EVALUATION OF GEOTHERMAL POTENTIAL OF TURKEY USING GIS BASED MULTI CRITERIA ANALYSIS

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ABSTRACT

EVALUATION OF GEOTHERMAL POTENTIAL OF TURKEY USING GIS BASED MULTI CRITERIA ANALYSIS

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Geothermal energy could meet more than the world's energy need. However, a very small amount of this energy is utilized by humanity, due to drilling and exploration costs for deep resources. Therefore, prospective studies have great importance in order to reduce the cost for exploration and utilization of geothermal energy. In this study Geographic Information System (GIS) based geothermal assessment techniques are used to determine the promising areas in Turkey. GIS is a combination of three features; operating spatial analyses, integrating geographical methods and taking advantage of the decision-making process. Publicly available geochemical data, active faults, travertines, map of Pliocene to Quaternary magmatic rocks occurrences have been analyzed and integrated by means of weighing according to Analytical Hierarchy Process (AHP). AHP is a Multi Criteria Decision Analysis (MCDA) approach, using the subjective and objective aspects of a decision process.

The geological data used in the study comprises the distribution map of travertines, 1/500.000 scale map of undifferentiated Plio-Quaternary and Quaternary magmatic rocks and active fault map of Turkey. Geochemical data are used for geothermometric techniques that involve various reservoir temperature maps generated from publicly available well data. Each data set is ranked, and thematic maps are generated.

The results have revealed that the favorable areas are mostly in accordance with the proven geothermal areas. This implies that the applied techniques validated. Therefore, in order to determine higher resolution geothermal potential of Turkey, further exploration and more systematic data are necessary.

Keywords: Geothermal Energy, Turkey, GIS, Analytical Hierarchy Process, Multi Criteria Decision Analysis

ÖZ

TÜRKİYE'NİN JEOTERMAL POTANSİYELİNİN CBS TABANLI ÇOK KRİTERLİ KARAR ANALİZİ İLE DEĞERLENDİRİLMESİ

Öztürk, Şafak
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Jeotermal enerji, dünyanın enerji ihtiyacının karşılanmasında önemli paya sahip olmakla birlikte, sondaj ve arama maliyetleri nedeniyle bu enerjinin çok az bir kısmı kullanılabilmektedir. Bu nedenle, jeotermal enerji arama ve üretim maliyetlerini azaltmak için potansiyel belirleme çalışmaları büyük öneme sahiptir. Türkiye'nin jeotermal potansiyeli yüksek alanlarını belirlemek amacıyla, Coğrafi Bilgi Sistemine (CBS) dayalı bir çalışma ortaya konmuştur. CBS' nin üç temel özelliği; mekansal analizlerin yapılabilmesi, coğrafi bilgi yöntemlerinin kullanılabilmesi ve karar analizlerinden yararlanılabilmesidir. Jeokimyasal veriler, aktif faylar, travertenler, Kuvaterner ve Pliyo - Kuvaterner magmatik kayaçlara ait haritalar Analitik Hiyerarşi Prosesi (AHP) yöntemi ile ağırlıklandırılmış, analiz edilmiş ve tüm veriler bir arada değerlendirilmiştir. AHP, bir kararın hem öznel hem de nesnel yönlerini gözeten bir Çok Kriterli Karar Analizi (ÇKKA) yaklaşımıdır.

Bu çalışmada kullanılan jeolojik veriler, 1/500.000 ölçekli Türkiye traverten dağılım haritası, Pliyo-Kuvaterner ve Kuvaterner magmatik kayaçları haritası ve aktif fay haritasını kapsamaktadır. Jeotermometre uygulamalarında ve daha sonra sıcaklık haritalarının üretilmesinde kullanılan jeokimyasal veriler ise, halka açık kuyu

verilerinden oluşmaktadır. Tüm veri setlerinin ağırlıkları belirlenerek, tematik haritalar oluşturulmuştur.

Elde edilen sonuçlar, potansiyeli yüksek alanların, çoğunlukla kanıtlanmış jeotermal sahalarla uyumlu olduğunu göstermektedir. Bu durum, uygulanan metodun sınırlı alanda ve daha çok veri ile uygulandığında, önemli sonuçlar verebileceğini göstermektedir. Bu nedenle, Türkiye'nin daha yüksek çözünürlüklü jeotermal potansiyelini belirlemek için, daha fazla araştırma ve sistematik veriye ihtiyaç vardır.

Anahtar Kelimeler: Jeotermal Enerji, Türkiye, CBS, Analitik Hiyerarşi Prosesi, Çok Kriterli Karar Analizi

To my family and friends

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CHAPTER 1

INTRODUCTION

Global energy consumption is constantly rising due to population growth, economic development, and technological innovations. Between 2000 and 2040, demand for energy is expected to increase from 10027 Mtoe to 19328 Mtoe, without improvements in energy efficiency (*World Energy Outlook*, 2018). However, with the sustainable development scenario, total energy demand is predicted to be 13715 Mtoe and the share of the fossil fuel is 60% among all resources. This ratio is 18% less than the current policy scenario. According to sustainable development scenarios, the renewables are predicted to be the key contributor for world energy consumption, providing 14.5 % of the primary energy in 2025 and 30.3 % in 2040. World primary energy demands with current energy policies and sustainable development scenario are summarized in Table 1.1.

Table 1.1. *World primary energy demand between 2000 and 2040 (World Energy Outlook, 2018)*

Resource	**2000**	**2017**	**Current Policies**		**Sustainable Development**	
			2025	**2040**	**2025**	**2040**
Coal	2308	3750	3998	4769	3045	1597
Oil	3665	4435	4902	5570	4334	3156
Gas	2071	3107	3616	4804	3454	3433
Nuclear	675	688	803	951	861	1293
Renewables	662	1334	1798	2642	2056	4159
Solid biomass	646	658	666	591	396	77
Total	**10027**	**19972**	**15782**	**19328**	**14146**	**13715**
Fossil fuel share	80%	81%	79%	78%	77%	60%
CO_2 emissions (Gt)	23.1	32.6	35.5	42.5	29.5	17.6

Coal, oil, and gas constitute the majority of world primary energy consumption. Increasing concern over the sustainability and environmental impact of fossil fuels has increased the need for clean and renewable energy resources.

Geothermal energy is a renewable source, produced and stored in the earth. The process can best be described as the movement of heat from the Earth's interior towards the surface where it dissipates. Geothermal reservoir, on the other hand, is a body of permeable hot rock within the Earth's crust which contains hot fluid that can be extracted from the reservoir and brought to the surface through boreholes (Lund, 2009). Moreover, the geothermal system is the combination of a source rock (source of heat), a reservoir and a cap rock, which preserves the heat inside the reservoir. The latter is not supposed to be part of the system in most cases. There are four types of geothermal systems: hydrothermal, hot dry rock, geopressured and magmatic (Barbier, 2002). The systems currently and mostly utilized are the hydrothermal systems due to the fact that these systems require relatively less amount of investment in research and development.

Geothermal energy potential is directly related to volcanic and tectonic activity, namely plate tectonics. Most of the geothermal fields are located along spreading ridges, subduction zones, inter-arc basins, and melting anomalies, i.e., in areas of young tectonism and volcanism, primarily along active plate boundaries (Muffler, 1976).

Turkey is located in one of the most seismically active regions in the world, at the junction of Africa, Arabian, and Eurasian Plates which have been interacting and causing various plate boundary relationships that resulted in a very complex tectonic evolutionary of Turkey. At present, the North Anatolian Fault Zone in the north and the East Anatolian Fault Zone (EAFZ) in the east forms transform plate boundary along which the Anatolian Block flees westwards towards the free face of South Aegean subduction system due to collision and further northwards convergence of Arabian Plate (Figure 1.1). In the west the slab edge processes, characterized mainly by subduction and roll-back of African oceanic slab below Anatolia, gave way to extensional deformation that resulted in the exhumation of various metamorphic complexes in the region. North, central, and southern Menderes and Cycladic core complexes are the products of this extension. Extension and westwards escape of Anatolian Block dominates the present tectonic scheme of Turkey which in turn control its geothermal potential. Such a complex tectonic development makes Turkey one of the most prominent geothermal regions in the world.

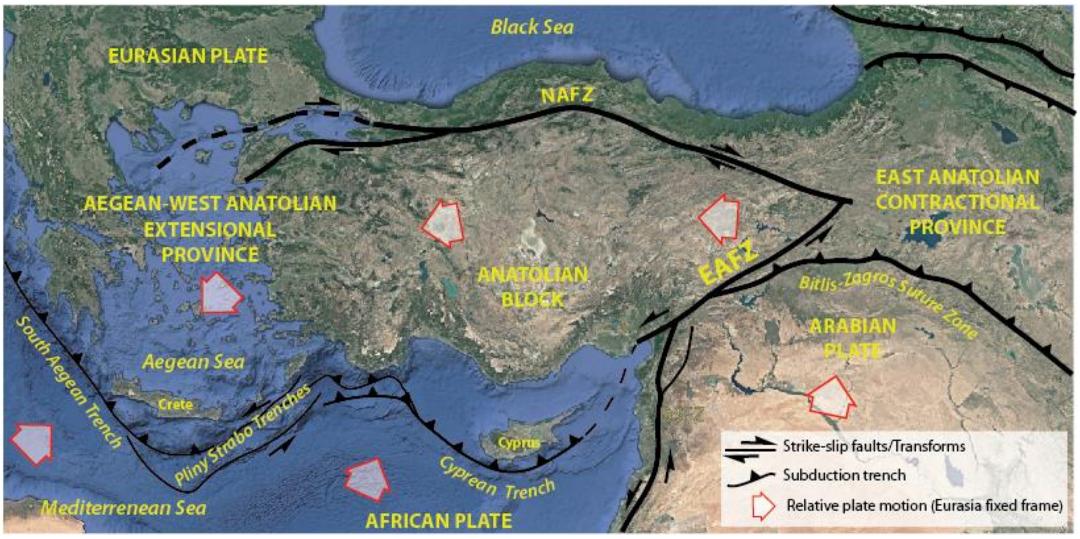

Figure 1.1. Regional tectonic units around Turkey (modified from Şengör et al., 1985; Bozkurt & Mittwede, 2001; Kaymakcı et al., 2018)

The reported cumulative capacity of geothermal power was 14 GW at the end of 2017 and predicted to reach 17 GW by the end of 2023 (*Renewables Information*, 2018), with the highest contributions of Indonesia, Kenya, Philippines and Turkey (Figure 1.2).

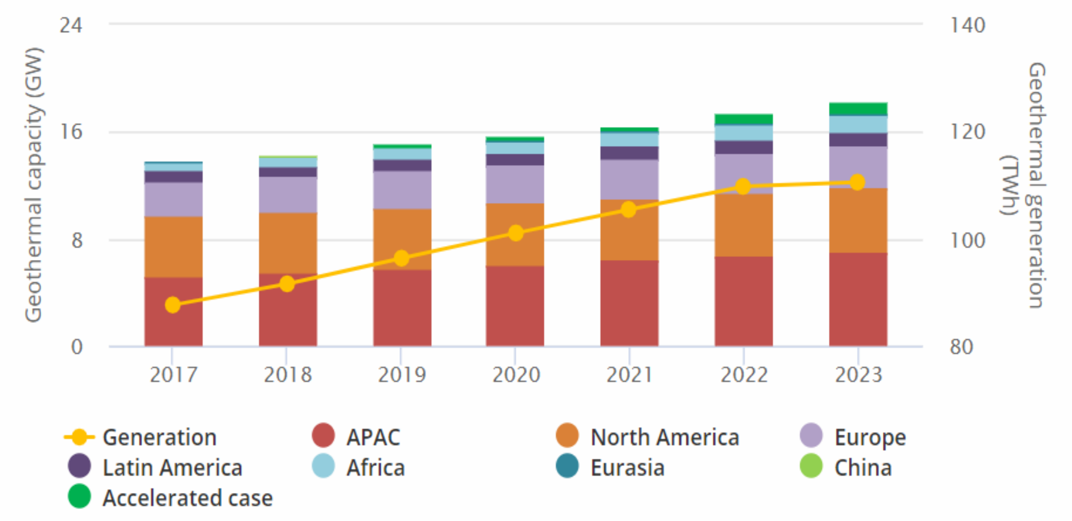

Figure 1.2. Geothermal capacity and generation per year (Renewables Information, 2018)

Furthermore, as stated in *2018 Annual Report* (2019), the European market had an annual growth rate of 10 % over the last five years, most of which is with contributions from Turkey (Figure 1.3).

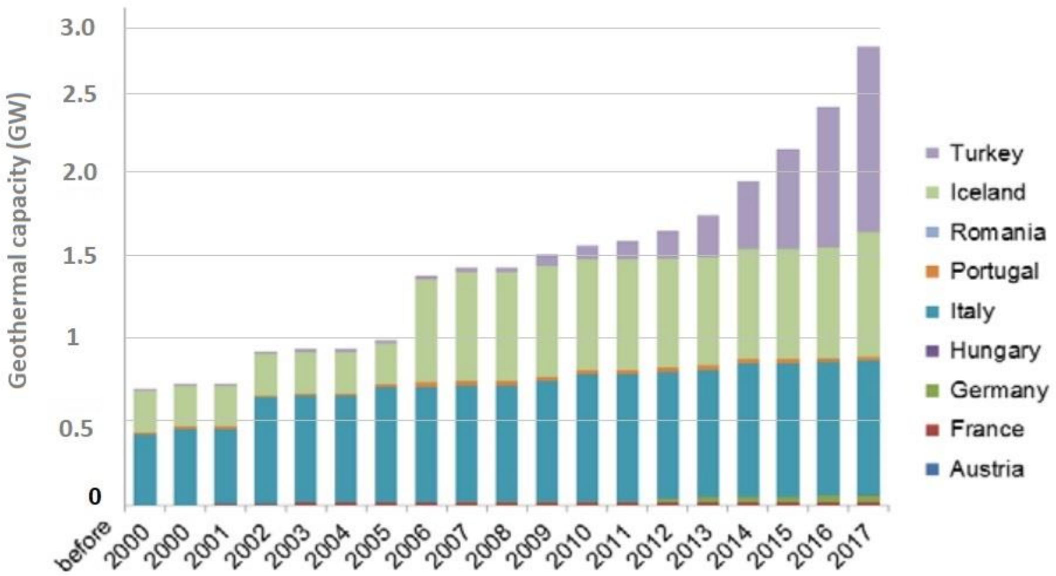

Figure 1.3. Geothermal installed capacity per year (2018 Annual Report, 2019)

1.1. Purpose and Scope

Geothermal energy is the energy contained as heat in the Earth's interior, which is clean, inexpensive, renewable, and can be utilized in various forms. The origin of the heat is in association with the internal structure and physical processes occurring within the Earth. When the heat below moves to the surface through a fault, fracture or any kind of discontinuity, and encounters with the water as in the case of geysers, the geothermal potential of that region is known. The potential is also known, due to increase of rock temperature with depth, proving that a geothermal gradient exists, with the average gradient of 30°C/km. There are, however, areas which need to be explored and accessible by drilling. These are the regions with magma bodies a few kilometers far from surface or with heat accumulation due to particular geological conditions of the crust (Barbier, 2002).

Turkey is one of the countries with high geothermal potential. During the last decade, a significant development was achieved in using this potential for electricity production and direct uses (district, greenhouse heating and thermal tourism) (Mertoğlu et al., 2015). A total of 290 geothermal sites are known in 63 provinces with temperatures ranging from 22°C to 287°C, most of which are located in Western Anatolia (Korkmaz et al., 2014). However, active tectonics regime and young volcanism in Turkey indicate that Turkey is a promising country with many undiscovered sites. This potential should be ascertained through detailed geological, geophysical and geochemical investigations.

The purpose of this thesis is to regionally evaluate the main indicators of geothermal energy potential in Turkey and select promising locations for further detailed studies. For this purpose, chemical data available for several wells and thermal springs throughout Turkey (MTA, 2005), map of Plio-Quaternary and Quaternary magmatic rocks (MTA, 2002) and active fault data (Kaymakcı et al., 2009) were evaluated through AHP method and probability map of geothermal potential of Turkey with 1/500.000 scale has been produced.

1.2. Organization of the Thesis

This thesis is composed of seven chapters. Chapter 1 is an introductory part composed of four subsections; purpose and scope, organization of the thesis, regional geological setting and, present status of geothermal energy in Turkey. Chapter 2 presents the geological data used in relation to geothermal potential. Geochemical data and temperature calculations are described in Chapter 3. In Chapter 4, the methodology used for the study is described. Chapter 5 is a data evaluation and integration section where the analyses are expounded. In Chapter 6, the results of this study are presented. Chapter 7 is a brief summary, together with conclusions and discussions on findings and utility of the methods used in this study.

