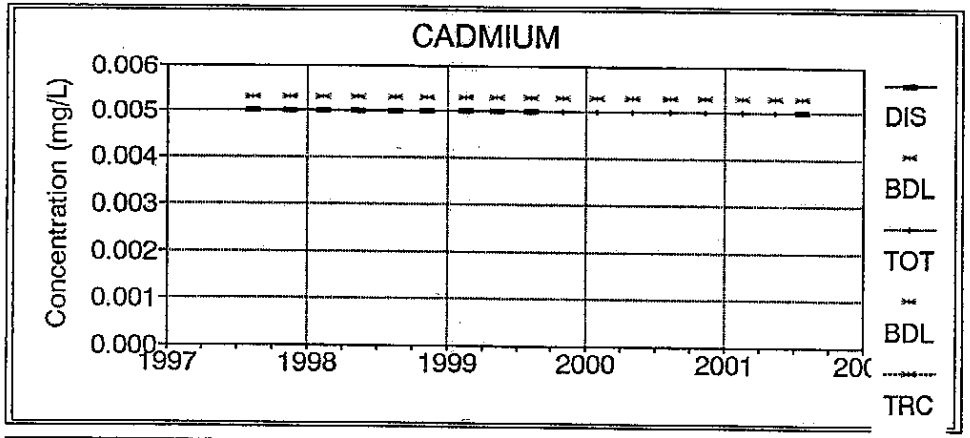

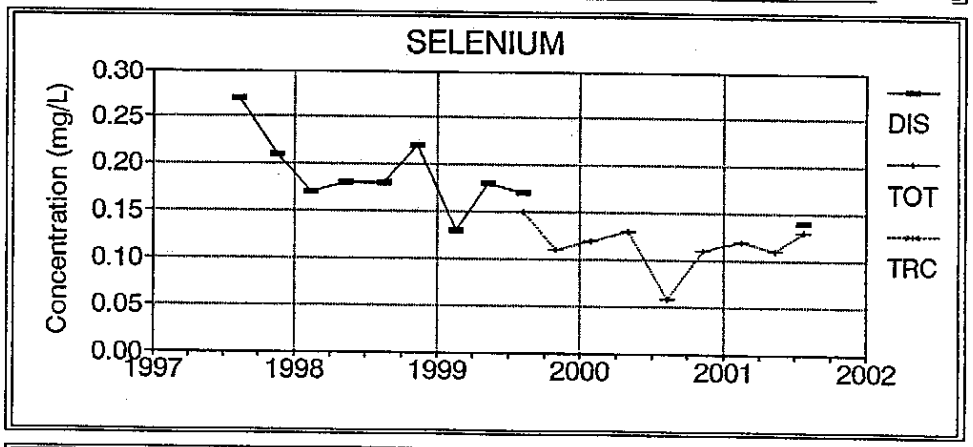

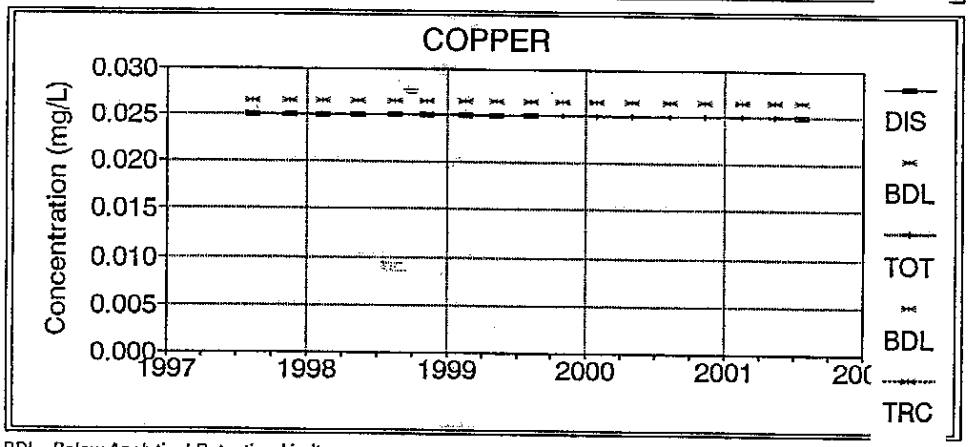

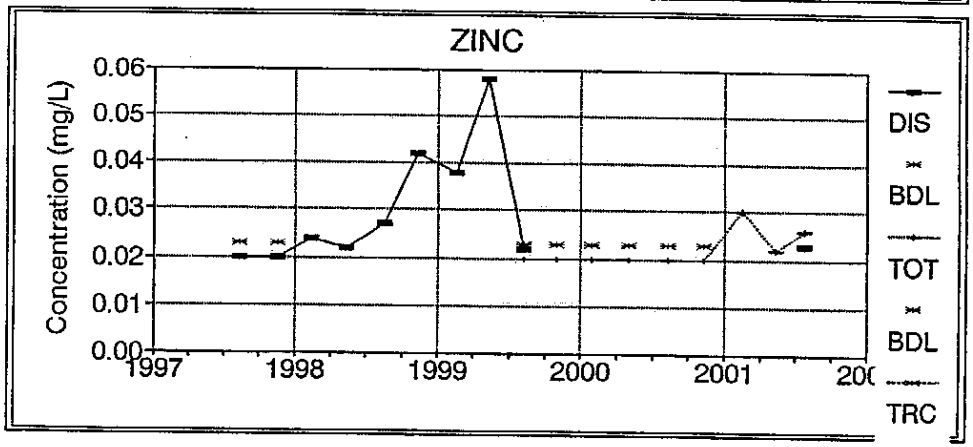

BDL - Below Analytical Detection Limit

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