F.7 タイムアンドモーション調査（4 ホローの集計）

F.7.1 調査の目的

分別とリサイクルのパイロットプロジェクトの候補地として、４つのホローが選定された。それに伴って、それぞれのホローにおいて、収集の現状を知る必要がある。どのような収集ルートを通り、どのような組織からどのくらいのごみを収集しているか、またその頻度はどのくらいか、などの情報を得て、それらを基にしてパイロットプロジェクトの収集計画を作成するものとする。本調査では、そのための基礎情報を集める事を目的として行った。

F.7.2 調査の方法

a.　調査の概要

1.	調査方式 ：	ごみ収集車の動向を調査員が追跡して記録
2.	調査期間	１週間
3.	対象者	パイロットプロジェクトの対象地に選定されたホローにおいて主にごみ収集を行う車両
4.	対象者の数	一つのホローに対して基本的に一車両
5.	対象地	スフバートル区５、７ホロー　バヤンズルフ区１、７ホロー
6.	記録した項目	車両の仕様、作業内容、時間、収集量、収集場所など

b.　調査の実施

本調査は、パイロットプロジェクト対象地において収集を行っている業者の了解・協力を得て、収集車の運転手に連絡を取ってから調査を開始した。パイロットプロジェクトの対象地で主に収集を行っているごみ収集車が収集を開始してから終了して最終処分場に投棄するまでのサイクルの全てに同行して、所定のシートにその動向を記録して現状の分析を行った。

c.　調査の期間

本調査は、以下の通りの期間に行われた。一週間のうちで、最も少ない所で８回のトリップ、最も多い所で１２回のトリップが行われた。

Location	Duration	Day off	Trip/week
SBD khoroo #5	23rd(TUE)-29th(MON), March, 2010	1 day	12 times
SBD khoroo #7	15th(THU)-21st(WED), April, 2010	1 day	9 times
BZD khoroo #1	7th(FRI)-13th(THU), May, 2010	1 day	11 times *
BZD khoroo #7	31st(WED), March-6th(TUE), April, 2010	2 day	8 times

* 2 trips made by another collection truck belong to Tsuzuku yume co.,ltd. instead of CMPUA.

d.　収集業者

本調査は、以下の機関を対象に行われた。SBDにおいては、Tsuzuki Yume（民間会社）とEU（区役所直轄）がそれぞれ１ホローずつごみ収集を担当している。BZDにおいては、２ホローともCMPUAが収集を担当している。

Location	Waste collection service provider
SBD khoroo #5	Tsuzuki Yume CO.,LTD.
SBD khoroo #7	Emergency Unit under Sukhbaatar district governor (EU)
BZD khoroo #1	City Maintenance Public Utility Agency under Ulaanbaatar Mayor (CMPUA)
BZD khoroo #7	City Maintenance Public Utility Agency under Ulaanbaatar Mayor (CMPUA)

e.　記録シートについて

調査において、使用された記録シートの項目は、アクテビティ毎に作業内容、開始時間、終了時間、要した時間、収集されたごみの体積、コンパクティング装置のホッパー部の回転数、分別の有無、アパートナンバー、G/Cの有無、管理人・清掃人の数、収集した場所の名前、収集した場所の分類、特記事項の１２項目である。

F.7.3　調査の結果

a.　車両について

ごみ収集車両は、SBD#7を除いて３ホローともコンパクター車が運行している。SBD#7で収集サービスを行っている車両はダンプトラックで、圧縮の見込みが大きいアパート地区のごみを収集するには適しておらず、また積込み作業もかなり困難である。そのため、作業員の数も他の３ホローの一人に比べて二人を要している。

表 F-43: Specification of collection vehicle of each khoroo

Item	SBD, Khoroo #5	SBD, Khoroo# 7	BZD, Khoroo# 1	BZD, Khoroo# 7
Type of collection vehicle	Compactor	Dump truck	Compactor	Compactor
Registration No.	UBZ 61-59	UNB 23-54	UBV 77-09	UBV 77-10
Year made	1997		1997	1997
Volume	6.5 m3	17 m3	6.24 m3	6.24 m3
Capacity	3.3 tons	3.0 tons	3.8 tons	3.8 tons
Crew	1 driver, 1 worker	1 driver, 2 workers	1 driver, 1 worker	1 driver, 1 worker
Belonging	Tuzuki yume	Emergency Unit	CMPUA	CMPUA


SBD khoroo#5


SBD khoroo#7


BZD khoroo#1


BZD khoroo#7

b. 各トリップの時間と収集・運搬されたごみの総量

以下の表に各トリップの詳細を示す。最も多くのトリップを行ったのが、SBD#5 の１２回で、最も少ないトリップを行ったのは、BZD#7 の８回であった。一回のトリップで、平均的に最も多くのごみを運んだのは BZD#1 の 3,600kg/trip で、最も少ないのは SBD#7 の 2,868kg/trip となった。ごみ収集車としてダンプトラックを利用している唯一のホローである SBD#7 においては作業効率が悪く、作業が深夜にまで及ぶことも度々あり、NEDS の閉場時間を過ぎてしまい、ごみを積んだままトラックを駐車場に持ち帰った事は２度あった。

表 F-44: The details of each trips

	Trip no.	Date	Start	Finish	Hours	Waste amount
SBD #5	1	3/23	8:00	11:56	3:56	3,150 kg
	2	3/23	11:56	17:27	5:31	3,020 kg
	3	3/24	7:25	11:45	4:20	2,940 kg
	4	3/24	11:45	18:27	6:42	3,220 kg
	5	3/25	7:20	12:00	4:40	2,920 kg
	6	3/25	12:00	17:04	5:04	3,020 kg
	7	3/26	7:25	12:54	5:29	3,000 kg
	8	3/26	12:54	19:03	6:09	2,940 kg
	9	3/27	8:35	13:00	4:25	2,780 kg
	10	3/27	13:00	17:54	4:54	2,760 kg
	11	3/29	7:00	12:25	5:25	3,620 kg
	12	3/29	12:25	- *		3,440 kg
					Total, 56:35 Avg,5:08	**Total,3,6810 kg Avg,3,068 kg**
SBD #7	1	4/15	8:35	15:46	7:11	2,740 kg
	2	4/15	15:46	21:40	5:54	2,360 kg
	3	4/16	8:10	16:16	8:06	3,060 kg
	4	4/16	16:16	22:52(09:18**)	6:36	2,300 kg
	5	4/17	8:50	17:31	8:41	3,080 kg
	6	4/19	8:05	13:44	5:39	3,390 kg
	7	4/19	13:44	20:27	6:43	2,440 kg
	8	4/20	9:25	16:50(08:15**)	7:25	2,720 kg
	9	4/21	7:30	18:43	11:13	3,720 kg
					Total,72:36 Avg,7:29	**Total,28,878 kg Avg,2,868 kg**
BZD #1	1	5/7	8:10	11:40	3:30	3,500 kg
	2	5/7	11:40	16:40	5:00	3,880 kg
	3	5/8	8:58	12:38	3:40	3,380 kg
	4	5/8	12:38	18:23	5:45	3,920 kg
	5	5/9	9:08	12:36	3:28	2,760 kg
	6	5/10	9:40	12:23	2:43	3,560 kg
	7	5/10	12:23	18:49	6:26	3,700 kg
	8	5/11	8:15	12:29	4:14	3,680 kg
	9	5/11	12:29	17:33	5:04	3,840 kg
	10	5/12	8:08	11:42	3:34	3,580 kg
	11	5/12	11:42	17:34	5:52	3,800 kg
					Total,49:16 Avg,4:28	**Total,39,600 kg Avg,3,600 kg**
BZD #7	1	3/31	8:27	12:10	3:43	3,640 kg
	2	3/31	12:10	17:17	5:07	2,520 kg
	3	4/2	9:25	12:09	2:44	2,920 kg
	4	4/2	12:09	16:46	4:37	2,040 kg
	5	4/3	8:55	12:52	3:57	2,840 kg
	6	4/5	9:34	12:37	3:03	3,260 kg
	7	4/5	12:37	17:20	4:43	3,820 kg
	8	4/6	8:58	15:21	6:23	3,240 kg
					Total,34:17 Avg,4:17	**Total,24,280 kg Avg,3,035 kg**

* It was impossible to follow the collection truck due to a traffic accident.
** The time when collection truck dumped waste at NEDS on next morning.

c. 収集・運搬されたごみの量（排出源別）

本調査において NEDS に運搬されたごみの量を排出源別に以下の表に示す。収集・運搬されたごみの中で、家庭から排出されたごみと、商業・公共施設から排出されたごみの割合は、どのホローにおいても顕著な差は見られず、全体の平均では 64%:36%となった。一日当りの平均において、アパートから最も多くのごみを収集・運搬したのは BZD#1 の 3,579 kg/day で、最も少ないごみを収集したのは SBD#7 の 2,429 kg/day であった。商業施設から最も多くのごみを収集・運搬したのは BZD#1 の 2,078 kg/day で、最も少ないごみを収集したのは BZD#7 の 944 kg/day であった。合計では、最も多くのごみを収集・運搬したのは BZD#1 の 5,657 kg/day で、最も少ないごみを収集したのは BZD#7 の 3,469 kg/day であった。

表 F-45: The amount of waste transported to NEDS by source

	Category	Daily average (kg/day)	Weekly (kg/week)	Rate to subtotal	Rate to grand total
BZD1	*Apartment	3,579 kg	25,053 kg	63%	20%
	**Business	2,078 kg	14,547 kg	37%	11%
	BZD1 sub total	5,657 kg	39,600 kg	**100%**	31%
BZD7	Apartment	2,525 kg	17,672 kg	73%	14%
	Business	944 kg	6,608 kg	27%	5%
	BZD7 sub total	3,469 kg	24,280 kg	**100%**	19%
SBD5	Apartment	3,272 kg	22,906 kg	62%	18%
	Business	1,986 kg	13,904 kg	38%	11%
	SBD5 sub total	5,259 kg	36,810 kg	**100%**	29%
***SBD7	Apartment	2,429 kg	17,001 kg	62%	13%
	Business	1,508 kg	10,554 kg	38%	8%
	SBD7 sub total	3,937 kg	27,556 kg	**100%**	21%
Total	**Apartment**	11,805 kg	82,633 kg	**64%**	
	Business	6,516 kg	45,613 kg	**36%**	
Grand Total		**18,321 kg**	**128,246 kg**	**100%**	

* “Apartment” stands for the waste from household.
** “Business” stands for the wastes from commercial or public activities.
*** Wastes which transported by another collection truck are included.

d. ごみの収集ルート

本調査において回った収集ルートのうち、代表的なものを以下の表に示す。

BZD#1 においては、月水金曜日に下記の通りのルートで収集し、主に午前中は D/C が無いアパートから収集して、午後は D/C なしアパートと商業・公共施設を回る。残りの火土日曜日に D/C 付アパートや決まった商業・公共施設を回る。

BZD#7 においては、月水金曜日に下記の通りのルートでアパートと商業・公共施設を交えて収集する。残りの火土曜日に D/C 付アパートから収集する。

 Dust Chute	 Temporary Discharge Point	 Discharge Point Outside	 Discharged Point Open Dumped

*_D/C_: Dust chute. _TDP_: Temporary discharge point, where people (here, watchmen) put out wastes only when collection truck comes there. There are no wastes at TDP except for collection time. _ODP_: Outside discharge point, where people can put out at anytime in container, fenced area and so on, and is located on outside. _DPo_: DP open dumped, where people put out wastes nearly illegally at public area.

*__AP__ = Apartment, __BS__ = Business, Public bodies
*"__Schedule__: Whether it is regularly collected on scheduled time when service receiver knows.
*Items not colored with gray stand for the collection point on 1st trip a day, items colored is 2nd trip a day.

表 F-46: A typical collection route on khoroos of BZD a day

No.	BZD1		type	schedule	BZD7		type	schedule
1	22	AP	TDP	yes	23	AP	TDP	yes
2	19, 21	AP	TDP	yes	DP on street	BS	DPo	yes
3	18	AP	TDP	yes	24	AP	TDP	yes
4	17a	AP	TDP	yes	115,116,29,58	AP	TDP	yes
5	17	AP	TDP	yes	24	AP	TDP	yes
6	Sansar-23	AP	TDP	yes	30	AP	TDP	yes
7	20	AP	ODP	yes	Sansar Hotel,bank,restaurant	BS	mixed	yes
8	26a	AP	TDP	yes	DP on street	BS	DPo	yes
9	16	AP	TDP	yes	31	AP	TDP	yes
10	14, 15	AP	TDP	yes	DP on street	BS	DPo	yes
11	101, 102, 103	AP	TDP	yes	DP on street	BS	DPo	yes
12	Anod bank	BS	ODP	yes	Shunkhlai	BS	TDP	yes
13	27, 28	AP	TDP	yes	DP on street	BS	DPo	yes
14	26	AP	TDP	yes	37a	AP	Other	yes
15	25	AP	TDP	yes	37b,38b,40,57L	AP	TDP	yes
16	8 kiosks along the road	BS	TDP	yes	57S	AP	TDP	yes
17	24	AP	TDP	yes	Auto service	BS	TDP	yes
18	Naranbulag	BS	TDP	yes	Gerel Center	BS	TDP	yes
19	23	AP	TDP	yes	Taiji Hotel	BS	ODP	yes
20	shops, barbers and supermarket	BS	TDP	yes	41,41a,59	AP	TDP	yes
21	Veni, Gun molor, New, Elsen tsag, Hotel, plus shops	BS	TDP	yes	Buudai Hotel	BS	ODP	yes
22	Illeglly dumped behind the 52 apart.	BS	DPo	yes	Fresh SM, MCPC	BS	TDP	yes
23	52, 30	AP	TDP	yes	D8,36g,church, bank,.Ham factory)	BS	TDP	yes
24	4/1, 4/2	AP	TDP	yes	BZD #1Hospital	BS	ODP	yes
25	Sky shopping center	BS	ODP	yes	38a	AP	ODP	yes

SBD#5 においては、午前中は毎日下記の通りのルートで D/C 無しアパートなどから収集して、午後は中大規模のレストランや D/C 付アパートなどから毎日違うルートで不定期（それぞれの貯留所がいっぱいになった時）に収集している。

SBD#7 においては、その多くが D/C 付アパートで構成されていたり、商業施設も独自のコンテナなどを有したりする事から、定期的なルートというものが全く存在せず、それぞれの貯留所が一杯になった所から順次収集していくという形式を採っている。

表 F-47: A typical collection route on khoroos of SBD a day

No.	SBD5		type	schedule	SBD7	type	type	schedule
1	39,52	AP	DPo	yes	11	AP	ODP	no
2	6,30	AP	TDP	yes	Smile	BS	ODP	no

3	5	AP	ODP	yes	Electricity supply	BS	TDP	no
4	11-14,28,30	AP	DPo	yes	10 (illegal)	AP	DPo	no
5	48	AP	DPo	yes	Chuluunbaatar	BS	TDP	no
6	24,25,26	AP	ODP	yes	9-1E	AP	DC	no
7	6th school	BS	ODP	no	9-2E	AP	DC	no
8	New wind	BS	TDP	no	9-4E	AP	DC	no
9	Sansar SM	BS	TDP	no	9-3E	AP	DC	no
10	Time out	BS	TDP	no	Labor welfare service center	BS	ODP	no
11	Mongolian BBQ	BS	ODP	no	Selbe plaza	BS	TDP	no
12	JS-tower	BS	DPo	no	6-2E	AP	DC	no
13					6-1E	AP	DC	no
14					6-5E	AP	DC	no
15					6-4E	AP	DC	no
16					6-3E	AP	DC	no
17					7-8E	AP	DC	no
18					7-7E	AP	DC	no
19					7-6E	AP	DC	no
20					40	AP	DPo	no
21					4-3E	AP	DC	no

それぞれの収集ポイントに、ある程度の収集スケジュールが適用されているかどうかを、収集箇所の形態毎に比較したものを表にして以下に示す。

・アパートのごみの収集ポイント

収集箇所毎では、最もスケジュール化されている収集箇所は TDP でスケジュール化されている収集箇所全体の 62.3%を占め、最もスケジュール化されていない収集箇所は D/C でスケジュール化されていない収集箇所全体の 70.3%を占めた。

ホロー毎では、BZD#1 が最もスケジュール化されており（スケジュール化された収集箇所全体の 44.7%）、逆に SBD#7 が最もスケジュール化されていなかった（スケジュール化された収集箇所が無かった）。

表 F-48: Comparison of the number of collection point on apartment generally scheduled and not by type of collection point

scheduled	Type of collection point	BZD1	BZD7	SBD5	SBD7	Total
Yes	D/C	3.8%	9.1%	0.0%	0.0%	12.9%
	TDP	37.1%	20.6%	4.5%	0.0%	62.3%
	ODP	3.8%	2.3%	6.4%	0.0%	12.5%
	DPo	0.0%	0.6%	9.5%	0.0%	10.0%
	Others	0.0%	2.3%	0.0%	0.0%	2.3%
Sub total		**44.7%**	**32.6%**	**20.5%**	**0.0%**	**100.0%**
No	D/C	0.0%	0.0%	18.2%	52.1%	70.3%
	TDP	0.0%	0.0%	1.2%	0.0%	1.2%
	ODP	0.0%	0.0%	0.0%	12.7%	12.7%
	DPo	0.0%	0.0%	0.0%	4.8%	4.8%
	Others	0.0%	0.0%	10.9%	0.0%	10.9%
Sub total		**0.0%**	**0.0%**	**30.3%**	**69.7%**	**100.0%**

・商業・公共施設のごみの収集ポイント

収集箇所毎では、最もスケジュール化されている収集箇所は TDP でスケジュール化されている収集箇所全体の 44.7%を占め、最もスケジュール化されていない収集箇所は D/C でスケジュール化されていない収集箇所全体の 31.4%を占めた。とはいえ、アパートごみの収集箇所に比べて、収集箇所毎のスケジュール化の割合にそれほど相違が無かった。

ホロー毎では、BZD#7 が最もスケジュール化されており（スケジュール化された収集箇所全体の 44.7%）、逆に SBD#7 が最もスケジュール化されていなかった（スケジュール化された収集箇所が無かった）。

表 F-49: Comparison of collection point on commercial and public organization is generally scheduled or not by type of collection point

scheduled	Type of collection point	BZD1	BZD7	SBD5	SBD7	Total
Yes	TDP	15.0%	19.0%	10.7%	0.0%	44.7%
	ODP	17.1%	8.6%	2.7%	0.0%	28.3%
	DPo	0.0%	19.0%	7.0%	0.0%	25.9%
	Others	1.1%	0.0%	0.0%	0.0%	1.1%
Sub total		33.2%	46.5%	20.3%	0.0%	100.0%
No	TDP	3.8%	0.0%	3.8%	21.0%	28.6%
	ODP	0.0%	0.0%	9.5%	21.0%	30.5%
	DPo	1.9%	0.0%	17.1%	12.4%	31.4%
	Others	0.0%	0.0%	0.0%	9.5%	9.5%
Sub total		5.7%	0.0%	30.5%	63.8%	100.0%

e. アパートから排出されるごみについて

本調査において収集された家庭ごみの重量と比率を収集箇所の形態別に以下の表に示す。まず、収集箇所の形態別では、D/C から収集されたごみが最も多く、33,879kg(全体の 41%)で、その他を除けば DP open dumped の 6,310kg (7.6%)が最も少なかった。ホロー毎に見ると、BZD#1 においては TDP から収集されたごみが最も多く、DP open dumped から収集されたごみは無かった。続いて BZD#7 においても TDP から収集されたごみが最も多かった。SBD#5 においては、D/C から収集されたごみが最も多く、DP open dumped から収集されたごみは４ホロー中最も多いものとなった。SBD#7 においては、D/C から収集されたごみが最も多く（４ホロー中でも最も多い）、TDP から収集されたごみは無かった。

全体的には、BZD において TDP から収集されたごみが多く、SBD において D/C および DP open dumped から収集されたごみが多かった。

収集されたごみを単位当たりの量（一人から一日に何 kg のごみを収集したか）で見てみると、最も多かったのは BZD#1 の 0.68kg/day/person で、最も少なかったのは BZD#7 の 0.34kg/day/person であり、全体の平均では 0.48kg/day/person となった。

表 F-50: Weight of household waste transported to NEDS by collection point

Location	Daily average (kg/day)	Population	GU (kg/day/person)
BZD1	3,579 kg	5,253	0.68 kg/day/person
BZD7	2,525 kg	7,461	0.34 kg/day/person
SBD5	3,272 kg	5,112	0.64 kg/day/person
SBD7	2,429 kg	6,733	0.36 kg/day/person
Total	**11,805 kg**	**24,559**	**0.48 kg/day/person**

* Number of population is calculated considering apartment covered on this survey based on data obtained form each khoroo office.

表 F-51: Weight of household waste transported to NEDS by collection point

(**Unit**:kg)

Unit (kg)	1 D/C	2 TDP	3 ODP	4 DPo	Others	Total
BZD1	7,493	15,402	2,159	0	0	25,053
BZD7	5,001	9,814	1,276	377	1,204	17,672
SBD5	8,449	2,458	3,643	4,771	3,586	22,906
SBD7**	12,936	0	2,903	1,162	0	17,001

Total	**33,879**	**27,673**	**9,981**	**6,310**	**4,790**	**82,633**

表 F-52: Rate of household waste transported to NEDS by collection point

	1 D/C	2 TDP	3 ODP	4 DPo	Others	Total
BZD1	9.1%	18.6%	2.6%	0.0%	0.0%	30.3%
BZD7	6.1%	11.9%	1.5%	0.5%	1.5%	21.4%
SBD5	10.2%	3.0%	4.4%	5.8%	4.3%	27.7%
SBD7*	15.7%	0.0%	3.5%	1.4%	0.0%	20.6%
Total	**41.0%**	**33.5%**	**12.1%**	**7.6%**	**5.8%**	**100.0%**

* Wastes which transported by another collection truck are included.

f. 商業・公共施設から排出されるごみについて

本調査において収集された商業・公共ごみの重量と比率を収集箇所の形態別に以下の表に示す。まず、収集箇所の形態別では、DP on outside から収集されたごみが最も多く、22,150kg(全体の 49%)で、その他を除けば TDP の 8,946kg (20%)が最も少なかった。ホロー毎に見ると、BZD#1 においては DP on outside が最も多く（全４ホロー中でも最も多い）、DP open dumped が最も少ない（全４ホロー中でも最も少ない）。更に、TDP から収集されたごみの量も全４ホロー中で最も多いものとなった。BZD#7 においては DP open dumped から収集されたごみが最も多く、その多くを占めた。SBD#5 においては DP on outside が最も多く、TDP が最も少なかった（全４ホロー中でも最低）。SBD#7 においては DP on out side が最も多かった。

表 F-53: Weight of commercial, public waste transported to NEDS by collection point

(**Unit**:kg)

Unit (kg)	1 DC	2 TDP	3 DP on outside	4 DP Open Dumped	Others	Total
BZD1	-	3,534	10,064	229	719	14,547
BZD7	-	1,962	671	3,975	0	6,608
SBD5	-	1,471	7,096	5,336	0	13,904
SBD7**	-	1,978	4,319	2,614	1,643	10,554
Total	-	8,946	22,150	12,154	2,362	45,613

表 F-54: Rate of commercial, public waste transported to NEDS by collection point

	1 DC	2 TDP	3 DP on outside	4 Open Dumped	Others	Total
BZD1	-	8%	22%	1%	2%	32%
BZD7	-	4%	1%	9%	0%	14%
SBD5	-	3%	16%	12%	0%	30%
SBD7*	-	4%	9%	6%	4%	23%
Total	-	20%	49%	27%	5%	100%

* Wastes which transported by another collection truck in assistance for main truck is included.

g. 各トリップにおける作業時間とその効率

収集に際して各作業にかけられた時間を、トリップ毎の平均にして以下の表に示す。（Lunch については、行なわれたトリップとそうでないトリップがあったので、行なわれたトリップだけをもって平均とした）

一回のトリップに最も時間がかかったのは SBD#7 の 7 時間 29 分で、最も短かったのは BZD#7 の 4 時間 17 分であった。各トリップにおける作業時間の内訳として、全体的

に Collection work がその多くを占め、次に Moving が多かった。処分場に入場してから退場するまでの時間は、一回につきおよそ８分ほどであった。Recycle は、収集作業員が回収した有価物を NEDS 近くのリサイクルディーラーと取引する作業を指し、一回あたり９分ほどであった。

作業効率（収集したごみの重量／それぞれの作業に要した時間）の面から見ると、トータル（１トリップの合計時間で割る）でも積込作業のみ（合計ではなく積込作業に要した時間だけで割る）でも、最も効率的だったのは BZD#1（Total,13.43kg/min　by collection work, 25.90kg/min.）で、最も非効率的だったのは SBD#7（Total,6.39kg/min　by collection work, 9.31kg/min.）であった。積込作業効率の各ホローの数値の開きに対して、トータルの効率のそれは比較的少ない事が、積込作業以外の作業の効率性にはあまり差異がないことを示している。

表 F-55: Expended hours to collect wastes by activity

(**Unit**: hours:minutes)

Activities: (per trip)	BZD1		BZD7		SBD5		SBD7	
1.Preparation	0:00	0.0%	0:00	0.0%	0:00	0.0%	0:01	0.4%
2.Collection work	2:19	52.0%	2:36	60.9%	3:25	66.6%	5:08	68.6%
3.Moving	1:30	33.7%	1:10	27.5%	0:53	17.2%	1:20	17.8%
4.Repair	0:00	0.2%	0:00	0.0%	0:01	0.4%	0:03	0.7%
5.Disposal	0:07	2.7%	0:08	3.2%	0:09	3.2%	0:09	2.1%
6.Fuel	0:00	0.0%	0:00	0.0%	0:01	0.4%	0:00	0.0%
7.Recycle	0:10	4.0%	0:08	3.2%	0:10	3.4%	0:08	2.0%
8.Lunch **	0:27	4.6%	0:34	5.0%	0:46	7.6%	0:30	3.0%
9.Others	0:07	2.8%	0:00	0.3%	0:05	1.8%	0:24	5.4%
Total time per trip	4:28	100.0%	4:17	100.0%	5:08	100.0%	7:29	100.0%
Weight transported to NEDS on avg per trip	3,600 kg		3,035 kg		3,068 kg		2,868 kg	
Collection efficiency (by *collection time*)	**25.90 kg/min**		**19.46 kg/min**		**14.96 kg/min**		**9.31 kg/min**	
Collection efficiency (by *total trip time*)	**13.43 kg/min**		**11.81 kg/min**		**9.96 kg/min**		**6.39 kg/min**	

h.　各収集ポイントにおける収集効率

収集の際の積込作業の効率（１分で何 kg のごみを収集したか）を、収集ポイント毎に分けて以下の表に示した。

・アパートから排出されたごみ

収集箇所毎では、最も効率的な収集箇所は TDP の 31.09 kg/min で、最も非効率的な種集箇所は DP on outside の 11.37 kg/min となり、続いて DC (12.15kg/min)、DP Open dumped (14.02kg/min) らの収集箇所も非効率的な数値が明らかになった。

・商業・公共から排出されたごみ

収集箇所毎では、最も効率的な収集箇所は TDP の 17.30 kg/min で、最も非効率的な種集箇所はその他を除けば DP on outside の 14.47 kg/min となったが、それほどの相違は表れなかった。

表 F-56: Collection work efficiency by collection point

(**Unit**: kg/min)

	Type of collection point	BZD1	BZD7	SBD5	SBD7*	Total
AP	1 DC	22.71	12.76	13.61	8.95	12.15
	2 TDP	36.24	31.97	15.56		31.09

	3 ODP	17.13	13.02	15.70	6.90	11.37
	4 DPo		28.99	14.41	10.96	14.02
	Others		22.72	15.13		16.52
BS	2 TDP	21.95	15.69	13.75	15.95	17.30
	3 ODP	22.52	11.99	16.20	7.33	14.47
	4 DPo	16.37	19.20	15.83	13.00	16.01
	Others	20.55			10.67	12.50

* Wastes which transported by another collection truck in assistance for main truck is included.

i. 収集車による有価物回収（Recycle activity）

本調査中に収集作業員によって回収され、リサイクルディーラーと取引された有価物の量と金額を以下の表に示す。トリップ当りの平均で最も多くの有価物を回収したのは SBD#5 で重量が 57.9kg （NEDS に搬入した量の 1.7%）、金額が 7,577tg であり、最も少ないのは BZD#7 で重量が 25.3kg （NEDS に搬入した量の 0.8%）、金額が 3,035tg となった。全体的には SBD では収集作業員が多くの有価物を回収・取引し、BZD では少ないものとなった。何れのホローにおいても、収集作業員が有価物の回収から得ている収入は、それぞれの賃金に対して少ないものではないことが明らかになった。

表 F-57: Weight of valuables dealt by collection worker

(**Unit**: kg)

Trip No.	BZD1		BZD7		SBD5		SBD7	
	valuables	Total	valuables	Total	valuables	Total	valuables	Total
1	25.1	3,500	28.1	3,640	70.0	3,150	100.2	2,740
2	26.4	3,880	27.6	2,520	24.8	3,020	0.0	2,360
3	28.6	3,380	4.0	2,920	41.1	2,940	121.9	3,060
4	6.1	3,920	62.0	2,040	88.2	3,220	0.0	2,300
5	17.4	2,760	22.8	2,840	46.5	2,920	83.6	3,080
6	24.9	3,560	21.6	3,260	34.2	3,020	31.6	3,390
7	80.7	3,700	25.2	3,820	57.6	3,000	25.7	2,440
8	14.8	3,680	10.9	3,240	82.7	2,940	0.0	2,720
9	30.6	3,840			76.7	2,780	88.0	3,720
10	25.6	3,580			33.4	2,760		
11	64.9	3,800			81.2	3,620		
12					*-	3,440		
Total	345.2	39,600	202.3	24,280	636.4	36,810	451.0	25,810
Avg (per trip)	31.4 (0.9%)	3,600	25.3 (0.8%)	3,035	57.9 (1.7%)	3,068	50.1 (1.7%)	2,868

* It was impossible to follow the collection truck due to a traffic accident.