1.3. Regional Geological Setting

Turkey is located on the Alpine-Himalayan mountain belt and comprises continental blocks belonging to Gondwana in the South and Laurasia in the North (Şengör & Yılmaz, 1981). The Taurides together with Anatolides rifted-off form the northern edge of Gondwana by the end of Paleozoic, leading to the opening of the Mesozoic Neotethys ocean that closed by northwards subduction below the Pontides, a continental block belonging to Laurasia (Şengör & Yılmaz, 1981; Kaymakcı et al., 2009). Anatolides, constitute the metamorphic northern equivalent of the Taurides and are metamorphosed mainly during the Late Cretaceous to Eocene collision, thrusting and obduction events. These metamorphic belts are exposed as core complexes by late Cretaceous (~82 Ma, Whitney et al., 2003) to early Miocene (Bozkurt & Mittwede, 2001) due to post-orogenic extension related to orogenic collapse, core complex development and escape tectonics.

Collision and further convergence of Arabian Plate resulted in the development of transcurrent tectonics coupled with back-arc extension in the western Anatolia that has been shaping active tectonics of Turkey (Figure 1.1). This resulted in the development of a number of strike-slip and normal fault systems which control heat flow and hence geothermal occurrences in Turkey which is the main concern of this study.

1.4. Present Status of Geothermal Energy in Turkey

Energy demand is one of the main challenges in Turkey. Reasons for the high demand are the increase in population and industrialization. Turkey is an energy importer country and most of the energy demand is supplied by imported energy sources, mostly natural gas and coal (Table 1.2). However, the adverse environmental effects of high energy consumption supplied from fossil fuels is a serious concern nowadays. For this reason, renewable energy resources gained prominence as being an environmental-friendly and sustainable energy source. According to a report, published by TEİAŞ, by the year 2019, installed capacity is about 1335 MWe for geothermal power plants, and the total installed capacity is 90450 MWe. Nevertheless, the share of renewable energy sources is still small compared to fossil fuels due to high costs in feasibility and exploration stages.

Table 1.2. *Installed capacity of Turkey in terms of sources (TEİAŞ, 2019)*

Source Type	**Installed Capacity MWe**	**Share (%)**	**# of Power Plants**	**Share (%)**
Natural gas	26163,1	28,926	326,0	4,063
Hydro (dam type)	20582,4	22,756	122,0	1,521
Lignite	10097,0	11,163	48,0	0,598
Import coal	8938,9	9,883	14,0	0,174
Hydro (river type)	7842,1	8,670	543,0	6,768
Wind	7228,0	7,991	257,0	3,203
Solar	5513,3	6,095	6410,0	79,895
Geothermal	**1335,5**	**1,477**	**48,0**	**0,598**
Bituminous coal	810,8	0,896	4,0	0,050
Biomass	698,5	0,772	157,0	1,957
Fuel oil	487,2	0,539	15,0	0,187
Asphaltite coal	405,0	0,448	1,0	0,012
Waste heat	339,2	0,375	75,0	0,935
Naphtha	4,7	0,005	1,0	0,012
LNG	2,0	0,002	1,0	0,012
Diesel fuel	1,0	0,001	1,0	0,012
TOTAL	90448,7		8023,0	

Turkey is the 7th richest country in the world in regard to geothermal potential. Geothermal exploration studies began in 1962 in Turkey and were led and conducted by the General Directorate of Mineral Research and Exploration (MTA). Total of 1500 thermal and mineral water springs have been explored so far, with the highest bottom hole temperature of 295 °C (Baba et al., 2019). Almost 95% of these fields are low-medium enthalpy fields which are suitable for direct use applications (heating, balneology, greenhouse heating) and 6% of those are suitable for electricity generation. Turkey's first and Europe's second geothermal power plant was constructed in 1984, in Denizli with 20.4 MWe installed capacity (Melikoglu, 2017). Mertoğlu et al. (2015) emphasized that a total of 1200 geothermal exploratory, production and reinjection wells were drilled in Turkey, up to 2015.

In Turkey, the distribution of hot springs, showing potential areas of utilization, are highly compatible with the fault systems and the Tertiary-Quaternary volcanics (Mutlu & Güleç, 1998) (Figure 1.4).

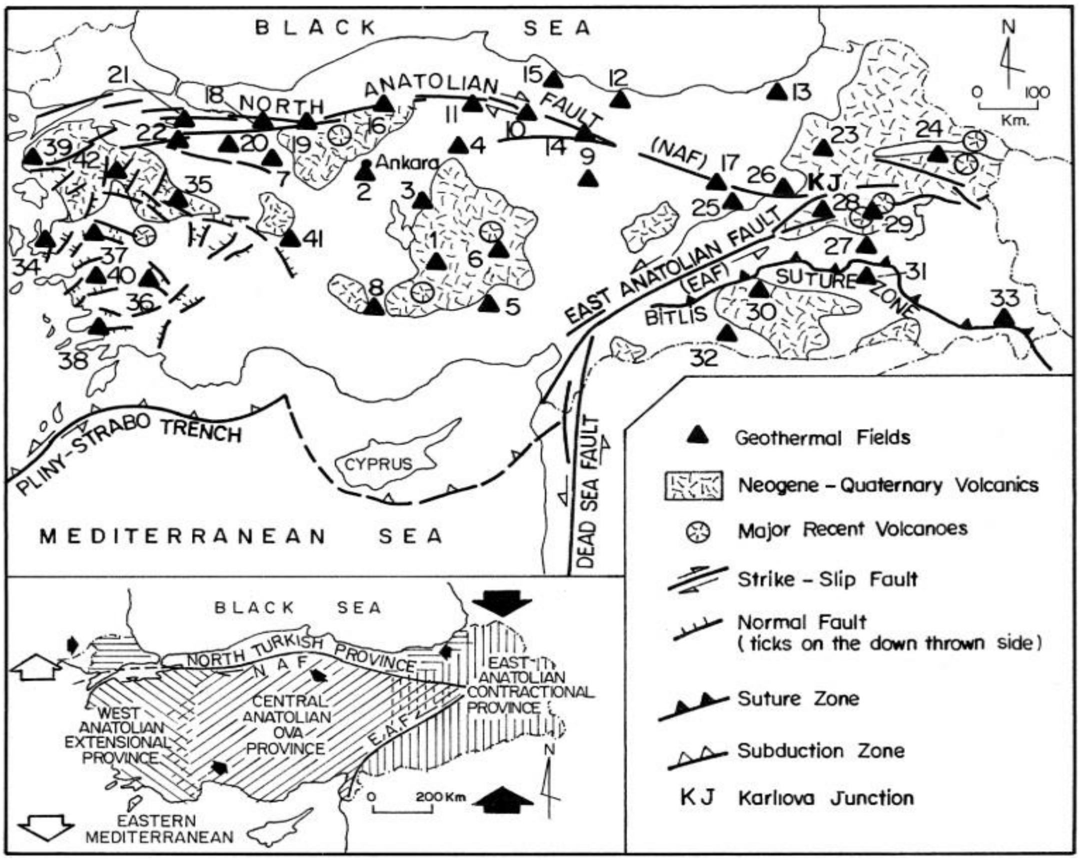

Figure 1.4. Distribution of geothermal areas in Turkey in connection with the major tectonic and volcanic features (modified from MTA, 1993). The inset map is from Şengör et al. (1985) and shows the major neotectonic provinces of Turkey. (1) Aksaray, (2) Ankara, (3) Kırşehir, (4).Yozgat, (5) Nigde, (6) Nevşehir, (7) Eskişehir, (8) Konya, (9) Sivas, (10) Amasya, (11) Çorum, (12) Ordu, (13) Rize, (14) Tokat, (15) Samsun, (16) Çankırı, (17) Erzincan, (18) Sakarya, (19) Bolu, (20) Bilecik, (21) Yalova, (22) Bursa, (23) Erzurum, (24) Ağrı, (25) Tunceli, (26) Bingol, (27) Bitlis, (28) Muş, (29) Van, (30) Diyarbakır, (31) Siirt, (32) Urfa, (33) Hakkari, (34) İzmir, (35) Kütahya, (36) Denizli, (37) Manisa, (38) Muğla, (39) Çanakkale, (40) Aydın, (41) Afyon, (42) Balıkesir. (The figure and explanations are taken from Mutlu & Güleç, 1998)

However, proven high enthalpy geothermal fields in Turkey are mostly concentrated on the grabens of Western Anatolia, with active extensional tectonics related to the Aegean slab dynamics (Roche et al., 2019). The westward movement of Anatolian plate, associated with N-S extension, resulted in E-W oriented graben systems and crustal thinning (Mc Kenzie, 1978; Angelier et al., 1982). These mechanisms are responsible for high geothermal potential in Denizli, Aydın and Manisa cities, which are located in Aegean region. These are well-known provinces with a total number of 46 power plants out of 49 (Table 1.3 and Figure 1.5).

Table 1.3. *Geothermal power plants in Turkey (https://jesder.org/)*

#	Power Plant	Province	Company	Installed Cap. (MWe)
1	Kızıldere-3	Denizli	Zorlu Enerji	165,0
2	Efeler (Efe-1,2,3,4)	Aydın	Güriş Holding	114,9
3	Kızıldere-2	Denizli	Zorlu Enerji	80,0
4	Pamukören	Aydın	Çelikler Enerji	67,5
5	Mis-3	Manisa	Mis En. Üretim	48,0
6	GalipHoca Germencik	Aydın	Güriş Holding	47,4
7	Alaşehir	Manisa	Zorlu Enerji	45,0
8	Maren (İrem, Sinem)	Aydın	Kipaş Holding	44,0
9	Dora-3	Aydın	Menderes Jeo.	34,0
10	Melih	Aydın	Kipaş Holding	33,0
11	Pamukören-4	Aydın	Çelikler Enerji	32,0
12	Greeneco-6	Denizli	Greeneco Enerji	26,0
13	Greeneco-3	Denizli	Greeneco Enerji	25,6
14	Greeneco	Denizli	Greeneco Enerji	25,6
15	Efe-7	Aydın	Güriş Holding	25,0
16	3S Kale	Aydın	3S Kale Enerji	25,0
17	Kemaliye	Manisa	Enerjeo Kemaliye.	24,9
18	Alaşehir-2	Manisa	Zorlu Enerji	24,9
19	Ken-3	Aydın	Kipaş Holding	24,8
20	Mehmethan	Aydın	Kipaş Holding	24,8
21	Deniz (Maren-2)	Aydın	Kipaş Holding	24,0
22	Ken Kipaş	Aydın	Kipaş Holding	24,0
23	Kerem	Aydın	Kipaş Holding	24,0
24	Kubilay	Aydın	Beştepeler En. Üret.	24,0
25	Türkerler Alaşehir-2	Manisa	Türkerler Holding	24,0
26	Türkerler Alaşehir	Manisa	Türkerler Holding	24,0
27	Özmen-1	Manisa	Özmen Holding	23,5
28	Efe-6	Aydın	Güriş Holding	22,6
29	Pamukören-3	Aydın	Çelikler Enerji	22,5
30	Sultanhisar-2	Aydın	Çelikler Enerji	22,5
31	Baklacı	Manisa	Akça Enerji	19,4
32	Kuyucak	Aydın	Turcas Enerji	18,0
33	Dora-4	Aydın	Menderes Jeo.	17,0

Table 1.3. (Continued)

#	Power Plant	Province	Company	Installed Cap. (MWe)
34	Kızıldere (Zorlu)	Denizli	Zorlu Enerji	15,0
35	Salihli-1	Manisa	Sanko Enerji	15,0
36	Sultanhisar	Aydın	Çelikler Enerji	13,8
37	Buharkent	Aydın	Limgaz Elek. Ür.	13,8
38	Gümüşköy	Aydın	BM Holding	13,2
39	Mis-1	Manisa	Mis Enerji Üretim	12,3
40	Karkey Umurlu	Aydın	Karadeniz Enerji	12,0
41	Umurlu-2	Aydın	Karadeniz Enerji	12,0
42	Maspo Enerji-4	Manisa	Gürmen Group	10,0
43	Dora-2	Aydın	Menderes Jeo.	9,5
44	Babadere	Çanakkale	MTN Enerji	8,0
45	Dora-1	Aydın	Menderes Jeo.	8,0
46	Tuzla	Çanakkale	Enda Enerji	7,5
47	Kızıldere	Denizli	Bereket Enerji	6,9
48	Tosunlar-1	Denizli	Akça Enerji	3,8
49	Afjes	Afyonkar.	Afjet Jeo.Elek.Ür.	2,8

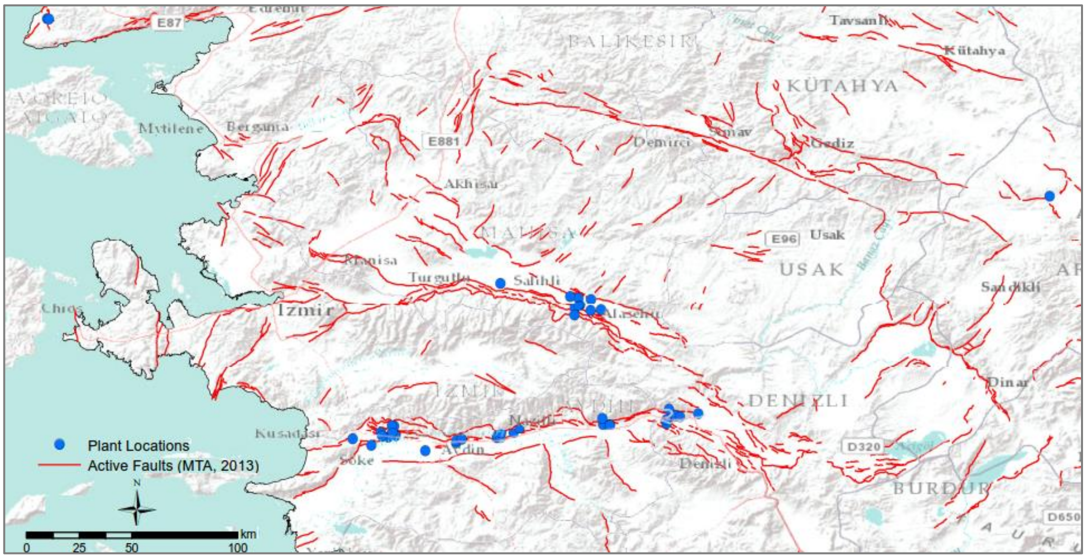

Figure 1.5. Power plant locations in Turkey

CHAPTER 2

GEOLOGICAL DATA

The geothermal potential is directly related to the tectonic setting of a region. Faults, fractures, heat source mechanism, fluid chemistry, fluid dynamics which are controlled by tectonic setting are key parameters to understand a geothermal system. Geothermal systems are basically classified into two categories; volcanically active regions, such as spreading ridges, subduction zones, inter-arc basins; and tectonically active regions, such as grabens, rift valleys, convergent or divergent plate boundaries (Muffler, 1993). In this study, active faults and young magmatic fields were used as the evidence layers, in order to construct the prospective map of the study area.

2.1. Active Faults

The faults and fractures have been considered as the potential zones for geothermal energy, as the fluids mostly tend to flow through fractures in the source rocks (Hanano, 2000). Surface manifestations of faults and fracture zones are generally used to identify the potential production zones. Moreover, geothermal fields are found mostly at the intersection of faults, which are bordering the major tectonic blocks (Noorollahi et al., 2015).

Turkey comprises various active faults that produce devastating earthquakes since the antiquity (Ambraseys & Jackson, 1998; Şengör & Yılmaz, 1981; Kaymakcı, 2009). The normal faults are associated with the west Anatolian horst-graben system associated exhumation of metamorphic rocks of the Menderes Core Complex. The rest of the country is dominated by strike-slip faults. These faults have overall transpressional component in the east close to the Eurasia-Arabia collision zone while they become transtensive in the west gradually as they approach the west Aegean-Anatolian extensional system (Bozkurt & Mittwede, 2001).

Şengör et al. (1985) divide Turkey into various neotectonic provinces depending on the dominant deformation styles. These are from the east to west, the East Anatolian Contractional Province, North Anatolian Province, West Anatolian Extensional Province, and Central Anatolian "Ova" Province. Main fault systems in Turkey are; i) right-lateral strike-slip North Anatolian Fault (NAF) and ii) left-lateral strike-slip East Anatolian Fault (EAF).

Geothermal fields in Turkey are mostly concentrated on the grabens of Western Anatolia, where the tectonic forces and resulting structures are thought to be responsible for the high heat flow and existence of medium to high-temperature geothermal systems in the Menderes Metamorphic Complex. On the other hand, ongoing subduction, collision, and continental Plateau development processes in the Eastern and the Central Anatolia have resulted in the development of volcanic fields with high heat flow rates. Nevertheless, these fault systems are creating permeable damage zones, pull-apart basins, and related structures which provide conduits for the percolation of geothermal fluids. In conclusion, relatively very young volcanic activity in Turkey coupled with active faulting have led to medium to high enthalpy geothermal fields (Şimşek, 1997).

