

## **Some Considerations for a Potential New Mercury Deposition Network Site at the Grand Bay NERR**

- 1. Possible Sites**
- 2. Budgets for Different Options (approximate...)**
- 3. Infrastructure, Equipment and Installation Needs / Options**



# **1. POSSIBLE SITES**



← MDN # 4 – in the vicinity of the Grand Bay NERR offices/labs

← MDN sites #1, #2, and #3, and speciated atmospheric mercury measurement tower (see close up map on next page)

Marsh Island

Barton Island Little Bay Island

Big Island

© 2008 Europa Technologies

© 2008 Tele Atlas  
elev 3 ft

© 2008 Google™

Eye alt 27508 ft

7947 ft  
lat 30.406653 lon -88.387846

Here are three possible sites near the tower/trailer. The location of sites #2 and #3 are approx. and may be wrong... Jake, Mark W., or Dave – can you confirm or correct the location of sites #2 and #3? Thanks!



**MDN # 3**

**MDN # 1**

**MDN # 2**

**Speciated  
atmospheric  
mercury  
measurement  
tower and trailer**

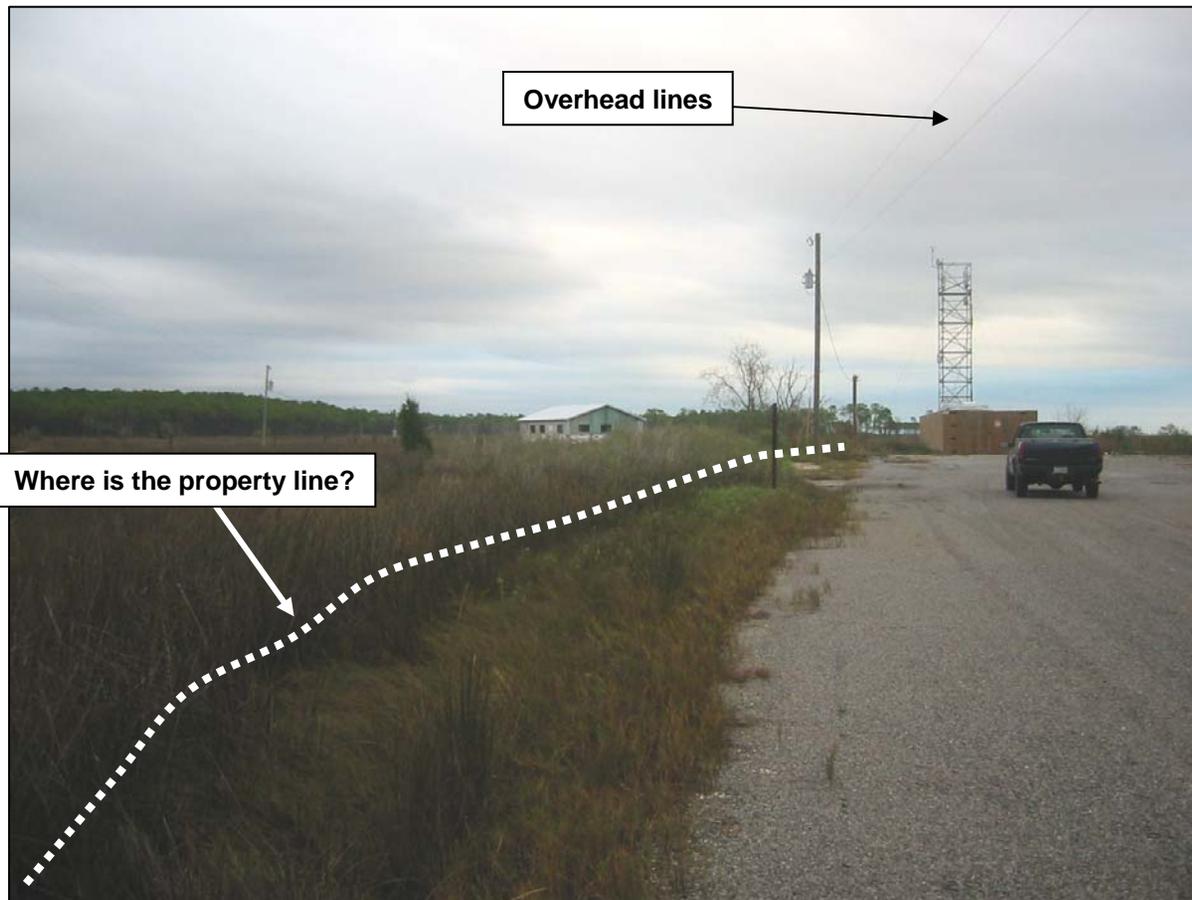
498 ft  
lat 30.413099° lon -88.404368°

© 2008 Tele Atlas  
elev 3 ft

© 2008 Google  
Eye alt 1733 ft

MDN Site #1: Somewhere near the edge of the gravel area, possibly overlapping the gravel but primarily in the vegetation area