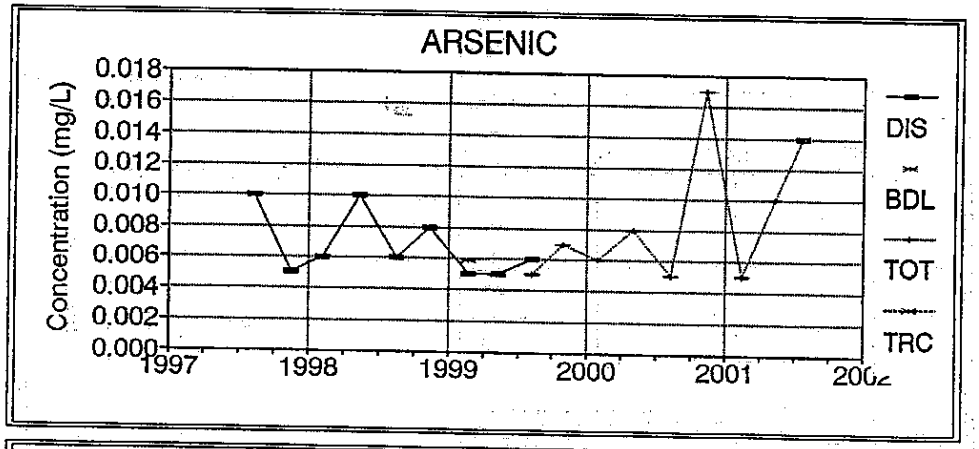
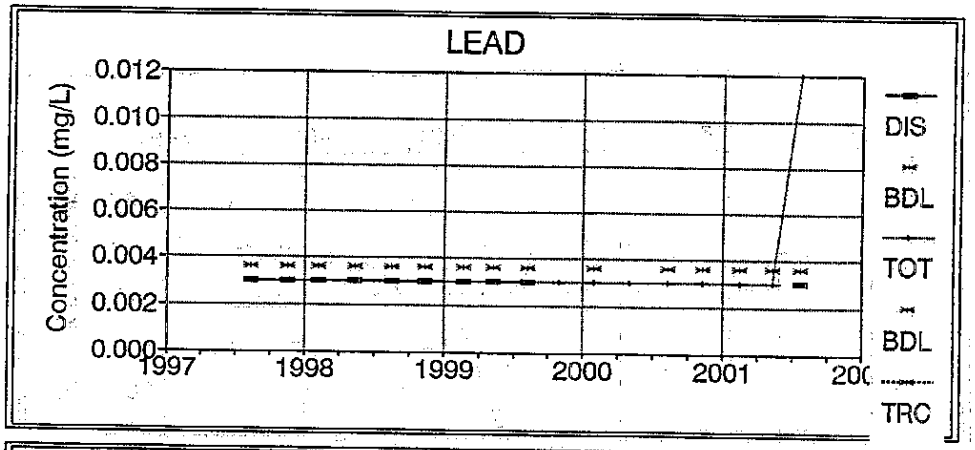
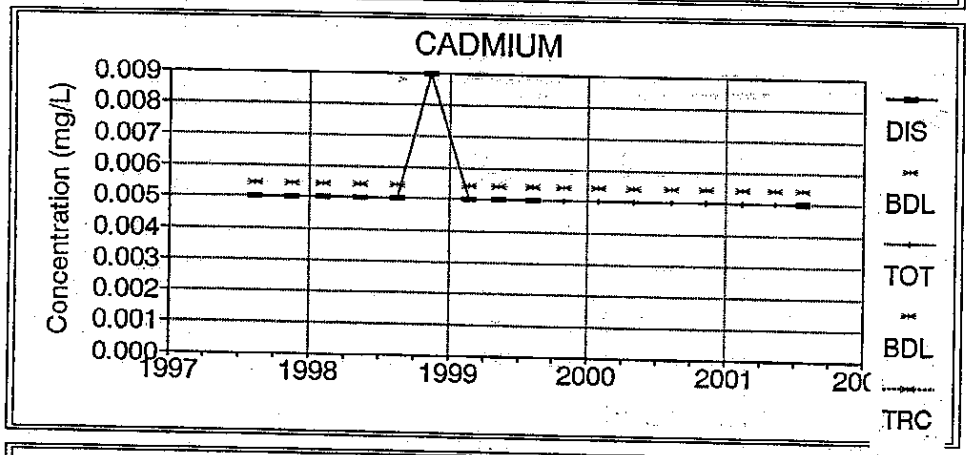
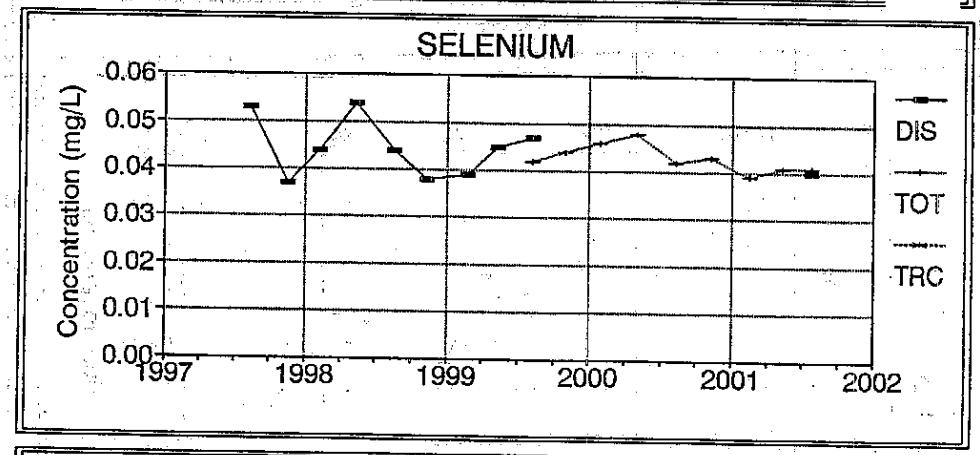
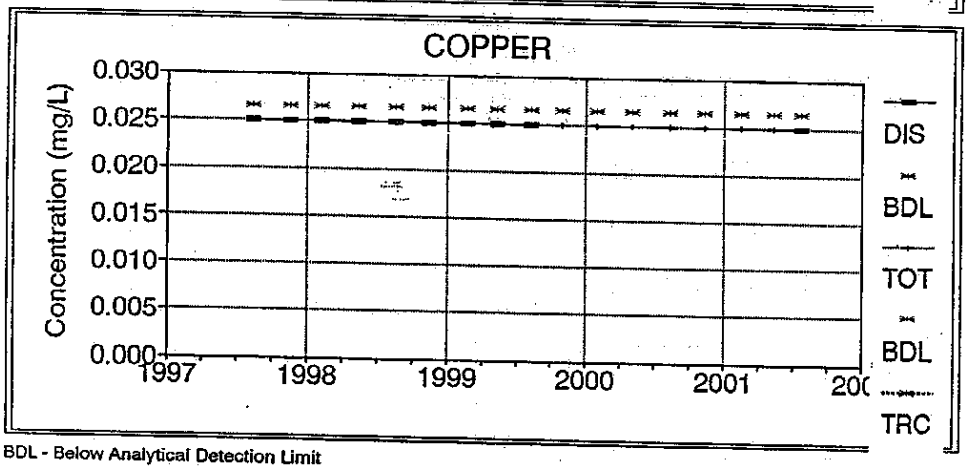
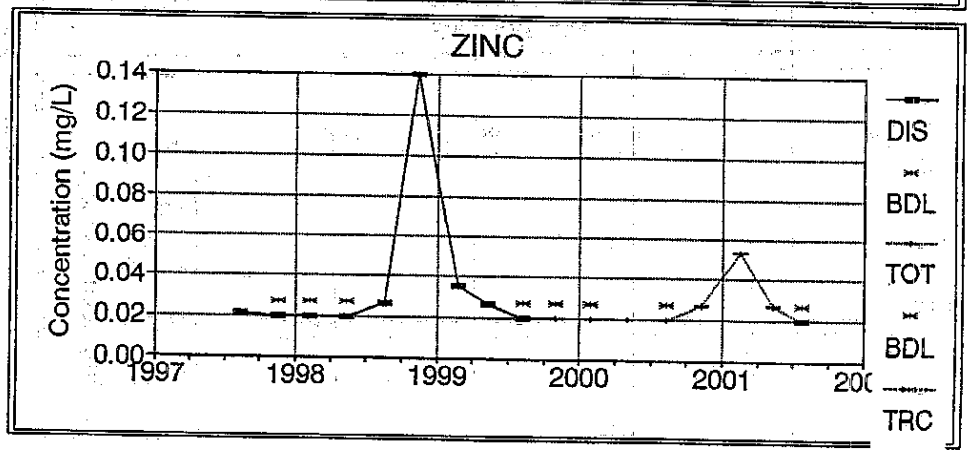






