

Atlantic Richfield Company

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April 6, 2020

Jessica LaClair
Project Manager
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway, 12th Floor
Albany, New York 12233-7016

**RE: Monthly Progress Report, March 2020
Former Anaconda Plant (a.k.a. Harbor at Hastings Site) Site No. 3-60-022
Hastings-On-Hudson, New York**

Dear Ms. LaClair:

Enclosed is the March 2020 Monthly Progress Report for the Former Anaconda Plant (a.k.a. Harbor at Hastings Site), New York State Department of Environmental Conservation (NYSDEC) Site No. 3-60-022, Hastings-on-Hudson, New York. This progress report has been prepared in accordance with Section XI of the AMENDED ORDER ON CONSENT and ADMINISTRATIVE SETTLEMENT between Atlantic Richfield Company and NYSDEC, dated November 6, 2013. The time period covered is March 1, 2020 through March 31, 2020.

If you have any questions or comments on this submittal, please feel free to contact me at 630-731-4463.

Sincerely,



Paul G. Johnson
Operations Project Manager

Enclosure

cc: Village Manager Mary Beth Murphy, Hastings-On-Hudson
Mark Chertok, Hastings-On-Hudson
Karl Coplan, Pace/Riverkeeper
File

ecc: Jacquelyn Nealon, New York State Department of Health
Maureen Schuck, New York State Department of Health
Susan Edwards, New York State Department of Environmental Conservation
Benjamin Conlon, Esq. NYSDEC, Office of General Counsel
Mayor Nicola Armacost, Hastings-On-Hudson
Trustee Morgan Fleisig, Hastings-On-Hudson
Village Manager Mary Beth Murphy, Hastings-On-Hudson
Jim Lucari, BP
Michael Daneker, Arnold & Porter
Martha Gopal, Sovereign Consulting Inc.

**FORMER ANACONDA WIRE AND CABLE PLANT SITE
(a.k.a. HARBOR AT HASTINGS SITE) OU1
NYSDEC SITE 360022
MONTHLY PROGRESS REPORT 178**

PREPARED BY: Atlantic Richfield Company
Paul Johnson

REPORTING PERIOD: March 1, 2020 through March 31, 2020

1. PROGRESS MADE THIS REPORTING PERIOD:

- DNAPL gauging and recovery was performed on March 2nd, 2020. HARW-5 was gauged and pumped as required by the August 2011 Design Basis Memorandum.
- Progress continued on these on-going design-related activities:
 - Submitted Draft Construction Sequencing Details to Support Fish Window Evaluation – received preliminary comments from NYSDEC FWS March 30th, 2020.
 - Submitted Draft Summary of Post-Remediation PCB Residuals to NYSDEC, evaluating potential separation layers for discussion with NYSDEC.
 - Draft Beneficial Use Preliminary Submittal.
 - Old Marina / Kinnally Cove Backfill Options – Design team evaluating.
 - Draft Evaluation of shoreline options presented at December 3rd, 2019 meeting. Followed up with Village; their consultant is expected to reach out to AR.
 - NYSDEC responded to September 24th, 2019 Draft Natural Deposition Memorandum; Sovereign revised and submitted; NYSDEC approved February 2nd, 2020.

2. UNANTICIPATED PROBLEM AREAS AND RECOMMENDED SOLUTIONS

- None this reporting period.

3. PROBLEMS RESOLVED

- None this reporting period.

4. DELIVERABLES SUBMITTED / RECEIVED

- March 3, 2020, Atlantic Richfield to NYSDEC: *Hastings February 2020 Monthly Progress Report.*
- March 11, 2020, Atlantic Richfield to NYSDEC: *Draft Beneficial Use Evaluation Memorandum.*

- March 30, 2020, NYSDEC to Atlantic Richfield: email of preliminary comments on *Construction Sequencing Related to Work Window Time Restrictions* (Arcadis).

