

**FIGURE 1  
LOCATION OF DWS PRODUCTION  
WELLS IN THE KEAUHOU AQUIFER**

Table 1

## Pumpage by DWS Basal and High Level Wells

Well		Average Annual Pumpage (MGD)		
State No.	Name	1990	1994	2013
<b>Basal Wells</b>				
3557-05	Kahaluu Shaft	4.737	5.614	4.234
3557-01	Kahaluu A	0.807	0.777	0.686
3557-02	Kahaluu B	0.992	1.050	0.514
3557-03	Kahaluu C	0.491	0.713	0.747
3557-04	Kahaluu D	0.672	0.952	0.330
3657-01	Holualoa	0.491	0.324	0.000
Total for Basal Wells		8.190	9.430	7.040
<b>High Level Wells</b>				
4358-01	Kalaoa	--	0.168	0.889
4057-01	QLT	--	--	1.299
4158-02	Honokohau	--	--	1.648
4258-03	Hualalai	--	--	0.000
3857-04	Waiaha	--	--	0.529
3957-01	Keopu	--	--	0.415
Total for High Level		0.000	0.168	4.251

Note: All pumpage data provided by DWS.

Figure 2. Average Pumpage of High Level Groundwater by DWS from Kalaoa to Keopu and Years Each of the High Level Wells was Brought On Line

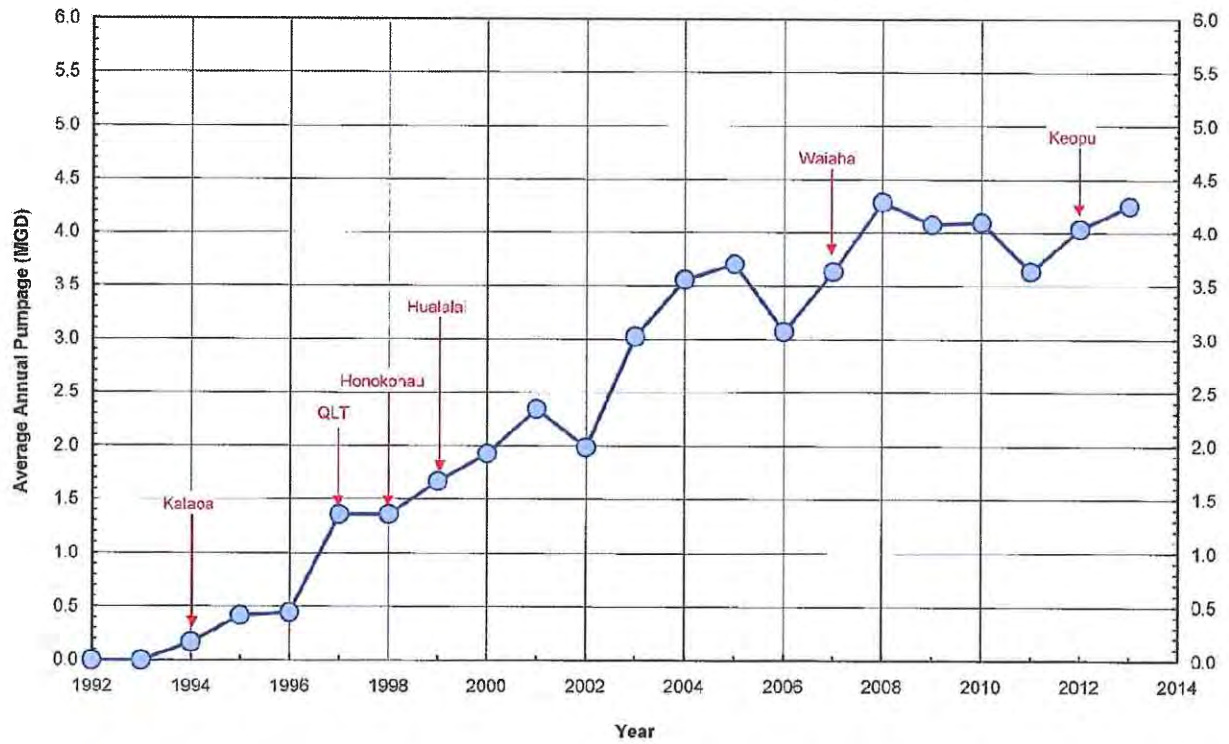
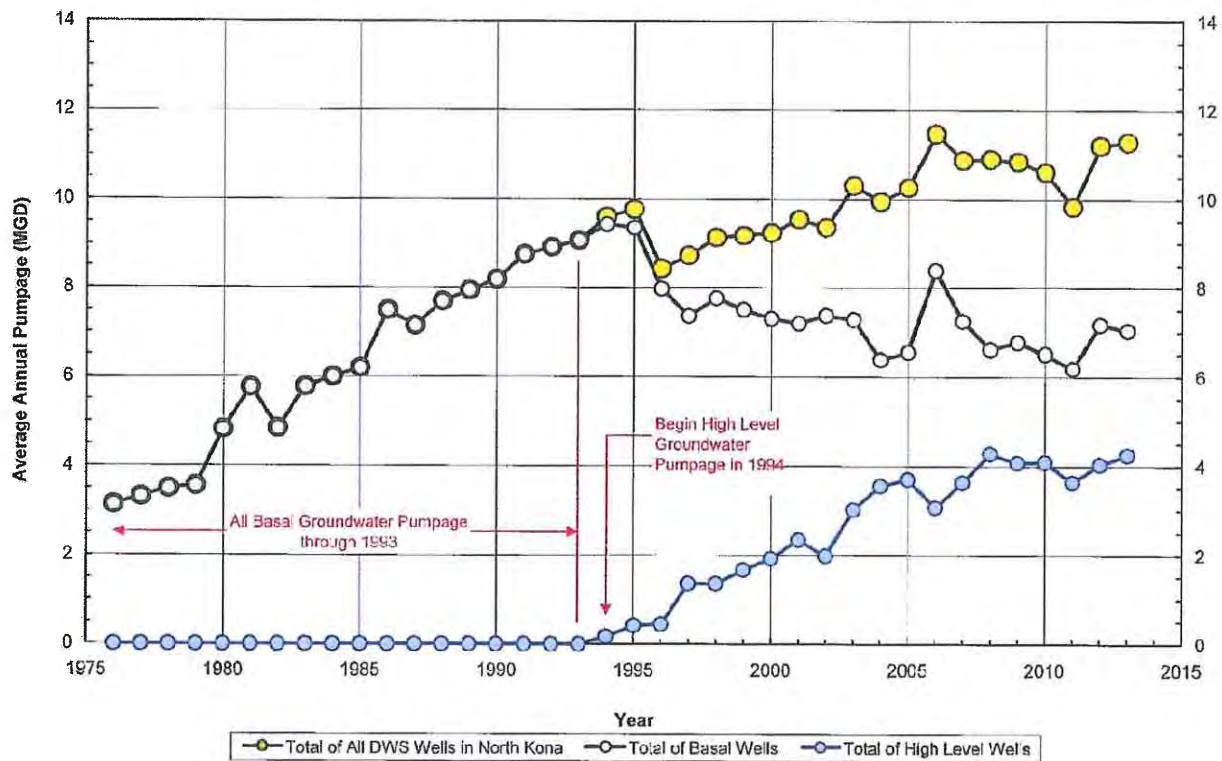
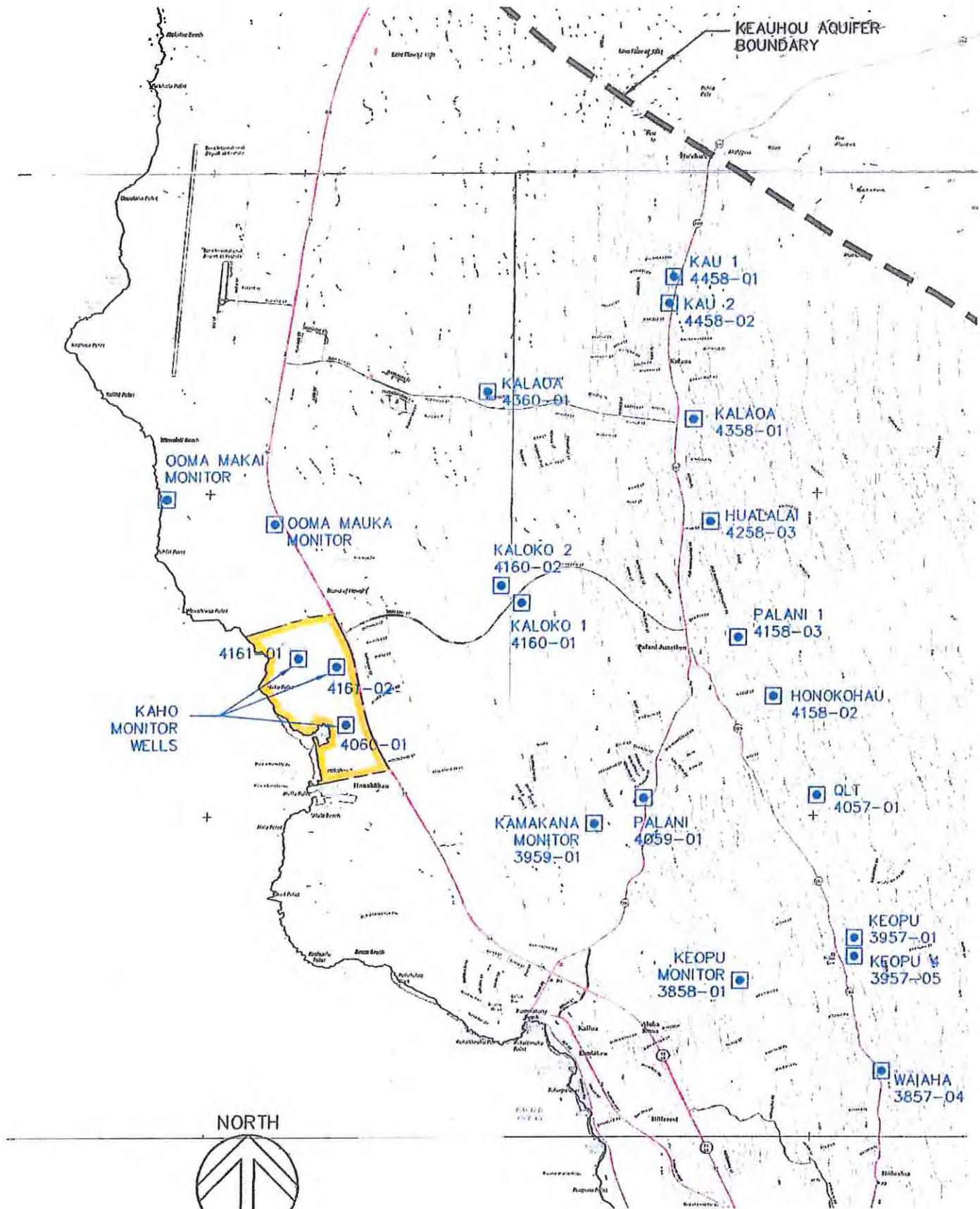


Figure 3. Pumpage of DWS Wells in North Kona from 1976 through 2013





**FIGURE 4**  
**WELL LOCATIONS FROM KEAHOLE**  
**POINT TO KAILUA TOWN**

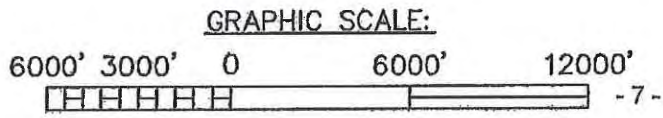


Figure 9. Water Level in the Kamakana Monitor Well In Comparison to the Ocean Tide at Kawaihae Harbor

