Annex 3.56 Action Plan 1 for O&M of Mechanical Equipment in Fall 2016



Training Title:	O & M Module 1 and Module 4	Date of Training:	Dec.26-Dec 30 th , 2016
Name of Participa	nt: <u>Amir Tufail</u>		
Name of Organiza	ation: WASA Lahore		

Please list three important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on SOP, Record Keeping, Preventive maintenance and HSE*)

1.

Make a schedule of repair maintenance of the disposals&tubewells about machinery (Error) & check &balance the record on daily basis.

2.

Normally maintenance manuals & the timing of operating machinery manuals all must be available on sites.

3.

In relevant field like pumps,motors&different types of valves even chlorination &major thing is ultrafiltration plant which are the main thing of my department .Personally I learn above mention thing that how to create normally repair, their functions. Causes of their damaging much more.

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA.

Sr. No.	Action Item (what)	Responsible (who)	Due Date (when)	Date Completed	Comments
1	Burn out the motor with and cause.	S.E	30-12-2016	31-12-2016	Due to workshop
2	Finalize the created plan	Sub Engg &SDO	30-12-16	5-1-1017	Team not available
3					
4					

- 1. Laptop where I make schedule of all machinery.
- 2. Log books at all for daily check and balance.
- 3. Manuals/Printed sheets at site must.
- 4. Department permission& funds.
- 5. Good team

Please identify any barriers or hindrances to the implement this plan.

- 1. Trained workers shortage.
- 2. Latest equipment which need but not avail abled.
- 3. Bad team

Other Comments or Notes:

Due to short time of training I learn more about my relevant field my responsibilities but main things remain which I will trying to gain the knowledge a lot by training.



Training Title:	O & M Module 1 and Module 4	Date of Training:	Dec.26-Dec 30 th , 2016
Name of Particip	oant: Fayyaz Ahmed		
Name of Organiz	zation: WASA Lahore		

Please list three important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on SOP, Record Keeping, Preventive maintenance and HSE*)

1.

Scheduling of repair, maintenance and cleanliness of installations(i.e tube wells, disposal stations, filtration plants)

2.

Displaying Sop's, data sheets and schedule at all installations as well as maintain officials record

3.

Monitoring, implementation and evaluation of schedules, SOP's, manuals and plans.

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA.

Sr. No.	Action Item (what)	Responsible (who)	Due Date (when)	Date Completed	Comments
1	Collecting manuals and SOP's from manufacturers.	SDO	7-1-2017	10-1-17	Delayed by manufacture r
2	Scheduling of O&M in accordance with the SOP's or manuals	SDO and Sub- Engg	12-1-17	12-1-17	
3	Reviewing of plans plans/drafts and displaying for implementation	SDO and Sub- Engg, Supervisor ,O perators	15-1-17	20-1-17	Team not available
4		-			

. Г			

- 1. Computer system/laptop
- 2. Departmental permission/funding
- 3.Work force
- 4.Printed sheets
- 5. Log books/work space etc.

Please identify any barriers or hindrances to the implement this plan.

- 1. Trained workers shortage.
- 2. Latest equipment's unavailability
- 3. Managements restriction/centralization of authorities
- 4.

- 1. Action plan can suffer due to interference of political or management's.
- 2. Non availability of resources can also disturb plan.
- 3. Multitasking duties and overburden of work can also fail the action plan.



Training Title:	O & M Module 1 and Module 4	Date of Training:	Dec.26-Dec 30 th , 2016
Name of Particip	oant: Souman Khalid		
Name of Organiz	zation: WASA Lahore		

Please list three important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on SOP, Record Keeping, Preventive maintenance and HSE*)

1.

Implementation plans for Sop's, Record keeping, preventive maintenance and HSE.

2.

Check for implementation of above mentioned plans on regular basis.

3.

Always try to improve the plans and implement them.

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA.

Sr. No.	Action Item (what)	Responsible (who)	Due Date (when)	Date Completed	Comments
1	Provision of maintenance plan for pumps	SDO&SE	15-1-2017		
2	Implementation of the plan(Regular basis)	Operator	20-1-17 weekly		
3	Inspections for regular proper implementation	Sub- Engg	27-1-17 weekly		
4		SDO&SE	15-2-17		
	Make a better plan or follow previous one.		Every Month		

1. Time

2. Manuals

- 3. Trainer
- 4.Funds(For prizes)

Please identify any barriers or hindrances to the implement this plan.

- 1. Frequent public complaints(Time)
- 2. Political involvements
- 3. Attitude of workers

Other Comments or Notes:

The plan can be implemented with some efforts and the support of high-ups to ensure the decrease in political pressure .If implemented this plan can reduce a lot of breakdown complaints and may give a huge relief to public as well as departments budget.



Training Title:	O & M Module 1 and Module 4	Date of Training:	Dec.26-Dec 30 th , 2016
Name of Particip	oant: <u>Waqas Liaqat</u>		
Name of Organiz	zation: WASA Lahore		

Please list three important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on SOP, Record Keeping, Preventive maintenance and HSE*)

1.

Preparation of maintenance history of every installation

2.

Focus on	n problema	atic/weak	areas	and	make	improve	ment plan

3.

Consultation with lower staff for important and then prepare plan for improvement with the consultation of higher ups.

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA.

Sr. No.	Action Item (what)	Responsible (who)	Due Date (when)	Date Completed	Comments
1	Identify low performance installation	SDO			
2	Checking needs repair/	SE			
3	Make proper/Estimate	SE			
4	Pursue until job done	SDO			

- 1. Installation history, its useful life etc.
- 2. Strong justification for its improvement
- 3. Required specification
- 4.Funds

Please identify any barriers or hindrances to the implement this plan.

- 1. Funds availability
- 2. Management interest
- 3.



Training Title:	O & M Module 1 and Module 4	Date of Training:	Dec.26-Dec 30 th , 2016
Name of Particip	pant: M Shakeel Ahmed		
Name of Organiz	zation: WASA Multan		

Please list three important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on SOP, Record Keeping, Preventive maintenance and HSE*)

1.

Keeping the all record that you need the time of maintenance.

2.

Trained the supervisor and other staff to maintain the site.

3.

Management is strong about the maintenance works.

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA.

Sr. No.	Action Item (what)	Responsible (who)	Due Date (when)	Date Completed	Comments
1	Contact KSB to request for provide gate valves	SDO	5-1-2017	10-1-2017	Installed the gate valve
2	Review draft to finalize the plan according the mothod	Sub- Engg	15-1-17	15-1-2017	
3	Visit the site with technical team	SDO and Sub- Engg	20-1-17	23-1-2017	Completed the visited
4					

- 1. Financial support for the body.
- 2. Key plan is ready to do the work at site
- 3. Man power is available for work.
- 4. Technical experts are provided the instructions to team.
- 5. All the work is to be done in specification.

Please identify any barriers or hindrances to the implement this plan.

- 1. Technical Team
- 2. Funds
- 3. Required tools for maintenance and operation

Other Comments or Notes:

All the team is to need the training about the maintenance provided the all tools at the site. Management is also to strong .Responsible peoples are known about the site.



Training Title: O & N	A Module 1 and Module 4	Date of Training:	Dec.26-Dec 30 th , 2016
Name of Participant:	Umair Ayub		
Name of Organization:	WASA Multan		

Please list three important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on SOP, Record Keeping, Preventive maintenance and HSE*)

1.

Importance of preventive maintenance

2.

The need to train the tube wells and pumps operators

3.

Importance of record keeping

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA.

Sr. No.	Action Item (what)	Responsible (who)	Due Date (when)	Date Completed	Comments
1	Requesting of O&M manuals from our vendors	SDO	7-1-2017		
2	Training the operators about standard SOP's	SDO and Sub- Engg	1-2-17		
3	Maintain and develop a sustainable inspection plan for pumps and motors	SDO and Sub- Engg	1-2-17		
4					

1. O&M manuals for all pumps, motors, valves and filtration plants

2. Standard maintenance products of required quality

3. Most important thing would be continuous inspection and maintenance plans regardless of the changing personal charge of facilities.

4.

Please identify any barriers or hindrances to the implement this plan.

- 1. Most difficult barrier can be the intra departmental communication about following a common plan for inspection of pumps, valves and motors.
- 2. 3.
- 2.

Annex 3.57 Action Plan 2 for O&M of Mechanical Equipment in Fall 2016



Training Title:	O & M Module 5 and Module 7	Date of Training:	Jan 9 th -Jan 13 th , 2017
Name of Particip	pant: <u>Aamir Tufail</u>		
Name of Organiz	zation: WASA Lahore		

Please list five important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on assembly components, preventive maintenance, operating procedures and HSE*)

- 1. HSE
- 2. Understanding equipment components and their functions
- 3. Preventive maintenance plan
- 4. SOPs
- 5. Record keeping

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA. "Develop equipment maintenance log for Ichra Sub Division O& M"

Sr. No.	Action Item (what)	Responsible (who)	Due Date (when)	Date Completed	Comments
1	Plan or discuss with SDO	SE	5-2-17	5-2-17	
2	Call a meeting to discuss detail	SDO	8-3-17	9-3-17	
3	Review draft list to finally list of vehicles driver	Computer operator/SE	15-3-17	16-3-17	
4	Meeting with team for discussion	SE/SDO	25-3-17	26-3-17	
5	Implementation	SE/SDO	2-4-17	2-4-17	

- 1. Good team
- 2. Proper material
- 3. Effort of all team specially immediate boss
- 4.
- 5.

Please identify any barriers or hindrances to the implement this plan.

1.Bad team

2.Shoratge of time for planning

3.miner resources



Training Title: O & M	Module 5 and Module 7	Date of Training:	Jan 9 th -Jan 13 th , 2017
Name of Participant: Fa	ayyaz Ahmed		
Name of Organization:	WASA Lahore		

Please list five important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on assembly components, preventive maintenance, operating procedures and HSE*)

- 1. HSE 1.PPE
- 2. Understanding equipment components and their functions 2. Equipment Record
- 3. Preventive maintenance plan 3. Vehicles maintenance schedules
- 4. SOPs 4.store space management
- 5. Record keeping 5. Work time measurement

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA. "Develop equipment maintenance log for South Drainage Yard"

Sr. No.	Action Item (what)	Responsible (who)	Due Date (when)	Date Completed	Comments
1	Meeting with staff	SDO	20-1-17		
2	Production of protective equipment lists from store	Sub Engineer	22-1-17		
3	Allocation of equipment's to staff as required	SE	24-1-17		
4	On job implementation distribution of equipment's	SE	26-1-17		
5	Finalizing of lists and reviews	SDO+SE	30-1-17		

- 1. Stock register
- 2. Procured equipment's along with user manuals
- 3. Trained supervisor + workers
- 4. Office work place
- 5. Organizational SOP'S

Please identify any barriers or hindrances to the implement this plan.

1.Overloading of work

2.Multitasking job

3.Improper and non-maintained stocks/records

Other Comments or Notes:

The procurement of equipment's for safety is mostly carried out by the procurement and stores department, so the equipment's are most of the times are not procured as per requirements.



Training Title:	0 & M	Module 5 and Module 7	Date of Training:	Jan 9 th -Jan 13 th , 2017
Name of Particip	oant: <u>So</u>	ouman Khalid		
Name of Organiz	zation:	WASA Lahore		

Please list five important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on assembly components, preventive maintenance, operating procedures and HSE*)

- 1. HSE
- 2. Understanding equipment components and their functions
- 3. Preventive maintenance plan
- 4. SOPs
- 5. Record keeping

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA. "Develop equipment maintenance log for WASA workshop Lahore"

Sr. No.	Action Item (what)	Responsible (who)	Due Date (when)	Date Completed	Comments
1	Record keeping	SE/SDO	7-2-17		
2	SOP's	SE/SDO	17-3-17		
3	HSE	SDO/SE/XE N	15-4-17		
4	Inspection	Operators/SE /SDO	31-5-17		
5					

1. Time

- 2. Funds
- 3. Manpower
- 4. Management
- 5.

Please identify any barriers or hindrances to the implement this plan.

1.Lack of time because of urgent official works.

2.No implementation of HSE in WASA ,Previously

3.No regular SE available of the moment



Training Title:	O & M	Module 5 and Module 7	Date of Training:	Jan 9 th -Jan 13 th , 2017
Name of Particip	pant: <u>W</u>	Vaqas Liaqat		
Name of Organi	zation:	WASA Lahore		

Please list five important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on assembly components, preventive maintenance, operating procedures and HSE*)

- 1. HSE
- 2. Understanding equipment components and their functions
- 3. Preventive maintenance plan
- 4. SOPs
- 5. Record keeping

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA. "Develop equipment maintenance log for water supply WASA liaqat Bagh Rawalpindi"

Sr. No.	Action Item (what)	Responsible (who)	Due Date (when)	Date Completed	Comments
1	Compile vehicles drivers license etc.	SE	18-1-17		
2	Vehicles fitness certificates	SE	25-1-17		
3	Vehicles preventive maintenance schedule	SE	30-1-17		
4	Making SOP's for drivers	SE	30-1-17		
5	Display of SOP's and reduce fitness and driver's license on 5S board	SE	2-2-17		

. Management support	
2.	
h.	
l.	
5.	

Please identify any barriers or hindrances to the implement this plan.

1. Funds shortage for preventive maintenance.

2. Audit observation for preventive maintenance.

3.No specific SOP's for preventive maintenance present

Other Comments or Notes:

The induction policy of heavy machinery drivers should be streamlined in terms of merit and education .The vehicle/machinery health depends upon its user. If the operator is well aware of its job then the machine needs less repair and less resource ultimately required.



Training Title:	O & M Module 5 and Module 7	Date of Training:	Jan 9 th -Jan 13 th , 2017
Name of Particip	ant: M.Zain ul abdin		
Name of Organiz	zation: WASA Faisalabad		

Please list five important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on assembly components, preventive maintenance, operating procedures and HSE*)

- 1. HSE 1.5S Technique
- 2. Understanding equipment components and their functions 2.SOP of jetting machine/Sucker machine
- 3. Preventive maintenance plan 3. Safety arrangements before completion of jobs
- 4. SOPs 4.Computerized record
- 5. Record keeping 5. Schedule maintenance & preventive maintenance according to record to manual inspect

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA. "Develop equipment maintenance log for South Drainage Yard"

Sr. No.	Action Item (what)	Responsible (who)	Due Date (when)	Date Completed	Comments
1	Call a meeting to discuss 5S in XEN office with staff	XEN	17-1-17	17-1-17	
2	Completion of all items list and location specification	SDO and Sub Engineer	20-1-17	29-1-17	
3	Machinery ,Dumper, Excavator ,for smooth surface	SE	03-2-17	5-2-17	
4	Implementation technique of 5S at office	SE	8-2-17	9-2-17	
5	Implementation of 5S technique at O&M store	SDO+SE			

- 1. Dumpers and excavators from JICA parking road.
- 2. Boards
- 3. Racks
- 4.
- 5.

Please identify any barriers or hindrances to the implement this plan.

1.Budget

2.

3.



Training Title:	O & M Module 5 and Module 7	Date of Training:	Jan 9 th -Jan 13 th , 2017
Name of Particip	ant: M Shakeel Ahmed		
Name of Organiz	zation: <u>WASA Multan</u>		

Please list five important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on assembly components, preventive maintenance, operating procedures and HSE*)

- 1. HSE 1.Checking the attendance the staff
- 2. Understanding equipment components and their functions 2. Check the work suction/jetting machine
- 3. Preventive maintenance plan 3. Desilting schedule of hasan parana sub division
- 4. SOPs 4.Safety equipment's are used in the field
- 5. Record keeping 5. Complete the log books and all old material

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA. "Develop equipment maintenance log for South Drainage Yard"

Sr. No.	Action Item (what)	Responsible (who)	Due Date (when)	Date Completed	Comments
1	Check the daily performance of staff	SE	14-1-17		
2	Checking the complaints register and resolve complaints	SE	14-1-17	17-1-17	
3	Desilting schedule in sub division	SDO/SE	14-1-17	25-1-17	
4					
5					

Implement this plan in office
 To manage the labor time table
 .
 .
 .

Please identify any barriers or hindrances to the implement this plan.

1.No hindrance		
2.		
3.		



Training Title:	O & M Module 5 and Module 7	Date of Training:	Jan 9 th -Jan 13 th , 2017
Name of Particip	oant: Umair Ayub		
Name of Organiz	zation: WASA Multan		

Please list five important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on assembly components, preventive maintenance, operating procedures and HSE*)

- 1. HSE 1.Creating maintenance schedule for jetting and sucker units
- 2. Understanding equipment components and their functions
- 3. Preventive maintenance plan
- 4. SOPs
- 5. Record keeping

Sewerage Division

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA. "Develop equipment maintenance log for South Drainage Yard"

Sr. No.	Action Item (what)	Responsible (who)	Due Date (when)	Date Completed	Comments
1	Vehicle list with vehicle number	SDO/SE	20-1-17		
2	List of drivers with their license number	Sub Engineer	20-1-17		
3	Arranging maintenance manufacturer for all vehicles	SDO/SE	25-1-17		
4	Create a maintenance log for monthly inspection	SDO/SE	25-1-17		
5	Quarterly review of maintenance log	SDO+SE			

1. Company maintenance manual's for trucks and tractor and for the jetting and suction limits
2.
3.
4.
5.

Please identify any barriers or hindrances to the implement this plan.

1.Budget		
2.		
3.		



Training Title:	O & M Module 5 and Module 7	Date of Training:	Jan 9 th -Jan 13 th , 2017
Name of Participa	ant: <u>Aamir Hussain shah</u>		
Name of Organiz	ation: WASA Rawalpindi		

Please list five important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on assembly components, preventive maintenance, operating procedures and HSE*)

- 1. HSE 1.Tube well
- 2. Understanding equipment components and their functions 2. Filtration plant
- 3. Preventive maintenance plan 3. Overhead reservoir
- 4. SOPs 4.Site office
- 5. Record keeping 5. Water meters

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA. "Develop equipment maintenance log for water supply WASA liaqat Bagh Rawalpindi"

Sr. No.	Action Item (what)	Responsible (who)	Due Date (when)	Date Completed	Comments
1	Meeting held	SDO	18-1-17		
2	Tube well check	T.W inspector	21-1-17		
3	Filtration plant cleaning	T.W inspector	25-1-17		
4	OHR	Supervisor	28-1-17		
5	Site office	SE	30-1-17		

- 1. Tube well log book
- 2. Safety material
- 3. Shoes
- 4. Gloves
- 5. Torch light

Please identify any barriers or hindrances to the implement this plan.

2.	
3.	



Training Title: O & M	1 Module 5 and Module 7	Date of Training:	Jan 9 th -Jan 13 th , 2017			
Name of Participant: Noshad Aslam						
Name of Organization:	WASA Rawalpindi					

Please list five important concepts, ideas, or skills which you plan to take from the training and implement in your work (*please focus on assembly components, preventive maintenance, operating procedures and HSE*)

- 1. HSE 1.Tube well
- 2. Understanding equipment components and their functions 2. Filter plant
- 3. Preventive maintenance plan 3. Overhead reservoir
- 4. SOPs 4.Ground storage tanks
- 5. Record keeping 5. Valve chamber

Please identify a specific plan (in sequential steps) that you will implement upon your return to WASA. "Develop equipment maintenance log for "Shamsabad water supply Rawalpindi"

Sr. No.	Action Item (what)	Responsible (who)	Due Date (when)	Date Completed	Comments
1	Check the tube wells	T.W inspector	17-1-17		
2	Check filter plants	T.W inspector	19-1-17		
3	Overhead reservoir	W/S Supervisor	22-1-17		
4	Valves chamber	W/S supervisor	24-1-17		
5	Ground storage tank	W/S Supervisor	28-1-17		

- 1. Staff equipment's
- 2. Helmet
- 3. Gloves
- 4. Shoes
- 5. Torch light

Please identify any barriers or hindrances to the implement this plan.

1.Acceptance by the office staff	
2.	
3.	

