

LESSONS FROM PIT LATRINE EMPTYING PROGRAMME

THE CONTRACT
AND
THE PITFALLS



A TYPICAL FORMAL VIP (NOT A BASIC PIT)



Things that were not taken into account at the time of construction

- Accessibility for emptying
- Community requirements
- How pit latrines would be emptied
- Cost of emptying the Pit Latrines
- **Education**

Ethekweni conducted a pilot study to evaluate the following

- The number of Pit latrines to be emptied
- The most suitable method of pit emptying
- The most economical method
- The method that the community would buy into
- The best method of disposal of the sludge

The pilot study was carried out in 500 sites selected on two main criteria

- Varying terrain
- Varying pit types

During the trial it was established that

- There were approximately 80000 pit latrines in Ethekekwini
- Council had approved that the pits would be emptied on a 5 year cycle
- Any additional emptying required would be to owners account
- Excavation buy hand was the easiest method
- Managing Contractor to be appointed



- Teams of six were the most economical
- Disposal of sludge at the Wastewater Treatment Works was the easiest
- That the community be employed as subcontractors

A contract was advertised

- A reassessment showed that there were only 35000 VIP pit latrines
- The award was made in 2007 to a joint venture Managing Contractor to empty 30000 VIP'S in Phase 1 which had a three year contract period.
- Through the Departments Procurement Section Six Sub Contractors were selected to work as Nominated Sub Contractors.
- The subcontractors in turn employed six teams of six persons made up from local labour from the area.

Key issues with the contract

- Health and Safety
- Tools and equipment
- Removal of sludge from site.
- Disposal of sludge

Health and safety

All staff are given a medical prior to engagement which includes the following

- a) Occupational Medical Questionnaire
- b) Occupational Medical Examination
- c) Notification of Result of Medical Examination
- d) Exit Medical Examination

ANNEXURE 13

OCCUPATIONAL MEDICAL QUESTIONNAIRE

NAME:	COMPANY: GRP/SLB JOINT VENTURE	JOB DESCRIPTION:
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ID NO:																			
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CD NO:																			
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PERSONAL HISTORY

Do you smoke?	Yes	No	Stopped Number per day:
Do you use alcohol?	Yes	No	Quantity per week:
Do you exercise	Yes	No	Specify:

FAMILY HISTORY

Have any of your relatives suffered from hypertension, high cholesterol, heart disease, epilepsy, diabetes, blindness, porphyria, cancer or any other hereditary disease?			
YES	NO	Specify:	

OCCUPATIONAL HISTORY		
Company	Period	Job Description

Please indicate if you are currently, or have previously been, exposed to any of the following hazards					
Noise	Radiation	Dust	Hazardous chemicals Substances	Heat Stress	

Have you ever been found medically unfit to perform any duties?	Yes	No	Specify
Have you ever had treatment for any occupational disorder?	Yes	No	Specify

MEDICAL HISTORY

Have you suffered or are you suffering from any of the following?

1. Heart disease, high blood pressure, chest pain or blood clots	Yes	No
2. Asthma, tuberculosis, chronic bronchitis or shortness of breath	Yes	No
3. Hay fever, sinusitis or allergies	Yes	No
4. Heartburn, peptic ulcer, vomiting of blood, blood in the stool or jaundice	Yes	No
5. Gout, arthritis, back problems, conditions affecting joints, loss of a limb or loss of function of a limb	Yes	No
6. Epilepsy, blackouts, dizziness or head injury	Yes	No
7. Depression, anxiety, schizophrenia, alcohol dependency, drug dependency or any mental disorder	Yes	No
8. Loss of hearing or vision	Yes	No
9. Diabetes, thyroid problems or glandular disorders	Yes	No
10. Disorders of kidneys, bladder or genital system	Yes	No
11. Scaling, blistering or redness of the skin	Yes	No
12. Cancer or tumors	Yes	No
13. Operations	Yes	No
14. Any other disorder not mentioned above	Yes	No
15. Are you currently using any medication?	Yes	No
16. Do you have a false limb, prosthesis, hearing aid or pacemaker?	Yes	No
17. Females only: Are you currently pregnant?	Yes	No