- ❑ question: where is property line – this will determine how far away from the gravel we can be
- ❑ question: how much traffic is there on the gravel, and on the nearby road, e.g., to the public boat ramp?
- ❑ pro – more scientific value since closest to the tower (if speciated measurement tower stays where it is)
- ❑ pro – convenience, easy power, relatively secure (gravel area is behind gate)
- ❑ con – will there be too much traffic?
- ❑ con – will have to meet siting criteria re: overhead lines, or may have to consider moving these lines



MDN Site #2: On concrete pad about 1000 feet west of tower/trailer

- ❑ pro – concrete pad already in place
- ❑ pro – easier to satisfy siting criteria (might have to cut clear a little vegetation)
- ❑ con – distance from tower, less scientific value, how much less is debatable...
- ❑ con – access not quite as easy (road overgrown, etc)
- ❑ con – power an issue (may have to implement solar option)

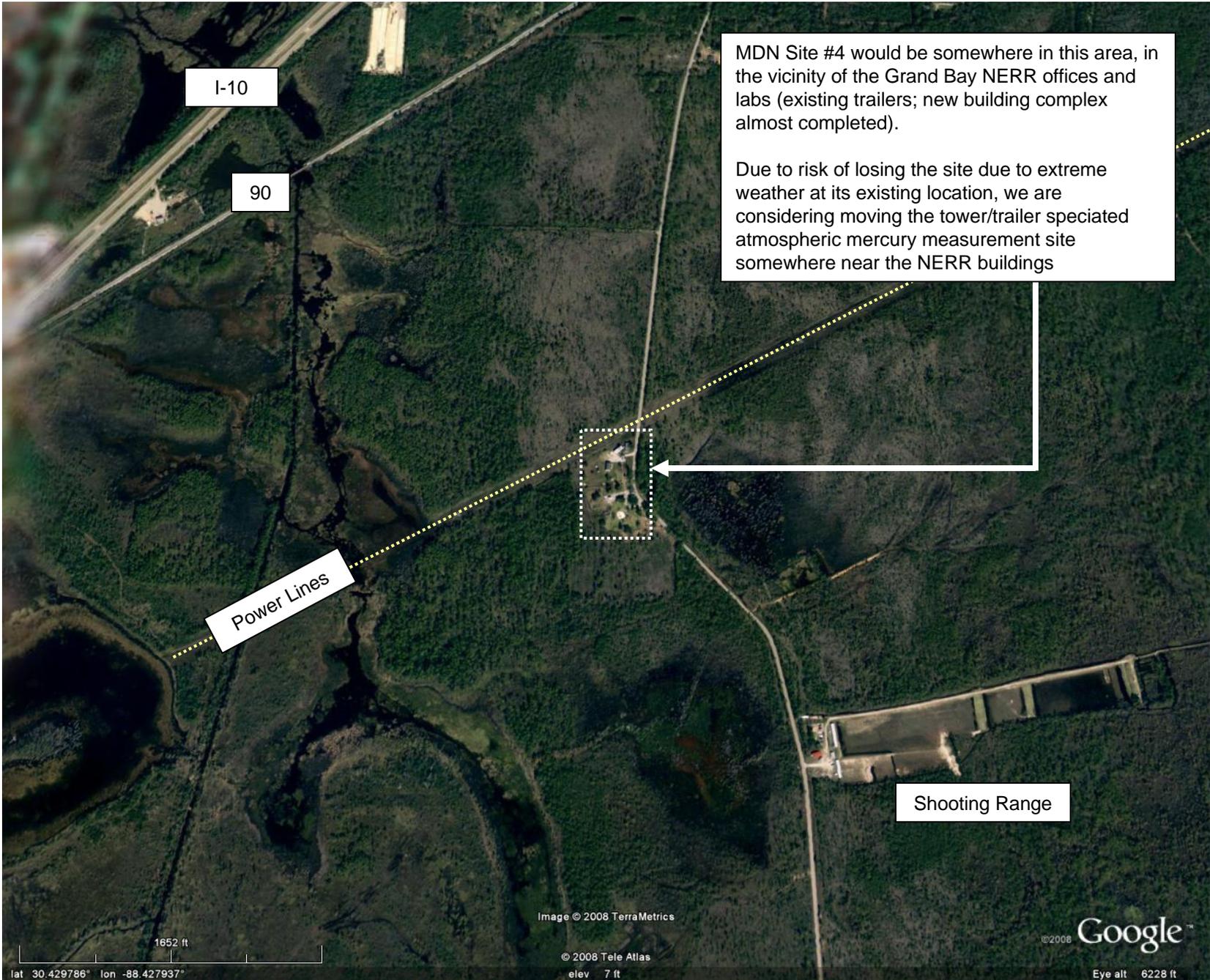
This view and views at right were taken standing on top of the concrete pad... Not sure of the directions...