5. UPCOMING EVENTS / ACTIVITIES PLANNED

- The April DNAPL gauging and recovery event and the LNAPL IRM activities scheduled for April 6th have been postponed due to the COVID-19 pandemic and New York State Governor Cuomo’s “PAUSE” order, per discussions with and notification to NYSDEC on March 16th, 2020. Scheduling of subsequent events will be dependent on the developing COVID-19 situation and AR will continue to communicate with NYSDEC regarding schedule. The tentative schedule is as follows:
- The next three DNAPL gauging and recovery events are tentatively scheduled to occur the weeks of May 4th, June 1st, and July 6th, 2020.
- Continue the Water Tower LNAPL IRM activities, as allowable, in accordance with the IRM Work Plan (Fluor Daniel GTI, December 1997), Fluor Daniel GTI correspondence to the NYSDEC dated May 18, 1998 and Atlantic Richfield correspondence with the NYSDEC on September 2, 2010. The upcoming LNAPL IRM events are tentatively scheduled to occur the week of May 4th, 2020 and the week of July 6th, 2020 in accordance with the schedule modification request, from monthly to quarterly, sent by Atlantic Richfield to NYSDEC on June 4, 2012, and the approval letter received from NYSDEC dated April 2, 2013.

6. KEY STAFFING

- Sovereign Consulting Inc.
- Parsons Environment and Infrastructure Group, Inc. (OM&M)
- Parsons Environment and Infrastructure Group, Inc. (Security)

7. PERCENTAGE COMPLETE

- DNAPL gauging and recovery – ongoing
- LNAPL IRM – ongoing

8. DATA

- Final data not generated during this reporting period.

9. CITIZEN PARTICIPATION ACTIVITIES

- None this reporting period.

LIST OF ACRONYMS

<i>Acronym</i>	<i>Description</i>
NYSDEC	New York State Department of Environmental Conservation
LNAPL	Light Non-Aqueous Phase Liquid
DNAPL	Dense Non-Aqueous Phase Liquid
OU	Operable Unit
IRM	Interim Remedial Measure
O&M	Operations and Maintenance

LIST OF REFERENCES

FLUOR Daniel GTI, 1997. *Draft Interim Remedial Measure Work Plan – Separate Phase Liquid Recovery*. December.

TABLE I
MARCH DNAPL PUMPING SUMMARY (WEEK OF 3/2/2020)
ATLANTIC RICHFIELD
1 RIVER STREET
HASTINGS-ON-HUDSON, NEW YORK

Well ID	Date Gauged/ Pumped	Installation Angle (deg)	Pre-Pumping Uncorrected Apparent Height (inches)	Pre-Pumping Corrected Apparent Height (inches)	Post-Pumping Uncorrected Apparent Height (inches)	Post-Pumping Corrected Apparent Height (inches)	Total Fluids Removed (gallons) ⁴	Total DNAPL Removed (gallons) ⁶	Post-Purging Distance of DNAPL Surface Below MS/Fill Interface (ft) ⁵
HARW-1	3/2/2020 ¹	0	0	0	NA**	NA**	NA**	NA**	NA**
HARW-2	3/2/2020 ²	0	17.0	17.0			NA**	NA**	3.3
	NA** ³				NA**	NA**			
HARW-3	3/2/2020 ²	16.5	6.0	5.8			NA**	NA**	3.8
	NA** ³				NA**	NA**			
HARW-4	3/2/2020 ²	24.5	8.0	7.3			NA**	NA**	3.5
	NA** ³				NA**	NA**			
HARW-5	3/2/2020 ²	23.5	34.0	31.2			126.0	7.4	4.3
	3/2/2020 ³				0.0	0.0			
HARW-6	3/2/2020 ²	14.0	9.0	8.7			NA**	NA**	3.8
	NA** ³				NA**	NA**			
HARW-7	3/2/2020 ²	0	12.0	12.0			NA**	NA**	3.7
	NA** ³				NA**	NA**			
HARW-8	3/2/2020 ²	0	17.0	17.0			NA**	NA**	3.3
	NA** ³				NA**	NA**			
HAOW-12A	3/2/2020 ²	0	8.0	8.0			NA**	NA**	4.5
	NA** ³				NA**	NA**			

Total Gallons of DNAPL Removed: 7.4

Notes:

¹DNAPL not present, pumping not completed in this well

²Pre-pumping gauge date

³Post-pumping gauge date.

⁴Total gallons of fluid (DNAPL and groundwater) removed from well based on measurement in container.

⁵Represents the distance of the post-purging DNAPL material interface from the top of the MS/Fill interface.

⁶Unless otherwise noted, this column refers to the total volume of DNAPL removed based calculation of volume based on well diameter and height of DNAPL in the well.

