

Pilot study of brominated flame retardants in waste electrical and electronic equipment (WEEE)

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Executive Summary

This report was commissioned by the Ministry for the Environment (MfE) in order to identify if the plastics in waste electrical and electronic equipment (WEEE, or e-waste) contained brominated flame retardants (BFRs).

The results of this pilot study of BFRs in New Zealand's e-waste are presented as an indicative finding in order to better understand the implications that the confirmed presence of BFRs may have for the environmentally sound management of these wastes.

During this study nearly 500 analyses revealed the presence of BFRs in the majority of the plastic components of electrical and electronic equipment. There was significant variation in the type and location of components that contained BFRs. Their use was not limited to areas in direct contact with a heat source and conversely not all components in contact with heat had BFRs present. The quantity by mass varied significantly with some printed circuit boards containing over 10 % bromine.

It is recommended that future work should focus on the feasibility of automating the identification and separation of bromine-containing plastics from the e-waste stream, and identifying environmentally sound ways of managing and disposing of bromine-containing waste plastics,

Introduction

Geo & Hydro – K8 Ltd was contracted by the Ministry for the environment to carry out a pilot study of brominated flame retardants in waste electrical and electronic equipment (WEEE or 'E-Waste').

The scope of this work includes:

- (i) XRF-testing of up to 200 samples from materials selected from among WEEE articles available at an industrial location in Auckland
- (ii) Report the results of the study in a written report
- (iii) Present / demonstrate the XRF technique at a MfE workshop
- (iv) Provide technical advice to MfE (post pilot study) concerning follow-up appraisal of BFR's in WEEE

Disclaimer

The technical component of this report describes the site investigation process, data collected, and interpretation of data obtained from this work. Its conclusions are only valid for the purpose for which it was requested. The report is valid only when it is in original form and must only be reproduced in its entirety.

While every care has been taken in the compilation of this report, to the extent that its conclusions are based on the analysis of WEEE items selected, the field analysis carried out without correlation with laboratory analysis and the assumption that the bromine present is related to the presence of BFR's. Anyone who relies on this report other than the Ministry for the Environment does so at her/his own risk.

BDEs and the Stockholm Convention

Certain members of a class of compounds used as fire retardants known as poly brominated diphenyl ethers (BDEs) were listed as persistent organic pollutants (POPs) by the Stockholm Convention in 2009. (Stockholm Convention 2009). Specifically those compounds containing 4-7 bromine substituents were targeted. New Zealand, as a signatory to the Convention is obliged to take steps to eliminate these compounds from current use and prevent their release to the environment.

After concerns were raised that the listing of these compounds would have a seriously detrimental effect to the plastics recycling industry, an amendment to Convention requirements was passed which provides an exemption for recycling of materials containing the listed BDEs. This exemption is to be reviewed in 2013 and every four years thereafter.

In the interim the Convention's persistent organic pollutant review committee (POPRC) has conducted a review of the exposure risk resulting from recycling and has called for the elimination of BDEs from waste streams that are recycled, calling on countries that are in a position to so do to establish and apply screening techniques and to separate materials containing BDEs to stop them being recycled. In addition the committee recommended that wastes were appropriately stored and not exported unless for an appropriate means of disposal such as high temperature incineration. Landfilling of wastes was not recommended unless the landfill was properly engineered to accept such wastes. Collection of data on the levels of BDE and related brominated dioxins in ambient air was also recommended.

In May 2011 the Stockholm Convention Conference of Parties (COP) passed a decision encouraging parties to implement the POPRC's recommendations and encouraging them to ensure that waste materials are not exported to developing countries and countries with economies in transition (Earth Negotiations Bulletin, 2011):

A decision of the 5th meeting of the Conference of the Parties to the Stockholm Convention, May 2011, recommended that:

- Countries "in a position to do so" are called on to provide support for implementing the recommendations of the POPs Review Committee, including to establish and apply screening techniques, and to separate material containing BDEs to stop them being recycled (refer UNEP/POPS/COP.5/15 Annex I, <http://chm.pops.int/Convention/COP/Meetings/COP5/COP5Documents/-tabid/1268/language/en-US/Default.aspx>).
- Identifying gaps in the information needed to facilitate the elimination of BDEs (refer to annex II in UNEP/POPS/POPRC.6/13, <http://chm.pops.int/Convention/POPsReviewCommittee/POPRCMeetings/-POPRC6/POPRC6Documents/tabid/783/language/en-US/Default.aspx>).
- "encourages parties to ensure that waste materials containing BDEs listed in Annex A are not exported to developing countries and countries with economies in transition, consistent with provision of the Stockholm Convention, including Article 6, paragraph 1(d), and the relevant provisions of the Basel Convention, and encourages parties to take appropriate steps to facilitate this."

E-waste materials containing BFRs

The only previous New Zealand study on the use of BFRs indicated that electronic waste (Waste Electrical and Electronic Equipment, WEEE, or -waste) will include plastic material containing these substances. (Keet, B. et al, 2010). In Europe e-waste is the fastest growing sector of the municipal solid waste stream (Swedish EPA, 2011). It is quite probable that the same situation exists in New Zealand. The European definition of e-waste is more extensive than electronic goods such as computers and contains such items as whiteware and electrical power tools.

Pilot study – XRF analysis of components

On 22 and 23 June 2011 Mr. Howard Ellis of the Ministry for the Environment and Dr Ben Keet from Geo & Hydro – K8 Limited carried out 446 XRF analysis at Sims Recycling Solutions located at 5/113 Pavillion Drive, Airport Oaks, Auckland.

The analyses were carried out using a handheld X-Ray Fluorescence analyser manufactured by InnovX, model Alpha 4000, which was optimised for bromine detection. Detection limit is around 10 ppm (0.001 %).

Given the wide variety of types of e-waste it was decided to start by selecting a number of items, number and photograph these, which would be then dismantled and the components brought to the area where they would be analysed. The process is shown in the pictures below.



Item No. 8. Dell LCD monitor – numbered and weighted (3.75 kg)



The same monitor, now dismantled, ready for analysis

The individual components made from or containing polymers potentially containing brominated flame retardants were analysed individually. In this example the screen rim, foot, back panel, printed circuit board (PCB) and the LCD screen would be analysed.

On-site calibration of XRF analyser

Before analyses were carried out, two bromine containing plastic standards were analysed to calibrate the XRF analyser. The Institute for Reference Materials and Measurements in Belgium provides European Reference Materials just like the National Institute of Standards and Technology (NIST) does in the US. In this study we have used two of the polymer samples (polyethylene) to calibrate the Bromine analysis carried out with the XRF analyser. These standards were provided by Sietronics Pty Ltd located in Canberra, Australia. Despite being past their validity date we have assumed the standards consisting of plastic granules would not lose their bromine contents over time.

The XRF gave high readings for bromine in both samples as is shown below.

Date	Time	Reading	Br	Sample No.
22-Jun-11	9:46:33	9	1171	Cal 808 Br (808 mg/kg bromine)
22-Jun-11	9:47:21	10	1198	Cal 808 Br (808 mg/kg bromine)
22-Jun-11	9:47:49	11	1205	Cal 808 Br (808 mg/kg bromine)
22-Jun-11	9:48:49	12	178	Cal 98 Br (98 mg/kg bromine)
22-Jun-11	9:49:15	13	182	Cal 98 Br (98 mg/kg bromine)
22-Jun-11	9:49:39	14	179	Cal 98 Br (98 mg/kg bromine)

The XRF result for the low concentration standard (98 mg/kg) requires reduction by 1.83 and the result for the high concentration sample by 1.47. In this report the XRF analysis are divided by 1.65, being the average of 1.83 and 1.47.

In the results section the corrected bromine concentration is indicated by Br-Corr.

Note 1

Bromine concentration is usually very low or very high; many of the articles had bromine concentration up to 400 times the concentration in the highest standard. Therefore these very high concentrations need to be seen as indicative values only. In future studies standards with higher bromine concentrations will need to be used.

Note 2

The Innov-X Alpha 4000 analyser was optimised for bromine detection without adjusting all other elements, which would have required sending the instrument to the factory. One of the effects is that the bromine concentration will be reported as negative in the presence of high levels of chlorine. This occurs when analysing PVC, where Cl is high while Br is absent. The negative values have to be interpreted as '0'.

Key findings

The main findings of the pilot study are:

- The pilot study identified the presence of brominated flame retardants (BFRs) in Waste Electrical and Electronic Equipment (WEEE).
- The majority of articles investigated contained plastic parts which contained bromine at well over 0.1 % bromine, the regulatory limit set by the European Union.

The detailed findings are:

- Printed Circuit Boards (PCB) usually contain high levels of BFR (bromine over 100,000 mg/kg¹)
- Generally fans all contain BFR's (bromine over 50,000 mg/kg)
- Inkjet printer heads contain BFR's (bromine over 50,000 mg/kg)
- Half the laser printer toner cartridges had bromine over 50,000 mg/kg (75,000 – 180,000 mg/kg)
- Fuser unit in laser printers and copiers contain BFR's (bromine over 50,000 mg/kg)
- Some items look alike but have very different BFR concentrations examples are item 22.4 (2 near identical PCB's out of identical photocopiers, EFTPOS – looking identical but different country of manufacture (item 43)
- Not all articles close to heat sources contain BFR's, like the hair dryer (item 33).
- Often the plastic panels on one instrument seem to contain BFR's at random. A good example is the large Ricoh photocopier (no. 14) of which about half the panels had bromine between 100,000 and 200,000 mg/kg bromine while the other half had bromine concentrations below 35 mg/kg.
- Articles with a RoHS sticker still contain BFR components (example item 3, IBM desktop computer made in China 2006, contained 2 fans both with over 80,000 mg/kg bromine concentration).
- Many small items which would not normally get hot, like telecom phone wire splitters (bromine 7,000 – 180,000 mg/kg), personal identification tags (bromine 4,000 – 23,000 mg/kg).

¹ 100,000 mg/kg bromine equals 10% bromine by weight

Outstanding issues

This pilot study has highlighted a number of issues concerning BFRs which should be addressed in the near future:

- Total mass of bromine compounds relative to the total mass of WEEE of specific types. For example the bromine in printed circuit boards relative to the total mass of the printed circuit boards (PCB). Similar for the plastic housing (sheet plastic) and bromine in components like fans, processors, etc.
- From a potential regulatory point of view clarity should be obtained on whether the BFR EU limit of 0.1 % or 1000 mg/kg applies to the whole article or its individual parts, or parts of the parts.
- Investigate the validity of the 'point and shoot' XRF analysis technique, employed during this study, compared to more laboratory-like analysis techniques (like grinding the sample and analysing the compressed fines. Other studies have found large differences in results², however this can be due to incorrect positioning of the analysis head relative to the object to be analysed.
- From an operational perspective, if possible, general rules need to be established for recyclers to allow most BFR containing products to be separated from non-BFR containing WEEE.
- When general rules appear impractical research needs to be done to establish the existence of sorting instruments to rapidly sort bromine containing parts from non bromine containing parts.
- Consideration should be given to the environmentally sound management of bromine-containing plastics in accordance with the Basel Convention, in conjunction with the desirability of recovering of precious metals and rare elements.
- Recognition should be given to the existence of BFR containing waste outside the WEEE waste stream (cars, furniture, buildings, etc.). For example:
 - It is important to discover whether or not significant quantities of BDEs were used in the cars supplied to New Zealand as new or second-hand vehicles or in the CKD kits used for car assembly This question needs to be asked directly of all significant vehicle suppliers to New Zealand. If information is not forthcoming then it should be sought from other countries' environmental agencies.
 - The flock³ waste produced during the car dismantling and crushing process to provide raw material for New Zealand's only secondary steel manufacturing plant will be composed of significant quantities of automotive foams. Some years ago this material was stockpiled on-site and it would be of interest to establish if this is an on-going practice or what current disposal practice is, should such material be shown to contain BDEs.

² http://www.spexsampleprep.com/knowledge-base/resources/brochures/rohswhee_poster_paper_dist.pdf

³ Flock waste or 'fluff' or shedder 'residue' (plastics, seat foam, glass and rubber) is seen as hazardous waste in some jurisdictions ref: Environmental impact of End-of-Life Vehicles: An Information Paper, Commonwealth Dept. of Environment and Heritage, UK, (2002) <http://www.mothersofeastla.com/web-content/citizengroup/21778.pdf>

Conclusions

The pilot study identified the presence of brominated flame retardants (BFRs) in Waste Electrical and Electronic Equipment (WEEE).

The majority of articles investigated contained plastic parts which contained bromine at well over 0.1 % bromine, the regulatory limit set by the European Union.

Recommendations

Future work should focus on:

- The feasibility of automating the identification and separation of bromine-containing plastics from the e-waste stream
- Identifying environmentally sound ways of managing and disposing of bromine-containing waste plastics, including automotive foams, building polystyrene and other BFR-containing polymers
- Leachate tests to confirm that properly engineered landfills are a safe depository for BFR containing polymers.

REFERENCES

Keet, B et al., 2010. *Investigation of brominated flame retardants present in articles being used, recycled and disposed of in New Zealand*. A technical report prepared for the Ministry for the Environment, Wellington, September, 2010

Secretariat of the Stockholm Convention, 2009. Decisions SC-4/14 on the listing of hexabromodiphenyl ether and heptabromodiphenyl ether and SC-4/18 on the listing of tetrabromodiphenyl ether and pentabromodiphenyl ether

Swedish Environmental Protection Agency, 2011. *Recycling and disposal of electronic waste. Health hazards and environmental impacts*. Report 6417, March 2011, Stockholm

APPENDIX A Analysis certificates of standards used



CERTIFICATE OF ANALYSIS

ERM[®] - EC681

POLYETHYLENE		
Parameter	Mass fraction	
	Certified value ¹ mg / kg	Uncertainty ² mg / kg
As	3.93	0.15
Br	98	5
Cd	21.7	0.7
Cl	92.9	2.8
Cr	17.7	0.6
Hg	4.50	0.15
Pb	13.8	0.7
S	78	17

1) Certified values are unweighted means of 4 to 24 data sets. Certified values represent total contents. Certified values are traceable to SI.

2) Estimated expanded uncertainty U with a coverage factor $k=2$, corresponding to a level of confidence of about 95 %, as defined in the Guide to the Expression of Uncertainty in Measurement (GUM), ISO, 1995. Uncertainty contributions arising from characterisation as well as from homogeneity and stability assessment were taken into consideration.

This certificate is valid until 1/2009; this validity may be extended as further evidence of stability becomes available.

The minimum sample intake is 600 mg.