表 F-58: Amount of money of valuables dealt by collection worker

(**Unit**: tugrug)

Unit: tg	BZD1	BZD7	SBD5	SBD7
Trip No.				
1	5,120 tg	4,740 tg	6,320 tg	11,290 tg
2	4,170 tg	4,360 tg	2,816 tg	tg
3	5,250 tg	1,600 tg	2,830 tg	12,670 tg
4	1,090 tg	6,150 tg	8,000 tg	tg
5	4,050 tg	5,600 tg	4,330 tg	13,770 tg
6	4,390 tg	2,800 tg	3,970 tg	6,500 tg
7	10,500 tg	3,150 tg	3,820 tg	4,080 tg
8	3,350 tg	1,400 tg	5,160 tg	tg
9	5,600 tg		5,310 tg	19,885 tg
10	4,000 tg		3,510 tg	
11	10,200 tg		9,540 tg	
12			- tg	

Total	57,720 tg	29,800 tg	55,606 tg	68,195 tg
Avg (per trip)	5,247 tg/ trip	3,725 tg/ trip	5,055 tg/ trip	7,577 tg/ trip

j. NEDSのWeigh bridge 登録について

本調査の対象者の情報と、それぞれ調査が行われた期間において NEDS のウェイブリッジに登録された情報を比較して、以下の表に示す。車両毎に、ウェイブリッジに登録された情報と、調査で得られた実際の情報を照らし合わせてみると、District に関しては全ての車両は間違いなく登録されているが、ホローに関しては正しく登録されたトリップは一度もない。また、SBD#7 の 23-54UBV のトリップのデータは Transporter が Emergency unit ではなく WSF となっているし、Waste category もアパートではなくゲル地区となっている。

表 F-59: Comparison of information about waste transported to NEDS between this survey and weigh bridge data base

Car license		District name	Khoroo number	Transporter	Waste category
61-59 UBZ	WBD	Sukhbaatar	Khoroo #3	"Tsuzuku yume" - /WSF/	Apartment
	Actual	Sukhbaatar	Khoroo #5	"Tsuzuku yume" - /WSF/	Apartment
23-54 UNB	WBD	Sukhbaatar	Khoroo #8	Sukhbaatar, WSF	Ger area
	Actual	Sukhbaatar	Khoroo #7	Sukhbaatar, Emergency Unit	Apartment
77-08 UBV	WBD	Bayanzurkh	Khoroo #18	CMPUA	Apartment
	Actual	Bayanzurkh	Khoroo #1	CMPUA	Apartment
77-10 UBV	WBD	Bayanzurkh	Khoroo #1	CMPUA	Apartment
	Actual	Bayanzurkh	Khoroo #7	CMPUA	Apartment

* WBD = information input into the weigh bridge data base.
* Actual = actual information obtained through this survey

また、以下には本調査の対象となった車両が調査期間中に NEDS に搬入したごみの重量と、ウェイブリッジデータベース（2010 年 3 月）における各車両が NEDS に搬入したごみの重量（月間平均）を、１トリップあたりの平均値で示した。SBD#5 においては、調査期間中と３月の月間平均値に開きは見られないが、SBD#7 と BZD#7 においては月間平均値が調査期間の値を大きく上回り、逆に BZD#1 においては月間平均値が調査期間の値を若干下回った。

表 F-60: Comparison of information about weight of wastes transported to NEDS between this survey and weigh bridge data base

Unit: kg/ trip	SBD, Khoroo# 5 61-59 UBZ	SBD, Khoroo# 7 23-54 UNB	BZD, Khoroo# 1 77-08 UBV	BZD, Khoroo# 7 77-10 UBV
Weight on this survey	3,068 kg/ trip	2,868 kg/ trip	3,600 kg/ trip	3,035 kg/ trip
Weight on WBD	3,059 kg/ trip	3,610 kg/ trip	3,310 kg/ trip	3,640 kg/ trip

* Weight on this survey = Weight of wastes transported to NEDS by each collection truck per trip on average which is obtained thorough this survey

* Weight on WBD= Weight of wastes transported to NEDS by each collection truck per trip on average which is obtained from Weigh bridge data base in March

F.7.4 Findings

1. 調査対象地域はウランバートル市の中心部に位置するため、商業・公共施設から出るごみが全体の約1/3を占めている。
2. BZDでは収集スケジュールがほぼ固定されているが、SBDではあまり固定されていない。
3. 最もスケジュールが固定されている収集箇所の形態はアパート、ビジネス共にTDPであり、最も固定されていない箇所はアパートではD/C、ビジネスではDPoとなった。
4. 最も多くのごみが収集されている収集ポイントの形態は、家庭ごみではD/Cであり、商業・公共施設からのごみではODPであった。
5. BZDは最も効率的に収集作業を行っており、SBDはその効率性がやや劣っている。中でも、ダンプトラックを収集に利用しているSBD#7の収集効率は最も低いものとなった。
6. 最も収集効率の高い収集ポイントの形態は、アパート、ビジネス共にTDPであり、最も低いものは、アパート、ビジネス共にODPであった。とはいえ、ビジネスごみにおいてはアパートのそれほど大きな収集効率の差は見られなかった。
7. 収集されているごみの原単位（kg/day/person）は全体で0.48 kg/day/person となり、マスタープランで予測された2009年の発生原単位（冬：0.297 kg/day/person, 夏：0.264 kg/day/person）よりやや多くなっている。
8. 収集作業員による有価物の回収・取引については、ごみ収集の効率の良いホローほど、その量が少ない。また、その量は一回のトリップで収集されるごみの量の１～２％程となっている。
9. ウェイブリッジデータは、現時点では登録した情報が正しいものと正しくないものがあるが、一旦登録した情報の更新がされていないため（例えばある車両がBZD, ホロー１, 搬入者 : CMPUA, 収集地 : アパート地区　と登録された場合に、以後はその車両が搬入する全てのごみはこの情報でデータベースに入力される）、仮に現在は正しいとしても、それらの情報が変更されたり、また突発的に他の地域のごみを収集した場合には実際の情報と誤差が生じる可能性が高い。

F.7.5 Recommendation

1. パイロットプロジェクトの対象地域においては、商業・公共施設から排出されるごみが約1/3を占めているため、収集マナーの改善、排出源の分別においては、これら事業者を取り込んで啓発する必要がある。
2. 分別排出、収集を住民に根付かせるためには、定時・定点収集を行うことが前提条件となるが、現状で最も排出量の多いD/Cについては、収集作業がスケジュール化されていないため、その実施に困難を伴うものと予想される。D/Cの使用禁止も含め対策を取る必要がある。
3. アパート地区のごみ収集に中国製ダンプトラックを使用しているKhorooが一カ所あるが、収集効率が悪いため定時に収集を行うには障害となっている。早急にコンパクター車の導入が望まれる。

4. M/Pにおいては。住民一人一日あたりのごみ発生量を2005年をベースとして、GDPの伸びに比例して増えていくと想定していた。GDPの伸びは毎年5.5%と想定していたが、2007年、2008年とモンゴル国のGDPの伸びは大幅に増加しているため、市民の生活様式もその間に変化し、予想以上に発生量は増えている可能性がある。ごみ量調査を再度やり直す必要がある。

5. 処分場のWeighbridgeのデータは、収集業者への支払根拠となっているため、登録更新システムを含め、その正確性を確保する必要がある。またデータの透明性・公平性を高めるために、収集業者への即日データ送信など、システムを改善する必要がある。

6. 本調査で明らかになった通り、最も収集効率の良い収集ポイントの形態はTDPなのだが、収集ポイントでTDPシステムを採用するためにはアパートの住民やウォッチマン、商業・公共施設においては各担当者の協力、それからスケジュール化された収集ルートの実施という２点が必要である。

7. BZDの成功例を挙げると、人々の協力を得るためにWSFの成した功績が大きい。BZDのWSFインスペクターは、収集車に同乗しており、収集システムを向上するために収集サービスの供給者とサービスを供給される側の深いコミュニケーションを促進している。対してSBDのそれは、たまに収集している様子を視察しに来る程度に留まっている。よって、各区域の担当するWSFインスペクターを利用して、排出者にシステムやルールの徹底を行うことが有効である。

F.8 NEDSへのごみの搬入量

Weighbridge date of UCDS (Jan. 2008--Dec 2008)
Collection amount – All Company by Duureg by Waste generation source,
unit: ton /month

2008.01	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	2569.5	7.0	1883.0	109.7	45.8	464.2	389.7	1.0	84.7	0.0	5,554.5
Bayanzurkh	2107.6	37.4	2537.0	122.4	118.6	77.1	53.7	0.0	105.2	0.0	5,158.9
Sukhbaatar	1301.4	10.3	1961.2	95.0	43.7	100.5	16.3	0.0	0.0	0.0	3,518.3
Songino Khairkhan	845.6	0.0	3263.1	51.6	37.6	112.7	65.6	0.0	3.9	0.0	4,380.0
Khan-Uul	343.6	1.4	327.3	41.9	0.0	136.9	124.3	0.0	0.0	0.0	975.4
Chingeltei	720.2	6.0	2060.6	25.8	0.0	54.8	87.4	0.0	36.4	0.0	2,991.2
Total	**7,887.8**	**62.1**	**12,022.1**	**446.4**	**245.7**	**946.1**	**736.9**	**1.0**	**230.2**	**0.0**	**22,578.2**
2008.02	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	2808.4	14.8	2159.2	62.4	35.8	550.5	543.5	0.0	103.9	0.0	6278.6
Bayanzurkh	1903.8	7.1	2685.6	43.4	127.9	118.6	65.2	2.8	93.6	0.0	5047.9
Sukhbaatar	1200.9	4.4	1563.2	56.1	57.6	83.3	26.8	0.0	0.0	0.0	2992.3
Songino Khairkhan	869.0	0.0	3447.9	12.3	35.7	178.2	99.0	0.0	5.0	0.0	4637.1
Khan-Uul	347.6	1.0	218.5	42.9	0.0	114.7	94.2	0.0	6.0	0.0	824.8
Chingeltei	712.4	3.0	1647.0	14.9	0.0	34.4	1.4	0.0	16.3	0.0	2429.4
Total	**7,832.1**	**30.3**	**11,721.4**	**232.1**	**257.1**	**1,079.7**	**830.1**	**2.8**	**224.7**	**0.0**	**22210.1**
2008.03	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	3254.2	26.5	2569.1	216.5	15.4	527.7	269.8	3.9	87.7	7.7	6978.4
Bayanzurkh	1957.5	26.8	3209.9	89.7	121.0	123.0	45.1	2.4	125.3	0.0	5700.7
Sukhbaatar	1504.5	5.1	2024.8	145.8	67.3	196.1	33.6	2.7	5.8	0.0	3985.6
Songino Khairkhan	1020.4	14.1	4683.8	50.5	91.0	150.7	203.0	0.0	29.1	0.0	6242.5
Khan-Uul	573.9	5.4	295.4	195.1	7.7	237.3	122.1	0.0	0.0	0.0	1436.8
Chingeltei	745.8	6.9	2255.0	39.5	3.1	30.5	5.5	0.0	32.7	5.1	3123.9
Total	**9,056.3**	**84.7**	**15,028.0**	**737.1**	**305.6**	**1,265.2**	**679.1**	**8.9**	**280.6**	**12.7**	**27468.0**
2008.04	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	4043.3	34.4	3109.8	275.6	51.6	700.0	706.2	5.1	103.3	0.0	9029.4
Bayanzurkh	2155.1	24.8	2692.5	102.4	125.3	194.0	24.4	0.0	129.9	4.0	5352.3
Sukhbaatar	1548.2	8.2	1656.4	117.1	92.8	142.4	44.7	0.0	8.4	0.0	3618.2
Songino Khairkhan	1283.1	12.2	5224.7	89.6	95.8	192.4	179.2	0.0	17.8	2.8	7097.5
Khan-Uul	564.3	5.3	337.1	174.8	0.0	246.2	323.9	0.0	1.4	1.4	1654.4
Chingeltei	751.8	12.4	1900.6	14.3	2.8	41.3	10.9	0.0	17.8	0.0	2651.8
Total	**10,345.8**	**97.3**	**14,721.1**	**773.7**	**368.4**	**1,516.3**	**1,289.2**	**5.1**	**278.5**	**8.2**	**29403.6**
2008.05	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	4930.8	322.9	2011.8	429.9	54.7	640.8	668.7	0.0	84.5	13.5	9151.5
Bayanzurkh	2524.5	35.1	2678.2	92.8	72.7	158.5	5.5	0.0	121.8	69.1	5758.2
Sukhbaatar	1878.2	9.2	1597.0	92.6	32.6	163.8	170.2	0.0	2.9	0.0	3946.4
Songino Khairkhan	1178.4	15.7	4836.4	150.9	58.0	234.6	111.6	0.0	15.1	21.7	6622.3
Khan-Uul	674.6	2.7	533.7	429.3	0.0	233.6	411.1	0.0	0.0	0.0	2285.0
Chingeltei	851.6	6.1	1521.2	25.5	0.0	67.7	12.2	0.0	12.1	0.0	2496.3
Total	**12,038.1**	**391.6**	**13,178.3**	**1,215.0**	**218.0**	**1,498.9**	**1,379.3**	**0.0**	**236.5**	**104.3**	**30259.8**
2008.06	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	4852.6	179.6	1562.2	260.0	55.0	828.6	81.9	3.5	202.0	12.4	8037.8
Bayanzurkh	2529.3	46.4	1927.5	46.3	64.1	234.4	0.9	0.0	171.0	74.8	5094.6
Sukhbaatar	1837.5	16.8	1100.0	201.8	45.5	280.4	1.0	0.0	0.9	0.0	3483.9
Songino Khairkhan	1296.5	9.4	3575.3	43.2	70.8	351.2	113.4	0.0	2.6	153.2	5615.4
Khan-Uul	607.3	12.2	335.6	280.4	22.6	430.9	269.4	0.0	0.0	4.3	1952.6
Chingeltei	828.3	7.9	1698.3	28.9	0.0	67.5	9.0	0.0	0.0	0.0	2634.0
Total	**11,951.4**	**272.3**	**10,198.8**	**860.6**	**257.9**	**2,192.9**	**459.7**	**3.5**	**376.5**	**244.7**	**26818.2**

2008.07	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	4219.2	75.9	1344.8	641.4	65.4	721.6	201.6	0.0	267.6	0.0	7537.5
Bayanzurkh	2188.3	8.3	1282.0	76.7	34.6	169.4	7.1	0.0	146.9	0.0	3913.3
Sukhbaatar	1609.4	2.1	1054.3	246.8	43.3	164.1	2.7	0.0	0.0	0.0	3122.6
Songino Khairkhan	1167.7	36.8	2102.6	51.5	54.6	185.2	112.3	1.1	0.0	0.0	3711.9
Khan-Uul	718.2	27.6	313.0	454.4	0.7	217.0	463.6	0.0	0.0	0.0	2194.5
Chingeltei	847.6	12.8	1074.0	32.1	2.8	62.5	0.0	0.0	0.0	0.0	2031.7
Total	**10750.5**	**163.4**	**7170.7**	**1502.8**	**201.4**	**1519.8**	**787.4**	**1.1**	**414.5**	**0.0**	**22511.6**
2008.08	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	4331.7	0.0	1254.2	495.9	109.2	866.6	204.3	2.5	248.0	5.6	7518.1
Bayanzurkh	2338.5	0.0	1458.0	166.5	63.0	278.9	9.8	0.0	220.2	0.0	4536.0
Sukhbaatar	1623.4	0.0	672.1	303.6	43.0	190.6	1.4	0.0	2.9	0.0	2836.9
Songino Khairkhan	900.8	2.2	1632.3	76.5	63.9	291.8	163.1	0.0	20.1	0.0	3150.7
Khan-Uul	586.2	5.2	116.3	532.9	0.0	377.3	473.9	0.0	0.0	0.0	2091.7
Chingeltei	858.0	6.3	1171.7	66.9	0.0	78.4	0.0	0.0	4.0	0.0	2185.2
Total	**10638.7**	**13.6**	**6304.6**	**1642.3**	**279.1**	**2083.7**	**852.5**	**2.5**	**495.1**	**5.6**	**22317.7**
2008.09	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	4050.3	20.9	1348.8	420.8	58.0	800.9	138.2	1.4	139.3	0.0	6978.6
Bayanzurkh	2634.9	8.2	1419.6	153.6	37.4	137.8	30.4	1.5	147.8	99.3	4670.4
Sukhbaatar	1803.4	4.8	864.4	561.0	74.7	202.4	31.0	7.4	2.9	2.7	3574.7
Songino Khairkhan	1363.2	20.6	4066.6	62.8	83.6	274.9	245.8	3.0	9.0	577.7	6707.1
Khan-Uul	558.3	2.7	249.7	408.8	0.8	328.9	254.1	0.0	0.0	17.1	1820.3
Chingeltei	797.4	4.0	1185.9	3.2	0.8	46.4	2.9	0.0	0.0	0.0	2040.6
Total	**11207.5**	**61.1**	**9155.0**	**1610.2**	**255.2**	**1791.3**	**702.4**	**13.2**	**299.0**	**696.8**	**25791.7**
2008.10	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	4101.2	64.6	1082.1	454.8	51.8	948.0	374.3	0.9	130.6	0.0	7208.3
Bayanzurkh	2440.2	30.3	1950.8	95.7	54.8	210.3	32.3	0.0	144.8	117.1	5076.4
Sukhbaatar	1632.7	5.7	855.9	124.1	70.8	126.0	2.4	0.0	0.0	61.8	2879.2
Songino Khairkhan	1110.4	2.1	2275.4	146.5	55.7	548.3	351.8	3.5	5.0	31.4	4530.0
Khan-Uul	464.1	4.0	190.4	247.4	3.0	237.0	133.4	6.7	4.3	0.0	1290.4
Chingeltei	811.2	6.6	1214.2	5.9	8.6	33.5	0.0	0.0	24.7	1.0	2105.5
Total	**10659.7**	**113.3**	**7568.7**	**1074.4**	**244.7**	**2103.1**	**894.2**	**11.1**	**309.4**	**211.3**	**23089.8**
2008.11	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	3719.5	20.1	1202.7	374.6	36.6	835.1	235.9	0.0	75.7	0.0	6500.2
Bayanzurkh	1841.0	17.0	1898.3	128.8	29.4	223.0	0.0	0.0	117.7	0.0	4255.2
Sukhbaatar	1281.2	10.3	1038.0	38.1	29.9	118.0	8.5	0.0	0.0	0.0	2524.0
Songino Khairkhan	784.5	9.3	1967.5	54.4	31.3	385.7	157.1	0.0	5.7	0.0	3395.4
Khan-Uul	379.2	0.0	193.3	285.5	0.3	305.9	75.1	2.9	0.0	0.0	1242.0
Chingeltei	664.6	6.2	1590.5	13.9	0.0	112.1	2.6	0.0	12.8	0.0	2402.7
Total	**8670.1**	**62.9**	**7890.3**	**895.3**	**127.5**	**1979.8**	**479.2**	**2.9**	**211.8**	**0.0**	**20319.5**
2008.12	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	2308.1	10.4	588.9	64.2	51.5	461.2	82.3	0.0	85.2	0.0	3651.9
Bayanzurkh	1191.5	21.0	1524.4	61.2	15.1	84.2	4.0	0.0	79.0	0.0	2980.4
Sukhbaatar	872.7	0.0	584.7	43.5	5.8	148.8	0.0	0.0	0.0	0.0	1655.5
Songino Khairkhan	657.3	4.8	1156.0	16.4	15.8	128.9	43.5	0.0	0.0	0.0	2022.7
Khan-Uul	298.4	0.0	108.6	39.5	0.0	97.4	77.4	0.0	0.0	0.0	621.2
Chingeltei	445.1	3.2	955.2	6.5	0.6	21.6	0.0	0.0	16.3	0.0	1448.5
Total	**5773.1**	**39.3**	**4917.9**	**231.2**	**88.8**	**942.1**	**207.2**	**0.0**	**180.6**	**0.0**	**12380.1**

Average from Jan 2008 to Dec 2008 **23,762.4** ton/month

Weighbridge date of UCDS (Jan. 2009– Dec 2009)
Collection amount – All Company by Duureg, by Waste generation source,

unit: ton /month

2009.01	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	3165.1	2.5	1115.2	37.7	92.4	720.2	185.9	3.0	144.1	3.1	5,469.2
Bayanzurkh	1890.6	19.4	2399.0	47.8	25.5	156.7	4.8	2.9	103.6	0.0	4,650.2
Sukhbaatar	1210.0	3.1	1004.3	10.2	6.3	110.6	3.1	0.0	5.0	0.0	2,352.5
Songino Khairkhan	1095.7	7.3	2412.3	29.6	61.4	204.7	47.6	0.0	8.6	0.0	3,867.2
Khan-Uul	334.1	0.0	119.6	271.1	0.7	105.8	141.1	0.0	0.0	0.0	972.4
Chingeltei	656.2	0.0	2306.2	5.3	4.5	79.5	4.1	10.2	26.4	0.0	3,092.5
Total	**8,351.7**	**32.3**	**9,356.6**	**401.5**	**190.8**	**1,377.5**	**386.6**	**16.0**	**287.7**	**3.1**	**20,403.9**
2009.02	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	3714.5	31.4	1356.6	48.9	67.5	722.5	262.3	0.0	98.1	0.0	6301.7
Bayanzurkh	1459.5	16.8	2688.4	33.2	45.1	126.0	13.3	0.0	171.3	0.0	4553.6
Sukhbaatar	1293.3	8.4	1500.7	13.2	2.1	133.4	12.4	0.0	0.0	0.0	2963.6
Songino Khairkhan	1134.8	8.0	3151.8	29.4	16.8	207.9	61.0	0.0	3.3	0.0	4612.9
Khan-Uul	277.1	1.2	116.5	159.7	0.0	201.1	180.3	0.0	0.0	0.0	935.9
Chingeltei	676.1	0.0	2176.3	19.0	4.2	60.7	0.0	0.0	31.8	0.0	2968.1
Total	**8,555.2**	**65.9**	**10,990.3**	**303.4**	**135.7**	**1,451.6**	**529.4**	**0.0**	**304.4**	**0.0**	**22336.8**
2009.03	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	3633.6	13.3	1268.9	76.3	142.9	773.7	528.6	4.4	88.8	0.0	6530.5
Bayanzurkh	1992.3	71.0	2348.5	34.5	52.0	123.3	3.4	0.0	338.8	7.2	4971.0
Sukhbaatar	1765.4	8.5	1163.6	10.8	2.3	134.4	7.6	0.0	0.0	0.0	3092.5
Songino Khairkhan	1671.1	3.9	3449.1	20.3	94.6	238.6	87.0	0.0	9.2	0.0	5573.7
Khan-Uul	586.5	0.0	241.6	176.9	14.4	225.5	149.9	0.0	0.0	0.0	1394.8
Chingeltei	887.2	5.0	2271.0	6.3	5.5	43.1	8.0	0.0	22.7	0.0	3248.7
Total	**10,536.0**	**101.7**	**10,742.6**	**325.1**	**311.6**	**1,538.7**	**784.4**	**4.4**	**459.5**	**7.2**	**24811.1**
2009.04	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	3398.7	4.5	1369.4	139.2	112.3	1020.6	558.7	3.4	118.7	89.3	6814.7
Bayanzurkh	2020.6	8.8	3272.4	60.1	49.6	315.1	20.9	3.5	152.8	490.9	6394.7
Sukhbaatar	1841.6	0.0	1135.3	7.1	0.8	214.1	4.0	2.7	11.0	13.5	3230.0
Songino Khairkhan	1425.7	0.0	3146.8	65.7	76.8	480.8	217.5	0.0	25.9	11.9	5451.1
Khan-Uul	478.0	4.2	308.2	168.8	10.7	348.6	197.1	1.7	0.0	11.5	1528.9
Chingeltei	865.1	10.0	2499.1	11.8	9.7	111.0	2.1	0.0	16.7	26.0	3551.5
Total	**10,029.7**	**27.5**	**11,731.2**	**452.6**	**259.9**	**2,490.3**	**1,000.3**	**11.3**	**325.0**	**643.1**	**26971.0**
2009.05	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	3931.8	4.1	695.6	326.2	234.2	601.1	884.8	0.0	89.6	0.0	6767.4
Bayanzurkh	4771.2	0.0	3638.2	283.2	2.1	206.9	45.9	0.0	141.9	1485.1	10574.5
Sukhbaatar	2064.5	5.4	907.2	80.4	9.4	129.6	23.6	0.0	0.0	12.5	3232.5
Songino Khairkhan	1315.3	3.1	4846.2	76.9	25.9	341.1	214.7	0.8	11.6	2425.4	9260.9
Khan-Uul	223.9	0.0	421.4	377.9	8.3	264.7	649.4	0.0	0.0	0.0	1945.5
Chingeltei	625.2	0.2	2292.4	35.1	24.2	177.5	3.4	0.0	38.7	8.8	3145.4
Total	**12,931.8**	**12.7**	**12,740.9**	**1,179.7**	**304.1**	**1,720.8**	**1,821.9**	**0.8**	**281.7**	**3,931.8**	**34926.3**
2009.06	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	3101.1	46.1	550.1	158.5	236.4	572.5	539.9	5.3	40.8	0.0	5250.6
Bayanzurkh	1711.1	0.0	2265.4	332.0	5.4	962.4	21.2	0.0	0.0	323.5	5021.1
Sukhbaatar	1701.3	7.8	672.1	70.6	0.0	134.3	5.7	0.0	0.0	0.0	2591.7
Songino Khairkhan	1065.5	143.8	2795.5	72.1	329.4	345.1	257.6	0.0	56.9	44.9	5110.8
Khan-Uul	89.4	0.0	312.4	206.2	5.6	155.6	772.2	0.0	0.0	0.0	1541.3
Chingeltei	673.6	3.8	1844.0	0.0	94.5	171.3	0.0	0.0	43.5	0.0	2830.8
Total	**8,342.0**	**201.6**	**8,439.5**	**839.3**	**671.3**	**1,741.3**	**1,596.6**	**5.3**	**141.2**	**368.4**	**22346.3**

2009.07	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	9093.6	0.5	622.5	63.5	222.1	540.0	439.2	3.3	64.6	154.1	11203.5
Bayanzurkh	4434.6	0.0	1475.4	207.4	4.9	172.0	15.6	1.9	0.0	0.0	6311.7
Sukhbaatar	1001.8	3.0	419.7	59.7	3.1	183.8	9.0	0.0	0.0	0.0	1680.1
Songino Khairkhan	796.5	25.0	1702.3	95.1	48.8	250.9	246.9	0.0	12.7	11.0	3189.2
Khan-Uul	35.3	0.0	261.4	193.7	2.6	158.2	530.2	0.0	0.0	0.0	1181.6
Chingeltei	586.9	0.0	969.9	6.9	85.1	227.1	0.0	0.8	34.2	0.0	1910.9
Total	**15948.7**	**28.5**	**5451.3**	**626.4**	**366.7**	**1532.0**	**1240.9**	**5.9**	**111.6**	**165.1**	**25477.0**
2009.08	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	1902.1	460.4	501.2	148.5	208.9	559.1	644.0	6.5	37.4	0.0	4468.0
Bayanzurkh	1210.8	0.0	1574.1	87.2	6.5	161.2	13.8	1.4	0.0	57.2	3112.2
Sukhbaatar	1065.9	1.0	583.4	37.2	0.0	192.1	16.9	0.0	0.0	0.0	1896.4
Songino Khairkhan	133.2	60.5	1245.5	43.9	256.9	168.5	175.9	1.3	55.9	16.8	2158.4
Khan-Uul	43.8	0.0	248.4	180.1	1.2	150.0	633.4	0.0	0.0	0.0	1256.9
Chingeltei	605.7	0.0	1044.4	51.7	110.9	74.0	0.0	0.3	33.4	0.0	1920.5
Total	**4961.5**	**521.9**	**5196.9**	**548.6**	**584.4**	**1304.9**	**1484.0**	**9.5**	**126.7**	**74.0**	**14812.4**
2009.09	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	3075.0	221.9	740.3	277.6	273.3	615.8	445.8	5.8	55.6	0.0	5711.2
Bayanzurkh	1708.8	1.8	1995.9	94.6	3.6	177.8	21.5	3.1	0.0	154.0	4161.2
Sukhbaatar	1418.4	0.4	923.9	456.6	0.0	270.7	66.9	0.6	0.0	0.0	3137.5
Songino Khairkhan	1386.7	133.4	2366.9	40.4	265.2	831.1	235.5	0.7	11.2	112.9	5384.0
Khan-Uul	94.2	0.0	354.5	127.2	4.5	196.5	361.0	0.0	0.0	0.0	1137.9
Chingeltei	822.0	0.0	1850.8	341.6	152.2	78.6	0.0	1.1	41.2	0.0	3287.4
Total	**8505.2**	**357.5**	**8232.2**	**1338.0**	**698.9**	**2170.4**	**1130.7**	**11.4**	**108.0**	**266.9**	**22319.2**
2009.10	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	3438.2	34.6	949.1	353.4	170.2	584.7	422.4	5.3	93.7	45.7	6097.1
Bayanzurkh	1969.3	6.3	2237.7	134.0	1.0	163.1	34.5	6.5	0.0	162.0	4714.5
Sukhbaatar	1951.9	1.7	1213.1	304.3	0.0	405.3	162.9	0.4	0.0	0.0	4039.7
Songino Khairkhan	1279.8	90.1	2762.1	53.4	324.3	543.4	269.8	1.2	49.7	23.1	5396.9
Khan-Uul	137.9	0.0	443.4	215.2	3.4	156.2	114.8	0.0	0.0	0.0	1070.9
Chingeltei	1012.4	0.0	1351.8	221.0	138.0	106.2	0.0	0.4	39.4	0.0	2869.2
Total	**9789.5**	**132.7**	**8957.2**	**1281.4**	**636.9**	**1958.9**	**1004.5**	**13.8**	**182.8**	**230.8**	**24188.4**
2009.11	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	2948.8	0.0	743.6	206.7	125.2	371.5	417.5	6.9	19.9	0.0	4840.1
Bayanzurkh	1812.4	0.0	2821.3	351.2	0.6	124.9	21.0	4.2	2.3	63.6	5201.4
Sukhbaatar	1653.9	0.0	1206.2	98.2	1.1	195.1	31.2	0.0	0.0	0.0	3185.7
Songino Khairkhan	1360.5	6.8	2731.4	91.9	220.3	164.3	132.3	2.2	0.0	0.0	4709.7
Khan-Uul	177.9	0.0	400.1	188.1	0.0	71.3	25.4	0.0	0.0	0.0	862.9
Chingeltei	590.7	0.0	1618.1	14.4	249.6	99.1	0.0	1.0	39.7	0.0	2612.5
Total	**8544.1**	**6.8**	**9620.6**	**950.6**	**596.8**	**1026.3**	**627.3**	**14.3**	**61.9**	**63.6**	**21412.2**
2009.12	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	2827.6	4.8	879.2	125.0	242.4	467.5	865.5	6.2	30.9	0.0	5449.1
Bayanzurkh	1600.9	0.0	3043.3	50.1	59.1	108.2	15.4	4.9	3.9	0.0	4885.7
Sukhbaatar	1853.3	0.0	1595.9	56.6	0.0	106.8	0.0	0.0	0.0	0.0	3612.6
Songino Khairkhan	1197.2	0.0	3422.2	25.1	186.3	121.5	117.7	4.8	0.0	0.0	5074.8
Khan-Uul	360.5	0.0	136.7	177.2	0.0	111.8	75.2	0.0	0.0	0.0	861.5
Chingeltei	753.8	0.0	1752.0	23.3	243.1	127.0	0.0	26.3	33.0	0.0	2968.4
Total	**8593.3**	**4.8**	**10829.3**	**457.2**	**730.9**	**1042.8**	**1073.8**	**42.2**	**67.9**	**0.0**	**22942.1**

Average from Jan 2009 to Dec 2009 **23,612.1** ton/month

Weighbridge date of UCDS (Jan. 2010– Jun 2010)
Collection amount – All Company by Duureg, by Waste generation source,

unit: ton /month

2010.01	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	2749.8	0.0	1028.4	62.3	226.6	512.4	767.8	4.5	29.2	0.0	5,381.1
Bayanzurkh	1504.0	0.0	3671.9	80.7	54.4	139.3	24.4	8.9	0.0	0.0	5,483.7
Sukhbaatar	2065.0	0.0	1602.4	27.1	0.0	83.9	36.8	0.0	0.0	0.0	3,815.2
Songino Khairkhan	1441.3	0.0	2978.0	26.7	243.6	89.6	169.4	2.9	17.9	0.0	4,969.4
Khan-Uul	358.4	0.0	77.3	77.8	0.0	114.7	189.3	0.0	0.0	0.0	817.6
Chingeltei	798.3	0.0	1916.1	38.0	202.0	64.6	0.0	1.2	40.0	0.0	3,060.2
Total	**8,916.8**	**0.0**	**11,274.2**	**312.6**	**726.7**	**1,004.6**	**1,187.7**	**17.5**	**87.2**	**0.0**	**23,527.2**
2010.02	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	2550.5	0.0	679.2	33.1	253.0	352.3	593.9	1.6	52.2	0.0	4515.9
Bayanzurkh	1409.3	0.0	3096.6	107.6	48.3	120.8	3.4	4.9	0.0	0.0	4790.9
Sukhbaatar	1548.9	0.0	1367.4	32.5	0.0	84.3	35.9	0.0	0.0	0.0	3069.1
Songino Khairkhan	1107.6	0.0	2807.0	23.0	150.8	126.6	233.6	1.9	9.3	0.0	4459.7
Khan-Uul	273.1	0.0	61.4	35.1	0.0	86.4	174.6	0.0	0.0	0.0	630.7
Chingeltei	649.8	0.0	1416.4	30.2	225.1	78.6	0.0	1.1	28.2	0.0	2429.5
Total	**7,539.3**	**0.0**	**9,428.0**	**261.5**	**677.2**	**849.2**	**1,041.4**	**9.5**	**89.7**	**0.0**	**19895.9**
2010.03	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	2965.5	0.0	1003.3	56.5	291.2	572.5	723.5	1.7	41.5	0.0	5655.8
Bayanzurkh	1643.4	0.0	3586.9	94.8	56.0	113.8	4.8	11.6	0.0	0.0	5511.4
Sukhbaatar	1954.3	0.0	1555.0	110.3	0.0	83.0	1.1	0.0	0.0	0.0	3703.6
Songino Khairkhan	1454.6	0.0	3313.4	52.5	200.1	140.0	285.5	10.8	8.3	0.0	5465.2
Khan-Uul	358.7	0.0	49.3	91.5	0.0	227.2	462.3	0.0	0.0	0.0	1188.9
Chingeltei	707.4	0.0	1752.2	8.8	294.9	88.1	0.0	0.3	28.8	0.0	2880.5
Total	**9,084.0**	**0.0**	**11,260.0**	**414.3**	**842.3**	**1,224.7**	**1,477.2**	**24.4**	**78.6**	**0.0**	**24405.5**
2010.04	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	3215.9	0.0	990.0	168.7	302.3	679.4	692.1	2.3	47.6	0.0	6038.3
Bayanzurkh	1867.4	0.0	3622.3	78.5	86.6	97.5	5.9	8.1	3.3	0.0	5769.6
Sukhbaatar	2174.8	0.0	1455.3	142.6	8.9	134.0	3.5	0.0	0.0	0.0	3919.0
Songino Khairkhan	1054.2	0.0	4406.4	44.5	252.8	294.2	414.5	18.6	17.0	36.4	6538.7
Khan-Uul	460.2	0.0	104.7	99.1	0.0	339.9	433.1	0.0	0.0	0.0	1437.1
Chingeltei	890.3	0.0	1933.2	12.0	140.2	67.2	0.0	0.0	31.0	0.0	3073.8
Total	**9,662.9**	**0.0**	**12,511.9**	**545.5**	**790.8**	**1,612.1**	**1,489.1**	**28.9**	**99.0**	**36.4**	**26776.5**
2010.05	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	3184.5	177.5	1001.6	140.1	180.6	760.5	645.9	2.5	52.2	0.0	6145.3
Bayanzurkh	2171.3	0.0	4593.7	118.3	85.4	131.3	29.8	0.9	0.0	0.0	7130.6
Sukhbaatar	2540.3	0.0	1551.8	55.7	4.4	162.3	42.3	0.0	0.0	0.0	4356.8
Songino Khairkhan	1067.3	0.0	3957.5	42.0	208.5	295.3	592.3	17.5	15.9	0.0	6196.4
Khan-Uul	61.0	0.0	59.4	95.8	0.0	172.9	102.1	0.0	0.0	0.0	491.2
Chingeltei	924.8	0.0	2274.9	13.3	299.8	168.7	0.0	0.0	4.9	0.0	3686.3
Total	**9,949.1**	**177.5**	**13,438.8**	**465.3**	**778.6**	**1,691.0**	**1,412.4**	**20.9**	**73.0**	**0.0**	**28006.6**
2010.06	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol	2631.6	145.3	1014.6	171.9	134.6	748.5	454.1	0.0	55.2	0.0	5255.7
Bayanzurkh	1912.7	0.0	3130.9	137.5	3.4	145.8	65.1	3.6	3.7	2.4	5405.0
Sukhbaatar	2429.2	0.0	1559.0	85.1	0.0	241.5	3.2	0.0	0.0	0.0	4318.0
Songino Khairkhan	1222.8	0.0	3933.6	92.2	199.2	197.6	245.1	0.0	36.9	21.7	5948.9
Khan-Uul	12.0	0.0	12.1	134.1	15.3	2005.3	96.9	0.0	0.0	0.0	2275.8
Chingeltei	930.6	0.0	1651.9	9.4	276.7	196.8	0.0	0.0	53.9	0.0	3119.3
Total	**9,038.9**	**145.3**	**11,302.1**	**630.2**	**629.3**	**3,535.4**	**864.4**	**3.6**	**149.6**	**24.1**	**26322.8**