In this study, fault data compiled by Kaymakcı et al. (2009) within the context of TUBİTAK Project (Grant number 105Y146) is used (Figure 2.1). This fault database contains all the Quaternary faults and probable faults with marked and undegraded linear morphological expression. Active faults which are marked as red lines were used in this study as an evidence layer. Because, it is known that, the proven geothermal fields in Turkey are mostly concentrated on the active fault zones.

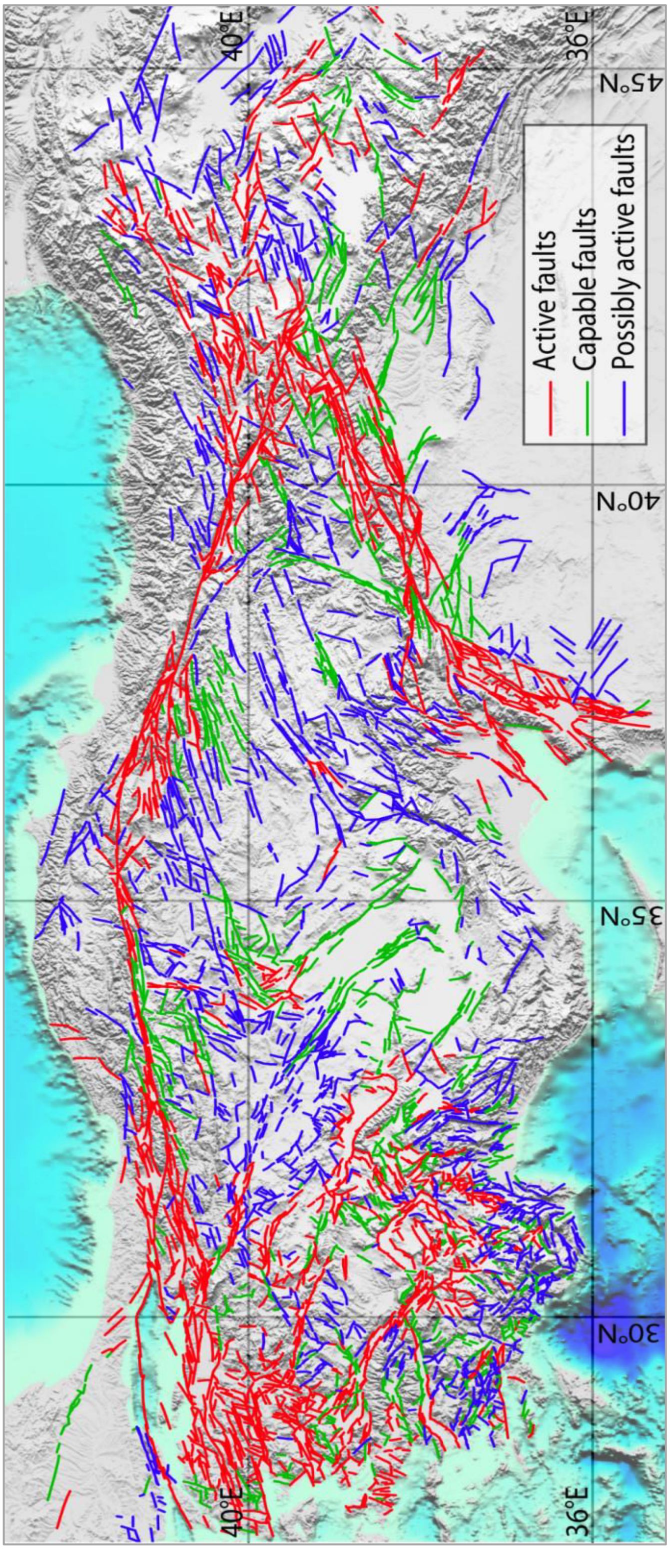

Figure 2.1. Active faults of Turkey (Kaymakcı et al., 2009)

2.2. Young Magmatic Fields

Most of the geothermal fields are lying on active plate boundaries, such as spreading ridges, subduction zones, inter-arc basins and areas of young tectonism and volcanism (Muffler, 1993). Magmatically active area has a higher geothermal gradient due to rising hot magma through the earth's crust (Figure 2.2). Circulating groundwater heated by surrounding rock reaches the surface as hot springs and geysers. Magmatic fields have higher than average thermal gradient simply because hot magma is ascending through the crust. Presence of a good confined reservoir rock, with or without connection to the surface water, through which groundwater percolates freely will be heated up and hot water will flow upwards to transfer the heat from the magmatic body to shallower depths. Hot springs, geysers, and related phenomena are surface manifestations of such a process.

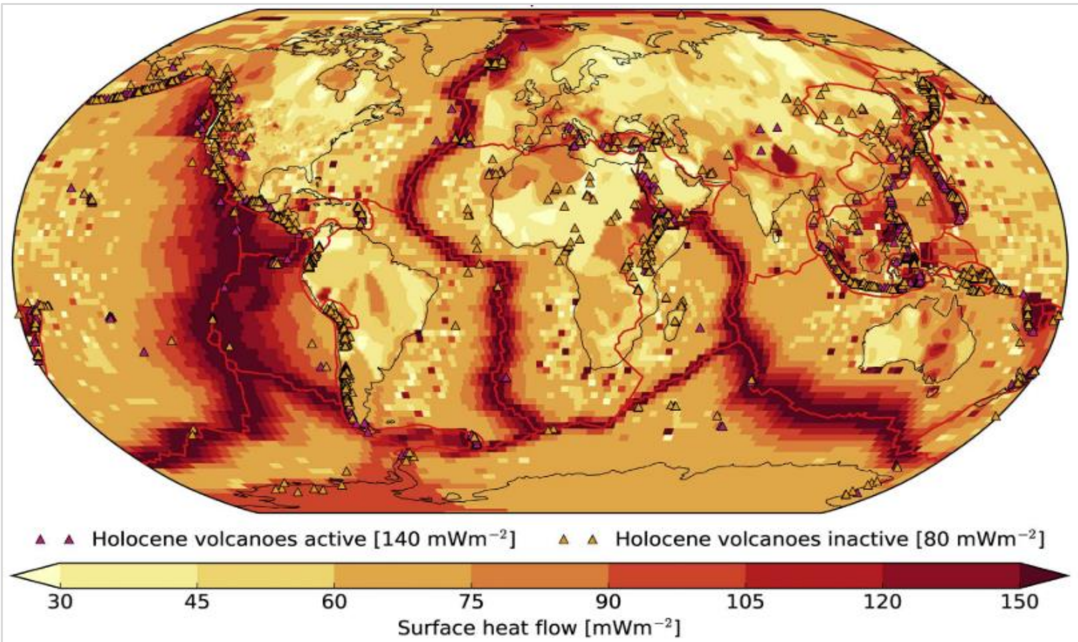

Figure 2.2. Global surface heat flow with plate boundaries and volcanoes (Limberger et al., 2018)

In this study, Plio-Quaternary and Quaternary magmatic fields in Turkey are used as a separate evidence layer. These regions are mainly located mainly in the Eastern, Central Anatolia and in the west around Kula volcanic field (Figure 2.3 and Figure 2.4).

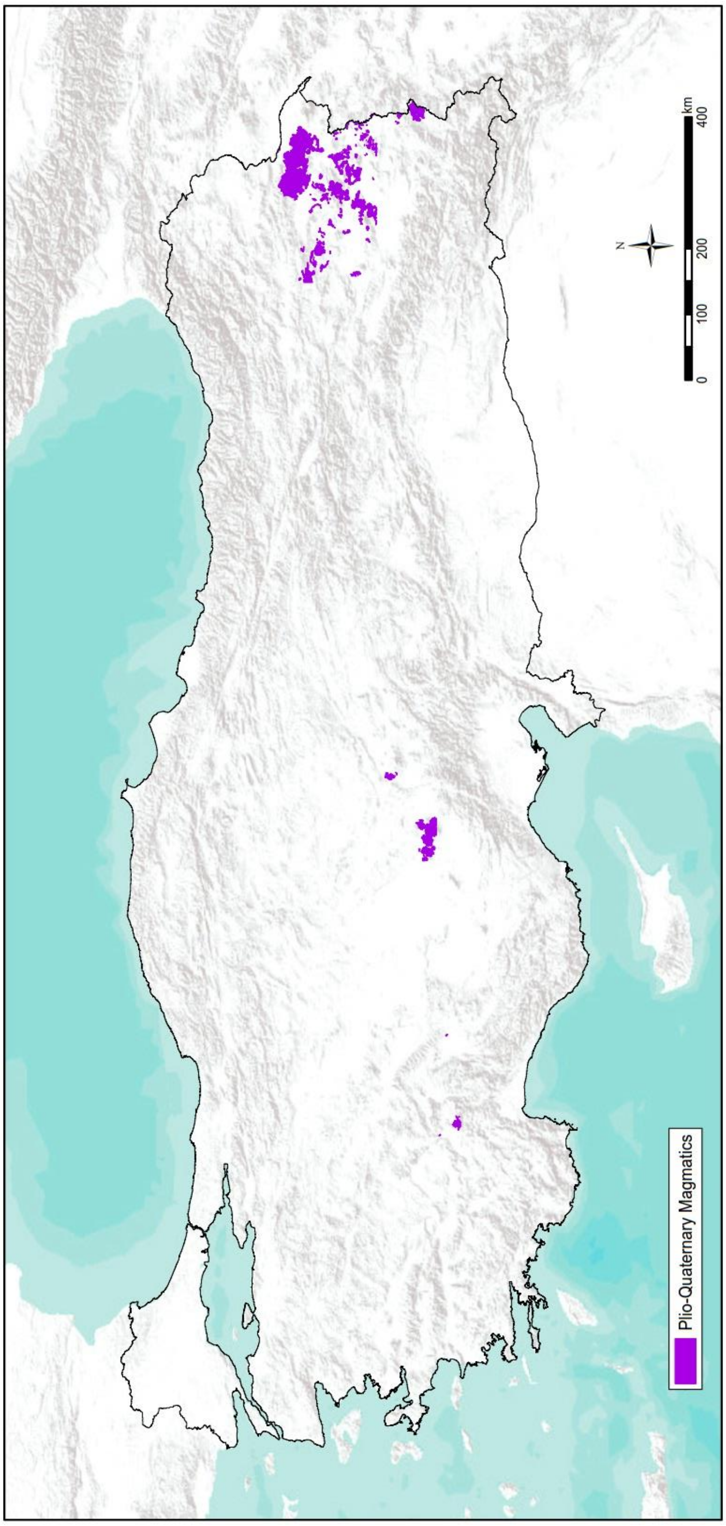

Figure 2.3. Distribution of Plio-Quaternary magmatics extracted from 1/500.000 scale geological maps of Turkey (MTA, 2002)

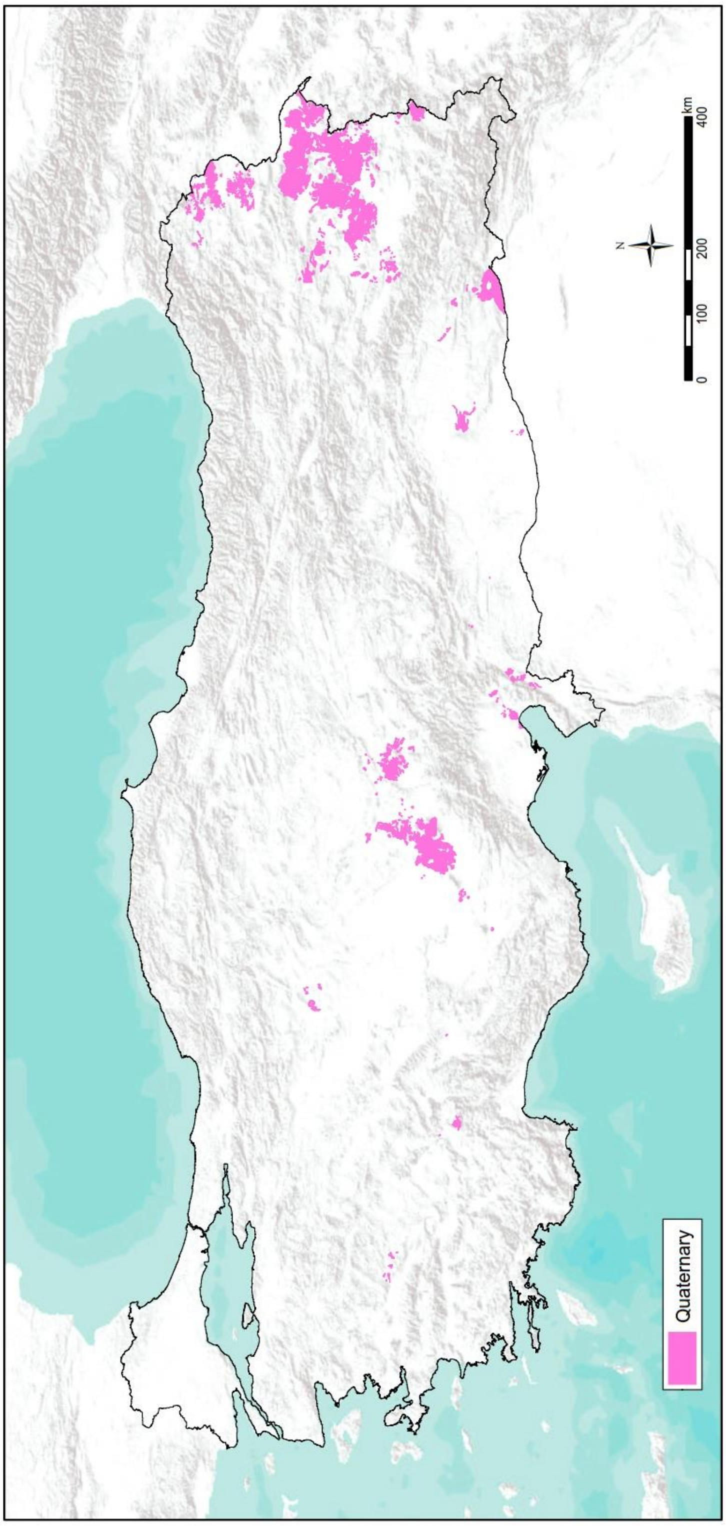

Figure 2.4. Distribution of Quaternary magmatics extracted from 1/500.000 scale geological maps of Turkey (MTA, 2002)

2.3. Travertines

Travertine deposits are generally associated with thermal springs and tectonic activity (Brogi et al., 2016). Deep circulating water along the fractures or water heated by magma bodies react with carbonate rocks and dissolves CO_2 under pressure. When the water reaches the surface, becomes supersaturated with $CaCO_3$, as losing the CO_2 with decreasing pressure. Finally, travertines (carbonates) precipitate around these springs. The size and thickness of travertines depend on the length of the spring hole, flow volume, rate of deposition, and time that the spring has been active (Wohletz & Heiken, 1992). Due to correlation with geothermal fluids, travertine areas extracted from 1/500.000 scale map of Turkey (MTA, 2002) is used as an evidence layer in this study (Figure 2.5).