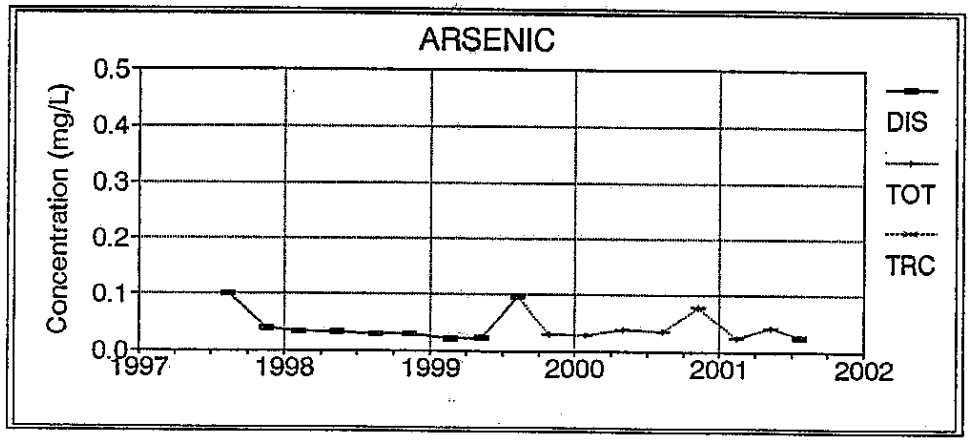


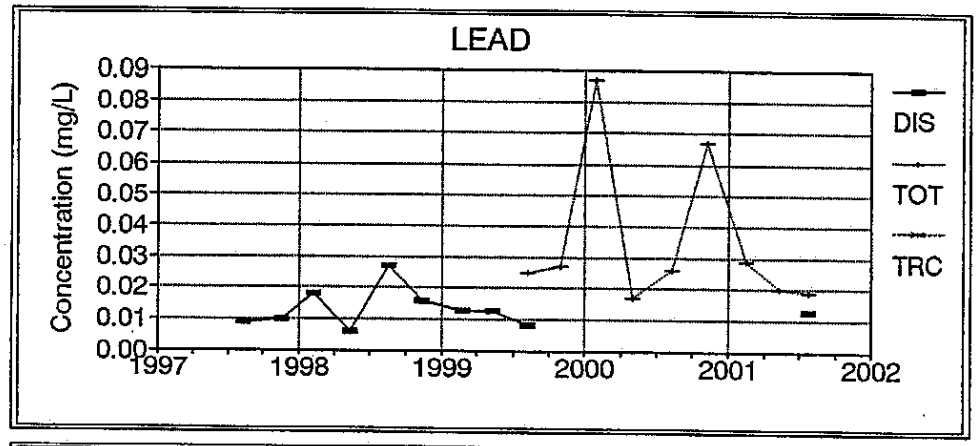


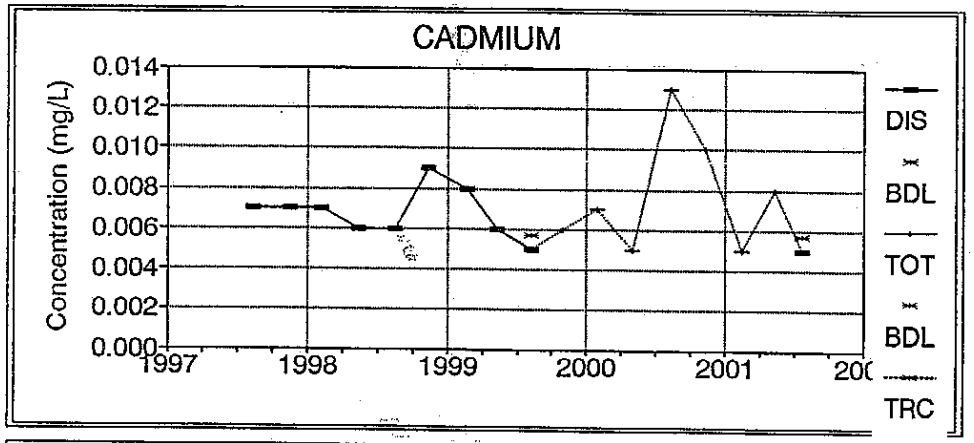


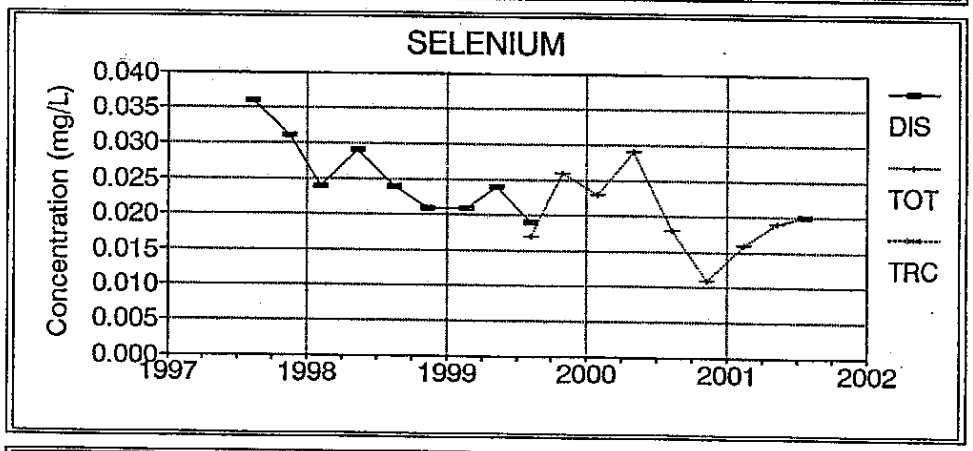
BDL - Below Analytical Detection Limit

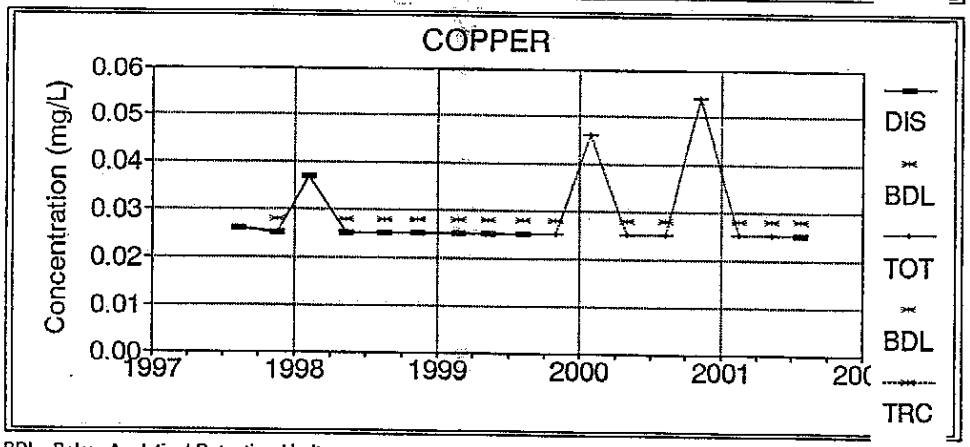
EP-8

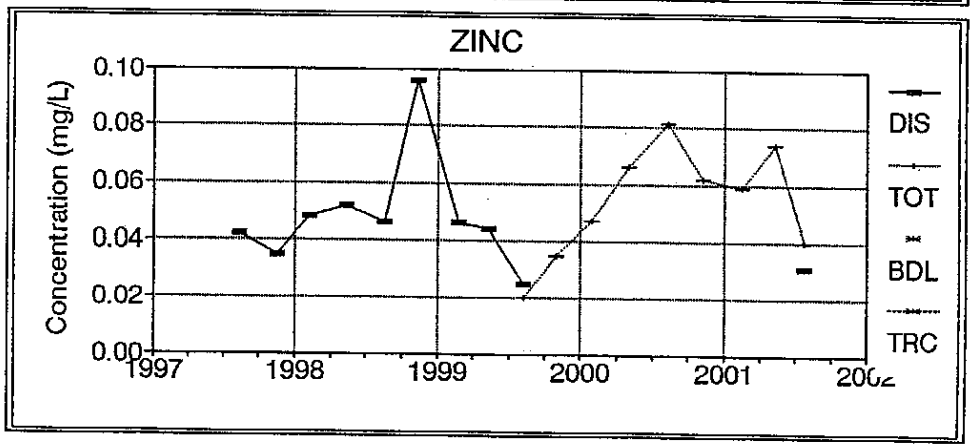