NOTE

European Reference Material ERM[®]-EC681 was originally certified as BCR-681. It was produced and certified under the responsibility of the IRMM according to the principles laid down in the technical guidelines of the European Reference Materials[®] co-operation agreement between BAM-IRMM-LGC. Information on these guidelines is available on the Internet (<http://www.erm-crm.org>).

Accepted as an ERM[®], Geel, May 2004
shelf life prolonged August 2005

Signed: _____

Prof. Dr. Hendrik Emons
Unit for Reference Materials
EC-DG JRC-IRMM
Retieseweg 111
2440 Geel, Belgium

All following pages are an integral part of the certificate.

CERTIFICATE OF ANALYSIS

ERM[®] - EC680

POLYETHYLENE		
Parameter	Mass fraction	
	Certified value ¹ mg / kg	Uncertainty ² mg / kg
As	30.9	0.7
Br	808	19
Cd	140.8	2.5
Cl	810	16
Cr	114.6	2.6
Hg	25.3	1.0
Pb	107.6	2.8
S	0.67·10 ³	0.07·10 ³

1) Certified values are unweighted means of 4 to 25 data sets. Certified values represent total contents. Certified values are traceable to SI.

2) Estimated expanded uncertainty U with a coverage factor $k=2$, corresponding to a level of confidence of about 95 %, as defined in the Guide to the Expression of Uncertainty in Measurement (GUM), ISO, 1995. Uncertainty contributions arising from characterisation as well as from homogeneity and stability assessment were taken into consideration.

This certificate is valid until 1/2009; this validity may be extended as further evidence of stability becomes available.

The minimum sample intake is 500 mg.

NOTE

European Reference Material ERM[®] EC680 was originally certified as BCR-680. It was produced and certified under the responsibility of the IRMM according to the principles laid down in the technical guidelines of the European Reference Materials[®] co-operation agreement between BAM-IRMM-LGC. Information on these guidelines is available on the Internet (<http://www.erm-crm.org>).

Accepted as an ERM[®], Geel, May 2004
shelf life prolonged August 2005

Signed: _____



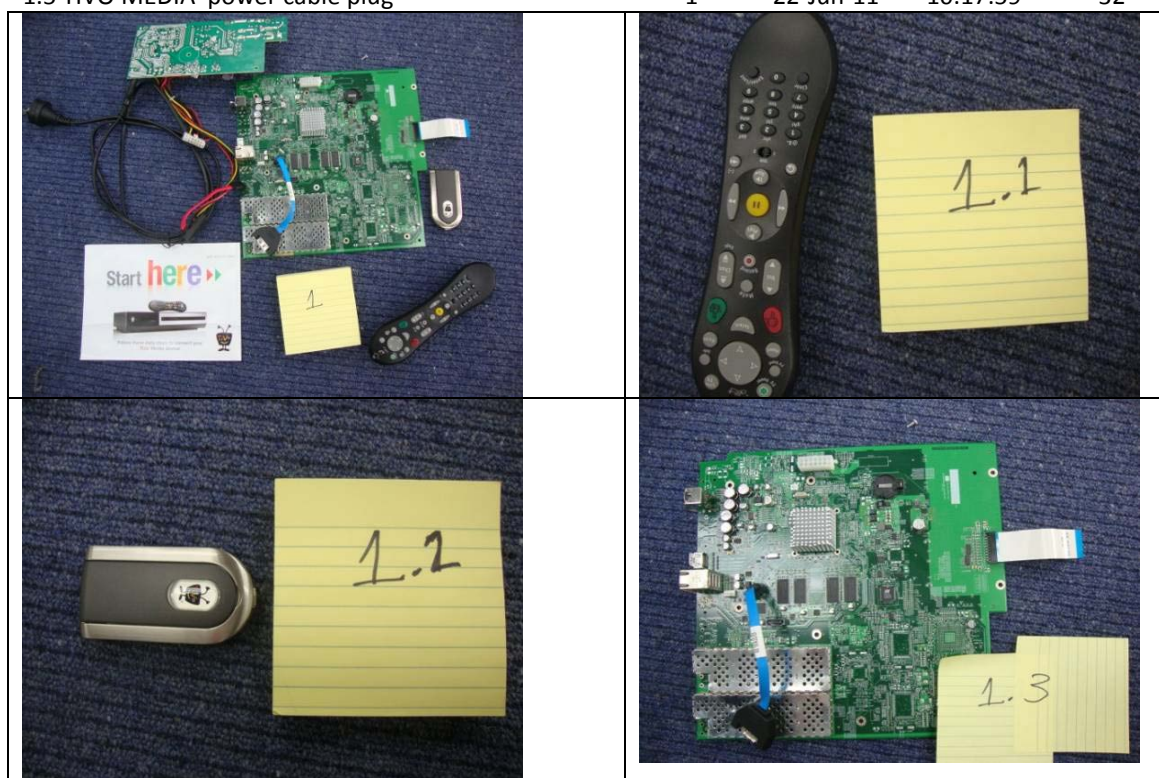
Prof. Dr. Hendrik Emons
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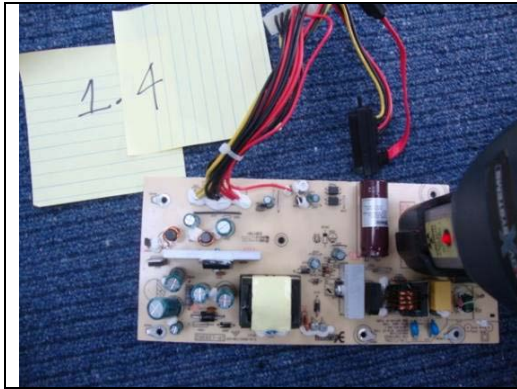
All following pages are an integral part of the certificate.

APPENDIX B XRF analysis of WEEE products and parts

Item 1 is a TIVA Media unit, to be introduced by Telecom, however withdrawn from market before release.

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
1.1 TIVO MEDIA unit remote	656	22-Jun-11	9:56:37	15
1.1 TIVO MEDIA unit remote	8	22-Jun-11	9:57:20	16
1.1 TIVO MEDIA unit remote	12	22-Jun-11	9:58:58	17
1.2 TIVO MEDIA USB connector	30,766	22-Jun-11	10:01:09	18
1.2 TIVO MEDIA USB connector	5,372	22-Jun-11	10:01:43	19
1.2 TIVO MEDIA USB connector	16,627	22-Jun-11 <td 10:02:36	20	
1.3 TIVO MEDIA PCB	987	22-Jun-11	10:04:12	21
1.3 TIVO MEDIA PCB	90,324	22-Jun-11	10:04:51	22
1.3 TIVO MEDIA PCB	73,142	22-Jun-11	10:05:41	23
1.3 TIVO MEDIA PCB light green	3,377	22-Jun-11	10:06:16	24
1.3 TIVO MEDIA PCB dark is high	83,867	22-Jun-11	10:07:03	25
1.4 TIVO MEDIA PCB of power unit	121,198	22-Jun-11	10:09:28	26
1.4 TIVO MEDIA PCB of power unit	119,731	22-Jun-11	10:10:11	27
1.4 TIVO MEDIA power unit - capacitor yellow	97,551	22-Jun-11	10:11:44	28
1.4 TIVO MEDIA power unit - capacitor drk red	242	22-Jun-11	10:12:27	29
1.4 TIVO MEDIA cable tree of power board	4	22-Jun-11	10:15:05	30
1.5 TIVO MEDIA power cable	-4	22-Jun-11	10:17:03	31
1.5 TIVO MEDIA power cable plug	-1	22-Jun-11	10:17:59	32





Item weights: 1.1 - 0.118 kg; 1.2 - 0.079 kg; 1.3 - 0.431kg; 1.4 - 0.299 kg; 1.5 - 0.13 kg

Item 2 is a CRT monitor

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
2 crt monitor case	142,153	22-Jun-11	15:01:06	154
2 crt monitor front rim	138,274	22-Jun-11	15:01:57	155
2 crt monitor front foot	103,833	22-Jun-11	15:02:59	156
2 crt monitor front coil	9,155	22-Jun-11	15:04:14	157
2 crt monitor front coil	21	22-Jun-11	15:04:47	158
2 crt monitor front board	116,492	22-Jun-11	15:05:45	159
2 CRT monitor front serial plug	-19	22-Jun-11	15:08:00	160
2 CRT monitor front serial plug	-12	22-Jun-11	15:08:29	161



Item 3 is IBM desktop, Made in China, 2006

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
3 IBMdesktop comp 2005 fans	80,170	22-Jun-11	15:11:59	163
3 IBMdesktop comp 2005 fans	80,072	22-Jun-11	15:12:29	164
3 IBMdesktop comp 2005 disk dr	20	22-Jun-11	15:13:22	165
3 IBMdesktop comp 2005 disk dr	154	22-Jun-11	15:13:56	166
3 IBMdesktop comp 2005 disk dr	8	22-Jun-11	15:15:17	167
3 IBMdesktop comp 2005 front	7	22-Jun-11	15:16:17	168



IBM desktop, Made in China, 2006


BFR >10% (board; fan;)

Has RoHS components sticker

No component photo's available

Item 4 is a Brother Laser Fax

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
4 Brother laser fax light grey covers	23	22-Jun-11	15:21:42	169
4 Brother laser fax light grey covers	11	22-Jun-11	15:22:20	170
4 Brother laser fax light grey keyboard - XRF reads PCB behind it	3,634	22-Jun-11	15:22:48	171
4 Brother laser fax light grey covers	23	22-Jun-11	15:23:48	172
4 Brother laser fax light grey covers	34	22-Jun-11	15:24:24	173
4 Brother laser fax light grey paper tray	5,305	22-Jun-11	15:25:49	174
4 Brother laser fax dark grey covers	53	22-Jun-11	15:27:05	175
4 Brother laser fax dark grey covers	9	22-Jun-11	15:27:40	176
4 Brother laser fax dark grey covers above FAN	628	22-Jun-11	15:28:15	177
4 Brother laser fax dark grey covers	10	22-Jun-11	15:28:57	178
4 Brother laserfax fan	48,438	22-Jun-11	15:29:46	179

	<p>Brother laser fax-2820</p> <p>Fan weight 0.022 kg</p> <p>BFR: 6,000 (board = 0.6%); 0.9% (back tray); v little (covers);</p>
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Item 5 is Brother Ink jet copier; MFC-990CW

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
5 Brother inkjet multifunct top cover	31	22-Jun-11	15:34:44	180
5 Brother inkjet multifunct top cover	10	22-Jun-11	15:35:13	181
5 Brother inkjet multifunct grey case	6	22-Jun-11	15:36:23	182
5 Brother inkjet multifunct grey case	7	22-Jun-11	15:36:57	183
5 Brother inkjet multifunct grey case	11	22-Jun-11	15:37:28	184
5 Brother inkjet multifunct frame	72	22-Jun-11	15:38:15	185
5 Brother inkjet printer head	29,711	22-Jun-11	15:38:43	186
5 Brother inkjet board	61,517	22-Jun-11	15:40:04	187



Brother ink jet copier; MFC-990CW


Total weight 7.3 kg

nothing in casing; >6% (board)
3% (printer head)



Item 6 is a LCD colour display Unit Samsung Feb 2008

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
6 lcd monitor foot	35	22-Jun-11	14:16:51	115
6 lcd monitor rim	36	22-Jun-11	14:17:33	116
6 lcd monitor back	11	22-Jun-11	14:18:18	117
6 lcd monitor lcd	36	22-Jun-11	14:19:00	118
6 lcd monitor boards	34,650	22-Jun-11	14:21:02	119
6 lcd monitor boards	93,587	22-Jun-11	14:21:43	120

	<p>LCD colour display Unit Samsung Feb 2008</p> <p>nothing in casing but 35,000 & 94,000 ppm in PCB's (3.5 and 9.4%)</p>
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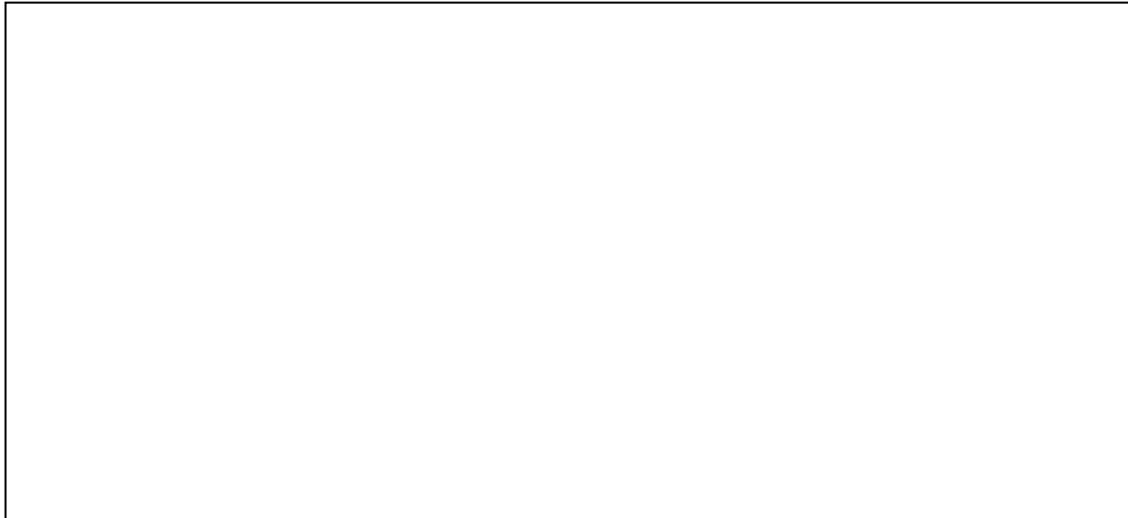


Item 7 is laser printer Lexmark, July 2007

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
7 lexmark printer framework	4689	22-Jun-11	14:23:44	121
7 lexmark printer framework	5	22-Jun-11	14:24:13	122
7 lexmark printer framework fan	58203	22-Jun-11	14:25:04	123
7 lexmark printer framework	8	22-Jun-11	14:25:50	124
7 lexmark printer fuser unit	17	22-Jun-11	14:26:35	125
7 lexmark printer fuser cover	242183	22-Jun-11	14:27:44	126
7 lexmark printer framework	22	22-Jun-11	14:29:23	127
7 lexmark printer power socket	58272	22-Jun-11	14:29:59	128
7 lexmark printer drum unit	16	22-Jun-11	14:31:39	129
7 lexmark printer toner cartridge	354	22-Jun-11	14:32:20	130
7 lexmark printer outside panels	10	22-Jun-11	14:33:57	131
7 lexmark printer outside panels	8	22-Jun-11	14:34:34	132
7 lexmark printer outside panels	72	22-Jun-11	14:35:00	133
7 lexmark printer outside panels	72	22-Jun-11	14:35:30	134
7 lexmark printer outside panels	14	22-Jun-11	14:35:59	135
7 lexmark printer outside panels	18	22-Jun-11	14:36:42	136