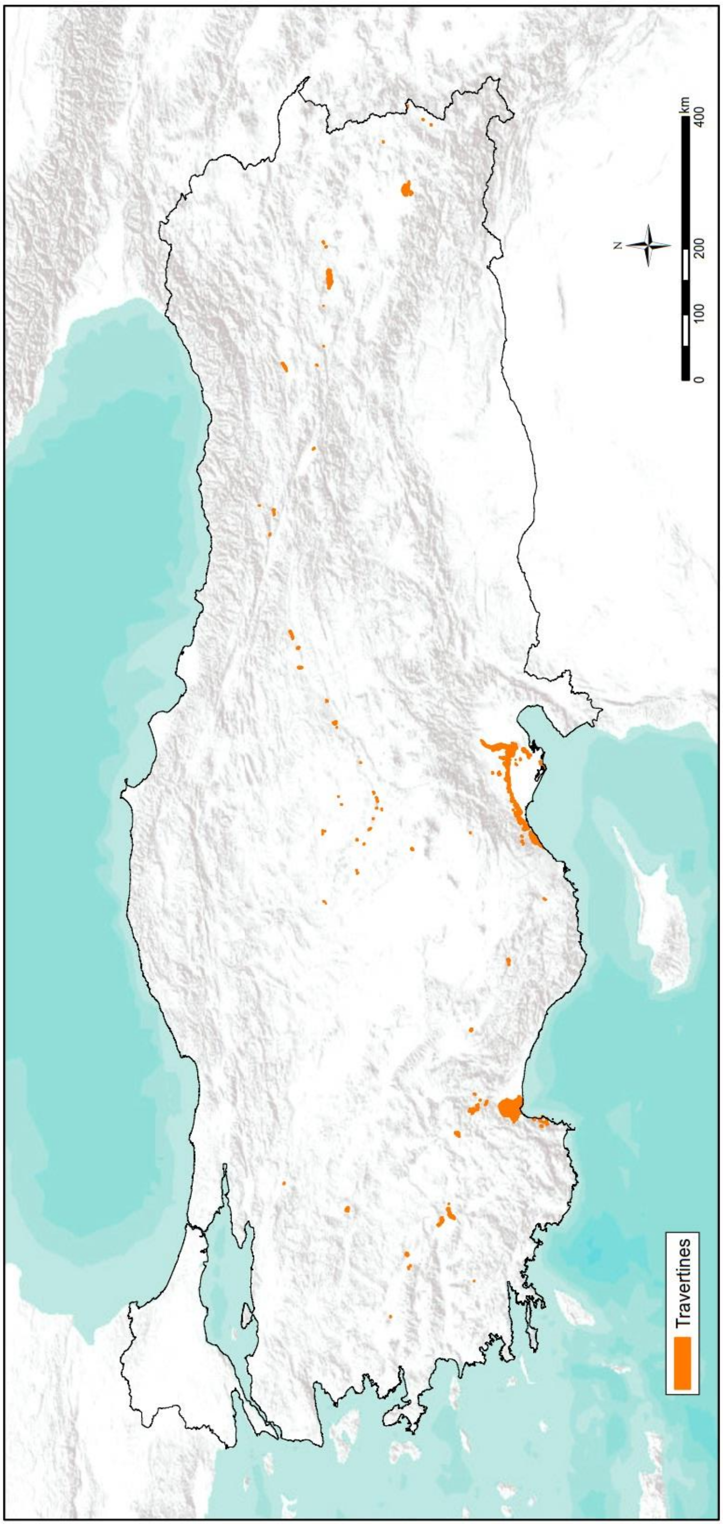

Figure 2.5. Distribution of travertines extracted from 1/500.000 scale geological maps of Turkey (MTA, 2002)

CHAPTER 3

GEOCHEMICAL DATA AND TEMPERATURE CALCULATIONS

Geothermal fluids, formed by the interaction of water and reservoir rock, are basically originated from meteoric or seawater. Rock type and the physical conditions (temperature, pressure and time) under which reactions occur reflects the geothermal hydrochemistry (Haizlip, 2016).

Geochemical data are used throughout the utilization of geothermal energy, from exploration to production stage. Reservoir temperature, origin and flow direction of geothermal fluid, which are the key parameters for geothermal exploration, are derived by means of geochemistry. Furthermore, environmental effects and problems, such as corrosion, scaling, and contamination are predicted, managed and monitored by means of geochemistry. Geochemical studies consist of three stages, from the collection of the samples, chemical analyses on samples, and interpretation of analytical results (Ármannsson, 2012).

In this study, geochemical data of 1214 wells and springs (Figure 3.1) belonging to 61 provinces at total (MTA, 2005) are compiled and analyzed (Appendix A). Most of the samples are from İzmir (153), Afyon (146), Balıkesir (92), Denizli (87), Manisa (56), Ankara (54) and Kütahya (54) with the average discharge temperatures of 90°C, 65°C, 62°C, 99°C, 67°C, 45°C and 67°C, respectively. SiO_2, Na, K and Ca concentrations from these sites are used in geothermometric calculations.

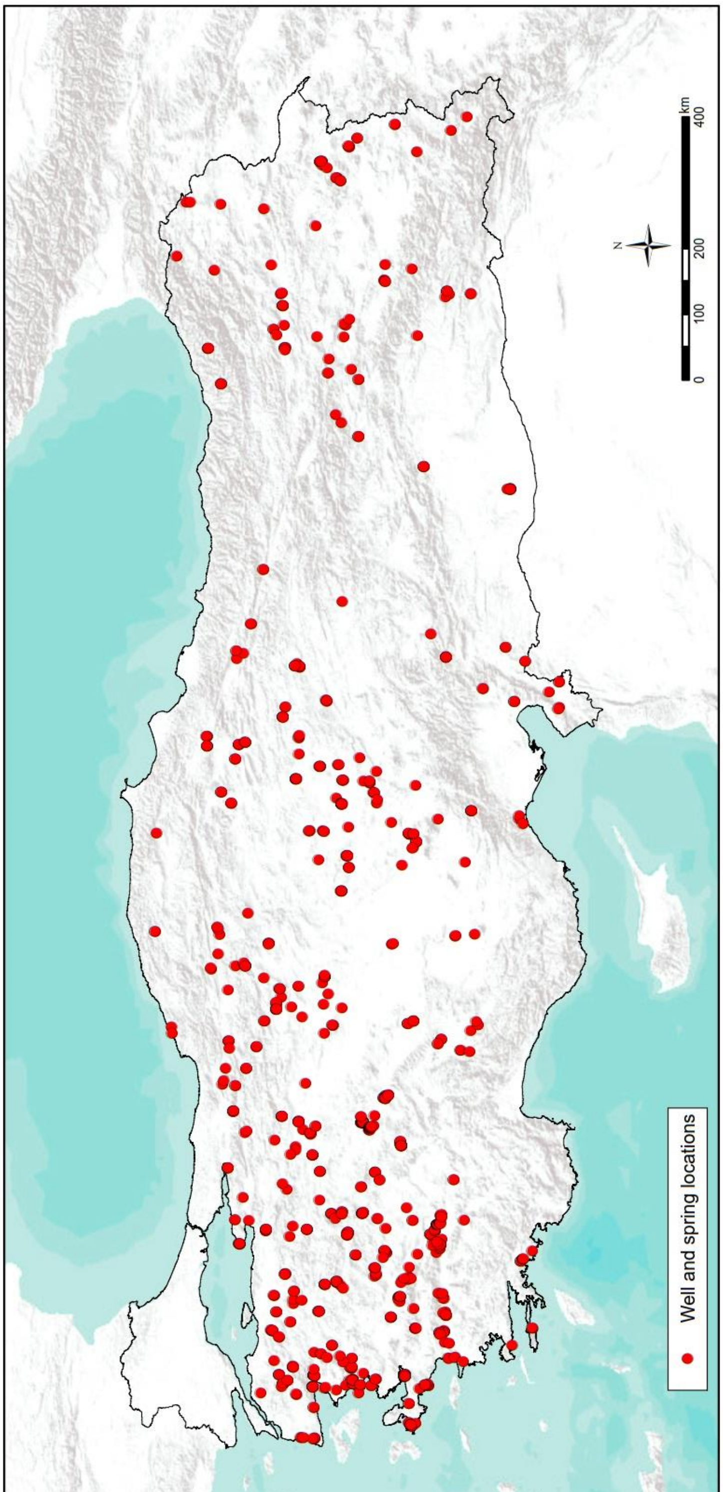

Figure 3.1. Well and spring data points

3.1. Geothermometry

Geothermometers provide an estimate of the subsurface temperature of geothermal fluid. Most of them are based on the temperature-dependent chemical reactions between fluids or fluid-rock, assumed that the rock reaches local equilibrium and controls the fluid chemistry (D'Amore, 1992). Geothermometers take advantage of slow re-equilibration at cooler temperatures, and preservation of chemical properties at hot equilibrium temperatures (Karingithi, 2009).

Geothermometers are classified into three groups; i) Water (solute) geothermometers, ii) Steam (gas) geothermometers and iii) Isotope geothermometers. Water and steam geothermometers, known as chemical geothermometers, depend on the chemical composition of water discharges and gas concentrations in steam discharges. In this study, the most frequently used water geothermometers, which are Silica, Na-K, and Na-K-Ca geothermometers are applied (Haizlip, 2016; Karingithi, 2009).

3.1.1. Silica Geothermometry

White et al. (1956) first suggested that the silica content may be used as an indicator of geothermal reservoir temperature. After White et al. (1956), many researchers have made investigations to understand the characteristics of the geothermal reservoir from the silica geochemistry of the fluid. Mahon (1966) proposed that discharged water from the Wairakei field in New Zealand is compatible with the solubility of quartz after corrections for adiabatic steam loss.

Silica Geothermometer was first proposed by Böðvarsson (1960), however, Fournier and Rowe (1966) were two scientists who suggested the formulas, based on the solubility of quartz mineral at a temperature range of 120–330 °C. Since then, Arnórsson (1975) mentioned the controlling effect of chalcedony at lower temperatures (<150 °C). Fournier (1977) published an article, describing the mixing of geothermal fluid with cold groundwater by the Silica-Enthalpy Mixing Model and presented the six widely used functions for Silica geothermometer. The functions, which are valid for the temperature range of 0-250°C and where T is the estimated temperature (°C) and C is the silica concentration (mg/l), as follows:

Amorphous silica (Fournier, 1977)

$$T = \frac{731}{4{,}52 - \log C} - 273{,}15 \qquad (3.1)$$

β Cristobalite (Fournier, 1977)

$$T = \frac{781}{4{,}51 - \log C} - 273{,}15 \qquad (3.2)$$

α Cristobalite (Fournier, 1977)

$$T = \frac{1000}{4{,}78 - \log C} - 273{,}15 \qquad (3.3)$$

Chalcedony (Fournier, 1977)

$$T = \frac{1032}{4{,}69 - \log C} - 273{,}15 \qquad (3.4)$$

Quartz (Fournier, 1977)

$$T = \frac{1309}{5{,}19 - \log C} - 273{,}15 \qquad (3.5)$$

Quartz (after steam loss) (Fournier, 1977)

$$T = \frac{1522}{5{,}75 - \log C} - 273{,}15 \qquad (3.6)$$

Fournier and Potter (1982) presented an equation, which has been revised and developed through all published experimental data on the solubility of quartz, which is valid up to 330°C. The equation represents; i) the temperature as a function of silica concentration, ii) silica concentration as a function of enthalpy of water and iii) enthalpies of water and steam as functions of temperature, assuming the adiabatic cooling is followed by a single-stage steam loss at any specified temperature. Arnórsson (1985) revised the equation based on Fournier and Potter (1982). These equations are;

Quartz (Fournier & Potter, 1982)

$$T = 42{,}198 + 0{,}28831\mathrm{C} - 3{,}6686 \times 10^{-4}C^2 + 3{,}1665 \times 10^{-7}C^3 + 77{,}034\ \log C \qquad (3.7)$$

Quartz (Arnórsson, 1985)

$$T = 53{,}500 + 0{,}11236\mathrm{C} - 0{,}5559 \times 10^{-4}C^2 + 0{,}1772 \times 10^{-7}C^3 + 88{,}390\ \log C \qquad (3.8)$$

Moreover, Arnórsson et al. (1983) used the data from boreholes in Iceland and improved the chalcedony equation, based on Fournier (1977), for the temperature range of 25-180°C.

Chalcedony (Arnórsson et al., 1983)

$$T = \frac{1112}{4{,}91 - \log C} - 273{,}15 \qquad (3.9)$$

Silica geothermometry has various limitations, such as, temperature range, boiling process which concentrates silica in geothermal liquid, and mixing process which dilutes the silica. Different minerals control the silica concentration at different temperatures, equilibrium with quartz above 180°C or with chalcedony, cristobalite, and amorphous silica at lower temperatures. The quartz geothermometer works best in the temperature range 150-225°C (Fournier & Rowe, 1966; Fournier, 1970;

Arnórsson, 1975; Fournier, 1981). These temperature ranges are considered in the geothermometric calculations.

3.1.2. Na-K Geothermometry

As mentioned before, geothermometers take advantage of slow re-equilibration at cooler temperatures and preservation of fluid chemistry at hot equilibrium temperatures. However, mixing, cooling and boiling processes may affect the fluid chemistry leading to wrong interpretations of geothermometers. When compared to silica geothermometers, Na-K geothermometer is relatively slow to reach a new equilibrium during cooling and ascent of geothermal fluid which enables to get more accurate results (Ármannsson, 2012). Moreover, the mixing problem is eliminated when applying the cation geothermometers based on Na-K ratio (Haizlip, 2016). Several equations have been proposed for Na-K by different researchers, where T is the estimated temperature (°C) and Na/K is the ratio of concentrations of Na and K (mg/l);

Na-K (Truesdell, 1976)

$$T = \frac{855{,}6}{0{,}857 + \log(\frac{Na}{K})} - 273{,}15 \qquad (3.10)$$

Na-K (Tonani, 1980)

$$T = \frac{833}{0{,}780 + \log\left(\frac{Na}{K}\right)} - 273{,}15 \qquad (3.11)$$

Na-K (Arnórsson et al., 1983)

$$T = \frac{933}{0{,}993 + \log\left(\frac{Na}{K}\right)} - 273{,}15 \qquad (3.12)$$

Na-K (Arnórsson et al., 1983)

$$T = \frac{1319}{1{,}699 + \log\left(\frac{Na}{K}\right)} - 273{,}15 \tag{3.13}$$

Na-K (Fournier, 1979)

$$T = \frac{1217}{1{,}483 + \log\left(\frac{Na}{K}\right)} - 273{,}15 \tag{3.14}$$

Na-K (Nieva and Nieva, 1987)

$$T = \frac{1178}{1{,}470 + \log\left(\frac{Na}{K}\right)} - 273{,}15 \tag{3.15}$$

Na-K (Giggenbach, 1988)

$$T = \frac{1390}{1{,}750 + \log\left(\frac{Na}{K}\right)} - 273{,}15 \tag{3.16}$$

3.1.3. Na-K-Ca Geothermometry

The Na-K-Ca geothermometer is based on an empirical formula created by Fournier and Truesdell (1973). This formula is based on molar Na, K, and Ca concentrations in natural waters within the temperature range of 4 - 340°C (Fournier & Truesdell, 1973). Na-K-Ca geothermometry generally gives better results for the temperatures higher than 200°C and differs from the Silica and Na-K geothermometers in the sense that it is not related to equilibrium with specific geothermal minerals (Arnórsson et al., 1983; Ármannsson, 2012).

The equation is utilized, considering the log (√ Ca /Na) value, as follows;

If the value is negative, calculate the estimated temperature for β=1/3; if the value is positive, calculate the estimated temperature for β=4/3. If the calculated temperature is higher than 100°C, recalculate it for β=1/3 (Fournier & Truesdell, 1973).

Na-K-Ca (Fournier & Truesdell, 1973)

$$T = \frac{1647}{\log\left(\frac{Na}{K}\right) + \beta\left(\log\left(\sqrt{\frac{Ca}{Na}}\right) + 2{,}06\right) + 2{,}47} - 273{,}15 \tag{3.17}$$

Where;

T: estimated temperature (°C)

Na/K: the ratio of concentration of Na and K (mg/l),

Ca/Na: the ratio of concentration of Ca and Na (mg/l),

CHAPTER 4

METHODOLOGY

Geothermal energy could meet more than the world's energy need. However, a very small amount of this energy is utilized by humans, due to its high drilling and exploration costs for deep resources (Sadeghi & Khalajmasoumi, 2014). Therefore, prospective studies have great importance in order to reduce the cost for exploration and utilization of geothermal energy.

For regional studies, one way to designate the areas in terms of geothermal potential is through spatial analysis with GIS and AHP, using fluid geochemistry, young magmatic fields, and active faults.

Spatial analysis is composed of three main stages; 1) data collection of wells/springs, active faults, and magmatic rocks, 2) analysis of correlation within and between evidence layers, and 3) integration of evidence layers to locate potential geothermal systems. In this study, correlations within each thematic map and between maps are performed using the weighted sum method.

At the first step of this study, a total of 1214 well and spring data (MTA, 2005) are compiled. The geochemical dataset of those wells and springs are analyzed, using silica geothermometer, Na-K geothermometer, and Na-K-Ca geothermometers. Assumption of the preservation of water chemistry is held during the application of chemical geothermometers.

In the next step, active fault database (Kaymakcı et al., 2009) is used due to the fact that faults and fractures create potential permeable zones for geothermal fluids to ascent toward the surface or upper geological formations. The data was integrated by Euclidean distance method.

At the final stage geology polygons, consisting of travertines, Quaternary and Plio-Quaternary magmatic rocks, which may relate to any deep intrusive bodies serving as a heat source for the hydrothermal systems, are used. The spatial distribution of the above-mentioned geology polygons is integrated by Euclidean distance method.

4.1. Multi Criteria Decision Analysis (MCDA)

Multi criteria decision analyses are often coupled with a GIS environment to identify potential areas to further explore and exploit geothermal energy and thus provide important input for decision making. Nonetheless, decision making is a complicated process, as it involves integration of various kinds of data, which generally inherits uncertain information. Therefore, the data need to be organized, the uncertainties have to be systematically examined and recognized during the decision-making process.

Complex problems, due to various criteria, require simultaneous evaluation. For this purpose, Multi-Criteria Decision Making (MCDM) is used to provide a systematic methodology to select the best alternative by decision-makers (Jankowski, 1995). GIS-based MCDA provides an inclusionary view of the criteria involved in decision-making processes (Tinti et al., 2018).