BDL - Below Analytical Detection Limit

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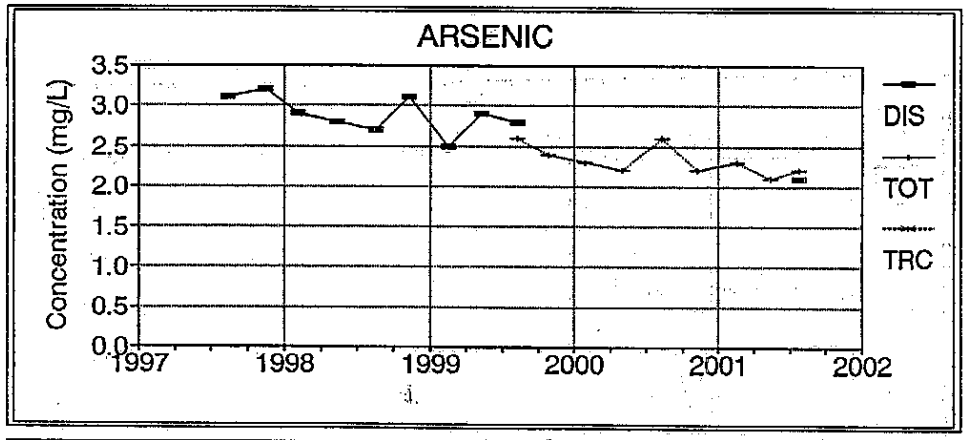
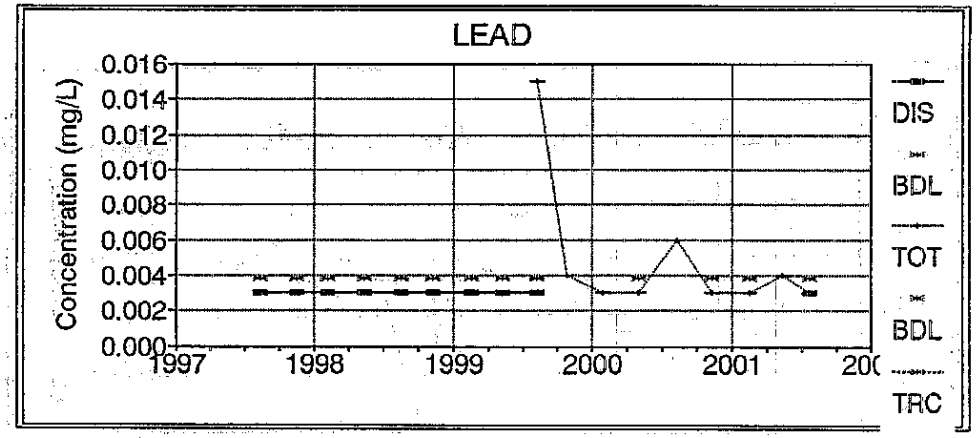
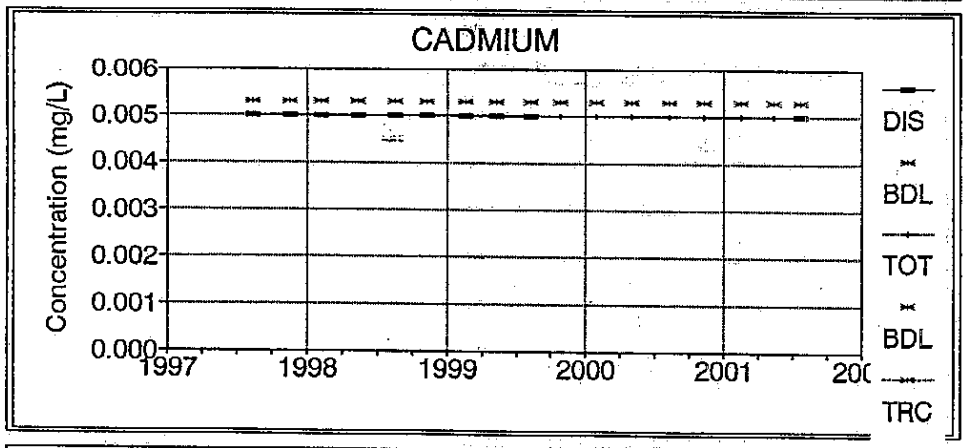
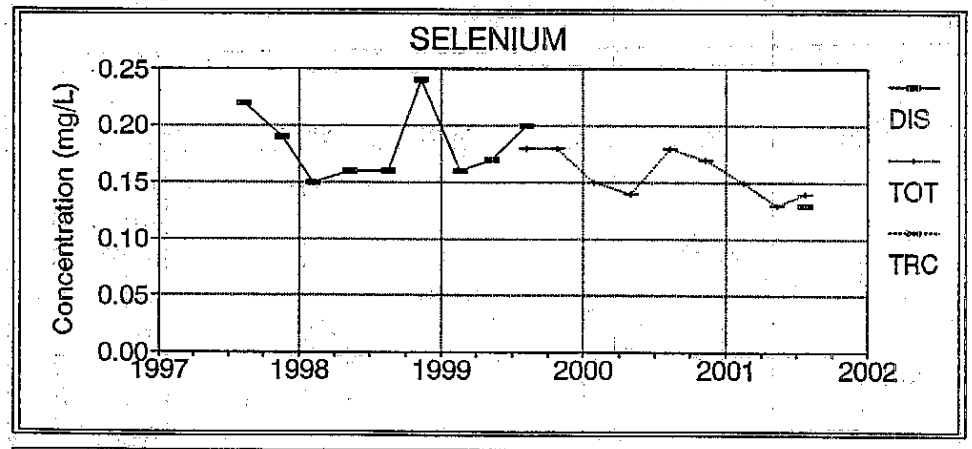
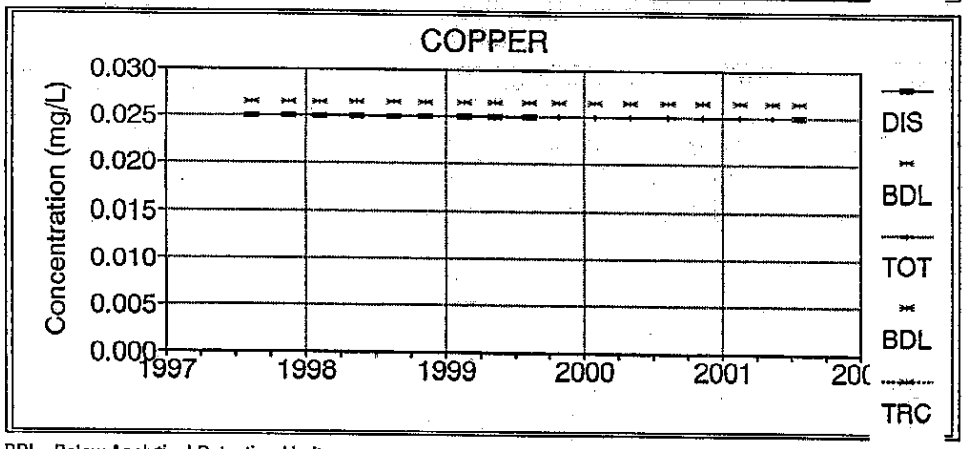
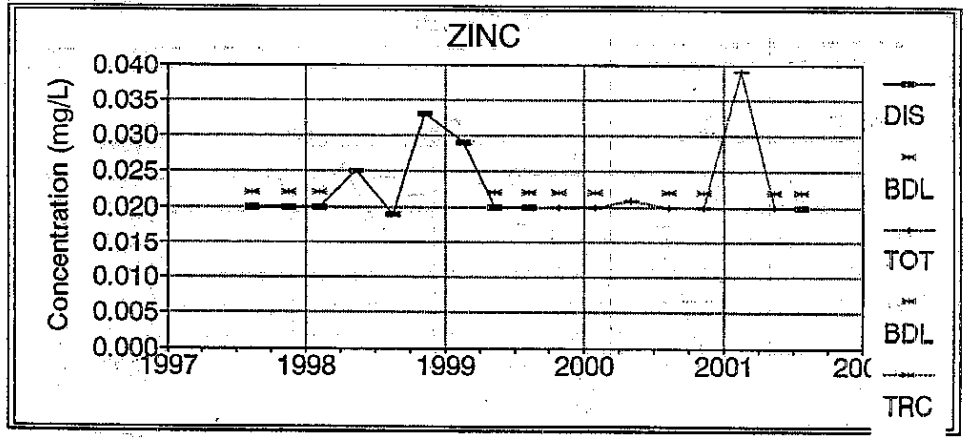