Laser printer Lexmark, July 2007



Item 8 is LCD Dell, LCD Dec 2002 Model E 151FP
Made in China

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
8 Dell LCD monitor back panel	163271	22-Jun-11	14:39:21	137
8 Dell LCD monitor front rim	166114	22-Jun-11	14:40:18	138
8 Dell lcd mon foot	147874	22-Jun-11	14:41:08	139
8 Dell lcd mon foot	144309	22-Jun-11	14:41:49	140
8 Dell lcd mon lcd	83	22-Jun-11	14:44:12	141
8 Dell lcd mon boards	82495	22-Jun-11	14:45:28	142
8 Dell lcd mon boards	55444	22-Jun-11	14:46:03	143



LCD Dell, LCD Dec 2002 Model E 151FP Made in China



Item 9 is CRT TV Digitor Model G5170 Made in China

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
9 TV digotor grey back case	214855	22-Jun-11	16:06:46	202
9 TV digotor grey back case	257626	22-Jun-11	16:07:18	203
9 TV digotor front rim	7	22-Jun-11	16:08:13	204
9 TV digotor coil	318012	22-Jun-11	16:09:46	205
9 TV digotor coil	312123	22-Jun-11	16:10:20	206
9 TV digotor board	62833	22-Jun-11	16:11:01	207
9 TV digotor board	6	23-Jun-11	10:28:53	2

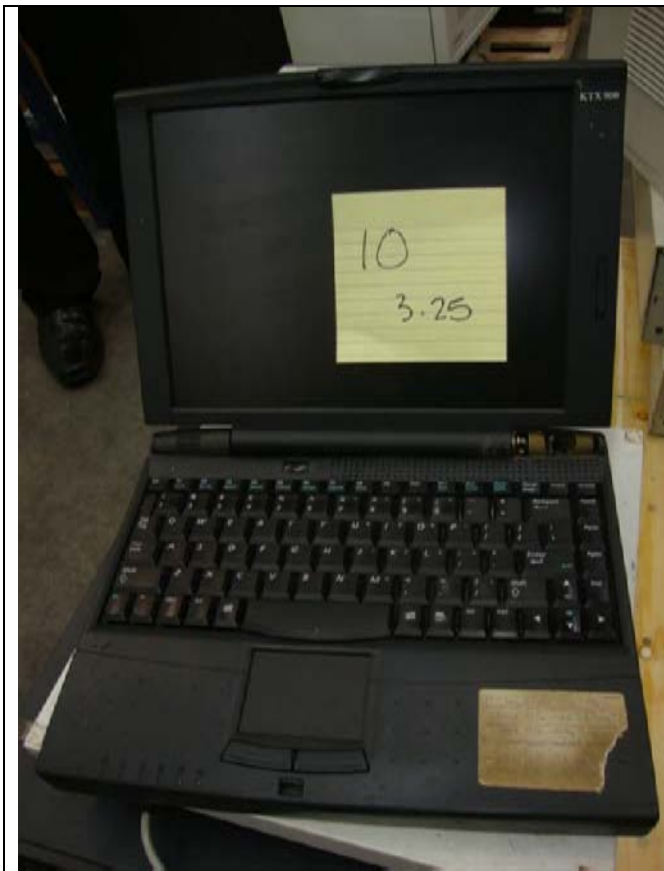


CRT TV Digitor Model G5170 Made in China



Item 10 is Laptop Laptop KTX 900 Made in Korea; 1997

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
10 notebook KTX Korea keyboard	145	22-Jun-11	14:52:38	147
10 notebook KTX Korea case	103250	22-Jun-11	14:53:20	148
10 notebook KTX Korea battery	153913	22-Jun-11	14:54:39	149
10 notebook KTX Korea diskette drive	16208	22-Jun-11	14:55:53	150
10 notebook KTX Korea hdd	85516	22-Jun-11	14:56:40	151
10 notebook KTX Korea board	93309	22-Jun-11	14:57:26	152
10 notebook KTX Korea LCD	37	22-Jun-11	14:58:05	153



Laptop Laptop KTX 900 Made in Korea; 1997

Item 11 is copier Canon 1020 made in Thailand; looks old

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
11 Canon photocopier other shell	11	22-Jun-11	15:46:18	188
11 Canon photocopier other shell	6	22-Jun-11	15:47:00	189
11 Canon photocopier other shell	1003	22-Jun-11	15:47:37	190
11 Canon photocopier other shell	8	22-Jun-11	15:48:11	191
11 Canon photocopier drum unit	19	22-Jun-11	15:49:00	192
11 Canon photocopier fuser unit	54346	22-Jun-11	15:49:31	193
11 Canon photocopier base	15	22-Jun-11	15:51:01	194
11 Canon photocopier base	11	22-Jun-11	15:52:02	195
11 Canon photocopier base	161	22-Jun-11	15:52:31	196



Copier Canon 1020 made in Thailand; looks old

Item 12 is microwave oven Sanyo Model EM S667W

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
12 microwave front panel	4810	22-Jun-11	15:59:11	197
12 microwave front panel	1541	22-Jun-11	15:59:48	198
12 microwave front door	4017	22-Jun-11	16:00:40	199
12 microwave front door	300694	22-Jun-11	16:01:19	200
12 microwave front door	151	22-Jun-11	16:02:07	201

microwave oven Sanyo Model EM S667W



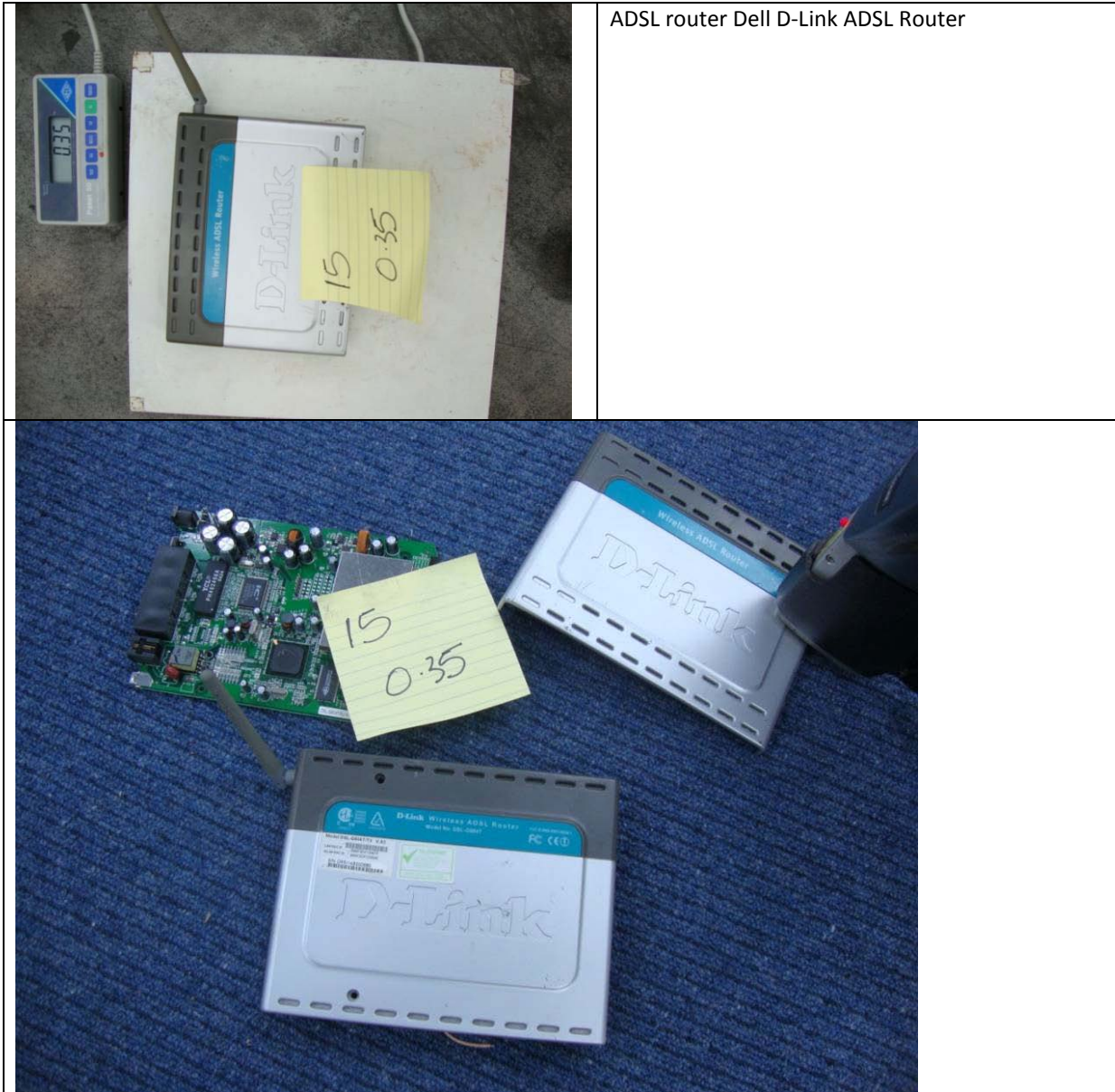
Item 14 is

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
14 Ricoh Aficio 1060 photocopier grey outside	9	23-Jun-11	12:27:09	95
14 Ricoh Aficio 1060 photocopier grey outside	13	23-Jun-11	12:27:40	96
14 Ricoh Aficio 1060 photocopier grey outside	197302	23-Jun-11	12:28:20	97
14 Ricoh Aficio 1060 photocopier grey outside	143454	23-Jun-11	12:29:07	98
14 Ricoh Aficio 1060 photocopier grey outside	138411	23-Jun-11	12:29:39	99
14 Ricoh Aficio 1060 photocopier grey outside	153344	23-Jun-11	12:30:15	100
14 Ricoh Aficio 1060 photocopier grey outside	7	23-Jun-11	12:30:48	101
14 Ricoh Aficio 1060 photocopier grey outside	143370	23-Jun-11	12:31:34	102
14 Ricoh Aficio 1060 photocopier grey outside	17	23-Jun-11	12:32:02	103
14 Ricoh Aficio 1060 photocopier grey outside	50648	23-Jun-11	12:32:35	104
14 Ricoh Aficio 1060 photocopier grey outside	108860	23-Jun-11	12:33:09	105
14 Ricoh Aficio 1060 photocopier grey outside	173699	23-Jun-11	12:33:45	106
14 Ricoh Aficio 1060 photocopier grey outside	14	23-Jun-11	12:34:18	107
14 Ricoh Aficio 1060 photocopier grey outside	15	23-Jun-11	12:34:56	108
14 Ricoh Aficio 1060 photocopier grey outside	20	23-Jun-11	12:35:33	109
14 Ricoh Aficio 1060 photocopier grey outside	21	23-Jun-11	12:36:02	110
14 Ricoh Aficio 1060 photocopier grey outside	33	23-Jun-11	12:36:28	111
14 Ricoh Aficio 1060 photocopier grey outside	148380	23-Jun-11	12:37:00	112
14 Ricoh Aficio 1060 photocopier grey outside	8	23-Jun-11	12:37:24	113
14 Ricoh Aficio 1060 photocopier grey outside	9	23-Jun-11	12:38:06	114
14 Ricoh Aficio 1060 photocopier grey outside	42	23-Jun-11	12:38:33	115
14 Ricoh Aficio 1060 photocopier grey outside	213195	23-Jun-11	12:39:01	116
14 Ricoh Aficio 1060 photocopier grey outside	195877	23-Jun-11	12:39:31	117
14 Ricoh Aficio 1060 photocopier grey outside	179293	23-Jun-11	12:39:57	118
14 Ricoh Aficio 1060 photocopier grey outside	1296	23-Jun-11	12:40:31	119
14 Ricoh Aficio 1060 photocopier pc boards	51496	23-Jun-11	12:41:23	120
14 Ricoh Aficio 1060 photocopier pc boards	1752	23-Jun-11	12:41:55	121
14 Ricoh Aficio 1060 photocopier pc boards	59124	23-Jun-11	12:42:31	122
14 Ricoh Aficio 1060 photocopier pc boards	26043	23-Jun-11	12:43:06	123
14 Ricoh Aficio 1060 photocopier pc boards	34621	23-Jun-11	12:43:37	124
14 Ricoh Aficio 1060 photocopier pc boards	72867	23-Jun-11	12:44:06	125
14 Ricoh Aficio 1060 photocopier pc boards	22537	23-Jun-11	12:44:59	126
14 Ricoh Aficio 1060 photocopier pc boards	21165	23-Jun-11	12:45:28	127



Item 15 is ADSL router Dell D-Link ADSL Router

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
15 D-Link ADSL router house	178558	22-Jun-11	14:48:44	144
15 D-Link ADSL router house	176637	22-Jun-11	14:49:13	145
15 D-Link ADSL board	1197	22-Jun-11	14:49:55	146



Item 16 is computer PCB (printed circuit board) 1997 Digital Equip Corp, Singapore

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
16 20 computer boards SMC	56735	22-Jun-11	11:16:21	33
16 20 computer boards SMC	53736	22-Jun-11	11:16:57	34
16 20 computer boards SMC	50501	22-Jun-11	11:17:36	35

