

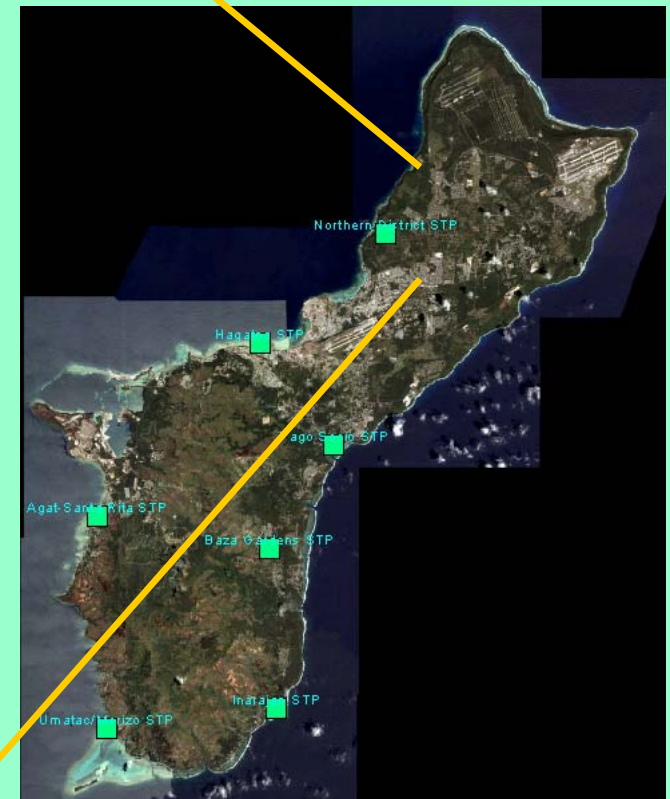
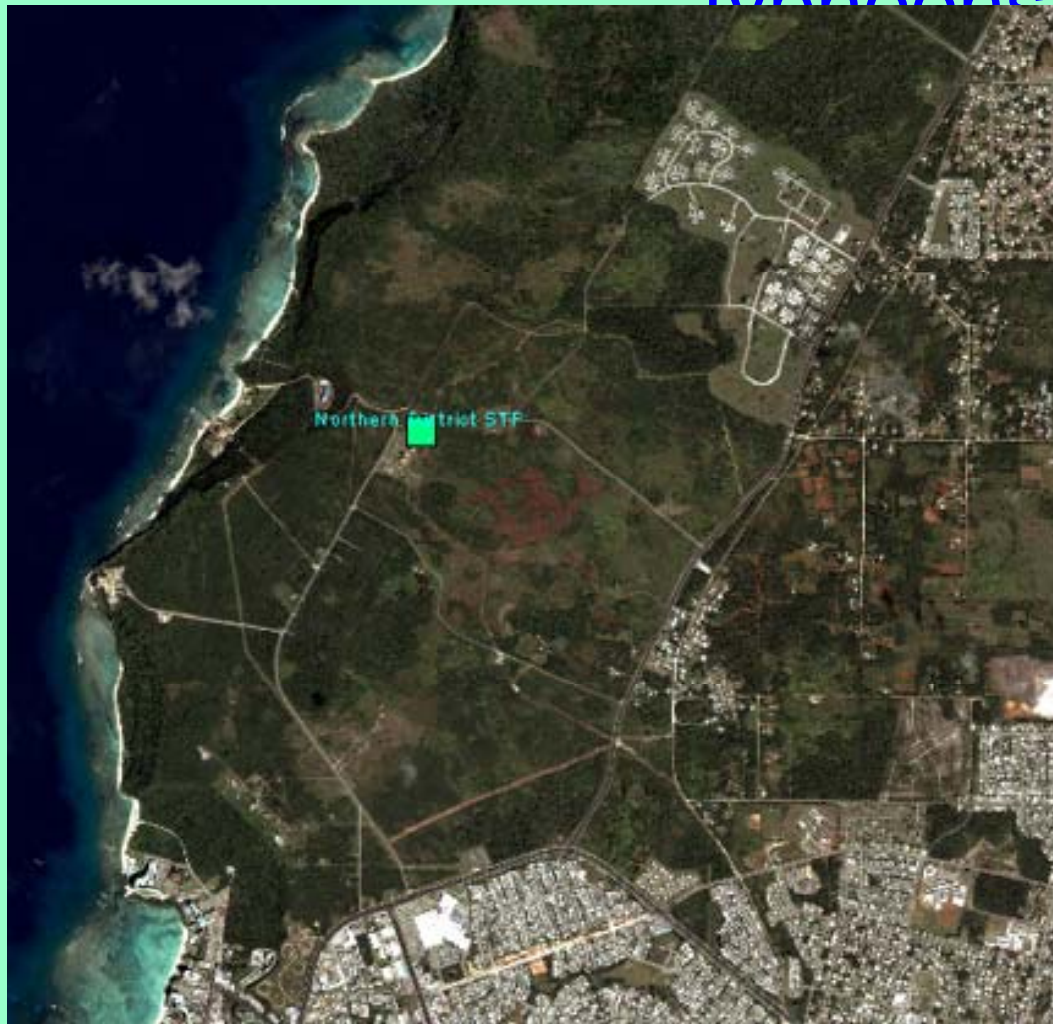
# Decommissioning Ton Chlorine Cylinders at Northern District Waste Water Treatment Plant