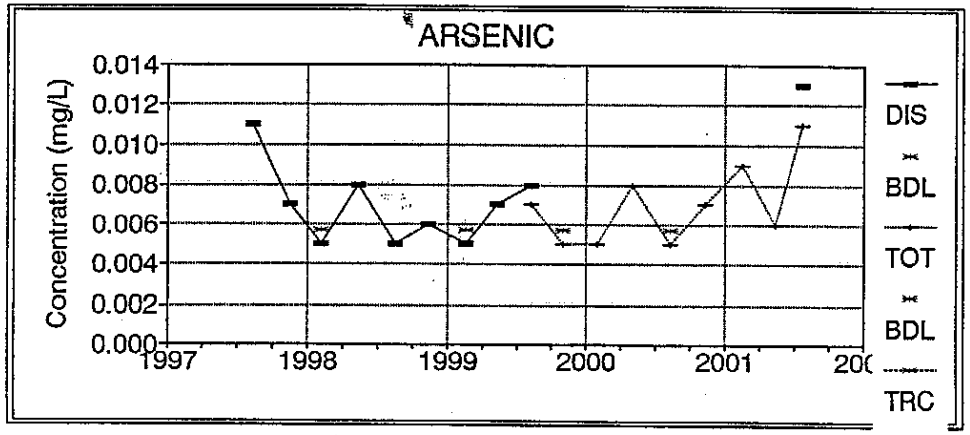


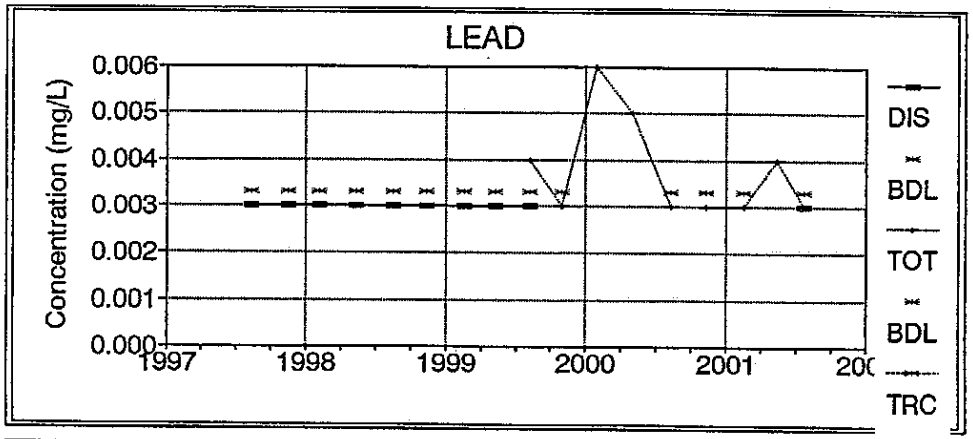


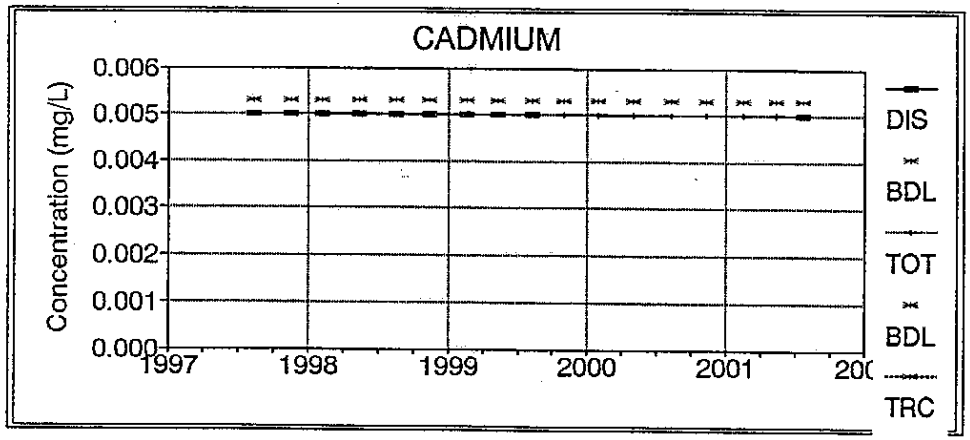


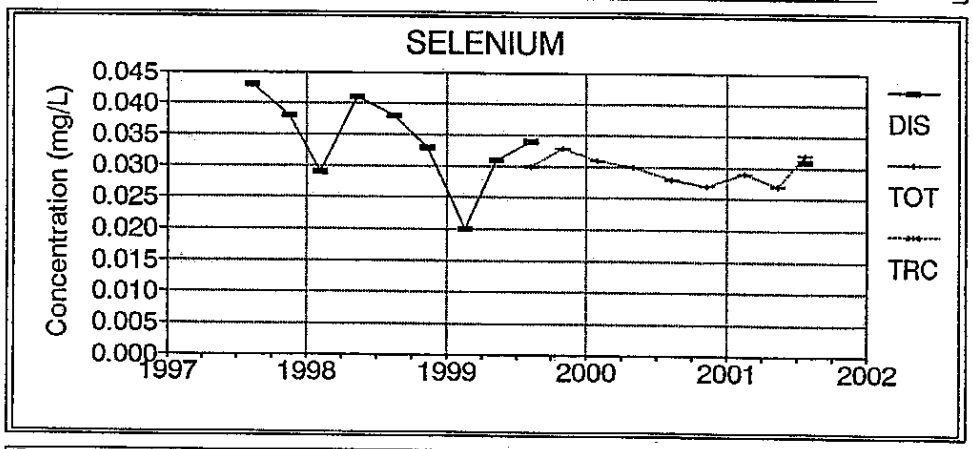
BDL - Below Analytical Detection Limit

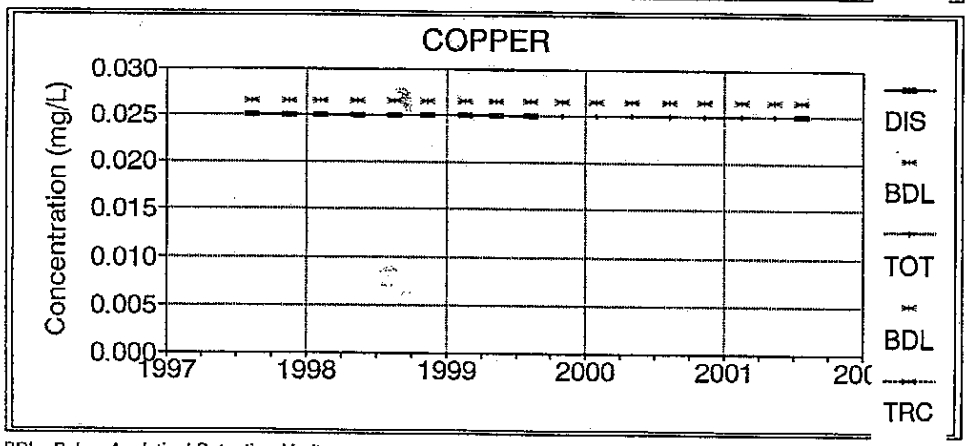
EP-8

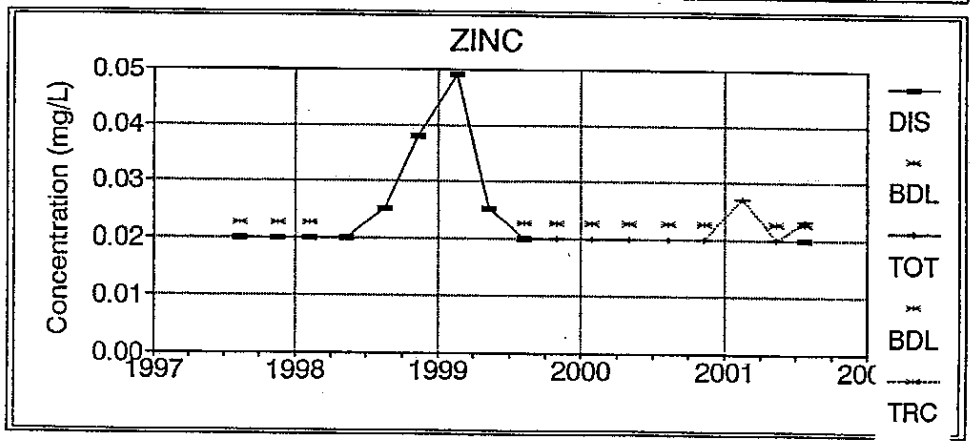












BDL - Below Analytical Detection Limit

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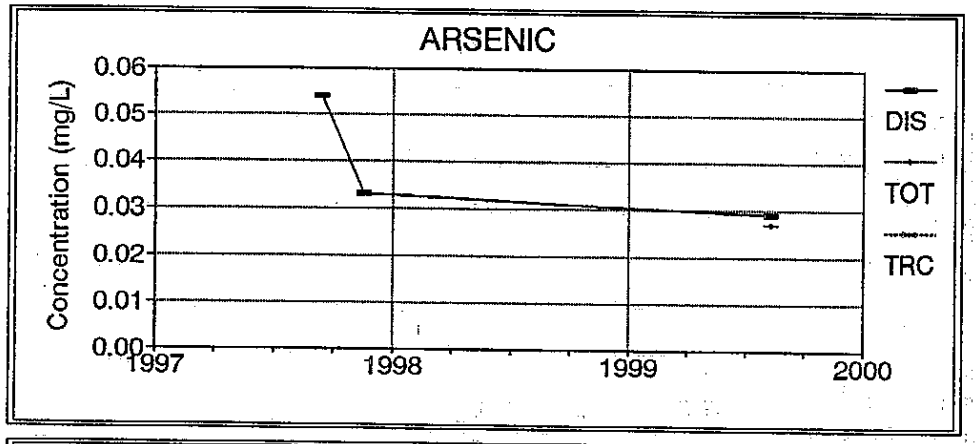