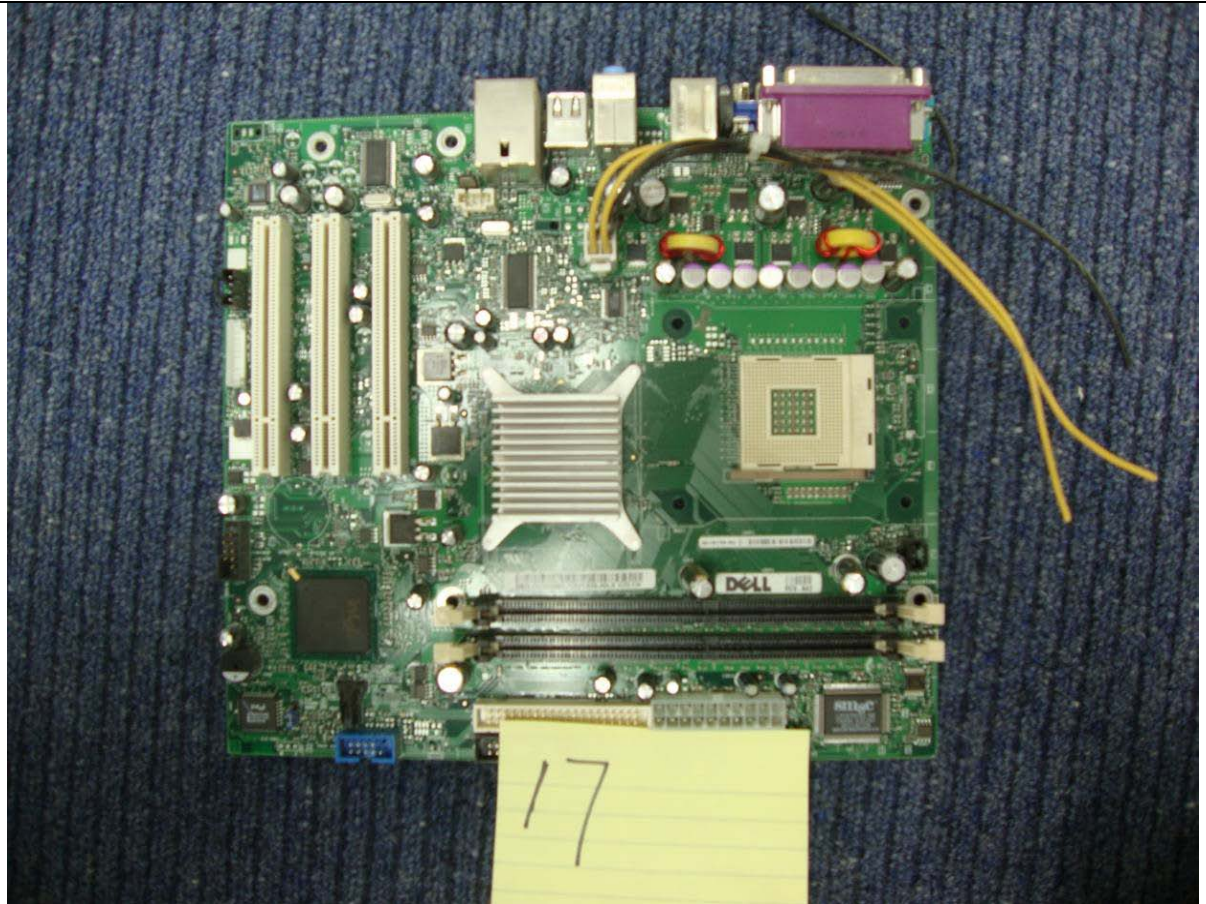
computer PCB (printed circuit board) 1997 Digital Equip Corp, Singapore



Item 17 is computer PCB (printed circuit board) Dell

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
17 computer boards Dell	47003	22-Jun-11	11:19:23	36
17 computer boards Dell	1607	22-Jun-11	11:19:56	37
17 computer boards Dell	4576	22-Jun-11	11:20:33	38
17 computer boards Dell	53210	22-Jun-11	11:21:06	39

computer PCB (printed circuit board) Dell



Item 18 is computer PCB (printed circuit board) Made in Taiwan

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
18 computer boards 368sx Taiwan	110458	22-Jun-11	11:24:39	40
18 computer boards 368sx Taiwan	83324	22-Jun-11	11:25:16	41
18 computer boards 368sx Taiwan	11716	22-Jun-11	11:25:49	42

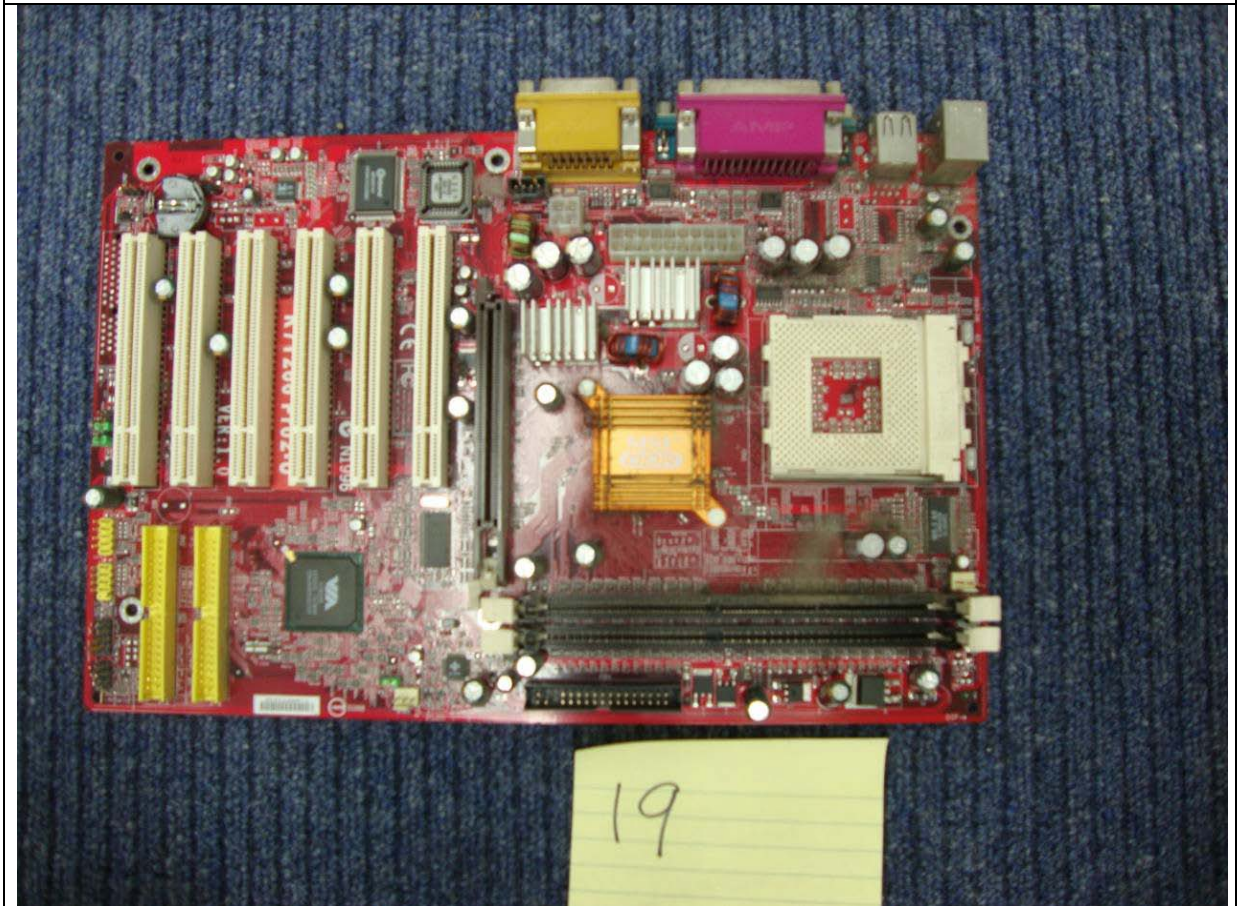
computer PCB (printed circuit board) Made in Taiwan



Item 19 is computer PCB (printed circuit board) Microstar Model MS 6593

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
19 computer boards MSI DDR	37526	22-Jun-11	11:28:06	43
19 computer boards MSI DDR	8887	22-Jun-11	11:28:39	44
19 computer boards MSI DDR	58148	22-Jun-11	11:29:08	45

computer PCB (printed circuit board) Microstar Model MS 6593



Item 20 is computer PCB (printed circuit board) Intel Desktop PCB (printed circuit board) D875PBZLK 2004

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
20 computer boards Intel	68830	22-Jun-11	11:31:14	46
20 computer boards Intel	27267	22-Jun-11	11:31:43	47
20 computer boards Intel	207644	22-Jun-11	11:32:20	48
20 computer boards Intel	5919	22-Jun-11	11:33:06	49
20 computer boards Pentium 3	79338	22-Jun-11	11:34:25	50
20 computer boards Pentium 3	4662	22-Jun-11	11:35:02	51
20 computer boards Pentium 3	462	22-Jun-11	11:35:38	52
20 computer boards Pentium 3	91528	22-Jun-11	11:36:14	53

computer PCB (printed circuit board) Intel Desktop PCB (printed circuit board) D875PBZLK 2004



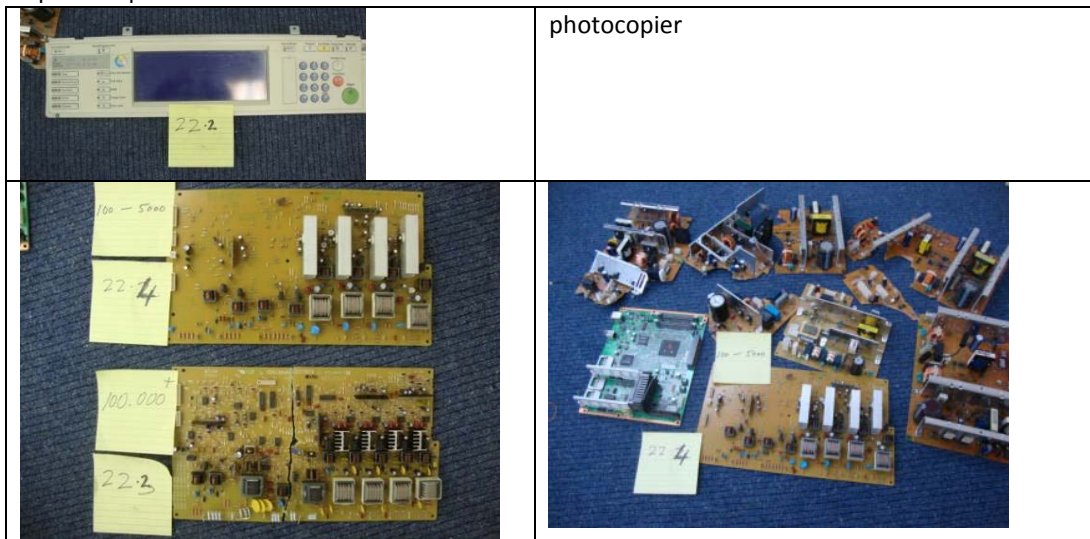
Item other computer board results

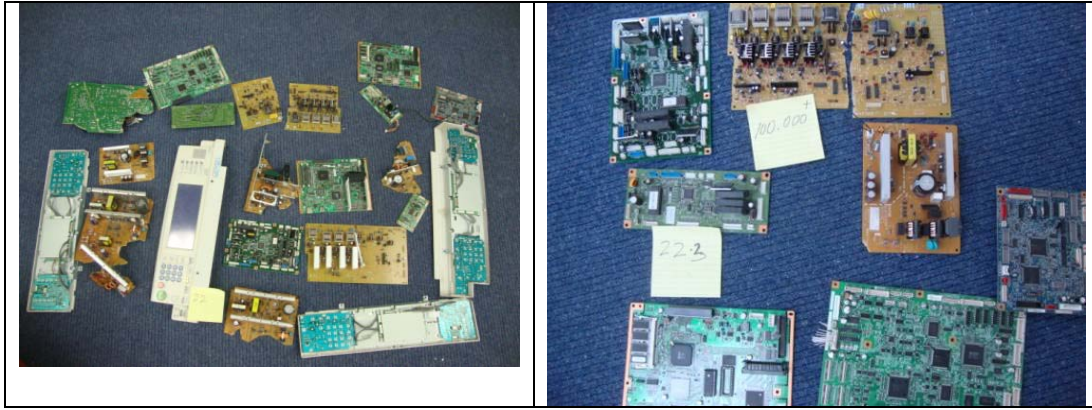
Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
other computer boards	72	22-Jun-11	13:13:47	55
other computer boards	68442	22-Jun-11	13:14:21	56
other computer boards	95434	22-Jun-11	13:15:03	57
other computer boards	883	22-Jun-11	13:15:35	58
other computer boards	1109	22-Jun-11	13:16:03	59
other computer boards	70113	22-Jun-11	13:16:27	60
other computer boards	7502	22-Jun-11	13:16:58	61
other computer boards	80075	22-Jun-11	13:17:31	62
other computer boards	3465	22-Jun-11	13:17:57	63
other computer boards	67600	22-Jun-11	13:18:26	64
other computer boards	40311	22-Jun-11	13:18:57	65
other computer boards	57679	22-Jun-11	13:19:22	66
other computer boards	55564	22-Jun-11	13:19:56	67
other computer boards	981	22-Jun-11	13:21:27	68
other computer boards	37206	22-Jun-11	13:24:15	69
other computer boards	1134	22-Jun-11	13:24:42	70
other computer boards	10456	22-Jun-11	13:25:14	71
other computer boards	54254	22-Jun-11	13:25:43	72
other computer boards	58905	22-Jun-11	13:26:45	73
other computer boards	71971	22-Jun-11	13:27:13	74
other computer boards	101000	22-Jun-11	13:27:42	75
other computer boards	107166	22-Jun-11	13:28:15	76
other computer boards	57299	22-Jun-11	13:28:40	77
other computer boards	47563	22-Jun-11	13:29:04	78
other computer boards	42855	22-Jun-11	13:29:29	79
other computer boards	-52	22-Jun-11	13:30:01	80