Steps of MCDA include the definition of the problem and setting goals, development of the model, setting criteria and alternatives, evaluation of the criteria and choice of MCDA method, setting weighting or scores, decision analysis, and experts' recommendations. MCDA flowchart for this study is presented in Figure 4.1.

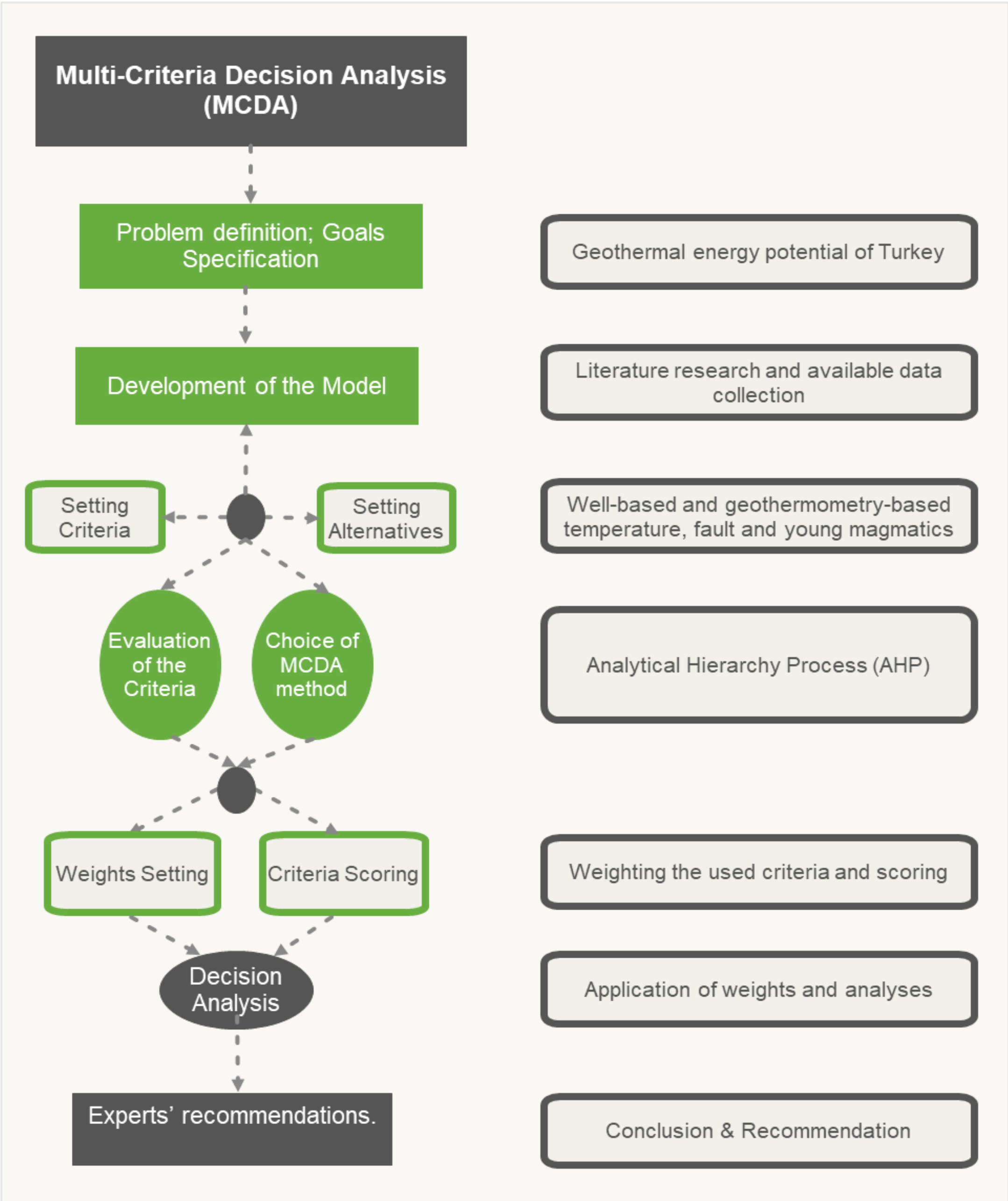

Figure 4.1. Flowchart of the MCDA process (modified from Yatsalo et al., 2015)

4.2. Weighted Summation Method

Weighted summation method is simply summing up the results of multiplied criteria value with weighted criteria, i.e. overlaying different rasters, by multiplying them with their weights and summing up together. This method is compensatory, where the 'bad' criterion scores can be compensated by 'good' ones. The method is a special form of Multi-Attribute Value Theory which is also a linear additive model proposed by Keeney and Raiffa (1976).

The total score for each alternative can be calculated using the following equation;

$$score\ (a_j) = \sum_{i=1}^{N} w_i v_i s_{ij} \tag{4.1}$$

Where;

a_j: alternative

score (a_j): score of each alternative

N: number of criteria

w_i: weight for criterion c_i

v_i: value function for criterion c_i

s_{ij}: score from alternative aj for criterion c_i

Weighted summation method is one of the most popular GIS-based MCDA approaches as it is straightforward and easily applicable within GIS environment.

4.3. Analytical Hierarchy Process (AHP)

Analytical Hierarchy Process (AHP) is one of the most commonly used methods of MCDA, which was first pronounced by Thomas Saaty in 1980. The AHP is a theory of evaluation through pairwise comparisons and base upon the judgments of experts to derive priority scales (Saaty, 2008). The priorities of the decision-maker for criterion are scored by Saaty scale table.

Table 4.1. *Scale for pairwise comparison (Saaty, 1980)*

Score	Description
1	Equally important
2	Equally to moderately important
3	Moderately important
4	Moderately to strongly important
5	Strongly important
6	Strongly to very strongly important
7	Very strongly important
8	Very to extremely important
9	Extremely important

AHP builds up a hierarchy of decision criteria using comparisons between each pair of criteria as a matrix. Paired comparisons produce weighting scores that measure the importance of the criteria among each other.

The first phase of the AHP process is the identification of problem or goal. The second phase of the AHP comprises of data collection, assignment of relative assessment in pairs with attributes of a hierarchical level and repeating the process for all levels of the hierarchy. The third phase of the AHP is to assign the relative weights. The last phase of the AHP is finding the composite normalized vector by multiplying the weight vectors of all successive levels (Stojanovi, 2013).

4.4. Topo-to-Raster

Topo-to-Raster is an ArcGIS tool, using the interpolation method for the creation of hydrologically correct digital elevation models (DEM). The tool is based on the ANUDEM program developed by Michael Hutchinson (1988, 1989). This tool uses an iterative finite-difference interpolation technique which optimizes the computational efficiency of local interpolation without losing the surface continuity of global interpolation and particularly designed to work intelligently with contour inputs. With the Topo-to-Raster tool, hydrologically correct topography with a resolution of 100 m was created, which is based on a total of 1214 well-based and calculated temperature data points.

4.5. Euclidean Distance Method

The Euclidean distance is the distance between two points in Euclidean space. Distance between two points is the absolute value of the difference between their coordinates in one dimension. Likewise, in two or three dimensions, the distance between any two points corresponds to the length of a straight line drawn between them. This is useful in several applications where the input data consist of an incomplete set of distances and the output is a set of points in Euclidean space realizing those given distances. Euclidean distance tool of ArcGIS is mostly used in multicriteria analysis. In this study, the method was used to create proximity to active faults, young magmatic fields, and travertines criteria layers.

CHAPTER 5

DATA EVALUATION AND INTEGRATION

5.1. Geological Data

5.1.1. Active Faults

Active fault data set consisting of fault alignments is interpreted with the Euclidean distance method, which is simply the distance between two points in Euclidean space. Fault data derived were grouped into six main categories with respect to distance to a fault: <2 km, 2-4 km, 4-6 km, 6-8 km, 8-10 km, and >10 km, according to AHP method. Weights of each distance interval, comparison matrix and bar graph of weights, derived from the excel file generated by Goepel (2013) are presented below.

Table 5.1. *Weights of distance to fault data*

Distance to Fault (km)	**<2**	**2-4**	**4-6**	**6-8**	**8-10**	**>10**
Weight	0,4257	0,2539	0,1496	0,0877	0,0517	0,0315

	< 2 km	2-4 km	4-6 km	6-8 km	8-10 km	>10 km		Normalized Principal Eigenvector
< 2 km	1	3	4	5	6	7	⇨	42.57%
2-4 km	1/3	1	3	4	5	6	⇨	25.39%
4-6 km	1/4	1/3	1	3	4	5	⇨	14.96%
6-8 km	1/5	1/4	1/3	1	3	4	⇨	8.77%
8-10 km	1/6	1/5	1/4	1/3	1	3	⇨	5.17%
>10 km	1/7	1/6	1/5	1/4	1/3	1	⇨	3.15%

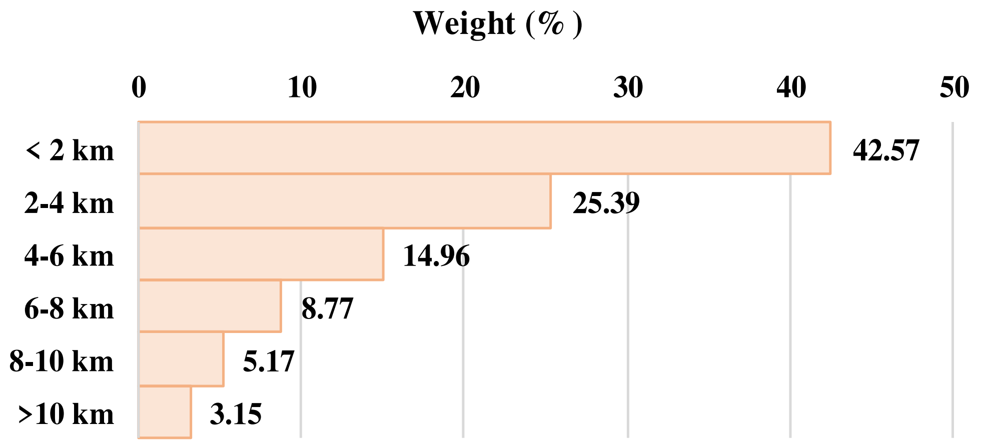

Figure 5.1. Comparison matrix and calculated weights for distance to fault (adapted from Goepel, 2013)

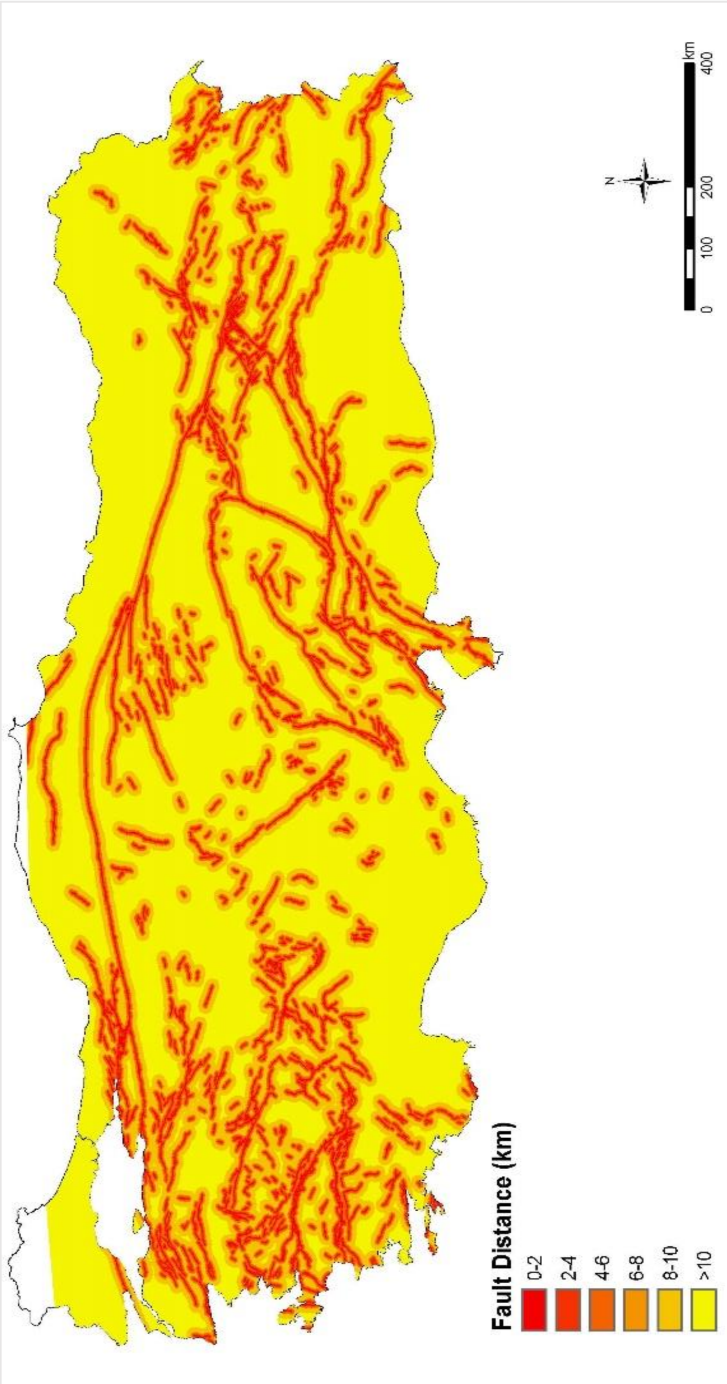

Figure 5.2. Map of distance to fault

5.1.2. Young Magmatic Fields and Travertines

This data set consisting of travertines, Plio-Quaternary and Quaternary magmatic rocks are interpreted via Euclidean distance, which is simply the distance between two points in Euclidean space. Geology data were grouped into six main categories with respect to distance to polygons: <5 km, 5-10 km, 10-20 km, 20-50 km, 50-100 km, and >100 km, according to AHP method. Weights of each distance interval, comparison matrix and bar graph of weights, derived from the excel file generated by Goepel (2013) are presented below.

Table 5.2. *Weights of distance to geology polygons data*

Distance to Geology (km)	**0-5**	**5-10**	**10-20**	**20-50**	**50-100**	**>100**
Travertines	0,4257	0,2539	0,1496	0,0877	0,0517	0,0315
Quaternary magmatics	0,4257	0,2539	0,1496	0,0877	0,0517	0,0315
Plio-Quaternary magmatics	0,4257	0,2539	0,1496	0,0877	0,0517	0,0315

	< 5 km	5-10 km	10-20 km	20-50 km	50-100 km	>100 km		Normalized Principal Eigenvector
< 5 km	1	3	4	5	6	7	⇨	42.57%
5-10 km	1/3	1	3	4	5	6	⇨	25.39%
10-20 km	1/4	1/3	1	3	4	5	⇨	14.96%
20-50 km	1/5	1/4	1/3	1	3	4	⇨	8.77%
50-100 km	1/6	1/5	1/4	1/3	1	3	⇨	5.17%
>100 km	1/7	1/6	1/5	1/4	1/3	1	⇨	3.15%

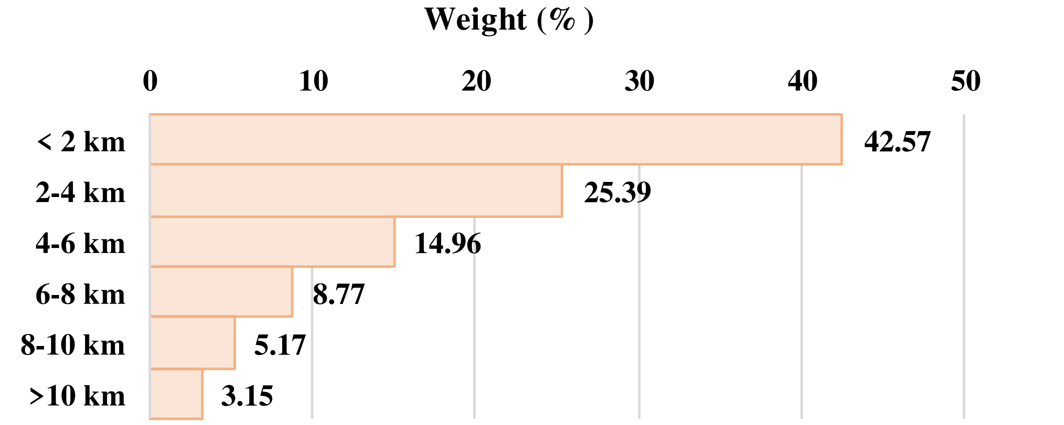

Figure 5.3. Comparison matrix and calculated weights for distance to geology polygons (adapted from Goepel, 2013)