MDN Site #3: 700 feet northeast of tower, in cleared land owned by Fish and Wildlife Service

- ❑ pro – relatively large cleared area, relatively easy access (there is a road)
- ❑ pro – easier to satisfy siting criteria (might have to cut clear a little vegetation)
- ❑ con – distance from tower, less scientific value, how much less is debatable...
- ❑ con – power an issue (may have to implement solar option)
- ❑ con – potential impact of homes relatively nearby





I-10

90

Power Lines

Shooting Range

MDN Site #4 would be somewhere in this area, in the vicinity of the Grand Bay NERR offices and labs (existing trailers; new building complex almost completed).

Due to risk of losing the site due to extreme weather at its existing location, we are considering moving the tower/trailer speciated atmospheric mercury measurement site somewhere near the NERR buildings

Image © 2008 TerraMetrics

© 2008 Tele Atlas  
elev 7 ft

©2008 Google™

Eye alt 6228 ft

1652 ft  
lat 30.429786° lon -88.427937°

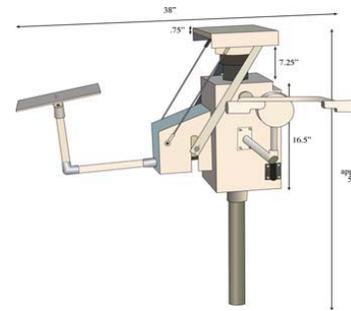
## **2. BUDGETS for DIFFERENT OPTIONS**

	Basic	Option A	Option B	Option C
	basic MDN option – weekly mercury wet deposition	Marginal costs of adding monthly Methyl-Mercury wet deposition	Marginal costs of adding National Trends Network (NTN) major ion wet deposition (weekly)	Marginal costs of adding event-based mercury wet deposition
One-time purchase of precipitation collector	\$4,700	Not needed, uses MDN sample	\$3,500	
One-time purchase of rain gauge	\$5,640		Not needed, uses same rain gauge as MDN	
One-time site set-up costs	platform (??) electricity (??) MDN training (\$500) <u>data acquisition PDA (\$300)</u> ~ \$5,000 (?)		~\$1,000? (platform has to be bigger as the collectors and rain gauge all have to 5 meters apart)	
<b>Subtotal Approximate Initial Costs</b>	<b>~ \$15,500</b>	<b>\$0</b>	<b>~ \$4,500</b>	<b>\$0</b>
Annual cost for sample analysis	\$11,072	\$1,950 ((\$6240 for weekly methyl-mercury)	\$5,836	\$17,211
Annual shipping costs	~\$1,000		~\$525	~2,000
Annual Operator Costs	~\$3,500 (approx 2 hrs/week)		\$2,500 (an additional 1-2 hrs per week)	\$7,000 (approx 4 extra hours/wk)
<b>Approximate Annual Operating Costs</b>	<b>~ \$15,500</b>	<b>~ \$2,000</b>	<b>~ \$9,000</b>	<b>~ \$26,000</b>
<b>Approximate Total First Year Costs</b>	<b>~ \$31,000</b>	<b>~\$2,000</b>	<b>~\$13,500</b>	<b>~\$26,000</b>

**3. INFRASTRUCTURE,  
EQUIPMENT  
and  
INSTALLTION  
NEEDS / OPTIONS**

## Some basic considerations - 1

- We need to obtain a precipitation collector for the mercury wet deposition sample (two models available)



N - CON Systems Co., Inc.  
Model 00 - 125 - 4



Loda Aerochemetrics  
Model 2001

- We need to obtain a precipitation gauge (two models available)



ETI Instrument Systems, Inc.  
Model: NOAH IV



Hach Environmental, Inc.  
Model: OTT NADP Pluvio

- If we want to measure major ions, too, we'll have to add another precipitation collector (one model available).