Who would have thought that this quiet park-like waste water treatment plant was hiding a problem of monumental proportions.

It is a facility with a lot of open space so it was a logical place to store rubbish from typhoons



But underneath it all was someone's idea of sweeping rubbish under the rug.



11 of them.

Really old too.



And in terrible condition.

## Immediate questions:

1. Full or Empty?
2. How long have they been there?
3. What kind of chlorine was in them?
4. What will happen if we try to move them?

### A little history:

These were found under a pile of 2002 typhoon rubbish in 2006 when the treatment plant was being cleaned up.

Chlorine had not been used in wastewater for about 13 years before these were found.

No one could tell us when they had been put there, but everyone we asked “thought” they were empty.

That makes them at least 17 years old since use and probably resting on the ground all that time.

Nobody is willing to roll them over and see what the undersides conditions are.

At least we have their number.

No	Serial No.	Tare weight	Actual weight recorded	Contains product Yes/No	Registered Company Owner
1	23749	1334 lb.			Gov Guam
2	30	1344 lb.			Gov Guam
3	26	1338 lb.			Gov Guam
4	18487	1348 lb.			Island Equipment Co.
5	32	1326 lb.			Gov Guam
6	25	1322 lb.			Gov Guam
7	15	1326 lb.			Gov Guam
8	18495	1326 lb.			Island Equipment Co.
9	31	1318 lb.			Gov Guam
10	19	1320 lb.			Gov Guam
11	5	1326 lb.			Gov Guam

So I figured we could weigh them to find out if they were full or empty.

Seemed reasonable to me,  
I'm chemist and our GWA Safety Officer.