If "Yes" to any of the above, please complete:

No.	Condition	Year

I DECLARE THAT:

- All information in the occupational medical questionnaire is correct to the best of my knowledge.
- I have not omitted any information concerning my health I accept to undergo the relevant medical examination and tests as requested by **GRP/SLB JOINT VENTURE**
- I authorize the doctor appointed by **GRP/SLB JOINT VENTURE** to obtain any relevant medical information from my general practitioner or specialist.

Name of Employee

Signature of Employee

Date



ANNEXURE 15

NOTIFICATION OF RESULT OF MEDICAL EXAMINATION

NAME : _____

IDENTITY NUMBER

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COMPANY: GRP/SLB (Joint Venture)	JOB DESCRIPTION:
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SPECIAL EXAMINATIONS PERFORMED:

Audiometry		Spirometry	
Chest X-ray		Resting and Effort ECG	
Visual Screening		Heat Stress Evaluation	
Other			

THE ABOVEMENTIONED HAS UNDERGONE THE TESTS AND EXAMINATIONS AS REQUESTED AND THE FOLLOWING WERE FOUND:

Fit to perform duties as per job description.

Not fit to perform duties as per job description.

Fitness pending further investigation.

EXCLUSIONS:

Nil		Heat Stress Areas		Heights, open water, fire, electricity or moving machinery.	
Noise Zones		Driving – Codes A1, A, B or EB			
Respiratory Risk Areas		Driving – Codes C1, EC1 or EC			
Other					

REFERRAL:

Nil		Own Health Care Provider		Optician		Audiologist	
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MEDICAL PRACTITIONER'S DECLARATION

Signed at _____ on ____ / _____ 200

OCCUPATIONAL MEDICAL PRACTITIONER	NAME		SIGNATURE	
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EXIT OCCUPATIONAL MEDICAL EXAMINATION

NAME:	COMPANY: GRP/SLB JOINT VENTURE	JOB DESCRIPTION:
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ID NO:

HEIGHT	m	WEIGHT	kg	BMI	
BP	mmHG	PULSE	/min	RHYTHM	NORMAL/ABNORMAL

URINE	NAD	BLOOD	PROTEIN	GLUCOSE	LEUCOCYTES
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ABNORMALITIES

Skin or Appendages	Yes	No		Gastro Intestinal System	Yes	No
Ophthalmic System	Yes	No		Genito Urinal System	Yes	No
Ear, Nose and Throat	Yes	No		Musculo Skeletal System	Yes	No
Cardio vascular System	Yes	No		Central Nervous System	Yes	No
Respiratory System	Yes	No		Endocrine System	Yes	No

SPECIAL EXAMINATIONS

Visual	Acuity R: 20/	Fields R	Color Vision Normal	Yes	No	Night Vision Normal	Yes	No
	Acuity L: 20/	Fields L				Wearing Glasses or Contact Lens		

FVC %	%	FEV1%	%	RATIO	%	PLH	%	CXR		NIHL	Yes	No
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DESCRIPTION OF ABNORMALITIES

IDENTIFIED OCCUPATIONAL DISORDERS

CHRONIC DISEASES

Hypertension	Asthma	Epilepsy	Mental	Drug/Alcohol	Diabetes
Obesity	Thyroid	COPD	Cardiac	Prosthesis	Arthritis

REFERRAL

	Nil
	Own Health Care Provider
	Optician
	Audiologist

COMMENTS

DECLARATION BY MEDICAL PRACTITIONER

Signed at _____ on _____ / _____ /2008

Name of Medical Practitioner

Signature of Medical Practitioner

Date _____



Health and safety

All staff are issued with PPE which includes

- a) Uniforms
- b) Safety steel toe gumboots
- c) Gas masks
- d) Rubber gloves
- e) Hats/Hard hats