Annex 3.58 OJT Implementation Procedure for Leakage Detection in Fall 2016 - Spring 2018

Procedure of On the Job Training

JICA Expert of Leak Detection

1 Leakage Detection

No.	Items	Check
1.	Preparation of the pipeline map (based on GIS data)	
2.	Preparation of the pipeline map of the leak detection site	
3.	Confirmation of the start and end point of leak detection	
4.	Confirmation of the leakage repair history/record near detection site	
5.	Information of the pipe (location, depth, material, diameter and lying age)	
6.	Information of the valve chamber, fire hydrant, and mother meter	
7.	Information of the kind of pavement (Co/As/None) and thickness	
8.	Preparation of the transportation	
9.	Confirmation of the leak detection team member's role	
10.	Confirmation of the departure time	
11.	Check of the traffic condition and the event near the detection site	
12.	Preparation of the working shoes, reflection vest and headlight	
13.	Check and charging of the battery of leak detector and equipment	
14.	Reporting of the result of leak detection (Survey length, No. of leak found)	

Checked by	, Date
Approved by	, Date
Approved by	, Date

Procedure of On the Job Training

JICA Expert of Leak Detection

2 Leakage repairing

No.	Items	Check
1.	Confirmation of the leakage occurrence contact receiving date and time	
2.	Confirmation of the location/address of the leakage repairing site	
3.	Confirmation of the visible scale of leakage (Large/Moderate/Small)	
4.	Confirmation of the road condition (Spouting/Submergence/Subsidence)	
5.	Preparation of the pipeline map of the leakage site	
6.	Confirmation of the shutdown valves location	
7.	Confirmation of the non-passage road area and detour (bypass) route	
8.	Confirmation of the leakage repair equipment, material and quantity	
9.	Confirmation of the leakage repair team member's role	
10.	Check of the traffic condition and the event near the leakage point	
11.	Preparation of the transportation	
12.	Confirmation of the departure time	
13.	Preparation of the working shoes, reflection vest and headlight	
14.	Information of the pipe (location, depth, material, diameter and lying age)	
15.	Information of the valve chamber, fire hydrant, and mother meter	
16.	Information of the kind of pavement (Co/As/None) and thickness	
17.	Contact to the Police and relative traffic organization	
18.	Reporting of the repair work result (Consumption material, quantity)	

Checked by	, Date
Approved by	, Date
Approved by	, Date

Annex 3.59 OJT Implementation Procedure 1 for O&M of Electrical Equipment in Fall 2016

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1		a Charles	12232		Star Star	a anti-	Daily Operation Record	1647	the second		$[\neg \delta_{ij}]_{ij} \in \mathbb{C}$	關係	1254		1949 (A)	12/21	1953.7
4							SOP Check List	運行	6266		N7/94		4000		Sec.		92,824
				1236439	and the second	Star May	Preventive Maintenance Record		1929	1.1	120050	1928	10138		1.56	all a	sti alt <u>e</u>
F		- ASTERNA	10.2017	$\mathcal{B}_{\mathrm{eff}} = \mathcal{B}_{\mathrm{eff}}$	和公司的	. The state of the	Daily Operation Record	Sign			42953		1994		12.13		1.2.24
5		1000	1.1.1.1			No.	SOP Check List		Street.		1203	(aug) Sena	1821		barri pi	and the	1991
	334.44		- Charles	1200	1935		Preventive Maintenance Record	1. Beld	1.197-15	532	1.6.653	1744	a liter		ter de la		
T	121323258	No.	· 10.285.00	S. S	ting the	Sec.	Daily Operation Record		2,23%	15752	$\leq f(x_i) _{t=1}^{\infty}$	AL.	1.50		1.573	3. A. L	1912
	. 28.38	and the second			17 - 14 - 14 - 14 - 14 - 14 - 14 - 14 -		SOP Check List	12	1.4000		-		9.6559.60		1		
		Start and		C. B. C. State	1-12-12-12	4.49	Preventive Maintenance Record	19.9	100	1214	1	ang di kara	19709	4	1	in set	

X insulation resistance couldn't be performed.

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M. Zaheer Rana WASA LAR

Approved by

WASA: Labore Division: 19bal Town Sub Division: Johar Jown

1.22	States Stream	A REPORT	ninistrative	Information	ARA RAIN	Salven da se	La Martina Martin de Martina		20	16				20	017	111	1.22.14
1	SACOME (AL)	Adn	ninistrative	informatio	on and a set	at 12 when the	$(q_{1},q_{2}) = \left(\frac{1}{2} \left(\frac{1}{2} \left(\frac{1}{2} \left(\frac{1}{2} \right) + \frac{1}{2} \left(\frac{1}{2} \left(\frac{1}{2} \right) + \frac{1}{2} \left(\frac{1}{2} \left(\frac{1}{2} \right) + \frac{1}{2} \left(\frac{1}{2} \right) \right) \right) \right) \right)$	N	ov	Ď	ec	J	an	F	eb	N	lar
Site	Loc	ation	Nam	e of the P	ersons in C	harge	Contents of Activity	Planning Data	Completed	Planning Date	Completed	Planning Date	Completed	Planning Data	Completed	Planning Date	Complete
	Sub Division	Site Name	XEN	SDO	Sub Engineer	Operator	网络帕尔尔尔 计标识书 网络古人人	Uete		Date		Data	7000				Constant Constant
4	Tolar	A-BLOCN	Sohail	Salway	Marris	Imray	Daily Operation Record	- 0.4			$(1, r) \in \mathbb{Z}^{n}$			$(\cdot,\cdot)_{q^{(i)}}$	$\{f_{i}(q_{i})\}$	1980	1
1.	in the of	A-Block T/w	Qadir	nlisax	Hassan	ALI	SOP Check List	29th		1. 15- 14-1	$\{(S^{(1)})_{i\in I}\}$		- Ø	- Elifert 100		-44-19	1.5
- 10-	Jown	'/"	Cheena	Consider the Att Att Att Att Att Att Att Att Att At	a de la comita		Preventive Maintenance Record	(金)		個語			12.25		1.1	and a	11134
1		1.50276-31	M. Ball	開拓的短期	派派的派	0.76785	Daily Operation Record	Region and	10.795		10.802	12	1,25,6	325	11.92	1557	1.0553
2		Same had	$\{a_i\}_{i=1}^{n-1} \{a_i\}_{i=1}^{n-1}$	And the second second	and the second	-	SOP Check List	X.	2330		10535		10 20 20	1922	teleter.		199545
1		33.44		And A.	111236		Preventive Maintenance Record		and the	Sugar 1	2204	State -	1.24	1.00	point a		1.14
9	Tradition.	station -	T. O. A. S.	19,31,975		1332-3	Daily Operation Record	· 杨雪花	1.282		1040		10.00	in the second	and a second	52	$<\pi^* T_{1,1}^{(1)}$
3.			and have				SOP Check List		1954		1.15		$\mathcal{T}_{\mathcal{T}}(\mathcal{A}_{\mathcal{T}})$		1292		1000
	Carles .	1997 199		Section 1	$= \frac{1}{2} \left[\frac{1}{2} \left[\frac{1}{2} \left[\frac{1}{2} \right] + \frac{1}{2} \left[\frac{1}{2} \left[\frac{1}{2} \left[\frac{1}{2} \right] + \frac{1}{2} \left[\frac{1}{2} \left[\frac{1}{2} \left[\frac{1}{2} \right] + \frac{1}{2} \left[\frac{1}{2} \left[\frac{1}{2} \left[\frac{1}{2} \right] + \frac{1}{2} \left[\frac{1}{2} \left[\frac{1}{2} \left[\frac{1}{2} \right] + \frac{1}{2} \left[\frac{1}{2} \left[\frac{1}{2} \left[\frac{1}{2} \left[\frac{1}{2} \right] + \frac{1}{2} \left[$		Preventive Maintenance Record	1811	7.622	1949 1949 1949	3-32° P	的理论	- Alger	1940	$\{T_n\}_n \{T_n^{-1}\}_n$	1000	1000
8	16/2010/201	"BRIDES INT	1.958.6	13.35%	NR 1550		Daily Operation Record		day.		1997		2.193	1220	and the second s		128.54
4							SOP Check List		distant.		332		13.516		jughin -		1999 27
\$			19625				Preventive Maintenance Record	1.4.3	$g_{1}^{2}(\phi_{1}^{2})$		$\mathcal{A}_{ij}^{*}(\mathcal{D}_{ij})$	A Stall	192239	Sing.	1993	(4.28°)	1999-12
T	danies z	Street St.	PERSONAL PROPERTY	17/28/5527	12762572	white.	Daily Operation Record	The set	Sec.		((e))(m)		12.222	Reg		A CONTRACT	1
5.							SOP Check List		8359		A MARCE		194.31		1.2.49		produces.
				Alter Ser			Preventive Maintenance Record		28812	行物		Maria	2862	8.87	16250		1. 45/4
	nàs generati	att for the state of the	nostrumper -	4.47520	C. C. Starter	Casta Start	Daily Operation Record	1.584	the is	Still	1.5		278	1.50		12	144
6.			262				SOP Check List	12.51	analysis.		ang d		ogerse.		(gliana)		-36.1
				Sent.		1.19	Preventive Maintenance Record	100	Page 1	Carl Ch	0200		der elle	- Marken	1.000	1.44	Post 9

W	ASA: Lal	nore	Division :	Coulder	9	Sub Divis	ion: Gulberg				Prepar	red by	A	പംന	Jan	ied	THE REAL
3	aparente te per	Ad.	ninistrative	Informatio	- 10 10 3 Mar	Weiter State	STREET STREET		20	16				20	017		
-	to Hall share to	A		informatio		With the With	Contents of Activity	N	ov	Ď	lec		an	F	eb	M	lar
Siles	Loca	ation	Nam	ne of the P	ersons in Ch	arge		Planning Data	Completed	Planning Data	Completed	Planning Data	Completed	Planning Date	Completed	Planning Date	Completed
	Sub Division	Site Name	XEN	SDO	Sub Engineer	Operator	 A second sec second second sec				1.175 (F		The real	11.1.481	Contraction of the		alle and
	CI		-	1017		1.11月11日	Daily Operation Record	28_	E.A.F.	1 41	a ding	一些推	1) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		1000	1.194	1.18.20
1.	Guberg	A-3	Vanish	Ampa		- 54	SOP Check List	-11 20	21.33	「大法」	1. 1. 1	的時	1 Parking	で設定	(100.5°); C	영상	1973
				A State of the sta	「小学校のため」」	1.111月1日1日	Preventive Maintenance Record	2016	(15)143		新花花	Sect-			- 3/2 4.		1.1.1
12		网络后期			1462921	NO.	Daily Operation Record	50	5557	$\gamma_{1} \bar{m}^{2}$	50222	317	$= \frac{1}{2} k_{1}^{2} k_{1}^{2} k_{1}^{2} \lambda_{1}^{2} \lambda_{1}^{2}$	222	100250		$\{\eta_{ij}\}_{j\in \mathbb{N}}$
2	Gulberg	A-1	Danish	Amjad	. <u> </u>	-	SOP Check List	29.	12.25		$(\mathcal{D},\mathcal{D}_{i})$	No.	$v_{0} d \tilde{v}_{0}^{*} [v_{0}^{*}]$		1.15 3.9		1,51,92
1	June	Section 1	1. Takara	3	1.33.9花		Preventive Maintenance Record	2016	110211	1993	17965		1.259.5	The second	1.1.1.2	- Eggi	1.508
		96448	1621122	Section?		1.5.200	Daily Operation Record		827.01	5,93	18-20	新聞	12162	ASA	. A.W.	145	2.927
3.			1982	Sec. Com			SOP Check List	33	377.92	(Cale	1508		1332852		N 23		1.16.198
6 T 4		19899	Para de				Preventive Maintenance Record	all he	સંસંકો	W.B.	1982.3	that's	30579	Shirt	28.24	84.5	1.18 - 1
1	1/2023.	Same Steel	There and	12:53:2	(Section)	Sau ar	Daily Operation Record		- Sta	1967	11225		nder a	200			
4.					A Delicher and Philippine		SOP Check List	and states	10515		10.855		30.22		19.22		est territ
8					12-25-28		Preventive Maintenance Record	343	12%		1.122	1968	389	(district	-246.	19965	1212
	10280-001	-TANKA L	12.2.1544	- 1995年1月	3000.75	A Store	Daily Operation Record	No. 14	16038		1.1	1976	1.155.64		A POT		3.34
5.			1. 1. 1.		The second		SOP Check List	198	(M)(3)		10.25524		12022		24.57		inertag
	24.1.11A		William.				Preventive Maintenance Record	196	0.50		Spin	56.2	2.875	440.0	1. 65 25	25794.5	Kalenda.
	1993284	$[1,q^2/(p^2,q^2)]$	1. Section	1080310	equilibrit.	(HERE)	Daily Operation Record	导家庭	13/27%	62	5.95	115	Selve #	123	1.2.2		Notestan L
6.			The second second	1999 - 1999 1997 - 1998 1997 - 1998			SOP Check List		ange ang	1992	a transfer		l'ages :	-12	-2015.5		ger Sy ger
1		Sec. 1	A States	Sec. The			Preventive Maintenance Record	and the	W.S.W.	198	149367	1997	1. 1. 1. 1. 1.	Ante-	1. Sector		NINSKI.

Approved by

UMAIR ASGHAR.

Approved by

WASA : MULTAN

Division : P & D

Sub Division:

1		Ada	ninistrativ	e Informat	ion the second	ALL ALL MARY	a strategic to a strategic and a strategic and a		20	16				20	017		1.11
		Au	ministrativ	e mornat	.ion	Harl Standard	- 当然的名称,这些那些"	N	lov	D	ec	J	an	F	eb	N	lar
Site No.	Loc	ation	Na	me of the	Persons in C	harge	Contents of Activity	Plenning		Plenning		Planning		Planning	Completed	Planing	
	Sub Division	Site Name	XEN	SDO	Sub Engineer	Operator	- Softlikke amerika	Dete	Completed	Date	Completed	Dete	Completed	Date	Compreted	Dete	Complet
	Formarpure	Foxoavavo	$z_{\rm H_2^+}(z), \overline{z}_{\rm H_2^+}(z)$	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	1 States	1. C. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	Daily Operation Record	1200	0	122	and a	「市市市	1		18	1	12
1.	SOUTH		Terdiaq	Augun	Arshod	Ansan	SOP Check List	29	0	$1-\frac{1}{2}(\frac{1}{2})$	173093				14.93	A.L.	1
		N Stranger		ter and		1200	Preventive Maintenance Record	12.20	-		A State		1922		in the second		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
-	147144	100000		The start	100000	1005407	Daily Operation Record	22	12345	1993	-1014	-SME	1.2	1977	11957	13/2	12
2							SOP Check List			27-11	-1.5		75877		600		13
		No. 201			1. 10 10		Preventive Maintenance Record	643	12.306	No.	1.1019	100	N YON		1-15-26	1.21	1.
1	Sec.M.d.	1.22	1.1840	的情况是	1000		Daily Operation Record	1247	1000	327	14.50	法之外	14.712	新新	Levrice.	$\epsilon^{(i)})$	1 contraction
3.				Mar Alexandre			SOP Check List		1609		1113908		52.55	ala di Ng	1. 30 d	1999	1.15%
	行行的	12.32		and the second			Preventive Maintenance Record	1483	e crayes		1002.4	in the	18:34	3-63	1.5.	144	1
T	States -	na na	NEWS	CARGE !!	1945799	50.4.57	Daily Operation Record	250	3.52	1992	1. 784 E. 1	a the	15.25	Bark	1000	(2m)	1819
	$F_{in} = \frac{1}{2} \left[$	a finder			1851455		SOP Check List				5.56		- 1622		162	13	188
			22.20		网络新教		Preventive Maintenance Record	1. Sala	o lagres	12.2	2132	19.25	17.20	0212		188	100
T	and the second se	1.15192.151	in Charles	Stript)	State State	-lating	Daily Operation Record	3/0	$\neg \phi Z^{*}$	-73/21	8.251	7.80 1.00	1.100	354	8.7%	128	1 1.770
	No. Ala						SOP Check List		332		6.13		282	1.20	3/18	1.15	1.22.2
				124-8			Preventive Maintenance Record	1999 B.	82%	1353	3.47	110	a since	(Trail	1.08427	02(3)	1983
T	167.5.4.19 S	Sec. Bar	1.4	1919-02	and the second	Past 12	Daily Operation Record	18	s aist	1 Sec	- Segura	535	1999	1325	Stark.	1	
		12 22 2		100	Sec.		SOP Check List			in the second	100		1.000 (M)	1218	1.5		
			and the	Mar 13	Sec. W.		Preventive Maintenance Record	Press.	122.74		4.5%	1-20	1. 2018	1943	2.45%		1338

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Approved by

WASA: GRW

Division: III (Model Town) Sub Division: B. (Alam chowk)

Prepared by Shakees Ahmanl.

1 16		Adm	inistrative	Informatio	n	(10 10 10 10 P	136) di Compositione de	1 m	20	16				20	017		
-	1					e su des ser a		N	lov	D	ec	J	an	F	eb	N	lar
Site No.	Loc	ation	Nam	e of the P	ersons in C	harge	Contents of Activity	Planning	Completed	Plenning	Completed	Planning	Completed	Planning		Planning	10-0
	Sub Division	Site Name	XEN	SDO	Sub Engineer	Operator		Dete		Dete	Compared	Dete	Competes	Planning Date	Completed	Dete	Completed
11	in an and	S. Take	$E_{n}^{(1)} = E_{n}^{(1)} = $		Road States		Daily Operation Record	S. A. P.	Same -	1.1.1			1 Sign	E. M.		100	
1.	E III	Camp No.2	Kashan	M. Igbal	Shakeel	0.0	SOP Check List	29	C. March		Set Che		1.1400		175-875		1824
		· 小学学生的(学)。 - 小学学校(学)。	ATSIL		Ahmad.	Salman	Preventive Maintenance Record	NON	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	- ACM	-181	重新	a de la	12.13	1344		Sec. Willi
	Sau West	18367	Sec. 1	2010	F. S. Star	S. Salar	Daily Operation Record	105.3	Charles	222	1-0.107	1.101	1.1.1.1.1	13.27		1.15	1.131.5
2	and the second s					1987.5	SOP Check List		Saturdia .	「お茶」	1.05/16		1000		1222	125	a served
ŝ.	anti filia		Stand Ser	A SERVICE		11-11-11	Preventive Maintenance Record		15/25	1.282	$\chi_{s}^{2}(2t)$	135	1.0000	1231	i dinta	123	129932
	W Diger		STORAGE IN	282702	1234519	and de	Daily Operation Record	EST.	1546	17.85	-3277-05	(S. 3)	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	- Sec.	11:4	1000	1.26.32
3.	1.1.1	1999				157.57	SOP Check List	h i più by costa	1949		120.02		7858		126.3		1. 1. 1. 1.
	SEL 3	10.284					Preventive Maintenance Record	tine.	Action	int.	1.1676.19	1000	136303	1000	nikus	120	in the
1		84.81	Margaria.	1223		C. S. Sala	Daily Operation Record	8.44	1.2.3924	303\$J	dines.	1.32	1.000	1985	33843	1942	- Starle
4		179 51	연말했		Constant of		SOP Check List		5.685		$\sim 10^{-10}$	125	10.00	110	1		1.17.1
1	的问题。	1995年1月		$U^{(n)}(\widehat{\mathcal{F}}_{n}^{(n)}) = U^{(n)}(\widehat{\mathcal{F}}_{n}^{(n)})$			Preventive Maintenance Record	the state	dina.	1803	1.55%	1993	1.18.19		1.202		a stand
	South Stre	10000		CONTRA-	12020	NAR M	Daily Operation Record		10.2	12.3	0.000	1325	10.23	323	1 2002	1926	in agene
5.	1923					2,60,52	SOP Check List	192	1. 1996	122	1 5.2.5	199	1.4.5		1.12		1 29%
	Part Contractor			Die Beer			Preventive Maintenance Record	and the second	1902	Sec. B.	P. P. Buch	1.2.16	15 11	132			1 29/2
1		State of the		N. Carl	82.25%	1953	Daily Operation Record	122	1. Section	125	1248	1289	100000	190		3.0	96 A.412
6.	Sec. 2						SOP Check List		t (Certi)		11.200		0 		1		S. Marz
2	Ser 2 K			The Contraction	Sand and	1200	Preventive Maintenance Record		2.578	10.18	1.3.2	1953	- nhi	1			and the second