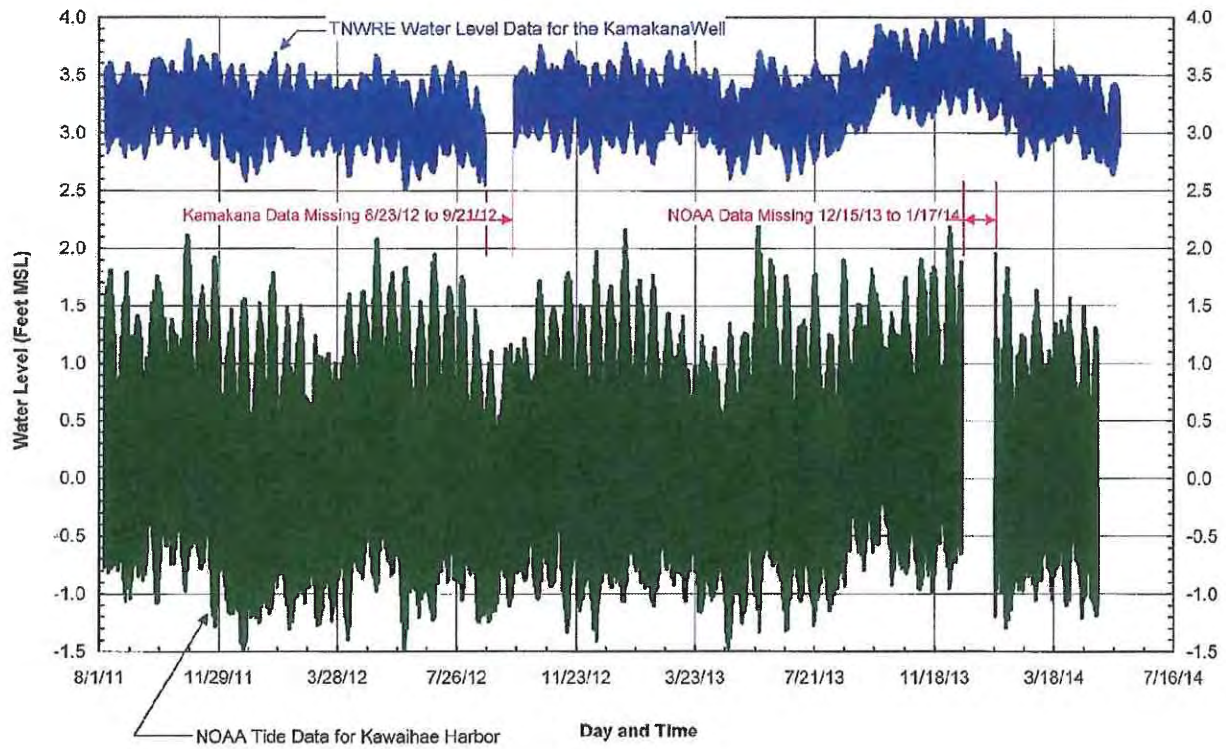


Figure 10. Filtering the Semi-Diurnal Tide Using the 24-MAV Statistic

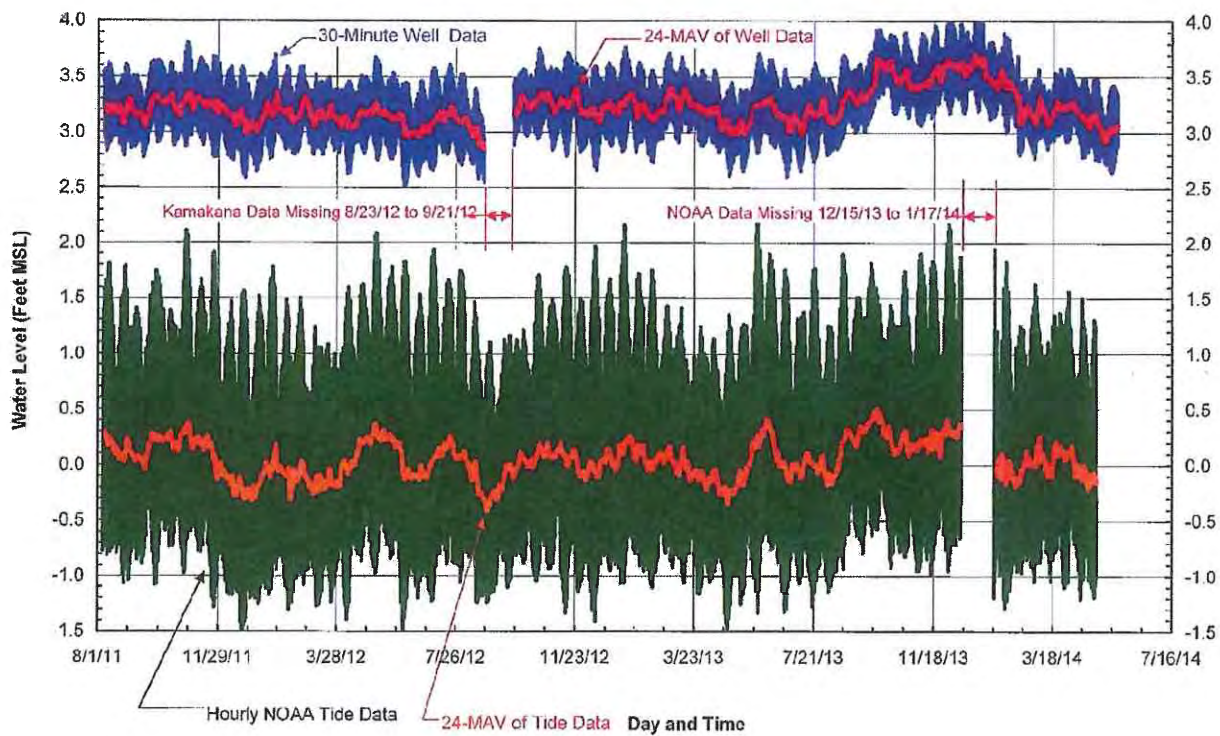
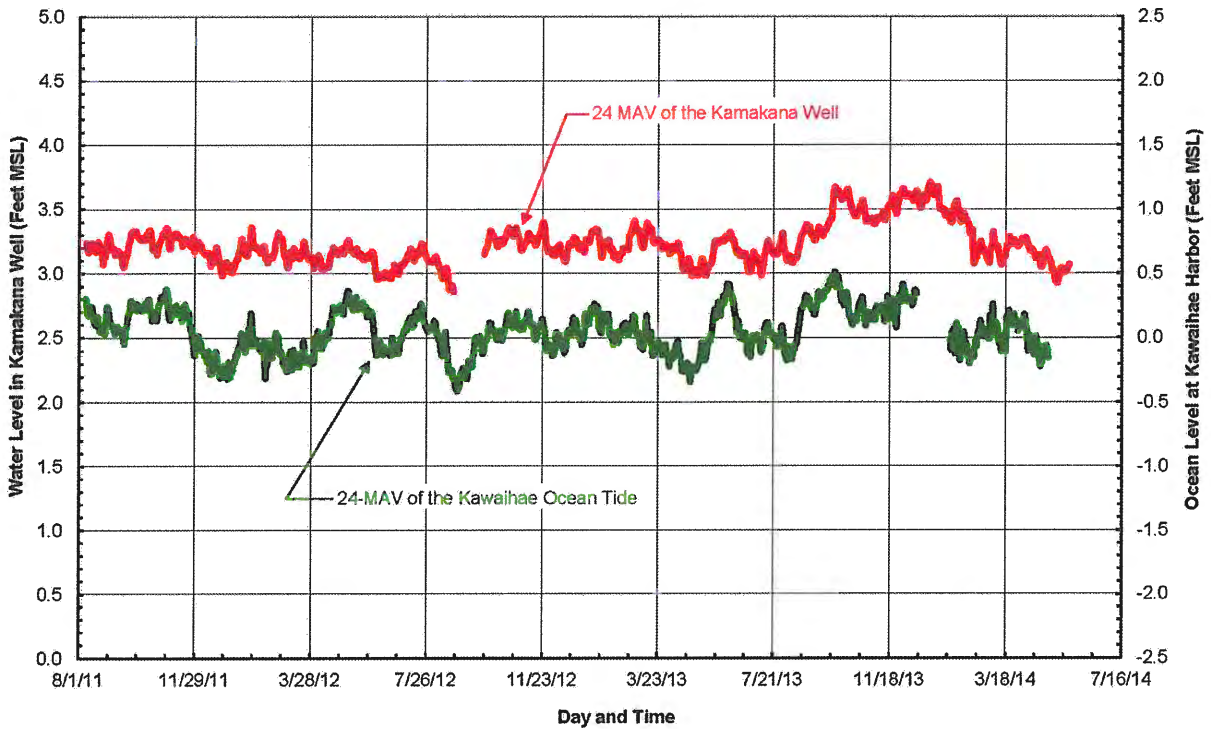


Figure 11. Comparison of the 24-MAVs of Water Levels in the Kamakana Monitor Well and at Kawaihae Harbor





Comparative Mean Water Levels

Year	Kamakana Well (Feet MSL)	Kawaihae Tide (Feet MSL)	Height Difference (Feet)
2011 (Aug. thru Dec.)	3.2085	0.0913	3.1172
2012	3.1552	0.0187	3.1365
2013	3.2844	0.0986	3.1858
2014 (thru 4/30)	3.2352	-0.00.12	3.2364

Figure 12. Salinity and Temperature Profile through the Water Column of the FG-2 Monitor Well on May 4, 2014