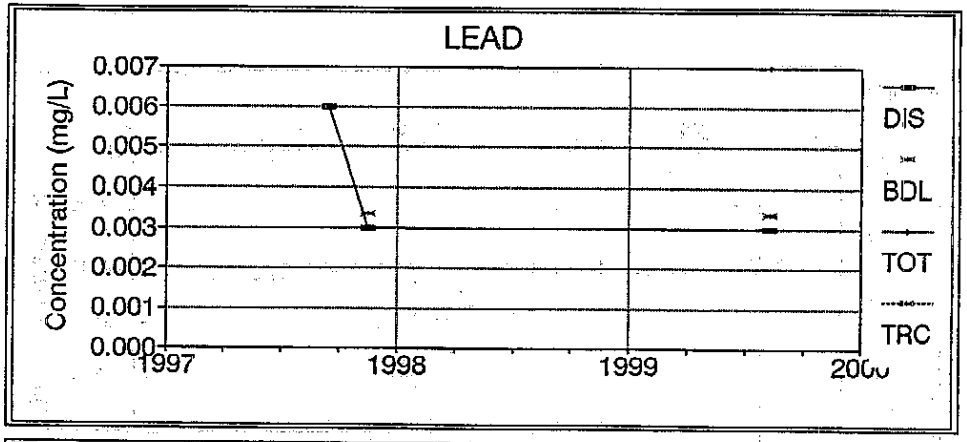

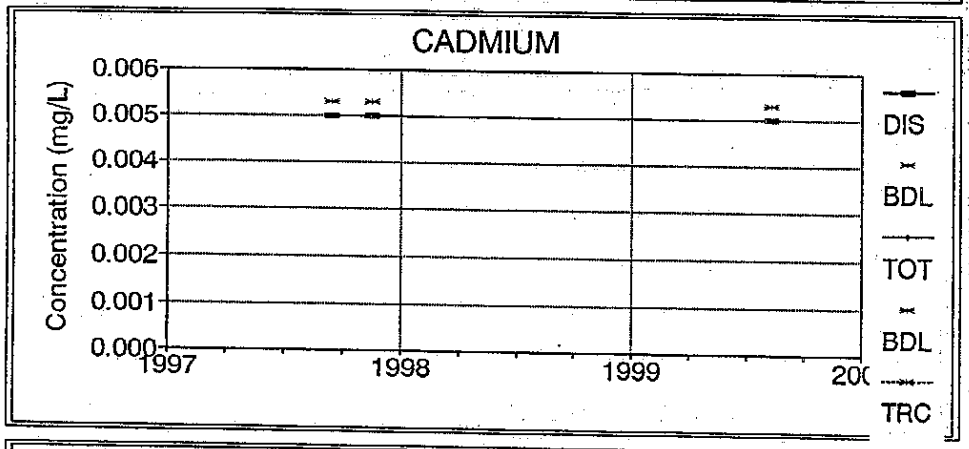

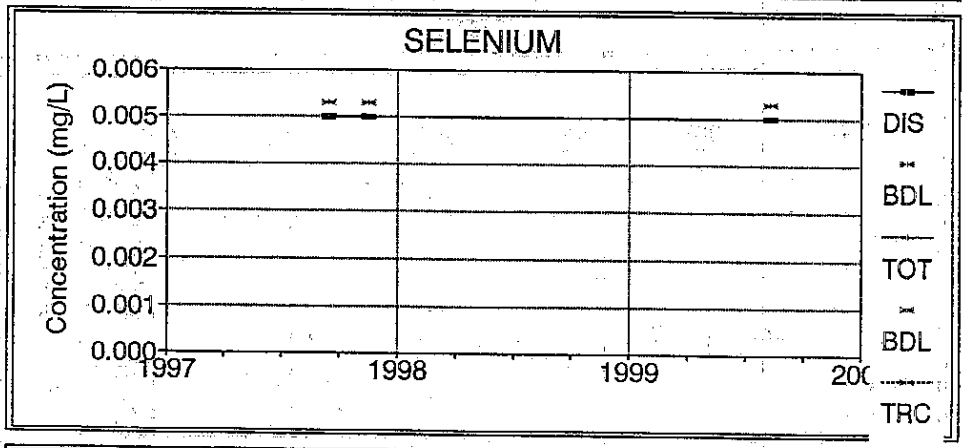

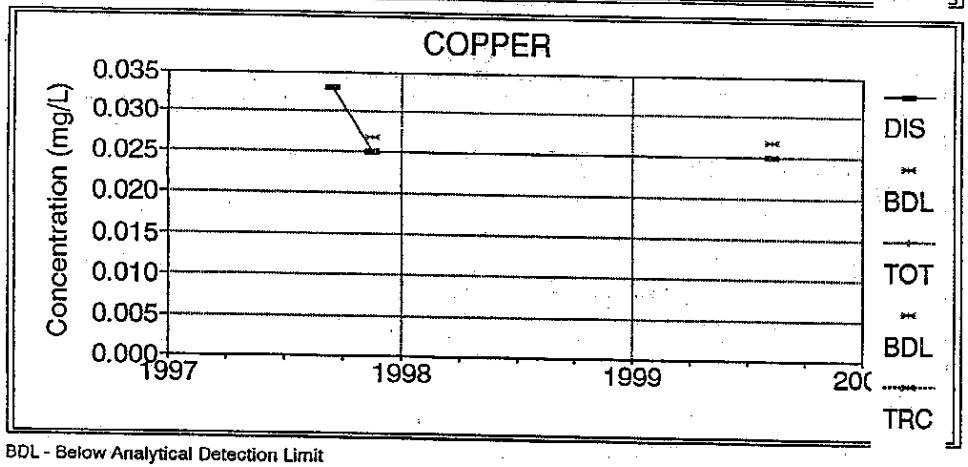

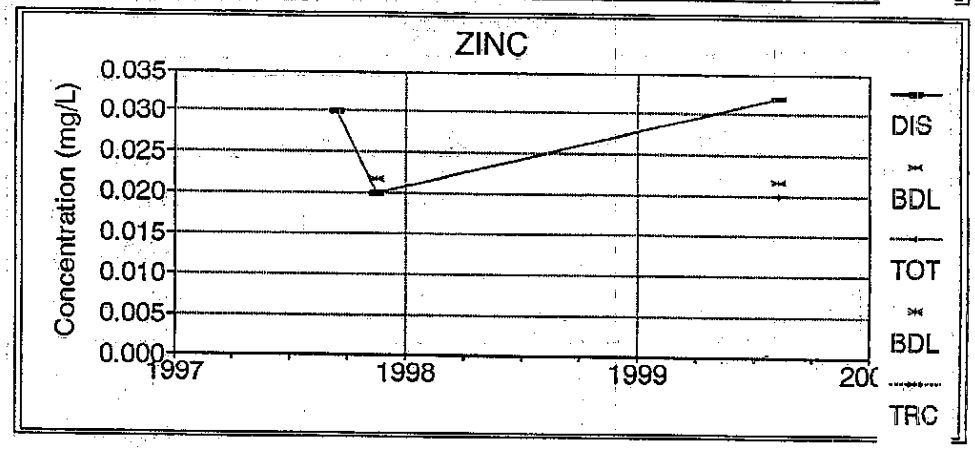

BDL - Below Analytical Detection Limit

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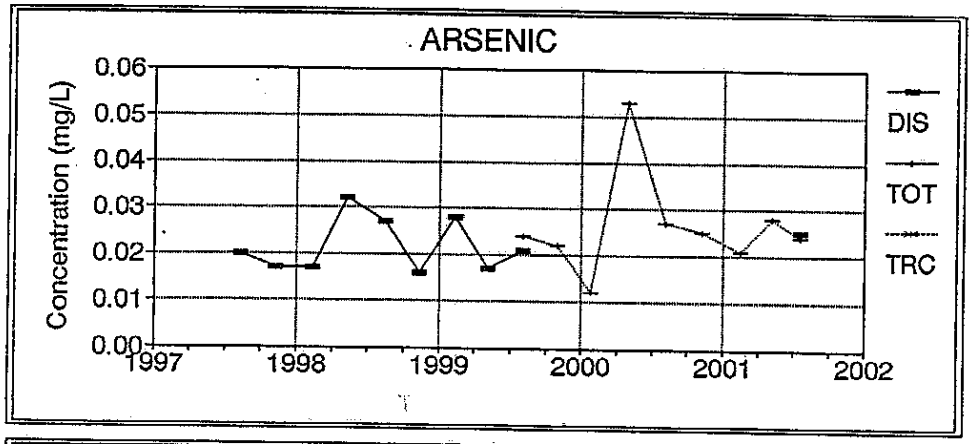