WASA: LHR

Division: Nighter Town-I Sub Division: GIREEN TOWN

Approved by SHAMAS A JOUB Prepared by H. M. RAHEEL

		Ad	ninistrative	Informatio	- 18-5 1950 Mars	and the second	SALATING STRATEGY ST. ST.		20	16				20	17	1.	1.00
1	1.1.1.1.1.1.1.1.1	Autor Autor		mormatio	 	8-2-12-25-2		N	ov	D	ec	J	ari	F	eb	M	ar
Site No.	Loca	ation	Nam	ne of the P	ersons in Cł	narge	Contents of Activity	Plenning	Completed	Plenning	Completed	Plenning	Completed	Planning	Completed	Planning	Completes
-	Sub Division	Site Name	XEN	SDO	Sub Engineer	Operator		Dete	1. 10000	Dete		Dete	1 Sector	Dete	299.0435	Dete	
		A	Tehlag,	Chamos	Iman		Daily Operation Record		9.4		$= V_{CY}^{*}$			-			i inter
1.	Greenlown	1/meex	Ishfaq Vienizi	Avil	JANAAN		SOP Check List	29184	K ala	10-11-1						1874 S. S.	
	and a straight of the straight	Chowk	lionisi	17/40			Preventive Maintenance Record	Nov	ALS ?			内语行	143		- Sister		Keling :
-	Tenterale.	4.2560		13 States	Na State of State	SHEW?	Daily Operation Record	333	1.13775		These .	No.	and a star		1 Carrie	1	- 7-(3).
2	Steve Sta	S. Sales	1.1.1.1	alling of the		Sec.	SOP Check List		$ _{\Omega} \lesssim 0$		Sec. 24		1.00	1450	11.785°E		1.0025
	William .	SM PA	a provide the	1.8.8.2.2	STATES IN	-1966-1866	Preventive Maintenance Record	1922	1.1250	125	April april	16-52	1.225 1.55	1.200	(b7 ^k)		1993.84
-	STA SE	ASSEM!	的情况感受	12260	((Separt))	3.528	Daily Operation Record	120	\$5.36v	1.65	a status	1.161	- 123/24	1776	178.5.5	1122	(Series
3.		532.19				1 bisto	SOP Check List		05375		- West		15787		12,352		1.32.35
	Salata.	12.000	一般意義			Sala 3	Preventive Maintenance Record	1.20	112	(Fig.)	WWW.	1.32.80	- Autor	1241	1.1.1.2		1.7594
1	्र अवस्थित्। इ.स. १९४१	Martin	120162	1309-13	1 martin	And Standards	Daily Operation Record	and the	1 april 2	Var	111231	No.	12.5	- 19	17/25	124	120
4.				Strateger St.			SOP Check List	35	1.046		1.25.07		119963		1922		
	312.54				S. M. Hall	1.2.2.2.2	Preventive Maintenance Record	1233	1.2.25%	5.8	0.12		e (d. St.	1.32	1.24		i izan
3	1.000	St. Sec.	133213221	Casta &	1.1.2000	See Aug	Daily Operation Record		1.48	100	1.2.2	1995 1995	and the set	117.30			100-5
5.						and produced	SOP Check List	1	e sere	1000	2809		1 25-1		1. 1.59		
	E.C.M.			12683		And Store	Preventive Maintenance Record	EN L	1.00		i ang	140	1 435	inger	1		1 200
1	45,913,0	gen alger is	1.201.022	- Filialiania	1200 - 1700	4.232.75	Daily Operation Record	1 1820	1. 834.0	1100	(with	125	e 1997	123	94 . ASE	53	
6.						100	SOP Check List		Sporta di		falastal d	1. 192			91.0038 1	1.22	197
	12335		AN REF.				Preventive Maintenance Record		L and	1 80	Sec.		2 Sugar	1000	10000	1 323	1

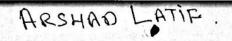
Approved by

Prepared by ADEEL SHARIF

2017 2016 Administrative Information Feb Mar Nov Dec Jan **Contents of Activity** Name of the Persons in Charge Location Planning Dete Planning Date Planning Plenning Date Plenning Site No. Completed Completed Completed Completed Completed Date Sub Division Site Name XEN SDO Sub Engineer Operator Asmaer Tirmy' Shames Chould Sha. Ayob. Daily Operation Record 29 Green Town. 1-1. SOP Check List 2016 -Preventive Maintenance Record **Daily Operation Record** SOP Check List 2. Preventive Maintenance Record **Daily Operation Record** SOP Check List 3. Preventive Maintenance Record **Daily Operation Record** SOP Check List 4. Preventive Maintenance Record **Daily Operation Record** SOP Check List 5. Preventive Maintenance Record **Daily Operation Record** SOP Check List 6. Preventive Maintenance Record

App

WASA: Lahore Division: Nishter town Sub Division: Green Gum.



Approved by

WASA: Multan Division: Disposed Div. Sub Division: South.

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Approved by Prepared by SHAFGAT MALIK Prepared by SHAFGAT MALIK

WASA: RAWALPINDi Division: BULK W/SUPPLY Sub Division: FILTRATION PLANT

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Site No.	Loc	ation	Nam	e of the P	ersons in C	harge	Contents of Activity	Planning	Completed	Planning	Completed	Planning Data	Completed	Planning Data	Completed	Planning Data	Completed
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2		Nreffel.	123			新聞	SOP Check List		26221		1.228.33		10252	Se N P	2.5430		
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	1. 200	"你们是你	10223		(14)100月2	11152831	Daily Operation Record	all the	21.75	202	13247	200	$\mathbb{C}^{n}_{a}(\mathbb{R})$		[EC(2)]	万家	4994
3.						No.	SOP Check List		1.8722		100		105237		に場合を	14-	$f_i^{(j_i)} g_{\mu_i}$
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3	STANDAY.	(Wag S. C		"你帮助我们	12 Winder	1995	Daily Operation Record	de la composition de la compos	22.25	22	182-15-	12.74	\$ 2581	- 1	14-54	The L	1.14.8
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				And Tell		25438.3	Preventive Maintenance Record	THE R.	Sec.	1.1.4	2:21	2.242	1996	120	2544	1	32.5
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ite 14.	Sub Division	Site Name	XEN	SD0	Sub Engineer	Operator	Park Services	Planning Date	Completed	Plenning Date	Completed	Planning Data	Completed	Planning Date	Completed	Planning Data	Comple
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1	Sec. 8(3) 51	Really	100000	125.13	1000	131502	Daily Operation Record	303	1.50%	3957	1100	14	a heady	297	2.96	1.25	1
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						1999	Preventive Maintenance Record		10.001	Sin	- Service	1.546.5	and the	1.20	1. 12 340		4.77
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	Tit.		and the	1. 1. 1. 1. 1.			SOP Check List		1. 181.2	1965	1/34		S. C. C. C.		1.2.2	123	12
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t	Nest Sea	1945 <i>(</i> 1970) 1	NEW .	12.65	States 2	grades.	Daily Operation Record	1224	0577		1.2.30	12/2	1.05	1.55	1-100	113	
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Division: Zarghan Sub Division: Malibayh

Approved by X EN

Prepared by S. P. O Absan Kujal

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Site No.	Loca	tion	Nam	e of the P	ersons in Cl	harge	Contents of Activity	Planning	Completed	Planning	Completed	Planning	Completed	Planning	Completed	Planning	Completed
	Sub Division	Site Name	XEN	SDO	Sub Engineer	Operator		Dete	10.000	Data	1000	Dete		Date		Dete	Compiercas
1	n de la constante de La constante de la constante de	1. 新闻		一般意识	13.25		Daily Operation Record	SALL.	A. P. Ker	-23H	1-0.1				13455	18.6	1.8%
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	1.00000000	111111	100.05	143630	The start of the	网络常常	Daily Operation Record	17/2	1.12.12	- AL	1.5.49	21882	16:257	1022	Control Sa	1945	Serie.
3.		and the second	Sector Sector			CHERCE .	SOP Check List	13	1.41	1 de la	1.30 %	124	10.20		and the second	128	1.06.0
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4.						12 19 14	SOP Check List		03.52	100	$c_{i}(d; i; T)$		125.1		1.00		1.1.2
÷						and the	Preventive Maintenance Record		(Select	1923	irna.	in these	35736	in fin	N.C.	122	1000
	A STRAGE	611.000	153. A.E.	244.2.8	经运行工具	223645	Daily Operation Record	32	13.0843	36	1.25%	- dia	111236	1213	1.8.82	2.8	1.87
5.					al end.		SOP Check List		1.285		1980		1 7822		No.	133	la la comuna
						S. March	Preventive Maintenance Record		- 8(*)(c)	1. 393.	12.00		(325-1	1333	13.8	1920	is parties
		Series and	1.112.2		150.96.42	-416-12LP	Daily Operation Record	1.3	12734	- 3946.)	- 35k -	1.3%	1.3035	1. 1999 y	15-3	2.3	1 2.65
6.			Sec. 4				SOP Check List		-bstate		1 5/ 3					125	1.1
		and the second		24 2 m 3	1.11	Por dest	Preventive Maintenance Record		a tigo	-387.23	1.0120	1996) 1996) 1997)	10013		1.57%	1.01	1.00

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Approved by Jaraid Taybal Jadan XE. Prepared by H. Fanaz Ali WASA: Division : Sub Division: MA Sidtho 2016 2017 Administrative Information Nov Dec Jan Feb Mar **Contents of Activity** Name of the Persons in Charge Location Site Planning Date Planning Date Planning Date Planning Date Planning Date Com Completed Completed Completed Completed Sub Division Site Name XEN SDO Sub Engineer Operator **Daily Operation Record** 0 0 ε Mohama TMA Ahatla Jourid Zabour Tonag Jan Mas 1. Astriz Bojwa SOP Check List Nov 0 0 0 water 29/bal chadas cialkot 31 8 29 work's 0 6 Ali **Preventive Maintenance Record** 0 **Daily Operation Record** TUDE WOR shahati 2. 11 SOP Check List Rangpun **Preventive Maintenance Record Daily Operation Record** TUBe Wet 3. 1 SOP Check List Lambiyan Baniyan Kangfura **Preventive Maintenance Record Daily Operation Record** 11 SOP Check List 4. Preventive Maintenance Record **Daily Operation Record** SOP Check List 5. **Preventive Maintenance Record Daily Operation Record** SOP Check List 6. Preventive Maintenance Record

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Annex 3.60 OJT Implementation Procedure 2 for O&M of Electrical Equipment in Fall 2016

of	Generator			and and and	ASTC 1.)AT	F <i>q</i>		Approved by	Put "O" w conplete th	
VA	sa FAIS	ALABAD		Division : M	ANAGEMEN	T (EAST))	Prepared by	i san ka ili shika	
		Ad	ministrative l	formation	and the state of the	- 14 - 14 - 14 - 14 - 14 - 14 - 14 - 14	10	· · · · · · · · · · · · · · · · · · ·	Contraction (L)	•
Site No.		sation	1967-1987-1987 N	ame of the Pe	ersons in Char	ge - Carro		Contents of Activity	Planning Date	Complete
	Sub Division	Site Name	XEN	SDO	Sub Engineer	Operator	38		Duto	26-19-18-14 19-19-18-14
							1.	O&M Manual	20-12-16	
1.	EAST	PS-31	KAMRAN	SALMAN	TAHER SHABBER	Asghare	2.	Basic Specification ➡Vender, Type, Capacity	20-12-16	$\begin{array}{c} (\gamma^{*}, \mathcal{A}_{X}^{*}) (\gamma^{*}) \\ \mathcal{A}_{X}^{*} (\gamma^{*}, \mathcal{A}_{X}^{*}) \\ \mathcal{A}_{X}^{*} (\gamma^{*}, \mathcal{A}_{X}^{*}) \\ \mathcal{A}_{X}^{*} (\gamma^{*}, \mathcal{A}_{X}^{*}) \\ \mathcal{A}_{X}^{*} (\gamma^{*}, \mathcal{A}_{X}^{*}) \end{array}$
212215			[AAA	HACHML	SUUDOL		3.	Daily O&M Record	20-12-16	
ANTE R							4.	Preventive Maintenance Plan	20-12-16	
							1.	O&M Manual	312-14	
2	EAST	MAN SOORA-	KAMRAN RAZA	HASHME	SHABBER	ADNAN	2.	Basic Specification ➡Vender, Type, Capacity	30-12-16	
2.		BAD					3.	Daily O&M Record	25-12-16	
		and and an and a second se					4.	Preventive Maintenance Plan	25-12-16	
STATES -				SALMAN	TAHER		1.	O&M Manual	05-01-17	
	EAST	ABDULLAHP	KAMRAN K RAZA	HASHMI	SHABBER	ADNAN	2.	Basic Specification ➡Vender, Type, Capacity	05-01-17	
3.				al de la companya San San San San San San San San San San			3.	Daily O&M Record	25-12-16	
1							4	Preventive Maintenance Plan	25-12-16	

OJT Implementation Procedure for O&M Manua Record Keeping & Preventive Maintenance Act Vity of Generator

Put "O" when you conplete the activity

Approved by

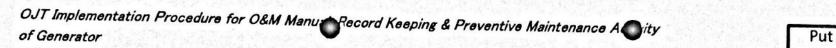
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Division :

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SHAFQAT MEHMOOD MALIK Prepared by

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Site No.		ation	ang salina N	ame of the P	ersons in Cha	rge	Contents of Act	ivity Planning Date	Completed
	Sub Division	Site Name	XEN	SDO	Sub Engineer	Operator	ARAD VILL VERSIONALISE PER	atentificaelidika (de Paris , E	a la serie de l La serie de la s
							1. O&M Manual	16-01-2017	
1.							2. Basic Specification ⇒Vender, Type, Capacity	20-01-2017	
		RAWAL LAKE FRIRATION PLANT RAWAL	M. AHMED	SHAFQAT	MUHAMMAD	MUHHAMMAD	3. Daily O&M Record	07-02-2017	
and a	Filtration PLant	DAM ISBD	MANZOOR	MEHMOOD	HL.	XAMEEN	4. Preventive Maintenance Pl	an 06-03-2017	
the state					認識		1. O&M Manual		
2.							2. Basic Specification ⇒Vender, Type, Capacity		Paljar.
						E and a	3. Daily O&M Record		$\mathcal{I}_{\alpha}^{(*,*)} = \sum_{i=1}^{n} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n}$
							4. Preventive Maintenance Pl	an	
							1. O&M Manual		
							2. Basic Specification ⇒Vender, Type, Capacity		
							3. Daily O&M Record		
							4. Preventive Maintenance P	lan	



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Division: III (B)

Approved by

4. Preventive Maintenance Plan

Prepared by SHAKEELAHMAD.

	The second s	Ac	ministrative I	nformation			1			V
Site No.		cation	200-10245 N	ame of the P	ersons in Char	rge		Contents of Activity	Planning	0
	Sub Division	Site Name	1.428.424.42				1		Date	Completed
		Tube Well	Kashan	m.	Shakeel	M .	1.	O&M Manual	03 Dec	$\left\{ \begin{array}{c} \phi & \phi \\ \phi & $
1.	Alam Chowk	Tube Well Camp No.2	Hafeez	Jaybal	Ahmad	Salman	2.	Basic Specification ➡Vender, Type, Capacity	03 Pec	
Contraction of the second	TTT (B)		00				3.	Daily O&M Record	03 Dec	
					and the second	A CALL AND A CALL	4.	Preventive Maintenance Plan	03 Dec	
					$\left \begin{array}{c} \frac{1}{2} \\ \frac{1}{2$		1.	O&M Manual		
2.							2.	Basic Specification ➡Vender, Type, Capacity		
						1997 - 19	3.	Daily O&M Record		
nister h		and and S					4.	Preventive Maintenance Plan		
1							1.	O&M Manual		
							2.	Basic Specification ➡Vender, Type, Capacity		
							3.	Daily O&M Record		
	164.8 5 7 8	AND ALL A	State Care	rattle son in	1.5.0 M 3.4 M	North Although				

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-			dministrative I					Planning	$\mathbb{E} \mathbb{E} \left[\mathcal{O}_{\mathbf{k}}^{(0)} \in \mathcal{O}_{\mathbf{k}} \right] \mathbb{E} \left[\mathcal{O}_{\mathbf{k}}^{(0)} \right] \mathbb{E} \left[\mathcal{O}_{\mathbf{k}^{(0)} \right] \mathbb{E} \left[\mathcal{O}_{\mathbf{k}^{(0)} $
No.	Sub Division	ation Site Name	XEN	ame of the Per	Sub Engineer	Operator	Contents of Activity	Date	Completed
14							1. O&M Manual	15 Jan	
1.							2. Basic Specification ➡Vender, Type, Capacity	ISJan	
10.00							3. Daily O&M Record	20 Jav	
2.4.5	Malibagh	YS-11	Zarghoon	Ahsan keja	Qudix	Nasi	4. Preventive Maintenance Plan	23Jan.	
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Annex 3.61 OJT Implementation Procedure 3 for O&M of Electrical Equipment in Fall 2016

Approved by SHAFQAT MEHMOOD MALIK

WASA: RAWAL Pinoi

Division : Filtraiim PLant

Prepared by

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Division: Gulberg

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Approved by Schail Aslom Simcha

WASA: LAHORE Division: XEN (ORM-) GBT

Prepared by SAEED AHMAD KHAN

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Approved by M. Zahees Rang

WASA: Labore

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WASA: Gigranwale Division: 11

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Division: Nighter Juan

Approved by Home RAHEEL

Prepared by

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Division: Disposal Division.

Prepared by UMAIR ASCIMAR.

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Approved by

WASA: Multan

Division: Disposal Stations

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Annex 3.62 OJT Implementation Procedure for O&M of Mechanical Equipment in Fall 2016 - Fall 2017



OJT Implementation plan for Record Keeping, SOP & Preventive Maintenance Activity of Pump, Motor and Valves



Course: WSD 5231 modules 1, 4

			Team and S	Site Inform	ation									201	7					
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Site No.	Participant Name	WASA/Division/Sub Division	Site Name	XEN	SDO	Sub Engineer	Operator		Date	Completed	Date	Completed	Planning Date	Completed	Date	Completed	Date	Completed	Date	Complete
								Daily operations record												
								Facility inspection sheet	15-Jan											
1.	Amir Tufail	Lahore/Allama Iqbal	LOS Tube well	Sohail Qadir	Saif Ch.	Amir Tufail	Ashfaq	Maintenance plan	15-5411											
	Anni Tulan	Town/Ichra	LOS Tube wen	Cheema	ban en.	Anni Tulan	Asinaq	O&M Manuals for Equipment												
								Daily operations record	15th											
								Facility inspection sheet	25th											
2.	Souman Khalid	Lahore/Ravi	Out fall Dewatering	Saleem Ashraf	Souman Khalid	Atif	Adnan Javed	Maintenance plan			5th									
		Town/Main Outfall	workshop					O&M Manuals for Equipment			15th									
								Daily operations record	-											
								Facility inspection sheet	16th											
3.	Fayyaz	Lahore/Drainage south/Drainage South-	Tank # 3 Township	Adeel Shareef	Hafiz Raheel Asraf	Fayyaz Ahmed Ch.	Muhammad Arif	Maintenance plan	-											
		1	rownsnip		Astai			O&M Manuals for Equipment												
								Daily operations record	4	30th		28th	-	30th						
			Tank # 3					Facility inspection sheet	1st	30th	1 st	28th	1st	30th			-			
4.	Waqas Liaqat	Lahore/Drainage south/Drainage South-	Township Komatsu	Adeel Shareef	Waqas	Ghaffar	Ilyas	Maintenance plan	-	15th		15th	-	15th						
		1	Excuvator					O&M Manuals for equipment		1st		1st		1st						
								Daily operations record												
								Facility inspection sheet	15th											
5.	Umair Ayub	Multan/Sewerage south/Hassan Parwana	Sewerage (Hassan Parwana South)	Irfan Ali	Umair Ayub	shakeel Ahmad		Maintenance plan												
								O&M Manuals for Equipment											_	



OJT Implementation plan for Record Keeping, SOP & Preventive Maintenance Activity of Pump, Motor and Valves



Course: WSD 5231 modules 1, 4

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									Daily operations record	1st to											
									Facility inspection sheet	15th											
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								WASA Lahore													
								WASA Multan													
																					<u> </u>

Annex 3.63 OJT Implementation Procedure for Asset Management in Fall 2016

04-Sohail Cheema & 06-Abdul Rehman

		Current	Future Requirement	Remarks
	what to do	Monitoring the existing assets: daily, weekly, monthly, quarterly		
	in charge	O & M department (Division Level)		
Task 1: Monitoring	Number of staffs	04 Number (01 Person each Sub division)	08 Number (02 Person each Sub division)	(02 Person for field work in each sub division).
	Training	NIL	Quarterly Basis	Capacity Building.
	Budget	52,000/- (PKR)	220,000/- (PKR)	
	Computers	NIL	NIL	
	Others	-	08 Numbers (Android Phones)	01 Number for each monitoring Official.
Task 2: Recording	what to do	Keeping records of the monitoring results		
	in charge	O & M department (Division Level)		



Module 4: Asset Replacement Plan

1 1				
	umber of	04 Number	08 (02 Person each Sub	02 Persons each sub
	affs	(01 Person each Sub division)	division)	division.