*DNAPL is present but is under 6-inches and discontinuous.

**Volume in the well is less than threshold required to perform DNAPL pumping procedures.

Apparent Height: refers to the distance between the DNAPL surface and the bottom of the well sump which includes all fluids (groundwater and DNAPL) in the matrix.

NA: Not Applicable

TABLE II
SUMMARY OF DNAPL MEASUREMENTS
NYSDEC #3-60-022
1 RIVER STREET
HASTINGS-ON-HUDSON, NEW YORK

	Date	Depth to Product (ft)	Product Apparent Height - Pre-pumping (ft)	Product Apparent Height - Post-pumping (ft)	Approximate Volume of Product Recovered (gallons) ³	Days Elapsed Between Measurement Readings	Measurement Tool Used	Recovery Procedure Used
MW-12	Cumulative 10/9/2006 - 7/29/2010	-	-	-	5.0	-	-	-
	TOTAL VOLUME RECOVERED TO DATE FROM MW-12 (GALLONS)				5.0			
HAOW-12A	Cumulative 3/2/2009 - 12/10/2018	-	-	-	49.7	-	DMT ⁴	-
	1/14/2019	42.9	0.7	-	-	35	DMT ⁴	-
	2/4/2019	42.3	1.3	-	-	21	DMT ⁴	-
	3/11/2019	42.4	1.2	-	-	35	DMT ⁴	-
	4/1/2019	42.6	1.0	-	-	21	DMT ⁴	-
	5/6/2019	42.5	1.1	-	-	35	DMT ⁴	-
	6/3/2019	42.4	1.2	-	-	28	DMT ⁴	-
	8/5/2019	42.5	1.1	-	-	63	DMT ⁴	-
	9/9/2019	42.4	1.2	-	-	35	DMT ⁴	-
	10/7/2019	42.6	1.0	-	-	28	DMT ⁴	-
	11/4/2019	42.4	1.2	-	-	28	DMT ⁴	-
	12/2/2019	DNAPL pumping not required to be completed					-	-
	1/13/2020	42.6	1.0	-	-	70	DMT ⁴	-
	2/3/2020	42.4	1.2	-	-	21	DMT ⁴	-
	3/2/2020	42.9	0.7	-	-	28	DMT ⁴	-
	TOTAL VOLUME RECOVERED TO DATE FROM HAOW-12A (GALLONS)				49.7			
HARW-1	Cumulative 9/29/2010 - 12/10/2018	-	-	-	0.0	-	-	-
	1/14/2019	No product detected	0.0	-	-	35	DMT ⁴	-
	2/4/2019	No product detected	0.0	-	-	21	DMT ⁴	-
	3/11/2019	No product detected	0.0	-	-	35	DMT ⁴	-
	4/1/2019	No product detected	0.0	-	-	21	DMT ⁴	-
	5/6/2019	No product detected	0.0	-	-	35	DMT ⁴	-
	6/3/2019	No product detected	0.0	-	-	28	DMT ⁴	-
	8/5/2019	No product detected	0.0	-	-	63	DMT ⁴	-
	9/9/2019	No product detected	0.0	-	-	35	DMT ⁴	-
	10/7/2019	No product detected	0.0	-	-	28	DMT ⁴	-
	11/4/2019	No product detected	0.0	-	-	28	DMT ⁴	-
	12/2/2019	DNAPL pumping not required to be completed					-	-
	1/13/2020	No product detected	0.0	-	-	70	DMT ⁴	-
	2/3/2020	No product detected	0.0	-	-	21	DMT ⁴	-
	3/2/2020	No product detected	0.0	-	-	28	DMT ⁴	-
	TOTAL VOLUME RECOVERED TO DATE FROM HARW-1 (GALLONS)				0.0			