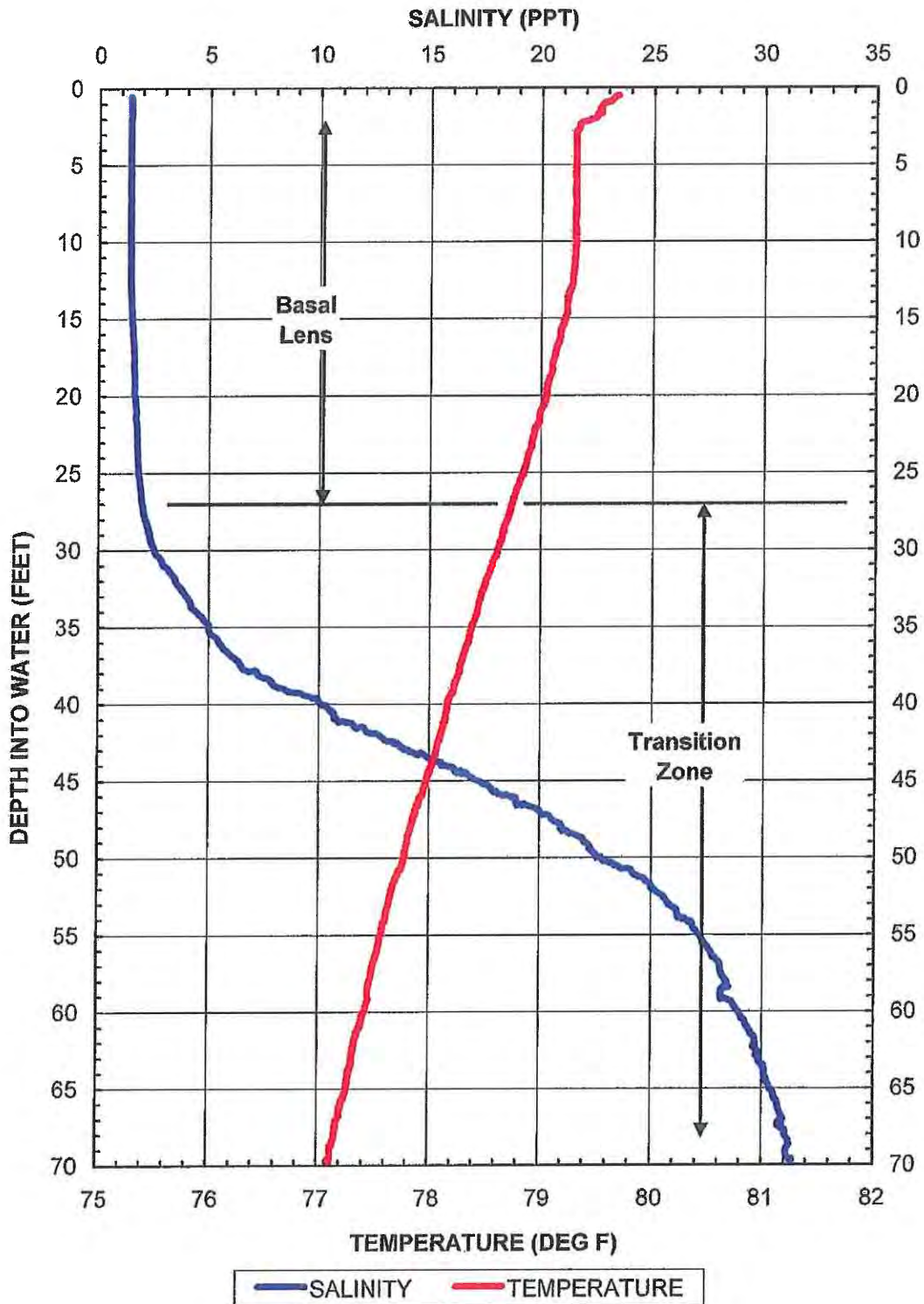


Figure 13. Salinity Profile Indicator Parameters

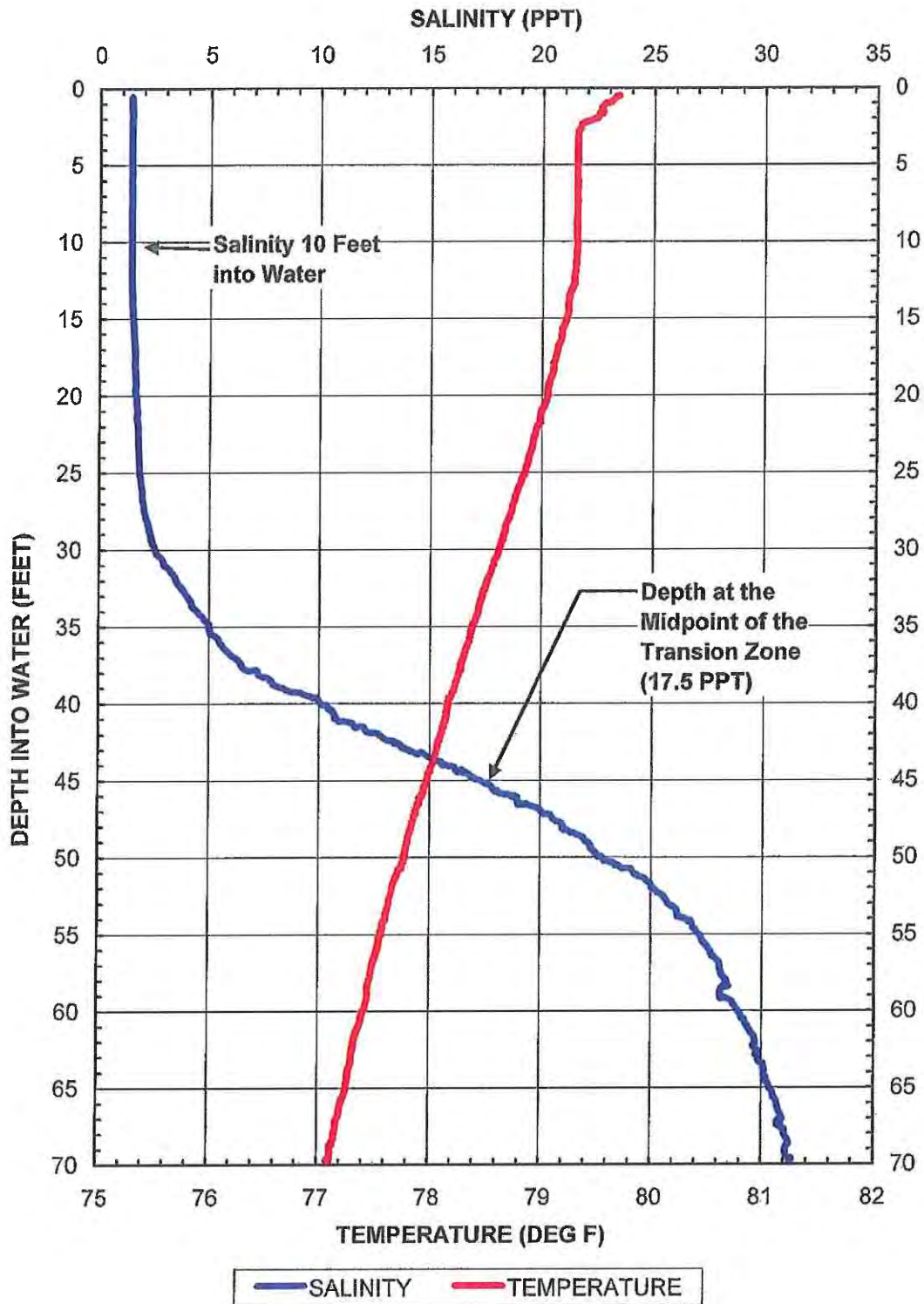
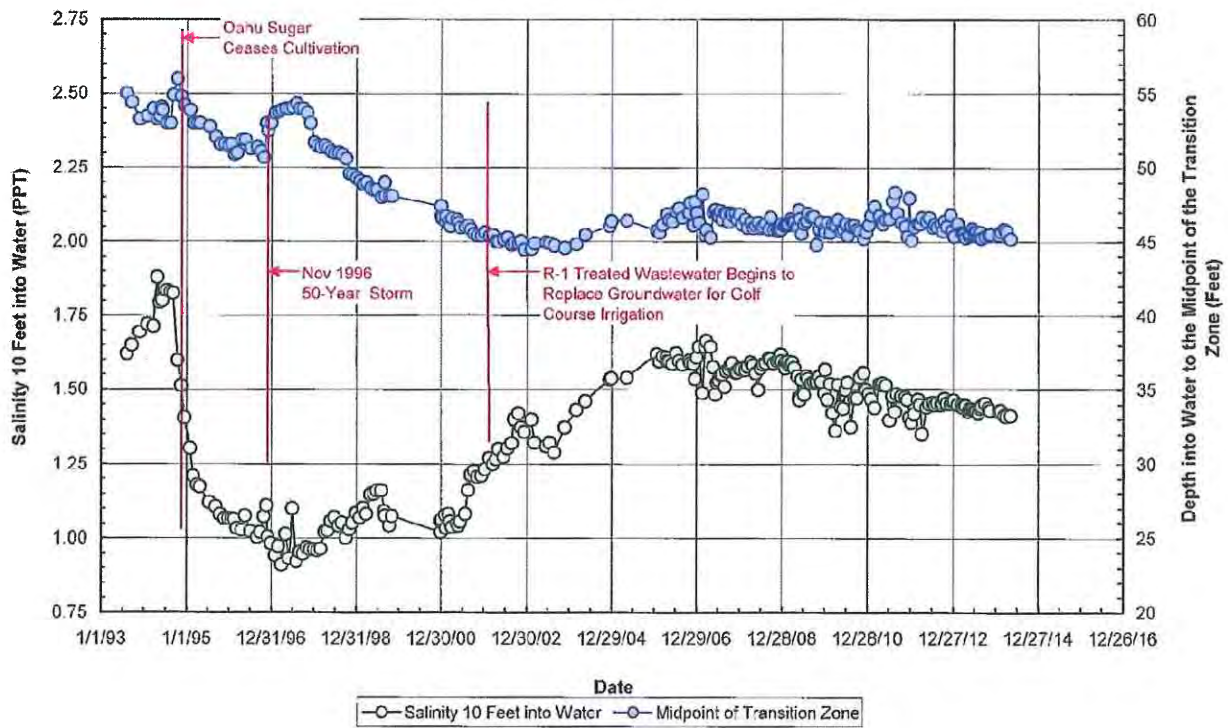
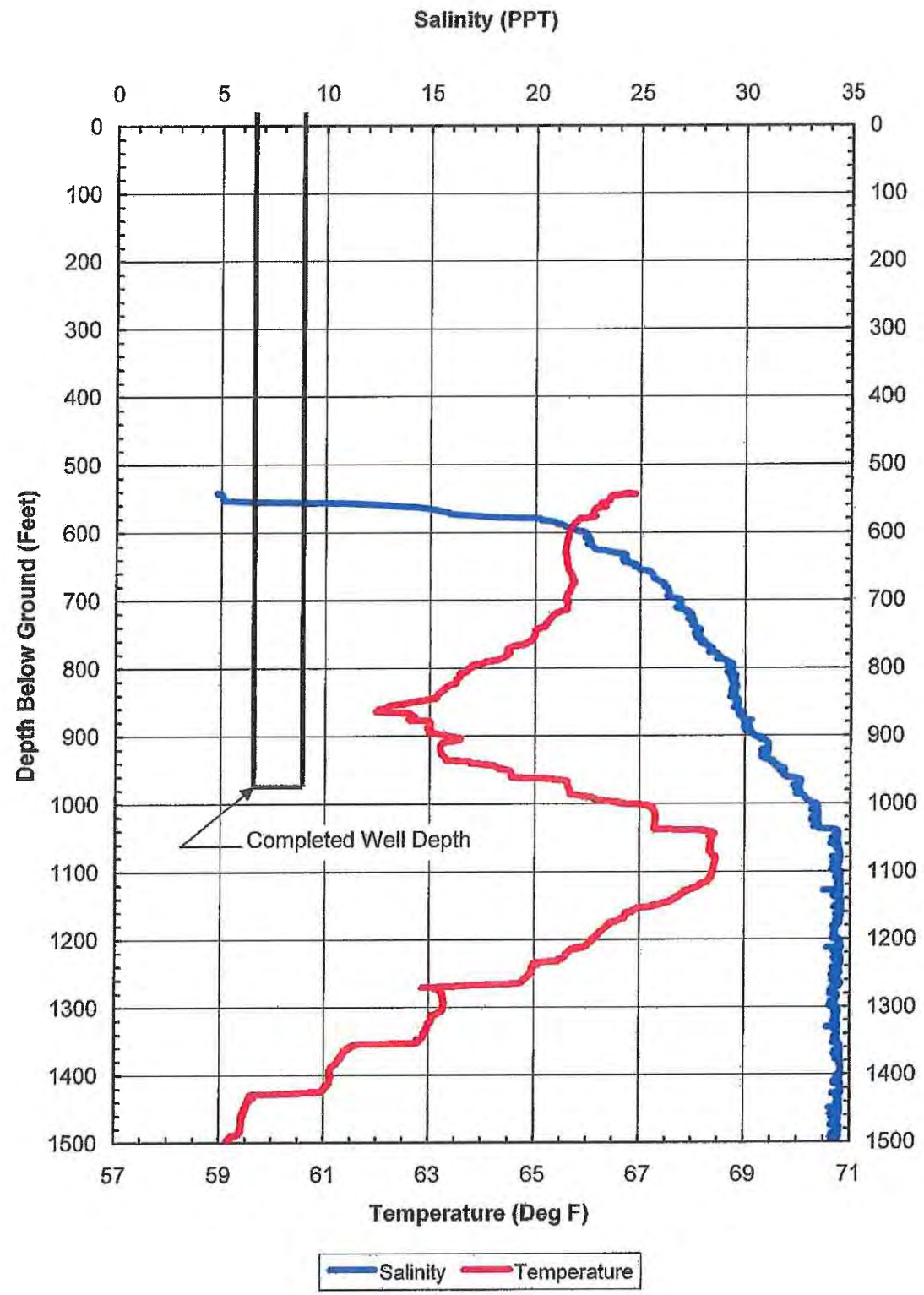