	Training	-	Quarterly Basis	Capacity Building.
Task 2: Recording	Budget	72,000/- (PKR)	244,000/- (PKR)	
	Computers	04 Number	09 Number	01 Number for each data entry operator, 01 Number for each SDO, and 01 Number for XEN.
	Others	-	-	
Task 3:	what to do	Updating GIS/ Asset database with the monitoring results		
Updating GIS/Asset	in charge	Director P&E		
Database	Number of staffs	03 Numbers	09 Numbers	03 Numbers in Head Office, 01 Number in each town.
	Training	-	Quarterly Basis	
	Budget	150,000/-	450,000/-	



Module 4: Asset Replacement Plan

	Computers	03 Numbers	09 Numbers	
	Others	-	-	



	what to do	New asset register/ database updating		
	in charge	Sub Division Officer		
Task 4: New asset	Number of staffs	04 Number	08 Number	02 Person each Sub Division
register	Training	NIL	Quarterly basis	How to evaluate conditions of assets, how to maintain the asset record/history.
	Budget	100,000/- (PKR)	400,000/- (PKR)	
	Computers	NIL	04 Number	01 Number in each sub division.
	Others	-	-	



Sohail Sindhu & Waqas

		Current	Future Requirement	Remarks
	what to do	Monitoring the existing assets: daily, weekly, monthly, quarterly		
	in charge	O & M department		
Task 1: Monitoring	Number of staffs	03	03	 1 no. Installations montoring 2 no water supply system montoring. 3 no sewerage system monitoring.
	Training	no	yes	
	Budget(PKR)	No particular budget for asset monitoring	5 lacs for 1 st year 1.6lac yearly onwards	3 bikes and 3 mobiles. 3 bikes with fuel 60 lit/bike/month.
	Computers	no	no	
	Others	No other facility	Need bikes with fueling. Android Mobile phones.	
Task 2:	what to do	Keeping records of the monitoring results		





Module 4: Asset Replacement Plan

Recording	in charge	O & M department		
		Number of staffs	2	3

	Training	no	Need training	
Task 2: Recording	Budget	exists	Needs upgradation	
	Computers	1	1	
	Others	nil	nil	
Task 3:	what to do	Updating GIS/ Asset database with the monitoring results		
Updating GIS/Asset	in charge	sdo	sdo	
Database	Number of staffs	0	1	GIS Trained staff is required
	Training	nil	Required	
	Budget	nil	3.5 lacs/annum	



Module 4: Asset Replacement Plan

Computers	0	1	
Others	nil	GIS equipment.	



	what to do	New asset register/ database updating		
Task 4:	in charge	GIS / Asset database sections and procurement sections		
New asset register	Number of staffs	1 sub engr	1 sub engr	
	Training	nil	Required	
	Budget	exist	50,000/-	
	Computers	0	1	
	Others	nil	nil	



15-Ms Burrira & 16-Ms Zoya WASA Faisalabad

		Current	Future Requirement	Remarks
	what to do	Monitoring the existing assets: daily, weekly, monthly, quarterly	There must be written schedule and constant check on these proceedings	
	in charge	WWM department (SDOs)		
Task 1: Monitoring	Number of staffs	<u>Disposals:</u> SE=3, Electrician=4, Mechanic=4 <u>Vehicle/Machinery:</u> SE=1, Supervisor=1, Mechanic=1	Number of staff is sufficient	
	Training	Nil	Technical trainings should be given in specific fields	
	Budget	No specific budget for monitoring, managed using O&M budget	Specific head should be there for monitoring	
	Computers	Nil	Min=3	
	Others	Level sensors, vehicle tracking system	Sufficient	
Task 2:	what to do	Keeping records of the monitoring results		



Module 4: Asset Replacement Plan

Recording	in charge	WWM department (SDOs)		
	Number of staffs	Computer Operator=3 Data collection=4	Operators=4 min	

	Training	No formal training. AD(s) guide staff as per requirement	MS office training should be compulsory
Task 2: Recording	Budget	No specific budget. O&M budget is used for recording results	Specific head should be there for recording
	Computers	3	4 min
	Others	-	-
Task 3:	what to do	Updating GIS/ Asset database with the monitoring results	
Updating GIS/Asset	in charge	GIS Analyst(s)	3 GIS Analyst (minimum) must be there
Database	Number of staffs	AD=2 Work charge/Surveyors=10	For surveys and ground truthing minimum 10 people are required in each project
	Training	No formal training executed	Formal trainings and workshops specially for lower staff must be arranged specially to handle equipment



Module 4: Asset Replacement Plan

Budget	Budget is not allocated specifically for GIS section; GIS work is completed in respective project individually	-	
Computers	2	Central repository/server required Arcpad/GPS devices Android Phones	
Others	-	-	



	what to do	New asset register/ database updating	
	in charge	GIS / Asset database sections and procurement sections	
Task 4: New asset register	Number of staffs	0 for DB records Manual recording=1 SE in each subdivision	Present staff must take responsibility of DB updates regarding Assets. other department's cooperation would be required for that task to complete systematically
	Training	1	some formal trainings and workshops required specifically on Faisalabad's system and data type
	Budget	Nil	A specific amount of budget solely dedicated for making and timely updates of assets must be considered
	Computers	0	Min 3 with central server
	Others		



4

Muhammad Tauseef

Assistant Director Engineering

WASA (GDA)

Gujranwala

		Current	Future Requirement	Remarks
	what to do	Monitoring the existing assets: daily, weekly, monthly, quarterly		
Task 1:	in charge	Assistant Director Engineering	Assistant Director Engineering	Regular Visits
Monitoring	Number of staffs	1(One sub engineer for each subdivision) 3(One team for 2 subdivisions)	2(Two sub engineers for each subdivision) 3(One team for each subdivision)	Monitoring will be more efficient
	Training	No Training	Trainings for each level of staff	Technical skills will improve
	Budget	No Budget Allocation	Allocation of Budget for procurement of Monitoring Equipment's	Quality of Monitoring will be Accurate
	Computers	No Computers	3 Computers for each subdivision	ADE can analyze instantly



Module 4: Asset Replacement Plan

	Others	No Vehicles	Vehicles for each level staff	Response time of staff will improve
Task 2:	what to do	Keeping records of the monitoring results		
Recording	in charge	Sub Engineer	Sub Engineer	Regular Visits
	Number of staffs	3(One team for 2 subdivisions) (Electrician, mechanical supervisor & a helper)	3(One team for each subdivision)	Monitoring will be more efficient

	Training	No Training	Trainings for each level of staff	Technical skills will improve
Task 2: Recording	Budget	No Budget Allocation	Allocation of Budget for procurement of Recording Equipment's	Quality of Recording will be Accurate
	Computers	No Computers	3 Computers for each subdivision	ADE can analyze Recording practice instantly
	Others	No Vehicles	Vehicles for each level staff	Response time of staff will improve
Task 3: Updating	what to do	Updating GIS/ Asset database with the monitoring results		
GIS/Asset Database	in charge	No One	GIS Expert is required	Overall Monitoring of Updating
	Number of staffs	No staff	2 Assistants for GIS Expert	Record will be updated on AIMS





Training	No Training	Trainings for both level of staff	Technical skills will improve
Budget	No Budget Allocation	Allocation of Budget for Establishment of GIS / Asset database	Assets will be evaluated and located
Computers	No Computers	3 Computers for each subdivision	Asset database will be saved in Computers
Others	No Phones	Android Phones should be given to staff	Very necessary for Asset database in field



	what to do	New asset register/ database updating		
Task 4:	in charge	Assistant Director Engineering	Assistant Director Engineering	
New asset register	Number of staffs	1(One sub engineer)	1 store keeper 2 helpers	Asset Register will be updated
	Training	No Training	Trainings for both level of staff	Technical skills will improve
	Budget	No Budget Allocation	Allocation of budget	
	Computers	No Computers	1 Computer	Balance Assets
	Others	No vehicles	2 vehicles	To provide in field



Module 4: Asset Replacement Plan

Waqas & Sajid WASA Multan

		Current	Future Requirement	Remarks
	what to do	Monitoring the existing assets: daily, weekly, monthly, quarterly	Categorization of assets on monitoring period basis and device specific SOPs. Deployment of skilled person for monitoring	At each sub-division level
	in charge	Concerned Sub-divisions	Concerned Sub-divisional staff	Capacity development of the sub divisions is necessary.
Task 1: Monitoring	Number of staffs	Operators and supervisors	Mechanic, electrician supervisors at each sub-division level	
	Training	Nil	Concerned sub-divisional staff must be trained and fully equipped in their own capacity.	Specific training how to monitor and judge the condition of the assets
	Budget	Nil	A specific budget must be allocated.	
	Computers	Nil	1x Laptop and 1x computer must be provided at each sub-division	If computerized SCADA system is installed
	Others	Nil	Vehicles & digital cameras, android mobile phones	For communication & monitoring
Task 2:	what to do	Keeping records of the monitoring results	Record must be computerized at each sub-division level	



Module 4: Asset Replacement Plan

Recording	in charge	Concerned Sub-divisions	Concerned Sub-divisions	SDO, S/E & skilled persons.
	Number of staffs	Nil	Computer & data entry operators	1 each to prepare and update the database.

Task 2:	Training	Nil	Concerned sub-divisional staff must be trained and fully equipped in their own capacity.	Asset recording & updating Training
Recording	Budget	Nil	Specific budget	
	Computers	Nil	1x Laptop and 1x computer must be provided at each sub-division	For recording, updating and keeping the data base
	Others	Nil	Printers, scanners	
Task 3:	what to do	Updating GIS/ Asset database with the monitoring results	Yes	
Updating	in charge	Nil	A Separate GIS Cell	P & D Directorate
GIS/Asset Database	Number of staffs	Nil	2 x GIS analysts, 1 x Assistant Director Engineering and assistant staff.	GIS Posts must be created.
	Training	Nil	How how to input and update data into assets database.	In Aljazari Academy Lahor.
	Budget	Nil	Specific Budget	



Computers	Nil	3 x Laptops and 3 x Computers	
Others	Nil	Nil	

	what to do	New asset register/ database updating	Yes	Especially an asset with worth 1 million and service life more than 1 year should be register immediately.
Task 4: New asset	in charge	Nil	Register a new assert in separate GIS Cell/ Asset database section	Assistant Director
register	Number of staffs	Nil	2 x GIS analysts, 1 x Assistant Director Engineering and assistant staff.	Total 5 No. of staff (including assistants)
	Training	Nil	How to evaluate conditions of assets, how to input and update data into assets database.	How to update new asset register/ database
	Budget	Nil	Specific budget	
	Computers	Nil	3 x Laptops and 3 x Computers	
	Others	Nil		

1. Hafiz Muhammad Waqas

2. Muhammad Sajid

(WASA Multan)



Module 4: Asset Replacement Plan

11&12 Asim & WASA Rawalpindi

		Current	Future Requirement	Remarks
	what to do	There is no proper monitoring system is working in R WASA. However, some assets are being monitored on daily or whenever visited by the in charge or any higher authority.	It is proposed that there must be a separate Assets Management Directorate, which have sufficient staff tools and budget for monitoring, recording of assets on GIS basis.	Will ensure the assets recording and updating GIS data base
Task 1:	in charge	Two, supervisors or higher officer	Director Assets Management	
Monitoring	Number of staffs	No proper staff is being engaged for monitoring purpose.	Director, Deputy Director, 2 Assistant Director, 4 sub engineer with office and field staff. (20 no)	From existing staff
	Training	nil	All staff must be trained at their own levels	
	Budget	No specific budget is allocated. The O&M budget is used	5 millions / annum	
	Computers	nil	4 laptop and 2 no's desk top	
	Others	nil	Transport (4 small vehicles and 6 no's motor bikes	



Module 4: Asset Replacement Plan

Task 2:	what to do	Yes there is a property register, stock register are using for this purpose	There should be a proper recording and updating system using GIS data base
Recording	in charge	Accounts department and store in charge	Director assets management
	Number of staffs	4 no's	1 assistant director with 2 sub engineers and GIS specialist

	Training	nil	Must be trained at their own level	Capacity building
Task 2: Recording	Budget	nil	As above	
	Computers	nil	1 no lap top and 1 desk top	
	Others	nil	1 small vehicle and 2 motor bike	
Task 3: Updating	what to do	No GIS system	There must be GIS based assets data base system	
GIS/Asset Database	in charge	nil	Director Assets management	
	Number of staffs	nil	1 GIS specialist with1 assistant	May be engaged from market
	Training	nil	Must be trained with up to date knowledge and latest technology	





Budget	nil	1.5 million	
Computers	Nil	1 lap top	
Others	nil	1 motor bike	



	what to do	No asset register is maintaining	There must be assets register maintained	
Task 4:	in charge	nil	Director assets management	
New asset register	Number of staffs	nil	1 accountant with 1 assistant	From existing staff
8	Training	nil	Must be trained	Capacity building
	Budget	nil	0.1 million	
	Computers	nil	1 desk top	
	Others	nil	nil	



M Ali - NSUSC

		Current	Future Requirement	Remarks
	what to do	Monitoring the existing assets: daily, weekly, monthly, quarterly		
Task 1: Monitoring	in charge	O & M department (Assistant Director)	Assistant Director(AM)	Regular visit and log signed at station
	Number of staffs	Junior Engineer's at their sector with their foreman's (3) as per assets requirment	SAME AS CURRENT Urgent Replacement required of retired person	
	Training	No training	Quarterly training program	
	Budget	Not define	Should be prepare with the help of AM	
	Computers	3 computers have in region	Laptop required for AM	
	Others	No vehicles	Vehicles Required for AM and junior Engineers	800 cc for AM & Bikes for Junior Engineers
Task 2: Recording	what to do	Keeping records of the monitoring results		
	in charge	O & M department (Junior Engineers)	Junior Engineers	





Module 4: Asset Replacement Plan

	Number of staffs	03 (JEs)	03	
--	---------------------	----------	----	--

Task 2: Recording	Training	No training	Quarterly Training Required for Fresh their brains
	Budget	No define	Should be prepared with the help of AM
	Computers	No Computer	01 system Required for recording
	Others		Vehicles required
Task 3: Updating GIS/Asset Database	what to do	Updating GIS/ Asset database with the monitoring results	
	in charge	No Any	Separate Engineer required for record the all GIS ,Assets coding,
	Number of staffs	No any	1 Engineer only
	Training	No any	Quarterly
	Budget	No any	Arrange for Engineer
	Computers	No	Laptop or system





Module 4: Asset Replacement Plan

Others		



	what to do	New asset register/ database updating	
	in charge	GIS / Asset database sections and procurement sections (GM capital works)	Engineer
Task 4: New asset register	Number of staffs	01	1 Engineer required for Operation and Services 2 which already mentioned in Task 3
	Training	No	Quarterly required
	Budget	No	For Engineer facilitation
	Computers	1 system	Laptop or system for O&S
	Others	No	At least bike for visiting the sites for recording of New Assets

Muhammad Ali

NSUSC



Module 4: Asset Replacement Plan

Annex 3.64 Action Plan for O&M of Tube Well and Pump Facility in Spring 2017

O&M Action Plan of Water Supply

Participant Name: M Tahir Rehman Designation: Sub Engineer (WASA Lahore)

Sr. No	Issue	Cause	Mitigation Measure
1	Leakage of Water Supply Lines	Contamination of clean drinking water	Repair of Lines
2	Low Pressure of water supply network		New reservoir / new t/w is operation
3	Connected Water Supply Lines to sewer line	Contamination of clean drink	New Water Supply line opposite site
4	Leaking of poor valve, jointing material	Poor water drinking	Replacent of good quality of valve jointing materi
5	Contamination of source point/ distribution lines		Chlorination
6	Laying of old cast iron pipe lines	Cause of contamination	New water supply line for good product

Participant Nam: Lal Tab Designation: Tube Well Incharge (WSSC Mardan)

- 1. Separation of sewerage line to water supply line
- 2. No chlorination

Participant Nam: Aamir Hussain Shah Designation: Sub Engineer RWP WASA

Sr. No	Issue	Cause	Mitigation Measure
1	Shortage of water	Ground water	New Tube well
		depletion problem	Surface Water
2	Low Pressure	Shortage of water	Repair of OHR
3	Biological Contamination		
4	Leakage	Old rusty	Repair of pipe/ Change the pipe line

Participant Name: Shafiq ur Rehman Designation: Field Supervisor (WSSC Kohat)

Sr. No	Issue	Cause	Mitigation Measure
1	Paip lieking		
2	Olds paip		

Participant Name:	Waqar Anjum
Designation:	Pipe Fitter WSSC Kohat KDA

Left blank chart

Participant Name:	Asim Nazir
Designation:	Deputy Director M&E WASA/RWP

Sr.	Issue	Cause	Mitigation
No			Measure
1	Shortage of water	Ground water	New tube well
		depletion population	surface water
2	Low Pressure	Shortage of water/	Provision of OHR
		OHR	New Machinery

3	Biological Contamination	Mixing of water with sewage / leakage	Chlorination
4	Contamination in distribution	Old rusting network and mixing issue	F/plants
5	Leakages	Old network/ incidents	Repair/ replacement of lines
6	Wastage of water	Lack of awareness	Public awareness
7	Political / Social Influence	Political system	Better management
8	Line Breakage	Old line	Replacement of old line
9	Ground treatment	Surface water contaminated	Treatment plant
10	Electricity Failure	Load Shedding	Generators

Annex 3.65 Action Plan for Leakage Detection in Spring 2017

Leakage Prevention Plan

WASA Multan

M. Waqas (Assistant Director) Amir Hussain Bukhari (Sub-Engineer)

- Leakage detection team at WASA Multan consists of 2 plumbers, 4 linemen and they are reported to Sub- Engineer who is reporting to SDO.
- Water distribution maps and drawings must be available at sub-division level for efficient working of leak detection team.
- Latest Leak detection equipment must be provided.
- Leak Detection team will visit the area on daily basis and provide the gathered information for record maintaining and necessary action.
- Pressure gauges and flow meters should be installed at each tube well as well as each distribution.
- Analysis will be performed on pipe design life, quality of pipe on quarterly basis for better planning future.
- By establishing the leak detection teams, leakage losses could be reduced up to 5-10 % during the current year.
- Patrolling survey method is usually feasible for data collection of leakage.
- The SDO and Sub-Engineer will quickly move their repair team to repair the observed leakages.
- After field counter measures, analysis will be done under the supervision of SDO and Sub-Engineer to determine the causes of leakage.
- Following the mentioned action plan, N.R. W's would be reviewed so that comparison could be done.
- Thus a system could be established for smooth operation and maintenance of water supply network.

WASA Gujranwala

Ali Qumain (RA) Urban Unit

Preparation

- 1. Formation of Leak Detection Team.
- 2. Select one zone and conduct this plan on one zone.
- 3. Prepare GIS maps which shows the condition of pipelines of each zone.
- 4. Calculate the discharges at regular intervals in selected area.
- 5. Select the exact leakage points in survey.
- 6. Repair the leakages with most feasible practices available.

Equipment

- 1. Pressure Recorder
- 2. Acoustic Leak Detector
- 3. Metal Pipe Locator
- 4. Non Metal Pipe Locator
- 5. Ultrasonic Flow Meter

Plan

- 1. Current NRW is 50 % and the target is to reduce it each year by 10 %
- 2. Repeat the similar plan in all the zones.

Evaluations

- 1. Conduct the surveys at regular intervals to evaluate the results.
- 2. Compare the current results with the past result so that improvement can be made in plan.

WASA Rawalpindi

Samran Zahid (Sub Engineer) Noushad Aslam (Sub Engineer)

• Preparation

- 1. We already have leakage detection cell which consists of 1 supervisor, 1 pipe fitter and 2 helpers.
- 2. We already have GIS maps.
- 3. Leak Detection equipment are needed for better results.

• Basic Survey

- 1. We will analyze the water supply pressure and flow by using the equipment.
- 2. We already have separate maps of each area and pipe lines.

• Plan

- 1. NRW is 40% and the target is to reduce every year by 10 %.
- 2. We will choose survey method according to the area.

• Action/Implementation

1. We will repair the pipelines immediately and also calculate the volume of leakages.

Water and Sanitation Services Peshawar

Engr. Amir Khattak

• Preparation

- 1. Establishment of Leakage detection cell and team which already consists of plumbers, pipe fitters and helpers.
- 2. Preparation of water distribution network maps and drawings which is under preparation.
- 3. Procurement of leak detection equipment which depends upon the availability of funds.

Basic Survey

- 1. Analysis of water supply (pressure and flow measurements), which has yet to be planned.
- 2. Divide the city into the Blocks, city is divided in 4 blocks which is further divided into small units.
- 3. Study and analysis of pipe's design life and material quality.