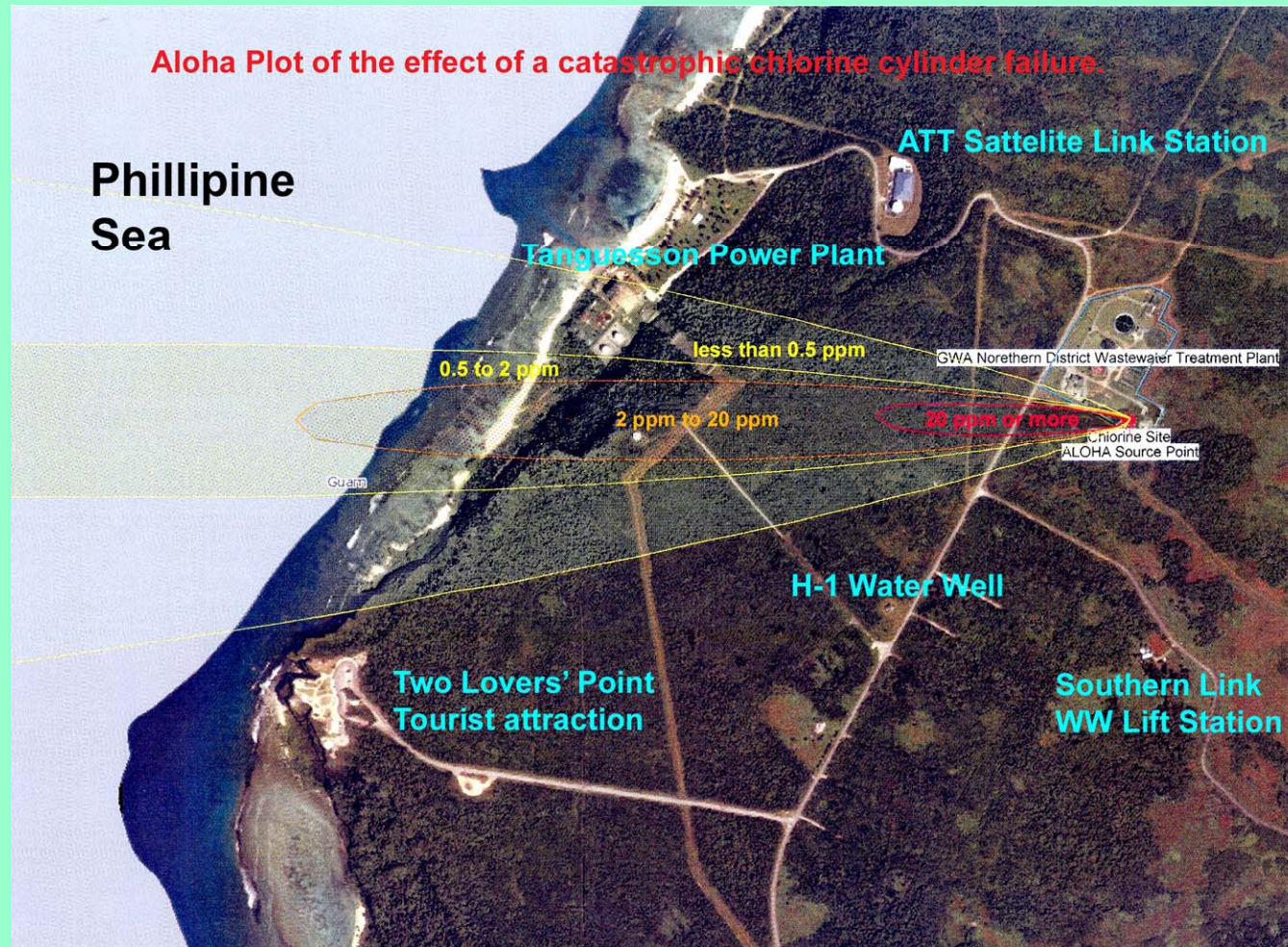
**Northern District Wastewater Treatment Plant**



0 0.01 0.02



Of course I missed a few things like risk and liability.



If one of them was full and we broke it open – we would have a serious problem on our hands unless the wind was just right.

So we reached for an environmental services contractor.