Figure 14. Salinity Trends in the Puuloa Sector of the Ewa Limestone Aquifer as Depicted by Data from the FG-2 Monitor Well



### Completion of the Kamakana Borehole as a Monitor Well



Profile through the Water Column  
of the Kamakana Monitor Well  
May 22, 2014

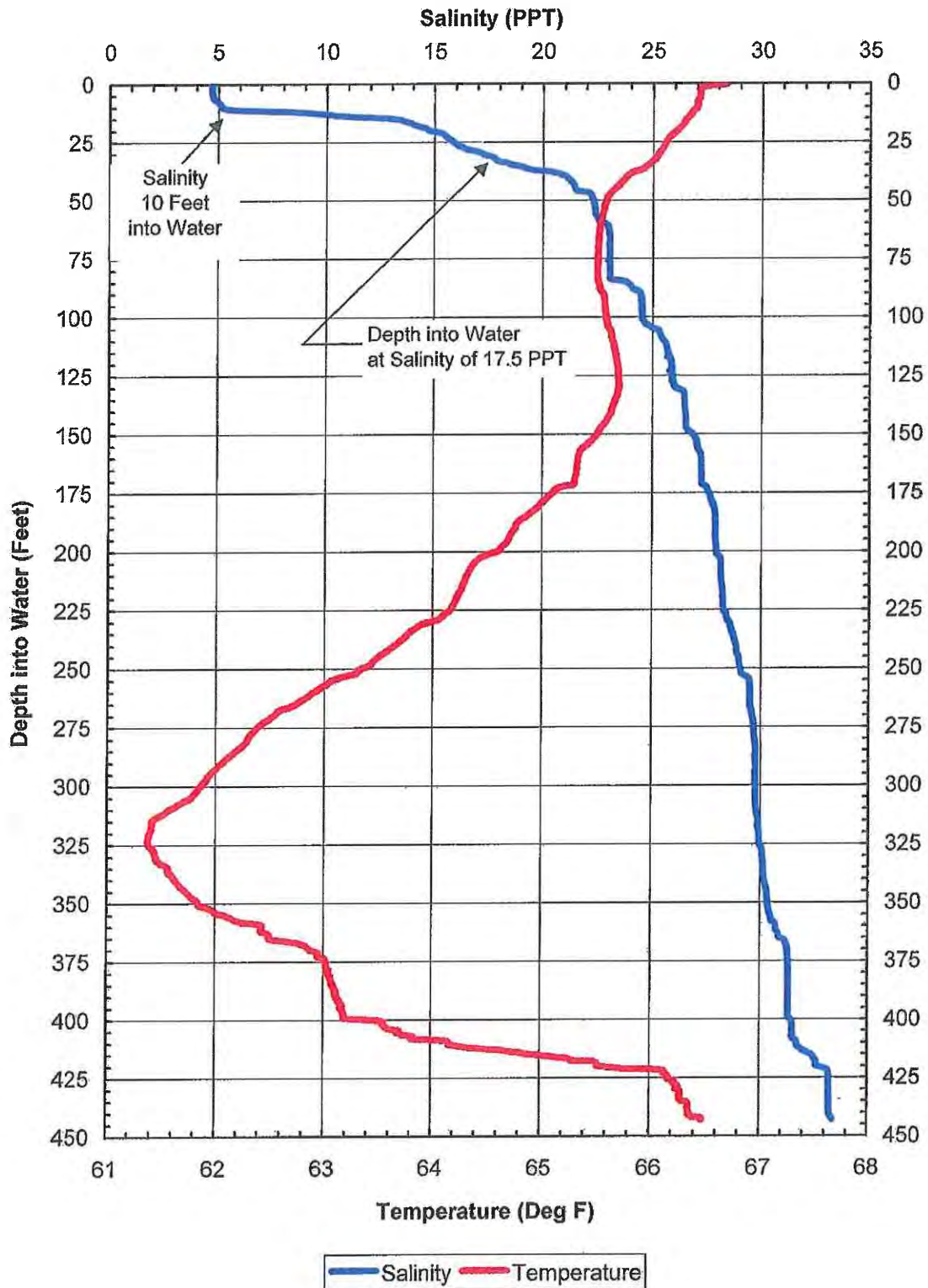


Figure 15. Comparative Salinity Profiles through the Water Column of the Kamakana Monitor Well, April 3, 2010 Versus May 22, 2014

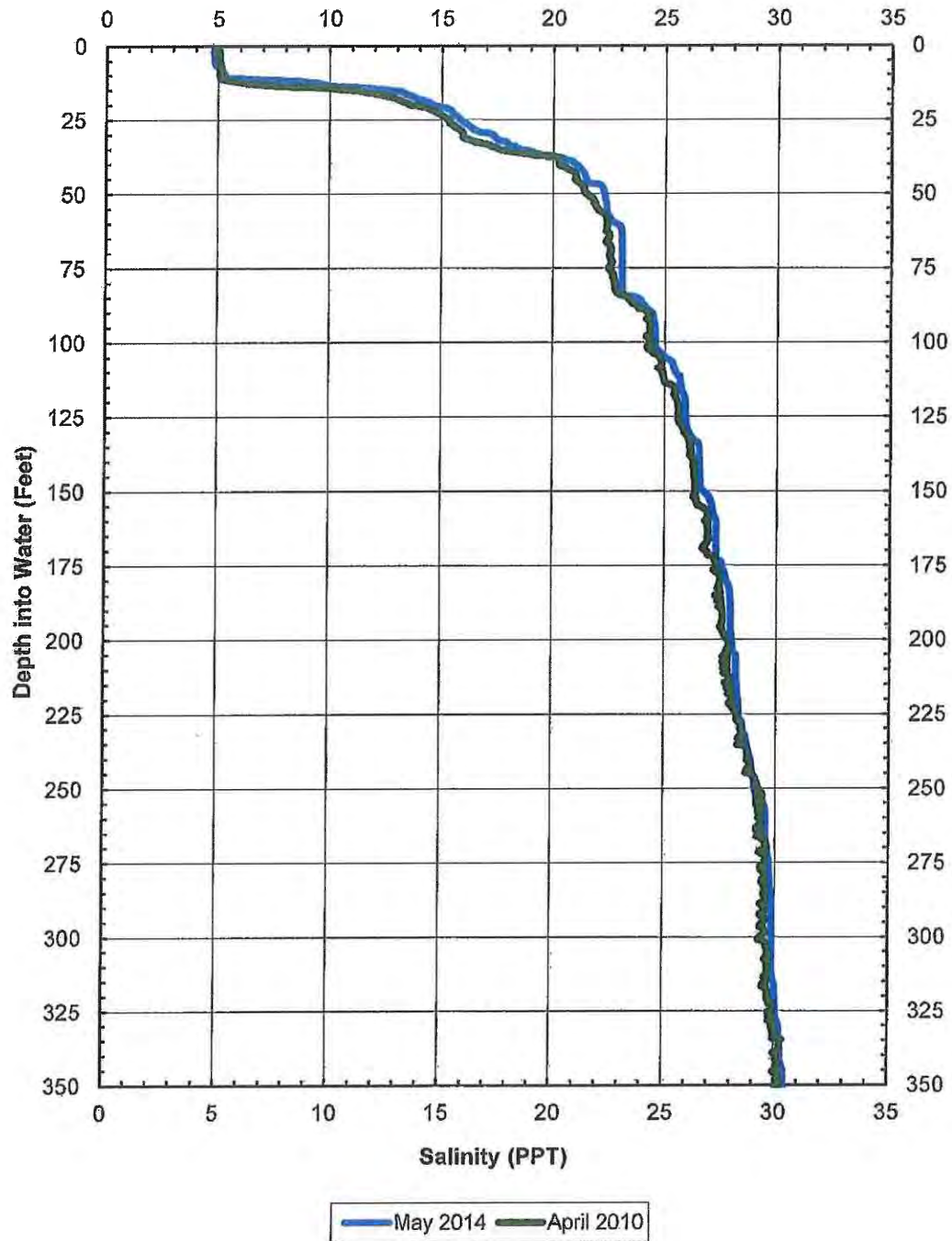


Figure 16. Trends of Salinity Indicator Parameters from Salinity Profiling in the Kamakana Monitor Well

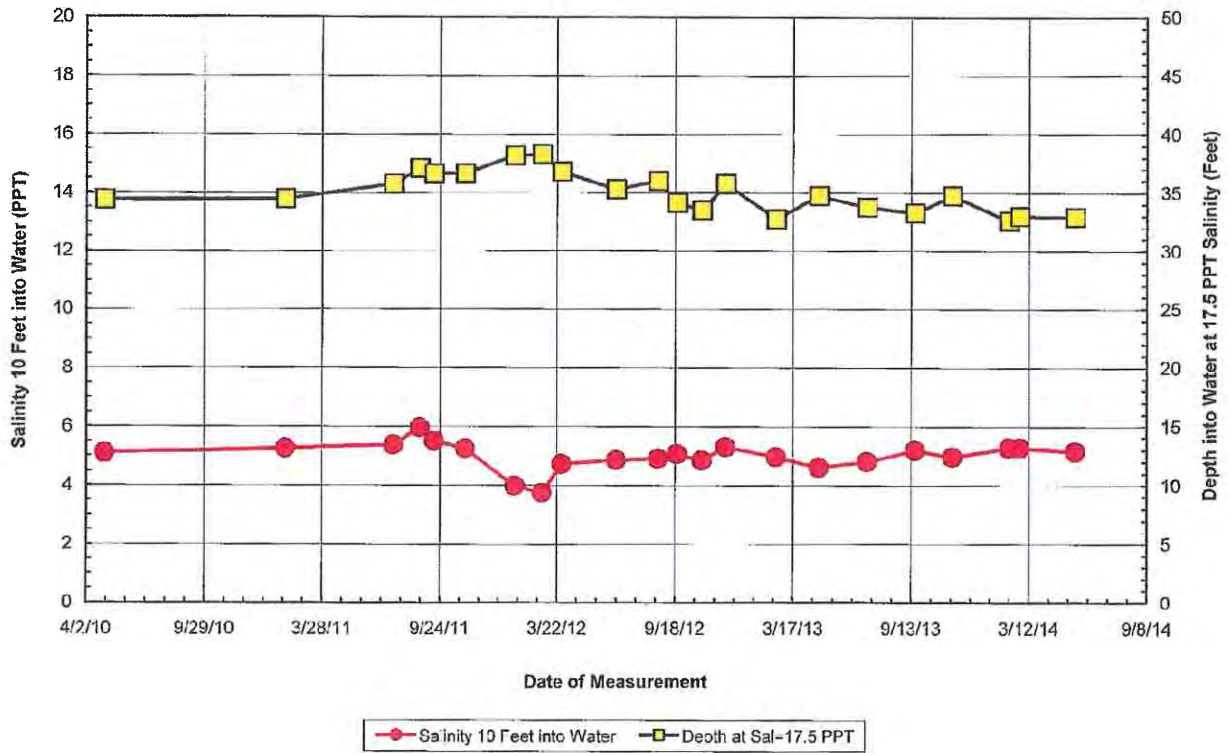




Figure 17. Salinity and Temperature Profile in the Ooma Mauka Monitor Well on May 20, 2014