• Action Implementation

- 1. Counter measures for leakage are under process which would be more effective if the equipment are available.
- 2. Leakage detection cell will organize the survey for leak detection which would focus particularly on conditions of pipe, workmanship and causes of leakage.
- 3. Leakage volume will be calculated provided that the equipment is available.
- 4. For surface leakages quick repairs are being done but for underground leakages more funds and equipment is needed.

• Evaluation

- 1. Analysis of the results will be done by calculation of discharges at various locations, also the metering system will be upgraded.
- 2. Plan vs Action will be reviewed keeping in view the reduction in NRW %.

Water and Sanitation Services Mardan

Muhammad Khalil Akbar Manager Municipal Services

- We will establish the leakage detection cell which will be consists of Assistant Manager (Water Supply), pipe line supervisor and plumbers.
- We will develop GIS maps of distribution network.
- We will procure Acoustic Leak Detector, Metal Pipe Locator and non-metal pipe locator.
- We will analyze one tube well network for 3 days and collect the previous data about pipe laying (year, type etc.)
- We will conduct walk through survey throughout the length of distribution pipe.
- Leakage will be find out by using Acoustic Leak Detector.
- As most of the pipes in Mardan are GI so we will analyze the causes of leakage and also prepare the GIS maps of pipe network.
- We have 22 tube wells in Mardan, so the survey will take 66 days.

Evaluation

- The analysis of leak prevention plan will enable us to decide whether the pipe needs repair or it should be replaced with a better quality.
- Our action plan will help us to improve the quality of water by reducing the contaminations.

Water and Sanitation Services Kohat

Azmat Ali

Ibrar Ali

• Formation of Teams

- 1. There are 30000 number of connections and 150 tube wells.
- 2. Total pipe Length is 10000 meters.
- 3. Blocks = 6, Helpers = 12, Pipe Fitters = 6, Supervisors = 6, Engineers = 2 and Manager = 1
- 4. There is one leak detection team and 6 sub teams.
- 5. Preparation of drawings and maps will be done.

• Basic Survey

- 1. Use of pressure recorders and flow meters to determine the flow and losses in network.
- 2. Use of the leakage detectors to pinpoint the leaks.

• Plan

- 1. Number of leakages to repair
- 2. Pipe length to be replaced.

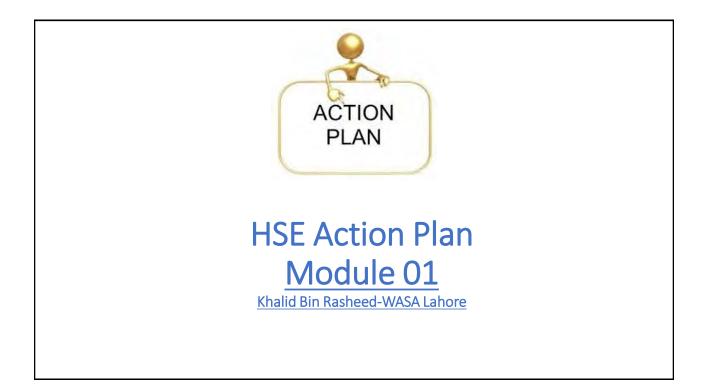
• Action

- 1. Set the teams along with their targets and equipment.
- 2. Teams will be divided by the types of pipes e.g. AC pipes, GI pipes and HDPE pipes etc.

• Evaluation

1. Check the flow meters and pressure recorders in pipe networks at night to identify the results and compare them with the past results.

Annex 3.66 Action Plan for O&M of Sewer and Storm Water Drainage in Spring 2017

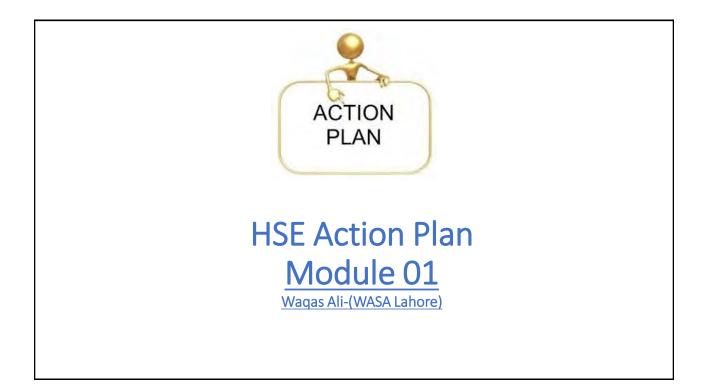


Α	DESCR	RIPTION OF PR	OBLEM						
1	Descript	ion of Problem	Desilting of drair						
	Date 15-02-17								
	Type / Rating of Hazard		Major		Probable Outcomes	Death			
2			Moderate			Drowning			
			Minor		outcomes				
	Hazard	Discovered							
3	Through		Inspection	Near Miss	Accident	Any Other			
						Other			

В	IMMEDIATE ACTION							
1 Date of			Remove Hazard	How?				
	Таке Ітте	diate Action	Isolate Hazard	How?				
			Restrict the Access	How?				
	Date of Response	15-02-17	Erect Signage	How?	By using ora	nge cones and PPEs		
	Response		Any Other	How?				
			Apply "5Whys" Methodology	Because o	f the lack of in	dicators or boards		
2	Finding Root	Cause						
			Lack of Training	Un-Safe O	&M Method	Ignorance		
3	Contributing Causes	Reasons /	No Use of PPE	Lack of Pro	oper Tools	Willful Misconduct		
			Improper House Keeping	Improper	Maintenance	Any Other		

			(C - Action Plan Te	mplate				
	1	2	3	4	5		6) (7
Sr. No.	WHAT TO DO?	HOW TO DO?	WHEN TO DO?	WHO TO DO?		DO WITH V	WHAT?	CHECK DONE?	WHO TO CHECK?
	Preventive	(Follow	(Frequency)	(Carried out By)		Materials	Tools/	How to	Effectiven
	Action	SOP)		Class of Work	Worker		Equip.	Check?	ess to be Checked By?
1	Use orange cones	Cones are apply around	Before the O&M work start	A field of manager to this work		Sign boards		By visiting the area	Field in charge
2	Using sign boards	Sign boars apply before or after the O&M area		Manager give a proper lecture to workers before works start and tell them the hazard and risk of field					

Sr. No.	Due Date	Dat	te Complete	Date Verified		Any New Ris Developed	sk / Hazard
	15-02-17	15-	02-17	16-02-17			No
D- SI	GNATURES						
Imple	menter Name		Khalid Bin Ras	heed	Si	gnature	
Authority Title		WASA, Lahore		Si	gnature		

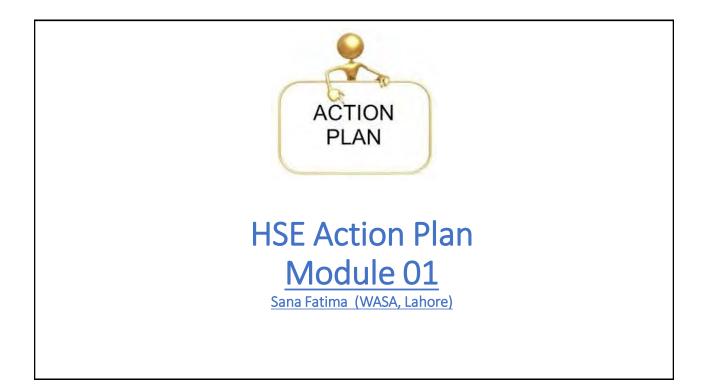


Α	DESCR	RIPTION OF PR	OBLEM				
1	Descript	ion of Problem	Desilting of man	hole			
	Date	15/02/-17					
			Major	Death		Death of	sewer manhole
2	Type / R	ating of Hazard	Moderate		Probable Outcomes		
			Minor		Outcomes		
	Hazard [Discovered					Inspection
3	Through		Inspection	Near Miss	Accident	Any Other	Ignorance
						Other	

В	IMMEDIA	TE ACTION				
			Remove Hazard	How?		
	Take Imme	diate Action	Isolate Hazard	How?		
1			Restrict the Acces	s How?		
_	Date of Response		Erect Signage	How?		ns, orange cones, tap ing the working area
			Any Other	How?		
2	Finding Root	Cause	Apply "5Whys" Methodology	in job , use	e PPEs , trainin	proper concentration g to all staff before de proper tools
			Lack of Training	Un-Safe O	&M Method	Ignorance
3	Contributing Causes	Reasons /	No Use of PPE	Lack of Pro	oper Tools	Willful Misconduct
			Improper House Keeping	Improper I	Maintenance	Any Other

			C - /	Action F	Plan Tem	plate			
	1	2	3	4)	5		6	7
Sr. No.	WHAT TO DO?	HOW TO DO?	WHEN TO DO?	WHO TO	DO?	DO WITH V	WHAT?	CHECK DONE?	WHO TO CHECK?
	Preventive	(Follow SOP)	(Frequency)	(Carried	out By)	Materials	Tools/	How to	Effectiveness
	Action			Class of Work	Worker		Equip.	Check?	to be Checked By?
1	Training	Use the orange cones	Before the work start		Workers		Tools/ Equip.	By visit before start work	Authorized person
2	Lack of proper tools	Wait for release the hazard gases							
3	Provide PPEs	Impose the PPEs							

Sr. No.	Due Date	Dat	te Complete	Date Verified	Any New R Developed	lisk / Hazard
	15/02/2017	15/	/02/2017	15/02/2017	No	
	GNATURES					
D- 31	GIVATORES					
Imple	menter Name		Waqas Ali		Signature	
Autho	ority Title		WASA Lahore	!	Signature	

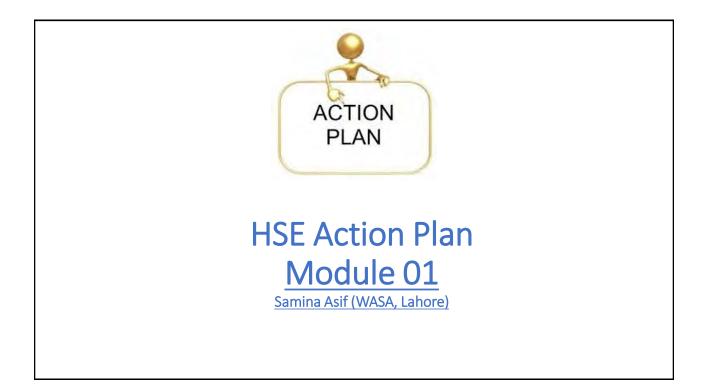


Α	DESCR	RIPTION OF PR	OBLEM				
1	Descript	ion of Problem	_ Damage to gas p	pipelines durin	g Drain dred	ging	
-	Date	15-02-2017			0	5 5	
			Major			Leakage o	of Gas
2	Type / R	ating of Hazard	Moderate		Probable Outcomes		
			Minor				
3	Hazard I Through	Discovered	Inspection	Near Miss	Accident	Any Other	

в	IMMEDIA	TE ACTION					
			Remove Hazard	How?	By repairing	gas pipelines	
	lake Immed	diate Action	Isolate Hazard	How?	By cutting o	ff gas supply	
1			Restrict the Acces	s How?	By using bar	riers	
	Date of Response		Erect Signage	How?			
	nesponse		Any Other	How?			
			Apply "5Whys"	Why oper carefully?	ator did not op	erate machine	
2	Finding Root	Cause	Methodology	Why unsa	fe O&M metho	od was used?	
				Why the c	perator was n	ot trained?	
			Lack of Training	Un-Safe O	&M Method	Ignorance	
3	Contributing Causes	Reasons /	No Use of PPE	Lack of Pro	oper Tools	Willful Miscond	duct
			Improper House Keeping	Improper	Maintenance	Any Other	

			C - Action	Plan Ter	nplate				
	1	2 3	4		5)	6	(7
Sr. No.	WHAT TO DO?	HOW TO DO?	WHEN TO DO?	WHO TO	DO?	DO WITH V	VHAT?	CHECK DONE?	WHO TO CHECK?
	Preventive	(Follow SOP)	(Frequency)	(Carried o	out By)	Materials	Tools/	How to	Effectivene
	Action			Class of Work	Worker		Equip.	Check?	ss to be Checked By?
	Training of machine operator	1. Visit the site before dredging	Train the operator at least twice a month				PPEs	Sudden checking	
		2. Prepare proper site plan before starting							
		3. Hand over plan to operator and instruct him if there is any pipeline exist							

Sr. No.	Due Date	Date Complete	Date Verified	Any New Ri Developed	sk / Hazard
D- SI	GNATURES				
Imple	menter Name	Sana Fatima		Signature	
Autho	ority Title	Assistant Dire (WASA, Laho		Signature	

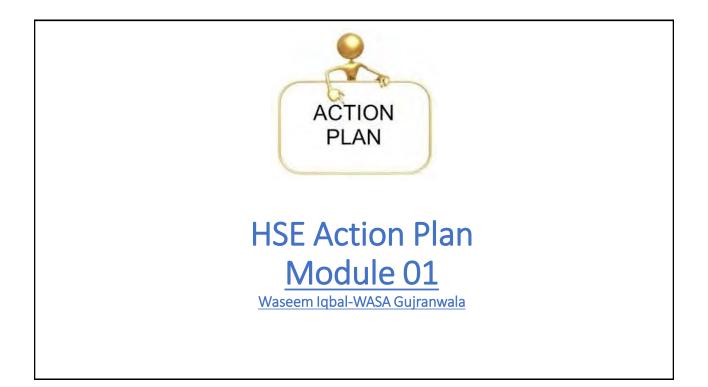


Α	DESCR	RIPTION OF PR	OBLEM				
1	Descript	tion of Problem	Damage to gas p	ipelines durin	g Drain drede	zing	
-	Date	15-02-2017			0	50	
			Major			Leakage	of Gas
2	Type / F	Rating of Hazard	Moderate		Probable Outcomes		
			Minor				
3	Hazard Through	Discovered า	Inspection	Near Miss	Accident	Any Other	

В	IMMEDIA	TE ACTION					
			Remove Hazard	How?	By repairing	gas pipe	elines
	lake Imme	diate Action	Isolate Hazard	How?	By cutting o	ff gas su	oply
1			Restrict the Access	How?	By using bar	riers	
	Date of Response		Erect Signage	How?			
	neoponoe		Any Other	How?			
			Apply "5Whys"	Why opera carefully?	itor did not op	erate m	achine
2	Finding Root	Cause	Methodology	Why unsaf	e O&M metho	od was u	sed?
				Why the o	perator was n	ot traine	d?
			Lack of Training	Un-Safe O	&M Method	Ignora	nce
3	Contributing Causes	Reasons /	No Use of PPE	Lack of Pro	per Tools	Willful	Misconduct
			Improper House Keeping	Improper I	Maintenance	Any Ot	her

			C - Action	Plan Ter	nplate				
	1	2 3	4		5)	6	(7
Sr. No.	WHAT TO DO?	HOW TO DO?	WHEN TO DO?	WHO TO	DO?	DO WITH V	VHAT?	CHECK DONE?	WHO TO CHECK?
	Preventive	(Follow SOP)	(Frequency)	(Carried o	out By)	Materials	Tools/	How to	Effectivene
	Action			Class of Work	Worker		Equip.	Check?	ss to be Checked By?
	Training of machine operator	1. Visit the site before dredging	Train the operator at least twice a month					Sudden checking	
		2. Prepare proper site plan before starting							
		3. Hand over plan to operator and instruct him if there is any pipeline exist							

Sr. No.	Due Date	Date Complete	Date Verified	Any New Ris Developed	sk / Hazard
D- SI	GNATURES				
		Coursing Asif		Circuit and	
Imple	ementer Name	Samina Asif		Signature	
Auth	ority Title	Assistant Dir Lahore)	ector (WASA,	Signature	



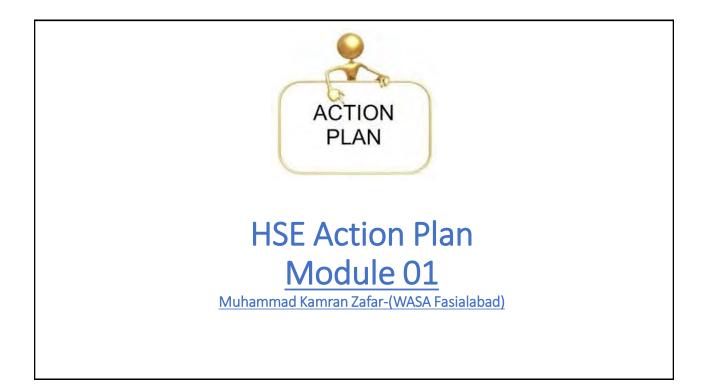
ACT	ION	PLA	N

Α	DESCRIPTION OF PROBLEM										
1	Description of Problem			While desilt the M.H. We have not any precaution measures, hazards & risk are there							
-	Date 15-02-17		We have not any								
2	Type / F	Rating of Hazard	Major	Cause death	Probable	We have not any arrangement as soon as possible					
_		0	Moderate		Outcomes						
			Minor]						
	Hazard	Discovered					Accidents				
3	Through		Inspection	Near Miss	Accident	Any Other					
						other					

В	IMMEDIA	TE ACTION						
	Take Immediate Action		Remove Hazard	l	How?	To make sur (Proper PPE	•	aution measures
_			Isolate Hazard		How?			
1			Restrict the Acc	ess	How?			
	Date of Response		Erect Signage		How?			
	hesponse		Any Other		How?			
2	Finding Root Cause		Apply "5Whys" Methodology		Not proper	rly managed		
							1	
			Lack of Training		Un-Safe O8	&M Method	Ignor	ance
3	Contributing Causes	Reasons /	No Use of PPE		Lack of Pro	oper Tools	Willfu	ul Misconduct
			Improper House Keeping		Improper N	Maintenance	Any C	Other

			С	- Actio	n Plan Te	emplate			
	1	2	3		4	5		6	7
Sr. No.	WHAT TO DO?	HOW TO DO?	WHEN TO DO?	wно то	DO?	DO WITH W	HAT?	CHECK DONE?	WHO TO CHECK?
	Preventive	(Follow	(Frequency)	(Carried	out By)	Materials	Tools/Equip.	How to	Effectiveness
	Action	SOP)		Class of Work	Worker			Check?	to be Checked By?
1	PPEs necessary	Step by step	Every week		Sub Engineer	Equipment	Tools may be	During work check	Senior officials
2	Safety measures	Very important	Every week		Sub Engineer	Awareness	Coordinate	During working	Head officials

Sr. No.	Due Date	Date Complete	Date Verified	Any New Ri Developed	sk / Hazard
1	That date			May be	
2			By head		
3					
D- SI	GNATURES				
Imple	menter Name			Signature	
Autho	ority Title			Signature	



Α	DESCR	DESCRIPTION OF PROBLEM									
1	Descript	ion of Problem	Remodeling of storm channel, as storm channel is damaged								
	Date	5-3-16									
			Major		Probable	Accident traffic	related to				
2	Type / Rating of Hazard	Moderate		Outcomes	Workers	causalities					
			Minor			Distresse	S				
3	Hazard I Through	Discovered	Inspection	Near Miss	Accident	Any Other					

В	IMMEDIA	TE ACTION						
			Remove Hazard	How?	Remodeling	is required		
Take Immediate		diate Action	Isolate Hazard	How?				
1			Restrict the Access	How?				
	Date of Response	14-4-16 Immediate	Erect Signage	How?				
	Response	IIIIIIculate	Any Other	How?				
			• • <i>"</i> =>• <i>d</i> "	Concrete channel is needed				
2	Finding Root Cause		Apply "5Whys" Methodology	It will be tolerant to discharge				
			memouology	It is broken badly				
			Lack of Training	Un-Safe O8	&M Method	Ignorance		
3	Contributing Causes	Reasons /	No Use of PPE	Lack of Pro	oper Tools	Willful Misconduct		
			Improper House Keeping	Improper Maintenance		Any Other		

			C	- Action Pla	an Temp	late			
	1	2	3	4		5		6	7
Sr. No.	WHAT TO DO?	HOW TO DO?	WHEN TO DO?	WHO TO DO	?	DO WITH V	VHAT?	CHECK DONE?	WHO TO CHECK?
	Preventive	(Follow	(Frequenc	(Carried out	By)	Materials	Tools/Eq	How to	Effectiveness
	Action	SOP)	y)	Class of Work	Worker		uip.	Check?	to be Checked By?
1	Remodeling	Make concrete channel (RCC)	Immediate	Engineering department	Civil related work	Steel bars, cement, sand coarse aggregate	Civil Engg. tools	Properly site visit, material testing	Engineers, Govt. Department
2	Site visit	Regularly	Regularly	Civil related	Civil related	Man power	Follow monitori ng	Different WASA equipment	Govt. Department
3	Channel monitoring	Professional staff	Immediate	Civil related	Workers	Man power	Follow monitori	Different WASA	Govt. Department