Item 22 is photocopier

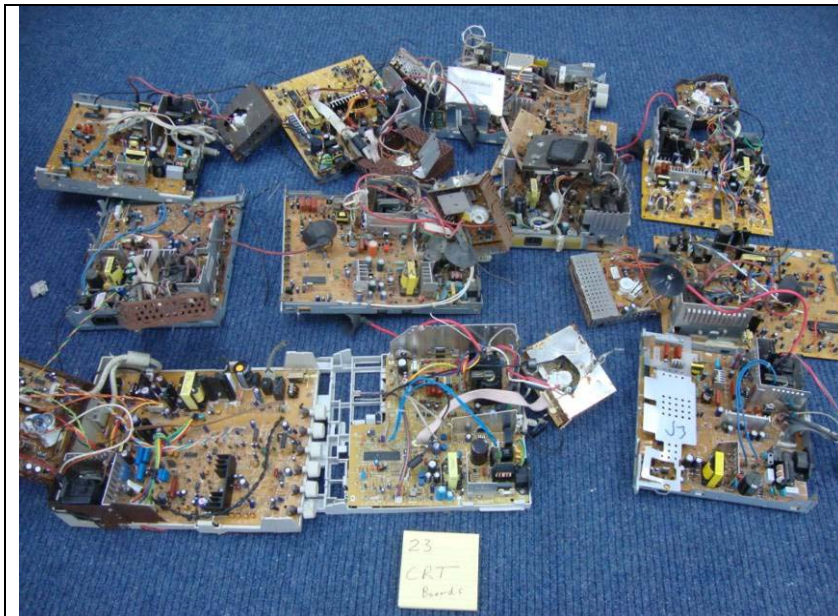
Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
22 photocopier boards	1159	22-Jun-11	13:33:52	81
22.1 photocopier outside plastic	153781	22-Jun-11	13:34:29	82
22 photocopier outside cover 22.2	163345	22-Jun-11	13:36:09	83
22 photocopier boards	1522	22-Jun-11	13:37:47	84
22 photocopier boards	130	22-Jun-11	13:38:22	85
22 photocopier boards	93	22-Jun-11	13:39:02	86
22 photocopier boards	94950	22-Jun-11	13:39:33	87
22 photocopier boards	59552	22-Jun-11	13:40:14	88
22 photocopier boards	3161	22-Jun-11	13:40:47	89
22 photocopier boards	2069	22-Jun-11	13:41:19	90
22 photocopier boards	1494	22-Jun-11	13:41:48	91
22 photocopier boards	56296	22-Jun-11	13:42:23	92
22 photocopier boards	35	22-Jun-11	13:43:39	93
22 photocopier boards	581	22-Jun-11	13:44:23	94
22 photocopier boards	1818	22-Jun-11	13:44:58	95
22 photocopier boards	2487	22-Jun-11	13:47:37	96
22 photocopier boards	16910	22-Jun-11	13:48:48	97
22 photocopier boards	529	22-Jun-11	13:49:22	98
22 photocopier boards	67008	22-Jun-11	13:49:52	99
22 photocopier boards	46328	22-Jun-11	13:50:29	100
22 photocopier boards	49913	22-Jun-11	13:51:03	101
22 photocopier boards	45871	22-Jun-11	13:51:37	102





Item 23 is PCB (printed circuit board)s from CRT monitors

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
23 CRT monitor boards	136358	22-Jun-11	13:59:20	103
23 CRT monitor boards	77779	22-Jun-11	14:00:13	104
23 CRT monitor boards	12630	22-Jun-11	14:00:45	105
23 CRT monitor boards	76178	22-Jun-11	14:01:24	106
23 CRT monitor boards	74713	22-Jun-11	14:02:07	107
23 CRT monitor boards	46259	22-Jun-11	14:02:41	108
23 CRT monitor boards	58447	22-Jun-11	14:03:13	109
23 CRT monitor boards	35	22-Jun-11	14:03:57	110
23 CRT monitor boards	40127	22-Jun-11	14:04:31	111
23 CRT monitor boards	30635	22-Jun-11	14:05:11	112
23 CRT monitor boards	18595	22-Jun-11	14:05:59	113
23 CRT monitor boards	75140	22-Jun-11	14:06:50	114

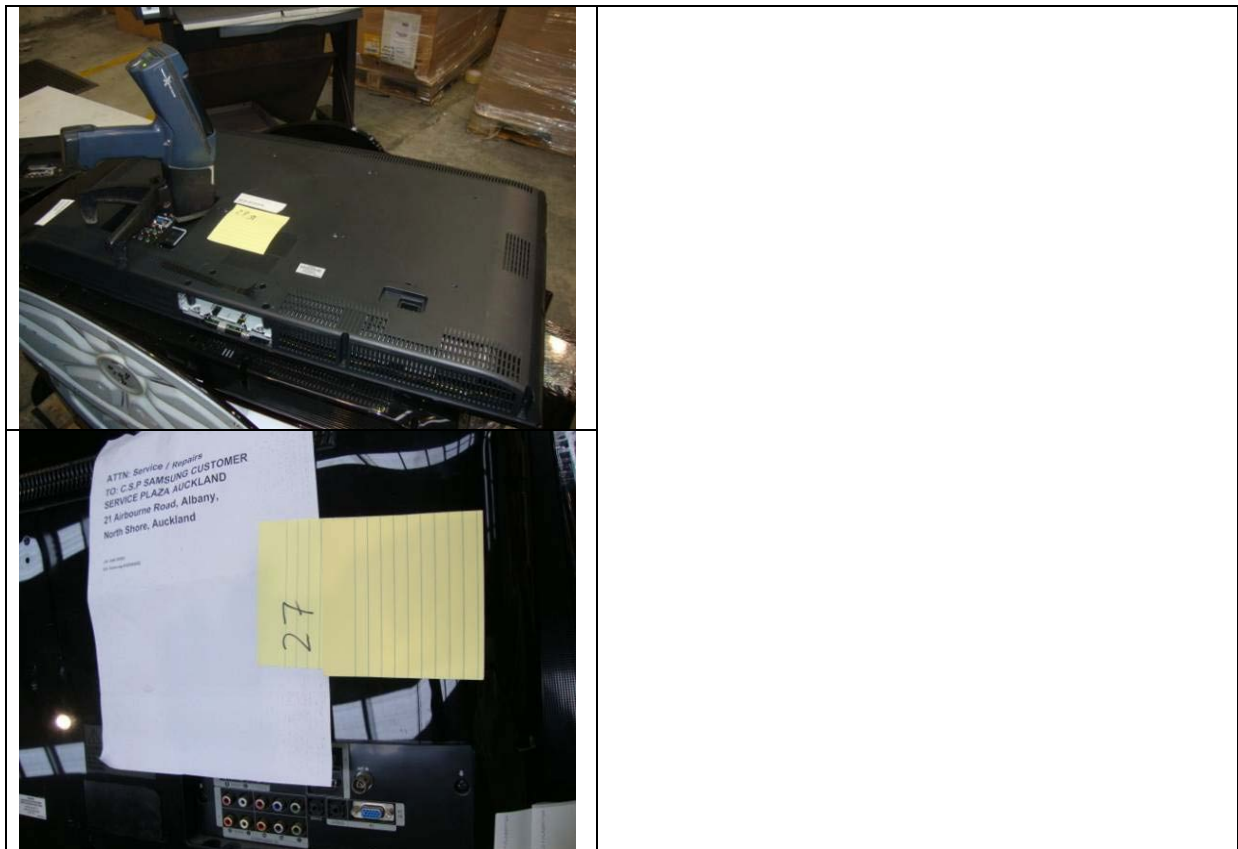


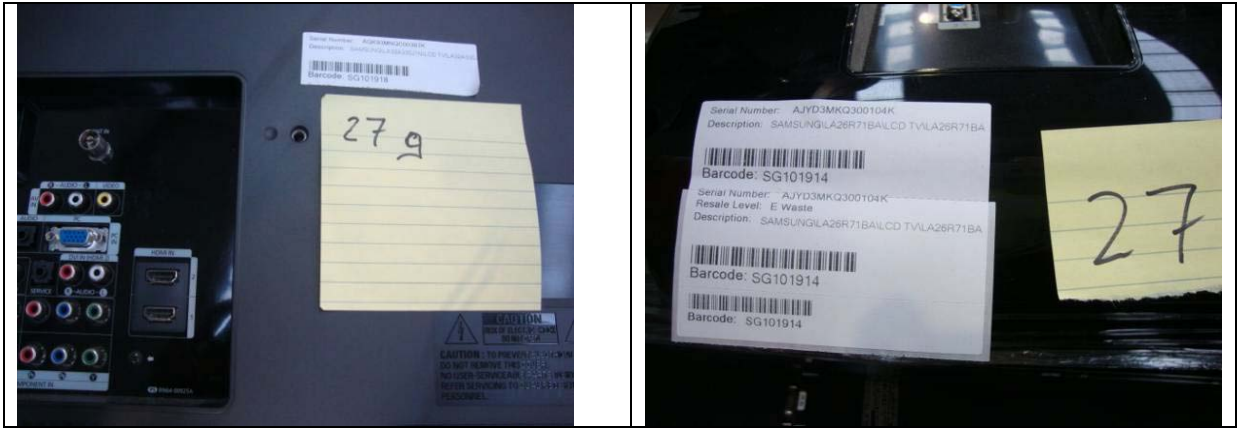
PCB (printed circuit board)s from CRT monitors

one PCB (printed circuit board) 30,000 but other 9 or so higher than 50,000; and mostly over 10% (>100,000)

Item 27 is LCD TV housings

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
27 LCD TV housings in hall 5 no. 27 a	8	23-Jun-11	10:31:22	3
27 LCD TV housings in hall 5 no. 27 a	449	23-Jun-11	10:31:51	4
27 LCD TV housings in hall 5 no. 27 b	46	23-Jun-11	10:32:51	5
27 LCD TV housings in hall 5 no. 27 b	41	23-Jun-11	10:33:21	6
27 LCD TV housings in hall 5 no. 27 b	6	23-Jun-11	10:33:48	7
27 LCD TV housings in hall 5 no. 27 e	79693	23-Jun-11	10:34:19	8
27 LCD TV housings in hall 5 no. 27 f	139	23-Jun-11	10:35:50	9
27 LCD TV housings in hall 5 no. 27 g	2790	23-Jun-11	10:36:23	10
27 LCD TV housings in hall 5 no. 27 h	4150	23-Jun-11	10:37:10	11
27 LCD TV housings in hall 5 no. 27 g conn section	1560	23-Jun-11	10:38:52	12
27 LCD TV housings in hall 5 no. 27 h conn section	6279	23-Jun-11	10:39:44	13
27 LCD TV housings in hall 5 no. 27 h conn section	3778	23-Jun-11	10:40:33	14





Item 28 is hp inkjet plotter

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
28 hp inkjet plotter	19	23-Jun-11	10:43:09	15
28 hp inkjet plotter	8	23-Jun-11	10:43:47	16
28 hp inkjet plotter	19	23-Jun-11	10:44:21	17
28 hp inkjet plotter ink unit	2027	23-Jun-11	10:45:22	18



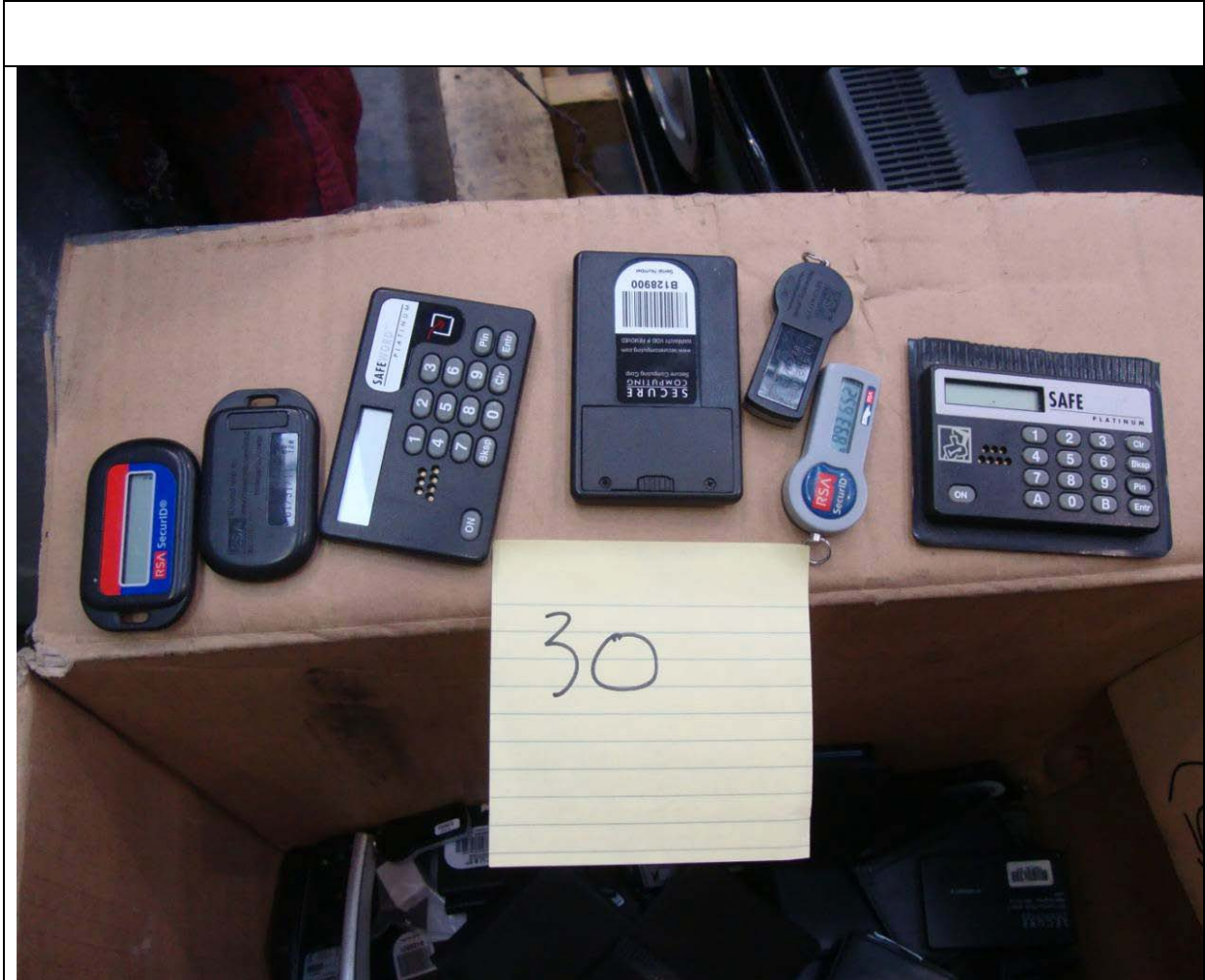
Item 29 is fax copiers - outside

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
29 fax copiers - outside	6	23-Jun-11	10:48:09	19
29 fax copiers - outside	9	23-Jun-11	10:48:36	20
29 fax copiers - outside	7	23-Jun-11	10:49:04	21
29 fax copiers - outside	499	23-Jun-11	10:49:40	22
29 fax copiers - outside	456	23-Jun-11	10:50:20	23
29 fax copiers - outside	10	23-Jun-11	10:50:55	24
29 fax copiers - cp control panel board	67144	23-Jun-11	10:51:24	25



Item 30 is security id

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
30 security id	4077	23-Jun-11	10:53:48	26
30 security id	838	23-Jun-11	10:55:12	27
30 security id	23218	23-Jun-11	10:55:51	28