	Date	Depth to Product (ft)	Product Apparent Height - Pre-pumping (ft)	Product Apparent Height - Post-pumping (ft)	Approximate Volume of Product Recovered (gallons) ³	Days Elapsed Between Measurement Readings	Measurement Tool Used	Recovery Procedure Used
HARW-2	Cumulative 9/29/2010 - 12/10/2018	-	-	-	812.3	-	-	-
	1/14/2019	38.8	1.3	-	-	35	DMT ⁴	-
	2/4/2019	38.0	2.0	0.08	5	21	DMT ⁴	double diaphragm pump
	3/11/2019	38.8	1.2	-	-	35	DMT ⁴	-
	4/1/2019	38.5	1.5	-	-	21	DMT ⁴	-
	5/6/2019	36.8	3.2	0.25	7.6	35	DMT ⁴	double diaphragm pump
	6/3/2019	38.8	1.3	-	-	28	DMT ⁴	-
	8/5/2019	36.8	3.2	0.25	7.6	63	DMT ⁴	double diaphragm pump
	9/9/2019	38.5	1.5	-	-	35	DMT ⁴	-
	10/7/2019	37.8	2.3	0.08	5.7	28	DMT ⁴	double diaphragm pump
	11/4/2019	39.8	0.2	--	--	28	DMT ⁴	-
	12/2/2019	DNAPL pumping not required to be completed					-	-
	1/13/2020	38.6	1.4	--	--	70	DMT ⁴	-
	2/3/2020	37.0	3.0	0.67	6.1	21	DMT ⁴	-
	3/2/2020	38.6	1.4	--	--	28	DMT ⁴	-
	TOTAL VOLUME RECOVERED TO DATE FROM HARW-2 (GALLONS)				844.3			
HARW-3	Cumulative 10/14/2010 - 12/10/2018	-	-	-	28.6	-	-	-
	1/14/2019	38.7	0.3	-	-	35	DMT ⁴	-
	2/4/2019	38.7	0.3	-	-	21	DMT ⁴	-
	3/11/2019	38.6	0.4	-	-	35	DMT ⁴	-
	4/1/2019	38.8	0.3	-	-	21	DMT ⁴	-
	5/6/2019	38.8	0.3	-	-	35	DMT ⁴	-
	6/3/2019	38.6	0.4	-	-	28	DMT ⁴	-
	8/5/2019	38.5	0.5	-	-	63	DMT ⁴	-
	9/9/2019	38.3	0.7	-	-	35	DMT ⁴	-
	10/7/2019	38.5	0.5	-	-	28	DMT ⁴	-
	11/4/2019	38.5	0.5	-	-	28	DMT ⁴	-
	12/2/2019	DNAPL pumping not required to be completed					-	-
	1/13/2020	38.5	0.5	-	-	70	DMT ⁴	-
	2/3/2020	38.3	0.7	-	-	21	DMT ⁴	-
	3/2/2020	38.5	0.5	--	--	28	DMT ⁴	-
	TOTAL VOLUME RECOVERED TO DATE FROM HARW-3 (GALLONS)				28.6			

	Date	Depth to Product (ft)	Product Apparent Height - Pre-pumping (ft)	Product Apparent Height - Post-pumping (ft)	Approximate Volume of Product Recovered (gallons) ³	Days Elapsed Between Measurement Readings	Measurement Tool Used	Recovery Procedure Used
HARW-4	Cumulative 10/14/2010 - 12/10/2018	-	-	-	213.8	-	-	-
	1/14/2019	40.4	0.6	--	--	35	DMT ⁴	-
	2/4/2019	40.4	0.6	--	--	21	DMT ⁴	-
	3/11/2019	40.3	0.8	--	--	35	DMT ⁴	-
	4/1/2019	39.8	1.2	--	--	21	DMT ⁴	-
	5/6/2019	40.0	1.0	--	--	35	DMT ⁴	-
	6/3/2019	40.0	1.0	--	--	28	DMT ⁴	-
	8/5/2019	39.8	1.2	--	--	63	DMT ⁴	-
	9/9/2019	39.8	1.3	--	--	35	DMT ⁴	-
	10/7/2019	39.6	1.4	--	--	28	DMT ⁴	-
	11/4/2019	39.4	1.6	--	--	28	DMT ⁴	-
	12/2/2019	DNAPL pumping not required to be completed					-	-
	1/13/2020	39.7	1.3	--	--	70	DMT ⁴	-
	2/3/2020	39.7	1.3	--	--	21	DMT ⁴	-
	3/2/2020	40.3	0.7	--	--	28	DMT ⁴	-
	TOTAL VOLUME RECOVERED TO DATE FROM HARW-4 (GALLONS)				213.8			
HARW-5	Cumulative 7/18/2011 - 12/11/2018	-	-	-	1036.4	-	-	-
	1/14/2019	36.6	3.7	0.1	9.4	34	DMT ⁴	double diaphragm pump
	2/4/2019	38.1	2.2	0.1	5.4	21	DMT ⁴	double diaphragm pump
	3/11/2019	36.6	3.7	0.1	9.4	35	DMT ⁴	double diaphragm pump
	4/2/2019	38.3	2.0	0.1	5.0	22	DMT ⁴	double diaphragm pump
	5/7/2019	36.7	3.6	0.1	9.1	35	DMT ⁴	double diaphragm pump
	6/4/2019	37.3	3.0	0.1	7.6	28	DMT ⁴	double diaphragm pump
	8/6/2019	35.1	5.3	0.1	13.5	63	DMT ⁴	double diaphragm pump
	9/10/2019	36.6	3.7	0.0	9.6	35	DMT ⁴	double diaphragm pump
	10/7/2019	37.5	2.8	0.1	7.2	27	DMT ⁴	double diaphragm pump
	11/4/2019	37.5	2.8	0.2	7.0	28	DMT ⁴	double diaphragm pump
	12/2/2019	DNAPL pumping not required to be completed					-	-
	1/13/2020	35.0	5.3	0.1	13.7	70	DMT ⁴	double diaphragm pump
	2/3/2020	38.3	2.0	0.5	3.9	21	DMT ⁴	double diaphragm pump
	3/2/2020	37.5	2.8	0.00	7.4	28	DMT ⁴	double diaphragm pump
	TOTAL VOLUME RECOVERED TO DATE FROM HARW-5 (GALLONS)				1144.6			