Sr. No.	Due Date	Dat	Date Complete Date Verified Any New F Developed			isk / Hazard	
	5-3-17	6-4	-17	7-4-17	No		No
D- SI	GNATURES						
Imple	menter Name		Kamran		Signature		
Authority Title		WASA Fasialabad		Signature			



HSE Action Plan Module 01

Salman Ahmed Hashmi (WASA, Fasialabad)

ACTION PLAN

Α	DESCR		OBLEM								
1	Description of Problem		Sewer pipe damaged and sewer man working to repair the pipe and								
	Date	15-02-17	trainc managem	traffic management during the repair work							
			Major			Death may occur if traffic not manage well,					
2	T	ation of Honord	Moderate		Probable						
2	туре / к	ating of Hazard	Minor		Outcomes	If sewer man not use proper PPEs during repair work					
3	Hazard Discovered Through		Inspection	Near Miss	Accident	Any Other					

В	IMMEDIA	TE ACTION					
	Take Imme	diate Action	Remove Hazard	How?	By plugging flow from d		e to avoid over d pipe
			Isolate Hazard	How?	By restricting public access to area		
1			Restrict the Access	How?	By using bar orange cone		d tape and
	Date of Response 15-02-17	15-02-17	Erect Signage	How?	Work ahead signs and spe signs		and speed limit
			Any Other	How?			
2	Finding Root	Cause	Apply "5Whys" Methodology	Pipe may b	e damaging o	lue to a	geing
			Lack of Training	Un-Safe O8	kM Method	Ignor	ance
3	Contributing Causes	Reasons /	No Use of PPE	Lack of Pro	per Tools	Willfu	Il Misconduct
			Improper House Keeping	Improper N	Aaintenance	Any C	Other

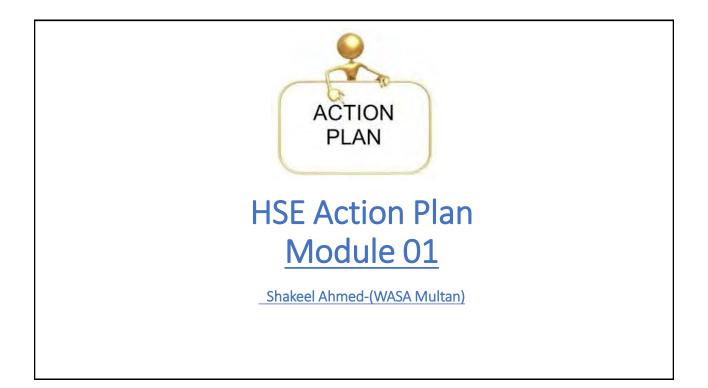
C - Action Plan Template

	1	2	3	4		5		6	7
Sr. No.	WHAT TO DO?	HOW TO DO?	WHEN TO DO?	WHO TO DO?		DO WITH WHAT?		CHECK DONE?	WHO TO CHECK?
	Preventive	(Follow	(Frequency)	(Carried ou	t By)	Materials	Tools/	How to	Effectiveness
	Action	SOP)		Class of Work	Worker		Equip.	Check?	to be Checked By?
1	Collect all PPEs before starting the repair work	Enroute/divert the traffic	For Generators/ Vehicles, refer to owner manual for when to do preventive maintenance	Generator operator		As desired by the machine	As desired	By maintaining a record, checking log book having a record when the pipe were laid	Engineer in-charge
2	Site visit	Using safety harness while lower the sewer man for starting repair work	Shelf life of pipe should be calculated by taking average and checking design age of pipe	Sewer supervisor					
3	Maintaining the record and cross checking	He must be in proper safety dress with SCBA		Sub-Engineer					

C- Action Plan Template

Sr. No.	Due Date	Date Complete	Date Verified	Any New Risl Developed	< / Hazard
	15-03-2017	17-03-2017	18-03-2017	N/A	

D- SIGNATURES			
Implementer Name	Salman Ahmed Hashmi	Signature	
Authority Title	Deputy Director WASA, Faisalabad	Signature	



			ACTION	I PLAN								
Α	DESCR	ESCRIPTION OF PROBLEM										
1	Descript	ion of Problem	Sewage blockage	e in loha mark	et dia of 36"							
-	Date	03-02-2017	Sewage blockage in loha market dia of 36"									
		•										
			Major			Stay out water is over						
2	Type / Rating of Hazard		Moderate		Probable Outcomes	buried in different Areas/ People facing						
			Minor		Outcomes	problems						
2	Hazard D Through	Discovered	Inspection	Near Miss	Accident	Any	Of proper desilting of sewer lines then no					
	mough		Inspection		Accident	Other	chance of blockage occurred					

В	IMMEDIA	TE ACTION						
			Remove Hazard	How?	To plan the o sewers	desilting	schedule of	
_	Take Immedia	ate Action	Isolate Hazard	How?	To manage t water	he othe	r way stagnant	
1			Restrict the Access	How?	To provides	the pum	ips	
	Date of Response 05-01-201	05-01-2017	Erect Signage	How?		Use the warning where labour are working and stagnant water ahead		
			Any Other	How?	Pump are install to pump out wate			
				Skilled labour are working at site				
2	Finding Root	Cause	Apply "5Whys" Methodology	All the apparatus are available at site				
			wiethouology	To maintain	machinery at	site		
			Lack of Training	Un-Safe O8	M Method	Ignora	ance	
3	Contributing Causes	Reasons /	No Use of PPE	Lack of Pro	per Tools	Willfu	Il Misconduct	
5	Causes		Improper House Keeping	Improper N	laintenance	Any C	other	

	C - Action Plan Template											
	1	2	3	4		5		6	7			
Sr. No.	WHAT TO DO?	HOW TO DO?	WHEN TO DO?	WHO TO D	00?	DO WITH W	/HAT?	CHECK DONE?	WHO TO CHECK?			
	Preventive Action	(Follow SOP)	(Frequency)	(Carried or Class of Work	ut By) Worker	Materials	Tools/ Equip.	How to Check?	Effectiveness to be Checked By?			
1	Desilting schedule	Provide the all safety equipment	Daily team moved to desilt	Desilting of sewer	Sewer man	Buckets etc.	Self breath ing appara tus	When labour start work , visit the site	A.D and Sub -Engineer			
2	Desilting team check time	all safety apparatus available	Tea working hours checked	How much sewer line desilted	No of sewer man				Sub- Engineer			

Sr. No.	Due Date	Dat	te Complete	Date Verified	Any New Develope	Risk / Hazard d
	03-01-2017	20-	01-2017	17-01-2017	Sewer blockage	
	21-01-2017	13-	01-2017	11-01-2017	Action Complete	d
D- SI	GNATURES					
Imple	menter Name		Shakeel Ahme	ed (S.E)	Signature	
Autho	ority Title		WASA Multar	1	Signature	



HSE Action Plan Module 01

Zia Ur Rehman-WASA Multan

ACTION PLAN

Α	DESCR	RIPTION OF PRO	OBLEM							
1	Description of Problem		Desilting of manhole (Manhole is a silted and my team have to desilt							
	Date	15-2-17	it)							
			Major			Sewer man may affected with gases				
2	Type / R	ating of Hazard	Moderate		Probable Outcomes	Sewer man may fall into the manhole				
			Minor			An accident may occur if traffic not controlled				
3	Hazard I Through	Discovered I	Inspection	Near Miss	Accident	Any Other				

В	IMMEDIA	TE ACTION						
		P . A	Remove Hazard	How?	Traffic are re controlled	emoved	l and traffic is	
1	Take Immediate Action 1 Date of Response 17-2-17		Isolate Hazard	How?	Gases are de detector	Gases are detected with gas detector		
-			Restrict the Access	How?				
			Erect Signage	How?				
			Any Other	How?				
		•						
2	Finding Root	: Cause	Apply "5Whys" Methodology	, , ,	s occur before ery time and i		hazard are dered as major	
			Lack of Training	Un-Safe O8	&M Method	Ignora	ance	
3	Contributing Causes	Reasons /	No Use of PPE	Lack of Pro	per Tools	Willfu	ul Misconduct	
			Improper House Keeping	Improper N	laintenance	Any C)ther	

C - Action Plan Template

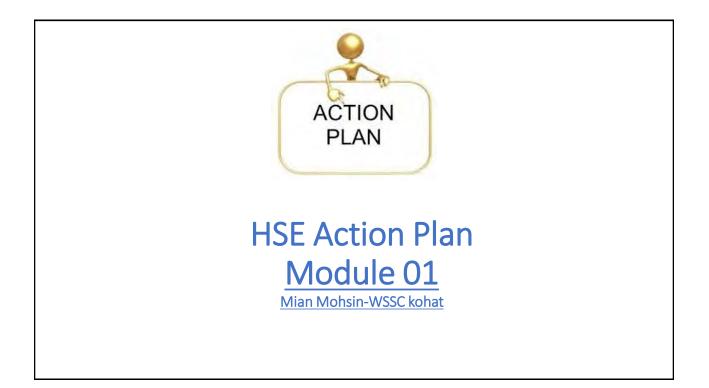
					\frown
1	2	A	5	6	7
- · ·	J	- /			•)

Sr. No.	WHAT TO DO?	HOW TO DO?	WHEN TO DO?	WHO TO	DO?	DO WITH WHA	π?	CHECK DONE?	WHO TO CHECK?
	Preventive	(Follow SOP)	(Frequency)	(Carried o	out By)	Materials	Tools/	How to Check?	Effectivenes
	Action			Class of Work	Worker		Equip.		s to be Checked By?
1	Design should be so that desilting may be minimum	We should design sewer line as self cleaning velocity should be obtain	Before laying sewer line	·		Engineering		Desilting should be minimum	By Engr.
2	Training should given to the workers	By helding training session	At start of employment and every years	V				Interview should be done	Managers
3	PPEs and equipment should be available	Should manage the PPEs	Each and every time should be available	V	V		V	Check the equipment and PPEs	Supervisor

C- Action Plan Template

Sr. No.	Due Date	Date Complete	Date Verified	Any New Risl Developed	< / Hazard
	16-02-17	17-02-17	17-02-17	No	

D- SIGNATURES			
Implementer Name	Zia Ur Rehman	Signature	
Authority Title		Signature	

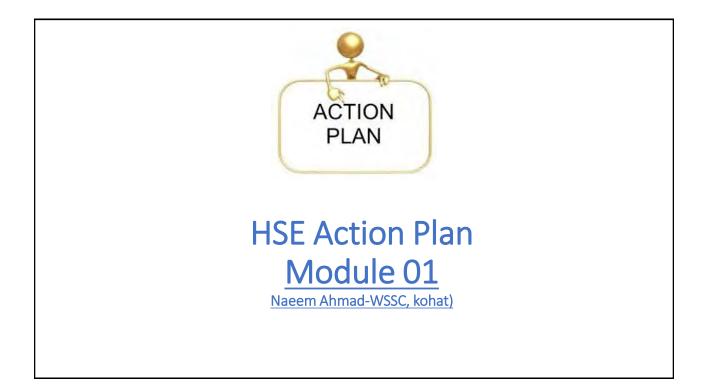


Α	DESCR	IPTION OF PR	DBLEM								
1	Descript	ion of Problem	Problem: Desil	Problem: Desilting of sewer							
-	Date	15-02-17									
			Major		Probable Outcomes	Head inj	ury				
2	-	Moderate		Unconscious							
			Minor		outcomes	Brain damaged/death					
	Hazard [Discovered									
3	Through		Inspection	Near Miss	Accident	Any Other					
						Other					

В	IMMEDIA	TE ACTION						
	Take Imme	diate Action	Remove Hazard	How?		Remove al the covers of sewers providing oxygen from outside		
_			Isolate Hazard	How?				
1			Restrict the Access	How?	Starting pe	g permit to work system		
	Date of Response		Erect Signage	How?				
	Response		Any Other	How?				
		•						
			a l "mad "	1) Not use	ed PPEs 2) no	t providi	ing by manager	
2	Finding Root	Cause	Apply "5Whys" Methodology	3) Not available at store 4) budget not available				
			memouology	5) Applied	d for budget			
			Lack of Training	Un-Safe O	&M Method	Ignor	ance	
3	Contributing Causes	Reasons /	No Use of PPE	Lack of Pr	oper Tools	Willfu	Il Misconduct	
			Improper House Keeping	Improper	Maintenance	Any C	Other	

			C	- Action P	lan Temp	olate			
	1	2	3	4	I	5		6	7
Sr. No.	WHAT TO DO?	HOW TO DO?	WHEN TO DO?	WHO TO DO	?	DO WITH W	'HAT?	CHECK DONE?	WHO TO CHECK?
	Preventive	(Follow	(Frequency)	(Carried out	By)	Materials	Tools/	How to	Effectiveness
	Action	SOP)		Class of Work	Worker		Equip.	Check?	to be Checked By?
1	Providing oxygen to patient	Where is oxygen muff	Time of accident		workers	Gas detector	Oxyge n mask	supervisor	Manager and HSE officers
2	Calling 1122			Concern Manager			PPEs		Supervisor
3	Shifted to hospital			HSE Officers, Concern Manager					

Sr. No.	Due Date	Dat	e Complete	Date Verified	Any New Risk / Hazard Developed		(/ Hazard
	15/2/17	15/	2/17	15/2/17		Insects infection etc.	
D- SI	GNATURES						
Imple	menter Name		Mian Mohsin	Gul	Się	gnature	
Autho	rity Title				Sig	gnature	

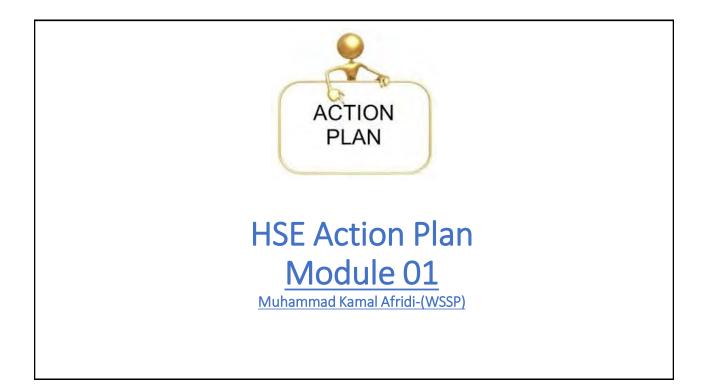


Α	DESCR	IPTION OF PR	OBLEM	DBLEM								
1	Descript	ion of Problem		Confined space (sewerage system)								
-	Date	15-2-2017	Problem: "Suffo	cation"								
			Major			Unconscious						
2	Type / Rating of Hazard	Moderate		Probable Outcomes	Head injury							
			Minor		Outcomes	Brain hemo	orage/Death					
	Hazard D	Discovered										
3	Through		Inspection	Near Miss	Accident	Any Other						
						other						

В	IMMEDIA	TE ACTION						
	Take Imme	diate Action	Remove Hazard	How?	Removal of r purging	Removal of manhole covering, purging		
_			Isolate Hazard	How?				
1			Restrict the Acce	ss How?	Introduce pe	ermit to	work system	
	Date of Response	Immediate 15-02-2017	Erect Signage	How?	Well before	execution work		
	Nesponse	13-02-2017	Any Other	How?	Testing etc.			
			A such a ((E) A (base))	Because	of engineering f	ailures		
2	Finding Root	Cause	Apply "5Whys" Methodology	Adminis	Administration failures			
			methodology	PPEs				
			Lack of Training	Un-Safe	O&M Method	Ignora	nce	
3	Contributing Causes	Reasons /	No Use of PPE	Lack of F	Proper Tools	Willful	Misconduct	
			Improper House Keeping	Imprope	er Maintenance	Any Ot	ther	

			C -	Action Pla	n Temp	late			
	1	2	3	4		5		6	7
Sr. No.	WHAT TO DO?	HOW TO DO?	WHEN TO DO?	WHO TO DO	?	DO WITH V	VHAT?	CHECK DONE?	WHO TO CHECK?
	Preventive	(Follow	(Frequency)	(Carried out	By)	Materials	Tools/	How to	Effectiveness
	Action	SOP)		Class of Work	Worker		Equip.	Check?	to be Checked By?
1	Inspection	Staff training	Before operation	Concerned manager		Gas detected	PPEs	HSE officers	Manager concern
2	Purging	Safety drills etc.	Gas monitoring after some time depends on case	HSE officers				supervisor	HSE officers
3	Use of suitable tools			Supervisor					
4	PPEs								

Sr. No.	Due Date	Dat	te Complete	Date Verified		Any New Risl Developed	k / Hazard
1	Nearly miss 15-2-2017					Fall hazard	
						More causality	
D- SI	GNATURES						
Imple	menter Name		Naeem Ahma	d	Sig	gnature	
Autho	ority Title				Sig	gnature	

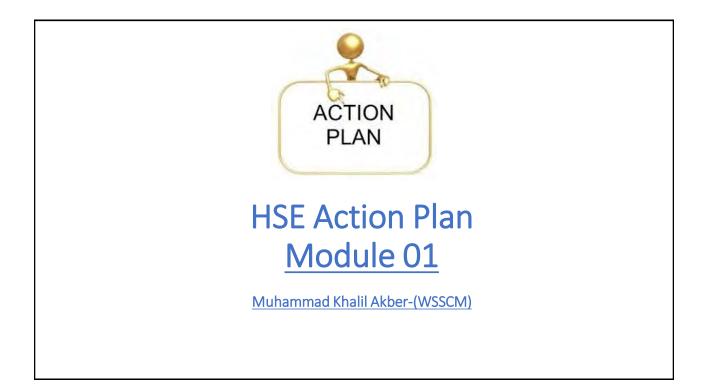


			ACTION	I PLAN						
Α	DESCR	IPTION OF PR	OBLEM							
1	Description of Problem		While lowering into the manhole, the sewer man got suffocated &							
-	Date	15/2/2017	fainted.							
		•								
2	Type / Rating of Hazard		Major		Probable	Such an Accidents may lead to the death of the sewer man				
-	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		Moderate		Outcomes					
			Minor							
3	Hazard Discovered Through		Inspection	Near Miss	Accident	Any Other				
						Other				

В	IMMEDIATE A	IMMEDIATE ACTION					
	Take Immediate Action		Remove Hazard	How?	By following	SOPs reg	arding PPEs
			Isolate Hazard	How?	Line Manage	Line Manager to play vigilant role	
1			Restrict the Access	How?		Sewer men not following SOPs, should be educated	
	Date of Response	16/2/2017	Erect Signage	How?		Informative pamphlets & stickers should be produced for awareness raising	
			Any Other	How?			
				PPEs r	not followed		
2	Finding Root (Cause	Apply "5Whys" Methodology	Line mana	Line manager casual about the SOPs/PPEs		
				Lack of ign	Lack of ignorance of hazardous effects		
			Lack of Training	Un-Safe O	&M Method	Ignora	ince
3	Contributing F Causes	Reasons /	No Use of PPE	Lack of Pro	oper Tools	Willfu	Misconduct
			Improper House Keeping	Improper I	Maintenance	Any O	ther

	C - Action Plan Template							
	1	2	3	4		5	6	7
Sr. No	WHAT TO DO?	HOW TO DO?	WHEN TO DO?	WHO TO DO)?	DO WITH WHAT?	CHECK DONE?	WHO TO CHECK?
•	Preventive	(Follow SOP)	(Frequency)	(Carried out By)		Materials &	How to Check?	Effectiveness
	Action			Class of Work	Worker	Tools/Equip.		to be Checked By?
1.	Use of PPEs should be made mandatory	 Supervisor, line manager to ensure adherence to the SOPs Testing of gases Wearing PPEs 	Each time when sewer man enter the manhole	Technician to check gases ratio	Sewer man follow the instruction of the supervisor accordingly	1. Gases testing machine 2. PPEs (Goggles, cylinder etc.	Supervisors will ensure the fulfilments of the SOPs, Line Manager will check through random spot checking	Data base will shoe the happening of the such event like sewer man suffocation. This will show that the SOPs & checks are not being followed

Sr. No.	Due Date	Date Complete	Date Verified	Any New Ris Developed	sk / Hazard
	28/2/2017				
D- SIGNATURES					
Implementer Name		Kamal Afridi		Signature	
Autho	ority Title	Zonal Manag	ger	Signature	



Α	DESCR	RIPTION OF PR	OBLEM								
1	Descript	tion of Problem	Desilting Manho	Desilting Manhole 6 ft. deep							
-	Date	15-02-17									
			Major								
2	Type / Rating of Hazard		Moderate		Probable Outcomes	Become	Injured				
			Minor								
	Hazard	Discovered									
3	Through		Inspection	Near Miss	Accident	Any Other					
						Other					

в	IMMEDIATE ACTION						
	Take Immediate Action		Remove Hazard	How?	W? Give PPEs		
			Isolate Hazard	How?	Stop worker	Stop workers for taking PPEs	
1			Restrict the Access	How?			
	Date of Response	15-02-17	Erect Signage	How?			
	Response		Any Other	How?	Treatment to the workers		
			Apply "5Whys"	1) Not taking PPEs 2) Ignorance 3) Lack of training			
2	Finding Root	Cause	Methodology	4) Pressure	4) Pressure from supervisor		
				5) Imprope	er supervisor a	at highe	r level
			Lack of Training	Un-Safe O8	&M Method	Ignora	ance
3	Contributing Causes	Reasons /	No Use of PPE	Lack of Pro	oper Tools	Willfu	Il Misconduct
			Improper House Keeping	Improper N	Vaintenance	Any C	ther

C - Action Plan Template									
	1	2	3	4		5		6	7
Sr. No.	WHAT TO DO?	HOW TO DO?	WHEN TO DO?	WHO TO	DO?	DO WITH V	WHAT?	CHECK DONE?	WHO TO CHECK?
	Preventive	(Follow	(Frequency)	(Carried o	(Carried out By)		Tools/Equip.	How to	Effectiveness to be Checked
	Action	SOP)		Class of Work	Worker			Check?	By?
1	Providing HSE	Yes	Every time before work		Workers		Tools/ Equipment	Site visit	Manger

Sr. No.	Due Date	Dat	te Complete	Date Verified		Any New Ris Developed	k / Hazard
1	15-02-17	15-	02-17	15-02-17		Slow progress	
D- S	IGNATURES						
Implementer Name		M. Khalil Akbar		Si	gnature		
Auth	ority Title				Si	gnature	

Name	Khalid Bin Rasheed
Designation	Sub Engineer
Organization	WASA, Lahore
Description	Drain Dredging
Area	Drainage Directorate South

<u>Planning:</u>

First we a planning to perform the process in which machinery, labor and other safety equipment are used.