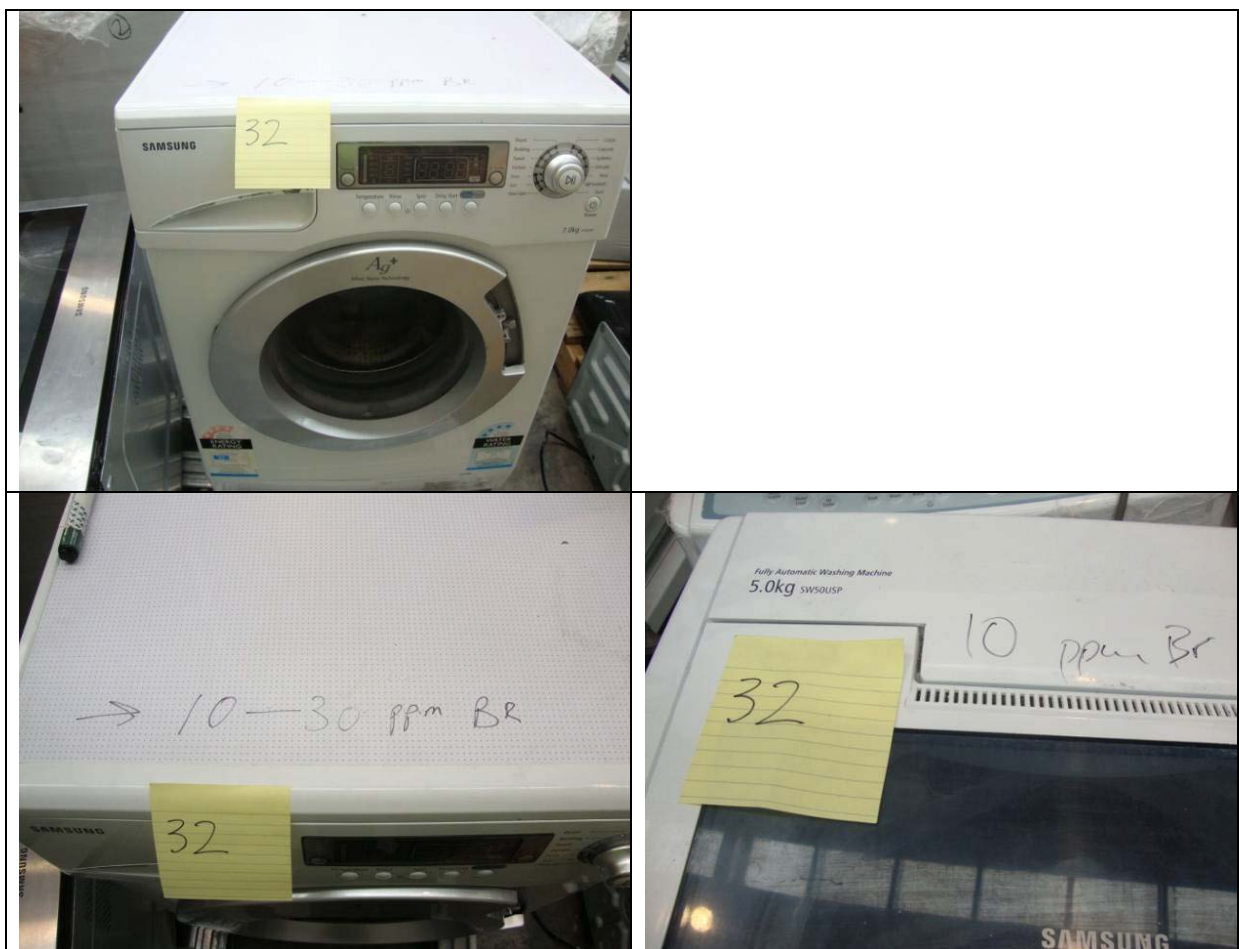
Item 31 is 2wire telecom splitter

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
31 2wire telecom splitter	14615	23-Jun-11	10:59:13	29
31 2wire telecom splitter	15280	23-Jun-11	10:59:47	30
31 2wire telecom splitter	6935	23-Jun-11	11:00:21	31
31 2wire telecom splitter	18523	23-Jun-11	11:01:00	32
31 2wire telecom splitter	15574	23-Jun-11	11:01:43	33
31 2wire telecom splitter	5892	23-Jun-11	11:02:25	34
31 2wire telecom splitter	179676	23-Jun-11	11:03:35	35



Item 32 is

Sample No. washing machine	Br-Corr (mg/kg)	Date	Time	Reading
32 washing machine	308	23-Jun-11	11:06:59	36
32 washing machine	15	23-Jun-11	11:07:33	37
32 washing machine	11	23-Jun-11	11:08:00	38
32 washing machine	139104	23-Jun-11	11:08:33	39
32 washing machine	151501	23-Jun-11	11:09:39	40
32 washing machine sw62asp	149972	23-Jun-11	11:11:24	41
32 washing machine	6	23-Jun-11	11:12:40	42
32 washing machine sw50usp	6	23-Jun-11	11:13:13	43
32 washing machine	8	23-Jun-11	11:15:33	44
32 washing machine	9	23-Jun-11	11:16:11	45



Item 33 is hair drier

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
33 hair drier	6	23-Jun-11	11:17:12	46
33 hair drier	3	23-Jun-11	11:17:44	47
33 hair drier	8	23-Jun-11	11:18:38	48



Item 34 is toner cartridges

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
34 toner cartridges	20	23-Jun-11	11:19:42	49
34 toner cartridges	94475	23-Jun-11	11:20:11	50
34 toner cartridges	6	23-Jun-11	11:21:08	51
34 toner cartridges	180805	23-Jun-11	11:21:40	52
34 toner cartridges	153227	23-Jun-11	11:22:28	53
34 toner cartridges	1755	23-Jun-11	11:23:07	54
34 toner cartridges	74182	23-Jun-11	11:23:36	55
34 toner cartridges	117	23-Jun-11	11:24:15	56
34 toner cartridges	134850	23-Jun-11	11:24:54	57



Item 35 is LCD projector

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
35 lcd projector	1105	23-Jun-11	11:26:53	58
35 lcd projector	5274	23-Jun-11	11:27:24	59
35 lcd projector	4978	23-Jun-11	11:27:59	60



Item 36 is UPS

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
36 ups	140456	23-Jun-11	11:29:58	61
36 ups	197488	23-Jun-11	11:30:26	62



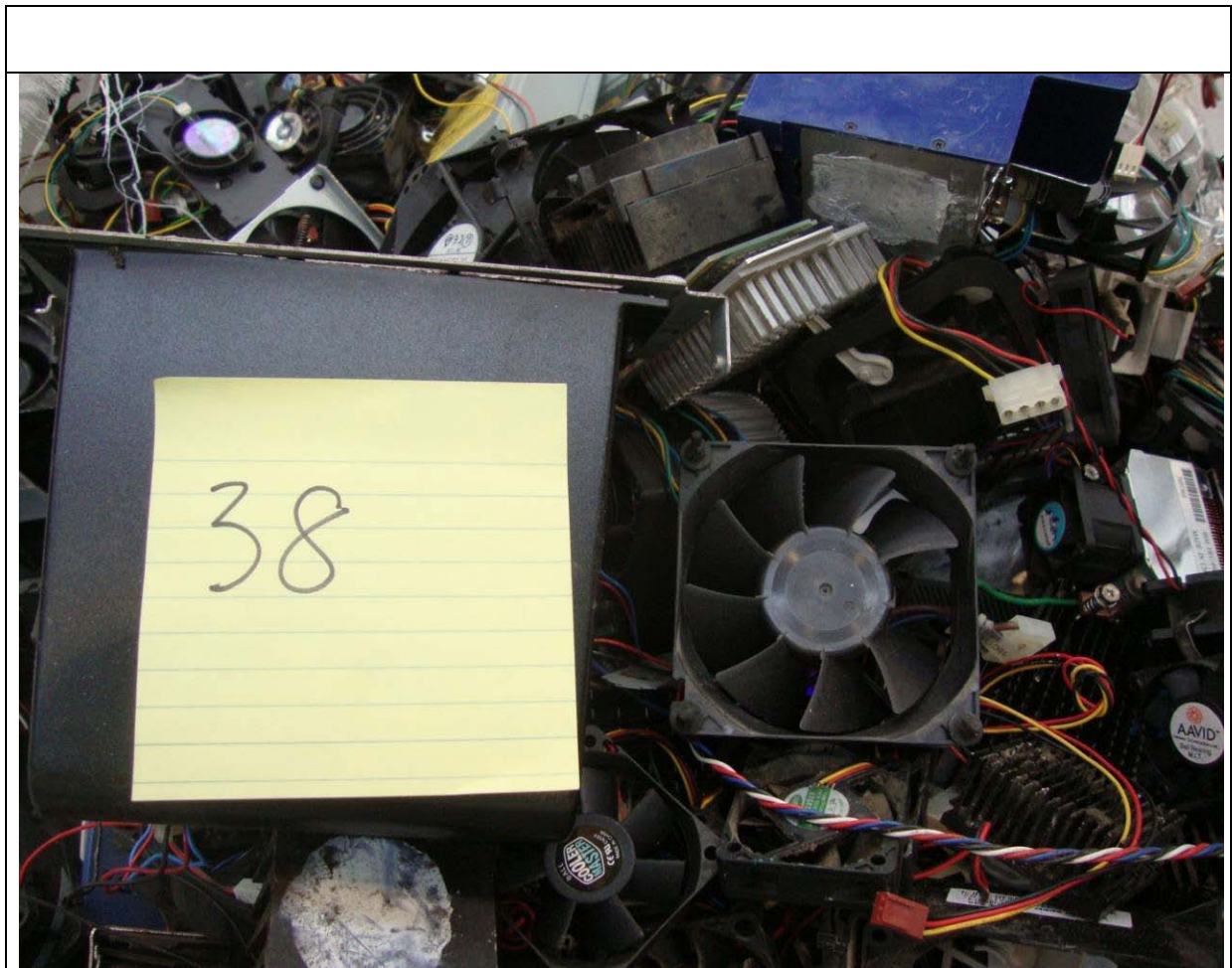
Item 37 is CD drives

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
37 cd drives	181714	23-Jun-11	11:32:15	63
37 cd drives	34	23-Jun-11	11:32:44	64
37 cd drives	8555	23-Jun-11	11:33:18	65
37 cd drives	149661	23-Jun-11	11:33:51	66
37 cd drives	186959	23-Jun-11	11:34:19	67
37 cd drives	158047	23-Jun-11	11:35:47	68
37 cd drives	131682	23-Jun-11	11:36:35	69



Item 38 is Fans

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
38 fans	35	23-Jun-11	11:38:27	70
38 fans	92182	23-Jun-11	11:38:56	71
38 fans	59643	23-Jun-11	11:39:25	72
38 fans	266	23-Jun-11	11:40:03	73
38 fans	322928	23-Jun-11	11:40:32	74
38 fans	92904	23-Jun-11	11:40:59	75
38 fans	13921	23-Jun-11	11:41:39	76
38 fans	88882	23-Jun-11	11:42:23	77



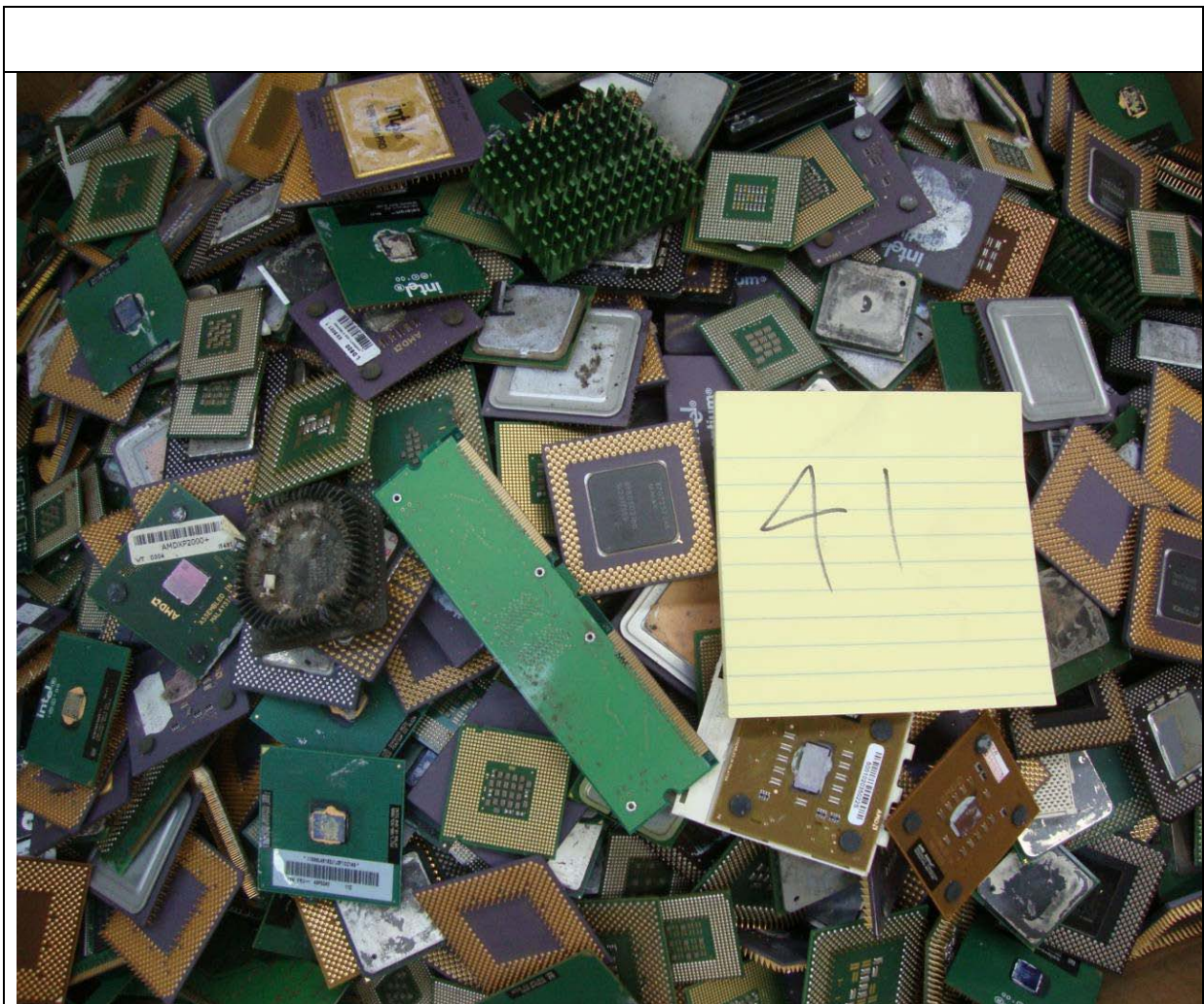
Item 40 is Plastic fronts of desktop computers

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
40 fronts desktop pc	5	23-Jun-11	12:12:49	78
40 fronts desktop pc	105	23-Jun-11	12:13:16	79
40 fronts desktop pc	86	23-Jun-11	12:13:44	80
40 fronts desktop pc	11	23-Jun-11	12:14:11	81
40 fronts desktop pc	12	23-Jun-11	12:14:38	82
40 fronts desktop pc	8	23-Jun-11	12:15:04	83