2010.07	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol											0.0
Bayanzurkh											0.0
Sukhbaatar											0.0
Songino Khairkhan											0.0
Khan-Uul											0.0
Chingeltei											0.0
Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
2010.08	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol											0.0
Bayanzurkh											0.0
Sukhbaatar											0.0
Songino Khairkhan											0.0
Khan-Uul											0.0
Chingeltei											0.0
Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
2010.09	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol											0.0
Bayanzurkh											0.0
Sukhbaatar											0.0
Songino Khairkhan											0.0
Khan-Uul											0.0
Chingeltei											0.0
Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
2010.10	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol											0.0
Bayanzurkh											0.0
Sukhbaatar											0.0
Songino Khairkhan											0.0
Khan-Uul											0.0
Chingeltei											0.0
Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
2010.11	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol											0.0
Bayanzurkh											0.0
Sukhbaatar											0.0
Songino Khairkhan											0.0
Khan-Uul											0.0
Chingeltei											0.0
Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
2010.12	Apartment	Dam/Canal	Ger area	Construction	Road	Org./mixed	Factory	Hospital	Market	Illegal waste	Total
Bayangol											0.0
Bayanzurkh											0.0
Sukhbaatar											0.0
Songino Khairkhan											0.0
Khan-Uul											0.0
Chingeltei											0.0
Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Average from Jan 2010 to Jun 2010 **24,822.4** ton/month

SECTION G　PDM 以外の活動成果品

G　PDM 以外の活動成果品

G.1　Bulgan Aimag Center 廃棄物管理改善計画書

G.1.1　背景

現在モンゴル国自然環境観光省（MONET）は、各都市に対し、廃棄物管理のＭＰを策定するように指示し、廃棄物管理改善のための予算付けを行い、各都市に改善の提案を募っているところである。

そこで、2011 年 6 月 28 日から 3 日間、11 箇所の Aimag Center から廃棄物担当者を招いて、ウランバートル市で Master Plan の策定方法に関するワークショップを開催した。その際に各都市の廃棄物担当者から、各都市は色々な問題を抱えており、JICA Expert Team (JET) による現地視察と技術的なアドバイスを、MONET を通じて正式に要請[1]した。

この要請を受け、ＪＥＴは 2011 年 7 月 4 日～6 日までの 3 日間、3 都市の Aimag Center（Bulgan, Erdenet, Darkhan）を訪れ、廃棄物管理施設の現場視察をおこない、県知事、廃棄物管理関係者と協議を行った。

その際、Bulgan Aimag Center の知事から、処分場の改善を緊急に実施したいので、その改善計画について、技術的な助言が欲しいと要請された。この要請を受け、本計画書を作成する。

G.1.2　目的

Bulgan 市の廃棄物管理の現状を把握し、課題の抽出と共に、その改善策を計画する。特に現在オープンダンピングの状態となっている最終処分場を、周辺環境への影響を削減し、管理された処分場へと改善する。その際には都市の規模、予算、処分量などを考慮し、実現可能な改善計画とする。

G.1.3　廃棄物管理の現況

a.　ブルガン市の概要

ブルガン市は、ブルガン県の県庁所在地であり、12,486 人（2011 年推定）の人口を有し、アパート地区に 3746 人(30％)、ゲル地区に 8741 人(70％)が居住している。牧畜と農業を主産業とする都市であり、県には多くの森があり、豊富な森林資源にめぐまれている。

[1] MONET Letter dated 30 Jun 2011 No 3/2490

b.　都市廃棄物発生量

ブルガン市においては、過去にごみ量調査を実施していないため、発生量は不明である。そこでウランバートル市の発生源単位（kg/日/人）を使用して計算すると、約 7.3ton/day のごみが発生していることになる。

表 G.1: 2011 年の都市廃棄物発生量

	アパート	ゲル	ビジネス	total
発生量kg/日	1,049	5,288	995	7,332

しかし、ブルガン市のゲル地区１戸あたりの面積は、「ウ」市に比べて広く、ほぼ全戸で家畜をかっているということで、家畜の糞が多くごみとして出てくるということなので、発生源単位は、「ウ」市より多い可能性はある。

c.　収集運搬

廃棄物の収集運搬は、市の所有する機材を用いて、City Maintenance Company (Public Company)が行っている。2011 年 7 月現在の市の所有機材は以下のとおり。

 KO440(6m3)　1台	 Bongo(4m3) 1台	 2.4m3 Tractor 2台

図 G.1: ブルガン市所有の収集機材

収集運搬量を処分場における記録（トリップ記録）から計算すると以下のとおりとなる。

表 G.2: ブルガン市の収集運搬量（トリップ/月）

Truck Type	Capacity	Month			Average Monthly Trip
		Apr	May	Jun	
	m3	trip/mth	trip/mth	trip/mth	trip/mth
KO440 Truck	6	65	82	67	71.3
Nissan Bongo	4	88	98	172	119.3
Tractor	2.4	101	212	257	190.0

月別のトリップ数が、車種毎にかなりばらついていることから、頻繁に故障が発生している可能性が、高い。また収集機材の運搬効率を 80%と設定すると、毎日約 40m3 の廃棄物を収集運搬しており、発生量のほぼ全量を収集していると想定される。

表 G.3: ブルガン市の収集運搬量（体積 m3/日）

Truck Type	Capacity	Average Monthly Trip	Carrying Efficiency	Monthly Collection Volume	Daily Collection Volume
	m3	trip/mth	%	m3	m3
KO440 Truck	6	71.3	80%	342.4	13.7
Nissan Bongo	4	119.3	80%	381.8	12.7
Tractor	2.4	190.0	80%	364.8	14.6
Total				1184.5	41.0

d. 最終処分

ブルガン市の最終処分場は、市の南東約 4.5km に位置し、約 30 年前から処分場として使用している。平らな地形で、西方には川がながれており、浸出水の流出には注意を払う必要がある。

処分場には重機はないため、運搬してきたごみは、ただ平らな進入可能な場所にダンプするだけで、境界もなく処分場は日々どんどん広がっている状況である。

処分場への進入路脇にはゲルがあり、搬入車両の記録をとっている。記録内容は、車両番号、車両容量、搬入時刻、搬出時刻、ドライバーの名前をサインとなっており、搬入ドライバーへは、処分場に来たことを示すチケットを渡しており、これがドライバーへの支払い根拠となっている。ドライバーへの支払いは、トリップベースとなっている。

図 G.2: ブルガン市最終処分場

処分場近影は以下のとおり。

図 G.3: 東側斜面からみた処分場全景

G.1.4 改善計画案

a. 収集運搬

収集運搬の改善計画として、6 月の普及セミナーで使用した教材の必要収集車両計算エ

クセルシートを用いて、必要な収集車両の台数を計算した。

条件としては、アパートごみは 8m3 コンパクター車、ゲル地区は 6 トンダンプトラックを用いて収集することにした。

その結果は 8m3 コンパクター車が 1 台、6 トンダンプトラックが 2 台あれば十分である結果となった。しかし、アパート、ビジネスごみが非常に少ないため、コンパクター車を使用せずに、6 トンダンプトラック 2 台があれば、十分に収集可能である。

Type of Truck	積載量	unit	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Compactor	8m3	Nos	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
Dump truck	10m3	Nos	1.1	1.1	1.2	1.2	1.3	1.3	1.4	1.5	1.6	1.6

あとはダンプトラックが進入困難な場所をトラクターで補完収集することになる。

結論として、現在の収集車両編成を大幅に変える必要はなく、故障に対応するため、**6m3 ダンプトラック 1 台の調達**を計画する。

b.　リサイクル

ごみの分別・リサイクルの対象としては、まずゲルから大量に出てくるという家畜の糞を対象とすべきである。家畜の糞は肥料もしくは燃料としてリサイクル可能であり、まずは住民教育として、家庭内でのリサイクルを推奨し、最終処分場に搬入するごみの量を削減する。

次に有価物（ガラス瓶、アルミ缶、PET）などを対象に排出源での分別を、同じく住民教育を通じて行う。その際には「ウ」市などで作成した PR ツールを利用して現地の状況に合わせ修正を加えて使用する。

紙やプラスチックのリサイクルについては、まず「ウ」市の先行事例を良く研究し、その後慎重にその導入を検討する。

c.　最終処分

最終処分場の改善にあたっては、以下の優先順序に従い、改善に当たることを計画する。

１．処分場の境界をはっきりと定めるために、古いごみを使って堰堤をつくること。
２．次に堰堤内に廃棄物を搬入するように収集会社に指示をすること。
３．定期的に重機を用いて、搬入さえたごみを狭い区域にまとめ、圧縮すること。
４．1ヶ月に1度くらいの割合で、覆土を行うこと。

となる。第 1 段階の堰堤の建設にあたっては、一気に大規模の堰堤を建設するのではなく、2 年～3 年分のごみ量を埋め立てることの可能な規模とし、時期をみてこれを拡張していくこと計画とする。

c.1　処分場の設計

c.1.1　最終処分量

最終処分量は、2011 年 4 月から 6 月にかけての搬入車両の記録をもとに計算すると以下のとおりとなる。

表 G.4: ブルガン市の収集運搬量（体積 m3/日）

Truck Type	Capacity	Average Monthly Trip	Carrying Efficiency	Monthly Collection Volume	Daily Collection Volume
	m3	trip/mth	%	m3	m3
KO440 Truck	6	71.3	80%	342.4	13.7
Nissan Bongo	4	119.3	80%	381.8	12.7
Tractor	2.4	190.0	80%	364.8	14.6
Total				1184.5	41.0

処分場に計量装置がないため、運搬時のごみの密度が不明であるが、人口から割り出した発生量から、その密度は、

7.32 ton ÷ 41.0 m3 = 0.18 t/m3 となり、ここでは、*0.2 ton / m3* と仮定する。

そこで 1 年間のごみ処分量を計算すると、

41.0 m3/day × 0.2 ton/m3 × 365 day = 2993 ton/year

となり、年間約 3,000 トンのごみを埋め立てる必要がある。

埋立にあたっては、ブルドーザーではなく、軽量のタイヤショベルなどを使って圧縮することを想定しているため、埋立後の密度は、0.5 ton/m3 とすると、年間必要な処分場の容量は、

3,000 ton/m3/year ÷ 0.5 ton/m3 ＝ 6,000 m3/year

となる。

c.1.2 処分場規模の設計

ブルガン処分場は、平らなところに位置しているため、以下の断面を持つ処分場として設計する。なおこの計算は普及ワークショップにおいて Excel を用いて演習をしており、ワークショップ参加者は独自に計算可能である。

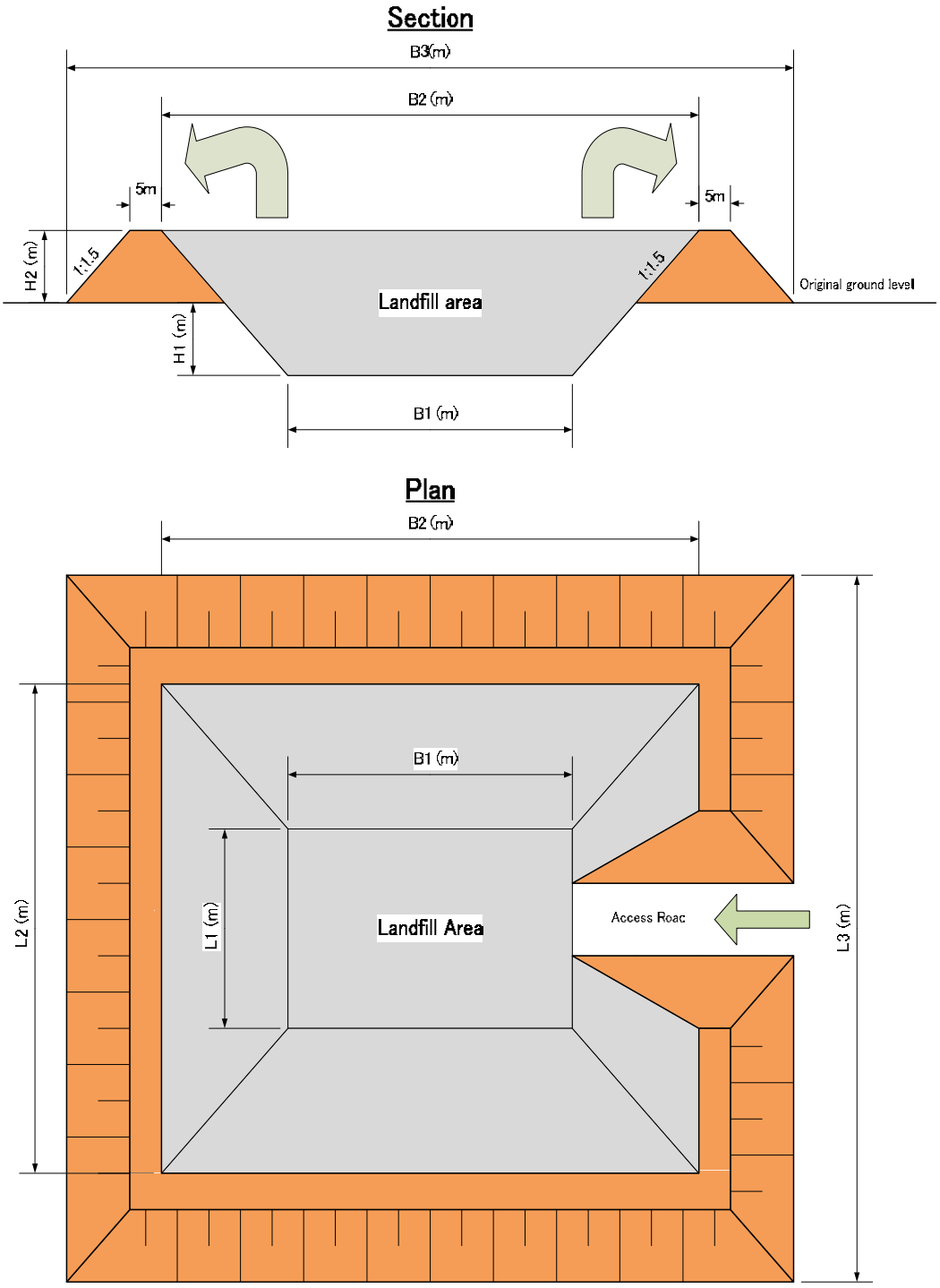


図 G.4: 処分場の形状

次にごみを埋め立てる処分場のサイズを計算する。前述の Excel Sheet を用いて計算すると、以下のとおりとなるが、ここでは 3 年分のごみを処分するのに必要なサイズとして計算した。しかしこれは予算によって規模を小さくすることも可能である。

B1 Landfill volume calculation

To calculate landfill site volume to match with accumulated required landfill volume (ARLV)
Step 1: Accumulated required landfill volume (ARLV)
Step 2: Input approximate land area (Width and length)

					Formula
1	Required landfill volume	Vlr=	18,000	m^3	For 3years (2011～2013)
2	Planed bottom length	B1=	100.0	m	
3	Planed bottom width	L1=	100.0	m	
4	Calculated bottom area	A1=	10,000	m^2	A1=B1xL1

Step 5: Input estimated height of landfill site

5	Proposed Height	H1+H2=	1.8	m	
6	Calculated top length	B2=	105.4	m	B2=B1+5x2+1.5x(H1+H2)x2
7	Calculated top width	L2=	105.4	m	L2=L1+5x2+1.5x(H1+H2)x2
8	Calculated top area	A2=	11,109	m^2	A2=B2xL2
9	Calculated landfill volume	Vlc=	18,998	m^3	Vlc=(A1+A2)/2x(H1+H2)
			OK		Vlr is biger than Vlc => OK If Vlr is smaller than Vlc => back to step 2

B2 Soil balance calculation

To calculate soil balance between excavation and embankment filling
Step 10: Input excavate height

10	Proposed excavate height	H1=	0.00	m	
11	Calculated embankment height	H2=	1.80	m	
12	Proposed excavate soil volume	Ves=	0	m^3	Ves=(A1+(B1+1.5xH1x2) x(L1+1.5xH1x2))/2xH1
13	Required embankment soil volum	Vev=	6,121	m^3	Vev=(5+5+H2x1.5x2)/2xH2 x(B2+5+L2+5)x2

Dimension of landfill site

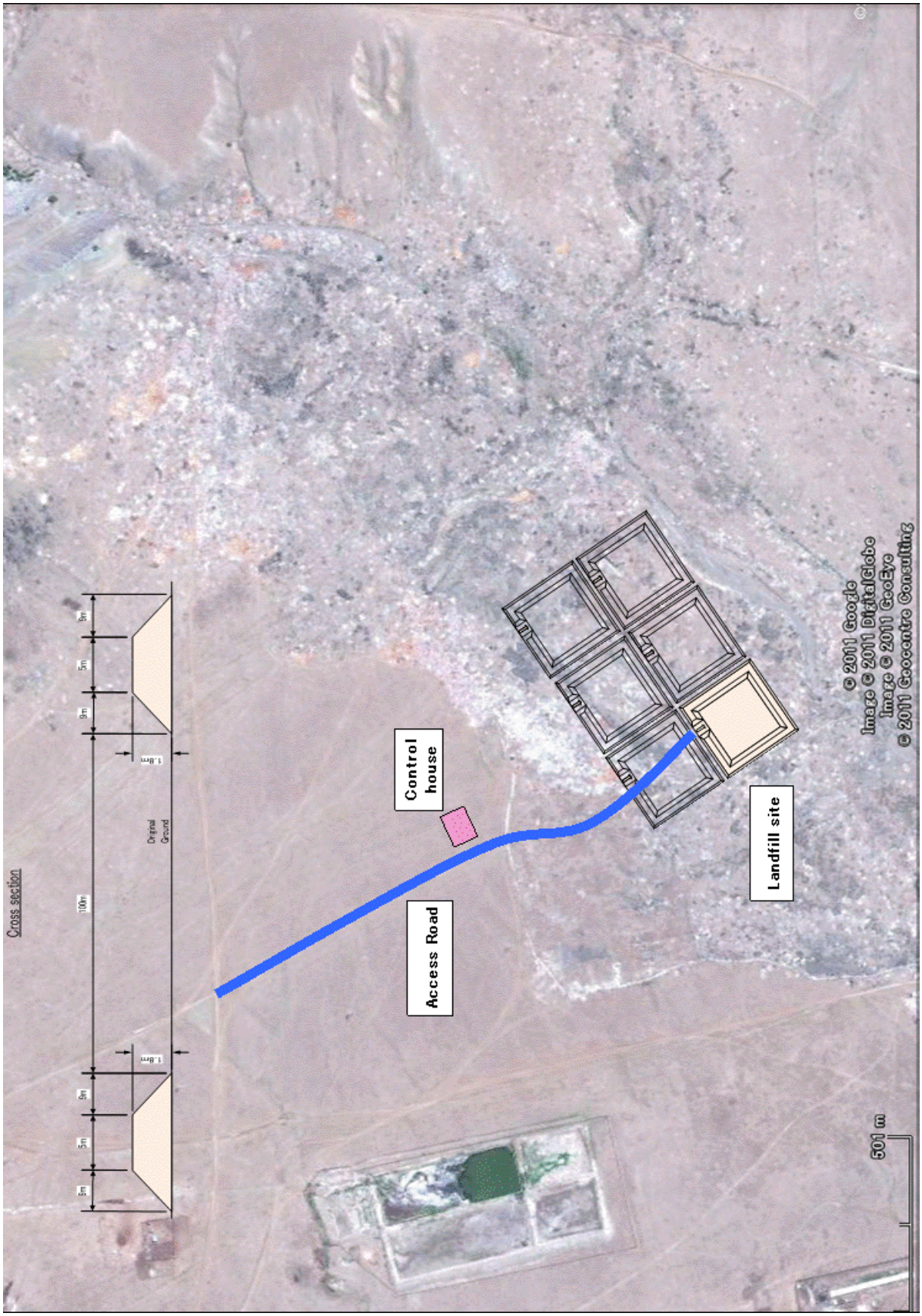
Required width	**B=**	**120.8**	**m**
Required length	**L=**	**120.8**	**m**
Required area	**A=**	**14,592.6**	**m^2**
Receivable volume	**Vlc=**	**18,998**	**m^3**
Bottom length	B1=	100.0	m
Bottom width	L1=	100.0	m
Top length	B2=	105.4	m
Top width	L2=	105.4	m
Excavate depth	H1=	0.0	m
Embankment height	H2=	1.8	m

3 年分のごみを埋め立てるのに必要なサイズは、120 m × 120 m の正方形となる。

c.1.3　処分場の配置

新たにつくる処分場の配置は、既存処分場のごみを捨てているところをつかって、古いごみを機械で押して、堰堤の材料として使用する計画となっている。これを、現在の処分場に配置すると以下のとおりとなる。

詳細な位置については、現場の状況に合わせて変更可能であるが、将来の拡張を考慮して位置を定める必要がある。


Control house
Access Road
Landfill site
Cross section
Original Ground
100m
© 2011 Google
Image © 2011 DigitalGlobe
Image © 2011 GeoEye
© 2011 Geocentre Consulting
501 m

c.1.4　機材の調達

処分場は、施設をつくって終わりではなく、その後の運営が非常に重要となる。運営のしかたによってその処分場の評価が決まるといっても過言ではない。処分場を衛生的な状態に保つ、すなわち衛生埋立を行うためには、収集車から撒き出されたゴミを、狭い区域に押し、空気や雨と接する面積をできるだけ小さくするために、重機が必要となる。

ウランバートル市のように、一日 1000 トン以上のゴミを埋め立てる処分場では、3 台のブルドーザーが必要であるが、ブルガン市のように、一日 40m3、10 トン以下の都市では、このようなブルドーザーを処分場で常時待機させることは、非常に不経済となり、持続可能ではない方策である。

そこで、以下のような、Excavator 付きのホイールショベルの調達が効果的である。

図 G.5: Excavator 付きホイールショベル

この Case Machine の長所として、

１．タイヤショベルのため、舗装道路の移動が容易である。（Bulldozer の場合は移動にトレーラーが必要）

２．Excavator 機能があるため、斜面のトリミングや、覆土材の掘削、積み込みができる。

３．ショベル機能で、ゴミを押し狭い区域にまとめることができる。

４．処分場で必要がない場合は、不法投棄の Clean Up や、道路の補修工事にも仕様できる。

５．上記処分場の建設は、この機械とダンプトラックがあれば可能である。

c.1.5　処分場の建設

処分場の建設は、前述のとおり、Case Machine とダンプトラックで施工する。その手順は、

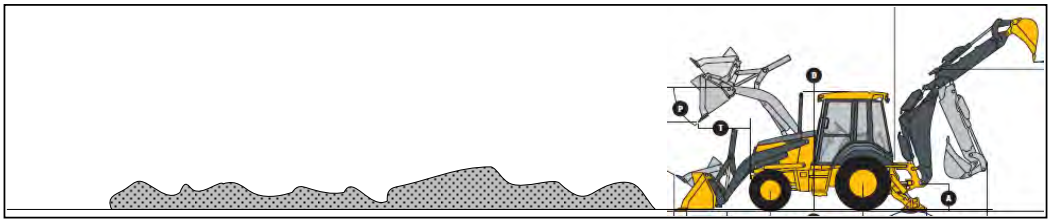
１．処分場の位置を測量により決定する。
２．堰堤の位置を決める
３．Case Machine とダンプトラックをつかって、堰堤を建設する。
４．処分場内部を掘削し、これをごみでできた堰堤に覆土する。

この手順を以下の図で示す。

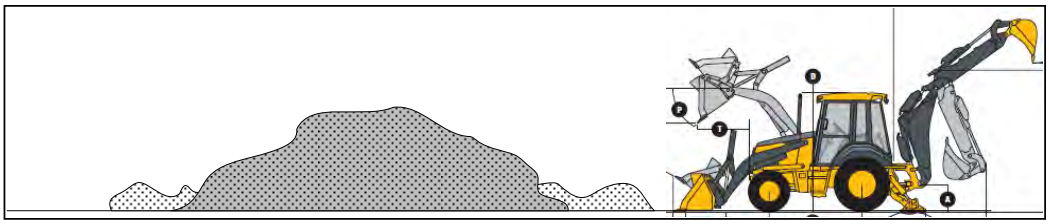
c.1.6　堰堤の建設

1. Making embankment by waste

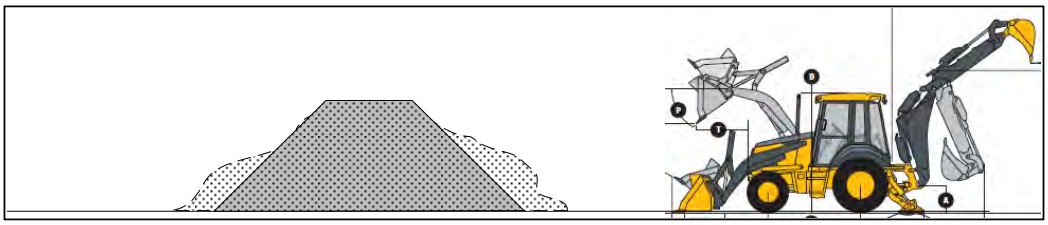
Step 1　To collect waste



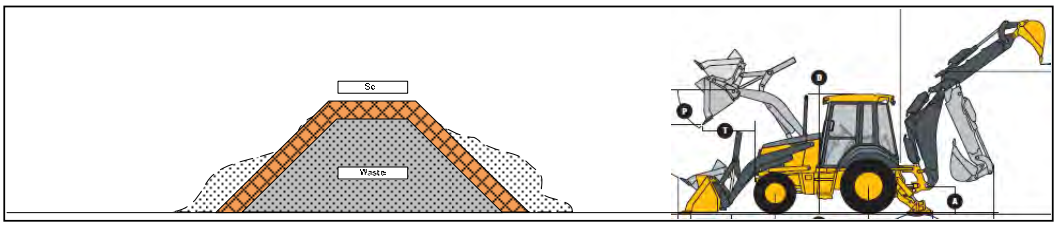
Step 2　To top up waste



Step 3　To compact and trim slope



Step 4　To cover waste by soil



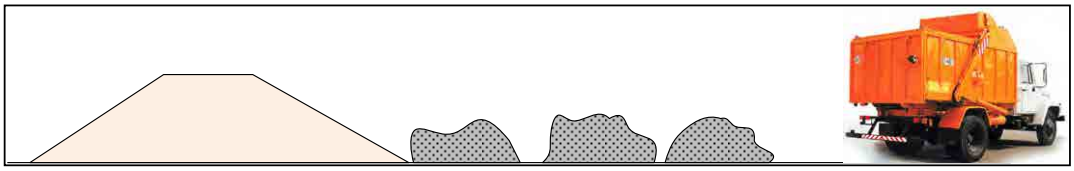
c.1.7　処分場の運営

処分場の運営は、上記 Case Machine1 台で実施可能である。搬入されるごみ量からして、

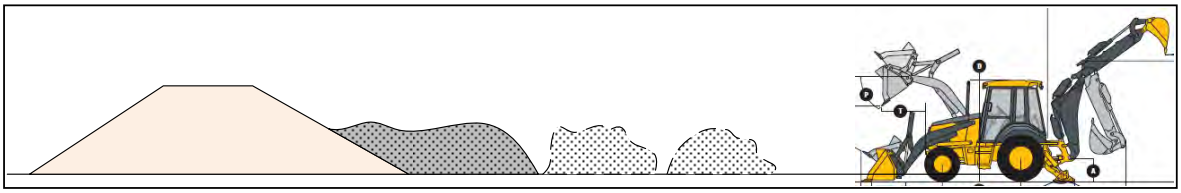
1 週間に一度程度、収集車から撒き出されたごみをショベルで押し、狭い区域に圧縮するとともに、翌週のゴミの捨て場所を確保する。その手順を以下の図で示す。

2. How to landfill

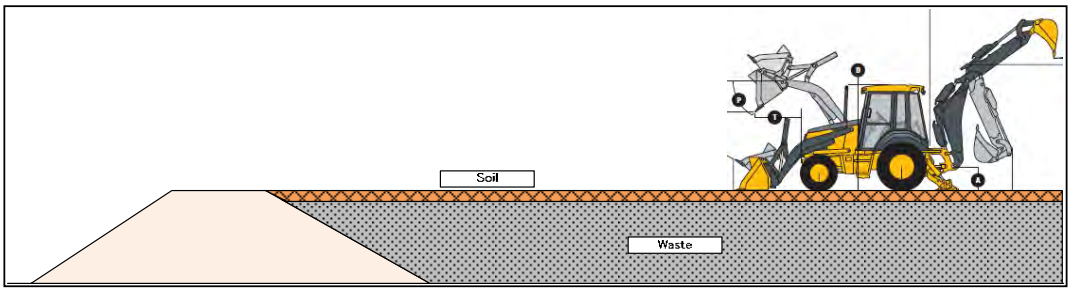
Step 1　Unload waste into the landfill pit



Step 2　To push and compact waste once in a week



Step 3　To cover by soil and shift to next landfill pit



G.1.5　結論

ブルガン市においては、廃棄物管理担当者（Nature Environment and Tourism）ならびに県知事とも廃棄物管理改善に対する意識は非常に高く、MONET の支援は有効に実施されると考えられる。そこで以下推奨する。

1．MONET の廃棄物管理改善基金をつかって、上記 Case Machine の調達をする。
2．調達にあたっては、その維持管理費の予算化を条件とする。
3．調達した Case Machine を使用して、早急に処分場の改善を実施する。
4．収集車については、その老朽化により今後も稼働率の低下が想定されるため、中期的に 6m3 ダンプトラックの調達を計画し、予算化を図る。
5．リサイクルについては、家畜の糞の利用を最優先し、住民教育を行う。

G.2　ゴミ収集車の入札支援:技術仕様書

G.2.1　一覧

		Compactor Truck				Dump Truck
	unit	①JHA5100ZYS	②JHA5071ZYS	③JHA5080ZYS	*④GT085-563-M*	*⑤FTR33FLD*
Chassis		china isuzu	china isuzu	china foton	*Japan Isuzu*	*Japan Isuzu*
Body		china shinmaywa	china shinmaywa	china shinmaywa	*Japan Shinmaywa*	*Japan Shinmaywa*
Body Volume	m3	10 m3	5.7 m3	5.7 m3	8.4 m3	10 m3
Hopper Volume	m3	0.6 m3	0.6 m3	0.6m3	1.1 m3	
Hydraulic Pressure	Mpa	20.6 Mpa	17.7 Mpa	17.7 Mpa	20.6 Mpa	
Chassis		五十鈴	五十鈴	北京福田	ISUZU FSR33F	ISUZU Japan
Length	m	7,250	6,210	6,305	7,005	6,505
Width	m	2,250	1,880	2,030	2,220	2,670
Height	m	2,800	2,280	2,360	2,940	2,770
wheel base	m	3,815	3,360	3,360	3,700	
Front Tread	m	1,680	1,504	1,730		
Rear Tread	m	1,650	1,425	1,590		
Engine		Diesel	Diesel	Diesel	Diesel	Diesel
Displacement		5193 cc	2999 cc	3760 cc	8226 cc	8226 cc
Power		129KW/2600rpm	96KW/3400rpm	105KW/2600rpm	129kw/2800rpm	147kw/2850rpm
Torque		500Nm/1500-2000rpm	280Nm/1700rpm	450Nm/1200-2200rpm	461Nm/1700rpm	500Nm/1700rpm
Gear		MT6	MT?	MT4	MT5	MT6
Tyre						
Front Tyre		8.25R20	7.5R15	7.5R16	8.25-20-14PRLT	9.00-20-14PRLUG
Rear Tyre		8.25R20	7.0R16	7.0R16	8.25-20-14PRLT	9.00-20-14PRLUG
Chassis Weight	kg	2,970	1,900	2,560		
Body Weight	kg	3,250	2,360	2,360		
Empty Weight	kg	6,220	4,260	4,920	6,435	5,915
Pay Load	kg	3,585	2,910	3,380	4,500	6,000
Passenger weight	kg	195	130	195		165
Total Weight (GVW)	kg	10,000	7,300	8,495	11100	12,080

G.2.2　仕様書（FOTON-chassis 5.7m3 Compactor）

Specification for Compactor Truck （JHA5080ZYS）

1. General

JHA5080ZYS compactor truck is composed of chassis and body. chassis is BJ1089VEJEA-FD and body is GT053. Body has functions of compacting wastes during loading and unloading wastes from body by discharging plate. JHA5080ZYS compactor truck can collect and transport wastes safely, sanitary, and saving manpower.