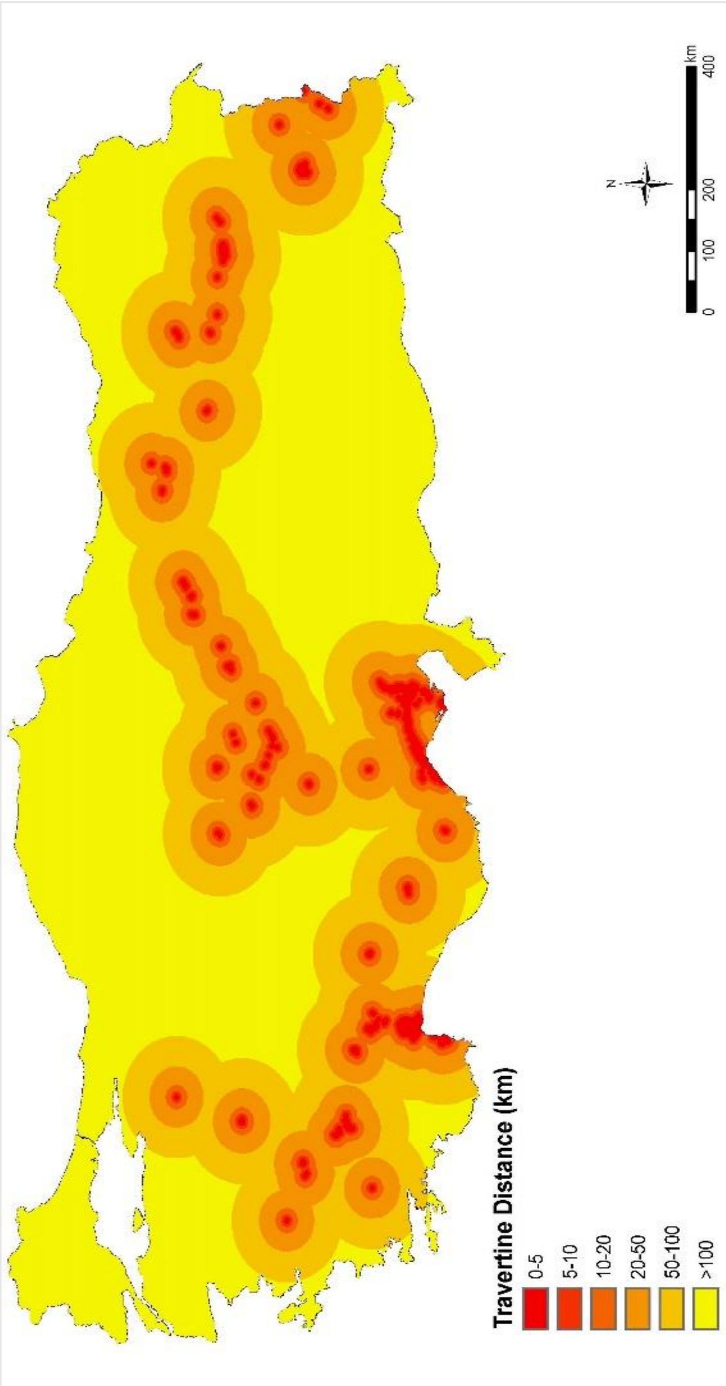

Figure 5.4. Map of distance to travertines

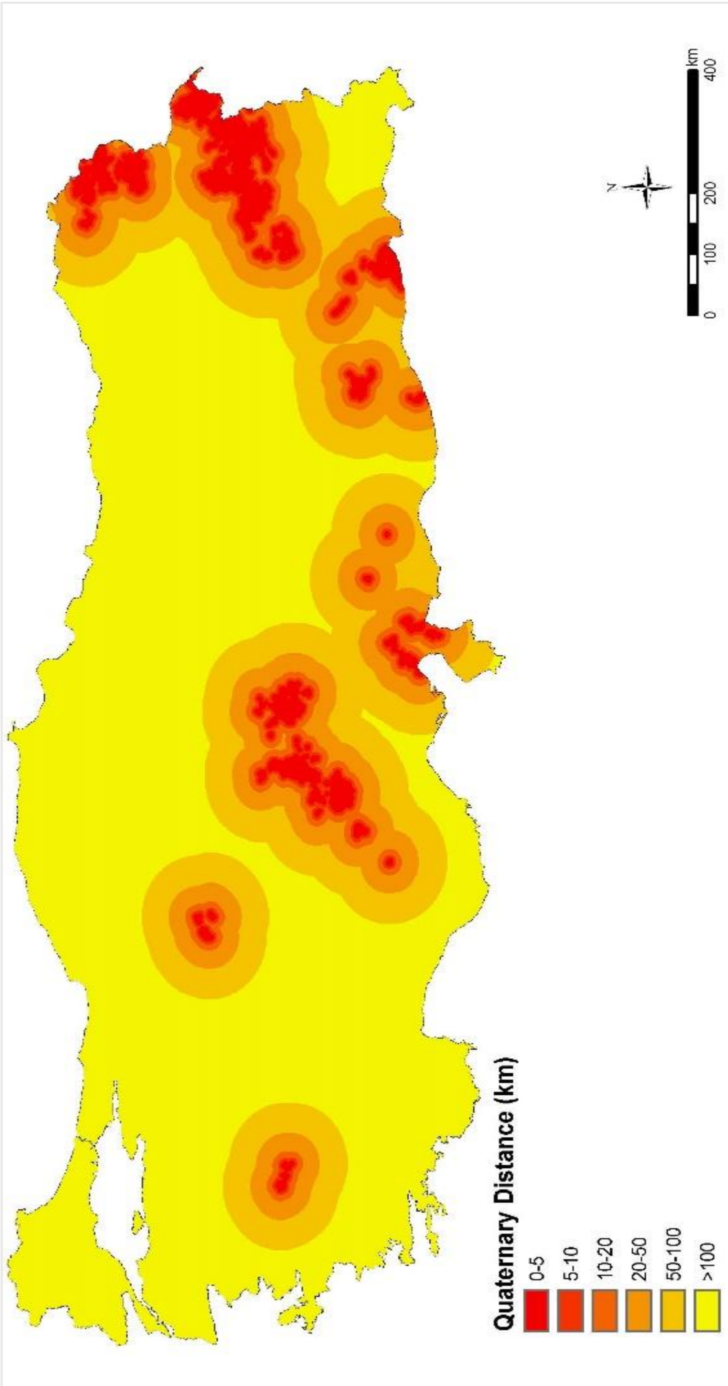

Figure 5.5. Map of distance to Quaternary magmatics

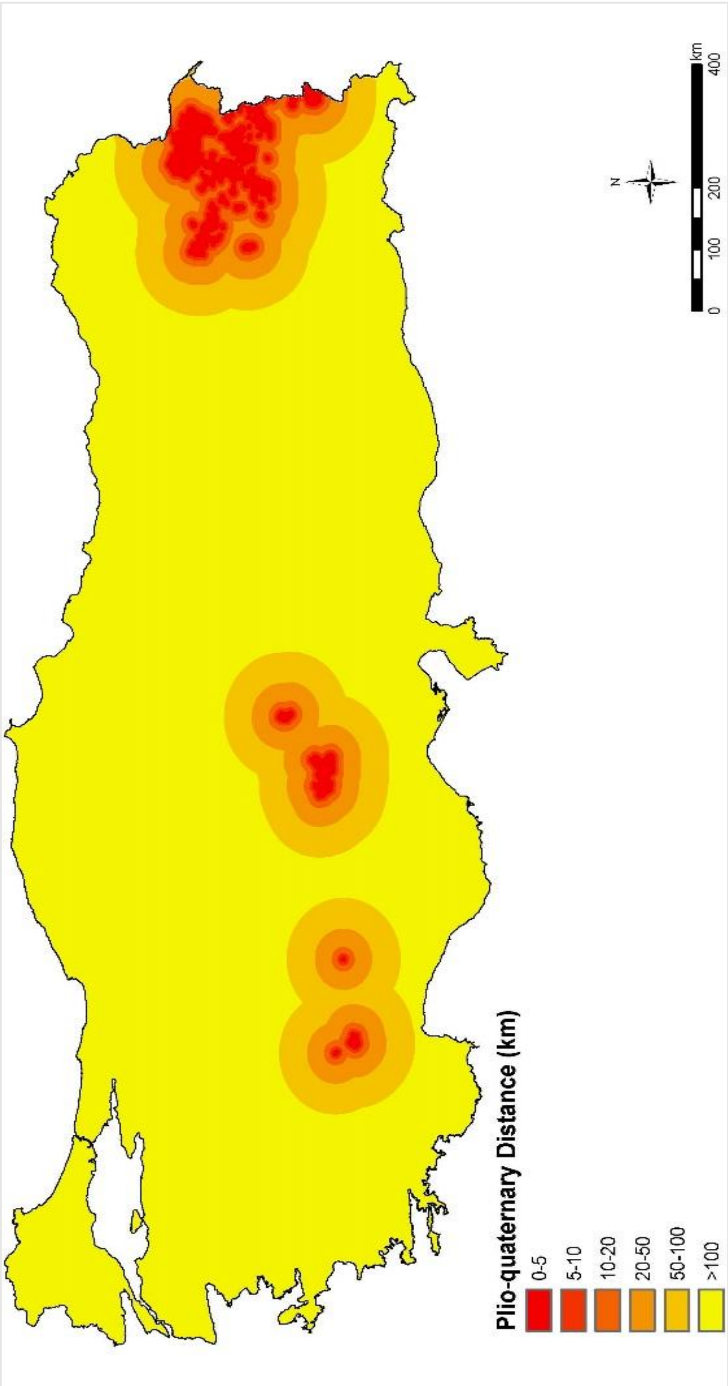

Figure 5.6. Map of distance to Plio-Quaternary magmatics

5.2. Geochemical Data

5.2.1. Silica Geothermometer-based Temperature Calculations

The silica geothermometers applied include Amorphous silica (Fournier, 1977); β Cristobalite (Fournier, 1977); α Cristobalite (Fournier, 1977); Chalcedony (Fournier, 1977); Quartz (Fournier, 1977); Quartz (after steam loss) (Fournier, 1977); Quartz (Fournier & Potter, 1982); Chalcedony (Arnórsson et al., 1983) and Quartz (Arnórsson, 1985). Results of silica geothermometry are summarized in Appendix-A. Underestimated and overestimated results compared to measured temperatures were eliminated. Distributions of silica geothermometry results for each equation are presented below.

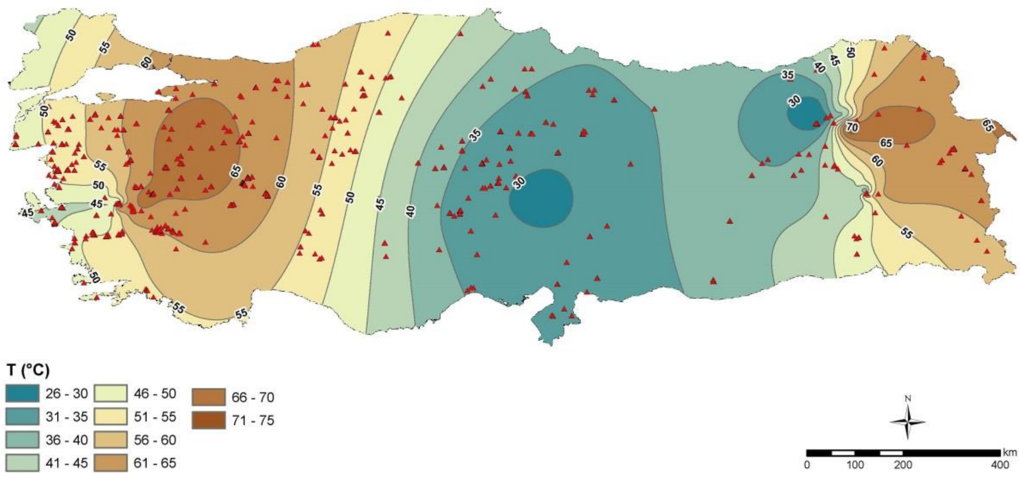

Figure 5.7. Temperature distribution derived from amorphous silica (Fournier, 1977)

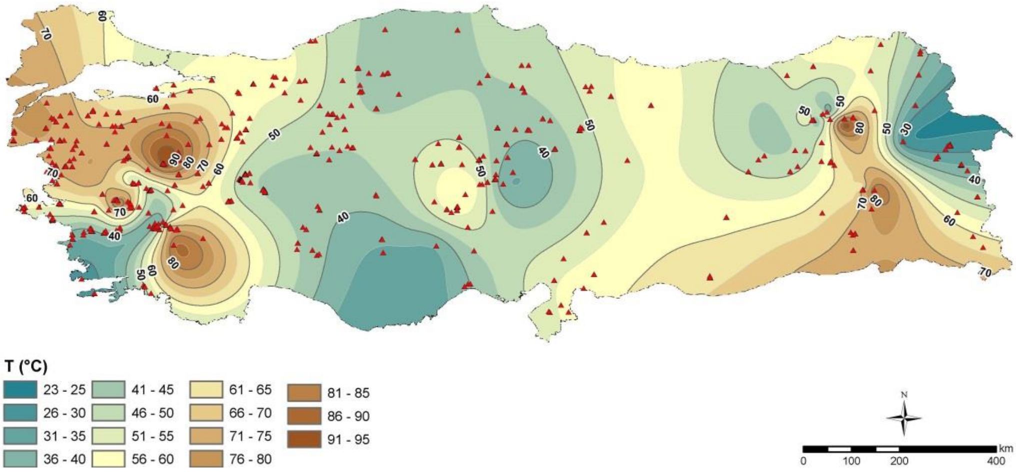

Figure 5.8. Temperature distribution derived from β Cristobalite (Fournier, 1977)

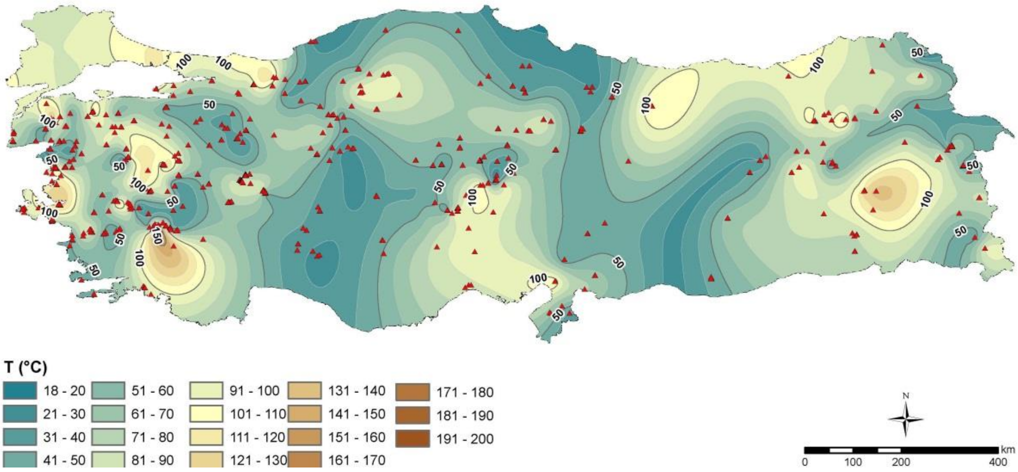

Figure 5.9. Temperature distribution derived from α Cristobalite (Fournier, 1977)

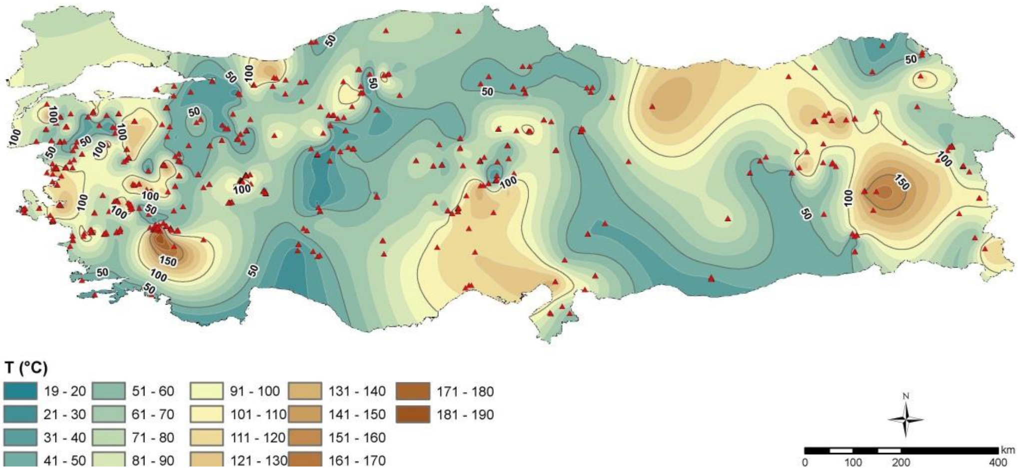

Figure 5.10. Temperature distribution derived from Chalcedony (Fournier, 1977)