	Date	Depth to Product (ft)	Product Apparent Height - Pre-pumping (ft)	Product Apparent Height - Post-pumping (ft)	Approximate Volume of Product Recovered (gallons) ³	Days Elapsed Between Measurement Readings	Measurement Tool Used	Recovery Procedure Used
HARW-6	Cumulative 7/19/2011 - 12/10/2018	-	-	-	0.0	-	-	-
	1/14/2019	40.1	0.7	-	-	35	DMT ⁴	-
	2/4/2019	40.1	0.7	-	-	21	DMT ⁴	-
	3/11/2019	40.4	0.4	-	-	35	DMT ⁴	-
	4/1/2019	40.3	0.5	-	-	21	DMT ⁴	-
	5/6/2019	40.3	0.5	-	-	35	DMT ⁴	-
	6/3/2019	40.3	0.5	-	-	28	DMT ⁴	-
	8/5/2019	40.3	0.5	-	-	63	DMT ⁴	-
	9/9/2019	40.0	0.8	-	-	35	DMT ⁴	-
	10/7/2019	40.2	0.6	-	-	28	DMT ⁴	-
	11/4/2019	40.1	0.7	-	-	28	DMT ⁴	-
	12/2/2019	DNAPL pumping not required to be completed					-	-
	1/13/2020	40.0	0.8	-	-	70	DMT ⁴	-
	2/3/2020	39.8	1.0	-	-	21	DMT ⁴	-
	3/2/2020	40.1	0.8	-	-	28	DMT ⁴	-
	TOTAL VOLUME RECOVERED TO DATE FROM HARW-6 (GALLONS)				0.0			
HARW-7	Cumulative 7/18/2011 - 12/11/2018	-	-	-	550.2	-	-	-
	1/14/2019	41.1	0.9	-	-	34	DMT ⁴	-
	2/4/2019	40.8	1.2	-	-	21	DMT ⁴	-
	3/11/2019	40.3	1.7	-	-	35	DMT ⁴	-
	4/1/2019	39.5	2.5	0.1	6.3	21	DMT ⁴	double diaphragm pump
	5/6/2019	41.1	0.9	-	-	35	DMT ⁴	-
	6/3/2019	41.3	0.8	-	-	28	DMT ⁴	-
	8/5/2019	40.3	1.7	-	-	63	DMT ⁴	-
	9/10/2019	40.0	2.0	0.3	4.6	36	DMT ⁴	double diaphragm pump
	10/7/2019	40.9	1.1	-	-	27	DMT ⁴	-
	11/4/2019	40.5	1.5	-	-	28	DMT ⁴	-
	12/2/2019	DNAPL pumping not required to be completed					-	-
	1/14/2020	39.0	3.0	0.1	7.6	71	DMT ⁴	-
	2/3/2020	41.5	0.5	-	-	20	DMT ⁴	-
	3/2/2020	41.0	1.0	-	-	28	DMT ⁴	-
	TOTAL VOLUME RECOVERED TO DATE FROM HARW-7 (GALLONS)				568.7			