LODA Electronics Co.,  
NADP Wet Deposition Collector

## Some basic considerations - 2

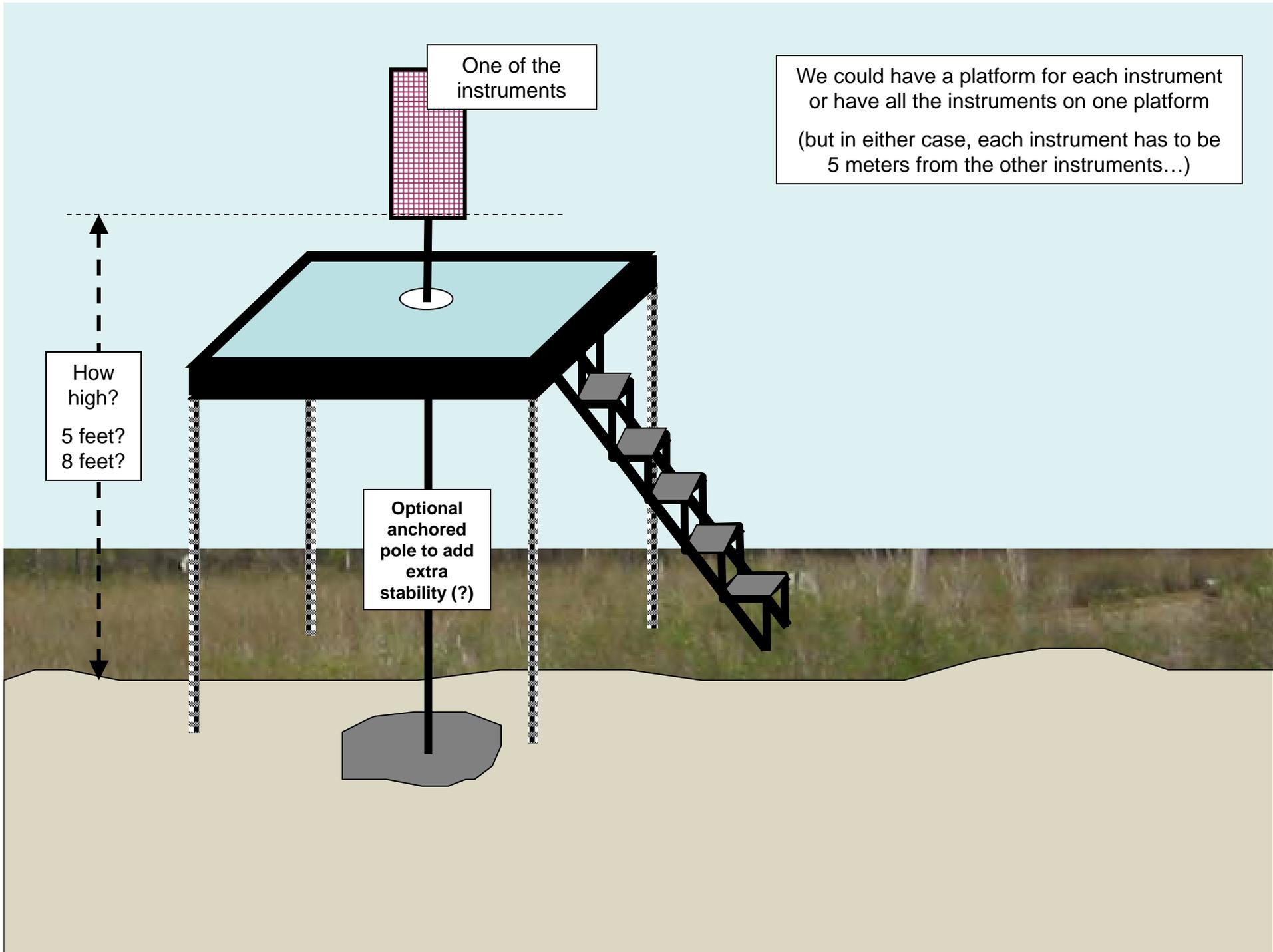
- Each piece of equipment needs to be 5 meters apart from each other.
- We'll probably want and need to elevate the equipment on a platform to make it less vulnerable to flooding... How high we make it will determine how less vulnerable we are...
- One of the MDN collectors (N-Con) and both of the rain gauges can be mounted on a pole (see previous page). We may want to do this for extra stability, but even in this case, would still need a platform for the operator to access the equipment.