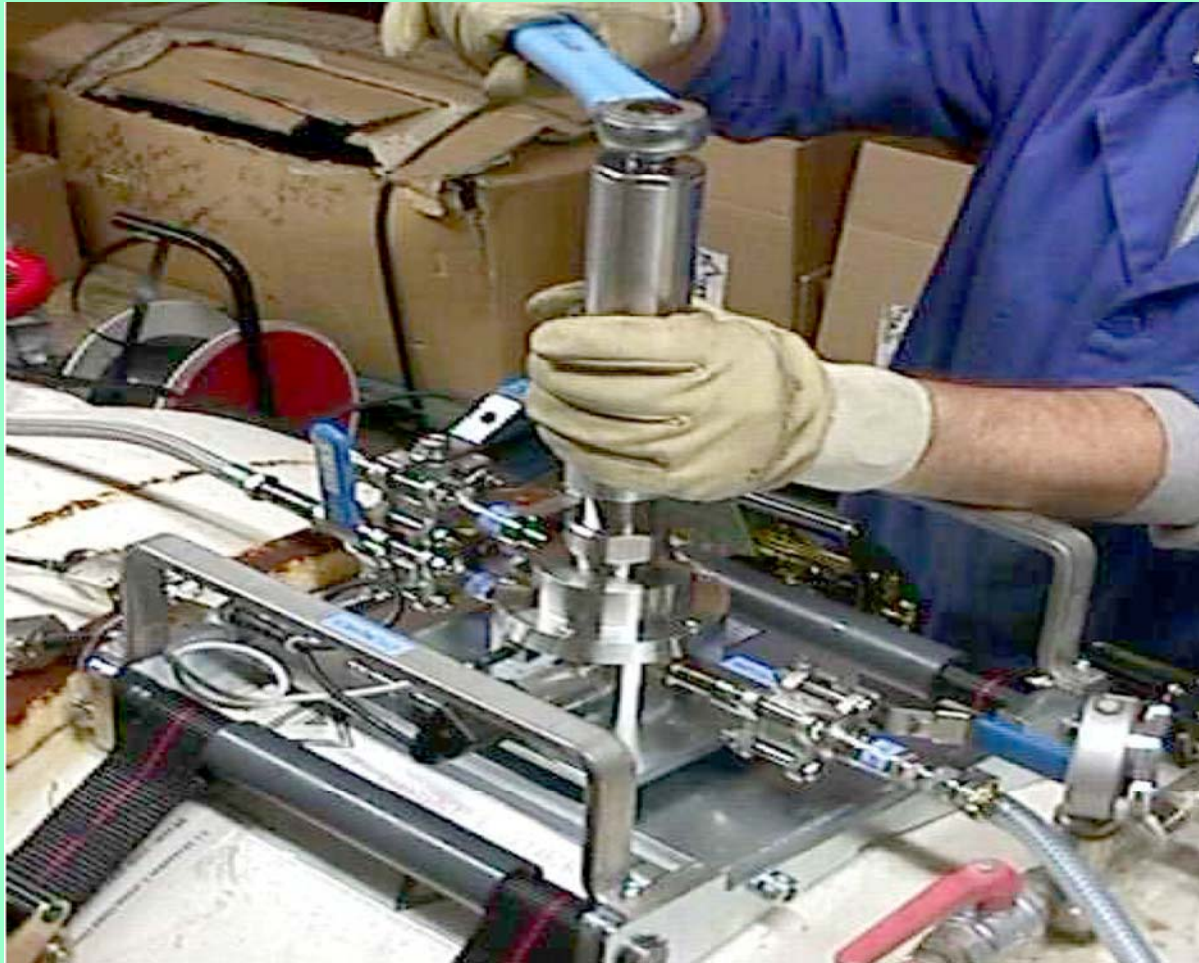


Who took a look, and said not only were the cylinders old and decrepit, but they might well contain nitrogen trichloride [NCl<sub>3</sub>] which is a very high explosive.

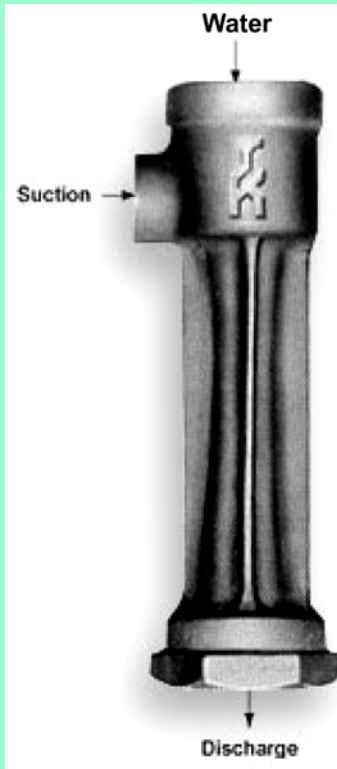
The only way that they would consider safe would be to tap into each cylinder, and vacuum out its contents.

Whatever was found inside would be scrubbed through a sodium hydroxide [NaOH] solution so that all chlorine would be converted to bleach (sodium hypochlorite) [NaOCl] solution which would be easy enough and safe enough to handle.