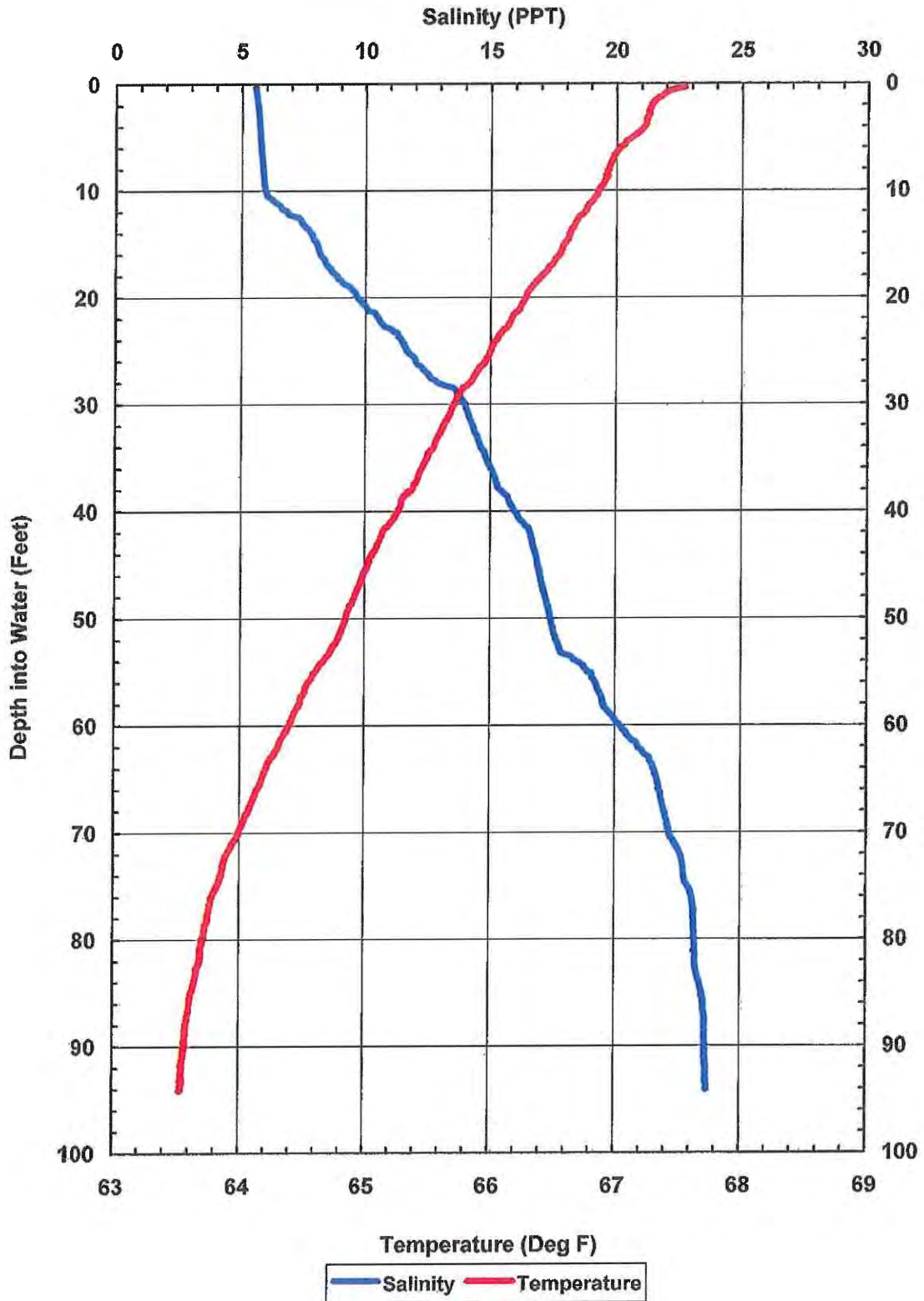


Figure 18. Salinity and Temperature Profile In the Ooma Makai Monitor Well on May 20, 2014

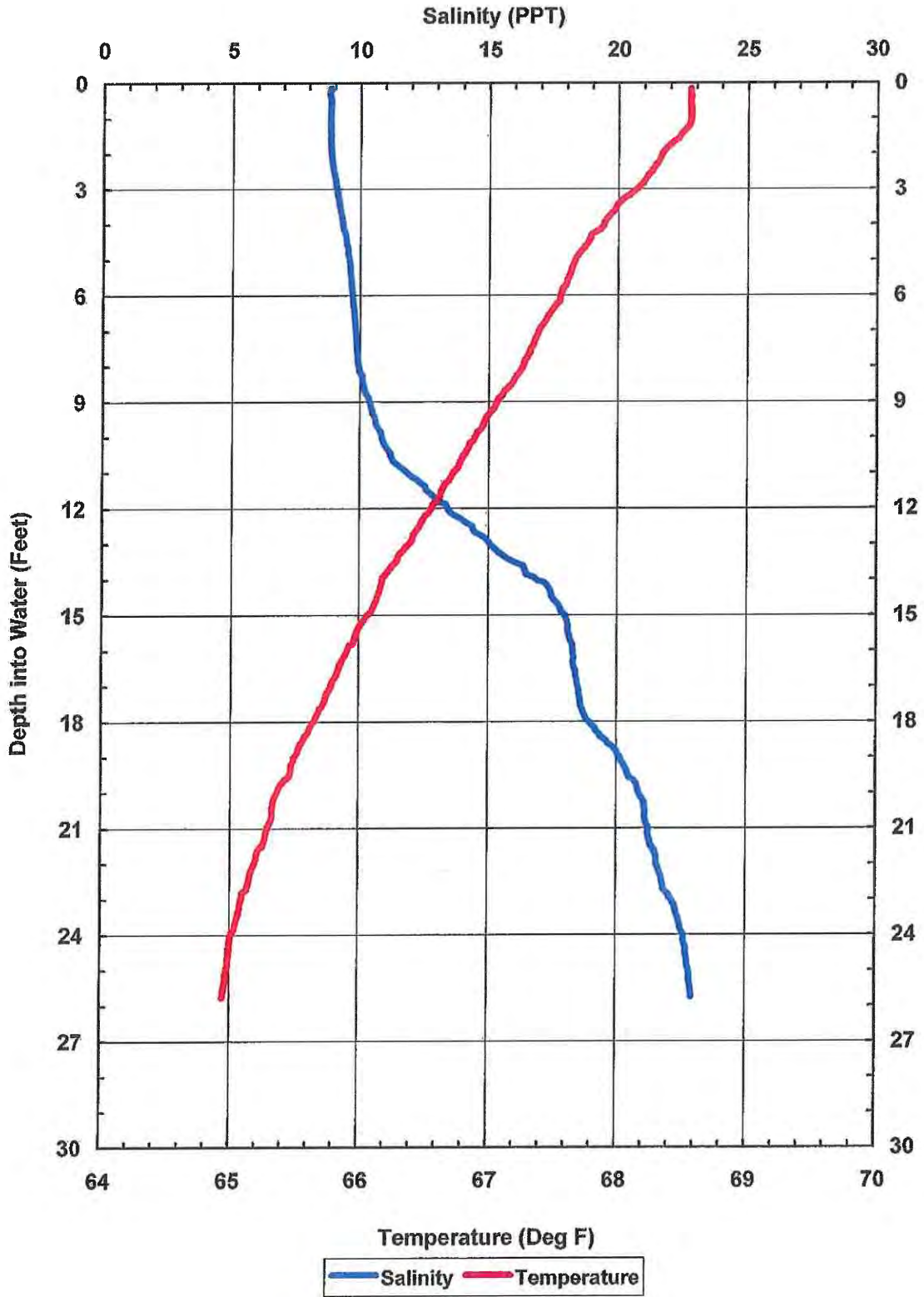


Figure 19. Trends of Salinity Indicator Parameters in the Ooma Mauka Monitor Well

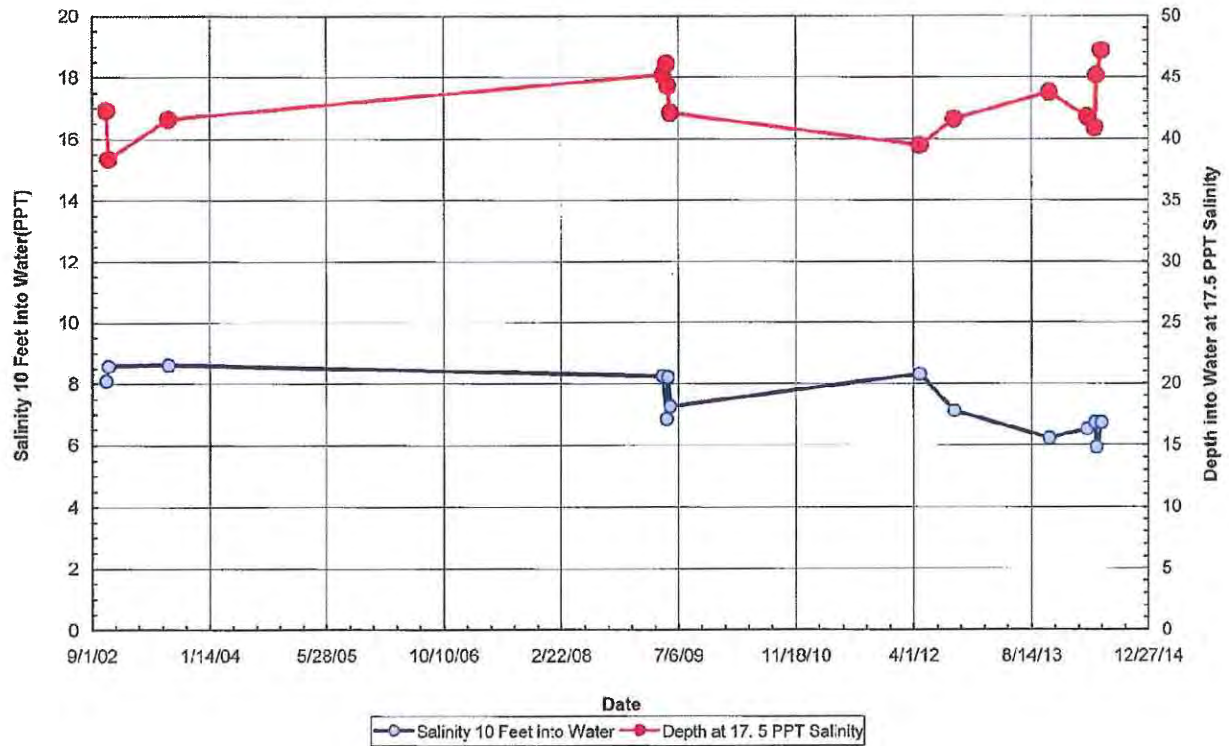


Figure 20. Trends of Salinity Indicator Parameters in the Ooma Makai Monitor Well