2. Main Size and Capacity

2.1 Overall

2.1.1Size of Chassis （Length）（Width）（Height）

Outside Dimension ････････････････････････････････････6305mm×2030mm×2360mm

Wheel base ……………………………………3360 mm

Tread（Front/Rear）……………………………1730/1590mm

Front/Rear Overhung……………………1095/1850mm

2.1.2Weight

Full Load………………………………………………8495kg

Empty Load…………………………………………… 4920kg

Pay Load (Carrying Capacity)………………………………3380kg

2.1.3Travelling

Minimum Rotation Radius…………………………15 m

Lowest Clearance…………………………………180 mm

Approach angle/departure angle…………………21/16 °

2.2 Chassis

2.2.1 Chassis

Type …………………………………北京福田 BJ1089VEJEA-FD (Foton)

Axle number ………………………………2

Wheel drive ………………………………4×2

Tire Size…………………………≪轮胎规格≫

Tire numbers ………………………………6

2.2.2 Engine

Number …………………………………ISF3.8s3141

Type ‥‥Indirect 4 cylinder, liquid cooler

Diesel Engine with Intercooler Turbo

Fuel …………………………………Diesel

Displacement ………………………………3760 ml

Power …………………………………105/2600(kw/rpm)

Maximum Torque……………………………450/1200-2200（N m/rpm)

2.2.3 Cabin

Color…………………………………white

Type …………………………Steel Made Single Flat Cabin

Riding Capacity…………………………………3 person

2.2.4Trasnmission

Type …………………………………≪变速器型式≫

Number of Gear ………………………………4 gears

2.2.5 Clutch

Type …………………………………Dry Single Plate

2.2.6 Handle

Type ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・Left handle

2.2.7Suspension

Type ・・・・・・・・・・・・・・・・Rigid Axle Suspension、
Leaf Spring Double cylinder shock absorber （DCSA）

Number of Leaf Spring(Front/Rear) ・・・・・・・・・・・・・・・・・・・・・・・・3+1/6+7

2.2.8Front Axle

Type・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・I shape forged steel

2.2.9 Rear Axle

Type・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・Banjo type

Final Gear Ratio・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・4.11

2.2.10 Chassis Frame

Frame Cross Section・・・・・・・・・・・・・・・・・・・・・・・・・・195×60×5

Joint・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・Rivet

2.2.11　Break System

Break・・・・・・・・・・・・・・・・・・・・・・・・・Front Disc Break/Rear Drum Break

Parking Break・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・Center Drum

Emergency Break・・・・・・・・・・・・・・・・・・・・Interlocked with Parking Break

Auxiliary Brake・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・Exhaust type

2.2.12Electricity

Rated voltage ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・24 v

Battery ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・100AH*2

Fuel tank・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・80 L

2.3 Body

2.3.1 Body Dimension （Length） （Width） （Height）

Effective Dimension・・・・・・・・・・・・・・・・・・・・・・・・・・・・2515mm×1715mm×1320mm

Effective Volume・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・5.7 m^3

2.3.2 Hopper Dimension

Dimension of Hopper Inlet・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・1420mm×850mm

Minimum Height of Hopper Inlet・・・・・・・・・・・・・・・・・850mm

Hopper Volume・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・0.6 m^3

2.3.3 Capacity

Loading Time・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・1 Cycle　around 13～15 seconds

Discharge Time・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・around 18 seconds

Discharge method‥‥‥‥‥‥‥‥‥‥‥‥‥‥‥‥‥‥‥‥Horizontal Push out type

2.3.4 Hopper Volume

Hopper Volume‥‥‥‥‥‥‥‥‥‥‥‥‥‥‥‥‥‥‥‥around 75 L

3. Special Feature

This truck is composed of chassis and body. body is composed of body itself, loading device, discharge plate. loading device and discharge plate are powered by hydraulic cylinder equipped in the body and have following features.

3.1 Pressing plate will function strongly with down, compress and up process. Bulk wastes can be loaded with compression function.

3.2 Discharge plate inside body move towards from automatically when wastes are loaded and compacted. Therefore, compaction of wastes loaded is efficient.

3.3 Self Rock Cylinder

Hydraulic Cylinders for Opening and Closing Hopper have special check valve so, in case hydraulic hose is damaged, hopper should not close. It is safety features for workers during operation.

3.4 Emergency stop device, alarm system for hopper open and close, inter rock switch for hopper close, automatic scraping device at hopper,. are equipped and safety operation will be secured during waste collection and washing as well.

4. Structure

4.1Loading Device

Loading will be conducted by press plate which is equipped at hopper with hydraulic devices. Wastes are crushed and compacted by press plate and further compacted inside the body with discharge plate.
Position of discharge plate is adjustable during loading.

4.2Unloading Device

Hopper open and close cylinder will open the hopper portion and discharge plate push out the loaded waste to outside. This operation will be conducted from inside cabin automatically.

4.3Hopper

Hopper is a strong structure made of steel and anti weather high tensile steel plate is used for the place where it is possible to be rust, and anti worn out high tensile steel plate is used for the main frame and the place where it is possible to be wear out..

4.4 Body

It is a strong structure with anti worn out high tensile steel plate is used at main places in order to improve anti rust performance.

4.5Hydraulic Device

Oil pump powered by PTO will push hydraulic oil through control valve to each hydraulic cylinder and enact waste loading, open and close hopper and discharge wastes.

4.5.1Hydraulic Pump

Type･･Gear Pump

Standard Rotation ･････････････････････････････Around 1000 rpm

Pump Capacity ･･････････････････････････････････Around 50 L／min

4.5.2Hydraulic Actuator

Press Cylinder･･･double acting cylinder

Pack Cylinder･･double acting cylinder

Rock Cylinder ･･･double acting cylinder

Lift Cylinder（self rock system）････････････････････double acting cylinder

Ejection Cylinder ･･････････････････････････････････････Plural stages double acting cylinder

4.5.3 Control Valve ･･･4 connection solenoid valve

4.5.4 Maximum Pressure･･････････････････････････Around17.7 MPa（Around 180 kgf/cm^2）

4.5.6 Operation Device

Each cylinder will be controlled by solenoid valve through electric signals

（1）Operation Device inside Cabin

1. PTO is operated by a lever equipped inside cabin.

2. Panel Switch in the Cabin

a. Change Switch（Loading・Unloading）

b. Hopper Switch（Open・Close）

c. Discharge Plate Switch（Front・Back）

d. Discharge Switch

（2）Switch at Hopper

1. Left Rear

a. Alarm Buzzer Button to inform Driver

b. Single/Continuous Operation Button

c. Start Button

d. Down Button(Stop Button)

e. Up Button

f. Press Plate Reverse Button

g. Emergency Stop Button

（d、e、f　is for single operation）

2. Right Rear

a. Emergency Stop Button

3. Hopper blow

a. Emergency Stop Press Plate

4.5.7 Hopper Rock Device and Prevention of Waste Water Leakage Device

Body and Hopper will be automatically rocked through hooks equipped at right and left rear. Seal packing is attached between hopper and body in order not to leak waste water.

5. Safety Device

5.1 Solenoid check valve was equipped with hydraulic cylinder for hopper open and close.

5.2 Protection switch for hopper closure is attached at rear body. Indication ramp is equipped in the cabin.

5.3 Protection bar for hopper closure is equipped at the rear body.

5.4 Emergency stop bars equipped below hopper inlet.

5.5 Emergency stop button is equipped at both side of hopper inlet.

5.6 Alarm buzzer rings during open and closure of hopper.

5.7 Loading operation can not be implemented in case hopper is unrocked.

5.8 During loading operation, in case hopper is opened, loading operation is automatically ceased.

5.9Prevention device for operation mistake

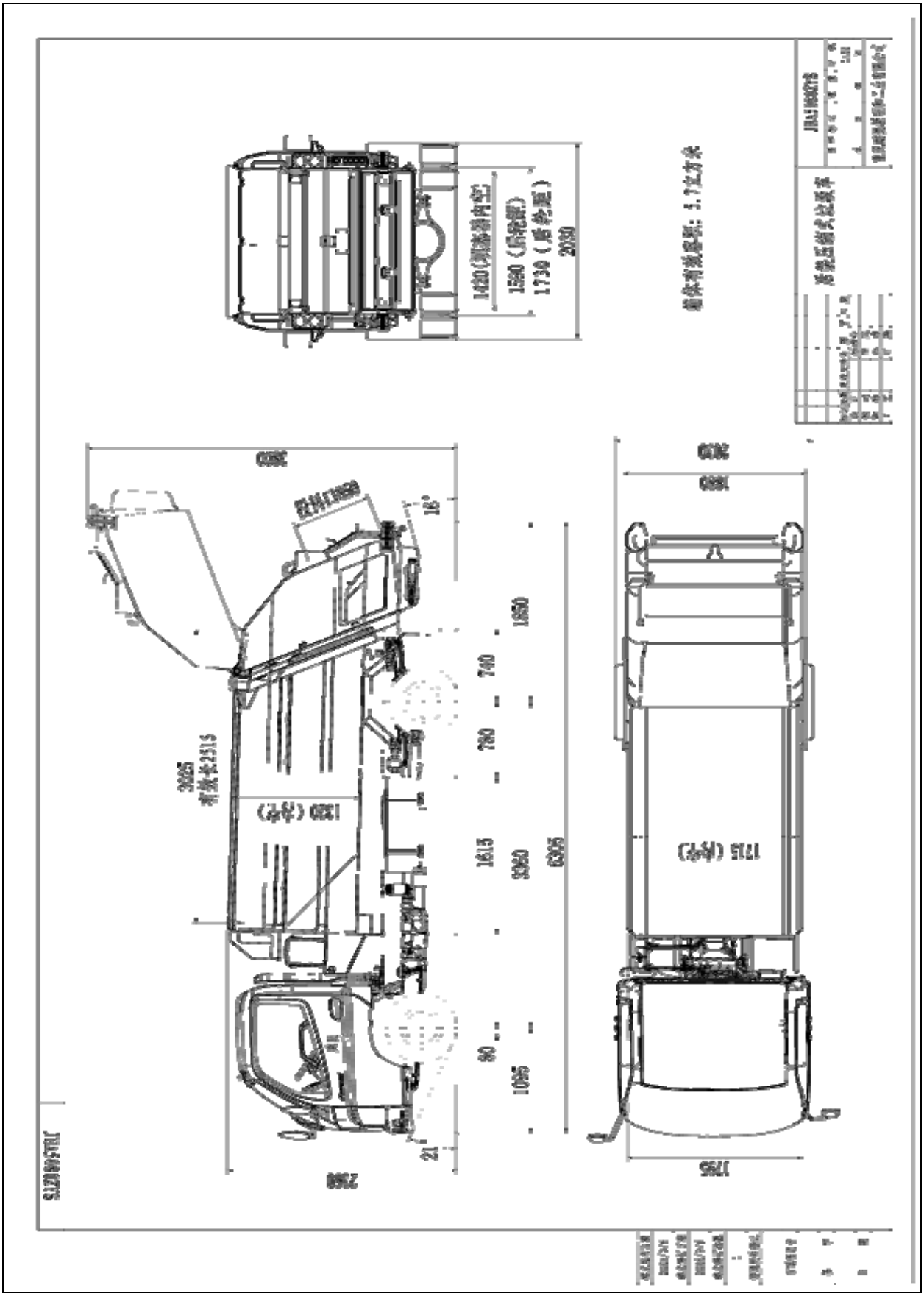
Sweep out restriction

Sweep out operation is automatically cancelled when the hopper's opening angle is 45 degrees or less.

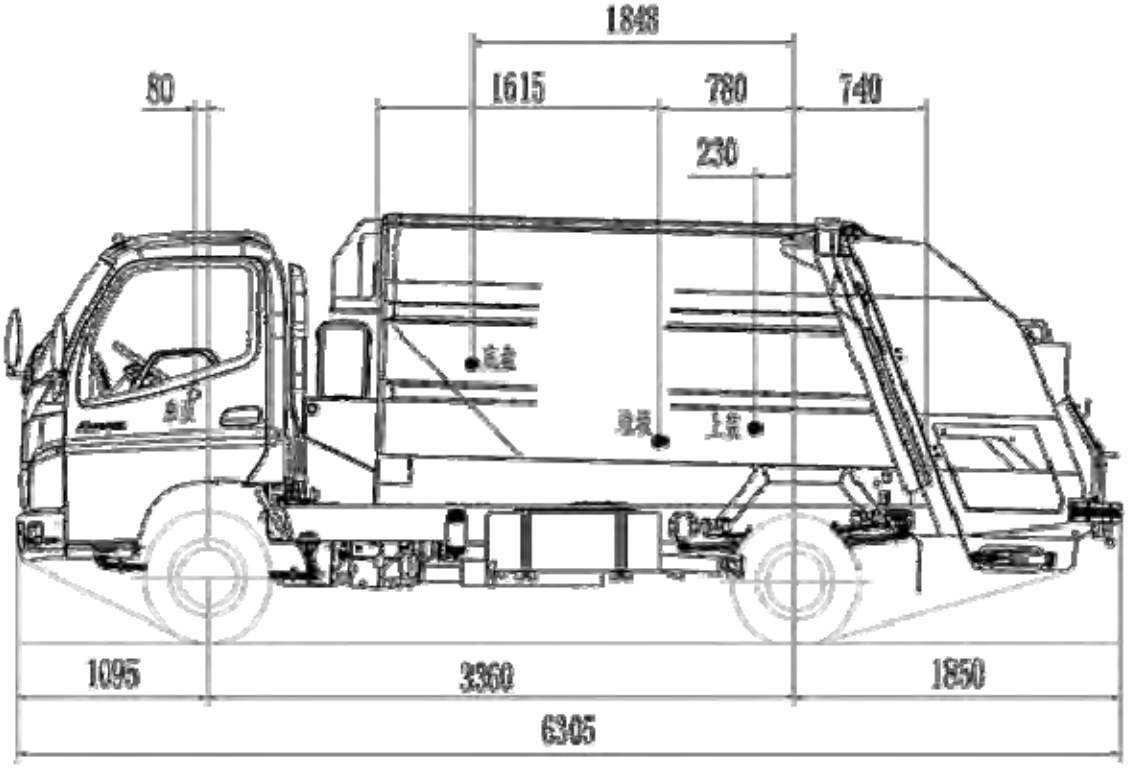
5.10 Hooking confirmation ramp in cabin.

6. Painting Body

After acid cleaning and phosphorylation treatment and surface preparation with under splaying, urethane paint will be applied with customers request color.



JHA5080ZYS重量计算				
	合计（kg）	前轮分布（kg）	后轮分布（kg）	重心（距后轮中心）
底盘	2560	1408	1152	1848
上装	2360	162	2198	230
车辆重	4920	1570	3350	1072
垃圾	3380	785	2595	780
乘员	195	200	-5	3440
整车总重	8495	2555	5940	1011
前轮载荷分布比例				
空载	1570/4920*1000=32% > 20%			
满载	2555/8495*1000=30% > 20%			



G.2.3 仕様書（ISUZU-chassis 10.2m3 Compactor）

Specification for Compactor Truck （JHA5100ZYS）

1. General

JHA5100ZYS compactor truck is composed of chassis and body. chassis is QL1100TKARY and body is GT100. Body has functions of compacting wastes during loading and unloading wastes from body by discharging plate. JHA5100ZYS compactor truck can collect and transport wastes safely, sanitary, and saving manpower.

2. Main Size and Capacity

2.1 Overall

2.1.1Size of Chassis （Length）（Width） （Height）

Outside Dimension ·····7250mm × 2250mm × 2800mm

Wheel base ·····3815 mm

Tread （Front/Rear）·····1680/1650mm

Front/Rear Overhung·····1100/2325mm

2.1.2Weight

Full Load·····10000kg

Empty Load····· 6220kg

Pay Load (Carrying Capacity)·····**3585kg**

2.1.3Travelling

Minimum Rotation Radius·····15 m

Lowest Clearance·····215 mm

Approach angle/departure angle·····21/16 °

2.2 Chassis

2.2.1 Chassis

Type ·····五十铃 QL1100TKARY

Axle number ·····2

Wheel drive ·····4×2

Tire Size·····9. 5R17. 5, 8.25-20, 8. 25R20

Tire numbers ·····6

2.2.2 Engine

Number ·····4HK1-TC

Type ····Indirect 4 cylinder, liquid cooler, direct injection Diesel Engine with Intercooler Turbo

Fuel ································Diesel

Displacement ······························5193 ml

Power ································129/2600(kw/rpm)

Maximum Torque···························500/1500-2000（N m/rpm）

2.2.3 Cabin

Color································White

Type ·····························Steel Made Single Flat Cabin

Riding Capacity·······························3 person

2.2.4Trasnmission

Type ································《变速器型式》

Number of Gear ·······························.空档齿轮

2.2.5 Clutch

Type ································Hydraulic Control, 膜片弹簧, Dry Single Plate

2.2.6 Handle

Type ································Left handle

2.2.7Suspension

Type ················Rigid Axle Suspension、Leaf Spring with double acting shock absorber

Number of Leaf Spring(Front/Rear) ······················8/10+6

2.2.8Front Axle

Type································I shape forged steel, 端拳式

2.2.9 Rear Axle

Type·································整体式冲焊桥壳全浮式半轴, 螺旋伞齿轮和准双曲面齿轮传动

Final Gear Ratio·······························4.1

2.2.10 Chassis Frame

Frame Cross Section··························216×70×6

Joint································Rivet

2.2.11 Break System

Break··································Hydraulic Assist Drum Break

Parking Break·······························Central Drum Break

Emergency Break····················Interlocked with Parking Break

~~Auxiliary Brake·······························Exhaust type~~

2.2.12Electricity

Rated voltage ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・24 v
Battery ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・70AH*2
Fuel tank・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・100 L

2.3 Body

2.3.1 Body Dimension （Length） （Width） （Height）

Effective Dimension・・・・・・・・・・・・・・・・・・・・・・・・・・・2980mm × 2060mm × 1660mm

Effective Volume・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・10.2 m^3

2.3.2 Hopper Dimension

Dimension of Hopper Inlet・・・・・・・・・・・・・・・・・・・・・・・・・・・・・1700mm × 960mm

Minimum Height of Hopper Inlet・・・・・・・・・・・・・・・・・900mm

Hopper Volume・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・0.6 m^3

2.3.3 Capacity

Loading Time・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・1 Cycle around 20 seconds

Discharge Time・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・around 25 seconds

Discharge method・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・Horizontal Push out type

2.3.4 Hopper Volume

Hopper Volume・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・around 140 L

3. Special Feature

This truck is composed of chassis and body. body is composed of body itself, loading device, discharge plate. loading device and discharge plate are powered by hydraulic cylinder equipped in the body and have following features.

3.1 Pressing plate will function strongly with down, compress and up process. Bulk wastes can be loaded with compression function.

3.2 Discharge plate inside body move towards from automatically when wastes are loaded and compacted. Therefore, compaction of wastes loaded is efficient.

3.3 Self Rock Cylinder

Hydraulic Cylinders for Opening and Closing Hopper have special check valve so, in case hydraulic hose is damaged, hopper should not close. It is safety features for workers during operation.

3.4 Emergency stop device, alarm system for hopper open and close, inter rock switch for hopper close, automatic scraping device at hopper,. are equipped and safety operation will be secured during waste collection and washing as well.

4. Structure

4.1Loading Device

Loading will be conducted by press plate which is equipped at hopper with hydraulic devices. Wastes are crushed and compacted by press plate and further compacted inside the body with discharge plate.
Position of discharge plate is adjustable during loading.

4.2Unloading Device

Hopper open and close cylinder will open the hopper portion and discharge plate push out the loaded waste to outside. This operation will be conducted from inside cabin automatically.

4.3Hopper

Hopper is a strong structure made of steel and anti weather high tensile steel plate is used for the place where it is possible to be rust, and anti worn out high tensile steel plate is used for the main frame and the place where it is possible to be wear out..

4.4 Body

It is a strong structure with anti worn out high tensile steel plate is used at main places in order to improve anti rust performance.

4.5Hydraulic Device

Oil pump powered by PTO will push hydraulic oil through control valve to each hydraulic cylinder and enact waste loading, open and close hopper and discharge wastes.

4.5.1Hydraulic Pump

Type･･Gear Pump

Standard Rotation ･････････････････････････････Around 1000 rpm

Pump Capacity ･･････････････････････････････････Around 50 L／min

4.5.2Hydraulic Actuator

Press Cylinder･･･double acting cylinder

Pack Cylinder･･double acting cylinder

Rock Cylinder ･･････････････････････････････････････double acting cylinder

Lift Cylinder（self rock system）･･･････････････････double acting cylinder

Ejection Cylinder ････････････････････････････････Plural stages double acting cylinder

4.5.3 Control Valve ････････････････････････････････････4 connection solenoid valve

4.5.4 Maximum Pressure･･････････････････････Around20.6 MPa（Around 210 kgf/cm^2）

4.5.6 Operation Device

Each cylinder will be controlled by solenoid valve through electric signals

（1）Operation Device inside Cabin

1. PTO is operated by a lever equipped inside cabin.

2. Panel Switch in the Cabin

a. Change Switch（Loading･Unloading）

b. Hopper Switch（Open･Close）

c. Discharge Plate Switch（Front･Back）

d. Discharge Switch

（2）Switch at Hopper

1. Left Rear

a. Alarm Buzzer Button to inform Driver

b. Single/Continuous Operation Button

c. Start Button

d. Down Button(Stop Button）

e. Up Button

f. Press Plate Reverse Button

g. Emergency Stop Button

(d、e、f　is for single operation)

2. Right Rear

a. Emergency Stop Button

3. Hopper blow

a. Emergency Stop Press Plate

4.5.7 Hopper Rock Device and Prevention of Waste Water Leakage Device

Body and Hopper will be automatically rocked through hooks equipped at right and left rear. Seal packing is attached between hopper and body in order not to leak waste water.

5. Safety Device

5.1 Solenoid check valve was equipped with hydraulic cylinder for hopper open and close.

5.2 Protection switch for hopper closure is attached at rear body. Indication ramp is equipped in the cabin.

5.3 Protection bar for hopper closure is equipped at the rear body.

5.4 Emergency stop bars equipped below hopper inlet.

5.5 Emergency stop button is equipped at both side of hopper inlet.

5.6 Alarm buzzer rings during open and closure of hopper.

5.7 Loading operation can not be implemented in case hopper is unrocked.

5.8 During loading operation, in case hopper is opened, loading operation is automatically ceased.

5.9Prevention device for operation mistake

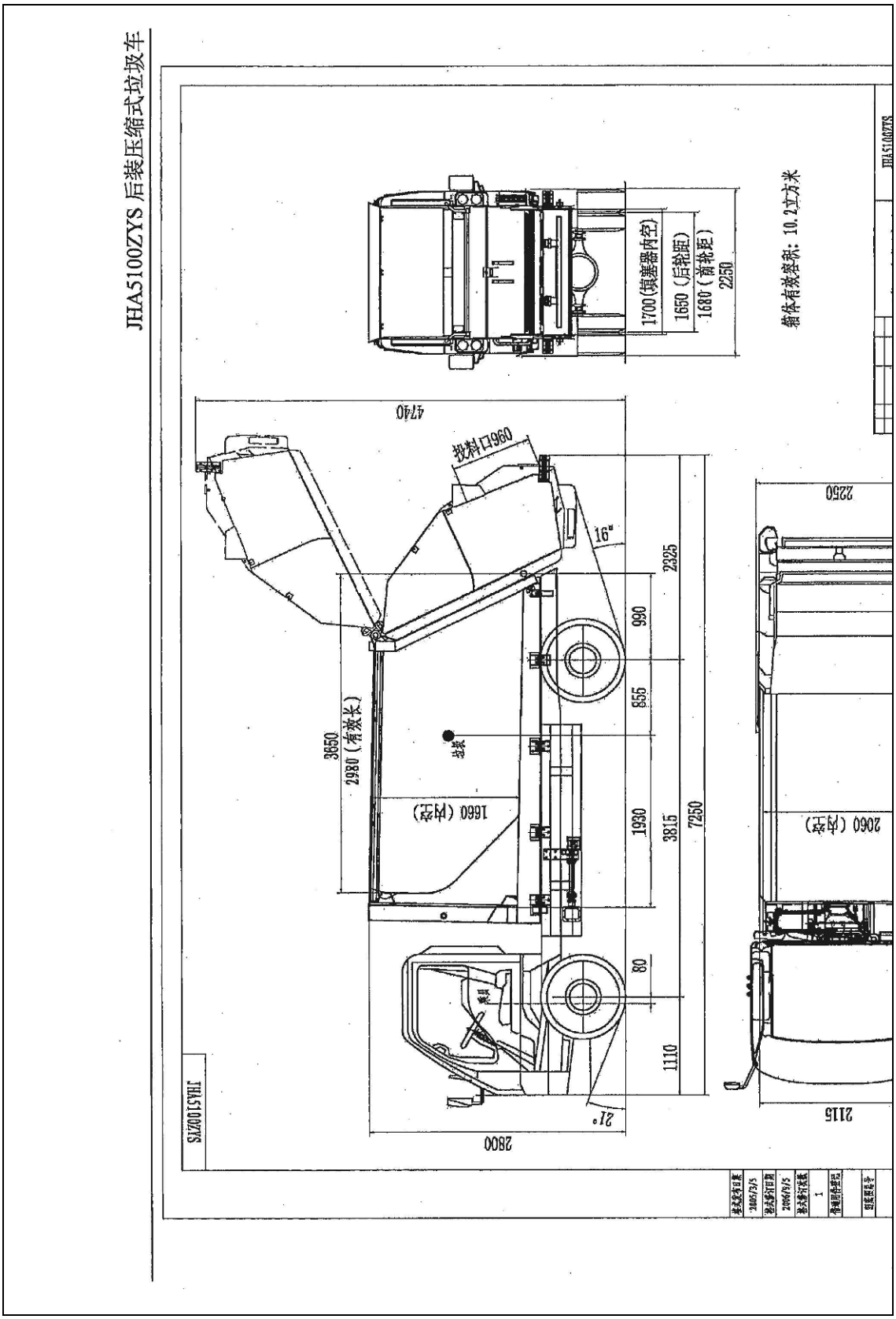
Sweep out restriction

Sweep out operation is automatically cancelled when the hopper's opening angle is 45 degrees or less.

5.10 Hooking confirmation ramp in cabin.

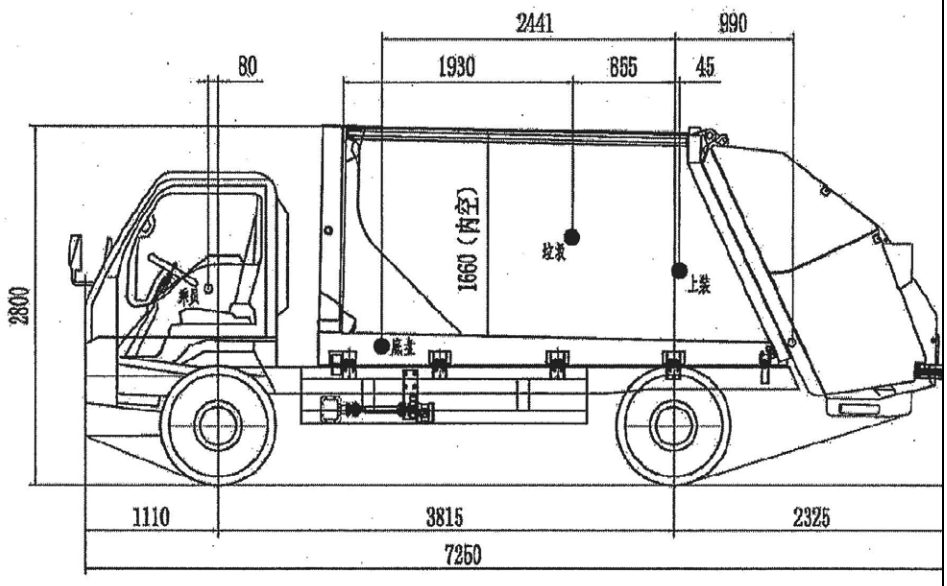
6. Painting Body

After acid cleaning and phosphorylation treatment and surface preparation with under splaying, urethane paint will be applied with customers request color.