Machinery:

- Excavator
- Dumper

The qualities of machinery depend upon the area of O&M.

Safety Measures:

To control the traffic problem we need safety measures such as orange cones, warning tapes etc. and PPEs to prevent our labor from any incident.

Working:

Now we start the work of dredging to drain with the help of our machinery. First the excavator operator will be prepare for working and use PPEs then start the work. Excavator bucket capacity is 1 Ton dumper capacity of loading is 8 Ton. So, maximum 8 buckets are loaded in the dumper. Excavator bucket is a back hoe type usually a solid waste a present at the drain in Tons and this waste is present at the culvert. First of all we make boundary with orange cones arrange the O&M to prevent from hazardous as a serious accidents. Excavator after collect a bucket of sludge or solid waste, water release from the bucket. We do this action because we loaded more waste into the dumper.

After loading the dumper we have to dump the waste at dumping site, the dumping site of Lahore is at Gujjar Colony before move a dumper a driver or a labor person check the clamp of the truck. So on the way the back door of the dumper open and hazard is happened.

Dumping Site:

The dumping site of Lahore is at Gujjar Colony, but this site is not permanent dumping site. Their dumper can dump the waste. This waste is far away from the city. So that this site chosen for solid waste dump.

Name	Waqas Ali
Designation	Sub Engineer
Organization	WASA, Lahore

Description: Drain Dredging

Area: drainage South, Length 5Km

Planning:

First of all we need to plan how to perform the process. We need machinery, Labour, money and resources etc.

Machinery:

Machinery	Quantity	Capacity	Fuel consumption
Excavator	02	1.00 Tons	14 liter
Tractor trolley	02		5 Km
Dump truck	02	8 Ton	8 Km/l

Labour:

Machine operator = 06

Sewer man = 04

Supervisors = 01

Engineers = 01

First of all we need a visit the site and calculate the value of sludge in drain. Our survey team visits the drain and gives us some value of sludge in drain. Suppose the value of sludge is 650 m^3 .

Now we are calculate the machinery required and we use the two excavator, two dumper and two tractor trolleys. The excavator is back hoe type and use of this machinery to remove the solid waste and sludge. Excavator put the solid waste and from the drain and put into the dump trucks. After the cleaning the drain our team transported the solid waste and sludge on the open area.

Many of hazardous are we can free during this process that why we planned the hazardous remove policy.

All the drivers are experienced holder and staff must use the PPEs like life line attentions, gloves, safety shoes, proper tools (SCBA), masks and proper guide line etc.

All the step perform the duty are fully and honesty with maximum safety factors. We get the permissions before the start of the work and signed on the worksheet like engineers and supervisors.

Name	Sana Fatima
Designation	Assistant Director
Activity	Process of Drain Dragging

Planning Phase:

- Selection of site
- Nominate staff members for performing the subject activity
- Select the proper machinery required for dredging (Excavators, Dumping Trucks)
- Instruct the staff members to wear PPEs (Helmets, Safety shoes, gloves)
- Take traffic control equipment to avoid traffic hazard
- All the machinery capacity and staff requirement should be according to sludge volume. (calculation are explained at the end) then more toward site related for dredging.

Implementing phase:

- First to void traffic hazards, segregates the work areas by isolating it with the help of traffic cones arrangement.
- Hydraulic man starts working
- Excavator will remove the solid waste wetted (sludge) into the trucks.
- When the truck is fully loaded with sludge, stop the working of excavator.
- Then instruct the driver to move toward the dumping site.

Closing Phase:

- Select proper dumping site (Sludge) to avoid all type of hazards i.e. environmental, biological etc.
- Then instruct the truck driver to remove sludge carefully
- Then instruct the truck driver to move toward office

Sludge Volume Calculation:

Sludge volume is calculated before drain dredging to estimate staff and machinery requirement. It is calculated by selected two locations (Foot Bridge) and by taking x-section of the drain at these two site. This activity is performed by taking these equipment:

- Staff disk arrangement (rod)
- Metallic tape
- Meter for distance measuring

The PPEs require for the sludge measurement are:

- Gloves
- Helmets
- Goggles
- Safety shoes

Staff member required: almost 2 members are required

Procedures:

- 1. First avoid traffic hazard
- 2. Select avoid foot bridge-1 (for measuring depth of sludge width)
- 3. With the help of meter rod, measure total depth, then take depth of the drain at location-3 so that after subtracting it from the total depth of sludge may be taken.
- 4. Take width (B_1) at foot bridge-1
- 5. Then move toward the foot bridge-2 by taking wheel meter along with to measure distance between wo bridges(Li).
- 6. Then at foot bridge-2 measure the total depth of the drain, then perform same procedure to measure average depth at this section S'.
- 7. Then take average of S & S', which gives avg. depth
- 8. Measure width at location B₂
- 9. Take avg. of $B_1 \& B_2$ for ant width
- 10. Then measure length along other bank of drain (Lo)
- 11. Take avg. of Li & Lo, avg. length will be obtained

Then by using following formula:

Sludge Volume = $D_{(avg)} * B_{(avg)} * L_{(avg)}$

D(avg) = Depth of sludge

B(avg)= Width of sludge

L(avg)= Length of sludge

Name	Samina Asif
Designation	Assistant Director
Organization	WASA, Lahore

Process of Drain Dredging:

1 Planning Phase:

In planning phase length of drain should be decided where dredging is required

i. Site Survey:

After deciding the length of the drain a site survey must be carried out to examine the existing condition at site. This survey will give an idea about traffic and population around the drain which will help in efficient development of machinery and staff.

ii. Sludge Estimation:

Sludge estimation will be carried out before commencement of maintenance work.

For sludge estimation, equipment related to measuring depth & width must be arranged. Ranging Rods, safety shoes, gloves, mask and distance meter required.

After arriving at site, person responsible for sludge estimation must wear PPEs mentioned above. A proper plan for traffic management must also be adopted for safety purposes.

Traffic cones and Barrication tapes must be used to aware traffic about maintenance activity.

After ranging rod must be used to measure the sludge at center and both sides of the drain, and also to measure total depth of the drain.

The Average depth of sludge & width & length where cleaning is required, will give us sludge volume.

iii. Machinery:

On the basis of estimation of sludge volume, we will have an idea that how much machinery is required at site & how many trucks are required to transport the sludge from site to disposal point. Staff operation is also depending upon sludge volume,

2 Implementation Phase:

After planning we are clear about site, sludge which we are going to handle. So, on the maintenance day, arrive at site with trained staff and proper machinery.

Divert the traffic any way from drain working area by using cones & flaggers. Deploy the machinery mainly excavator & start the operation.

3 Handling/Disposal:

After collecting all the material from drain, remove the traffic diversions & move the vehicles to the to the Disposal point.

After reaching point, unload the truck safely. Make sure that no person is standing over there to avoid hazards from splashing.

After unloading, vehicles must return to the office for operational activity.

Name	Mirza Waseem Iqbal
Organization	WASA Gujranwala
Designation	Sub-Engineer
Date	17-02-2017

Drain Dredging:

Step 1:

First we have to know where we have to decide the area and its length of reach.

Step 2:

We manage the drain dredging with accessories like dump truck with man power immediately and before moving to site check the everything light and also the fuel as well.

Step 3:

We reach the site for dredging for and put in use the machinery.

Step 4:

As first we check the traffic flow at our site. Now we use cones in alignment and Barrication tape properly traffic. We should at least complete uniforms and PPEs

Step 5:

Now we placed our dragging at work area so that nobody will disturb you. put the dump truck nearest to the machine then is not only garbage thrown at the road.

Step 6:

Immediate work start and the dump ready to away this garbage to dispose outside the city.

Step 7:

The disposal material must be thrown to the site burnt and dig into the mud.

Step 8:

This wastage must inside the mud because it will not cause to disturb the water table underground.

Step 9:

Most important the water table is now disturbing at least 9 m water table deficient under the ground. So we face water loss at least 9 m.

Step 10:

After completion our assignment at site of work properly assemble the whole activity and safety things.

Remarks:

- 1. Safe of time
- 2. Safe of economy
- 3. Safe of fuel
- 4. Safe of more use of man power
- 5. Also the drain flow will proper after the desilted
- 6. It also the help of the budget of the concern WASA authority
- 7. It will increase our efficiency

Name	Shakeel Ahmed
Designation	Sub Engineer
Organization	WASA, Multan

Drain Dredging:

The dredging of the drain of Bohar Gate Shah Gervais is require. For this purpose, first we manage the machinery and helpers, and also make a time estimation plan to check in how many days this dredging work will be completed. After that we use following safety equipment to control the interference of the public:

- Safety cones
- Safety warning tape
- Signal board etc.

After completed the safety precautions, machinery and workers will send to the site. Before starting work, wear safety helmets and safety shoes. Sludge will lift with the help of excavator and dragger machine. The truck will lift in proper manner, avoid overloading. otherwise it will be falling on road during the movement of truck. And it is painful for public.

After loaded the truck, sludge removed on dumping site. During work, take care of the parts of machinery.

Where machinery or labours are working, site in charge must be at there and also first aid box should be there. In case of any emergency, initial treatment could provide to worker.

After completion, worker collect all the safety equipment and clear the area for public.

Before reaching the truck at office, its washing compulsory. The report of this activity will submitted to the concern Engineer.

If work not complete in one day, then mark the area and start the work from there on second day. It is easy way to complete the work as soon as possible.

Name	Zia Ur Rehman
Designation	Sub Engineer
Organization	WASA, Multan

Title: Dredging of Drain

Objectives:

The objective of this step to safe desuldging of drain and disposing the sludge in proper and safe way including its safe transportation.

Planning:

For dredging the drain we have to remove measures the sludge volume, by determining the sludge depth, X sectional depth of drain and length. And then machinery, labour, and safety equipment and fuel and then a place for safe disposal of sludge.

1. Sludge Volume:

We have to dredge a drain of length 116.55 m and having X section (Width=2.4 m) and depth of sludge 0.2933 m by taking measurement on site.

Sludge volume = $116.55 \times 2.4 \times 0.2933 = 82.046 \text{ m}^3$

2. Machinery required:

We required an excavator with four dump trucks. For this purpose

3. Fuel required:

For dump trucks = 0.33*4*(7*2)*3 = 56 liters

For Excavator = 14 * 2 hrs.= 28 liters

Add 10 L for reaching at site = 28 + 10 = 38 L

Total fuel consumption = 94 L

4. Labour Required:

For dump truck:

(Driver + Helpers)*4

So four drivers with four helpers are required for this dump trucks.

For Excavator= operator + helper

Safety Equipment:

Nearly 12 safety cones and warning tapes and traffic reflections are required.

PPEs:

Helmets, goggles, gloves and safety shoes etc.

Procedures:

First of all sludge is measured and then planning for machinery and labour & equipment is done. After machinery is arranged. They are shifted to a site. On site first of all safety cones are placed for traffic control.

The dump truck is stopped in line on the side of road and excavator on starting point of site. The dredging is starting and dump truck are filled, when first is shifted it move toward disposing point which is 7 Km away from the site.

Nearly four turns of each dump truck is completed, after this completing dredging the excavator is shifted to the office and our task is completed.

The disposing is done by safe way in trucks and they are covered with sand or soil.

Remarks:

The task is completed in safe way and precautions have been followed.

Name	Muhammad Kamran Zafar
Designation	Assistant Director
WASA	Faisalabad

Drain dredging:

For the purpose of drain dredging, we required some machinery and staff. They are estimated as follow:

- 1) Staff
- 2) Gloves
- 3) Distance measuring wheel
- 4) Goggles
- 5) Orange cones
- 6) Barricaded tape
- 7) Dumping truck
- 8) Excavator (back hoe/front hoe)

First of all, we take a total depth of the channel by inserting staff deep inside the channel as its center by forcefully. Then we calculate a depth at which sludge start. It can be calculated very easily when a slight friction come on its way. Suppose full depth of the channel is 94 cm and depth at which a sludge start is 54 cm. Then we have total depth of the sludge 94-54=40 cm. similarly we shall calculate sludge start level at the end of channel width too. One support it is 60 and other end it is 64. So we shall have sludge level at ends

94-60=34 cm

94-64=30 cm

So we have three sludge level,

One end=34 cm

Middle=40 cm

Other end=30 cm

Average=34.66 cm

We shall also measure a width of the channel. Suppose that comes to be 220 cm. this whole calculation is for when you standing taking calculation from one bridge. Now move toward the other bridge and measure distance by measuring wheels. Distance must be taken from both side of the channel and take average of it

Distance between two footsteps (bridge) =100 m

=110 m

Average = 100 + 110 = 105 m

2

Also repeat the methods for sludge thickness at 2nd foot too. Suppose sludge thickness at 2nd foot step is

One end= 35 m

Middle= 45 m

Other end =45 m

Average= 38.33

Width of foot 2=230 m

Taking avg. of width of two foots= 220+230 = 225 cm

2

Now perform calculation is in meters.

Calculate sludge volume= 2.25*105*0.3649

 $= 86.2 m_3$

So we have calculated the volume of the sludge. Now we shall transport this volume to dump site by dump trucks. Suppose capacity of the dump truck is 10 m₃. Sludge to dump site in nine goes

<u>86.2</u> = 8.62

10

So take it is nine.

Name	Salman Ahmed Hashmi
Designation	Assistant Director Technical
Organization	WASA, Faisalabad

Title: Drain Dredging

Action plan for drain dredging:

Machinery required:

- 1. Excavator or dredger machine
- 2. Dumper
- 3. PPEs
- 4. Manpower

First step for commencing the drain dredging is to make a traffic management plan. Normally drains are along road sides so traffic management plan is necessary. We use many orange cones, barricaded tapes and flaggers for controlling the traffic. Persons working at site must be in proper PPEs. It may include reflecting jackets, safety helmets, safety gloves and safety shoes. Next steps are as follow:

i. Calculate the volume of sludge in the drain by measuring the length, width and depth using different instrument. Length and width of drain can measuring by using distance measuring wheel and depth can measure by using staff/measuring rod having pointed bottom. The surface of sludge in the drain can be felt by the measuring rod and it should be subtracted from total depth of the drain. Following formula is to be used for calculating the volume of sludge

V = l*w*h

Where $l = \underline{li+lo}_2$ w= width of the drain h= depth of the drain Let's take a complete of a drain having the following L= 115 m (length of drain to be desilted) Select two point W= 2.5 m (width of the drain to be desilted) H= 0.28 m (depth of sludge) V= 80.5 m3 (total sludge) V= 193.73 metric tons $\frac{193.73}{8} = 24$ approx. A truck has a capacity to carrying 8 tons. We will need about 24 dump truck to carry sludge from drain to dumping site. Suppose the distance is 10 Km from the drain to dumping site and the fuel consumption of dump truck is 2 km/l, so 10 Km (going)+ 10 Km (come back)=20 Km

Each dump truck will need 10 liter. So, 24 dump truck will need 10 * 24 = 240 liters Working capacity of excavator= 1 ton

Fuel consumption of excavator/backhoe= 10 L/h

Suppose it will take 50 hours, so it will consume 500 L fuel.

Name	Kamran Afridi
Designation	Zonal Manager (WSSP)
Activity	Drain Dragging

1. <u>Planning:</u>

Before start the activity we need to correlate the various activities involved in the whole dredging process. Manager & in charge should make out the various requirement for the activity in term of manpower, machinery, expense foe POL, coordination with the line department like traffic police etc. after that chronological activities should be laid down on a paper.

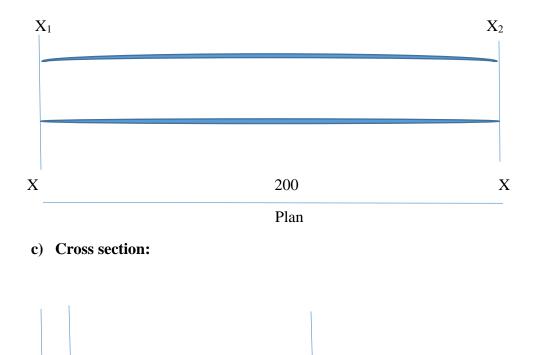
i. Activities:

4'

a) Dredging of 200 ft. drain with the cross section 8'* 4"

8'

b) Plan of the drain



ii. **Man power:** helper = 4 Nos Driver = 1 Nos

iii. **Fuel requirement**: 100 liters

iv. Coordination:

Inform traffic police about activity with date and time.

v. Equipment:

Ranging rod, distance meter, measuring tape and excavator with back hoe bucket. Helmets for works and gloves.

2. Dredging Activity:

Upon reaching the dredging site, first of all traffic cones should be placed following the SOPs like traffic approach zones transition zone make area end zone and showing mark area work zone. After securing the work area with respect to the all sort of hazards like traffic etc. actual work should be started by following the steps as mentioned below.

• At X-Section I take measurement for overall depth of flow and depth of sludge at around three locations

At poin-1:

- Overall depth of flow =3.5'
- Depth of water from surface up to sludge surface = 2.5'
- Depth of sludge = 1'

At point-2:

- Overall depth of flow =3.5'
- Depth of water from surface up to sludge surface = 2.0'
- Depth of sludge = 1.5'

At point-3:

- Overall depth of flow =3.5'
- Depth of water from surface up to sludge surface = 2.25'
- Depth of sludge = 1.25'
- Average depth of sludge = 1.25'

Now repeat the same procedure for XX_2

After taking depth of sludge at both the section average of average should be calculated say (X ft.)

Now measure the length of the drain by using measuring meter. As the drain is in a curve, therefor reading should be taken along both banks of the drain. Centre line should be calculated by averaging both the measurement.

Now we have

Average depth of the drain = X_{ft} Average length of drain= 200 ft. X- Section of the sludge = 8*4

Volume of sludge = X * 200*8'

 $= Y cf^3$

We will use tractor trolley having carrying capacity of 300 cft.

No of trolleys require = $\underline{Y cf^3}$

300

Z number of trolleys will be required to clear the sludge.

Name	Mian Mohsin Gul
WSSC Kohat	

Activity = Drain Dredging

-> Planning:

- 1) Identify the 5000 ft. length of dredging
- 2) Arrangement of tractor trolley an excavator for carrying the sludge
- 3) Arrangement for man power
- 4) Taking traffic control measures
- 5) Providing of PPEs

\Box Procedures:

We have already calculated the volume of sludge in 500 ft. length and find out the 20 number of tractors of volume 2.5/100 cft. will which have needed for operation.