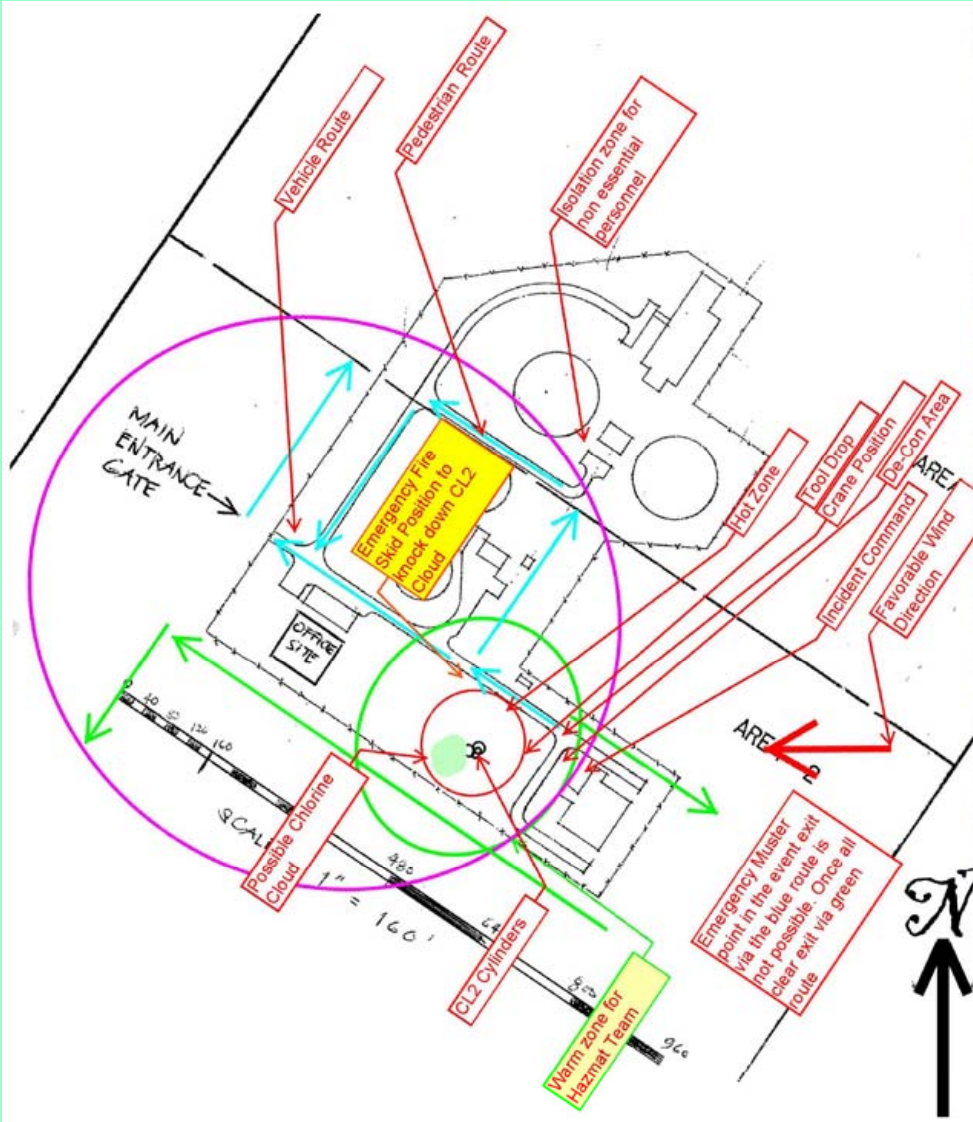
The taping device would be like this one only the one we would use would be motor driven and operated remotely because of the  $\text{NCl}_3$  risk.