JHA5100ZYS 后装压

JHA5100ZYS重量计算				
	合计（kg）	前轮分布（kg）	后轮分布（kg）	重心（距后轮中
底盘	2970	1900	1070	2441
上装	3250	-38	3288	-45
车辆重	6220	1862	4358	1142
垃圾	3585	803	2782	855
乘员	195	199	-4	3895
整车总重	10000	2864	7136	1093
前轴载荷分布比例				
空载	1862/6220*100%=30% ＞ 20%			
满载	2864/10000*100%=28.6% ＞ 20%			



G.3 RPF施設運営費積算

G.3.1 積算の比較

a. KOICAによる積算

KOICA Estimation

	Description	unit	Quantity	Rate MNT	Amount MNT	Remarks	
	Conditions						
	8 hours /day operation x 300 days 38 people are working Incoming Waste: Mix collection waste from apartment Incoming waste amount : 80 ton/day RPF production: 1.6 ton/day Residue 80%						
Operation Cost estimated by KOICA							
A	Variable Cost						
1	Electricity	kwh	767,004	87.87	67,396,641	767004kwh/300day = 2557kwh/day	
2	Fuel	liter	18,180	1,450	26,361,000	Excavator, Folk Lift 18180liter/300day =60liter/day	
3	Water	ton	120	1,105	132,600		
4	Maintenance and Repair cost	%	1	3,219,000,000	32,190,000	1% of Total Budget	
	Sub total				126,080,241		
B	Labour Cost						
1	Labor cost	month	12	5,700,000	68,400,000	38p * 150,000MNT/Mth	
2	Other Expense	%	5	68,400,000	3,420,000		
3	Insurance	%	0.3	3,219,000,000	9,657,000		
	Sub total				81,477,000		
	Total Cost				207,557,241		
Income from selling valuables for one year (300days)							
	Glass	kg	1,814,400	10	18,144,000	6,048	kg/day
	Cardboard	kg	696,000	40	27,840,000	2,320	kg/day
	Paper	kg	4,363,200	30	130,896,000	14,544	kg/day
	Plastic	kg	2,553,600	70	178,752,000	8,512	kg/day
	Iron	kg	306,000	30	9,180,000	1,020	kg/day
	Aluminium	kg	143,700	450	64,665,000	479	kg/day
	Sub Total				429,477,000		
	profit per Year				221,919,759		

b. JETによる積算

JICA Estimation							
Operation Cost estimated by JICA using KOICA Information							
A	Variable Cost						
1	Electricity	kwh	767,004	87.87	67,396,641		
2	Fuel	liter	18,180	1,650	29,997,000	revise unit rate	
3	Water	ton	120	1,105	132,600		
4	Maintenance and Repair cost	%	1	3,219,000,000	32,190,000		
	Sub total				129,716,241		
B	Labour Cost						
1	Labor cost	month	12	5,700,000	68,400,000		
2	Other Expense	%	5	68,400,000	3,420,000		
3	Insurance	%	0.3	3,219,000,000	9,657,000		
	Sub total				81,477,000		
C	Residue Transportation						
	80ton/day x 80% =64ton/day						
	64ton x 300 days = 19,200 ton/year						
	10 ton dump truck	ton	19,200	5,000	96,000,000		
	Total				307,193,241		
Income from selling valuables for one year (300days)						Using PP results	
	PET	kg	64,800	380	24,624,000	0.27	%
	Colored Plastic	kg	115,200	150	17,280,000	0.48	%
	Glass Bottle	kg	525,600	40.6	21,339,360	2.19	%
	Iron	kg	129,600	50	6,480,000	0.54	%
	HQ Paper	kg	208,800	80	16,704,000	0.87	%
	Cardboard	kg	1,087,200	17	18,482,400	4.53	%
	Bone	kg	252,000	20	5,040,000	1.05	%
	HDPE (plastic bag)	kg	24,000	200	4,800,000	0.10	%
	Metal	kg	26,400	630	16,632,000	0.11	%
	Sub Total				131,381,760		
	Annual Operation Cost				175,811,481		

SECTION H Project Design Matrix

H Project Design Matrix

H.1 PDM$_4$

プロジェクトデザインマトリックス$_4$ **(PDM$_4$)**
プロジェクト名: モンゴル国ウランバートル市廃棄物管理能力強化プロジェクト
実施機関: ウランバートル市環境汚染・廃棄物管理部（EPWMD）　　協力機関:都市保全公共施設庁（CMPUA）、廃棄物サービス基金（WSF）、区役所
実施期間: 2009年10月から2012年10月まで (3年間)
対象者: EPWMD,CMPUA,WSF,区役所の職員
対象地: ウランバートル市
太字:変更もしくは指標を設定、下線:ペンディング　　Date: May, 2011

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
上位目標 不適切な廃棄物処理によって悪影響を受けている「ウ」市の都市環境と公衆衛生が改善される。	1. 50% の「ウ」市民が、都市環境と衛生環境を、平均以上だと回答する。 2. 10 カ所の既存不法投棄場のうち 6 カ所の大規模不法投棄場をなくする。		
プロジェクト目標 人材育成を通じて、「ウ」市の廃棄物管理能力が強化される。	1. 60% の「ウ」市民が、廃棄物管理に対する満足度を平均以上だと回答する。 2. ゲル地区において、ごみ収集サービスを受けている世帯が 90%以上になる。 3. ｱﾊﾟｰﾄ地区におけるごみ収集率が人口増にも拘らず 100%を維持する。 4. ゲル地区におけるごみ料金の徴収率が 30%に向上する。	1. 進捗報告書 2. JCC ミーティング議事録 3. EPWMD,CMPUA,WSF,区役所からの報告書 4. 「ウ」市における社会満足度調査の報告書 5. 各ホローへのアンケート調査 6. 各 WSF へのアンケート調査 7. ゲル地区住民へのアンケート調査	1. 廃棄物管理に係る政策案、規程案、ガイドライン案が「ウ」市に公式に承認、改定の上承認されること。 2. 廃棄物管理に必要な予算が継続的に配賦されること。 3. 民間のリサイクル市場が継続的に存在すること。
成果 1 廃棄物管理事業の計画・政策立案に係るウランバートル市環境汚染・廃棄物管理部（EPWMD）の人材が育成される。	1. EPWMD によって廃棄物管理事業に関する政策案、規則案、ガイドライン案が作成される。 2. EPWMD によってマスタープランの更新案が作成される。 3. EPWMD の組織強化アクションプランが作成される。	1. キャパシティ・アセスメントシート 2. テキスト・マニュアル等 3. 研修記録、参加者リスト 4. 廃棄物管理事業に関する政策案、規則案、ガイドライン案 5. マスタープランの更新案 6. アクションプラン 7. 進捗報告書	1. 「ウ」市の廃棄物管理計画における基本政策、制度、責任機関が変更されないこと。 2. プロジェクト期間中、実施機関及び協力機関のカウンターパート人材が継続的に配置されること。
Output 2 ごみ収集車と重機の維持管理に係る都市整備公共施設庁（CMPUA）とEPWMDの人材が育成される。	1. 廃棄物管理に係わる「ウ」市の機材（収集車両と重機）の運用報告書が CMPUA より EPWMD に年 4 回提出される。 2. 廃棄物管理に係わる「ウ」市の機材の維持管理報告書が CMPUA より EPWMD に	1. キャパシティ・アセスメントシート 2. テキスト・マニュアル等 3. 研修記録、参加者リスト 4. 機材の運用報告書 5. 機材の維持管理報告書	

	年 4 回提出される。 3. CMPUA と各区が、ごみ収集運搬計画を作成し、EPWMD に年 1 回提出する。	6. ごみ収集運搬計画報告書 7. TUK へのセミナー記録 8. 進捗報告書	
Output 3 ナランギンエンゲル処分場の適切な運営に係る都市整備公共施設庁（CMPUA）の人材が育成される。	1. モニタリング委員会により、衛生埋立を実施していると評価される。 2. CMPUA によって埋立地搬入ごみのごみ質調査結果がまとめられる。 3. CMPUA によってガス発生状況調査を含む処分場環境モニタリングが定期的になされるようになる	1. キャパシティ・アセスメントシート 2. テキスト、埋立作業マニュアル等 3. モニタリング委員会の評価 4. 実習指導記録、参加者リスト 5. ごみ質調査報告書 6. ガス発生状況調査報告書 7. 処分場環境モニタリング報告書 8. 進捗報告書	
Output 4 ~~廃棄物管理の財務管理に係るEPWMDと廃棄物管理基金（WSF）の人材が育成される。~~ 廃棄物処理事業の管理に係わるEPWMDとWSFの人材が育成される。	1. 財務管理制度が全 WSF で共通化される。 2. EPWMD が各 WSF の財政状況を定期的にモニタリングするようになる。 3. EPWMDが廃棄物処理事業の管理にかかわる理解を深める。 4. 適正な収集料金に基づく各発生源別のごみ料金規定を設計できるようになる。 5. 収集業者選定に必要な標準入札手続き、標準入札図書が作成される。 6. 選定した収集業者の契約管理方式が明確になる。	1. キャパシティ・アセスメントシート 2. テキスト・財務管理マニュアル 3. 研修記録・参加者リスト 4. WSFの財務分析報告書 5. 提言書 6. 進捗報告書 7. ごみ収集料金計算ガイドライン 8. 収集業者選定の標準入札手続き 9. 策定された標準入札図書 10. 収集業者契約管理ガイドライン	
Output 5 市民啓発活動に係るEPWMDと区役所の人材が育成される。	1. ごみ分別とリサイクルに関する市民啓発ツールが整備される。 2. パイロットプロジェクトの実施を通して市民啓発手法を学び、その後 C/P によって自主的にキャンペーンを実施する。 **3.** PP サイトにおいて、住民のごみの分別排出マナーに対する意識が向上する。	1. キャパシティ・アセスメントシート 2. テキスト、市民啓発キャンペーンマニュアル等 3. 研修記録、参加者リスト 4. 住民啓発キャンペーンに係わるパイロットプロジェクトのモニタリング報告書 5. 提言書 6. 進捗報告書 **7.** パイロットプロジェクト対象地の住民に対するアンケート調査	
Output 6 「ウ」市に適したごみ分別リサイクル計画が提言される。	1. 手分別のパイロット施設が整備・運営され、必要な追加経費、効率、衛生状態などについてEPWMD/CMPUA が認識する。 2. 有価物を回収する労務者（前の WP）がマニュアルとガイドラインに従い手選別場	1. セミナー記録、参加者リスト 2. 処分場のごみ分別リサイクル計画に係わるパイロットプロジェクトのモニタリング報告書 3. 提言書	

	での就労に協力する。 3. ごみ分別リサイクル計画に関する提言書が公式に「ウ」市に提出される。	4. 進捗報告書	

成果１に係る活動 1-1)JICA専門家チーム(JET)がEPWMD職員の能力についてベースライン調査を行なう。 1-2) JETが研修計画（セミナー、ワークショップ、サイト視察等）及び教材（テキスト・マニュアル等）を作成する。 1-3) JETがEPWMDに対して廃棄物管理政策・計画に関する研修を実施する。 1-4) 廃棄物管理事業の政策、計画、規則、ガイドライン策定についてJETがEPWMDに助言を行なう。 1-5) 都市廃棄物に含まれる有害廃棄物とe-waste の管理に係るセミナーをJETとEPWMDが実施する。 1-6) JETの支援のもと、マスタープランの見直しのため、ごみ量調査を行う。 1-7) JETの支援の下、EPWMDがマスタープランの見直しと更新（アップデート）を行なう。 1-8) JETの助言の下、EPWMDが組織強化アクションプランを策定する。 **成果２に係る活動** 2-1) JETがCMPUAの機材維持管理能力についてベースライン調査を行なう。 2-2) JET が研修計画と教材（テキスト、マニュアル等）を作成する。 2-3) JETがCMPUAとEPWMDに対して機材維持管理に関する研修を実施する。 2-4) JETがCMPUAの整備工場スタッフに対して実習指導を行なう。 2-5) JETがCMPUAの整備工場の運営管理計画に関する提言を行なう。 2-6) JETと協力しCMPUAとEPWMDがウランバートル市のごみ収集運搬計画について見直しと提言を行なう。 2-7) JETの助言の下、CMPUAとEPWMDがTUKsに対してごみ収集車両の維持管理に関するセミナーを行なう。 **成果３に係る活動** 3-1) JETがCMPUAの埋立管理能力についてベースライン評価を行なう。 3-2) JETが研修計画と教材（埋立運営マニュアル含む）を作成する。 3-3) JETがCMPUAに対して埋立管理に関する研修を実施する。 3-4) JETがCMPUAの技術スタッフに対して埋立管理に関する実習指導を行なう。 3-5) JETとEPWMDの協力の下、CMPUAが処分場で受け入れるごみ量・ごみ質の調査を行なう。 3-6) JETとEPWMDの協力の下、CMPUAが処分場での埋立地ガス排出モニタリング調査を行なう。	**投入** **＜日本側＞** 1. 短期専門家 (1) 総括 / 廃棄物管理 (2) 収集運搬・機材整備 (3) 衛生埋立 (4) 財務管理 (5) 市民啓発 (6) 分別とリサイクル (7) 業務調整（必要に応じて） 2. ごみ手分別パイロット施設 3. 携帯ガス計測器 4. 本邦研修の実施 5. プロジェクト運営経費 6. 通訳	**投入** **＜モンゴル側＞** 1. カウンターパートの配置 2. 執務室及びパイロット施設建設のための土地の確保（基礎インフラ含む） 3. JET 用のオフィスとミーティングルーム 4. 電気、ガス、水、電話、インターネット回線や家具などの設備 5. モンゴル側がプロジェクト活動を実施するに当たって利用可能な必要経費	1. EPWMD、CMPUA、WFS がプロジェクト実施に必要な人員を割り当てる。

3-7) JETとEPWMDの協力の下、CMPUAが処分場の環境モニタリングレポートを作成する。			
成果４に係る活動 4-1) JETがEPMWDの廃棄物処理事業の管理能力のベースライン評価を行なう。 4-2) JETが研修計画と教材を作成する。 4-3) JETがWSFに対して財務管理に関する研修を実施する。 4-2) JET、EPWMD、WSFが各WSFの財務分析を行なう。 4-5) JETとEPWMDが収益計画を含めた財務管理システムへの提言をまとめる。 4-6) JETと協力しEPWMDとWSFが財務管理システムへの提言を実行する。 4-7）JETがEPWMDとCMPUAの意思決定者に対して、包括的なSWMに関するコンサルテーションを行う 4-8) JETとEPWMDが協力し、ごみ収集料金計算ガイドライン策定を支援する。 4-9) JETとEPWMDが協力し、収集業者選定のための入札手順策定を支援する。 4-10) JETとEPWMDが協力し、収集業者選定のための標準入札図書作成を支援する。 4-11) JETとEPWMDが協力し、収集業者の契約管理ガイドライン策定を支援する。 4-12)JETとEPWMDが協力し、Weighbridgeのデータベース管理マニュアル作成を支援する。			
成果５に係る活動 5-1) JETがEPWMDと区役所の市民啓発活動能力についてベースライン評価を行なう。 5-2) JETが研修計画と教材を作成する。 5-3) JETが区役所に対する市民啓発に関する研修を実施する。 5-4) JETの支援の下、EPWMDと区役所が市民啓発活動に関するパイロットプロジェクトと社会満足度調査を計画する。 5-5) EPWMD、区役所、JETがパイロットプロジェクトを実施し、モニタリングを行なう。 5-6) EPWMD、区役所、JETが市民啓発活動に関する提言をまとめる。			
成果６に係る活動 6-1) JETがEPWMDとCMPUAに対して３Rについてのセミナー、ワークショップを実施する。 6-2) JET、EPWMD、CMPUAにより、ごみ分別リサイクルについてのパイロットプロジェクトが計画され、ナランギンエンゲル処分場の構内に手分別パイロット施設が建設される。			**Pre-conditions** 1. EPWMD が廃棄物管理の関連組織の調整機関として機能する。 2. WSF がプロジェクトに財務情報を公開するこ

6-3) ウエイストピッカーの参加を得て、EPWMD、CMPUA、JETがごみ分別に係るパイロットプロジェクトを実施する。 6-4) JET、EPWMD、CMPUAがパイロットプロジェクトのモニタリングと評価を行なう。 6-5) パイロットプロジェクトの結果に基づき、JET,EPWMD、CMPUAが適切なごみ分別リサイクル計画についての提言をまとめる。			とに協力的である。 3. ウエイストピッカーがパイロットプロジェクトに対して協力的である。

注:

(1) PDM 表内において「X%」と記載されている部分は、定量的な指標としてのある具体的な数値を意味する。これらの数値は、プロジェクト開始時期にモンゴル側と JET の間での協議に基づいて決定される。

(2) “Objective Verifiable Indicators” と “Means of Verification” の項目に記載されている内容は、プロジェクトの開始に先立って定められているので、暫定的なものである。これらは、プロジェクトの実施過程において JET とモンゴル側の協議に基づいて具体化または追加され、JCC ミーティングで承認されるものである。

SECTION I

キャパシティ・アセスメント

I　キャパシティ・アセスメント

I.1　EPWMD

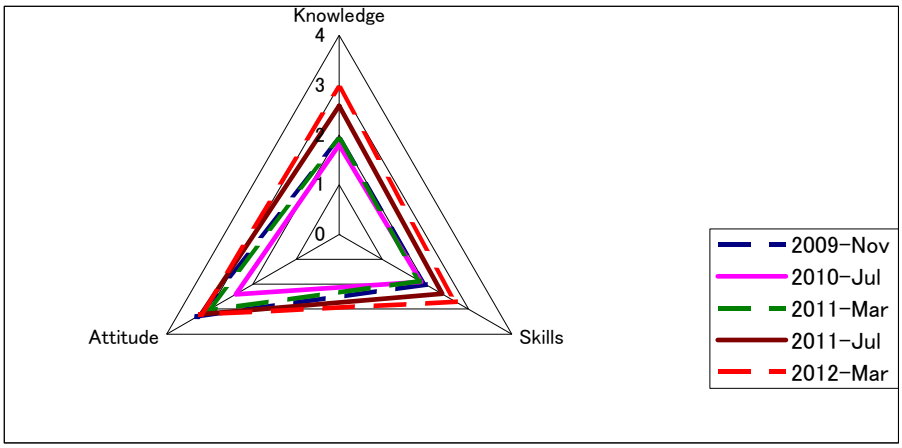
I.1.1　個人評価

a.　一覧

Items		Assessment for Individual EPWMD							
		Ariguun	Odjargal	Batbileg	Ganbaatar	Mungunzul	Enkh-Amgalan	Nurmaa	Average
Nov-09	Knowledge	1.1	2.3	2.1	2.9	1.5	1.2		1.9
	Skills	1.6	1.8	2.1	1.9	1.7	2.3		2
	Attitude	2.7	3.0	3.0	3.9	2.9	3.1		3.3
	Average	1.8	2.4	2.4	2.9	2.0	2.2		2.4
Jul-10	Knowledge	1.5	2.2	2.3	2.2	2.2	1		1.8
	Skills	2.3	2.3	2.2	2.1	2.2	1.3		1.9
	Attitude	2.9	2.1	3.0	2.3	3.0	2		2.4
	Average	2.2	2.2	2.5	2.2	2.5	1.4		2.0
Mar-11	Knowledge	2.1	2.3	2.4		2.4	1.5	0.7	1.9
	Skills	2.4	2.4	2.3		2.3	1.8	0	1.9
	Attitude	3.0	3.0	3.0		3.0	3.1	3.3	3.1
	Average	2.5	2.6	2.6		2.6	2.1	1.3	2.3
Jul-11	Knowledge	2.7	2.9	2.9		2.9	2.3	1.8	2.6
	Skills	2.8	2.7	2.8		2.7	2.4	0.9	2.4
	Attitude	3.4	3.0	3.3		3.0	3.1	3.4	3.2
	Average	3.0	2.9	3.0		2.9	2.6	2.0	2.7
Mar-12	Knowledge	3.2	3.2	3.1		3.0	2.7	2.4	2.9
	Skills	3.4	2.9	2.9		2.8	2.7	1.5	2.7
	Attitude	3.4	3.1	3.3		3.0	3.1	3.4	3.2
	Average	3.3	3.1	3.1		2.9	2.8	2.4	3.0
	Attendance Rate								

Individual Average

Items	2009-Nov	2010-Jul	2011-Mar	2011-Jul	2012-Mar
Knowledge	1.9	1.8	1.9	2.6	2.9
Skills	2	1.9	1.9	2.4	2.7
Attitude	3.3	2.4	3.1	3.2	3.2
Average	2.4	2.0	2.3	2.7	3.0



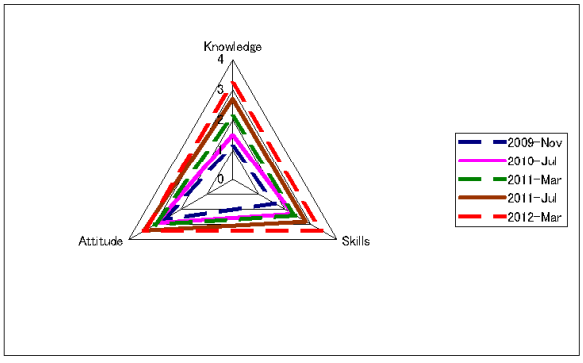
b. アリグン

Organization: EPWMD
Evaluation: Excellent: 4, Good: 3, Fair: 2, Poor: 1 None: 0
A

Code	Items	2009-Nov	2010-Jul	2011-Mar	2011-Jul	2012-Mar
A	Knowledge					
A.1	Basic Subjects					
A.1.1	I know problems caused by waste.	3	3	3	3	4
A.1.2	I know the objectives by SWM	3	3	3	3	4
A.1.3	I know the basic components of SWM technical system.	3	3	3	3	4
A.1.4	I know the survey method of waste generation amount.	3	2	2	3	4
A.1.5	I know the method of determine the various waste amounts	2	2	2	3	4
A.1.6	I know the method of physical waste composition survey	2	2	2	3	4
A.1.7	I know the various survey methods of waste properties.	2	2	2	3	4
A.1.8	I know the properties of each waste composition.	2	1	2	3	4
A.1.9	I know the waste properties by source	2	1	2	3	4
A.1.10	I know how to understand the waste stream.	3	3	3	3	4
	Average for A.1	2.5	2.2	2.4	3.0	4.0
A.2	Discharge, Storage, Collection, Transportation					
A.2.1	I know various waste discharge and storage system.	1	2	2	3	4
A.2.2	I know various waste collection methods.	2	2	2	3	4
A.2.3	I know various waste transportation methods	2	2	2	3	4
A.2.4	I know various equipment of waste transportation	2	2	2	3	4
	Average for A.2	1.8	2.0	2.0	3.0	4.0
A.3	Waste Processing and Treatment					
A.3.1	I know the mechanism of composting	0	0	2	2	3
A.3.2	I know disadvantage of composting	0	0	1	2	3
A.3.4	I know the incineration technology	1	1	2	2	2
A.3.5	I know the RDF technology	0	1	2	2	3
A.3.6	I know the waste separation technology	2	2	2	3	3
	Average for A.3	0.5	0.8	1.8	2.2	2.8
A.4	Waste Separation and Recycling					
A.4.1	I know the advantages of waste separation at generation source.	2	2	2	3	4
A.4.2	I know the disadvantages of waste separation at generation source	2	2	2	3	4
A.4.3	I know the advantages of Recycling	2	2	2	2	3
A.4.4	I know the disadvantages of Recycling	2	2	2	2	3
	Average for A.4	2	2	2	2.5	3.5
A.5	Final Disposal					
A.5.1	I know the problems caused by waste disposal	1	2	2	3	3
A.5.2	I know the required facility of waste disposal in accordance with waste type	0	1	2	3	3
A.5.3	I know the leachate control system	1	0	2	3	3
A.5.4	I know various gas vent system.	1	0	2	2	2
A.5.5	I know the necessity of security facilities.	1	2	2	3	3
A.5.6	I know the landfill method.	2	2	2	3	3
	Average for A.5	0.9	1.2	2	2.8	2.8
A.6	Healthcare Waste					
A6.1	I know the type of healthcare wastes and their risk.	0	2	2	2	2
A6.2	I know how to handle healthcare waste.	0	2	2	2	2
	Average for A.6	0	2	2	2	2
A.7	Law, Regulation, Guideline					
A.7.1	Law on Household and Industrial Wastes	2	3	3	4	4
A.7.2	Ordinance of Minister for Health of Mongolia: Regulation on collection, transportation and disposal of hospital generated waste	1	2	2	2	2
A.7.3	Joint Ordinance of Minister for Environment and Minister for Health: Approval of list and regulation /Methodological instructions to collect, store, transport and dispose poisonous chemical waste in environment sound manner)	1	1	1	1	2
A.7.4	Ordinance of Minister for Environment :Approval of Regulation /Regulation on waste disposal operations, special waste disposal facilities, requirements for such facilities, and activities of individuals, companies and organizations that conduct activities related to the waste disposal and removal/	1	1	1	1	2
A.7.5	Decree of Presidium of City Council :Approval of Regulation on Establishment of buffer zone for waste disposal sites and their operations	1	2	2	2	3
A.7.6	Decree of Presidium of City Council: Approval of Regulation on Waste Fund	3	2	2	2	2
A.7.7	Decree of Presidium of City Council: Regulation to involve organizations, companies and individuals in the activities related to cleaning, maintenance and protection of streets and squares of Ulaanbaatar city on contract basis	2	3	3	4	4
A.7.8	Decree of Presidium of City Council: Approval of renewing of service fee /Service fee to collect and transport waste of organizations, companies and households of Ulaanbaatar	4	2	4	4	4
A.7.9	Decree of Presidium of City Council: Approval of renewing of service expenses /Tariff for hunting street dogs and cats, waste transportation tariff/	4	3	4	4	4
A.7.10	Decree of Presidium of City Council: Approval of Regulation /Regulation for organizations, companies and individuals to conduct city renovation and cleaning	4	3	4	4	4
	Average for A.7	2.3	2.2	2.6	2.8	3.1
A.8	Social Environmental Consideration					
A.8.1	I know NIMBY Syndrome	0	1	1	3	3
A.8.2	I know the environment aspects to be considered.	2	1	1	2	3
A.8.3	I know the social aspects to be considered.	2	1	1	2	3
	Average for A.8	1.5	1.0	1.0	2.3	3.0

A.9	**Contract Management**					
A.9.1	I know advantages and disadvantages of various types of Contracts.	1	2	2	3	4
A.9.2	I know how to estimate costs.	1	2	2	3	3
A.9.3	I know how to monitor progress	1	2	2	3	3
A.9.4	I know how to manage contract.	1	2	2	3	3
	Average for A.9	1	2	2	3	3.3
A.10	**Basic principals and measures**					
A.10.1	I know Polluter Pay Principles.	1	2	2	3	4
A.10.2	I know Extensive Producers Responsibility	0	2	2	3	4
A.10.3	I know the administrative measures for the environmental management.	0	1	1	3	3
	Average for A.10	0.3	1.7	1.7	3	3.7
A.11	**Site Investigations (Geological Survey, Topographical Survey, Social Survey)**					
A.11.1	I know how to conduct geological survey	0	0	3	3	3
A.11.2	I know how to conduct topographic survey	0	0	1	2	3
A.11.3	I know how to conduct social survey	2	0	3	3	4
	Average for A.11	0.7	0	2.3	2.7	3.3
A.12	**Environmental Protection Measures**					
A.12.1	I know the meaning of pollution source and pollution load	0	1	3	3	3
A.12.2	I know how to consider the environmental protection; Environmental permissible amount, Life cycle assessment, Risk management	0	0	3	3	3
	Average for A.12	0	0.5	3	3	3
	Average for A	**1.1**	**1.5**	**2.1**	**2.7**	3.2
B	**Skills**					
B.1	I can do the waste discharge rate survey	2	1	3	4	4
B.2	I can do the waste physical composition survey.	2	2	2	4	4
B.3	I can survey and draw the waste stream	3	3	3	3	3
B.4	I can project the waste amount	2	3	3	3	3
B.5	I can project the waste composition	2	2	2	3	3
B.6	I can calculate the required number of waste collection trucks	3	3	3	3	4
B.7	I can calculate the waste disposal amount	3	3	3	3	4
B.8	I can calculate the required volume of waste disposal	3	3	3	3	4
B.9	I can plan the waste treatment and disposal system	1	3	3	3	3
B.10	I can select the optimum waste treatment and disposal system	1	2	2	2	3
B.11	I can estimate or understand the cost of SWM facilities.	1	2	2	3	3
B.12	I can estimate or understand the cost of equipment	1	2	2	3	3
B.13	I can estimate or understand the cost of waste collection	2	3	3	3	4
B.14	I can estimate or understand the cost of landfilling Operation	2	2	2	3	3
B.15	I can estimate or understand the cost of maintenance of equipment	1	2	2	3	4
B.16	I can formulate the operation and maintenance plan of equipment	0	2	2	2	3
B.17	I can understand EIA report	0	2	2	2	3
B.18	I can prepare financial report.	0	1	2	2	3
B.19	I can draft regulation and/or guideline on SWM	2	2	2	2	3
	Average for B	**1.6**	**2.3**	**2.4**	**2.8**	3.4
C	**Attitude**					
C.1	I can actively think over the SWM conditions and problems and behave toward the solution	3	3	3	3	3
C.2	I can actively contribute the improvement of public health and the environmental preservation.	2	2	3	4	4
C.3	I can involve colleague and staff for taking action	2	3	3	3	3
C.4	I can prepare the realistic proposal taking fully the present conditions into account.	3	3	3	3	3
C.5	I can flexibly deal with the problems based on the characteristics of the problems and resources own.	3	3	3	4	4
C.6	I can listen people's voices and explain them their social duties.	3	3	3	3	3
C.7	I can explain to the people about SWM plan.	3	3	3	4	4
	Average for B	**2.7**	**2.9**	**3**	**3.4**	3.4
	Overall Average Score	**1.8**	**2.2**	**2.5**	**3**	3.3

	Summary	2009-Nov	2010-Jul	2011-Mar	2011-Jul	2012-Mar
A	Knowledge	1.1	1.5	2.1	2.7	3.2
B	Skills	1.6	2.3	2.4	2.8	3.4
C	Attitude	2.7	2.9	3	3.4	3.4



c. オッドジャルガル

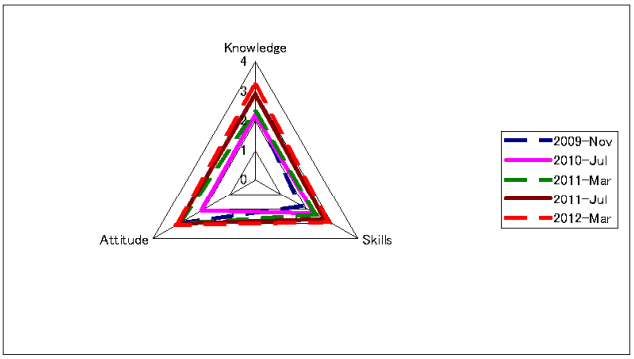
Capacity Assessment Evaluation Result for Individual

Organization: EPWMD
Evaluation: Excellent: 4, Good: 3, Fair: 2, Poor: 1 None: 0
B

Code	Items	2009-Nov	2010-Jul	2011-Mar	2011-Jul	2012-Mar
A	Knowledge					
A.1	**Basic Subjects**					
A.1.1	I know problems caused by waste.	4	3	3	4	4
A.1.2	I know the objectives by SWM	3	3	3	4	4
A.1.3	I know the basic components of SWM technical system.	2	3	3	4	4
A.1.4	I know the survey method of waste generation amount.	3	2	3	4	4
A.1.5	I know the method of determine the various waste amounts	3	2	3	3	3
A.1.6	I know the method of physical waste composition survey	2	2	2	3	3
A.1.7	I know the various survey methods of waste properties.	3	2	2	3	3
A.1.8	I know the properties of each waste composition.	3	2	2	3	3
A.1.9	I know the waste properties by source	3	3	3	3	3
A.1.10	I know how to understand the waste stream.	1	2	2	3	3
	Average for A.1	2.7	2.4	2.6	3.4	3.4
A.2	**Discharge, Storage, Collection, Transportation**					
A.2.1	I know various waste discharge and storage system.	1	2	2	3	4
A.2.2	I know various waste collection methods.	3	2	2	3	4
A.2.3	I know various waste transportation methods	1	2	2	3	3
A.2.4	I know various equipment of waste transportation	3	2	2	3	3
	Average for A.2	2.0	2.0	2.0	3.0	3.5
A.3	**Waste Processing and Treatment**					
A.3.1	I know the mechanism of composting	1	2	2	3	3
A.3.2	I know disadvantage of composting	1	2	2	3	3
A.3.4	I know the incineration technology	1	3	3	3	3
A.3.5	I know the RDF technology	1	2	2	3	4
A.3.6	I know the waste separation technology	2	3	3	4	4
	Average for A.3	1.2	2.4	2.4	3.2	3.4
A.4	**Waste Separation and Recycling**					
A.4.1	I know the advantages of waste separation at generation source.	3	3	3	4	4
A.4.2	I know the disadvantages of waste separation at generation source	1	2	2	4	4
A.4.3	I know the advantages of Recycling	3	3	3	3	3
A.4.4	I know the disadvantages of Recycling	1	2	2	2	3
	Average for A.4	2.0	2.5	2.5	3.3	3.5
A.5	**Final Disposal**					
A.5.1	I know the problems caused by waste disposal	2	3	3	3	4
A.5.2	I know the required facility of waste disposal in accordance with waste type	3	2	2	3	4
A.5.3	I know the leachate control system	2	2	2	3	3
A.5.4	I know various gas vent system.	3	2	2	3	3
A.5.5	I know the necessity of security facilities.	4	2	2	3	3
A.5.6	I know the landfill method.	1	3	3	3	3
	Average for A.5	2.6	2.3	2.3	3.0	3.3
A.6	**Healthcare Waste**					
A6.1	I know the type of healthcare wastes and their risk.	3	2	2	3	3
A6.2	I know how to handle healthcare waste.	3	2	2	3	4
	Average for A.6	3.0	2.0	2.0	3.0	3.5
A.7	**Law, Regulation, Guideline**					
A.7.1	Law on Household and Industrial Wastes	4	3	4	4	4
A.7.2	Ordinance of Minister for Health of Mongolia: Regulation on collection, transportation and disposal of hospital generated waste	4	2	2	3	3
A.7.3	Joint Ordinance of Minister for Environment and Minister for Health: Approval of list and regulation /Methodological instructions to collect, store, transport and dispose poisonous chemical waste in environment sound manner/	4	2	2	3	3
A.7.4	Ordinance of Minister for Environment :Approval of Regulation /Regulation on waste disposal operations, special waste disposal facilities, requirements for such facilities, and activities of individuals, companies and organizations that conduct activities related to the waste disposal and removal/	4	2	4	4	4
A.7.5	Decree of Presidium of City Council :Approval of Regulation on Establishment of buffer zone for waste disposal sites and their operations	4	2	4	4	4
A.7.6	Decree of Presidium of City Council: Approval of Regulation on Waste Fund	4	2	2	3	3
A.7.7	Decree of Presidium of City Council: Regulation to involve organizations, companies and individuals in the activities related to cleaning, maintenance and protection of streets and squares of Ulaanbaatar city on contract basis	4	2	4	4	4
A.7.8	Decree of Presidium of City Council: Approval of renewing of service fee /Service fee to collect and transport waste of organizations, companies and households of Ulaanbaatar	4	2	4	4	4
A.7.9	Decree of Presidium of City Council: Approval of renewing of service expenses /Tariff for hunting street dogs and cats, waste transportation tariff/	4	3	4	4	4
A.7.10	Decree of Presidium of City Council: Approval of Regulation /Regulation for organizations companies and individuals to conduct city renovation and cleaning activities/	4	3	4	4	4
	Average for A.7	4.0	2.3	3.4	3.7	3.7
A.8	**Social Environmental Consideration**					
A.8.1	I know NIMBY Syndrome	0	2	2	3	4
A.8.2	I know the environment aspects to be considered.	2	2	2	2	2
A.8.3	I know the social aspects to be considered.	2	2	2	2	2
	Average for A.8	1.8	2.0	2.0	2.3	2.7