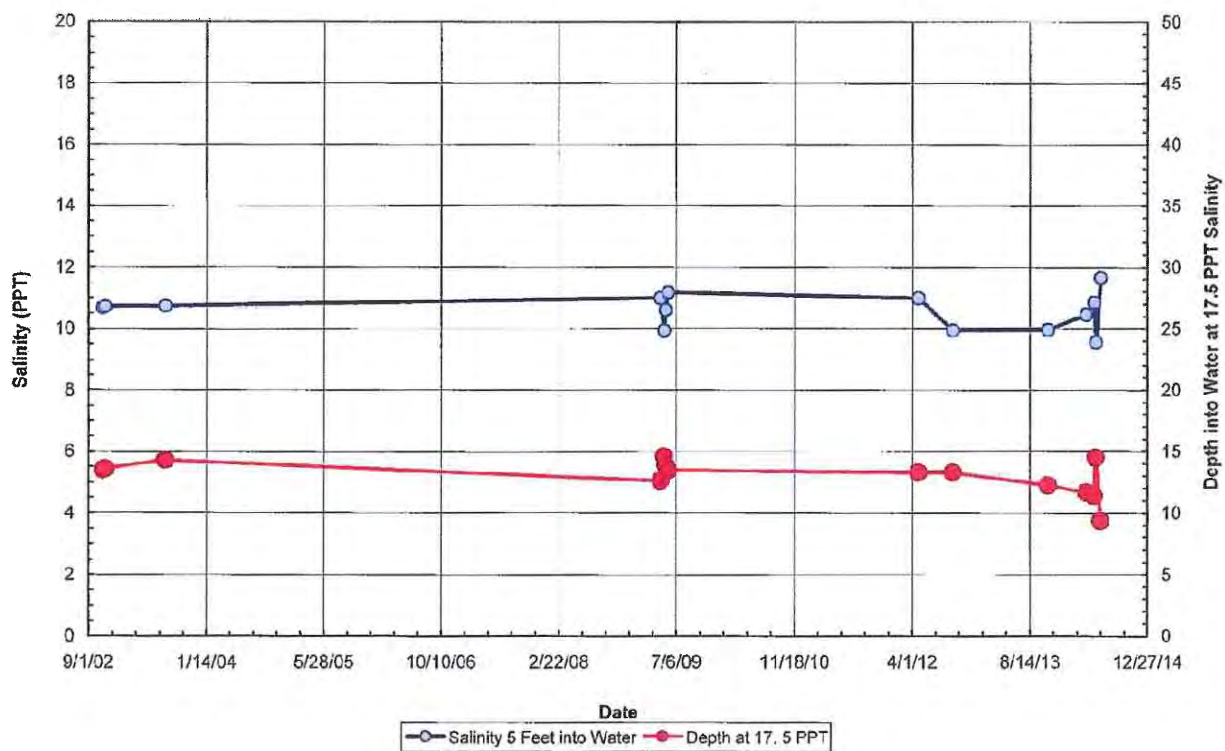


Figure 21. Salinity and Temperature Profile through the Water Column of the Kaloko 2 Irrigation Well (No. 4160-02) on May 13, 2014

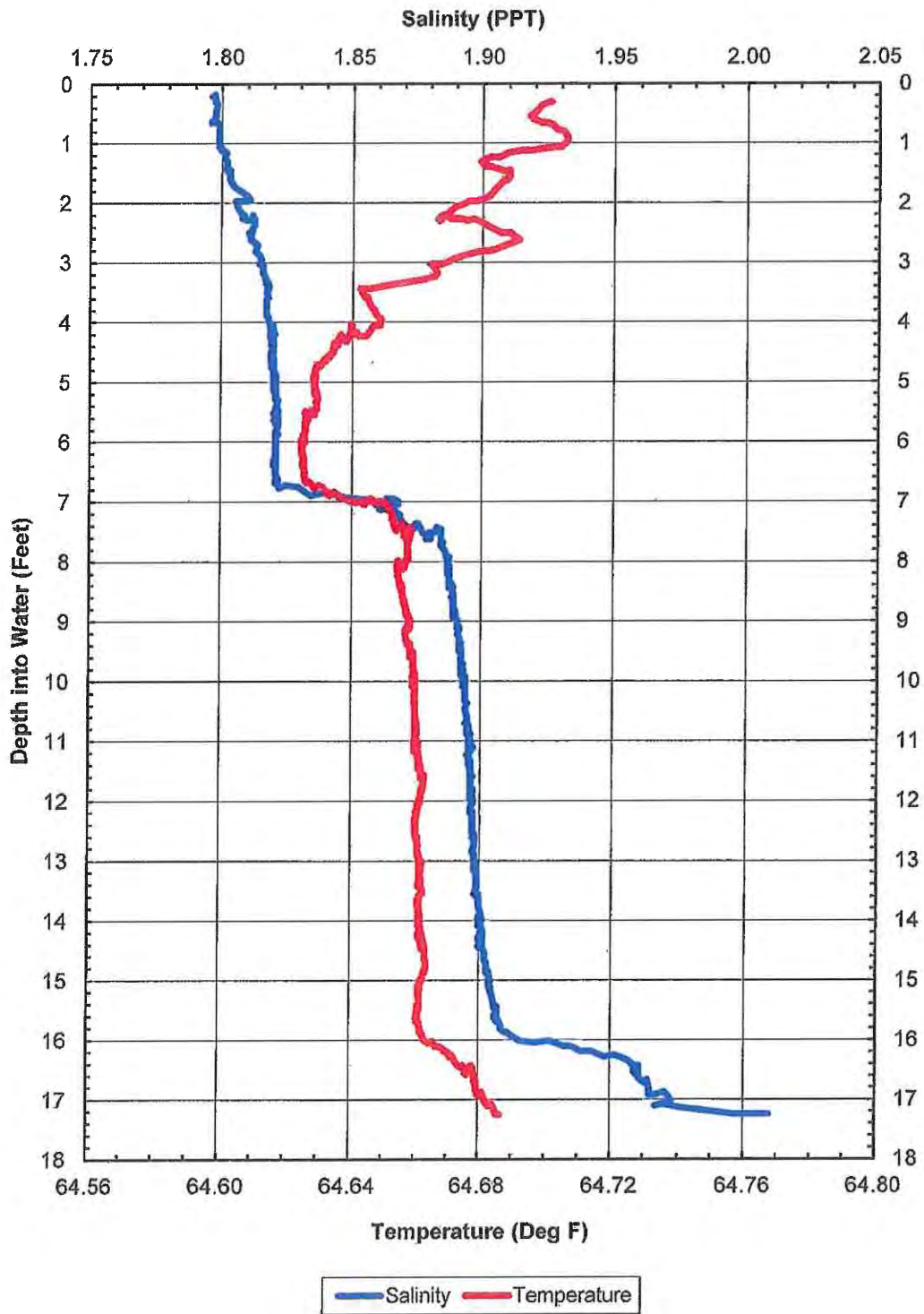
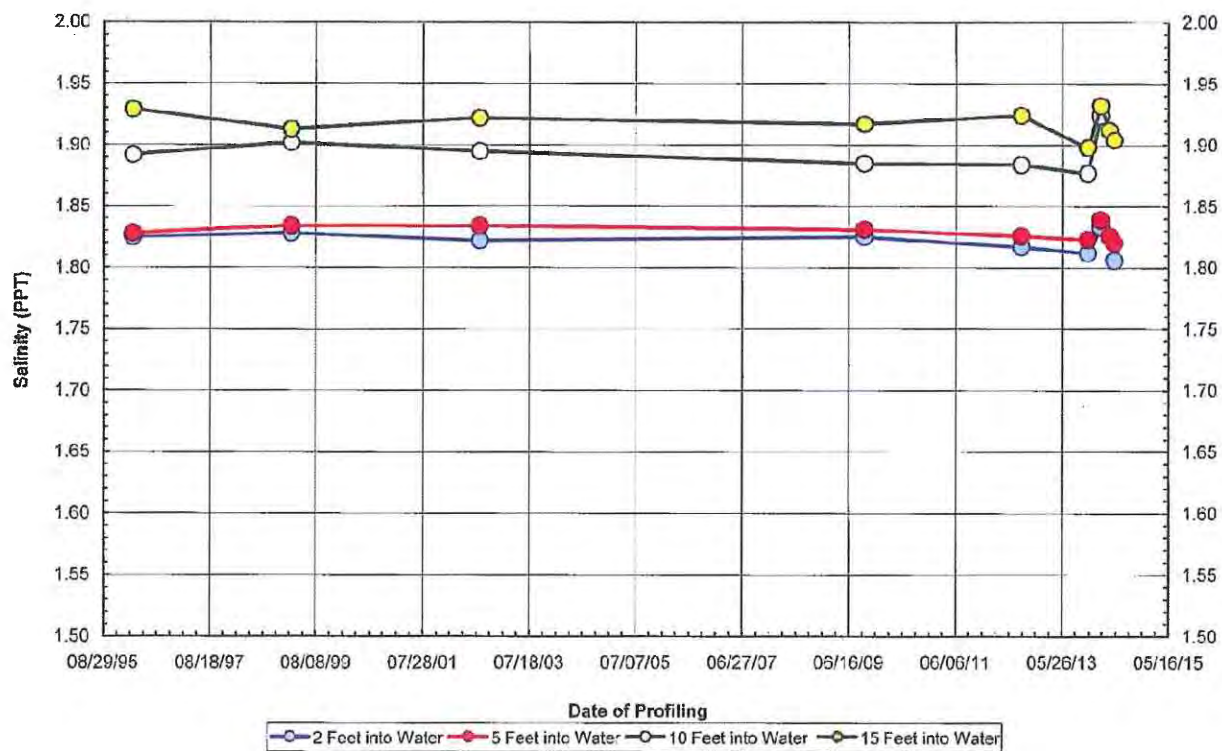


Figure 22. Salinity Trends in the Water Column of the Kaloko 2 Irrigation Well



**Figure 5. Salinity and Temperature Profile through the Water Column of the Kamakana Monitor Well on April 3, 2010 Prior to Encountering Fresh Water at Depth**

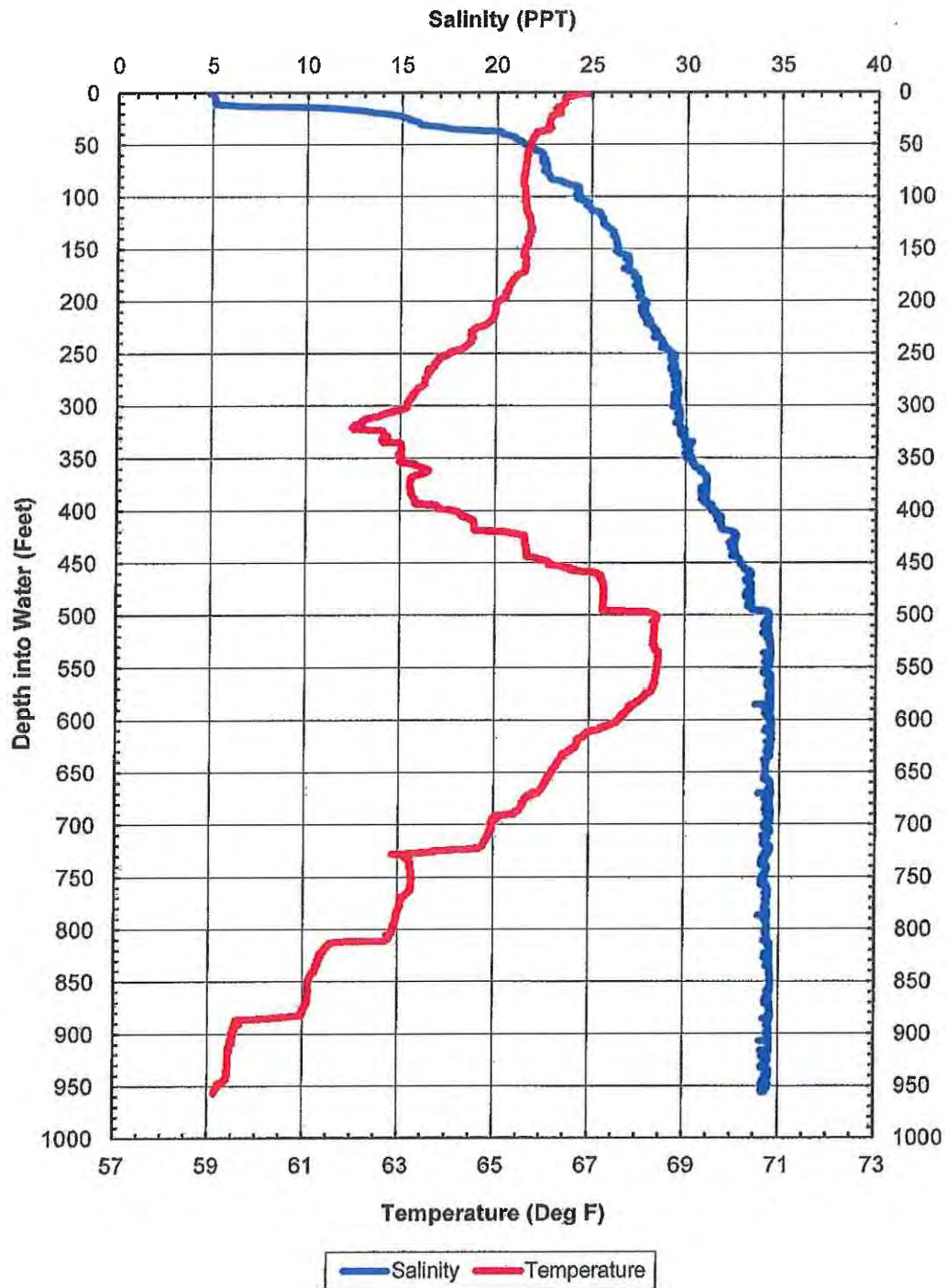


Figure 7. Temperature in Saline Groundwater Below the Basal Lens at the Kamakana Monitor Well