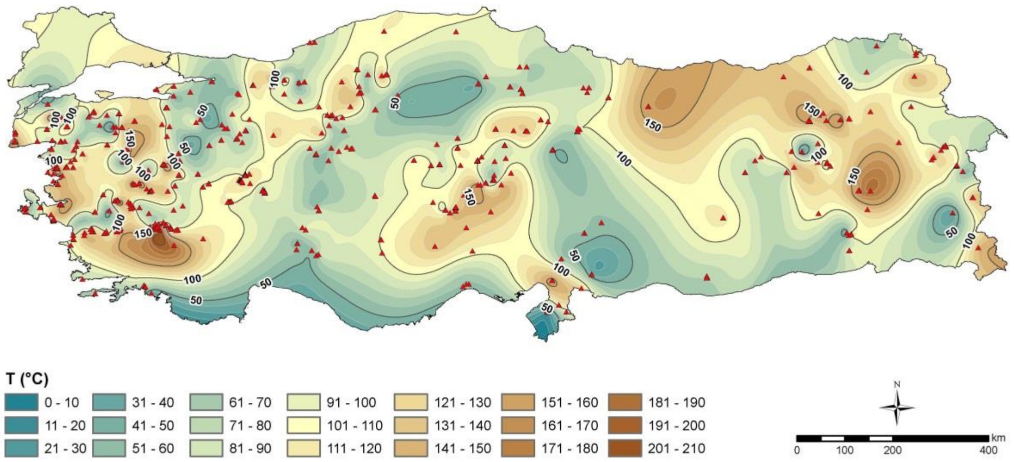

Figure 5.11. Temperature distribution derived from Quartz (Fournier, 1977)

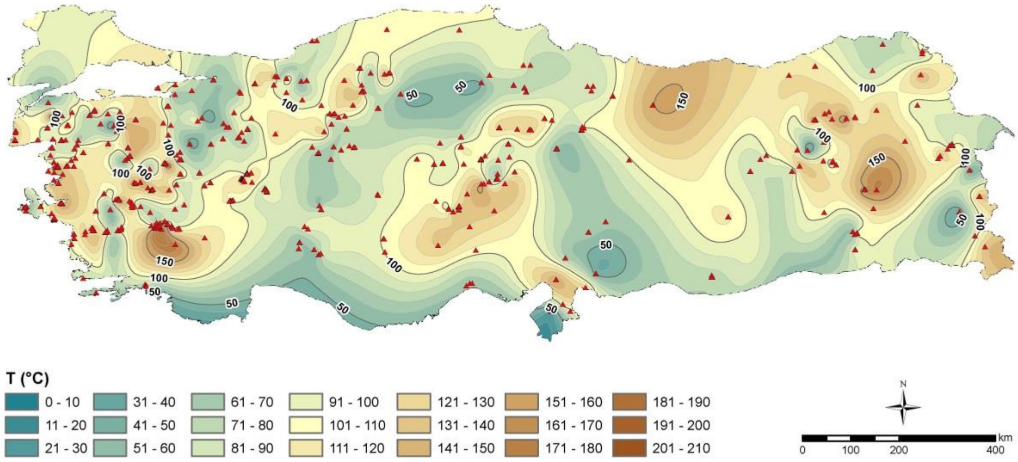

Figure 5.12. Temperature distribution derived from Quartz (after steam loss) (Fournier, 1977)

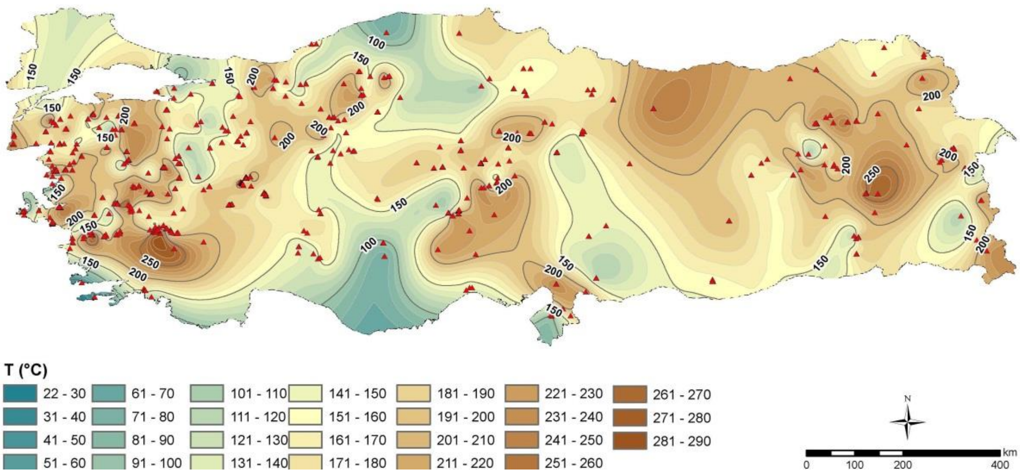

Figure 5.13. Temperature distribution derived from Quartz (Fournier & Potter, 1982)

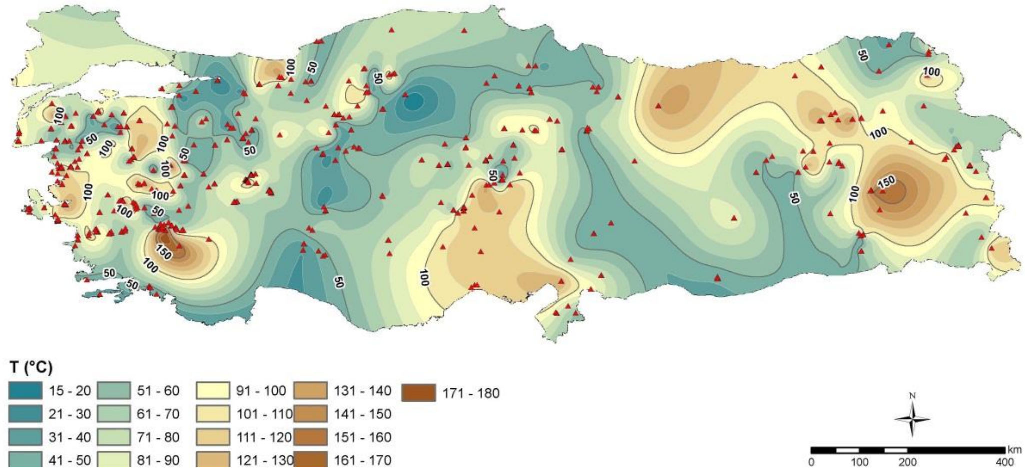

Figure 5.14. Temperature distribution derived from Chalcedony (Arnórsson et al., 1983)

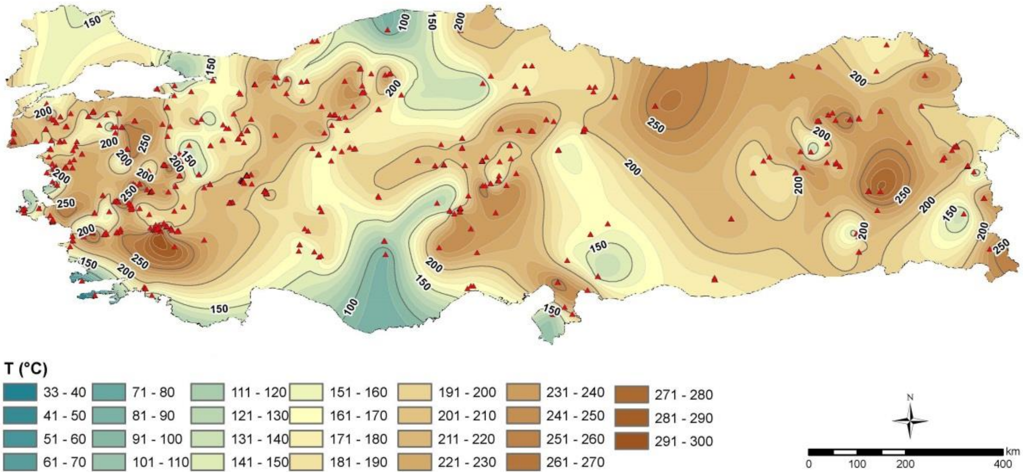

Figure 5.15. Temperature distribution derived from Quartz (Arnórsson, 1985)

Silica geothermometer results from above-mentioned equations are integrated and an average silica geothermometer map is created. The temperature assigned to each point was the average value derived from all equations (Figure 5.16).

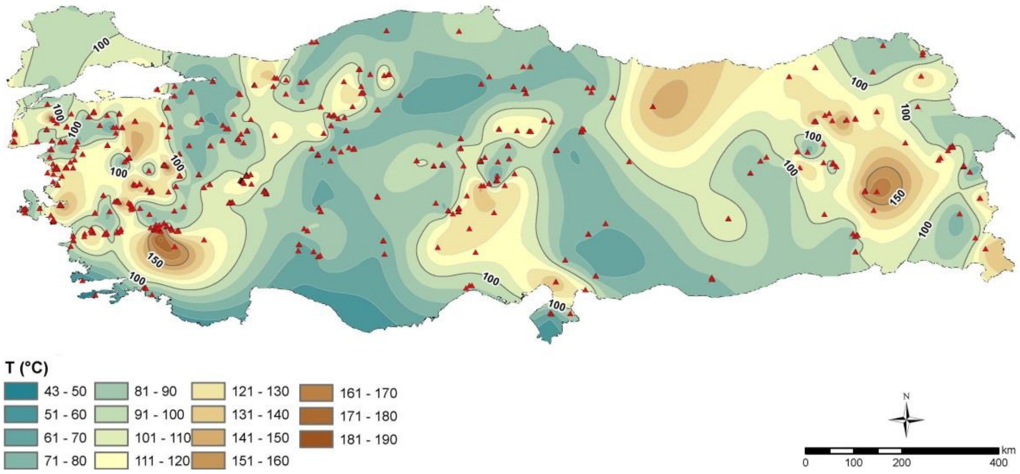

Figure 5.16. Average temperature distribution derived from silica geothermometers

5.2.2. Na-K Geothermometer-based Temperature Calculations

The Na-K geothermometers applied include (Truesdell, 1976); (Tonani, 1980); (Arnórsson et al., 1983); (Arnórsson et al., 1983); (Fournier, 1979); (Nieva and Nieva, 1987) and (Giggenbach, 1988). Results of Na-K geothermometry are summarized in Appendix-A. Underestimated and overestimated results compared to measured temperatures were eliminated. Distributions of Na-K geothermometry results for each researcher are presented below.

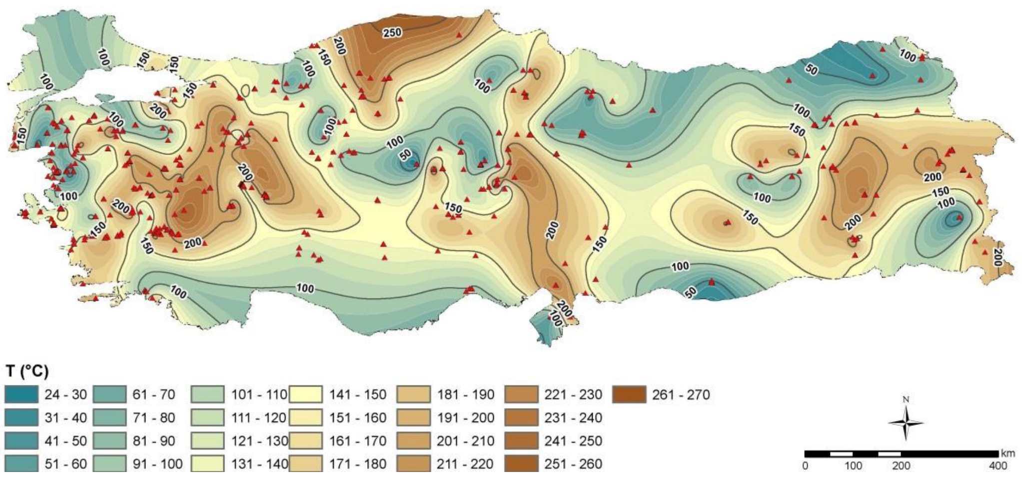

Figure 5.17. Temperature distribution derived from Na-K ratio (Truesdell, 1976)

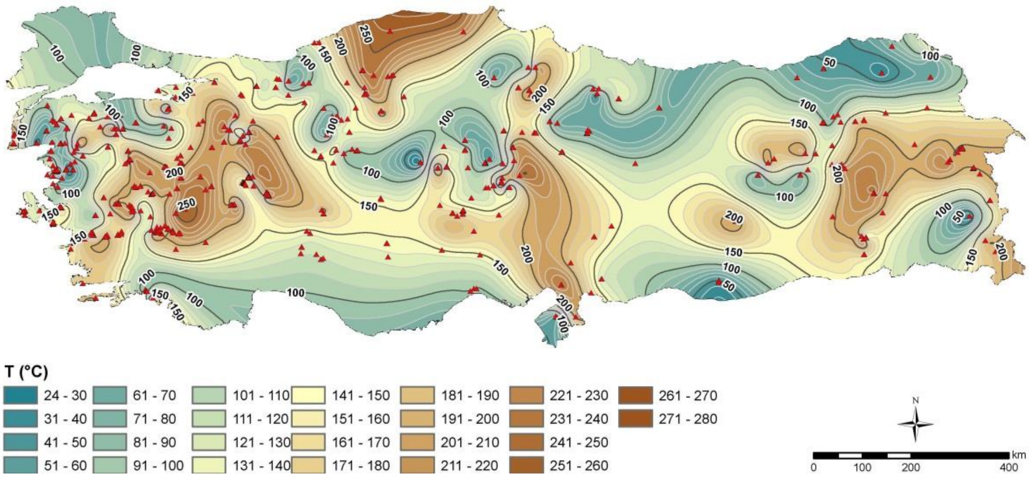

Figure 5.18. Temperature distribution derived from Na-K ratio (Tonani, 1980)

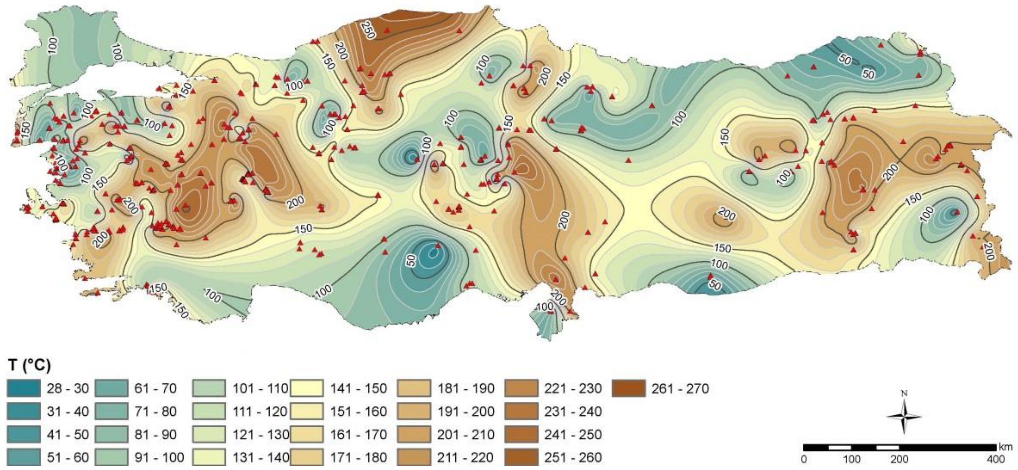

Figure 5.19. Temperature distribution derived from Na-K ratio (Arnórsson et al., 1983)

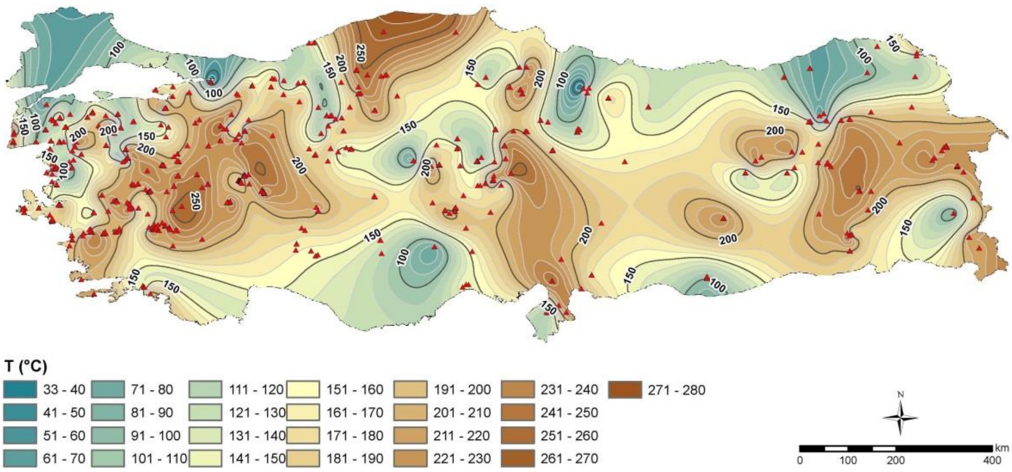

Figure 5.20. Temperature distribution derived from Na-K ratio (Arnórsson et al., 1983)