Some examples of the ppe





Health and safety

Ablution facilities at each site which include

- a) Chemical portable toilets
- b) Shower Facilities
- c) Disinfectant soap
- d) Hand cleaner

The construction of the pits and the variance in design created a lot of problems with accessibility







Method of emptying pits

- Most economic method of emptying pits is by hand



Tools and equipment

- Some of the tools used to empty the pit latrines



Some of the specially created tools





The Gulper

- This was originally demonstrated by Steve Sugden
- We have modified the original for various reasons



Detritus is one of the problems encountered



Removal of sludge from place of residence

- If the sludge is not buried on site then
- Drumbarrowers are the most common method of transporting the Sludge on sites with no vehicular access
- Drums are half filled before transportation to collection site
- Collection site is the nearest vehicular collection point



Removal sludge from site of works

- Sludge is then removed from site by various vehicular methods to collection points
- It is taken to Burial sites or Treatment works



Liaison and education

- Liason
 - CLO'S appointed in each working area
 - Public meetings held prior to entering area
 - Workers sourced with local Councillor
 - CLO visits all affected homes

Education

- Council Liaison officers visit community
 - Community educated about use of VIP
 - Community educated about hygiene
 - Pamphlets handed out to community
 - **Council Liaison officers revisit community on an ongoing basis to reinforce the above**

Page of pamphlet



Disposal of sludge

- The various methods proposed from the pilot study are:
 - Discharge into Waste Water Treatment Works
 - Discharge into nearby water borne sewer
 - Burial on site
 - Dispose at landfill site
 - Discharge to sea outfall
 - Burial off site

Discharge at treatment works



Discharge at treatment works

- Organic loading
- High nitrogen content – compounds problems with nitrification in the process
- Overloading of works digesters
- Drop off in final effluent quality
- Digested sludge in, digested sludge out

Discharge into nearby waterborne sewer

- No nearby sewer
- Settling out of solids and grit in sewer
- No nearby water connection for liquification of sludge
- Arrives at treatment works causing problems at works

Burial on site

- Only possible in rural areas.
- Not in built up highly dense areas.
- Due to high pathogen loading this could be problematic if residents are migrant
- Not an environmental problem – stabilised (digested) sludge.

Disposal at landfill site

- New guidelines for disposal of digested sludge
- Guidelines completed by Golder & Ass for WRC given to DWAF
- Proposal was to mix in 5% lime by volume – Delists sludge
- Still must conform to co disposal regs (10%)
- However could not get DWAF approval

Burial off site

- Current study at umlazi e-ponds



PROPOSAL

- To bury pit sludge in trenches
- Trenches 2m deep 1m wide at 3m centres
- Boreholes installed around the perimeter to monitor ground water before, during and after by Dave Still
- Sludge to be buried in various layer thicknesses and capped
- Trees of various varieties to be planted protected and monitored varying from gum trees to fruit trees

PROPOSAL (contd)

- Trees are planted between trenches and in some cases on top of trenches
- Vermiculture and Botany specialists will be involved
- Continuous sampling of incoming sludge and analysis of the buried sludge by KZN University
- On completion of project a full report prepared by WRC and submitted to DWAF for use in other areas



Recording on completion

- Owners sign a completion certificate
- Toilet is numbered
- GPS referenced
- Captured on our GIS system



Sludge pelletising

- Necessary to dispose of the sludge stockpile at treatment works
- Joint venture with private companies
- Design and patent of Spaghetti producing machine
- Removes detritus
- Produces pathogen free fertilizer
- Mobile



Lessons learned from the pit latrine emptying project

- The pits are not used properly
- Emptying of the pits is an extremely messy, smelly and unhygienic process
- It is costly to empty VIP's
- Disposal of the sludge is not easy
- New on site pit latrines should be UD toilets

Ongoing education plays a big part in the success of pit latrine management



THANK YOU