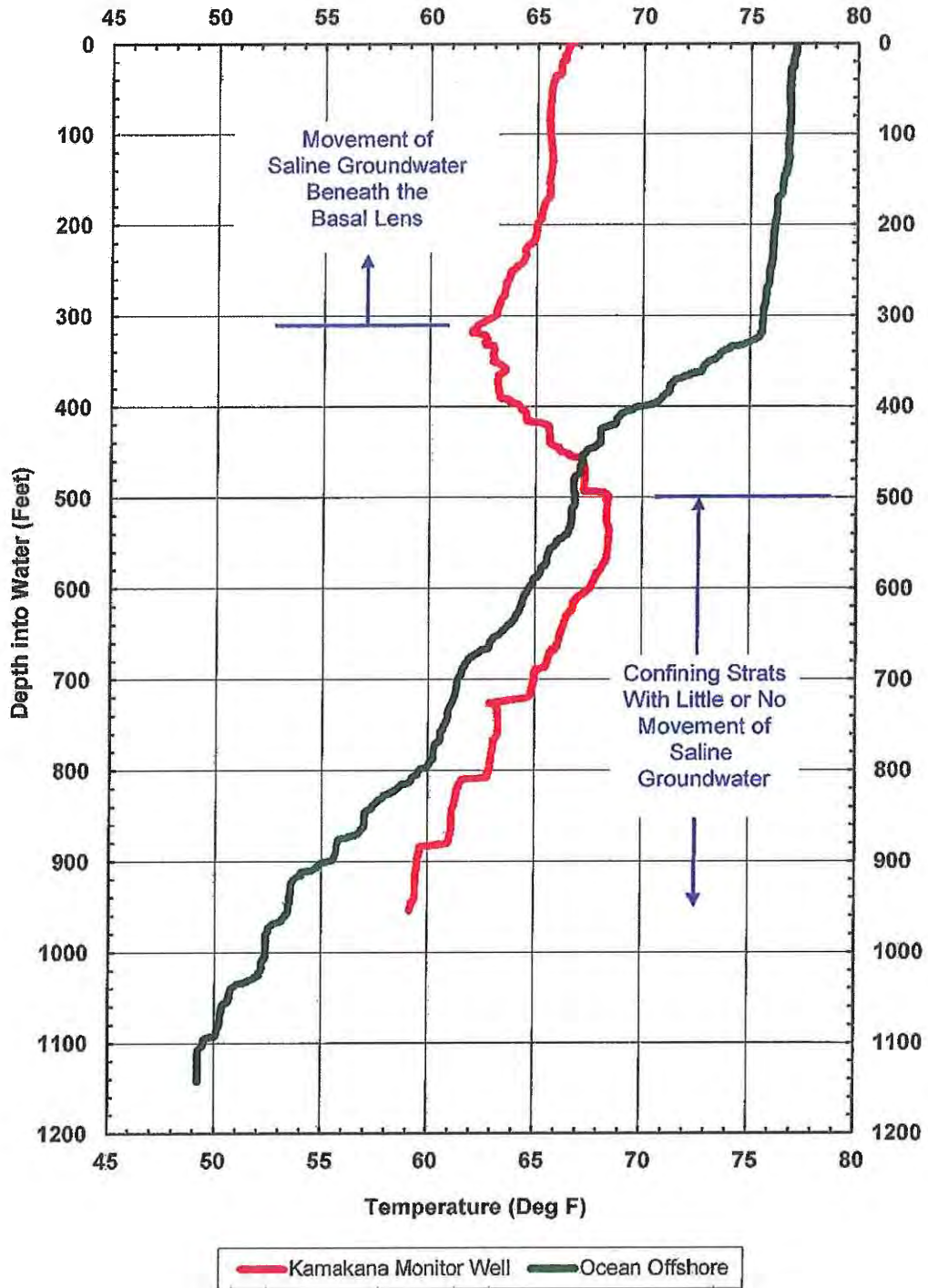
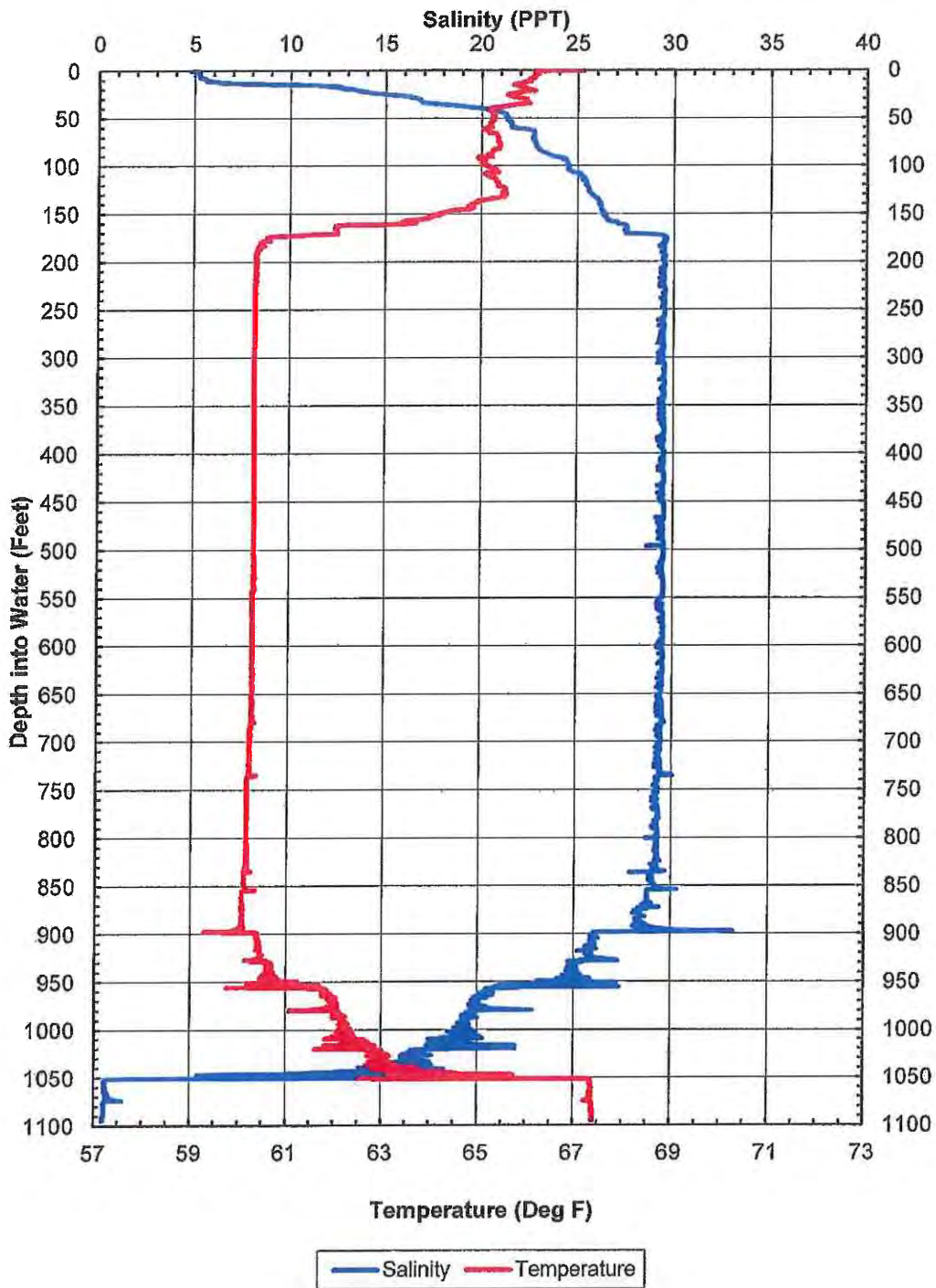


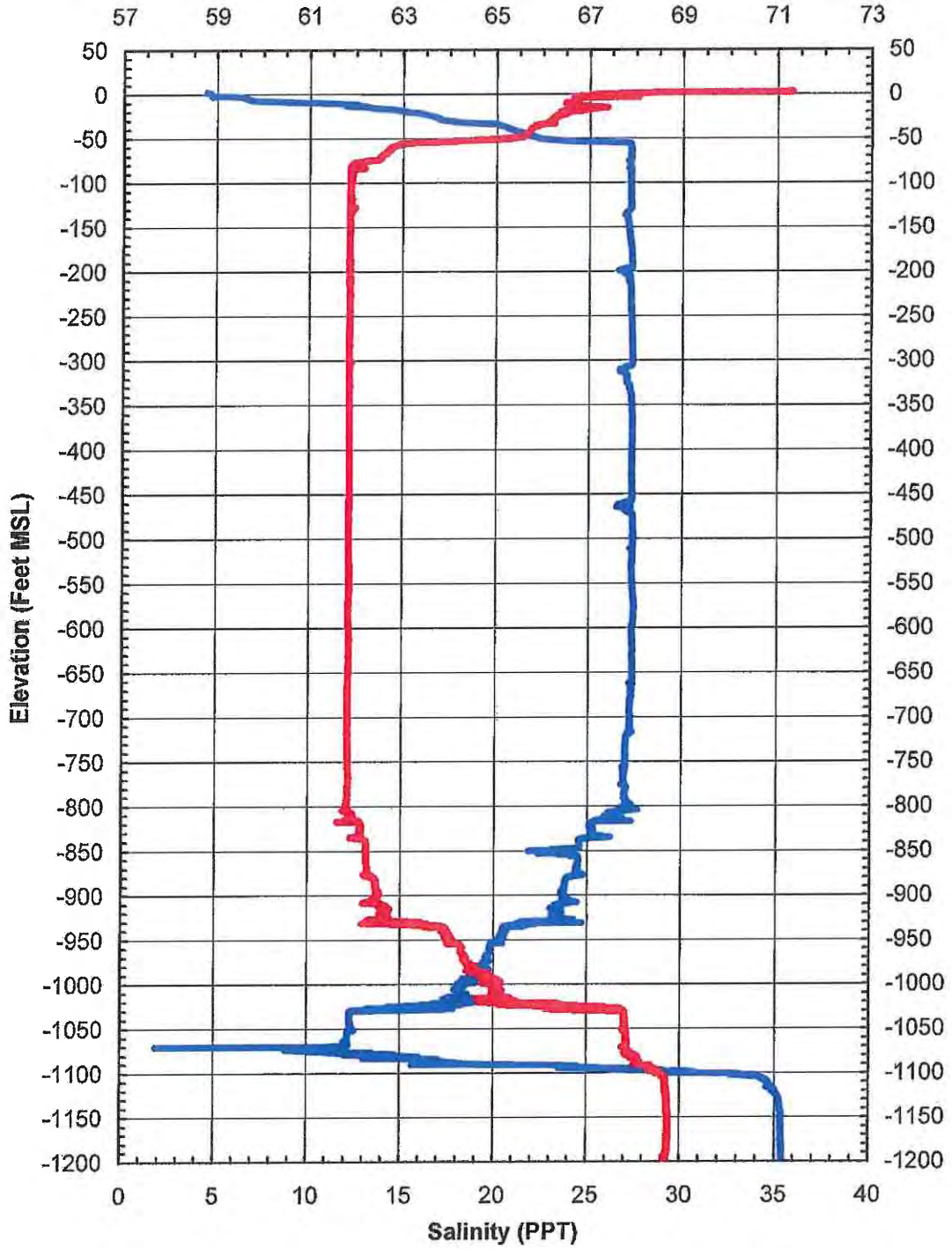


Figure 6. Profile through the Water Column of the Kamakana Monitor Well on May 12, 2010 After Encountering Fresh Water at Depth