A.9	**Contract Management**					
A.9.1	I know advantages and disadvantages of various types of Contracts.	1	2	2	3	3
A.9.2	I know how to estimate costs.	3	2	2	3	3
A.9.3	I know how to monitor progress	3	2	2	3	3
	Average for A.9	2.5	2.0	2.0	3.0	3.0
A.10	**Basic principals and measures**					
A.10.1	I know Polluter Pay Principles.	2	2	2	3	3
A.10.2	I know Extensive Producers Responsibility	2	2	2	3	3
A.10.3	I know the administrative measures for the environmental management.	1	2	2	2	3
	Average for A.10	1.7	2.0	2.0	2.7	3.0
A.11	**Site Investigations (Geological Survey, Topographical Survey, Social Survey)**					
A.11.1	I know how to conduct geological survey	3	2	2	2	3
A.11.2	I know how to conduct topographic survey	2	2	2	2	3
A.11.3	I know how to conduct social survey	3	2	2	3	3
	Average for A.11	2.7	2.0	2.0	2.3	3.0
A.12	**Environmental Protection Measures**					
A.12.1	I know the meaning of pollution source and pollution load	1	2	2	3	3
A.12.2	I know how to consider the environmental protection; Environmental permissible amount, Life cycle assessment, Risk management	1	2	2	2	2
	Average for A.12	1.0	2.0	2.0	2.5	2.5
	Average for A	**2.3**	**2.2**	**2.3**	**2.9**	**3.2**
B	**Skills**					
B.1	I can do the waste discharge rate survey	2	2	3	3	3
B.2	I can do the waste physical composition survey.	2	3	3	3	3
B.3	I can survey and draw the waste stream	1	3	3	3	3
B.4	I can project the waste amount	1	2	3	3	3
B.5	I can project the waste composition	1	2	2	3	3
B.6	I can calculate the required number of waste collection trucks	3	2	2	3	4
B.7	I can calculate the waste disposal amount	3	3	3	3	3
B.8	I can calculate the required volume of waste disposal	2	2	2	3	3
B.9	I can plan the waste treatment and disposal system	2	2	2	2	2
B.10	I can select the optimum waste treatment and disposal system	1	2	2	2	3
B.11	I can estimate or understand the cost of SWM facilities.	1	2	3	3	3
B.12	I can estimate or understand the cost of equipment	3	2	2	2	2
B.13	I can estimate or understand the cost of waste collection	3	2	2	2	4
B.14	I can estimate or understand the cost of landfilling Operation	3	3	3	3	3
B.15	I can estimate or understand the cost of maintenance of equipment	1	2	2	2	2
B.16	I can formulate the operation and maintenance plan of equipment	1	2	2	2	2
B.17	I can understand EIA report	1	2	2	4	4
B.18	I can prepare financial report.	1	2	2	3	3
B.19	I can draft regulation and/or guideline on SWM	2	3	3	3	3
	Average for B	**1.8**	**2.3**	**2.4**	**2.7**	**2.9**
C	**Attitude**					
C.1	I can actively think over the SWM conditions and problems and behave toward the	3	2	3	3	3
C.2	I can actively contribute the improvement of public health and the environmental preservation.	3	2	3	3	3
C.3	I can involve colleague and staff for taking action	3	2	3	3	3
C.4	I can prepare the realistic proposal taking fully the present conditions into account.	3	2	3	3	3
C.5	I can flexibly deal with the problems based on the characteristics of the problems and resources own.	3	2	3	3	3
C.6	I can listen people's voices and explain them their social duties.	3	2	3	3	3
C.7	I can explain to the people about SWM plan.	3	3	3	3	4
	Average for B	**3.0**	**2.1**	**3.0**	**3.0**	**3.1**
	Overall Average Score	**2.4**	**2.2**	**2.6**	**2.9**	**3.1**

	Summary	2009-Nov	2010-Jul	2011-Mar	2011-Jul	2012-Mar
A	Knowledge	2.3	2.2	2.3	2.9	3.2
B	Skills	1.8	2.3	2.4	2.7	2.9
C	Attitude	3	2.1	3	3	3.1



d. バットビレグ

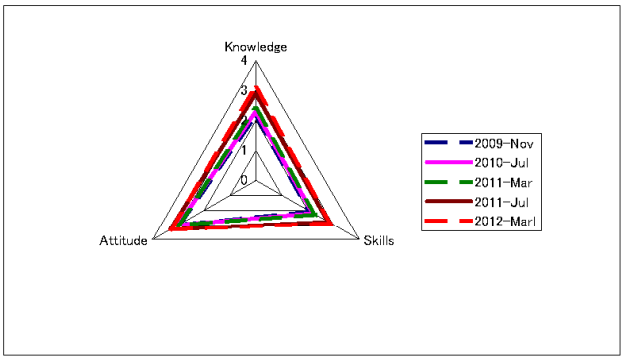
Capacity Assessment Evaluation Result for Individual

Organization: EPWMD
Evaluation: Excellent: 4, Good: 3, Fair: 2, Poor: 1 None: 0
C

Code	Items	2009-Nov	2010-Jul	2011-Mar	2011-Jul	2012-Mar
A	Knowledge					
A.1	**Basic Subjects**					
A.1.1	I know problems caused by waste.	3	3	3	3	3
A.1.2	I know the objectives by SWM	3	3	3	3	3
A.1.3	I know the basic components of SWM technical system.	3	3	3	3	3
A.1.4	I know the survey method of waste generation amount.	2	2	3	3	3
A.1.5	I know the method of determine the various waste amounts	2	2	2	3	3
A.1.6	I know the method of physical waste composition survey	2	2	2	3	3
A.1.7	I know the various survey methods of waste properties.	2	2	2	3	3
A.1.8	I know the properties of each waste composition.	2	2	2	3	3
A.1.9	I know the waste properties by source	2	2	2	3	3
A.1.10	I know how to understand the waste stream.	0	2	2	3	3
	Average for A.1	2.1	2.3	2.4	3.0	3.0
A.2	**Discharge, Storage, Collection, Transportation**					
A.2.1	I know various waste discharge and storage system.	3	3	3	3	3
A.2.2	I know various waste collection methods.	3	2	3	3	3
A.2.3	I know various waste transportation methods	3	2	2	3	3
A.2.4	I know various equipment of waste transportation	3	3	3	3	3
	Average for A.2	3.0	2.5	2.8	3.0	3.0
A.3	**Waste Processing and Treatment**					
A.3.1	I know the mechanism of composting	0	2	2	3	3
A.3.2	I know disadvantage of composting	1	2	2	3	3
A.3.4	I know the incineration technology	3	2	2	2	2
A.3.5	I know the RDF technology	0	3	3	3	4
A.3.6	I know the waste separation technology	3	3	3	4	4
	Average for A.3	1.3	2.4	2.4	3.0	3.2
A.4	**Waste Separation and Recycling**					
A.4.1	I know the advantages of waste separation at generation source.	3	3	3	4	4
A.4.2	I know the disadvantages of waste separation at generation source	3	3	3	4	4
A.4.3	I know the advantages of Recycling	3	3	3	3	3
A.4.4	I know the disadvantages of Recycling	3	3	3	3	3
	Average for A.4	3.0	3.0	3.0	3.5	3.5
A.5	**Final Disposal**					
A.5.1	I know the problems caused by waste disposal	2	2	2	3	3
A.5.2	I know the required facility of waste disposal in accordance with waste type	3	2	2	3	3
A.5.3	I know the leachate control system	2	2	2	3	3
A.5.4	I know various gas vent system.	1	2	2	3	3
A.5.5	I know the necessity of security facilities.	2	2	2	3	3
A.5.6	I know the landfill method.	3	3	3	3	3
	Average for A.5	2.0	2.2	2.2	3.0	3.0
A.6	**Healthcare Waste**					
A6.1	I know the type of healthcare wastes and their risk.	1	2	2	2	2
A6.2	I know how to handle healthcare waste.	1	2	2	2	2
	Average for A.6	1.0	2.0	2.0	2.0	2.0
A.7	**Law, Regulation, Guideline**					
A.7.1	Law on Household and Industrial Wastes	3	2	3	3	3
A.7.2	Ordinance of Minister for Health of Mongolia: Regulation on collection, transportation and disposal of hospital generated waste	2	2	2	3	3
A.7.3	Joint Ordinance of Minister for Environment and Minister for Health: Approval of list and regulation /Methodological instructions to collect, store, transport and dispose poisonous chemical waste in environment sound manner/	1	2	2	3	3
A.7.4	Ordinance of Minister for Environment :Approval of Regulation /Regulation on waste disposal operations, special waste disposal facilities, requirements for such facilities, and activities of individuals, companies and organizations that conduct activities related to the waste disposal and removal/	2	2	2	3	3
A.7.5	Decree of Presidium of City Council :Approval of Regulation on Establishment of buffer zone for waste disposal sites and their operations	1	2	2	3	3
A.7.6	Decree of Presidium of City Council: Approval of Regulation on Waste Fund	3	2	3	3	3
A.7.7	Decree of Presidium of City Council: Regulation to involve organizations, companies and individuals in the activities related to cleaning, maintenance and protection of streets and squares of Ulaanbaatar city on contract basis	3	2	3	3	3
A.7.8	Decree of Presidium of City Council: Approval of renewing of service fee /Service fee to collect and transport waste of organizations, companies and households of Ulaanbaatar	3	2	3	3	3
A.7.9	Decree of Presidium of City Council: Approval of renewing of service expenses /Tariff for hunting street dogs and cats, waste transportation tariff/	3	2	3	3	3
A.7.10	Decree of Presidium of City Council: Approval of Regulation /Regulation for organizations companies and individuals to conduct city renovation and cleaning activities/	3	2	3	3	3
	Average for A.7	2.4	2.0	2.6	3.0	3.0
A.8	**Social Environmental Consideration**					
A.8.1	I know NIMBY Syndrome	2	3	3	4	4
A.8.2	I know the environment aspects to be considered.	2	2	3	3	3
A.8.3	I know the social aspects to be considered.	2	2	2	3	3
	Average for A.8	2.3	2.3	2.7	3.3	3.3

A.9	**Contract Management**					
A.9.1	I know advantages and disadvantages of various types of Contracts.	3	2	2	2	3
A.9.2	I know how to estimate costs.	2	2	2	2	3
A.9.3	I know how to monitor progress	2	2	2	3	3
	Average for A.9	2.3	2.0	2.0	2.3	3.0
A.10	**Basic principals and measures**					
A.10.1	I know Polluter Pay Principles.	3	2	3	3	4
A.10.2	I know Extended Producers Responsibility	2	2	2	3	4
	Average for A.10	2.3	2.0	2.5	3.0	4.0
A.11	**Site Investigations (Geological Survey, Topographical Survey, Social Survey)**					
A.11.1	I know how to conduct geological survey	1	2	2	2	3
A.11.2	I know how to conduct topographic survey	1	2	2	2	3
A.11.3	I know how to conduct social survey	3	3	3	4	4
	Average for A.11	1.7	2.3	2.3	2.7	3.3
A.12	**Environmental Protection Measures**					
A.12.1	I know the meaning of pollution source and pollution load	2	2	2	3	3
A.12.2	I know how to consider the environmental protection; Environmental permissible amount, Life cycle assessment, Risk management	2	2	2	2	2
	Average for A.12	2.0	2.0	2.0	2.5	2.5
	Average for A	2.1	2.3	2.4	2.9	3.1
B	**Skills**					
B.1	I can do the waste discharge rate survey	3	2	3	4	4
B.2	I can do the waste physical composition survey.	2	2	3	4	4
B.3	I can survey and draw the waste stream	2	3	3	3	3
B.4	I can project the waste amount	2	2	3	3	3
B.5	I can project the waste composition	2	2	2	2	2
B.6	I can calculate the required number of waste collection trucks	3	2	2	3	3
B.7	I can calculate the waste disposal amount	2	2	2	3	3
B.8	I can calculate the required volume of waste disposal	2	2	2	3	3
B.9	I can plan the waste treatment and disposal system	2	2	2	2	2
B.10	I can select the optimum waste treatment and disposal system	2	2	2	2	2
B.11	I can estimate or understand the cost of SWM facilities.	2	2	2	2	2
B.12	I can estimate or understand the cost of equipment	2	2	2	3	3
B.13	I can estimate or understand the cost of waste collection	2	2	2	3	4
B.14	I can estimate or understand the cost of landfilling Operation	2	2	2	3	3
B.15	I can estimate or understand the cost of maintenance of equipment	2	2	2	2	4
B.16	I can formulate the operation and maintenance plan of equipment	2	2	2	2	2
B.17	I can understand EIA report	2	3	3	3	3
B.18	I can prepare financial report.	1	2	2	3	3
B.19	I can draft regulation and/or guideline on SWM	3	3	3	3	3
	Average for B	2.1	2.2	2.3	2.8	2.9
C	**Attitude**					
C.1	I can actively think over the SWM conditions and problems and behave toward the	3	3	3	3	3
C.2	I can actively contribute the improvement of public health and the environmental preservation.	3	3	3	4	4
C.3	I can involve colleague and staff for taking action	3	3	3	3	3
C.4	I can prepare the realistic proposal taking fully the present conditions into account.	3	3	3	3	3
C.5	I can flexibly deal with the problems based on the characteristics of the problems and resources own.	3	3	3	3	3
C.6	I can listen people's voices and explain them their social duties.	3	3	3	3	3
C.7	I can explain to the people about SWM plan.	3	3	3	4	4
	Average for B	3.0	3.0	3.0	3.3	3.3
	Overall Average Score	2.4	2.5	2.6	3.0	3.1

	Summary	2009–Nov	2010–Jul	2011–Mar	2011–Jul	2012–Marl
A	Knowledge	2.1	2.3	2.4	2.9	3.1
B	Skills	2.1	2.2	2.3	2.8	2.9
C	Attitude	3	3	3	3.3	3.3



e. ムングンゾル

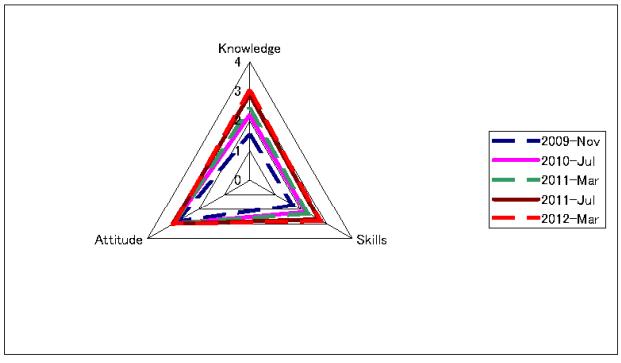
Capacity Assessment Evaluation Result for Individual

Organization: EPWMD
Evaluation: Excellent: 4, Good: 3, Fair: 2, Poor: 1 None: 0
D

Code	Items	2009-Nov	2010-Jul	2011-Mar	2011-Jul	2012-Mar
A	**Knowledge**					
A.1	**Basic Subjects**					
A.1.1	I know problems caused by waste.	3	2	2	3	3
A.1.2	I know the objectives by SWM	3	2	2	3	3
A.1.3	I know the basic components of SWM technical system.	1	2	2	3	3
A.1.4	I know the survey method of waste generation amount.	1	2	2	3	3
A.1.5	I know the method of determine the various waste amounts	1	3	3	3	3
A.1.6	I know the method of physical waste composition survey	1	2	2	3	3
A.1.7	I know the various survey methods of waste properties.	1	2	2	2	2
A.1.8	I know the properties of each waste composition.	1	2	2	3	3
A.1.9	I know the waste properties by source	1	2	2	3	3
A.1.10	I know how to understand the waste stream.	1	3	3	3	3
	Average for A.1	1.4	2.2	2.2	2.9	2.9
A.2	**Discharge, Storage, Collection, Transportation**					
A.2.1	I know various waste discharge and storage system.	2	3	3	3	3
A.2.2	I know various waste collection methods.	2	3	3	3	3
A.2.3	I know various waste transportation methods	2	2	2	3	3
A.2.4	I know various equipment of waste transportation	2	2	2	3	3
	Average for A.2	2.0	2.5	2.5	3.0	3.0
A.3	**Waste Processing and Treatment**					
A.3.1	I know the mechanism of composting	1	2	2	3	3
A.3.2	I know disadvantage of composting	1	2	2	3	3
A.3.4	I know the incineration technology	1	2	2	3	3
A.3.5	I know the RDF technology	1	2	2	3	3
A.3.6	I know the waste separation technology	2	3	3	3	3
	Average for A.3	1.2	2.2	2.2	3.0	3.0
A.4	**Waste Separation and Recycling**					
A.4.1	I know the advantages of waste separation at generation source.	2	3	3	4	4
A.4.2	I know the disadvantages of waste separation at generation source	1	3	3	4	4
A.4.3	I know the advantages of Recycling	2	3	3	3	3
A.4.4	I know the disadvantages of Recycling	1	3	3	3	3
	Average for A.4	1.5	3.0	3.0	3.5	3.5
A.5	**Final Disposal**					
A.5.1	I know the problems caused by waste disposal	1	3	3	3	3
A.5.2	I know the required facility of waste disposal in accordance with waste type	1	3	3	3	3
A.5.3	I know the leachate control system	2	2	2	3	3
A.5.4	I know various gas vent system.	1	2	2	3	3
A.5.5	I know the necessity of security facilities.	1	2	2	3	3
A.5.6	I know the landfill method.	2	3	3	3	3
	Average for A.5	1.3	2.5	2.5	3.0	3.0
A.6	**Healthcare Waste**					
A6.1	I know the type of healthcare wastes and their risk.	1	2	2	2	2
A6.2	I know how to handle healthcare waste.	1	2	2	2	2
	Average for A.6	1.0	2.0	2.0	2.0	2.0
A.7	**Law, Regulation, Guideline**					
A.7.1	Law on Household and Industrial Wastes	3	3	3	3	3
A.7.2	Ordinance of Minister for Health of Mongolia: Regulation on collection, transportation and disposal of hospital generated waste	2	3	3	3	3
A.7.3	Joint Ordinance of Minister for Environment and Minister for Health: Approval of list and regulation /Methodological instructions to collect, store, transport and dispose poisonous chemical waste in environment sound manner)	2	3	3	3	3
A.7.4	Ordinance of Minister for Environment :Approval of Regulation /Regulation on waste disposal operations, special waste disposal facilities, requirements for such facilities, and activities of individuals, companies and organizations that conduct activities related to the waste disposal and removal/	2	2	2	3	3
A.7.5	Decree of Presidium of City Council :Approval of Regulation on Establishment of buffer zone for waste disposal sites and their operations	3	2	2	3	3
A.7.6	Decree of Presidium of City Council: Approval of Regulation on Waste Fund	3	3	3	3	3
A.7.7	Decree of Presidium of City Council: Regulation to involve organizations, companies and individuals in the activities related to cleaning, maintenance and protection of streets and squares of Ulaanbaatar city on contract basis	3	3	3	3	3
A.7.8	Decree of Presidium of City Council: Approval of renewing of service fee /Service fee to collect and transport waste of organizations, companies and households of Ulaanbaatar	3	2	2	3	3
A.7.9	Decree of Presidium of City Council: Approval of renewing of service expenses /Tariff for hunting street dogs and cats, waste transportation tariff/	3	3	3	3	3
A.7.10	Decree of Presidium of City Council: Approval of Regulation /Regulation for organizations companies and individuals to conduct city renovation and cleaning activities.	3	3	3	3	3
	Average for A.7	2.7	2.7	2.7	3.0	3.0
A.8	**Social Environmental Consideration**					
A.8.1	I know NIMBY Syndrome	1	2	3	3	3
A.8.2	I know the environment aspects to be considered.	1	2	2	3	3
A.8.3	I know the social aspects to be considered.	1	2	2	3	3
	Average for A.8	1.3	2.0	2.3	3.0	3.0

A.9	**Contract Management**					
A.9.1	I know advantages and disadvantages of various types of Contracts.	2	2	2	3	4
A.9.2	I know how to estimate costs.	2	2	2	3	3
A.9.3	I know how to monitor progress	2	2	2	3	3
	Average for A.9	2.0	2.0	2.0	3.0	3.3
A.10	**Basic principals and measures**					
A.10.1	I know Polluter Pay Principles.	1	2	3	3	3
A.10.2	I know Extensive Producers Responsibility	1	2	3	3	3
A.10.3	I know the administrative measures for the environmental management.	1	2	3	3	3
	Average for A.10	1.0	2.0	3.0	3.0	3.0
A.11	**Site Investigations (Geological Survey, Topographical Survey, Social Survey)**					
A.11.1	I know how to conduct geological survey	1	2	2	2	2
A.11.2	I know how to conduct topographic survey	1	2	2	2	2
A.11.3	I know how to conduct social survey	2	2	2	3	4
	Average for A.11	1.3	2.0	2.0	2.3	2.7
A.12	**Environmental Protection Measures**					
A.12.1	I know the meaning of pollution source and pollution load	1	1	2	3	3
A.12.2	I know how to consider the environmental protection; Environmental permissible amount, Life cycle assessment, Risk management	1	1	2	3	3
	Average for A.12	1.0	1.0	2.0	3.0	3.0
	Average for A	**1.5**	**2.2**	**2.4**	**2.9**	**3**
B	**Skills**					
B.1	I can do the waste discharge rate survey	2	2	3	3	3
B.2	I can do the waste physical composition survey.	2	2	3	3	3
B.3	I can survey and draw the waste stream	2	2	2	3	3
B.4	I can project the waste amount	2	2	2	3	3
B.5	I can project the waste composition	2	2	2	3	3
B.6	I can calculate the required number of waste collection trucks	2	2	2	2	3
B.7	I can calculate the waste disposal amount	1	2	2	3	3
B.8	I can calculate the required volume of waste disposal	1	2	2	3	3
B.9	I can plan the waste treatment and disposal system	2	2	2	2	2
B.10	I can select the optimum waste treatment and disposal system	1	2	2	2	2
B.11	I can estimate or understand the cost of SWM facilities.	2	2	2	2	2
B.12	I can estimate or understand the cost of equipment	2	2	2	3	3
B.13	I can estimate or understand the cost of waste collection	2	2	2	3	3
B.14	I can estimate or understand the cost of landfilling Operation	1	2	2	3	3
B.15	I can estimate or understand the cost of maintenance of equipment	1	2	2	3	3
B.16	I can formulate the operation and maintenance plan of equipment	1	2	2	2	2
B.17	I can understand EIA report	2	3	3	3	3
B.18	I can prepare financial report.	2	3	3	3	3
B.19	I can draft regulation and/or guideline on SWM	2	3	3	3	3
	Average for B	**1.7**	**2.2**	**2.3**	**2.7**	**2.8**
C	**Attitude**					
C.1	I can actively think over the SWM conditions and problems and behave toward the	2	3	3	3	3
C.2	I can actively contribute the improvement of public health and the environmental preservation.	3	3	3	3	3
C.3	I can involve colleague and staff for taking action	3	3	3	3	3
C.4	I can prepare the realistic proposal taking fully the present conditions into account.	3	3	3	3	3
C.5	I can flexibly deal with the problems based on the characteristics of the problems and resources own.	3	3	3	3	3
C.6	I can listen people's voices and explain them their social duties.	3	3	3	3	3
C.7	I can explain to the people about SWM plan.	3	3	3	3	3
	Average for B	**2.9**	**3**	**3**	**3**	**3**
	Overall Average Score	**2**	**2.5**	**2.6**	**2.9**	**2.9**

	Summary	2009-Nov	2010-Jul	2011-Mar	2011-Jul	2012-Mar
A	Knowledge	1.5	2.2	2.4	2.9	3
B	Skills	1.7	2.2	2.3	2.7	2.8
C	Attitude	2.9	3	3	3	3



f. エンフアムガラン

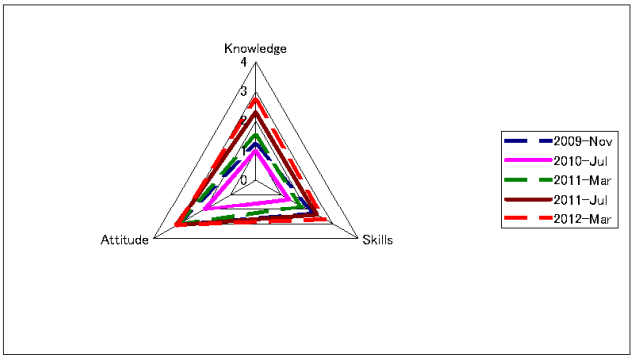
Capacity Assessment Evaluation Result for Individual

Organization: EPWMD
Evaluation: Excellent: 4, Good: 3, Fair: 2, Poor: 1 None: 0
E

Code	Items	2009-Nov	2010-Jul	2011-Mar	2011-Jul	2012-Mar
A	**Knowledge**					
A.1	**Basic Subjects**					
A.1.1	I know problems caused by waste.	3	2	2	3	3
A.1.2	I know the objectives by SWM	3	2	2	3	3
A.1.3	I know the basic components of SWM technical system.	2	2	2	3	3
A.1.4	I know the survey method of waste generation amount.	3	2	2	3	3
A.1.5	I know the method of determine the various waste amounts	2	2	2	3	3
A.1.6	I know the method of physical waste composition survey	0	1	2	3	3
A.1.7	I know the various survey methods of waste properties.	0	1	2	2	3
A.1.8	I know the properties of each waste composition.	0	1	2	2	3
A.1.9	I know the waste properties by source	0	1	2	2	2
A.1.10	I know how to understand the waste stream.	0	1	3	3	3
	Average for A.1	1.3	1.5	2.1	2.7	2.9
A.2	**Discharge, Storage, Collection, Transportation**					
A.2.1	I know various waste discharge and storage system.	3	2	2	3	3
A.2.2	I know various waste collection methods.	3	2	2	3	3
A.2.3	I know various waste transportation methods	3	2	2	3	3
A.2.4	I know various equipment of waste transportation	1	2	2	3	3
	Average for A.2	2.5	2.0	2.0	3.0	3.0
A.3	**Waste Processing and Treatment**					
A.3.1	I know the mechanism of composting	1	1	2	3	3
A.3.2	I know disadvantage of composting	0	1	2	3	3
A.3.3	I know the bio-gas technology	0				
A.3.4	I know the incineration technology	1	2	2	2	2
A.3.5	I know the RDF technology	0	1	1	2	3
A.3.6	I know the waste separation technology	3	1	3	3	3
	Average for A.3	0.8	1.2	2.0	2.6	2.8
A.4	**Waste Separation and Recycling**					
A.4.1	I know the advantages of waste separation at generation source.	1	2	2	3	3
A.4.2	I know the disadvantages of waste separation at generation source	1	2	2	3	3
A.4.3	I know the advantages of Recycling	1	2	2	3	3
A.4.4	I know the disadvantages of Recycling	1	2	2	3	3
	Average for A.4	1.0	2.0	2.0	3.0	3.0
A.5	**Final Disposal**					
A.5.1	I know the problems caused by waste disposal	0	2	2	3	3
A.5.2	I know the required facility of waste disposal in accordance with waste type	1	2	2	2	3
A.5.3	I know the leachate control system	1	1	1	2	3
A.5.4	I know various gas vent system.	1	1	1	2	3
A.5.5	I know the necessity of security facilities.	0	1	1	2	3
A.5.6	I know the landfill method.	0	1	1	2	3
A.5.7	I know how to dispose healthcare waste.	0				
	Average for A.5	0.4	1.3	1.3	2.2	3.0
A.6	**Healthcare Waste**					
A6.1	I know the type of healthcare wastes and their risk.	0	1	1	2	2
A6.2	I know how to handle healthcare waste.	0	1	1	2	2
	Average for A.6	0.0	1.0	1.0	2.0	2.0
A.7	**Law, Regulation, Guideline**					
A.7.1	Law on Household and Industrial Wastes	2	1	3	3	3
A.7.2	Ordinance of Minister for Health of Mongolia: Regulation on collection, transportation and disposal of hospital generated waste	1	1	1	2	2
A.7.3	Joint Ordinance of Minister for Environment and Minister for Health: Approval of list and regulation /Methodological instructions to collect, store, transport and dispose poisonous chemical waste in environment sound manner/	2	1	1	2	2
A.7.4	Ordinance of Minister for Environment :Approval of Regulation /Regulation on waste disposal operations, special waste disposal facilities, requirements for such facilities, and activities of individuals, companies and organizations that conduct activities related to the waste disposal and removal/	1	1	1	2	3
A.7.5	Decree of Presidium of City Council :Approval of Regulation on Establishment of buffer zone for waste disposal sites and their operations	2	1	1	2	3
A.7.6	Decree of Presidium of City Council: Approval of Regulation on Waste Fund	2	2	2	2	2
A.7.7	Decree of Presidium of City Council: Regulation to involve organizations, companies and individuals in the activities related to cleaning, maintenance and protection of streets and squares of Ulaanbaatar city on contract basis	2	2	2	2	3
A.7.8	Decree of Presidium of City Council: Approval of renewing of service fee /Service fee to collect and transport waste of organizations, companies and households of Ulaanbaatar	2	2	2	2	3
A.7.9	Decree of Presidium of City Council: Approval of renewing of service expenses /Tariff for hunting street dogs and cats, waste transportation tariff/	2	2	2	2	2
A.7.10	Decree of Presidium of City Council: Approval of Regulation /Regulation for organizations companies and individuals to conduct city renovation and cleaning activities/	2	2	2	2	3
	Average for A.7	1.8	1.5	1.7	2.1	2.6
A.8	**Social Environmental Consideration**					
A.8.1	I know NIMBY Syndrome	0	0	1	2	3
A.8.2	I know the environment aspects to be considered.	0	0	1	2	3
A.8.3	I know the social aspects to be considered.	2	0	1	2	3
A.8.4	I know the principal of waste disposal.	2				
	Average for A.8	1.0	0.0	1.0	2.0	3.0

A.9	**Contract Management**					
A.9.1	I know advantages and disadvantages of various types of Contracts.	2	1	1	3	3
A.9.2	I know how to estimate costs.	2	1	1	2	2
A.9.3	I know how to monitor progress	2	1	1	2	2
	Average for A.9	2.0	1.0	1.0	2.3	2.3
A.10	**Basic principals and measures**					
A.10.1	I know Polluter Pay Principles.	1	1	1	2	3
A.10.2	I know Extensive Producers Responsibility	1	1	1	2	3
A.10.3	I know the administrative measures for the environmental management.	1	1	1	2	2
	Average for A.10	1.0	1.0	1.0	2.0	2.7
A.11	**Site Investigations (Geological Survey, Topographical Survey, Social Survey)**					
A.11.1	I know how to conduct geological survey	1	0	2	2	3
A.11.2	I know how to conduct topographic survey	1	0	2	2	3
A.11.3	I know how to conduct social survey	3	0	3	3	3
	Average for A.11	1.7	0.0	2.3	2.3	3.0
A.12	**Environmental Protection Measures**					
A.12.1	I know the meaning of pollution source and pollution load	1	0	1	2	2
A.12.2	I know how to consider the environmental protection; Environmental permissible amount, Life cycle assessment, Risk management	0	0	0	1	2
	Average for A.12	0.5	0.0	0.5	1.5	2.0
	Average for A	**1.2**	**1.0**	**1.5**	**2.3**	**2.7**
B	**Skills**					
B.1	I can do the waste discharge rate survey	3	2	2	3	3
B.2	I can do the waste physical composition survey.	2	2	2	3	3
B.3	I can survey and draw the waste stream	2	2	2	3	3
B.4	I can project the waste amount	2	1	2	3	3
B.5	I can project the waste composition	2	1	2	3	3
B.6	I can calculate the required number of waste collection trucks	4	2	2	2	3
B.7	I can calculate the waste disposal amount	4	2	2	2	3
B.8	I can calculate the required volume of waste disposal	3	1	1	2	3
B.9	I can plan the waste treatment and disposal system	2	1	2	2	2
B.10	I can select the optimum waste treatment and disposal system	1	1	1	1	2
B.11	I can estimate or understand the cost of SWM facilities.	2	1	2	2	2
B.12	I can estimate or understand the cost of equipment	2	1	2	2	2
B.13	I can estimate or understand the cost of waste collection	3	1	1	2	3
B.14	I can estimate or understand the cost of landfilling Operation	2	1	2	2	3
B.15	I can estimate or understand the cost of maintenance of equipment	2	1	1	2	2
B.16	I can formulate the operation and maintenance plan of equipment	1	1	1	2	2
B.17	I can understand EIA report	1	1	3	3	3
B.18	I can prepare financial report.	2	1	2	3	3
B.19	I can draft regulation and/or guideline on SWM	3	1	2	3	3
	Average for B	**2.3**	**1.3**	**1.8**	**2.4**	**2.7**
C	**Attitude**					
C.1	I can actively think over the SWM conditions and problems and behave toward the	2	2	2	2	2
C.2	I can actively contribute the improvement of public health and the environmental preservation.	3	2	3	3	3
C.3	I can involve colleague and staff for taking action	3	2	3	3	3
C.4	I can prepare the realistic proposal taking fully the present conditions into account.	3	2	3	3	3
C.5	I can flexibly deal with the problems based on the characteristics of the problems and resources own.	4	2	4	4	4
C.6	I can listen people's voices and explain them their social duties.	3	2	3	3	3
C.7	I can explain to the people about SWM plan.	4	2	4	4	4
	Average for B	**3.1**	**2.0**	**3.1**	**3.1**	**3.1**
	Overall Average Score	**2.2**	**1.4**	**2.1**	**2.6**	**2.8**