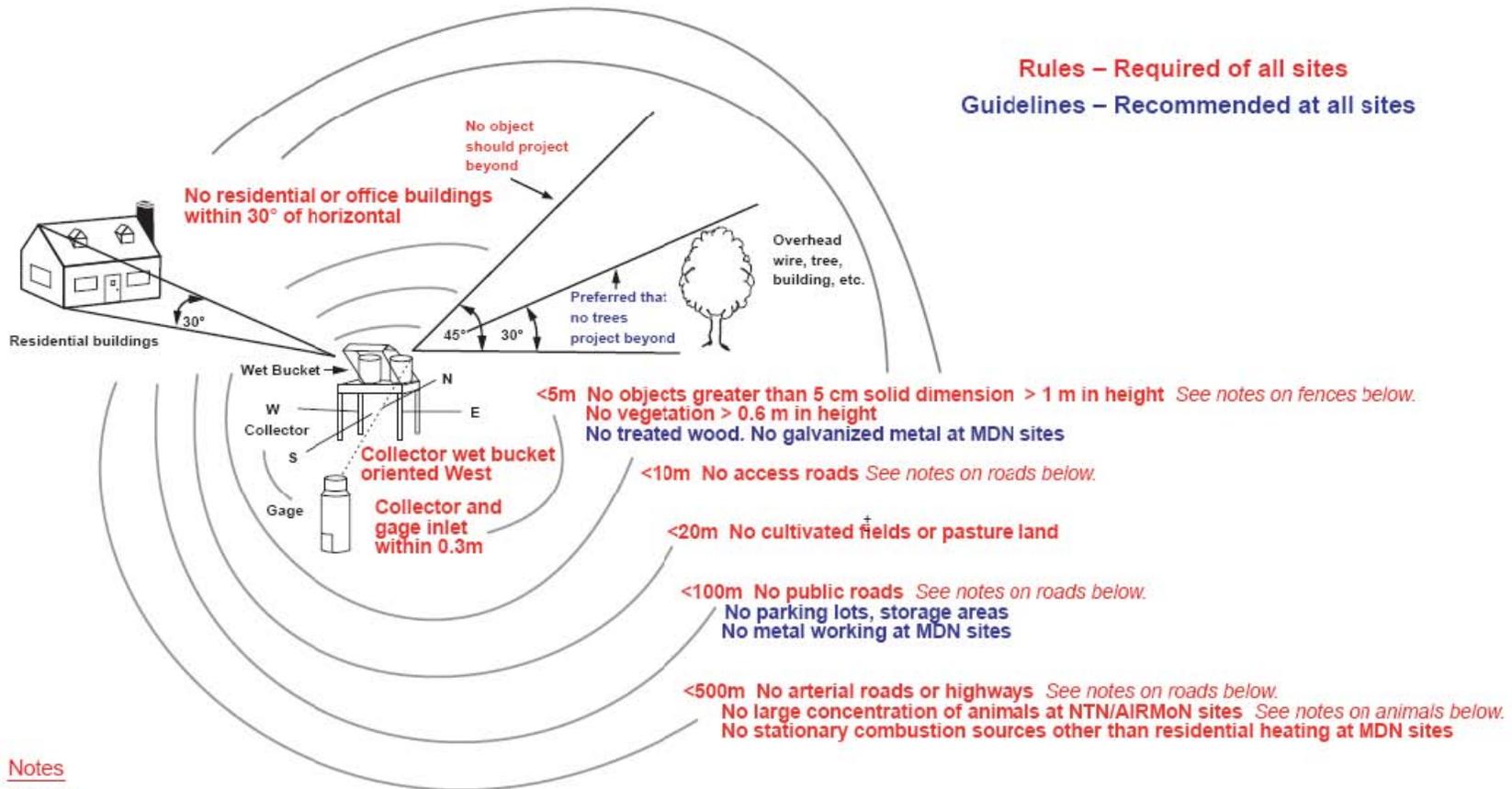
## Solar Power Option

For our installation, a solar power option is likely feasible. This has been done in similar sites. The extra cost would be on the order of \$1,000, and existing system designs and off-the-shelf equipment are available. We could also use batteries that are recharged each week.





# NADP Siting Criteria



## Notes

### Roads:

Access roads have < 10 vehicles per day, low speed (no closer than 10m)

Other roads have > 100 vehicles per day (no closer than 100m)

Highways have 4 lanes or > 100 vehicles per hour (no closer than 500m)

Interstates (no closer than 1 km)

No large animal operations (more than 250 beef cattle, 100 dairy cattle, 350 pigs or 10,000 chickens)

within 500m from NTN/AIRMoN collector

Raingage is located within 5m to 30m from collector

Fences >1m in height allowed as close as 5m from collector, 2m from raingage

These criteria were approved by the NADP Network Operations Subcommittee May 2006, revised October 2006