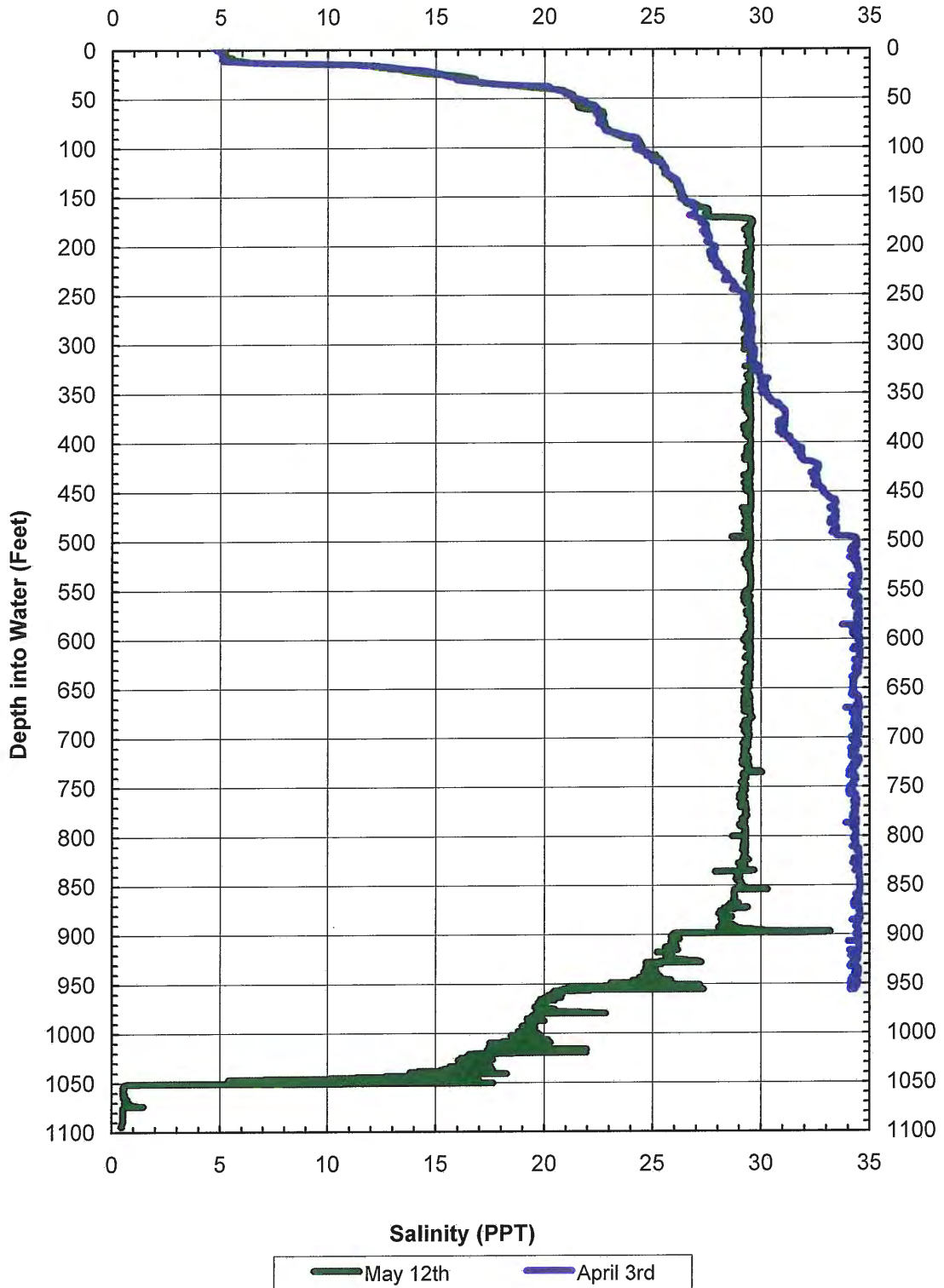
Profile through the Water Column  
of the Kamakana Monitor Well  
August 18, 2010

Temperature (Deg F)

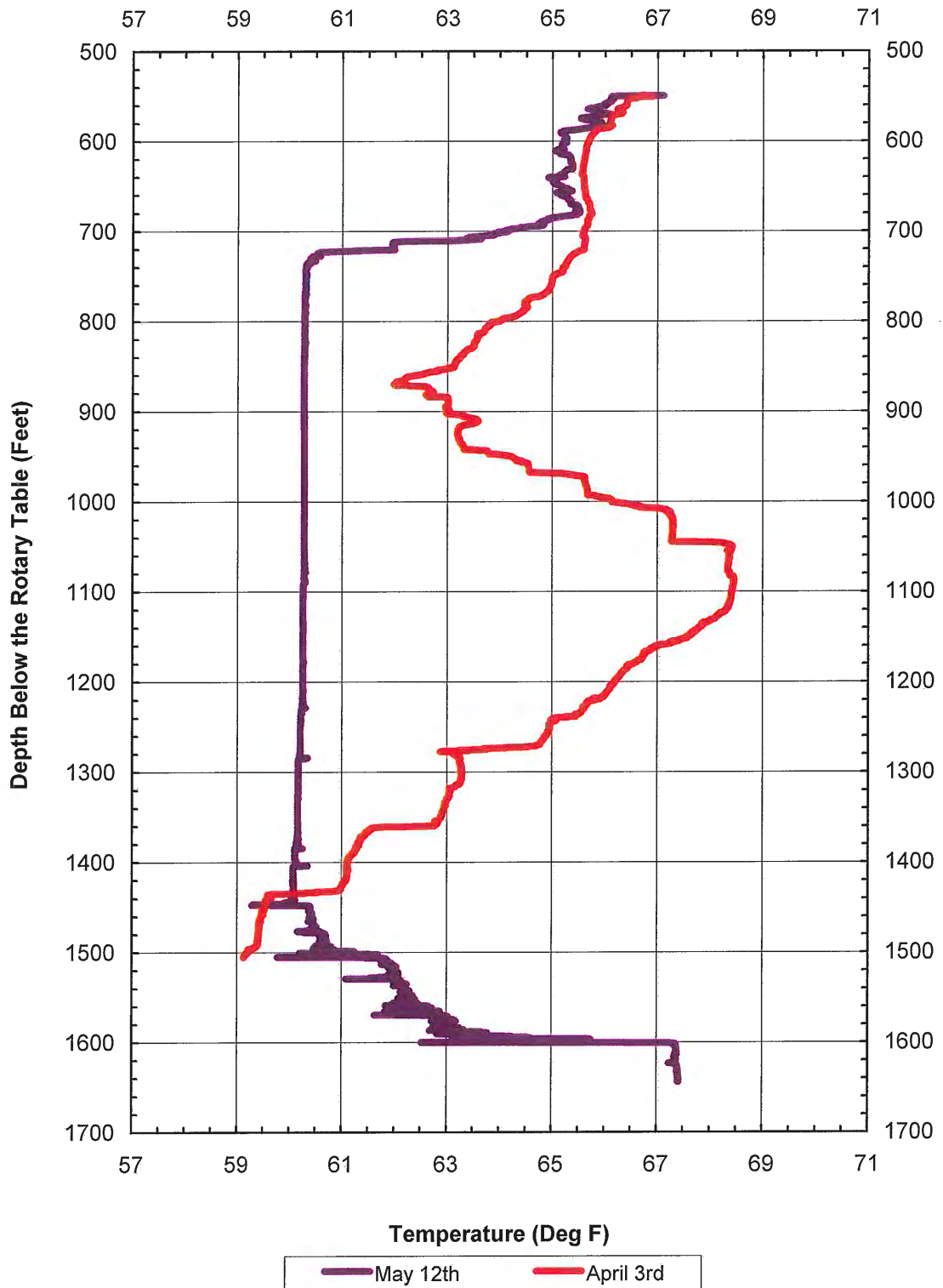


— Salinity — Temperature

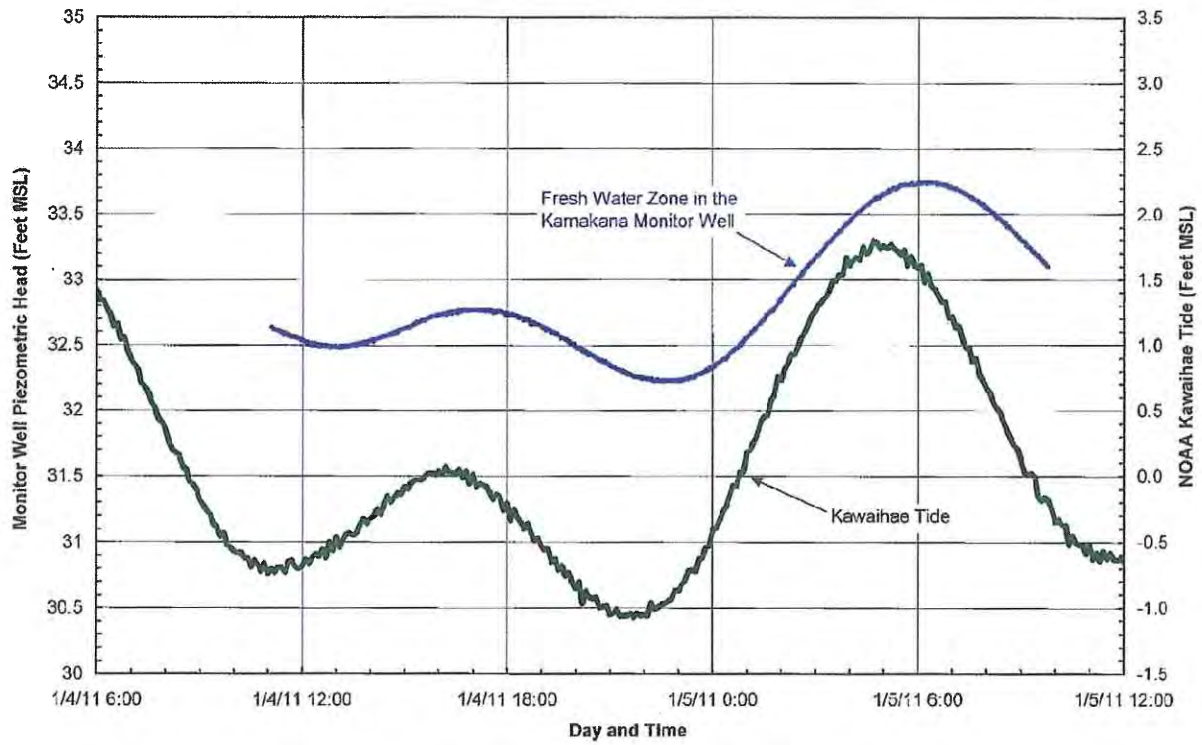
Comparison of Salinity Profiles  
on April 3, 2010 and May 12, 2010



**Figure 4**  
**Comparison of Temperature Profiles**  
**on April 3, 2010 and May 12, 2010**



Tidal Response Prior to the January 5, 2011 Air Lift Pump Test



Tidal Response in the Basal Aquifer at the Kamakana Monitor Well