	Summary	2009-Nov	2010-Jul	2011-Mar	2011-Jul	2012-Mar
A	Knowledge	1.2	1	1.5	2.3	2.7
B	Skills	2.3	1.3	1.8	2.4	2.7
C	Attitude	3.1	2	3.1	3.1	3.1



g.　　ノルマー

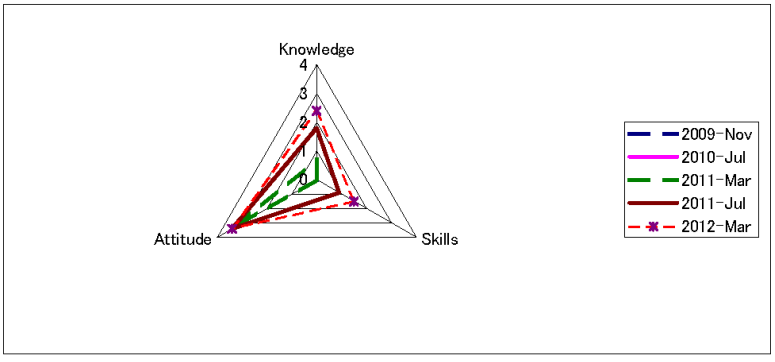
Capacity Assessment Evaluation Result for Individual

Organization: EPWMD
Evaluation: Excellent: 4, Good: 3, Fair: 2, Poor: 1 None: 0
F

Code		2009-Nov	2010-Jul	2011-Mar	2011-Jul	2012-Mar
A	Knowledge					
A.1	**Basic Subjects**					
A.1.1	I know problems caused by waste.			0	1	2
A.1.2	I know the objectives by SWM			0	1	2
A.1.3	I know the basic components of SWM technical system.			0	1	2
A.1.4	I know the survey method of waste generation amount.			0	1	2
A.1.5	I know the method of determine the various waste amounts			0	1	2
A.1.6	I know the method of physical waste composition survey			0	1	2
A.1.7	I know the various survey methods of waste properties.			0	1	2
A.1.8	I know the properties of each waste composition.			0	1	2
A.1.9	I know the waste properties by source			0	1	2
A.1.10	I know how to understand the waste stream.			0	1	2
	Average for A.1			0.0	1.0	2.0
A.2	**Discharge, Storage, Collection, Transportation**					
A.2.1	I know various waste discharge and storage system.			0	1	2
A.2.2	I know various waste collection methods.			0	1	2
A.2.3	I know various waste transportation methods			0	1	2
A.2.4	I know various equipment of waste transportation			0	1	2
	Average for A.2			0.0	1.0	2.0
A.3	**Waste Processing and Treatment**					
A.3.1	I know the mechanism of composting			0	1	1
A.3.2	I know disadvantage of composting			0	1	1
A.3.3	I know the bio-gas technology					
A.3.4	I know the incineration technology			0	1	1
A.3.5	I know the RDF technology			0	1	3
A.3.6	I know the waste separation technology			0	1	3
	Average for A.3			0.0	1.0	1.8
A.4	**Waste Separation and Recycling**					
A.4.1	I know the advantages of waste separation at generation source.			2	3	3
A.4.2	I know the disadvantages of waste separation at generation source			2	3	3
A.4.3	I know the advantages of Recycling			2	3	3
A.4.4	I know the disadvantages of Recycling			2	3	3
	Average for A.4			2.0	3.0	3.0
A.5	**Final Disposal**					
A.5.1	I know the problems caused by waste disposal			0	1	2
A.5.2	I know the required facility of waste disposal in accordance with waste type			0	1	2
A.5.3	I know the leachate control system			0	1	2
A.5.4	I know various gas vent system.			0	1	2
A.5.5	I know the necessity of security facilities.			0	1	2
A.5.6	I know the landfill method.			3	3	3
A.5.7	I know how to dispose healthcare waste.			4	4	4
	Average for A.5			0.5	1.3	2.2
A.6	**Healthcare Waste**					
A6.1	I know the type of healthcare wastes and their risk.			4	4	4
A6.2	I know how to handle healthcare waste.			4	4	4
	Average for A.6			4.0	4.0	4.0
A.7	**Law, Regulation, Guideline**					
A.7.1	Law on Household and Industrial Wastes			4	4	4
A.7.2	Ordinance of Minister for Health of Mongolia: Regulation on collection, transportation and disposal of hospital generated waste			4	4	4
A.7.3	Joint Ordinance of Minister for Environment and Minister for Health: Approval of list and regulation /Methodological instructions to collect, store, transport and dispose poisonous chemical waste in environment sound manner/			4	4	4
A.7.4	Ordinance of Minister for Environment :Approval of Regulation /Regulation on waste disposal operations, special waste disposal facilities, requirements for such facilities, and activities of individuals, companies and organizations that conduct activities related to the waste disposal and removal/			0	1	2
A.7.5	Decree of Presidium of City Council :Approval of Regulation on Establishment of buffer zone for waste disposal sites and their operations			0	1	2
A.7.6	Decree of Presidium of City Council: Approval of Regulation on Waste Fund			0	1	2
A.7.7	Decree of Presidium of City Council: Regulation to involve organizations, companies and individuals in the activities related to cleaning, maintenance and protection of streets and squares of Ulaanbaatar city on contract basis			0	1	2
A.7.8	Decree of Presidium of City Council: Approval of renewing of service fee /Service fee to collect and transport waste of organizations, companies and households of Ulaanbaatar			3	3	3
A.7.9	Decree of Presidium of City Council: Approval of renewing of service expenses /Tariff for hunting street dogs and cats, waste transportation tariff/			0	1	1
A.7.10	Decree of Presidium of City Council: Approval of Regulation /Regulation for organizations companies and individuals to conduct city renovation and cleaning activities/			4	4	4
	Average for A.7			1.9	2.4	2.8
A.8	**Social Environmental Consideration**					
A.8.1	I know NIMBY Syndrome			0	3	3
A.8.2	I know the environment aspects to be considered.			0	1	2
A.8.3	I know the social aspects to be considered.			0	1	2
	Average for A.8			0.0	1.5	2.3
A.9	**Contract Management**					
A.9.1	I know advantages and disadvantages of various types of Contracts.			0	1	2
A.9.2	I know how to estimate costs.			0	1	1
A.9.3	I know how to monitor progress			0	1	2
	Average for A.9			0.0	1.0	1.7
A.10	**Basic principals and measures**					
A.10.1	I know Polluter Pay Principles.			0	2	3
A.10.2	I know Extensive Producers Responsibility			0	2	3
A.10.3	I know the administrative measures for the environmental management.			0	2	2

	Average for A.10			0.0	2.0	2.7
A.11	**Site Investigations (Geological Survey, Topographical Survey, Social Survey)**					
A.11.1	I know how to conduct geological survey			0	1	2
A.11.2	I know how to conduct topographic survey			0	1	2
A.11.3	I know how to conduct social survey			0	3	4
	Average for A.11			0.0	1.7	2.7
A.12	**Environmental Protection Measures**					
A.12.1	I know the meaning of pollution source and pollution load			0	2	2
A.12.2	I know how to consider the environmental protection; Environmental permissible amount, Life cycle assessment, Risk management			0	1	2
	Average for A.12			0.0	1.5	2.0
	Average for A			**0.7**	**1.8**	**2.4**
B	**Skills**					
B.1	I can do the waste discharge rate survey			0	2	2
B.2	I can do the waste physical composition survey.			0	2	2
B.3	I can survey and draw the waste stream			0	2	2
B.4	I can project the waste amount			0	2	2
B.5	I can project the waste composition			0	2	2
B.6	I can calculate the required number of waste collection trucks			0	1	2
B.7	I can calculate the waste disposal amount			0	1	1
B.8	I can calculate the required volume of waste disposal			0	1	1
B.9	I can plan the waste treatment and disposal system			0	1	1
B.10	I can select the optimum waste treatment and disposal system			0	1	1
B.11	I can estimate or understand the cost of SWM facilities.			0	0	1
B.12	I can estimate or understand the cost of equipment			0	0	1
B.13	I can estimate or understand the cost of waste collection			0	0	2
B.14	I can estimate or understand the cost of landfilling Operation			0	0	1
B.15	I can estimate or understand the cost of maintenance of equipment			0	0	1
B.16	I can formulate the operation and maintenance plan of equipment			0	0	1
B.17	I can understand EIA report			0	0	1
B.18	I can prepare financial report.			0	0	1
B.19	I can draft regulation and/or guideline on SWM			0	3	3
	Average for B			**0.0**	**0.9**	**1.5**
C	**Attitude**					
C.1	I can actively think over the SWM conditions and problems and behave toward the			2	3	3
C.2	I can actively contribute the improvement of public health and the environmental preservation.			3	3	3
C.3	I can involve colleague and staff for taking action			4	4	4
C.4	I can prepare the realistic proposal taking fully the present conditions into account.			3	3	3
C.5	I can flexibly deal with the problems based on the characteristics of the problems and resources own.			3	3	3
C.6	I can listen people's voices and explain them their social duties.			4	4	4
C.7	I can explain to the people about SWM plan.			4	4	4
	Average for B			**3.3**	**3.4**	**3.4**
	Overall Average Score			**1.3**	**2.0**	**2.4**

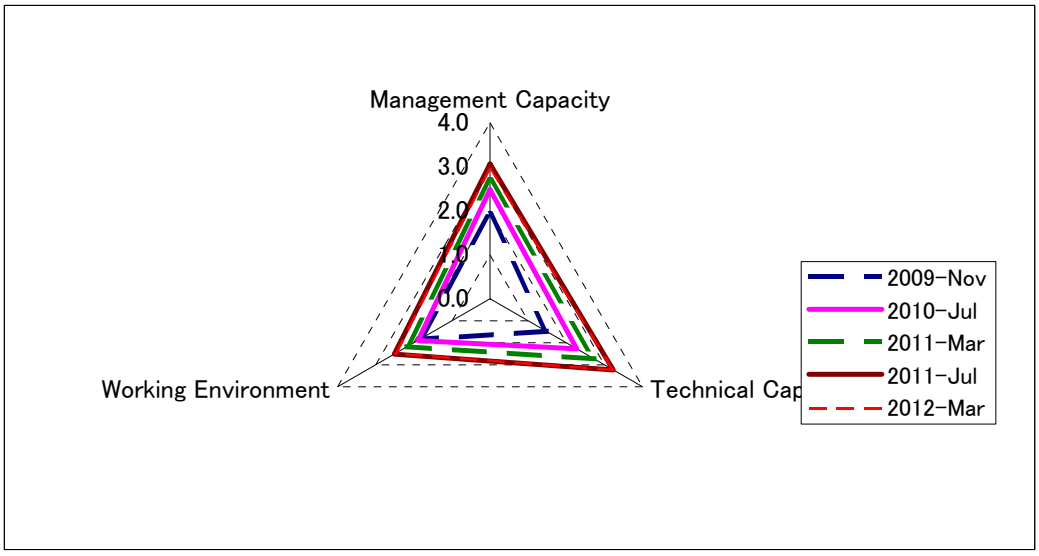
	Summary	2009-Nov	2010-Jul	2011-Mar	2011-Jul	2012-Mar
A	Knowledge	0	0	0.7	1.8	2.4
B	Skills	0	0	0	0.9	1.5
C	Attitude	0	0	3.3	3.4	3.4



I.1.2 組織評価

a. 要約

Item		Assessment				
		2009-Nov	2010-Jul	2011-Mar	2011-Jul	2012-Mar
A	**Management Capacity**	1.9	2.5	2.7	3.1	2.9
B	**Technical Capacity**	1.5	2.3	2.7	3.2	3.2
C	**Working Environment**	1.8	1.9	2.2	2.5	2.5
	Average	1.8	2.2	2.5	2.9	2.9



b. 詳細

Capacity Assessment Evaluation Sheet
Interviewee: B
Organization: EPWMD
Position: Director
Date of Evaluation: 9th Nov 2009, Jul 2010, Mar 2011, Jul 2011、Mar 2012
Evaluation: Excellent: 4, Good: 3, Fair: 2, Poor: 1 None: 0

		D	D	B	B	B	
Code	Subjects	2009-Nov	2010-Jul	2011-Mar	2011-Jul	2012-Mar	Remarks
A	**Management Capacity**						
A.1	**Planning**						
A.1.1	We know the objectives and roles of EPWMD	2	3	3	3	4	給与以外のプロジェクトに対する予算を申請する。Degiiが担当
A.1.2	We have action plan of EPWMD including the policy, goal, targets, strategy, stage development schedule.	0	3	3	4	3	部には4つの主要な事業がある
A.1.3	The appropriate budget for EPWMD can be prepared.	2	3	3	3	3	1. 不法投棄場のクリーンアップ
A.1.4	We can assist district government to prepare waste collection plan.	0	3	2	3	3	2. 公共トイレの設置
	Average	1.0	3.0	2.8	3.3	3.3	3. ゴミ箱の設置 PPの成果
A.2	**Communication**						4. 凍結防止剤の購入
A.2.1	We know EPWMD's activity schedule of this year.	3	3	3	3	3	
A.2.2	We know EPWMD's activity schedule of this month.	3	3	3	3	3	
A.2.3	We have periodical meeting among department staff.	3	3	3	3	3	毎週1回
A.2.4	We always report my findings to my boss and other staff.	2	2	3	3	3	
A.2.5	We have opportunities to discuss my opinions with my colleagues.	2	3	2	2	2	横の意志の疎通がない
	Average	2.6	2.8	2.8	2.8	2.8	Topがかわってから進展がない。
A.3	**Human Resource Management**						
A.3.1	There are sufficient number of staffs for the works	1	2	2	2	2	100万人の清掃を管理する部が7名
A.3.2	The staffs have sufficient capacities (knowledge, skill, attitude, qualification, etc.) to do the work.	2	2	3	3	3	少しずつ向上している
A.3.3	Attendance is properly recorded.	4	2	4	4	4	指紋認証の出勤管理システムを導入
A.3.4	Leaves are properly recorded	4	2	4	4	4	管理は人事部
	Average	2.8	2	3.3	3.3	3.3	
A.4	**Directions**						
A.4.1	There are clear instructions from head of the department	3	3	3	3	3	
A.4.2	Instructions are not inconsistent	3	2	3	3	3	
A.4.3	Instructions are made according to the capacity of the staffs	3	2	3	3	3	
	Average	3.0	2.3	3.0	3.0	3.0	進展なし
A.5	**Waste Fund Management**						
A.5.1	We can obtain necessary data from district waste fund	1	2	2	4	2	報告は受けているが内容まで入り込めな
A.5.2	We can analyze financial status of district waste fund	1	2	2	2	2	担当は一人の女性のみ
A.5.3	We can assist to improve district waste fund operation.	1	2	2	2	2	
	Average	1.0	2.0	2.0	2.7	2.0	DWSFはCHDを除いて廃止された
A.6	**Contract Management**						
A.6.1	EPWMD can hire local consultant	1	2	2	2	2	コンサルは雇わず、全て自分たちでやる
A.6.2	EPWMD can assist District Government to prepare tender document	2	2	2	2	2	標準入札図書ができた
A.6.3	EPWMD can assist District Government to control private companies	1	2	2	3	3	不法投棄のクリーンアップのための業者選定の入札業務はやっている
	Average	1.3	2.0	2.0	2.3	2.3	
A.7	**Coordination with relevant organizations**						
A.7.1	EPWMD can prepare the proposals to donors.	2	3	3	3	3	医療廃棄物の焼却炉とオートクレーブの事業でMOHと共同で事業を推進中
A.7.2	EPWMD can correspond to the donors.	2	3	3	4	3	KOICA
A.7.3	EPWMD can coordinate with relevant organizations such as Ministry of Nature, Environment and tourism, Ministry of Health, Specialized Inspection Agency,	2	3	3	4	4	学校教育 Autocrave
	Average	2.0	3.0	3.0	3.7	3.3	援助機関の受皿としての能力は確保
A.8	**Publicity**						
A.8.1	EPWMD can update web-site	2	2	2	3	3	WEBの更新は専門の部署が担当
A.8.2	EPWMD can publish Newsletters	0	3	3	3	3	
A.8.3	EPWMD can publish leaflet, posters.	2	3	3	4	4	PPの成果
A.8.4	EPWMD can respond or dispatch messages through media	3	3	3	4	4	TV program
	Average	1.8	2.8	2.8	3.5	3.5	
	Average for A	**1.9**	**2.5**	**2.7**	**3.1**	**2.9**	
B	**Technical Capacity**						
B.1	**Understanding the current conditions**						
B.1.1	EPWMD knows basic data in each district and khoroo	2	3	3	4	4	担当あり
B.1.2	EPWMD knows the cleanliness in each district	2	2	3	4	4	キャンペーン
B.1.3	EPWMD knows discharge and collection system in each khoroo.	1	2	3	3	3	
B.1.4	EPWMD knows waste collection and disposal amount in each khoroo	1	3	3	3	3	WBDB配信システム完備
B.1.5	EPWMD knows waste fee collection rate in each khoroo	1	3	3	4	4	プロジェクトの成果
	Average	1.4	2.6	3	3.6	3.6	
B.2	**Technical Support**						
B.2.1	We can obtain necessary data from district government	1	2	3	3	3	POS
B.2.2	we can assist district government to formulate necessary plan	1	3	3	3	3	
B.2.3	We can assist CMPUA to obtain necessary data from weighbridge record.	2	3	3	4	4	データ配信
B.2.4	We can obtain waste disposal amount from CMPUA timely.	2	3	3	4	4	データ配信
	Average	1.5	2.8	3.0	3.5	3.5	
B.3	**Public Awareness Raising**						
B.3.1	We can assist district government to conduct public awareness raising campaign regarding SWM	2	2	3	4	4	キャンペーンの予算は、City WSFであったり、助役の緊急予算であったりする。
B.3.2	We can develop educational tools for public awareness raising regarding	2	2	3	3	3	PPの成果
B.3.3	EPWMD can assist district government to get consensus from the public to conduct waste separation at generation source	2	2	2	3	3	PPの成果
	Average	2.0	2.0	2.7	3.3	3.3	
B.4	**Project Implementation**						
B.4.1	EPWMD can take initiative to implement the separate discharge and separate collection pilot project	1	2	2	3	3	PP1 Phase2
B.4.2	EPWMD can formulate project implementation plan.	1	2	2	2	2	
B.4.3	EPWMD can examine and realize the necessary cost for operation and advantages and disadvantages of each plan for promoting recycling	1	1	2	2	2	
B.4.4	EPWMD can prepare guideline for promoting recycling	1	2	3	3	3	
	Average	1.0	1.8	2.3	2.5	2.5	
	Average for B	**1.5**	**2.3**	**2.7**	**3.2**	**3.2**	

C	**Working Environment**						
C.1	**Education and Training**						
C.1.1	There is a training programme for the staff	2	1	1	2	2	Donor Programme
C.1.2	The objective of the training course is presented to all the staff	2	2	3	3	3	
C.1.3	Anybody can attend training course when they request.	2	3	3	3	3	
C.1.4	Chances of attending training course are even to all the staff	2	3	3	3	3	
	Average	2.0	2.3	2.5	2.8	2.8	
C.2	**Salary**						
C.2.1	We are receiving appropriate salary according to the type of work.	2	1	2	2	2	給与は低いが副収入がある模様
C.2.2	We are receiving appropriate salary according to the amount of work	2	1	1	2	2	3年間やめるものがいない。
C.2.3	We are receiving appropriate salary according to the position	2	1	2	2	2	3年間やめるものがいない。
C.2.4	Salary scheme is fair to all the staff.	2	3	3	3	3	
	Average	2.0	1.5	2.0	2.3	2.3	
C.3	**Quality of Work**						
C.3.1	Our work is useful to build better society.	4	3	4	4	4	
C.3.2	Our work is closely related with people's life.	4	3	4	4	4	
C.3.3	Information regarding our work are frequently come out in the media.	3	3	3	3	3	
C.3.4	We are proud of doing my work.	3	3	3	3	3	
	Average	3.5	3	3.5	3.5	3.5	
C.4	**Amount of Work**						
C.4.1	Our work can be completed within the working hours	2	0	1	2	2	
C.4.2	We feel amount of work is appropriate	2	1	1	2	2	
C.4.3	Overtime is paid according to the actual working hour	0	0	0	1	1	職員はそのほとんどが20代だが残業は支払われない。
C.4.4	We can take a paid vacation without difficulty	1	1	3	4	4	新Directorのもと容易になった。
	Average	1.3	0.5	1.3	2.3	2.3	
C.5	**Office equipment**						
C.5.1	The size and number of desks, chairs, drawers, cabinets, etc. is sufficient.	3	2	3	3	3	
C.5.2	There are enough computers.	3	3	3	3	3	
C.5.3	The number and types of application software is sufficient.	3	3	3	3	3	
C.5.4	There are enough printers.	1	1	1	2	2	
C.5.5	There are enough photocopiers.	3	3	3	3	3	
C.5.6	There are enough meeting spaces	1	3	2	3	2	Meeting Roomが一つに減った
	Average	2.3	2.5	2.5	2.8	2.7	
C.6	**Communication means**						
C.6.1	There are enough telephone lines.	1	3	3	3	3	固定電話から携帯への電話に制限がある
C.6.2	Telephone bill is paid by the municipality	1	3	3	3	3	個人で所有する携帯電話を使って仕事をしてもリファンドされない
C.6.3	Broadband internet is accessible.	2	3	3	3	3	
	Average	1.3	3.0	3.0	3.0	3.0	
C.7	**Transportation**						
C.7.1	There are enough vehicles for the work.	1	1	1	1	1	部に所属する車は1台
C.7.2	Transportation cost for the work is refundable	0	0	0	1	1	交通費はリファンドされない。
	Average	0.5	0.5	0.5	1	1	
	Average for C	**1.8**	**1.9**	**2.2**	**2.5**	**2.5**	
	Total Average	**1.8**	**2.2**	**2.5**	**2.9**	**2.9**	

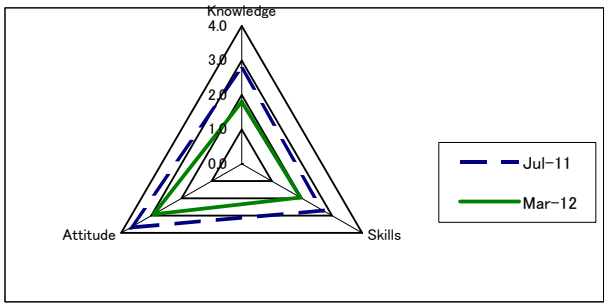
I.2 CMPUA

I.2.1 個人評価

a. 一覧

	Items	Assessment				
		Purevdorj	Iderchulen	Oyunchimeg	Amgalan	Average
2011 Jul						
	Knowledge	0.3	3.1			2.8
	Skills	0.1	2.6			2.7
	Attitude	3.0	4.0			3.7
	Average	1.1	3.2			3.1
2012 Mar						
	Knowledge	1.4	3.3	0.9	1.6	1.8
	Skills	1.3	2.9	2.1	1.5	2.0
	Attitude	3.3	4.0	2.4	2.0	2.9
	Average	2.0	3.4	1.8	1.7	2.2
	Attendance Rate	73%				

	2人	
	Individual Summary	Assessment
A	Item	Jul-11	Mar-12
B	**Knowledge**	2.8	1.8
C	**Skills**	2.7	2.0
	Attitude	3.7	2.9
	Average	3.1	2.2



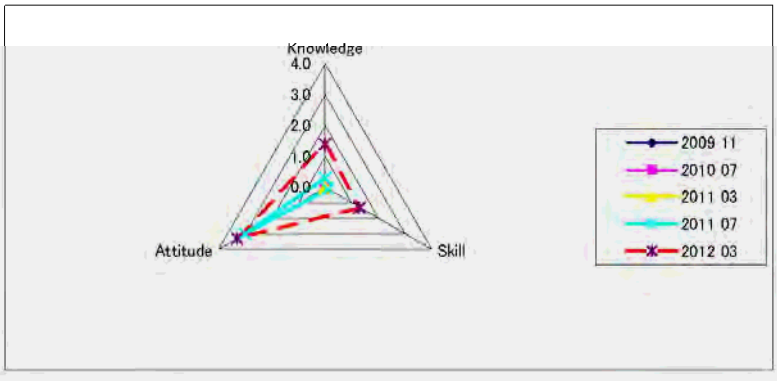
b. プレウドルジ

Capacity Assessment Evaluation Sheet
Organization:CMPUA
Date of Evaluation: 11,16 Nov 2009, July 2010, March 2011
Evaluation: Excellent: 4, Good: 3, Fair: 2, Poor: 1 None: 0
A

Code	Items	Assessment				
		2009 11	2010 07	2011 03	2011 07	2012 03
A	**Knowledge**					
A.1	**Basic Subjects**					
A.1.1	I know problems caused by waste.				2	2
A.1.2	I know the objectives by SWM				2	2
A.1.3	I know the basic components of SWM technical system.				0	1
A.1.4	I know the survey method of waste generation amount.				0	1
A.1.5	I know the method of physical waste composition survey				0	1
A.1.6	I know the properties of each waste composition.				0	1
A.1.7	I know the waste properties by source				0	1
A.1.8	I know how to understand the waste flow.				0	1
	Average				0.5	1.3
A.2	**Discharge, Storage, Collection, Transportation**					
A.2.1	I know various waste discharge and storage system.				1	2
A.2.2	I know various waste collection methods.				1	2
A.2.3	I know various waste transportation methods				1	2
A.2.4	I know various equipment of waste transportation				1	2
	Average				1.0	2.0
A.3	**Waste Processing and Treatment**					
A.3.1	I know the mechanism of composting				0	1
A.3.2	I know the incineration technology				0	1
A.3.3	I know the RDF technology				0	2
A.3.4	I know the waste separation technology				0	2
	Average				0.0	1.5
A.4	**Waste Separation and Recycling**					
A.4.1	I know the advantages of waste separation at generation source.				1	2
A.4.2	I know the disadvantages of waste separation at generation source				1	2
A.4.3	I know the advantages of Recycling				1	2
A.4.4	I know the disadvantages of Recycling				1	2
	Average				1.0	2.0
A.5	**Final Disposal**					
A.5.1	I know the problems caused by waste disposal				1	2
A.5.2	I know the required facility of waste disposal in accordance with waste type				0	2
A.5.3	I know the leachate control system				0	1
A.5.4	I know various gas vent system.				0	2
A.5.5	I know the necessity of security facilities.				0	2
A.5.6	I know the landfill method.				0	2
	Average				0.2	1.8
A.6	**Healthcare Waste**					
A6.1	I know the type of healthcare wastes and their risk.				0	1
A6.2	I know how to handle healthcare waste.				0	1
	Average				0.0	1.0
A.7	**Law, Regulation, Guideline**					
A.7.1	Law on Household and Industrial Wastes				0	1
A.7.2	Ordinance of Minister for Health of Mongolia: Regulation on collection, transportation and disposal of hospital generated waste				0	0
A.7.3	Joint Ordinance of Minister for Environment and Minister for Health: Approval of list and regulation /Methodological instructions to collect, store, transport and dispose poisonous chemical waste in environment sound manner/				0	0
A.7.4	Ordinance of Minister for Environment :Approval of Regulation /Regulation on waste disposal operations, special waste disposal facilities, requirements for such facilities, and activities of individuals, companies and organizations that conduct activities related to the waste disposal and removal/				0	1
A.7.5	Decree of Presidium of City Council :Approval of Regulation on Establishment of buffer zone for waste disposal sites and their				0	1
A.7.6	Decree of Presidium of City Council: Approval of Regulation on				0	1
A.7.7	Decree of Presidium of City Council: Regulation to involve organizations, companies and individuals in the activities related to cleaning, maintenance and protection of streets and squares of				0	1
A.7.8	Decree of Presidium of City Council: Approval of renewing of service fee /Service fee to collect and transport waste of organizations, companies and households of Ulaanbaatar city/				0	1
A.7.9	Decree of Presidium of City Council: Approval of renewing of service expenses /Tariff for hunting street dogs and cats, waste				0	1
A.7.10	Decree of Presidium of City Council: Approval of Regulation /Regulation for organizations, companies and individuals to conduct city renovation and cleaning activities/				0	1
	Average				0.0	0.8
A.8	**Social Environmental Consideration**					
A.8.1	I know NIMBY Syndrome				0	2
A.8.2	I know the environment aspects to be considered for SWM				1	1
A.8.3	I know the social aspects to be considered for SWM				1	1
	Average				0.7	1.3

A.9	**Contract Management**					
A.9.1	I know advantages and disadvantages of various types of Contracts.				0	1
A.9.2	I know how to estimate costs.				0	1
A.9.3	I know how to monitor progress				0	1
	Average				0.0	1.0
A.10	**Basic principals and measures**					
A.10.1	I know Polluter Pay Principles.				0	2
A.10.2	I know Extended Producers Responsibility				0	2
A.10.3	I know the administrative measures for the environmental management.				0	1
	Average				0.0	1.7
A.11	**Site Investigations (Geological Survey, Topographical Survey, Social Survey)**					
A.11.1	I know how to conduct geological survey				0	1
A.11.2	I know how to conduct topographic survey				0	1
A.11.3	I know how to conduct social survey				0	1
	Average				0.0	1.0
A.12	**Environmental Protection Measures**					
A.12.1	I know the meaning of pollution source and pollution load				0	1
A.12.2	I know how to consider the environmental protection; Environmental permissible amount, Life cycle assessment, Risk management				0	1
	Average				0.0	1.0
	Average for A				**0.3**	**1.4**
B	**Skills**					
B.1	I can do the waste discharge rate survey				0	1
B.2	I can do the waste physical composition survey.				0	1
B.3	I can survey and draw the waste flow				0	1
B.4	I can project the waste amount				0	1
B.5	I can project the waste composition				0	1
B.6	I can calculate the required number of waste collection trucks				0	1
B.7	I can calculate the waste disposal volume based on weighbridge data				0	2
B.8	I can calculate another how many years NEDS become full.				0	1
B.9	I can make a basic plan for sorting facilities in NEDS.				0	2
B.10	I can take preventive measures for causing fire				1	2
B.11	I can estimate the cost of SWM facilities.				0	1
B.12	I can estimate the cost of equipment				0	1
B.13	I can estimate the cost for opeartion of heavy equipment				0	2
B.14	I can estimate the cost of landfilling Operation				0	2
B.15	I can estimate the cost of maintenance of equipment				0	2
B.16	I can formulate the operation and maintenance plan of equipment				0	1
B.17	I can understand EIA report				0	1
B.18	I can conduct environmental monitoring				0	1
B.19	I can paln and implement dam construction for next stage.				0	1
	Average for B				**0.1**	**1.3**
C	**Attitude**					
C.1	I can actively think over the SWM conditions and problems and behave toward the solution				3	3
C.2	I can actively contribute the improvement of public health and the environmental preservation.				3	3
C.3	I can involve colleague and staff for taking action				3	4
C.4	I can prepare the realistic proposal taking fully the present conditions into account.				3	3
C.5	I can flexibly deal with the problems based on the characteristics of the problems and resources own.				3	4
C.6	I can listen people's voices and explain them their social duties.				3	3
C.7	I can explain to the people about SWM plan.				3	3
	Average for C				**3.0**	**3.3**
	Overall Average Score				**1.1**	**2.0**

	Summary	2009 11	2010 07	2011 03	2011 07	2012 03
A	Knowledge	0.0	0.0	0.0	0.3	1.4
B	Skill	0.0	0.0	0.0	0.1	1.3
C	Attitude	0.0	0.0	0.0	3.0	3.3



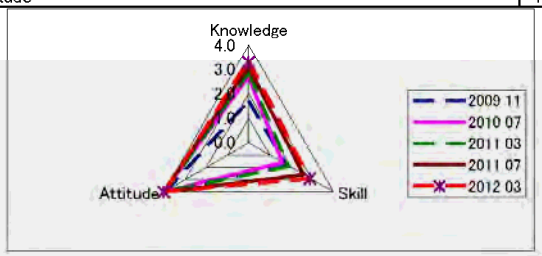
c. イデルチョローン

Capacity Assessment Evaluation Sheet
Organization:CMPUA
Date of Evaluation: 11,16 Nov 2009, July 2010, March 2011
Evaluation: Excellent: 4, Good: 3, Fair: 2, Poor: 1 None: 0
B