Item 41 is CPU's

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
41 processors	5934	23-Jun-11	12:16:06	84
41 processors	-4	23-Jun-11	12:16:35	85
41 processors	-3	23-Jun-11	12:17:00	86
41 processors	-3390	23-Jun-11	12:17:30	87
41 processors	-28	23-Jun-11	12:17:59	88
41 processors	23594	23-Jun-11	12:18:31	89
41 processors	34341	23-Jun-11	12:19:10	90
41 processors	11638	23-Jun-11	12:19:42	91
41 processors	6339	23-Jun-11	12:20:29	92
41 processors	452	23-Jun-11	12:21:22	93
41 processors	36347	23-Jun-11	12:21:47	94



Item 42 is modem / ADSL routers

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
42 modem / adsl	2102	23-Jun-11	13:50:22	130
42 modem / adsl	189899	23-Jun-11	13:50:55	131
42 modem / adsl	12224	23-Jun-11	13:51:31	132
42 modem / adsl	515	23-Jun-11	13:52:01	133
42 modem / adsl	220999	23-Jun-11	13:52:55	134
42 modem / adsl	154860	23-Jun-11	13:53:30	135
42 modem / adsl	783	23-Jun-11	13:54:05	136



Item 43 is EFTPOS machines

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
43 PIN Machines	1939	23-Jun-11	13:55:35	137
43 PIN Machines	1675	23-Jun-11	13:56:19	138
43 PIN Machines	262181	23-Jun-11	13:57:03	139
43 PIN Machines	57783	23-Jun-11	13:57:40	140
43 PIN Machines	99189	23-Jun-11	13:58:09	141
43 PIN Machines	280668	23-Jun-11	13:58:35	142
43 PIN Machines	2173	23-Jun-11	13:59:01	143
43 PIN Machines	2196	23-Jun-11	13:59:41	144
43 PIN Machines	25	23-Jun-11	14:00:16	145



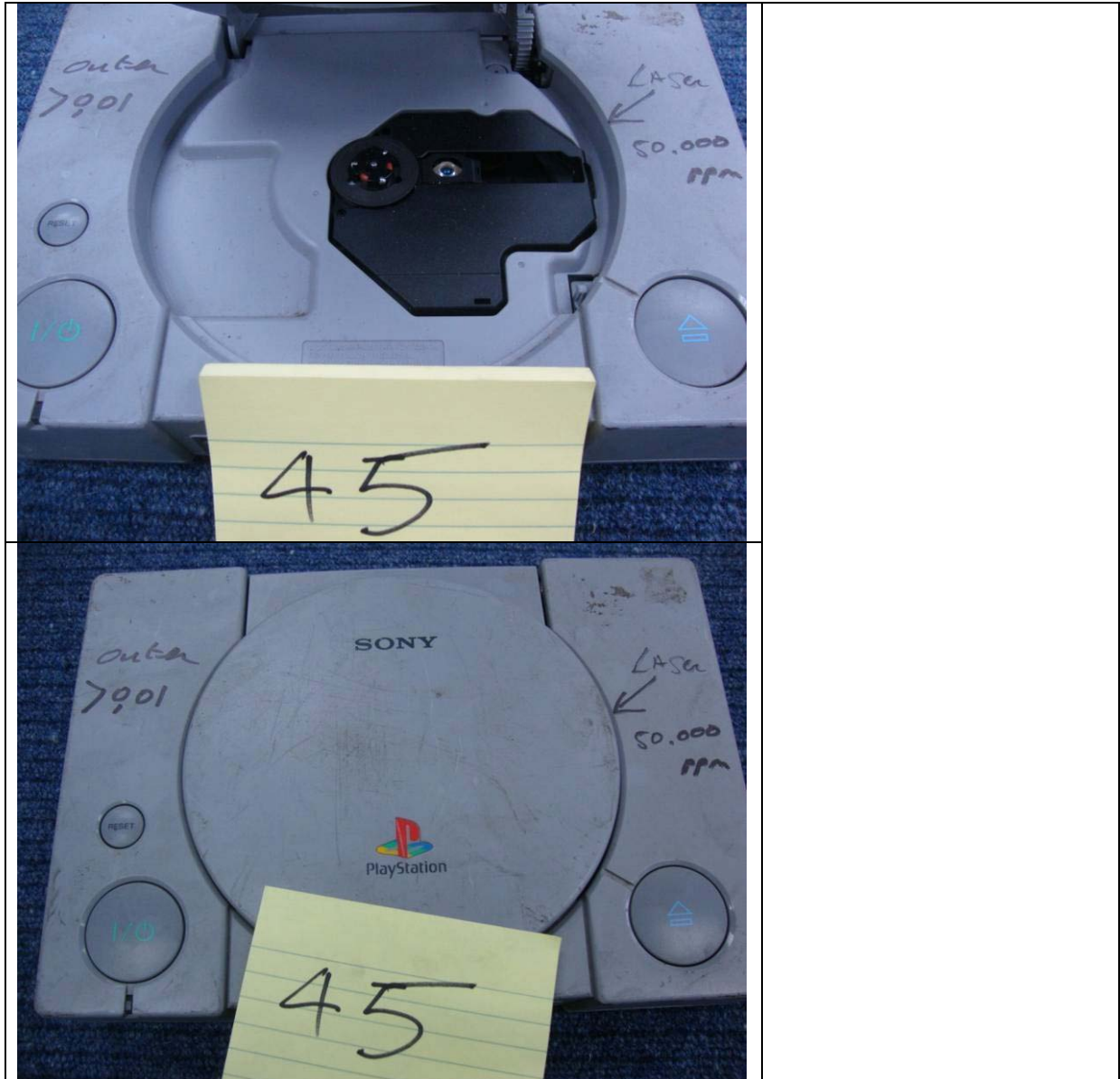
Item 44 is desk phones

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
44desk phones	23	23-Jun-11	14:09:03	149
44desk phones	16	23-Jun-11	14:09:32	150
44desk phones	20	23-Jun-11	14:10:03	151
44desk phones	13	23-Jun-11	14:10:30	152
44desk phones	24	23-Jun-11	14:10:59	153
44desk phones	22	23-Jun-11	14:11:25	154
44desk phones	549	23-Jun-11	14:11:54	155
44desk phones	9	23-Jun-11	14:12:20	156
44desk phones	230	23-Jun-11	14:12:49	157
44desk phones	573	23-Jun-11	14:13:21	158
44desk phones	728	23-Jun-11	14:13:59	159
44desk phones	12	23-Jun-11	14:14:40	160
44desk phones	104	23-Jun-11	14:15:12	161
44desk phonesboard inside	70	23-Jun-11	14:16:50	162



Item 45 is playstation 1

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
45 playstation 1	6	23-Jun-11	14:19:00	163
45 playstation 1	9	23-Jun-11	14:19:38	164
45 playstation 1 laser unit inside	27482	23-Jun-11	14:20:15	165



Item 46 is notebook acer aspire 3000

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
46 notebook acer aspire 3000	682	23-Jun-11	14:29:02	166
46 notebook acer aspire 3000	237	23-Jun-11	14:29:53	167
46 notebook acer aspire 3000	989	23-Jun-11	14:30:25	168
46 notebook acer aspire 3000	354	23-Jun-11	14:31:01	169
46 notebook acer aspire 3000 fan	118664	23-Jun-11	14:31:31	170
46 notebook acer aspire 3000	113	23-Jun-11	14:32:18	171
46 notebook acer aspire 3000 HDD PCB	29142	23-Jun-11	14:32:58	172
46 notebook acer aspire 3000 Board	70272	23-Jun-11	14:33:49	173



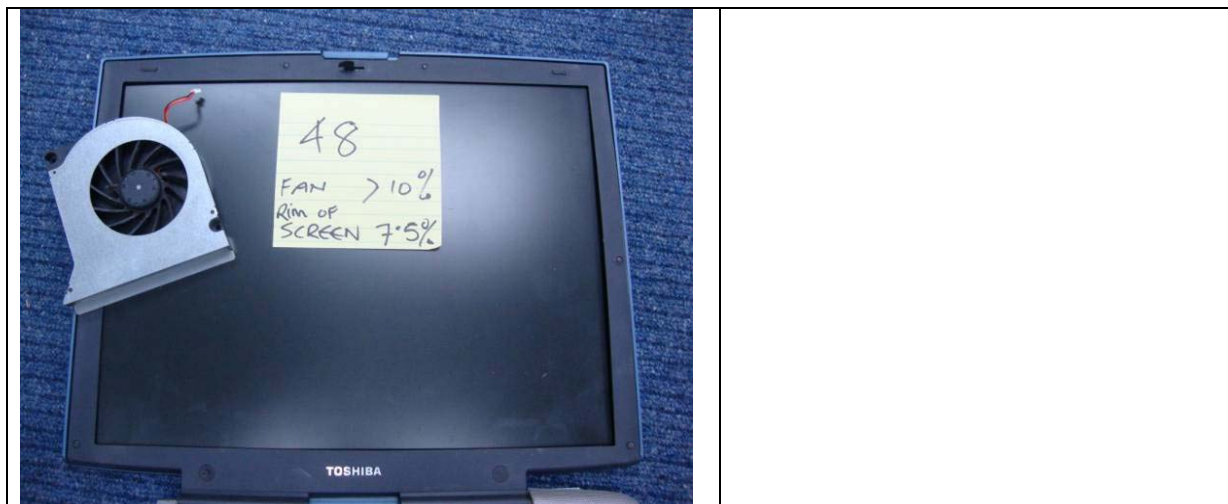
Item 47 is notebook Acer Compaq Presario C700

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
47 notebookacer compaq presario C700	79	23-Jun-11	14:35:55	174
47 notebookacer compaq presario C700	39	23-Jun-11	14:36:46	175
47 notebookacer compaq presario C700	41	23-Jun-11	14:37:15	176
47 notebookacer compaq presario C700	10	23-Jun-11	14:37:45	177
47 notebookacer compaq presario C700	20	23-Jun-11	14:38:24	178
47 notebookacer compaq presario C700	44	23-Jun-11	14:38:54	179
47 notebook Acer Compaq Presario C700 board only w BFR	40205	23-Jun-11	14:39:28	180



Item 48 is notebook Toshiba satellite 2450

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
48 notebook toshiba satellite 2450	83	23-Jun-11	14:42:26	181
48 notebook Toshiba satellite 2450 screen rim	44518	23-Jun-11	14:43:15	182
48 notebook toshiba satellite 2450	474	23-Jun-11	14:44:18	183
48 notebook toshiba satellite 2450	29	23-Jun-11	14:44:55	184
48 notebook toshiba satellite 2450	1763	23-Jun-11	14:45:26	185
48 notebook toshiba satellite 2450 fan 1	132962	23-Jun-11	14:45:56	186
48 notebook toshiba satellite 2450 fan 2	30	23-Jun-11	14:46:39	187
48 notebook toshiba satellite 2450	7	23-Jun-11	14:47:29	188
48 notebook toshiba satellite 2450	157	23-Jun-11	14:47:59	189
48 notebook Toshiba satellite 2450 small PCB	28512	23-Jun-11	14:48:34	190
48 notebook toshiba satellite 2450	251	23-Jun-11	14:49:27	191





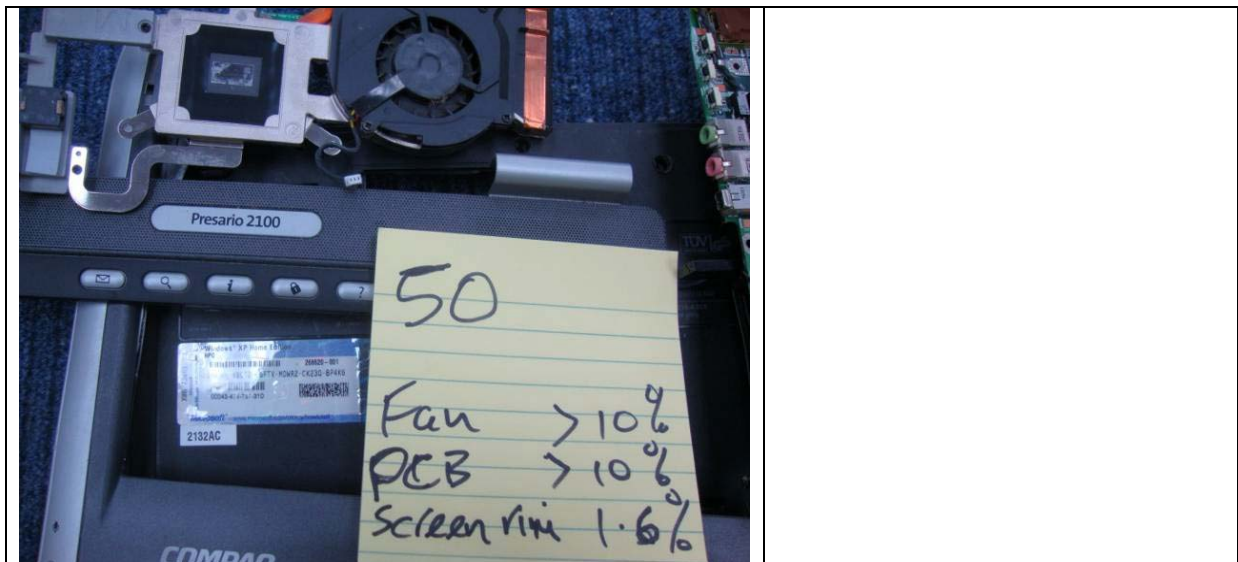
Item 49 is notebook excell model 532

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
49 notebook excell model 532	1029	23-Jun-11	14:51:22	192
49 notebook excell model 532	1012	23-Jun-11	14:51:52	193
49 notebook excell model 532	1618	23-Jun-11	14:52:22	194
49 notebook excell model 532	60	23-Jun-11	14:52:53	195
49 notebook excell model 532 pboard	77141	23-Jun-11	14:53:29	196
49 notebook excell model 532 fan	91443	23-Jun-11	14:54:17	197