	Date	Depth to Product (ft)	Product Apparent Height - Pre-pumping (ft)	Product Apparent Height - Post-pumping (ft)	Approximate Volume of Product Recovered (gallons) ³	Days Elapsed Between Measurement Readings	Measurement Tool Used	Recovery Procedure Used
HARW-8	Cumulative 7/19/2011 - 12/10/2018	-	-	-	26.9	-	-	-
	1/14/2019	41.5	1.5	-	-	35	DMT ⁴	-
	2/4/2019	41.5	1.5	-	-	21	DMT ⁴	-
	3/11/2019	41.3	1.7	-	-	35	DMT ⁴	-
	4/2/2019	41.0	2.0	0.3	4.6	22	DMT ⁴	double diaphragm pump
	5/6/2019	42.3	0.7	-	-	34	DMT ⁴	-
	6/3/2019	42.2	0.8	-	-	28	DMT ⁴	-
	8/5/2019	41.8	1.3	-	-	63	DMT ⁴	-
	9/9/2019	41.9	1.1	-	-	35	DMT ⁴	-
	10/7/2019	41.6	1.4	-	-	28	DMT ⁴	-
	11/4/2019	41.5	1.5	-	-	28	DMT ⁴	-
	12/2/2019	DNAPL pumping not required to be completed					-	-
	1/13/2020	41.7	1.3	-	-	70	DMT ⁴	-
	2/3/2020	42.0	1.0	-	-	21	DMT ⁴	-
	3/2/2020	41.6	1.4	-	-	28	DMT ⁴	-
	TOTAL VOLUME RECOVERED TO DATE FROM HARW-8 (GALLONS)				31.5			

TOTAL VOLUME RECOVERED TO DATE FROM ALL WELLS (GALLONS)

2886.2

Notes:

MW-12

Depth to Top of Screen: 33 ft
Depth to Bottom: 36 ft

HARW-1

Depth to Top of Screen: 24 ft
Depth to Bottom: 42 ft

HARW-5

Angle from Vertical: 23.5°
Vertical Depth to Top of Screen: 27 ft
Vertical Depth to Bottom: 40.3 ft

HAOW-12A

Depth to Top of Screen: 28.6 ft
Depth to Bottom: 43.6 ft

HARW-2

Depth to Top of Screen: 26 ft
Depth to Bottom: 40 ft

HARW-6

Angle from Vertical: 14°
Vertical Depth to Top of Screen: 26.7 ft
Vertical Depth to Bottom: 40.8 ft

HARW-3

Angle from Vertical: 16.5°
Vertical Depth to Top of Screen: 25.4 ft
Vertical Depth to Bottom: 39 ft

HARW-7

Depth to Top of Screen: 27.5 ft
Depth to Bottom: 42 ft

HARW-4

Angle from Vertical: 24.5°
Vertical Depth to Top of Screen: 28.7 ft
Vertical Depth to Bottom: 41 ft

HARW-8

Depth to Top of Screen: 28.5 ft
Depth to Bottom: 43 ft

For historical reference to past DNAPL measurement events prior to January 2017, please refer to the January 2018 monthly report submitted to NYSDEC on 5 February 2018.

DMT = DNAPL Measurement Tool, consisting of a copper tubing handle, a spacer section to prevent the probe from contacting the sides of the well riser, and an all-thread rod probe to extend into the DNAPL.

¹ Reserved

² Reserved

³ Volume of product recovered by downwell pump is estimated by approximating the volume discharged to the drum and additional product in tubing and on pump.

Volume of product recovered by bailer is estimated using the bailer volume and number of times bailed.

Volume of product recovered by double diaphragm and positive displacement piston pumps are estimated by approximating the volume discharged to the drum or by using the pre- and post-pumping apparent height of product and the well dimensions (8" diameter well).

⁴ All depth and thickness values for HARW-3, HARW-4 HARW-5 and HARW-6 are provided as vertical equivalents of the field measurements based on the angle of the installed well.