Code	Items	Assessment				
		2009 11	2010 07	2011 03	2011 07	2012 03
A	**Knowledge**					
A.1	**Basic Subjects**					
A.1.1	I know problems caused by waste.	3	4	4	4	4
A.1.2	I know the objectives by SWM	2	3	3	3	3
A.1.3	I know the basic components of SWM technical system.	2	3	3	3	3
A.1.4	I know the survey method of waste generation amount.	2	2	2	3	3
A.1.5	I know the method of physical waste composition survey	2	2	2	3	3
A.1.6	I know the properties of each waste composition.	1	2	2	3	3
A.1.7	I know the waste properties by source	1	2	2	3	3
A.1.8	I know how to understand the waste flow.	1	2	2	2	3
	Average	1.8	2.5	2.5	3.0	3.1
A.2	**Discharge, Storage, Collection, Transportation**					
A.2.1	I know various waste discharge and storage system.	3	4	4	4	4
A.2.2	I know various waste collection methods.	3	4	4	4	4
A.2.3	I know various waste transportation methods	3	3	3	3	3
A.2.4	I know various equipment of waste transportation	3	3	3	3	3
	Average	3.0	3.5	3.5	3.5	3.5
A.3	**Waste Processing and Treatment**					
A.3.1	I know the mechanism of composting	1	3	3	3	3
A.3.2	I know the incineration technology	2	3	3	3	3
A.3.3	I know the RDF technology	0	3	3	3	4
A.3.4	I know the waste separation technology	1	3	3	4	4
	Average	1.0	3.0	3.0	3.3	3.5
A.4	**Waste Separation and Recycling**					
A.4.1	I know the advantages of waste separation at generation source.	1	4	4	4	4
A.4.2	I know the disadvantages of waste separation at generation source	1	4	4	4	4
A.4.3	I know the advantages of Recycling	2	4	4	4	4
A.4.4	I know the disadvantages of Recycling	1	4	4	4	4
	Average	1.3	4.0	4.0	4.0	4.0
A.5	**Final Disposal**					
A.5.1	I know the problems caused by waste disposal	2	3	3	4	4
A.5.2	I know the required facility of waste disposal in accordance with waste typ	1	2	2	4	4
A.5.3	I know the leachate control system	1	2	2	4	4
A.5.4	I know various gas vent system.	2	3	3	3	3
A.5.5	I know the necessity of security facilities.	1	2	2	3	3
A.5.6	I know the landfill method.	2	3	3	3	3
	Average	1.5	2.5	2.5	3.5	3.5
A.6	**Healthcare Waste**					
A6.1	I know the type of healthcare wastes and their risk.	2	4	4	4	4
A6.2	I know how to handle healthcare waste.	2	3	3	3	3
	Average	2.0	3.5	3.5	3.5	3.5
A.7	**Law, Regulation, Guideline**					
A.7.1	Law on Household and Industrial Wastes	4	4	4	4	4
A.7.2	Ordinance of Minister for Health of Mongolia: Regulation on collection, transportation and disposal of hospital generated waste	4	4	4	4	4
A.7.3	Joint Ordinance of Minister for Environment and Minister for Health: Approval of list and regulation /Methodological instructions to collect, store, transport and dispose poisonous chemical waste in environment sound manner/	4	4	4	4	4
A.7.4	Ordinance of Minister for Environment :Approval of Regulation /Regulation on waste disposal operations, special waste disposal facilities, requirements for such facilities, and activities of individuals, companies and organizations that conduct activities related to the waste disposal and removal/	3	4	4	4	4
A.7.5	Decree of Presidium of City Council :Approval of Regulation on Establishment of buffer zone for waste disposal sites and their	3	4	4	4	4
A.7.6	Decree of Presidium of City Council: Approval of Regulation on	3	3	3	3	3
A.7.7	Decree of Presidium of City Council: Regulation to involve organizations, companies and individuals in the activities related to cleaning, maintenance and protection of streets and squares of	3	3	3	3	3
A.7.8	Decree of Presidium of City Council: Approval of renewing of service fee /Service fee to collect and transport waste of organizations, companies and households of Ulaanbaatar city/	2	3	3	3	3
A.7.9	Decree of Presidium of City Council: Approval of renewing of service expenses /Tariff for hunting street dogs and cats, waste	3	3	3	3	3
A.7.10	Decree of Presidium of City Council: Approval of Regulation /Regulation for organizations, companies and individuals to conduct city renovation and cleaning activities/	2	3	3	3	3
	Average	3.1	3.5	3.5	3.5	3.5
A.8	**Social Environmental Consideration**					
A.8.1	I know NIMBY Syndrome	0	3	3	4	4
A.8.2	I know the environment aspects to be considered for SWM	0	3	3	3	3
A.8.3	I know the social aspects to be considered for SWM	0	3	3	3	3
	Average	0.0	3.0	3.0	3.3	3.3

A.9	**Contract Management**					
A.9.1	I know advantages and disadvantages of various types of Contracts.	4	4	4	4	4
A.9.2	I know how to estimate costs.	1	1	2	2	2
A.9.3	I know how to monitor progress	1	2	2	2	2
	Average	2.0	2.3	2.7	2.7	2.7
A.10	**Basic principals and measures**					
A.10.1	I know Polluter Pay Principles.	4	4	4	4	4
A.10.2	I know Extended Producers Responsibility	3	3	3	4	4
A.10.3	I know the administrative measures for the environmental management.	3	2	2	2	2
	Average	3.3	3.0	3.0	3.3	3.3
A.11	**Site Investigations (Geological Survey, Topographical Survey, Social Survey)**					
A.11.1	I know how to conduct geological survey	0	0	1	2	3
A.11.2	I know how to conduct topographic survey	0	0	1	2	3
A.11.3	I know how to conduct social survey	2	0	2	2	3
	Average	0.7	0.0	1.3	2.0	3.0
A.12	**Environmental Protection Measures**					
A.12.1	I know the meaning of pollution source and pollution load	0	1	2	2	3
A.12.2	I know how to consider the environmental protection; Environmental permissible amount, Life cycle assessment, Risk management	0	1	1	2	3
	Average	0.0	1.0	1.5	2.0	3.0
	Average for A	1.6	2.7	2.8	3.1	3.3
B	**Skills**					
B.1	I can do the waste discharge rate survey	3	3	3	4	4
B.2	I can do the waste physical composition survey.	2	1	2	4	4
B.3	I can survey and draw the waste flow	2	1	2	2	3
B.4	I can project the waste amount	0	1	1	2	3
B.5	I can project the waste composition	0	1	1	2	3
B.6	I can calculate the required number of waste collection trucks	0	1	1	2	3
B.7	I can calculate the waste disposal volume based on weighbridge data	4	3	3	3	3
B.8	I can calculate another how many years NEDS become full.	3	1	2	3	3
B.9	I can make a basic plan for sorting facilities in NEDS.	0	1	1	3	3
B.10	I can take preventive measures for causing fire	4	3	3	3	3
B.11	I can estimate the cost of SWM facilities.	1	3	3	3	3
B.12	I can estimate the cost of equipment	1	1	2	2	2
B.13	I can estimate the cost for opeartion of heavy equipment	1	2	2	2	2
B.14	I can estimate the cost of landfilling Operation	4	2	2	2	3
B.15	I can estimate the cost of maintenance of equipment	2	0	1	2	2
B.16	I can formulate the operation and maintenance plan of equipment	2	1	1	2	2
B.17	I can understand EIA report	2	1	1	2	2
B.18	I can conduct environmental monitoring	0	1	2	2	3
B.19	I can paln and implement dam construction for next stage.	4	4	4	4	4
	Average for B	1.8	1.6	1.9	2.6	2.9
C	**Attitude**					
C.1	I can actively think over the SWM conditions and problems and behave toward the solution	4	4	4	4	4
C.2	I can actively contribute the improvement of public health and the environmental preservation.	4	4	4	4	4
C.3	I can involve colleague and staff for taking action	4	4	4	4	4
C.4	I can prepare the realistic proposal taking fully the present conditions into account.	4	4	4	4	4
C.5	I can flexibly deal with the problems based on the characteristics of the problems and resources own.	4	4	4	4	4
C.6	I can listen people's voices and explain them their social duties.	4	4	4	4	4
C.7	I can explain to the people about SWM plan.	4	4	4	4	4
	Average for C	4.0	4.0	4.0	4.0	4.0
	Overall Average Score	2.5	2.8	2.9	3.2	3.4

	Summary	2009 11	2010 07	2011 03	2011 07	2012 03
A	Knowledge	1.6	2.7	2.8	3.1	3.3
B	Skill	1.8	1.6	1.9	2.6	2.9
C	Attitude	4.0	4.0	4.0	4.0	4.0



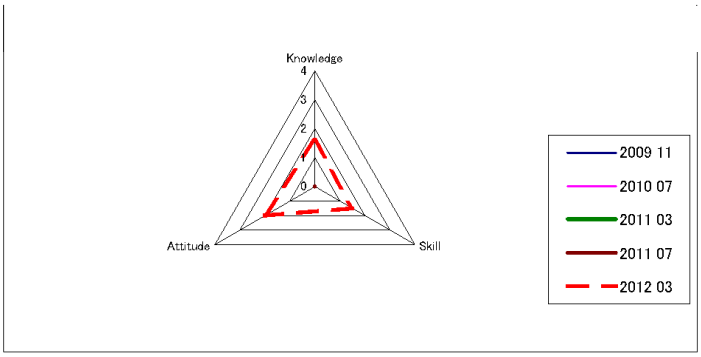
d. アムガラン

Capacity Assessment Evaluation Sheet
Organization:CMPUA
Date of Evaluation: 14 March 2012
Evaluation: Excellent: 4, Good: 3, Fair: 2, Poor: 1 None: 0
C

Code	Items	Assessment				
		2009 11	2010 07	2011 03	2011 07	2012 03
A	**Knowledge**					
A.1	**Basic Subjects**					
A.1.1	I know problems caused by waste.					2
A.1.2	I know the objectives by SWM					2
A.1.3	I know the basic components of SWM technical system.					1
A.1.4	I know the survey method of waste generation amount.					2
A.1.5	I know the method of physical waste composition survey					0
A.1.6	I know the properties of each waste composition.					0
A.1.7	I know the waste properties by source					0
A.1.8	I know how to understand the waste flow.					3
	Average					1.3
A.2	**Discharge, Storage, Collection, Transportation**					
A.2.1	I know various waste discharge and storage system.					3
A.2.2	I know various waste collection methods					2
A.2.3	I know various waste transportation methods					2
A.2.4	I know various equipment of waste transportation					2
	Average					2.3
A.3	**Waste Processing and Treatment**					
A.3.1	I know the mechanism of composting					0
A.3.2	I know the incineration technology					2
A.3.3	I know the RDF technology					3
A.3.4	I know the waste separation technology					2
	Average					1.8
A.4	**Waste Separation and Recycling**					
A.4.1	I know the advantages of waste separation at generation source.					3
A.4.2	I know the disadvantages of waste separation at generation source					2
A.4.3	I know the advantages of Recycling					2
A.4.4	I know the disadvantages of Recycling					2
	Average					2.25
A.5	**Final Disposal**					
A.5.1	I know the problems caused by waste disposal					3
A.5.2	I know the required facility of waste disposal in accordance with waste type					0
A.5.3	I know the leachate control system					1
A.5.4	I know various gas vent system.					2
A.5.5	I know the necessity of security facilities.					2
A.5.6	I know the landfill method.					2
	Average					1.7
A.6	**Healthcare Waste**					
A6.1	I know the type of healthcare wastes and their risk.					1
A6.2	I know how to handle healthcare waste.					2
	Average					1.5
A.7	**Law, Regulation, Guideline**					
A.7.1	Law on Household and Industrial Wastes					2
A.7.2	Ordinance of Minister for Health of Mongolia: Regulation on collection, transportation and disposal of hospital generated waste					0
A.7.3	Joint Ordinance of Minister for Environment and Minister for Health: Approval of list and regulation /Methodological instructions to collect, store, transport and dispose poisonous chemical waste in environment sound manner/					0
A.7.4	Ordinance of Minister for Environment :Approval of Regulation /Regulation on waste disposal operations, special waste disposal facilities, requirements for such facilities, and activities of individuals, companies and organizations that conduct activities related to the waste disposal and removal/					0
A.7.5	Decree of Presidium of City Council :Approval of Regulation on Establishment of buffer zone for waste disposal sites and their					0
A.7.6	Decree of Presidium of City Council: Approval of Regulation on					0
A.7.7	Decree of Presidium of City Council: Regulation to involve organizations, companies and individuals in the activities related to cleaning, maintenance and protection of streets and squares of					0
A.7.8	Decree of Presidium of City Council: Approval of renewing of service fee /Service fee to collect and transport waste of organizations, companies and households of Ulaanbaatar city/					2
A.7.9	Decree of Presidium of City Council: Approval of renewing of service expenses /Tariff for hunting street dogs and cats, waste					2
A.7.10	Decree of Presidium of City Council: Approval of Regulation /Regulation for organizations, companies and individuals to conduct city renovation and cleaning activities/					0
	Average					0.6
A.8	**Social Environmental Consideration**					
A.8.1	I know NIMBY Syndrome					0
A.8.2	I know the environment aspects to be considered for SWM					2
A.8.3	I know the social aspects to be considered for SWM					2
	Average					1.3

A.9	**Contract Management**					
A.9.1	I know advantages and disadvantages of various types of Contracts.					3
A.9.2	I know how to estimate costs.					2
A.9.3	I know how to monitor progress					3
	Average					2.7
A.10	**Basic principals and measures**					
A.10.1	I know Polluter Pay Principles.					2
A.10.2	I know Extended Producers Responsibility					2
A.10.3	I know the administrative measures for the environmental management.					3
	Average					2.3
A.11	**Site Investigations (Geological Survey, Topographical Survey, Social Survey)**					
A.11.1	I know how to conduct geological survey					0
A.11.2	I know how to conduct topographic survey					0
A.11.3	I know how to conduct social survey					2
	Average					0.7
A.12	**Environmental Protection Measures**					
A.12.1	I know the meaning of pollution source and pollution load					1
A.12.2	I know how to consider the environmental protection; Environmental permissible amount, Life cycle assessment, Risk management					0
	Average					0.5
	Average for A					**1.6**
B	**Skills**					
B.1	I can do the waste discharge rate survey					2
B.2	I can do the waste physical composition survey.					2
B.3	I can survey and draw the waste flow					3
B.4	I can project the waste amount					2
B.5	I can project the waste composition					2
B.6	I can calculate the required number of waste collection trucks					1
B.7	I can calculate the waste disposal volume based on weighbridge data					3
B.8	I can calculate another how many years NEDS become full.					1
B.9	I can make a basic plan for sorting facilities in NEDS.					1
B.10	I can take preventive measures for causing fire					2
B.11	I can estimate the cost of SWM facilities.					0
B.12	I can estimate the cost of equipment					0
B.13	I can estimate the cost for opeartion of heavy equipment					0
B.14	I can estimate the cost of landfilling Operation					1
B.15	I can estimate the cost of maintenance of equipment					1
B.16	I can formulate the operation and maintenance plan of equipment					1
B.17	I can understand EIA report					2
B.18	I can conduct environmental monitoring					2
B.19	I can pain and implement dam construction for next stage.					2
	Average for B					**1.5**
C	**Attitude**					
C.1	I can actively think over the SWM conditions and problems and behave toward the solution					1
C.2	I can actively contribute the improvement of public health and the environmental preservation.					2
C.3	I can involve colleague and staff for taking action					3
C.4	I can prepare the realistic proposal taking fully the present conditions into account.					2
C.5	I can flexibly deal with the problems based on the characteristics of the problems and resources own.					2
C.6	I can listen people's voices and explain them their social duties.					2
C.7	I can explain to the people about SWM plan.					2
	Average for C					**2**
	Overall Average Score					

	Summary	2009 11	2010 07	2011 03	2011 07	2012 03
A	Knowledge	0.0	0.0	0.0	0.0	1.6
B	Skill	0.0	0.0	0.0	0.0	1.5
C	Attitude	0.0	0.0	0.0	0.0	2.0



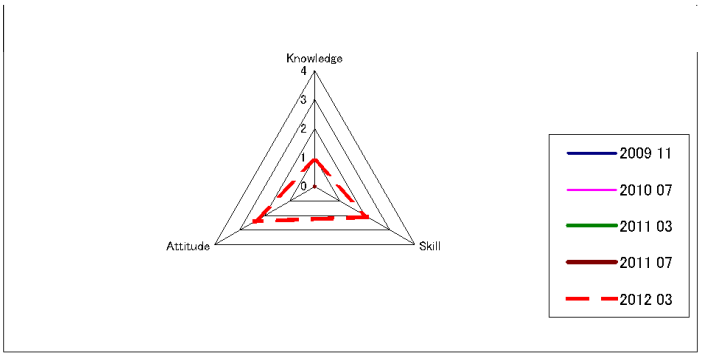
e. オユンチメグ

Capacity Assessment Evaluation Sheet
Organization:CMPUA
Date of Evaluation: 14 March 2012
Evaluation: Excellent: 4, Good: 3, Fair: 2, Poor: 1 None: 0
D

Code	Items	Assessment				
		2009 11	2010 07	2011 03	2011 07	2012 03
A	**Knowledge**					
A.1	**Basic Subjects**					
A.1.1	I know problems caused by waste.					4
A.1.2	I know the objectives by SWM					3
A.1.3	I know the basic components of SWM technical system.					0
A.1.4	I know the survey method of waste generation amount.					1
A.1.5	I know the method of physical waste composition survey					1
A.1.6	I know the properties of each waste composition.					0
A.1.7	I know the waste properties by source					1
A.1.8	I know how to understand the waste flow.					1
	Average					1.4
A.2	**Discharge, Storage, Collection, Transportation**					
A.2.1	I know various waste discharge and storage system.					2
A.2.2	I know various waste collection methods					2
A.2.3	I know various waste transportation methods					3
A.2.4	I know various equipment of waste transportation					3
	Average					2.5
A.3	**Waste Processing and Treatment**					
A.3.1	I know the mechanism of composting					0
A.3.2	I know the incineration technology					2
A.3.3	I know the RDF technology					1
A.3.4	I know the waste separation technology					2
	Average					1.3
A.4	**Waste Separation and Recycling**					
A.4.1	I know the advantages of waste separation at generation source.					2
A.4.2	I know the disadvantages of waste separation at generation source					1
A.4.3	I know the advantages of Recycling					2
A.4.4	I know the disadvantages of Recycling					1
	Average					1.5
A.5	**Final Disposal**					
A.5.1	I know the problems caused by waste disposal					3
A.5.2	I know the required facility of waste disposal in accordance with waste type					0
A.5.3	I know the leachate control system					1
A.5.4	I know various gas vent system.					1
A.5.5	I know the necessity of security facilities.					1
A.5.6	I know the landfill method.					2
	Average					1.3
A.6	**Healthcare Waste**					
A6.1	I know the type of healthcare wastes and their risk.					1
A6.2	I know how to handle healthcare waste.					0
	Average					0.5
A.7	**Law, Regulation, Guideline**					
A.7.1	Law on Household and Industrial Wastes					3
A.7.2	Ordinance of Minister for Health of Mongolia: Regulation on collection, transportation and disposal of hospital generated waste					1
A.7.3	Joint Ordinance of Minister for Environment and Minister for Health: Approval of list and regulation /Methodological instructions to collect, store, transport and dispose poisonous chemical waste in environment sound manner/					1
A.7.4	Ordinance of Minister for Environment :Approval of Regulation /Regulation on waste disposal operations, special waste disposal facilities, requirements for such facilities, and activities of individuals, companies and organizations that conduct activities related to the waste disposal and removal/					1
A.7.5	Decree of Presidium of City Council :Approval of Regulation on Establishment of buffer zone for waste disposal sites and their					1
A.7.6	Decree of Presidium of City Council: Approval of Regulation on					1
A.7.7	Decree of Presidium of City Council: Regulation to involve organizations, companies and individuals in the activities related to cleaning, maintenance and protection of streets and squares of					1
A.7.8	Decree of Presidium of City Council: Approval of renewing of service fee /Service fee to collect and transport waste of organizations, companies and households of Ulaanbaatar city/					1
A.7.9	Decree of Presidium of City Council: Approval of renewing of service expenses /Tariff for hunting street dogs and cats, waste					1
A.7.10	Decree of Presidium of City Council: Approval of Regulation /Regulation for organizations, companies and individuals to conduct city renovation and cleaning activities/					1
	Average					1.2
A.8	**Social Environmental Consideration**					
A.8.1	I know NIMBY Syndrome					0
A.8.2	I know the environment aspects to be considered for SWM					0
A.8.3	I know the social aspects to be considered for SWM					0
	Average					0

A.9	**Contract Management**					
A.9.1	I know advantages and disadvantages of various types of Contracts.					1
A.9.2	I know how to estimate costs.					1
A.9.3	I know how to monitor progress					1
	Average					1
A.10	**Basic principals and measures**					
A.10.1	I know Polluter Pay Principles.					0
A.10.2	I know Extended Producers Responsibility					0
A.10.3	I know the administrative measures for the environmental management.					1
	Average					0.3
A.11	**Site Investigations (Geological Survey, Topographical Survey, Social Survey)**					
A.11.1	I know how to conduct geological survey					0
A.11.2	I know how to conduct topographic survey					0
A.11.3	I know how to conduct social survey					0
	Average					0
A.12	**Environmental Protection Measures**					
A.12.1	I know the meaning of pollution source and pollution load					0
A.12.2	I know how to consider the environmental protection; Environmental permissible amount, Life cycle assessment, Risk management					0
	Average					0
	Average for A					**0.9**
B	**Skills**					
B.1	I can do the waste discharge rate survey					2
B.2	I can do the waste physical composition survey.					1
B.3	I can survey and draw the waste flow					1
B.4	I can project the waste amount					1
B.5	I can project the waste composition					1
B.6	I can calculate the required number of waste collection trucks					3
B.7	I can calculate the waste disposal volume based on weighbridge data					4
B.8	I can calculate another how many years NEDS become full.					2
B.9	I can make a basic plan for sorting facilities in NEDS.					2
B.10	I can take preventive measures for causing fire					1
B.11	I can estimate the cost of SWM facilities.					1
B.12	I can estimate the cost of equipment					2
B.13	I can estimate the cost for opeartion of heavy equipment					4
B.14	I can estimate the cost of landfilling Operation					4
B.15	I can estimate the cost of maintenance of equipment					4
B.16	I can formulate the operation and maintenance plan of equipment					3
B.17	I can understand EIA report					2
B.18	I can conduct environmental monitoring					0
B.19	I can pain and implement dam construction for next stage.					1
	Average for B					**2.1**
C	**Attitude**					
C.1	I can actively think over the SWM conditions and problems and behave toward the solution					1
C.2	I can actively contribute the improvement of public health and the environmental preservation.					1
C.3	I can involve colleague and staff for taking action					3
C.4	I can prepare the realistic proposal taking fully the present conditions into account.					3
C.5	I can flexibly deal with the problems based on the characteristics of the problems and resources own.					2
C.6	I can listen people's voices and explain them their social duties.					4
C.7	I can explain to the people about SWM plan.					3
	Average for C					**2.4**
	Overall Average Score					**1.8**

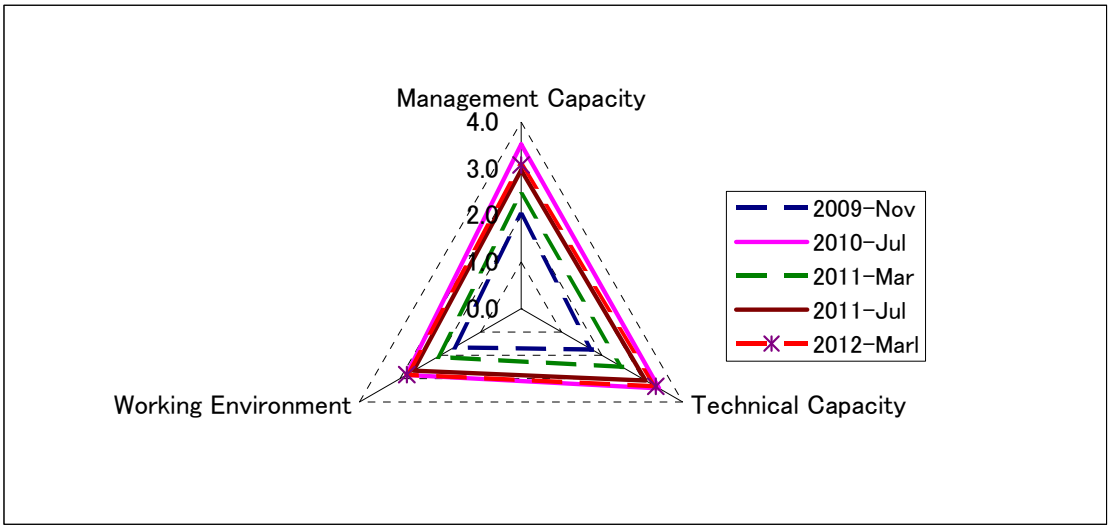
	Summary	2009 11	2010 07	2011 03	2011 07	2012 03
A	Knowledge	0.0	0.0	0.0	0.0	0.9
B	Skill	0.0	0.0	0.0	0.0	2.1
C	Attitude	0.0	0.0	0.0	0.0	2.4



I.2.2 組織評価

a. 要約

Item		Assessment				
		2009-Nov	2010-Jul	2011-Mar	2011-Jul	2012-Marl
A	**Management Capacity**	2.0	3.5	2.4	3.0	3.1
B	**Technical Capacity**	1.8	3.4	2.5	3.1	3.3
C	**Working Environment**	1.7	2.8	2.1	2.7	2.8
	Average	1.8	3.3	2.3	2.9	3.1



b. 詳細

Capacity Assessment Evaluation Sheet
Organization:CMPUA
Position:Director
Date of Evaluation:Jul 2011
Evaluation: Excellent: 4, Good: 3, Fair: 2, Poor: 1 None: 0

No	Organization:CMPUA	2009 11	2010 07	2011 03	2011 07	2012 03
A	**Management Capacity**					
A.1	**Planning**					
A.1.1	We know the objectives and roles of CMPUA	3	4	4	4	4
A.1.2	The appropriate budget for CMPUA can be prepared.	3	4	3	4	4
A.1.3	We can formulate operation plan of equipment.	1	4	2	3	3
A.1.4	We can formulate maintenance plan of equipment.	1	4	2	3	3
	Average	2.0	4.0	2.8	3.5	3.5
A.2	**Communication**					
A.2.1	We know CMPUA's activity schedule of this year.	3	4	4	4	4
A.2.2	We know CMPUA's activity schedule of this month.	2	4	3	3	3
A.2.3	We have periodical meeting among department staff.	2	4	3	4	4
A.2.4	We always report my findings to my boss and other staff.	2	4	2	3	3
A.2.5	We have opportunities to discuss my opinions with my colleagues.	2	4	2	3	3
	Average	2.2	4.0	2.8	3.4	3.4
A.3	**Human Resource Management**					
A.3.1	There are sufficient number of staffs for the works	2	4	3	3	3
A.3.2	The staffs have sufficient capacities (knowledge, skill, attitude, qualification, etc.) to do the work.	2	3	3	3	3
A.3.3	Attendance is properly recorded.	3	4	4	4	4
A.3.4	Leaves are properly recorded	3	3	3	3	3
	Average	2.5	3.5	3.3	3.3	3.3
A.4	**Directions**					
A.4.1	There are clear instructions from head of the department	2	4	3	4	4
A.4.2	Instructions are not inconsistent	3	3	3	4	4
A.4.3	Instructions are made according to the capacity of the staffs	3	3	3	3	3
	Average	2.7	3.3	3.0	3.7	3.7
A.5	**Financial Management**					
A.5.1	CMPUA can arrange necessary budget for operation of NEDS.	3	3	3	4	4
A.5.2	CMPUA can claim waste collection and transportation fees from WSF timely	3	1	3	3	3
A.5.3	CMPUA can make a payment to his workers without delay.	3	4	3	4	4
	Average	3.0	2.7	3.0	3.7	3.7
A.6	**Maintenance Management**					
A.6.1	CMPUA has spare parts record and update periodically	1	3	3	4	4
A.6.2	CMPUA has written procedure to order spare parts	2	3	3	4	4
A.6.3	CMPUA stores the necessary spare parts in order to save the idling time of	1	3	2	3	3
A.6.4	CMPUA has allocated necessary budget for the consumables and spare parts for heavy equipment.	1	4	2	3	3
A.6.5	CMPUA prepare and submit report on maintenance of equipment periodically	1	3	2	3	3
	Average	1.2	3.2	2.4	3.4	3.4
A.7	**Operation Management**					
A.7.1	CMPUA prepare report on operation of equipment periodically	1	3	2	2	3
A.7.2	CMPUA prepare waste collection plan periodically	1	3	1	2	2
A.7.3	CMPUA manage the waste collection area visually.	1	4	1	2	3
	Average	1.0	3.3	1.3	2.0	2.7
A.8	**Coordination with relevant organizations**					
A.8.1	CMPUA can prepare the proposals to donors.	2	3	2	2	2
A.8.2	CMPUA can correspond to the donors.	1	4	1	2	3
A.8.3	CMPUA can coordinate with relevant organizations such as Ministry of Nature, Environment and tourism, Ministry of Health, Specialized Inspection Agency, etc.	3	4	3	3	3
	Average	2.0	3.7	2.0	2.3	2.7
A.9	**Publicity**					
A.9.1	CMPUA can update web-site	0	4	0	0	0
A.9.2	CMPUA can respond or dispatch messages through media	3	4	3	3	3
	Average	1.5	4	1.5	1.5	1.5
	Average for A	**2.0**	**3.5**	**2.4**	**3.0**	**3.1**

B	**Technical Capacity**					
B.1	**Understanding the current conditions**					
B.1.1	CMPUA can compile and analyze weighbridge data	2	4	3	4	4
B.1.2	CMPUA knows the weigh bridge data in a digital file format everyday.	1	3	3	4	4
B.1.3	CMPUA knows the waste collection amount everyday.	2	4	3	4	4
	Average	1.7	3.7	3.0	4.0	4.0
B.2	**Technical Support**					
B.2.1	CMPUA can organize the monitoring committee for the assessment of sanitary	2	3	3	3	3
B.2.2	CMPUA can prepare and submit environmental monitoring report periodically.	2	2	3	3	4
B.2.3	CMPUA can train other Aimag officers for the operation of sanitary landfilling	2	3	3	3	4
	Average	2.0	2.7	3.0	3.0	3.7
B.3	**Social Consideration**					
B.3.1	CMPUA can pay attention of working conditions of waste pickers	1	4	2	2	2
B.3.2	CMPUA can manage waste pickers for safety operation of landfill.	2	4	2	2	3
B.3.3	CMPUA can coordinate waste pickers to implement waste separation in NEDS	2	4	3	4	4
	Average	1.7	4.0	2.3	2.7	3.0
B.4	**Project Implementation**					
B.4.1	CMPUA can take initiative to implement the separate discharge and separate collection pilot project	1	4	1	3	3
B.4.2	CMPUA can formulate project implementation plan.	2	3	2	2	2
B.4.3	CMPUA can examine and realize the necessary cost for operation and advantages and disadvantages of each plan for promoting recycling	2	3	2	3	3
	Average	1.7	3.3	1.7	2.7	2.7
	Average for B	**1.8**	**3.4**	**2.5**	**3.1**	**3.3**
C	**Working Environment**					
C.1	**Education and Training**					
C.1.1	There is a training programme for the staff	1	2	1	1	2
C.1.2	Anybody can attend training course when they request.	1	2	2	2	2
C.1.3	Chances of attending training course are even to all the staff	1	4	1	2	2
	Average	1.0	2.7	1.3	1.7	2.0
C.2	**Salary**					
C.2.1	We are receiving appropriate salary according to the type of work.	2	3	3	3	3
C.2.2	We are receiving appropriate salary according to the amount of work	2	2	2	2	3
C.2.3	We are receiving appropriate salary according to the position	2	3	3	3	3
	Average	2.0	2.7	2.7	2.7	3.0
C.3	**Quality of Work**					
C.3.1	Our work is useful to build better society.	3	4	3	3	3
C.3.2	Our work is closely related with people's life.	3	4	3	4	4
C.3.3	Information regarding our work are frequently come out in the media.	3	4	3	4	4
C.3.4	We are proud of doing my work.	3	4	3	4	4
	Average	3.0	4.0	3.0	3.8	3.8
C.4	**Amount of Work**					
C.4.1	Our work can be completed within the working hours	2	4	2	3	4
C.4.2	We feel amount of work is appropriate	2	3	2	3	4
C.4.3	Overtime is paid according to the actual working hour	1	4	1	1	1
C.4.4	We can take a paid vacation without difficulty	1	4	2	3	3
	Average	1.5	3.8	1.8	2.5	3.0
C.5	**Office equipment**					
C.5.1	The size and number of desks, chairs, drawers, cabinets, etc. is sufficient.	2	3	3	3	3
C.5.2	There are enough computers.	2	3	3	3	3
C.5.3	There are enough printers.	2	3	2	3	3
C.5.4	There are enough photocopiers.	1	3	2	3	3
C.5.5	There are enough meeting spaces	1	2	1	2	2
	Average	1.6	2.8	2.2	2.8	2.8
C.6	**Communication means**					
C.6.1	NEDS has fixed telephone line.	0	0	0	0	0
C.6.2	Central Workshop has fixed telephone line	3	4	3	3	3
C.6.3	Broadband internet is accessible at NEDS	0	0	2	3	3
C.6.4	Broadband internet is accessible at CMPUA Office	3	0	3	3	3
	Average	1.5	1.0	2.0	2.3	2.3
C.7	**Transportation**					
C.7.1	There are enough vehicles for the work.	1	4	2	3	3
C.7.2	Transportation cost for the work is refundable	1	2	1	3	3
	Average	1.0	3.0	1.5	3.0	3.0
	Average for C	**1.7**	**2.8**	**2.1**	**2.7**	**2.8**
	Total Average	**1.8**	**3.3**	**2.3**	**2.9**	**3.1**