# Vacuum eductor and solution tank.



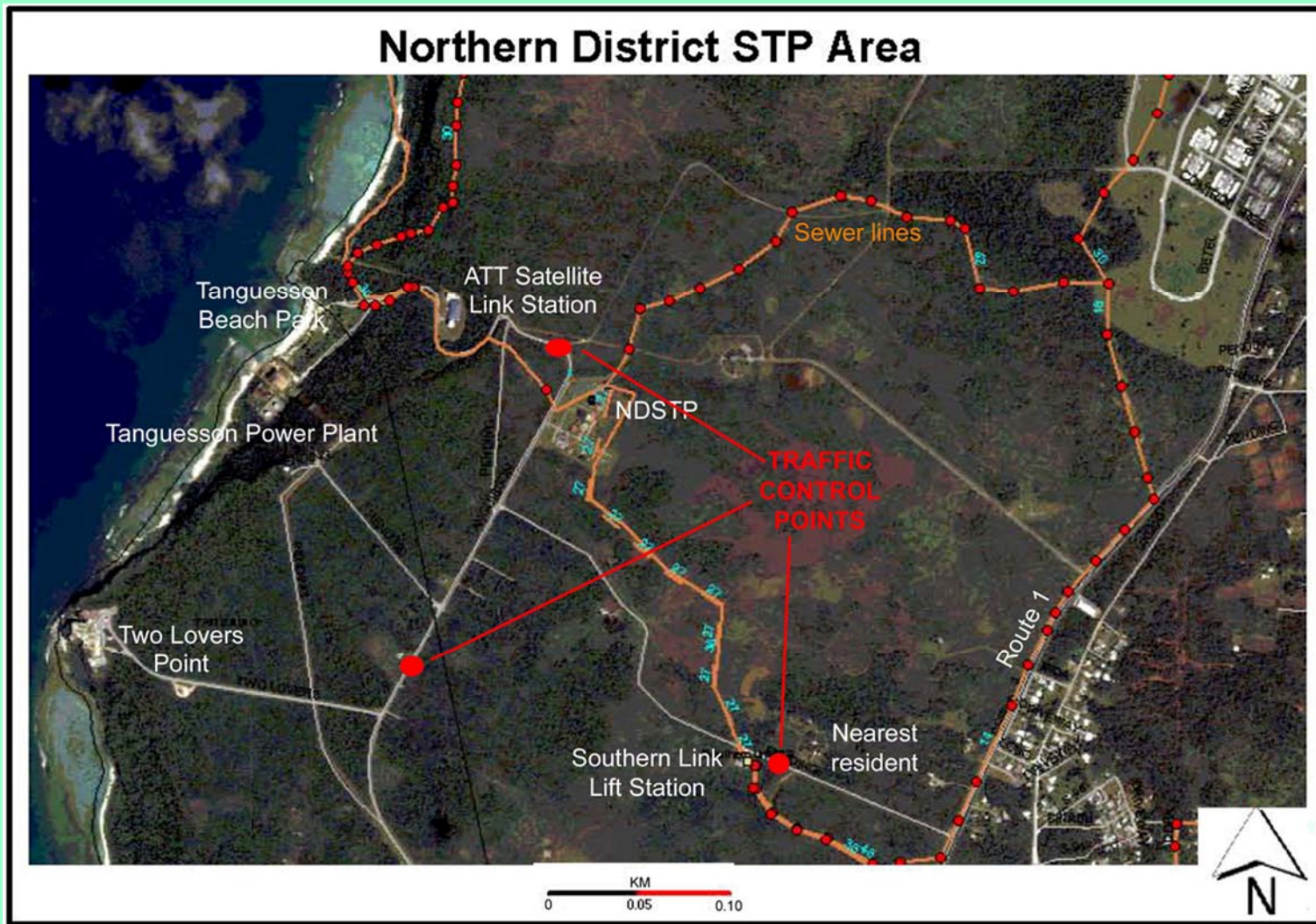
We now have a plan.



Location of Cylinders

Site management.

We plan to work at night, monitor the periphery and control access in the vicinity.



We have met with all the stakeholders to make sure the plan is understood and that all the bases have been covered:

Guam Waterworks Authority,  
Guam Environmental Protection Agency,  
US Environmental Protection Agency,  
Guam Police Department,  
Guam Fire Department,  
Guam Homeland Security office of Civil Defense,  
Guam National Guard 94<sup>th</sup> Civil Support Team,  
Dededo Mayor's office,  
Guam Department Parks and Recreation,  
Guam Power Authority  
Local Area Residents

We are in the final stages of contract negotiation with VES, and expect approval of the project and the funding by the Consolidated Commission on Utilities shortly.

Then we can get it done.