We arrange five number of trolley of 2.5/100 cft. volume to carry 4 Nos. Tripp site of sludge disposal site.

 $\overrightarrow{\gamma}$ PPEs used in this operation are Helmets, Goggles, Jackets, Boots, Traffic control equipment e.g. safety cones, signs etc.

 \Rightarrow Equipment for measuring volume are:

- 1) Tape
- 2) Ranging rod
- 3) Goggles
- 4) Larger tap for measuring distance between selected points.

Conclusion Remarks:

Operation accomplished in 10 hours, all the PPEs & traffic Control equipment are submitted to store room, the trolley has been washed and placed safely.

Name	Naeem Ahmed
Company	WSSC, Kohat
Activity	Drain Dragging

Planning:

A. Inspection:

To calculate the silt in the existing drain to be clean. i.e. 5000 CFT in 1 Km drain.

B. Allocation of fleet:

- Excavation 1 Nos.
- Tractor trolley 5 Nos.

C. Man power:

- 5 Nos. of tractor drivers
- 1 Nos. of Excavator driver
- 2 Nos. of helpers with Excavator
- 2 Nos. of supervisors

D. Fuel consumption

Depend upon the distance to be covered but normal layers such as 5 lit/trip.

20*5=100 liters for tractor trolley

15*6= 90 liters for Excavators

Procedures for Excavation:

- Direct all of the planner's staff to reach the site on time with following arrangement
- The following PPEs must be wear by each official.

Supervisor:

- Normal uniform of WSSC Kohat
- Safety boots with steel protection
- Safety jackets
- Safety helmets (In case of normal operational cap)

Drivers:

• Uniform

- Safety boots with steel protection
- Safety helmets
- Safety jackets

Helpers:

- Uniform
- Safety boots (rubber boots are in case he may work in water)
- Wader
- Safety protection gloves
- Safety jackets
- Full water proof clothing
- Self-Control Breathing Apparatus (SCBA) in case of usage in culnets etc.

Other safety equipment for road safety:

- Safety cones
- Signal Stick
- Road safety slogans
- Tape etc.

The work will start as per approved. Standards operating procedures (SOPs), that will ensure to the safety of the staff as the General public.

Completion/Ending of Activity:

After completion of work as per approved SOPs. All of the equipment be washed with proper caution for ensuring the long term usage and durability of tools and equipment.

Name	Sana Fatima
Designation	Manager Municipal Services
Organization	WSSCM

Description of Activity:

Name of work: Desilting of main drain at Mardan Bazar

<u>Planning:</u>

We will select a day on which traffic flow is minimum and general public entry is minimum.at Friday shops observe holidays so we will do the activity on Friday.

Resources:

HSE, Tools, vehicles, machinery, workers

Execution:

The drain is 4 km long, 3 ft. wide and 4 f. deep.

First of all, we provide personal protection equipment to the workers that will includes Gum Boots, Gloves, Helmets, uniform for the specialized work and worker. The sludge measured is 3 ft. in depth, 3 feet wide, and 4 Km.

Volume of sludge=4000*0.91*0.91

 $= 3312 m_3$ = 116963 ft₃

We have 8 tractor trollies of 300 cft. each

So number of trips= 49 per day

We will need 2 excavators each of 1-ton capacity to fill the tractor trollies. As excavator will not cleaned/desilted the drain along the sides of the drain so the remaining sludge will be lifted by workers with the help of spades.

The dumping site is 5 Km away. The fuel consumption of each trolley is 5 Km/liter. No of trips are 49.

The kilometer covered will be 49*2=490

Fuel requirement= $\underline{490} = 98$ liters

So excavation will work for 8 hours. So fuel consumption is 14 liters/hours

=14*8*2=224 liters required for excavation

One blade is also required at dumping site fuel consumption of tractor blade is 8 liters/hrs.

8*8=64 liters'/day consumption

The activity will be started at 7:00 am and will be finished at 3:00 pm.

No of workers required.

Supervisor 2 Nos at site and 1 Nos at dumping ground.

Drivers:

- 8 for tractor trollies
- 2 for Excavators
- 1 for tractor blade

I labour will also be required with tractor trolley. So number of labors with tractor trolley= 8 Nos

Number of workers require for desilting we will need 1 worker per 100 m. so the number of worker will be 40.

After cleaning the drain, the sides will be washed with water with the help of shrinking Lori that will require four sanitary workers to sweep.

Fuel consumption of sprinkling Lori is 4 liters/Km. so it will be 4*4=16 liters

Action Plan for operation & Maintenance of Sewerage System at Millat Chowk Sub-Division and Adjoining Areas

Muhammad Kamran Zafar	
Assistant Director	
P&D WASA Faisalabad	

Area Description:

Total area to be served	4 Km2
Total population of area	12800
Topography	Uniform
Sewerage system Description	
Length of sewer	8000 ft
Total discharge	4.0 cusec
Diameter of sewer lines	18"and 24"
Material of pipes	RCC
Number of manhole	80
Upstream points	8 ft
Downstream points	24 ft

Tools and Material:

- Sucker and Jetter machine
- Bamboo Cane
- Steel Rods
- Dewatering Sets
- One dumping trucks
- Traffic control equipment
- Gas Detector

Man power:

Supervisor	3
Sewer men	20
Drivers	5

Planning:

- Sewerage layout plan of the area
- GIS based sewerage layout
- Three teams with equal manpower

- PPEs must be provided
- Sewer line and manhole inspection checklist must be prepared
- Inspection team will prepare preliminary inspection report and will submit report with 15 days to Sub- Divisional Offices.

Problems highlighted in meeting while discussing report.

- 1) Desilting of sewer line
- 2) Replacement of manhole cover
- 3) Blockages

Strategy:

Three teams will employed on sewer desilting and replacement of damaged manhole covers.

Execution:

Time period for execution = 3 months

- First of all, PPEs to the workers must be prepared allocate suitable equipment for highlighted problems.
- Traffic hazards must be availed by proper regulating the traffic
- Submit weekly report to supervisor
- Gas detection must be done before entering the manhole
- Perform the desilting and manhole cover replacement activities
- The work should be completed in three months
- After completion of the work supervisor submit the completion report
- SDO will finally give completion report after himself checking the site to higher authorities.
- After execution sucker and Jetter machine will be send to maintenance depart for its repairing and maintenance

ACTION PLAN FOR OPERTION AND MAINTENANCE OFMILLAT CHOWK SUB-DIVISION FASIALABAD

Salman Ahmed Hashmi	
Assistant Director	
WASA Faisalabad	

1. Area Description:

Total area to be served	4 Km2
Total population of area	12800
Topography	Uniform

2. Sewerage system Description:

Length of sewer	8000 ft
Total discharge	4.0 cusec
Diameter of sewer lines	18"and 24"
Material of pipes	RCC
Upstream points	8 ft
Downstream points	24 ft

3. Tools and Machines:

a)	Jetter Machine	01 Nos.
b)	Sucker Machines	01 Nos.
c)	Bamboo Canes	20 Nos.
d)	Steel rods	5 Nos.
e)	Dewatering sets	1
f)	Dump Trucks	1
g)	PPEs	
h)	Orange Cones, Flaggers	

4. Manpower

Supervisor	3
Sewer men	20
Drivers	5

Action Plan:

For a preventive maintenance of sewerage line, we should obtain a GIS map showing all the sewerage infrastructure detail of all the area 8000 ft line should be inspected after every 2 months. Three comprises of one supervisor and six should inspected and examine the 8000 ft pipeline. Teams should have the inspection checklist of sewer line and manhole. By inspecting the site, team should fill in the checklist carefully and supervisor will submit the checklist to sub –engineer and he will submit to Sub- Divisional Offices after counter checking the site problems. Team should examine visual, structure and hydraulic infrastructure.

Problems highlighted in the checklist should be discussed in the meeting between SDO and higher officials. Upon getting the approval to start work, three teams comprising supervisor and sewer men should be assigned duty to resolve the highlighted problem with proper strategy.

Major problems:

- a) Blockage of sewer lines
- b) Crown failure
- c) Replacement of damaged manhole cover
- d) Repair of damaged surround

Time period for execution: 3 Months

Execution:

- Before starting any repair work or desilting process, provide PPEs to the workers. Allocate suitable equipment to the workers.
- Deploy proper machinery and staff according to the requirement at site.
- Avoid traffic hazard at site by using flaggers and traffic cones to maintain the traffic flow
- After opening a manhole, gas detector should be used to check for any harmful gases and if there are any harmful gases
- Perform the desilting and manhole cover replacement activity as per site requirement
- All the problem identified during inspection phase be completed within three months
- After completion of the activity, supervisor will provide report to SDO
- SDO will visit the site on and off.
- After completion of the work and report it will be submitted to higher officials
- Overall, this activity should be performed after every six months

ACTION PLAN FOR OPERTION AND MAINTENANCE OF SEWERAGE SYSTEM (TRUNK SEWERS & MANHOLE) MILLAT CHOWK SUB-DIVISION FASIALABAD

Samina Asif	
Assistant Director	
WASA Lahore	

1. Area Description:

i.	Total area to be served	4 Km2
ii.	Total population of area	12,800
iii.	Topography	Flat

2. Sewerage system Description:

i.	Length of sewer	8000 ft
ii.	Total waste water flow	4.0 cusec
iii.	Diameter of sewer lines	18"and 24"
iv.	Number of Manhole	80
v.	Material of pipes	RCC
vi.	Upstream level	8 ft
vii.	Downstream level	24 ft

3. Tools and Machines:

i.	Jetter Machine	01 Nos.
ii.	Sucker Machines	01 Nos.
iii.	Bamboo Canes	20 Nos.
iv.	Steel rods	5 Nos.
v.	Dewatering sets	1
vi.	Dump Trucks	1
vii.	PPEs, Flaggers, traffic Control Equipment/barriers	

4. Manpower

i.	Supervisor	3
ii.	Sewer men	20
iii.	Drivers	5

Planning: (Time line 1 Month)

Obtain a comprehensive GIS based map showing all the sewerage infrastructure in the area. Prepare a detailed checklist for sewers & Manhole Inspection. Constitute different Team should examine visual, structure and hydraulic inspection of sewerage infrastructure and handed over them the checklist.

After inspection, supervisor will submit the filled checklist along with "inspection report" to the SDO within 15 days.

After getting the "inspection report" a meeting must be held between SDO of the area and other higher officials of the Sub –Division.

Develop a proper strategy to resolve the issues highlighted/identified during field inspection.

Major problems:

- a) Blockage of sewer lines
- b) Crown failure
- c) Replacement of damaged manhole cover
- d) Repair of damaged surround

Time period for execution: 3 Months

Execution:

- First of all, provide PPEs to the workers & also proper gadgets for traffic management before commencement of ant desilting operation. Deploy proper machinery and staff according to the requirement at site.
- Deploy proper machinery & staff according to the requirement of the site.
- Supervisor must have submitted weekly report to the SDO
- Supervisor is responsible to ensure the use of PPEs, Gas Detector and all other gadgets at site.
- Perform the desilting activity and replace damaged manhole covers within the specified time
- SDO will visit the site on and off.
- After completion of the activity, supervisor will provide report to SDO
- Complete report will be submitted to higher officials of the department
- Again the final meeting will be arranged between SDO & other higher officials of the Department to receive the result of all activities.
- Thus must arranged within one month after the completion of the execution phase.

ACTION PLAN FOR OPERTION AND MAINTENANCE OF SEWERAGE SYSTEM (TRUNK SEWERS & MANHOLE) MILLAT CHOWK SUB-DIVISION FASIALABAD

Sana Fatima	
Assistant Director	
WASA, Lahore	

Project Area Description:

i.	Served Area	4 Km2
ii.	Total population of served area	12,800
iii.	Topography	Flat

Description of Sewerage system:

Length of sewer	8000 ft
Total waste water flow	4.0 cusec
Diameter of sewer lines	18"and 24"
Number of Manhole	80
Material of pipes	RCC
Upstream level	8 ft
Downstream level	24 ft

1. Tools and Machines:

1.	Jetter & Sucker Machine	01 Nos.
2.	Bamboo Canes	20 Nos.
3.	Steel rods	5 Nos.
4.	Dewatering sets	1
5.	Dump Trucks	1
6.	PPEs, Flaggers, traffic Control Equipment/barriers	

2. Manpower

i.	Supervisor	3
ii.	Sewer men	20
iii.	Operators/Drivers	5
iv.	Flag man	

Planning phase:

Obtain a comprehensive GIS based map showing all the sewerage layout plan of the project area showing all infrastructure detailed in the area.

Prepare a detailed checklist relating to visual, structure and hydraulic inspection of Manhole sewer lines.

Constitute different Team for inspection purpose and handed over the checklist to the members.

At the end, supervisor will submit the inspection report to the SDO within 15 days.

After getting the "inspection report" SDO will discuss the problem with the responsible authorities (within 15 days)

Develop a proper strategy to resolve the issues highlighted/identified during inspection & testing of sewerage system of project.

Major problems:

- a) Blockage of sewer lines
- b) Crown failure
- c) Replacement of damaged manhole cover
- d) Repair of damaged surround

O&M Task:

- a) Desilting
- b) Damaged manhole cover
- c) Damaged surround

Time period for execution: 3 Months

Execution:

- i. Before starting the activity, provide PPEs to the workers
- ii. Allocate suitable equipment/machinery highlighted problems
- iii. Avoid traffic hazard after reaching aa site according to requirement
- iv. Gas detection test must be performed before starting work
- v. Perform desilting & manhole cover/ surround replacement as per requirement
- vi. After completion of activity, Supervisor must have submitted weekly report to Authority within 3 month
- vii. SDO will visit the site on and off during maintenance activity.
- viii. Complete report will be submitted to higher officials
- ix. Repair and maintenance should be performed as & when require
- x. Again the final meeting will be arranged between SDO & other higher officials of the Department to receive the result of all activities.

ACTION PLAN FOR DESILTING OF SEWER LINE BEFORE MONSOON SEASON

Team Members:

Name	Designation	WASA
Zia Ur Rehman	Sub- Engineer	Multan
M. Shakeel Ahmed	Sub- Engineer	Multan
Waqas Ali	Sub- Engineer	Lahore

1 <u>Planning and Execution:</u>

a) Objective:

Desilting of sewer lines in different areas of different sizes, from 42" dia to 12" dia in almost six months.

b) Catchment Area:

The catchment area is 20 sq. Km with population of 30 Lac persons.

c) Sewer Length:

We have to clean the following sewer lines:

Diameters	Length
42"	10 Km
36"	20 Km
24"	25 Km
12"to 18"	50 Km

d) Duration:

We divided our jobs into two parts one is trunk sewer desilting and other is branch sewer desilting and we require six months to perform our complete jobs.

e) Labour:

We have required five teams having five members each and every team has a supervisor and a person for traffic control. Driver and helpers are also required for respective machinery which are required.

f) Machinery:

We require following machinery

- Sucker Machines
- Jetter Machines
- Winch Machines
- Tractor trolley
- Dumpers

g) Tools:

- Desilting Bucket
- Tripod with Attachment
- Steel rod
- Kassi etc.

h) Personal Protective Equipment:

For execution of work at site following safety equipment are required.

- 1) Breathing Apparatus
- 2) Gas Detector
- 3) Safety Vests
- 4) Horneces
- 5) Life Lines
- 6) Safety Helmets
- 7) Goggles
- 8) Safety Shoes
- 9) Emergency lights

i) Traffic Control:

At site for safety of labour and machineries following tools are required

- 1) Diversion Board
- 2) Safety cones
- 3) Warning tapes
- 4) Traffic warden rod (light)

2 **Execution:**

A. Desilting of Trunk Sewer:

1) Length:

The trunk sewer having length 42" dia sewer line is 10 Km and 36" dia has 20 Km. So, total length of trunk sewer for Desilting purpose is 30 Km.

2) Time for Execution:

The sewer line of 30 Km can be desilted in 2.5 months.

3) Team Required:

We have five teams and each and every team has a supervisor and five sewer men and a person for traffic control.

4) Machinery:

One number of pick up for transportation and a dumper for sludge carrying purpose.

B. Branch Sewer Line

1) Length:

Diameter	Length
24"	25 Km
12"-18"	50 Km
Total length	75 Km

2) Time for Execution:

Three months required for execution the job.

3) Team Required:

We have same team (5) as in trunk sewer.

4) Machineries:

- Winch machine
- Sucker Machine
- Jetter Machine

In a week total 7.5 Km sewer line is desilting by all team.

5) **Re-Desilting:**

Trunk sewer line is desilted of desilting is completed and system is ready for Monsoon.

3 <u>Inspection:</u>

a) Daily Inspection:

Daily inspection is done by supervisor with the help of performance, pictures and videos.

b) Weekly & Monthly Inspection:

Such inspection is done by Sub-Engineer and Assistant Director inspect site visually and collected data submitted by supervisor.

c) Final Inspection:

Final inspection is done by deputy Director and Director works, visually and collected data submitted by Sub- Engineer and Assistant Director and finally report is submitted to Managing Director.

ACTION PLAN OF ZONE-B, WSSP

Team Members:

1	Ahmed Khalil	2	Khalid Bin Rasheed
3	Naeem Ahmed	4	Zafar Ullah

1 <u>Task:</u>

Preparation of Operation and Maintenance (O&M) Action Plan of Sewerage System of the Zone-B, Peshawar which consist of 21 unions councils of Peshawar City.

2 Current Status:

a) Length of the Sewer	60 Km
b) Type of the Sewer material	R.C.C.
c) Diameter of the Sewer pipe	9" to 3'
d) Resource available	 Jetter & Sucker Machine Steel Rods Bamboo Rods PPEs Barricades tools
e) Staff available	 Chief supervisor Supervisor Sewer Men Drivers Helpers

3 Planning & Scheduling:

As Zone –B consist of 21 UCs having Sewer pipe of different diameters 9" to 3'. The steps will be followed before the start of execution.

a) Composition of Groups:

Different groups of supervisors, sewer men will be created for cleaning of sewer lines at different location for effective cleaning activities.

b) Fleet Management:

A team of supervisors, helpers and drivers will be deployed to keep the vehicles in running condition and will be utilized on demand from the supervisor of different groups.

c) Tools:

The following different tools will be utilized by the groups:

- Steel rods
- Bamboo Stick
- PPEs
- Traffic control Supervisors

d) Schedule:

A timeline will be provided to the supervisors for effective utilization of resources and staff.

4 Executive Plan:

During execution, the following steps will be followed:

a) SOPs:

The SOPs developed will be followed during execution.

Sr. No.	Location	Tasks	Resources	Time	Assigned To	
1	Gulbahar	Sewer Cleaning	• Staff	No. of days	Supervisors	
			• Jetter & Sucker			
			Steel Rods			

b) Timeline:

The supervisor will work hardtop achieve the timeline provided which is assumed a 3 days for cleaning 1 Km length of Sewer.

c) Team Role:

The following personnel has assigned for the execution of work:

Chief Supervisor	Will supervise overall condition
Supervisor	Will be responsible for the group activities
Drivers	Will be responsible to keep the vehicles in good condition
Helpers	Will assist the driver

d) Execution of work:

The Following different steps will be followed during execution of work:

i. Barricade of Area:

Before the start of work, the area must be barricaded to avoid of accidents.

ii. Traffic Control:

The members of groups will be deployed to control traffic in working place.

iii. Machinery Usage:

Machinery will be deployed as per SOPs.

iv. Safety Control:

Supervisor will check all the safety tools (PPEs) provided to the Sewer men and ensure its usage.

v. Checking the Area:

The area () the manhole before the start of work to avoid any dangerous.

5 Data Collection and Record:

The Supervisor will keep the record of the resources assigned and check the work executed as per approved checklist.

• Verification:

The data provided by the supervisors will checked by the supervised. The data handed over to the Assistant Manager before verification by the chief supervisor. He assistant Manager will analyze the data and access the progress, defects, incidents occurred and recommended. The deficiency arises during the work to the higher-ups for the remedial measures.

Sr. No.	What To Do	How To Do	When To Do	Who To Do By)	(Carried out	Do with What		Check Done (How To check)	Who to Check (To Be Checked By)
	Define O&M Task	Followed SOPs	(Frequency)	Class of work	Workers	Material	Tools/ Equipment		
1	Sewerage System Cleaning operation	Followed approved SOPs mentioned in Action Plan	Preventive Operation, Regularly cleaning of Sewer System, Emergency (plans & SOPs)	Supervisors	Drivers, Helpers, Drain Cleaners	PPEs, Sign Board, Bamboo Stick	Sucking & Jetting machine, Cleaning Rods, Bamboo Stick	Inspection , Record keeping	Concern Supervisor, AM/AD etc.