Item 50 is notebook Compaq Presario 2100

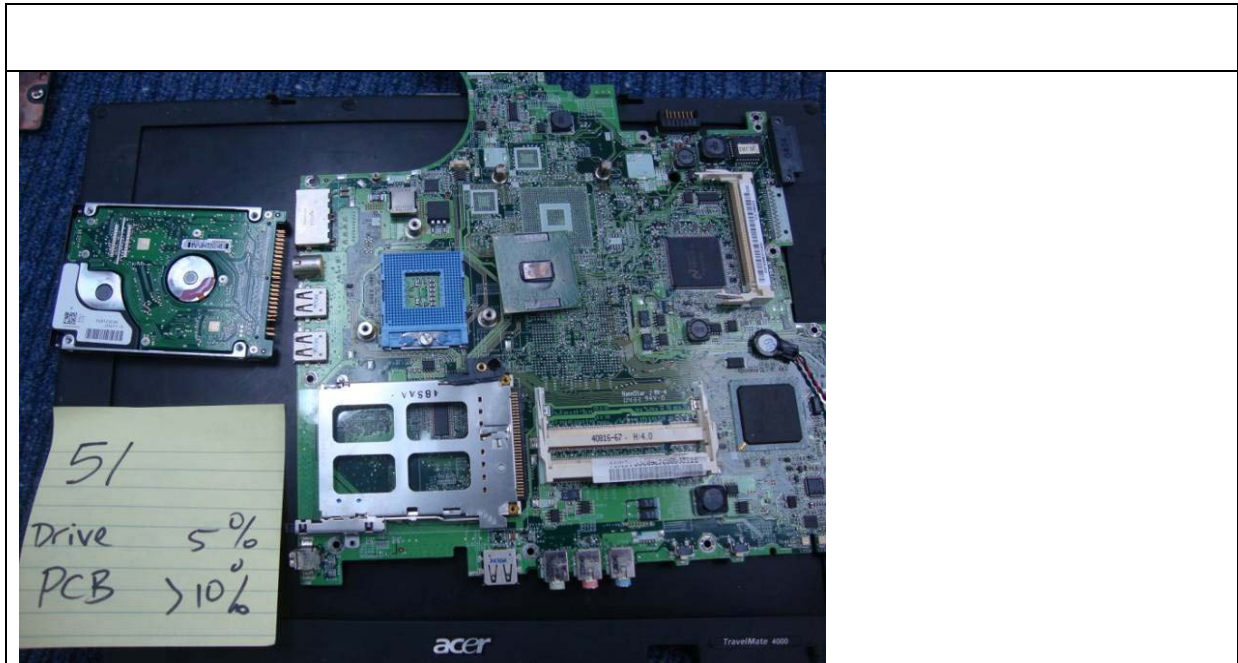
Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
50 notebook compaq	30	23-Jun-11	14:58:02	198
50 notebook compaq	9639	23-Jun-11	14:58:36	199
50 notebook Compaq Presario 2100 screen rim	5390	23-Jun-11	15:00:00	200
50 notebook compaq presario 2100	14	23-Jun-11	15:00:48	201
50 notebook compaq presario 2100	10	23-Jun-11	15:01:31	202
50 notebook compaq presario 2100 pboard	80231	23-Jun-11	15:02:04	203
50 notebook compaq presario 2100 fan	81374	23-Jun-11	15:02:50	204
50 notebook Compaq Presario 2100 HHD board	20409	23-Jun-11	15:03:37	205
50 notebook compaq presario 2100	332	23-Jun-11	15:04:22	206
50 notebook compaq presario 2100	170267	23-Jun-11	15:04:49	207
50 notebook compaq presario 2100	59	23-Jun-11	15:06:59	208





Item 51 is notebook Acer travelmate 4000

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
51 notebook acer travelmate 4000	22	23-Jun-11	15:10:13	210
51 notebook acer travelmate 4000	699	23-Jun-11	15:10:46	211
51 notebook acer travelmate 4000	47	23-Jun-11	15:11:25	212
51 notebook acer travelmate 4000	68	23-Jun-11	15:11:54	213
51 notebook acer travelmate 4000 pcboard	58654	23-Jun-11	15:12:22	214
51 notebook Acer travelmate 4000 HDD card	25694	23-Jun-11	15:13:08	215
51 notebook acer travelmate 4000	21	23-Jun-11	15:14:00	216



Item 51 B is Acer Aspire 3620

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
51 B notebook acer aspire 3620	348	23-Jun-11	15:17:01	217
51 B notebook acer aspire 3620	7	23-Jun-11	15:17:31	218
51 B notebook acer aspire 3620	262	23-Jun-11	15:18:10	219
51 B notebook acer aspire 3620	20	23-Jun-11	15:18:46	220
51 B notebook acer aspire 3620	237	23-Jun-11	15:19:17	221
51 B notebook acer aspire 3620	12	23-Jun-11	15:19:56	222
51 B notebook Acer aspire 3620 rim	3253	23-Jun-11	15:20:23	223



Note the 0.6 % on the sticker in the picture is the uncorrected bromine concentration (needs to be divided by 1.65)

Item 52 is notebook Toshiba satellite L20 (no picture)

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
52 notebook toshiba satellite L20	23	23-Jun-11	15:23:10	224
52 notebook toshiba satellite L20	76	23-Jun-11	15:23:48	225
52 notebook toshiba satellite L20	10	23-Jun-11	15:24:29	226
52 notebook toshiba satellite L20	9	23-Jun-11	15:24:55	227
52 notebook toshiba satellite L20	33	23-Jun-11	15:25:51	228

52 notebook Toshiba satellite L20 PCB	24051	23-Jun-11	15:26:23	229
52 notebook toshiba satellite L20	150240	23-Jun-11	15:27:11	230
52 notebook Toshiba satellite L20 fan	112	23-Jun-11	15:28:14	231

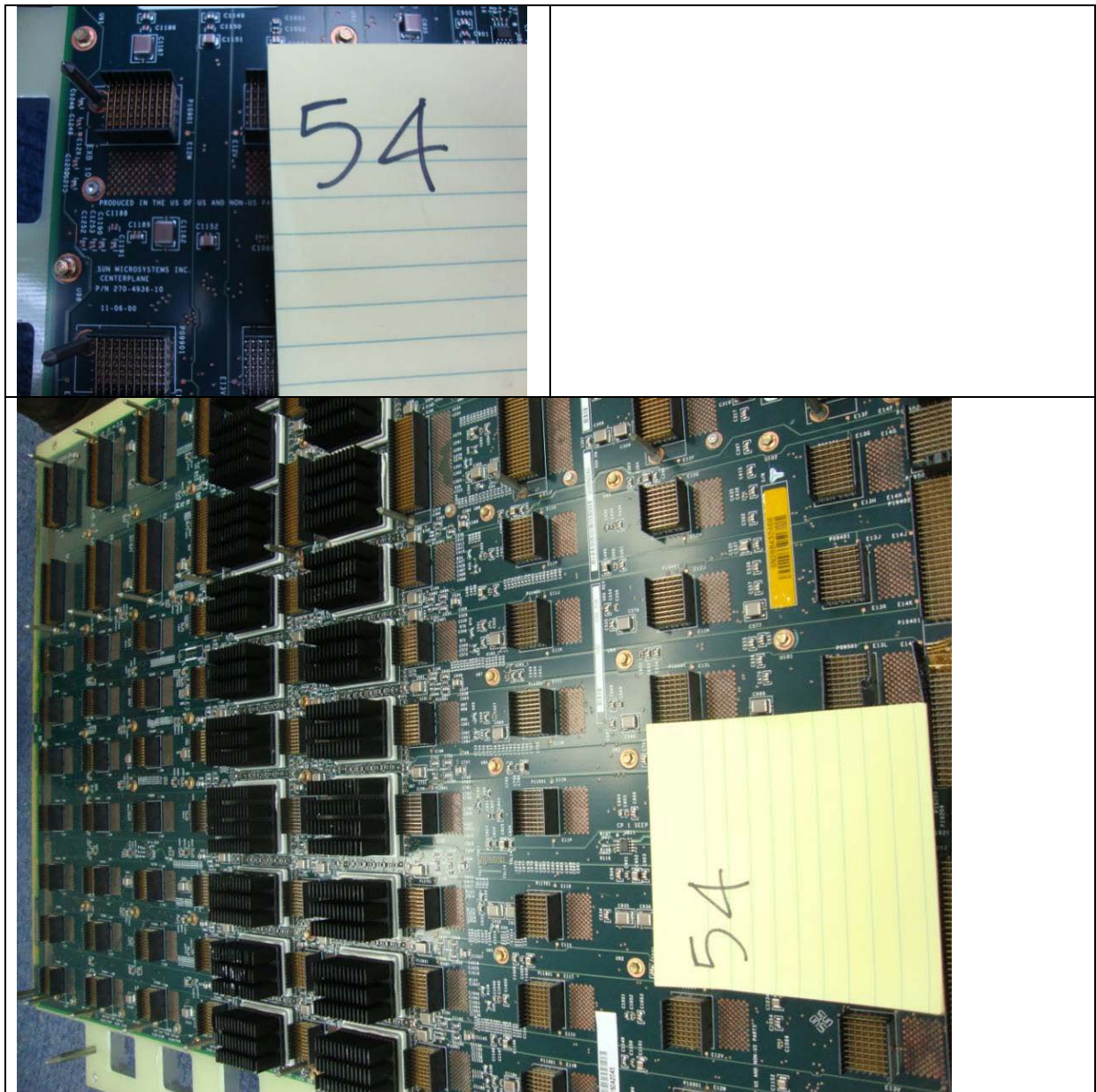
Item 53 is crt mon housing

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
53 crt mon housing	142743	23-Jun-11	15:39:07	232
53 crt mon housing	139319	23-Jun-11	15:39:35	233
53 crt mon housing	189502	23-Jun-11	15:39:59	234



Item 54 is mainframe board Sun micro syst

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
54 mainframe board Sun micro syst	180173	23-Jun-11	15:42:13	235
54 mainframe board Sun micro syst	73043	23-Jun-11	15:42:50	236
54 mainframe board Sun micro syst	189690	23-Jun-11	15:43:37	237
54 mainframe board Sun micro syst	145805	23-Jun-11	15:44:16	238
54 mainframe board Sun micro syst	5226	23-Jun-11	15:45:31	239
54 mainframe board Sun micro syst	33	23-Jun-11	15:46:07	240
54 mainframe board Sun micro syst storage expansion slot	61411	23-Jun-11	15:47:50	241
54 mainframe board Sun micro syst storage expansion slot	56359	23-Jun-11	15:48:26	242
54 mainframe board Sun micro syst storage expansion slot	8372	23-Jun-11	15:49:07	243



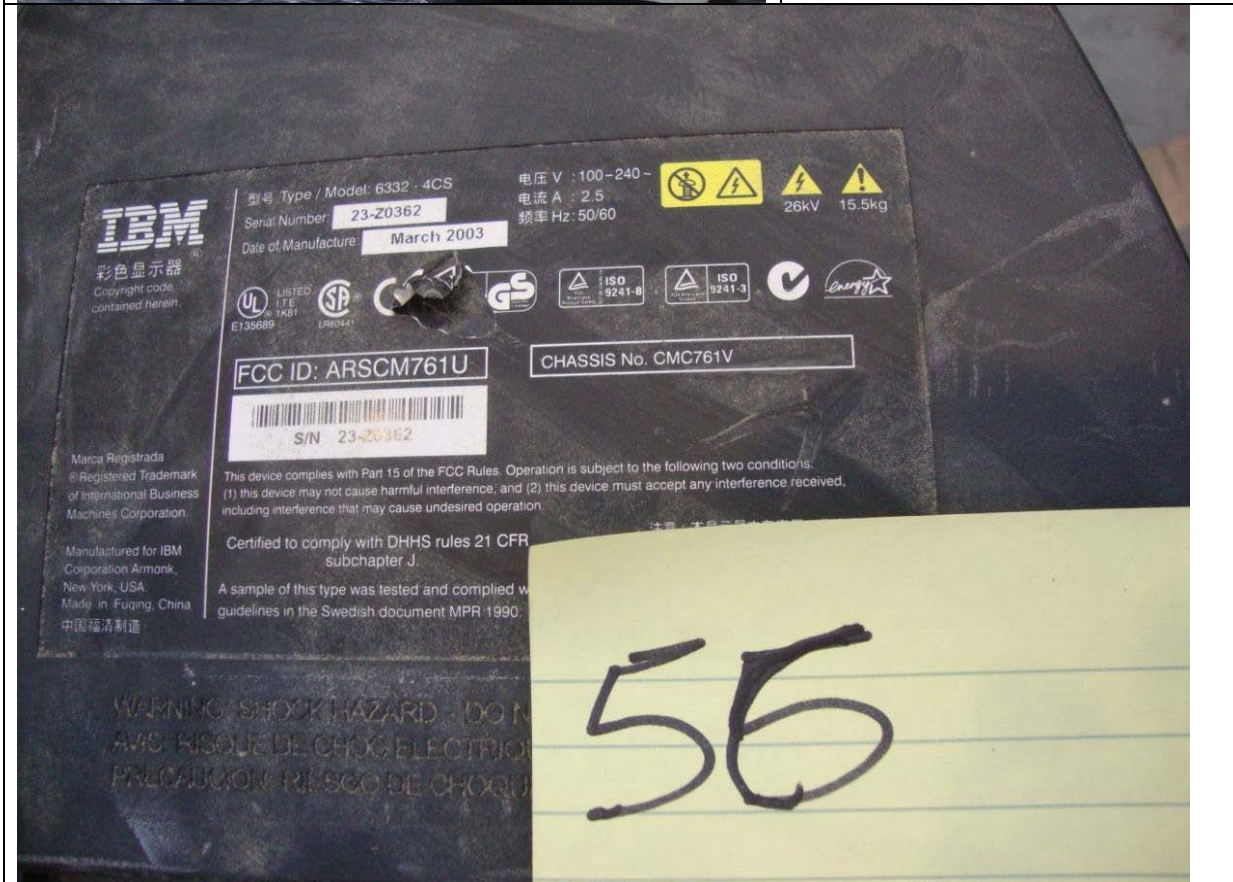
Item 55 is telecom board siemens

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
55 telecom board siemens	42491	23-Jun-11	15:51:32	244
55 telecom board siemens	7585	23-Jun-11	15:51:59	245
55 telecom board siemens	11429	23-Jun-11	15:52:55	246



Item 56 is CRT monitor outside case black

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
56 CRT monitor outside case black	144288	23-Jun-11	15:55:48	247
56 CRT monitor outside case black	160893	23-Jun-11	15:56:56	248
56 CRT monitor outside case black	2675	23-Jun-11	15:57:25	249
56 CRT monitor outside case black	150686	23-Jun-11	15:58:30	250



Item 58 is projection tv

Sample No.	Br-Corr (mg/kg)	Date	Time	Reading
58 projection tv	4071	23-Jun-11	16:04:42	256
58 projection tv	10	23-Jun-11	16:05:08	257
58 projection tv connector	73111	23-Jun-11	16:05:36	258