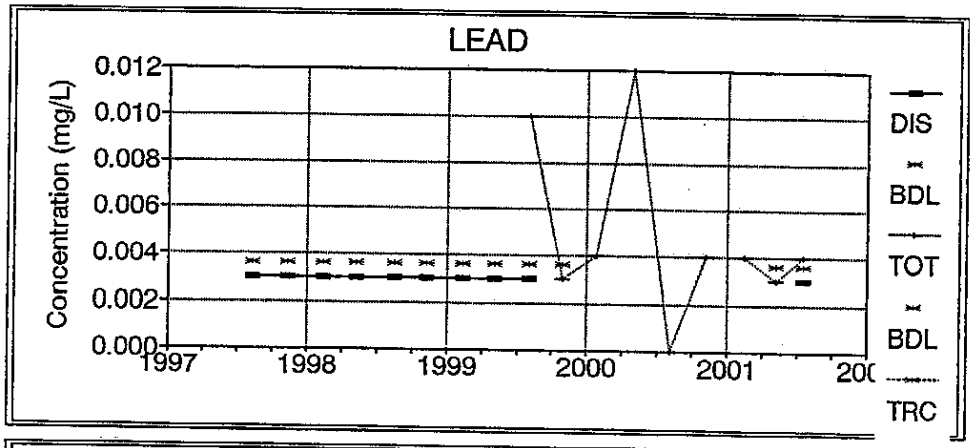

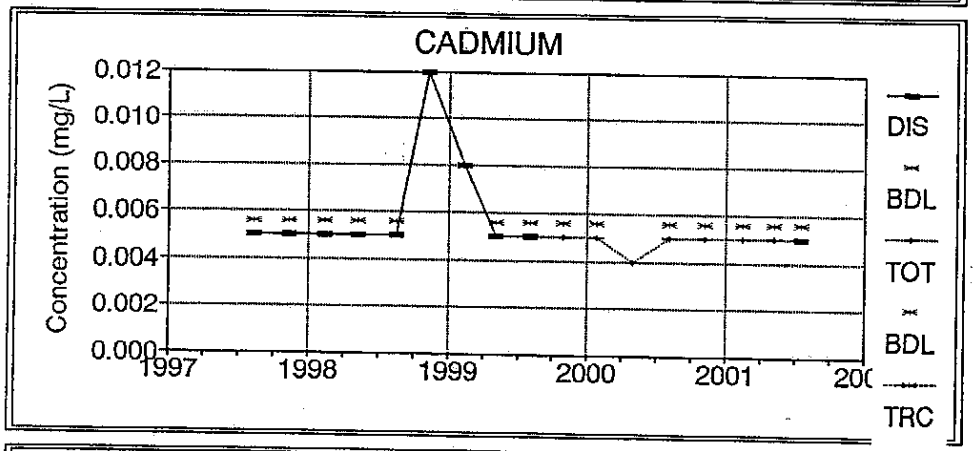

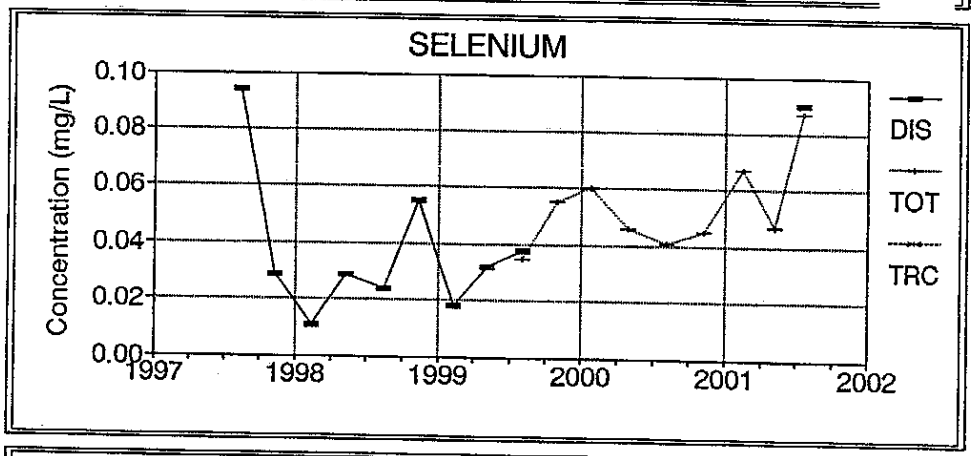

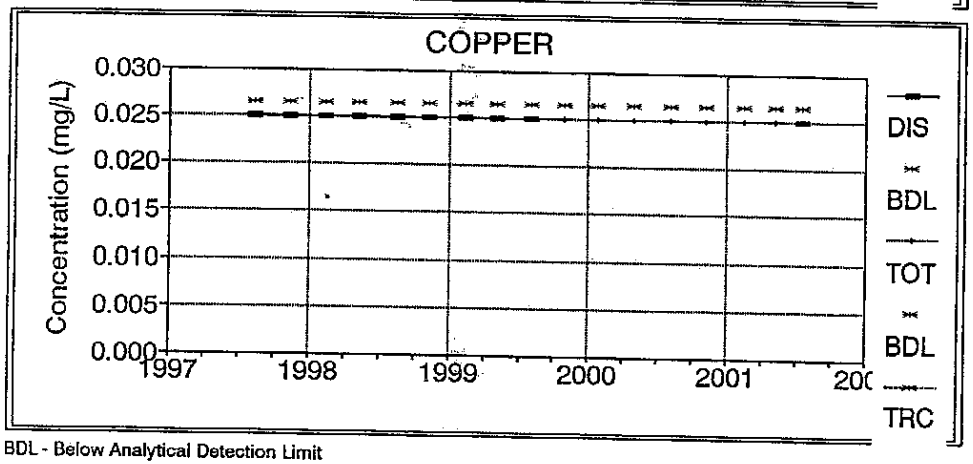

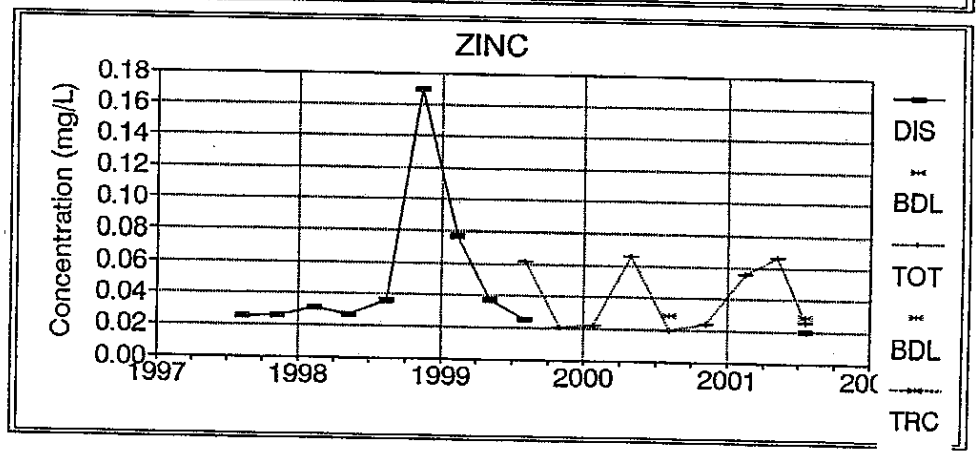

BDL - Below Analytical Detection Limit

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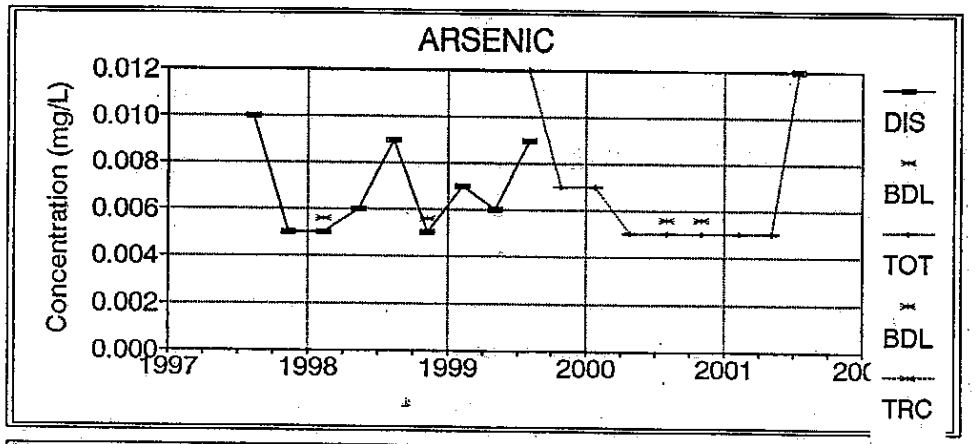

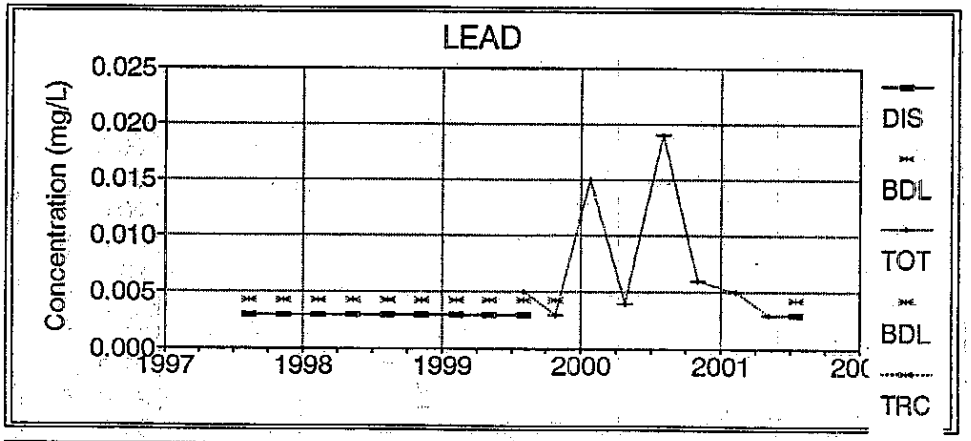

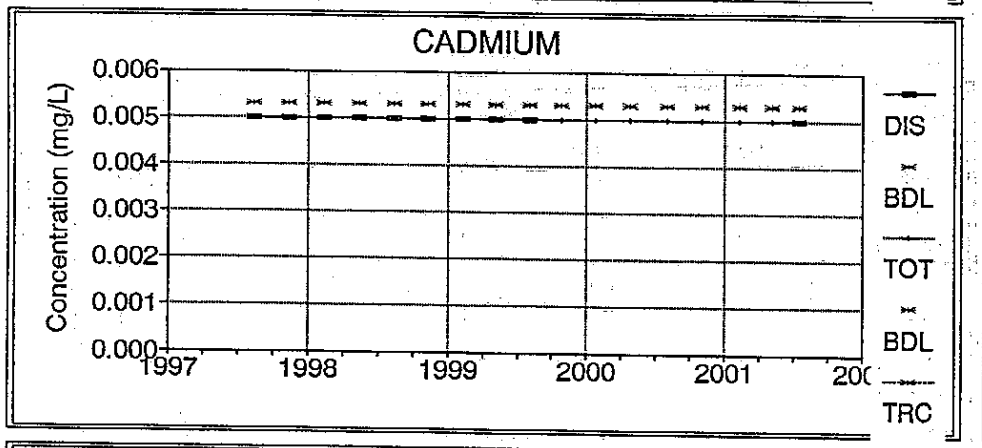

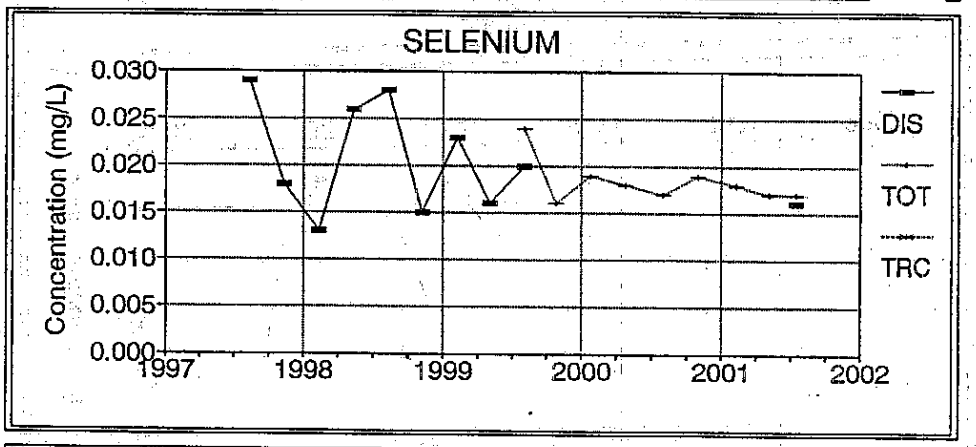

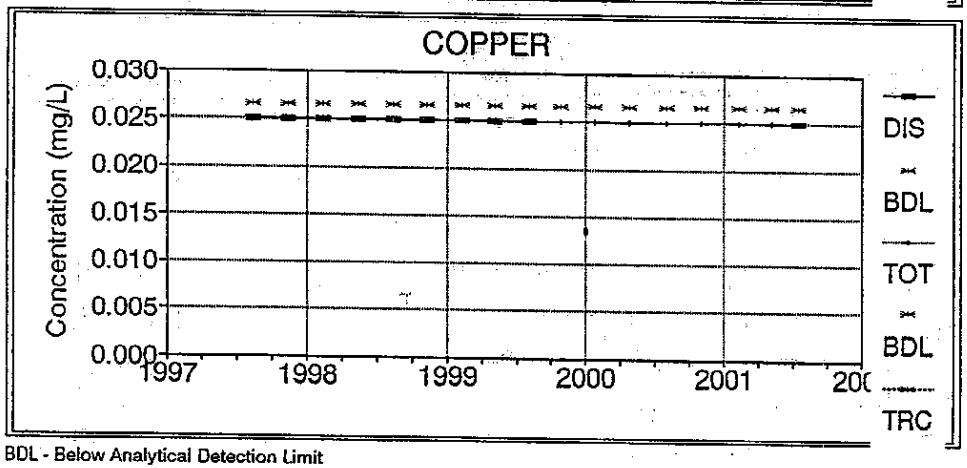

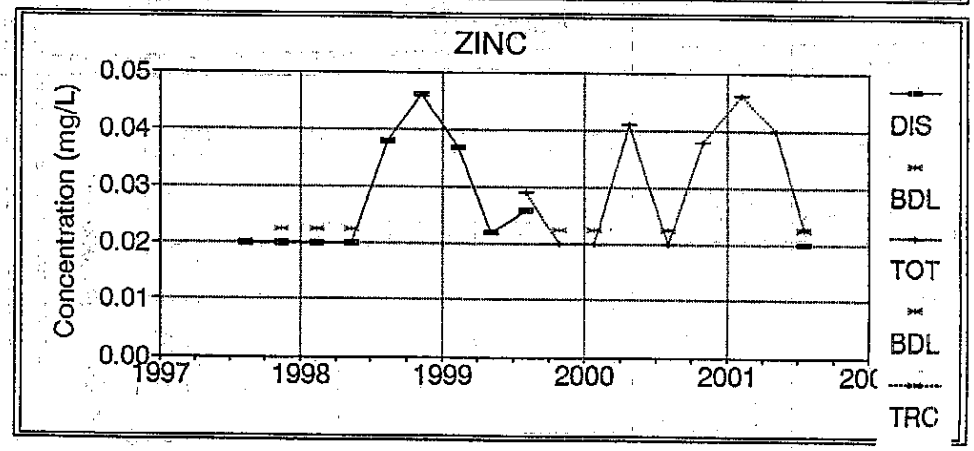

BDL - Below Analytical Detection Limit