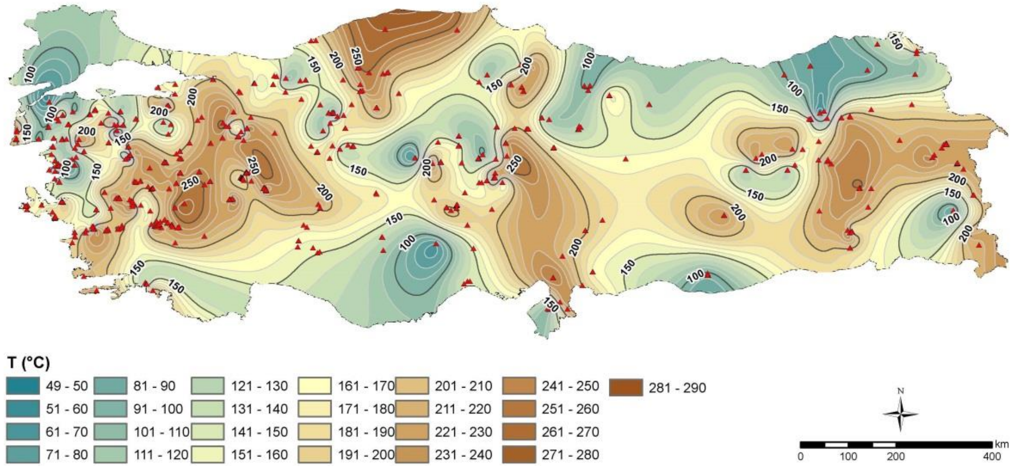

Figure 5.21. Temperature distribution derived from Na-K ratio (Fournier, 1979)

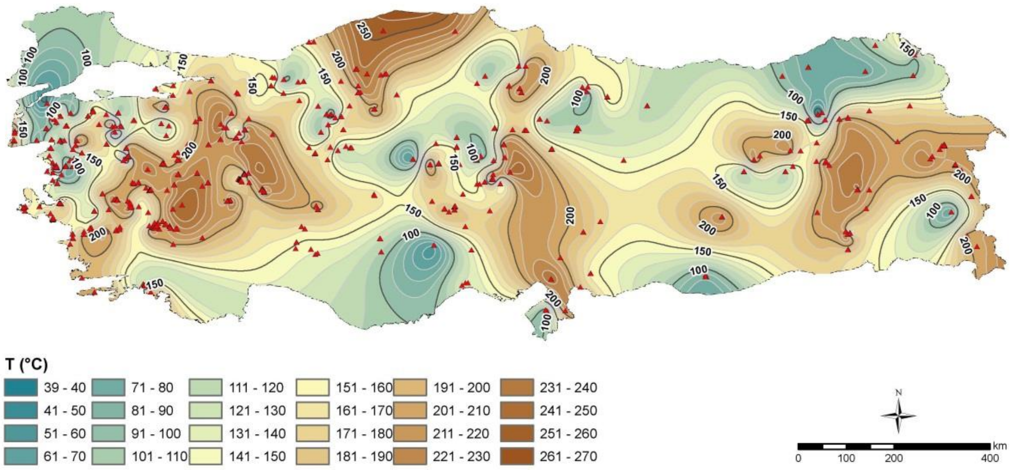

Figure 5.22. Temperature distribution derived from Na-K ratio (Nieva & Nieva, 1987)

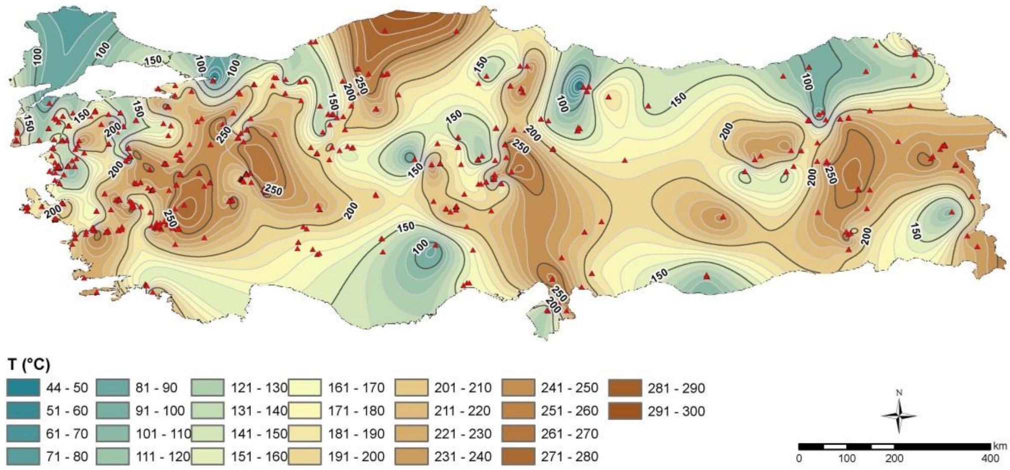

Figure 5.23 Temperature distribution derived from Na-K ratio (Giggenbach, 1988)

Na-K geothermometer results from above-mentioned equations are integrated and an average Na-K geothermometer map is created. The temperature assigned to each point was the average value derived from all equations (Figure 5.24).

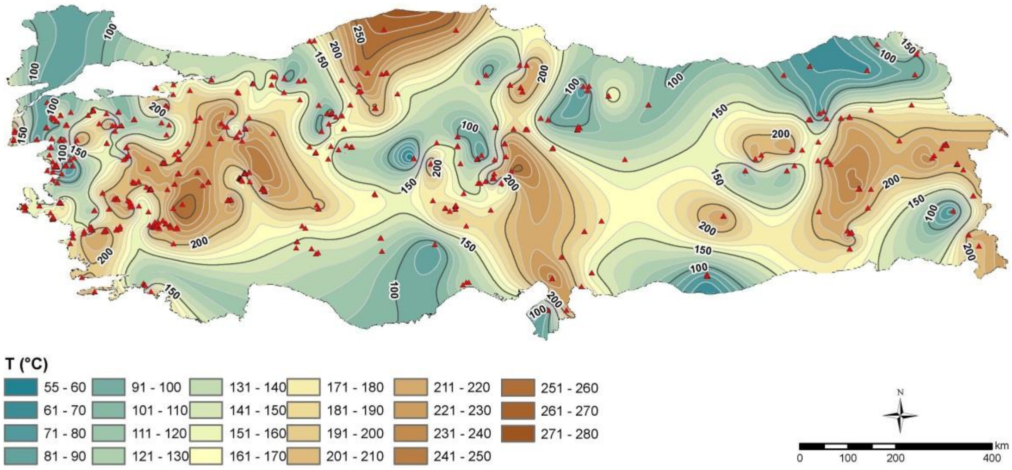

Figure 5.24. Average temperature distribution derived from Na-K geothermometers

5.2.3. Na-K-Ca Geothermometer-based Temperature Calculations

The Na-K-Ca geothermometer is applied according to the formula from Fournier and Truesdell (1973). Results of Na-K-Ca geothermometry are summarized in Appendix-A. Underestimated and overestimated results compared to measured temperatures were eliminated. Distribution of Na-K-Ca geothermometry results for Fournier and Truesdell (1973) is presented below.

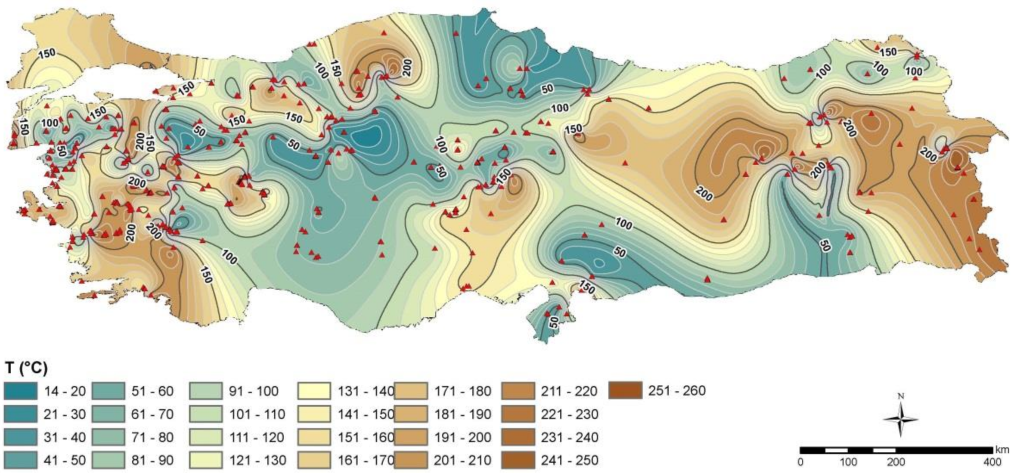

Figure 5.25. Temperature distribution derived from Na-K-Ca ratio (Fournier & Truesdell, 1973)

Temperature data derived from wells/springs and geothermometers are grouped into five main categories: T>200°C, 150-200°C, 100-150°C, 50-100°C and T<50°C, according to AHP method. Weights of each temperature interval, comparison matrix and bar graph of weights, derived from the excel file generated by Goepel (2013) are presented below.

Table 5.3. *Weights of temperature data*

Temperature (T°)	**>200**	**200-150**	**149-100**	**99-50**	**49-0**
Well	0,4699	0,2619	0,1441	0,0793	0,0448
SiO2	0,4699	0,2619	0,1441	0,0793	0,0448
Na-K	0,5292	0,2681	0,1342	0,0684	*
Na-K-Ca	0,4699	0,2619	0,1441	0,0793	0,0448

(*) No temperature data lower than 50°C

	>200°C	200-150°C	149-100°C	99-50°C	49-0°C		Normalized Principal Eigenvector
>200°C	1	3	4	5	6	⇨	46.99%
200-150°C	1/3	1	3	4	5	⇨	26.19%
149-100°C	1/4	1/3	1	3	4	⇨	14.41%
99-50°C	1/5	1/4	1/3	1	3	⇨	7.92%
49-0°C	1/6	1/5	1/4	1/3	1	⇨	4.48%

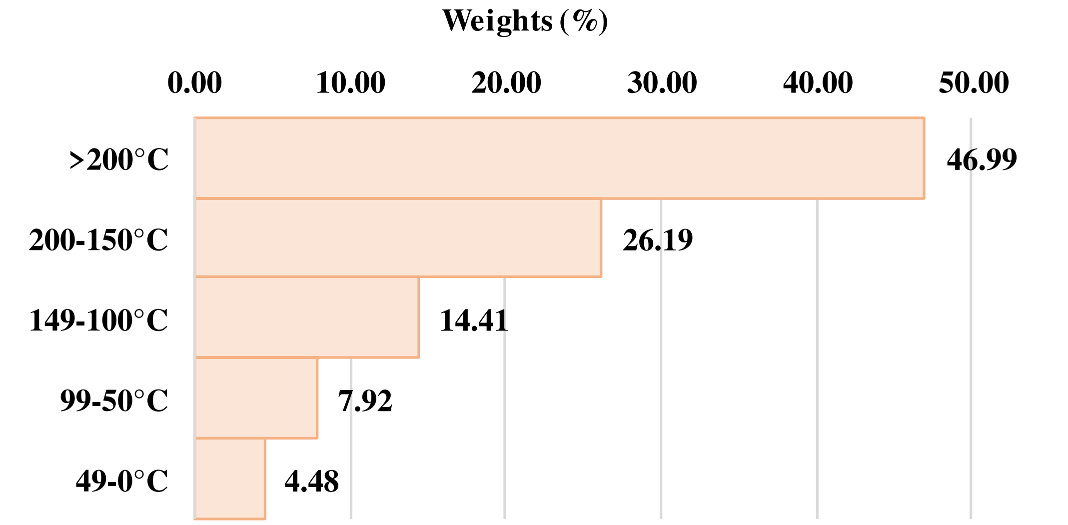

Figure 5.26. Comparison matrix and calculated weights for temperature (adapted from Goepel, 2013)

5.3. Input Well-based Temperature Data

Point data sets are classified as i) well-based temperatures, derived from direct measurements from wells/springs and ii) temperatures calculated by geothermometry applications.

Temperature data were rastered using ArcGIS "topo-to-raster" tool, which is an interpolation method specifically designed for the hydrologically correct digital elevation models (DEMs). This method is based on the ANUDEM program developed by Michael Hutchinson (1988, 1989). The ANUDEM is commonly used to calculate the elevation models in regular grid form.

Total of 1214 well and spring temperature measurements are used to introduce the high potential areas, which have already been explored or utilized.

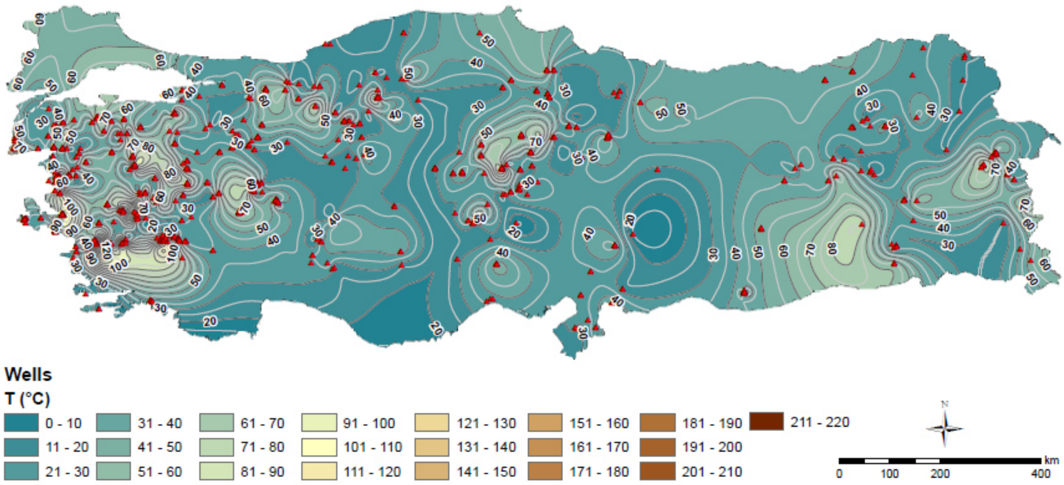

Figure 5.27. Temperature distribution derived from direct measurements from wells & springs

Geothermometer calculations were used to reduce bias due to the fact that not all geothermal systems have been drilled and sampled below the surface. (Coolbaugh et al., 2002). Each geothermometer was applied considering the equations, created or developed by different scientists.

CHAPTER 6

RESULTS

Point data, classified and rastered for well-based temperature and geothermometry-based temperatures; line data, weighted for distance to fault; and polygon data weighted for distance to travertines, Quaternary and Plio-Quaternary magmatic fields were interpreted together and overall weights were assigned for each category. Weights of categories, comparison matrix and bar graph of weights, derived from the excel file generated by Goepel (2013) are presented below.

Table 6.1. *Weights of all categories*

Category		**Weight**
Well-based Temp. (T°C)		0,2627
SiO_2 Geothermometry-based Temp.(T°C)		0,1558
Na-K Geothermometry-based Temp.(T°C)		0,1558
Na-K-Ca Geothermometry-based Temp.(T°C)		0,1558
Distance to Fault (km)		0,0885
	Travertines	0,0885
Distance to Geology Polygons(km)	Quaternary Mag.	0,0581
	Plio-Quaternary Mag.	0,0348

	Well-based (T°C)	SiO2 Geoth.-based (T°C)	Na-K Geoth.-based (T°C)	Na-K-Ca Geoth.-based (T°C)	Distance to Fault (km)	Distance to Travertines (km)	Quaternary Mag. (km)	Distance to Plio-Quaternary Mag. (km)		Normalized Principal Eigenvector
Well-based (T°C)	1	2	2	2	3	3	4	5	⇨	26.27%
SiO2 Geoth.-based (T°C)	1/2	1	1	1	2	2	3	4	⇨	15.58%
Na-K Geoth.-based (T°C)	1/2	1	1	1	2	2	3	4	⇨	15.58%
Na-K-Ca Geoth.-based (T°C)	1/2	1	1	1	2	2	3	4	⇨	15.58%
Distance to Fault (km)	1/3	1/2	1/2	1/2	1	1	2	3	⇨	8.85%
Distance to Travertines (km)	1/3	1/2	1/2	1/2	1	1	2	3	⇨	8.85%
Quaternary Mag. (km)	1/4	1/3	1/3	1/3	1/2	1/2	1	3	⇨	5.81%
Distance to Plio-Quaternary Mag. (km)	1/5	1/4	1/4	1/4	1/3	1/3	1/3	1	⇨	3.48%

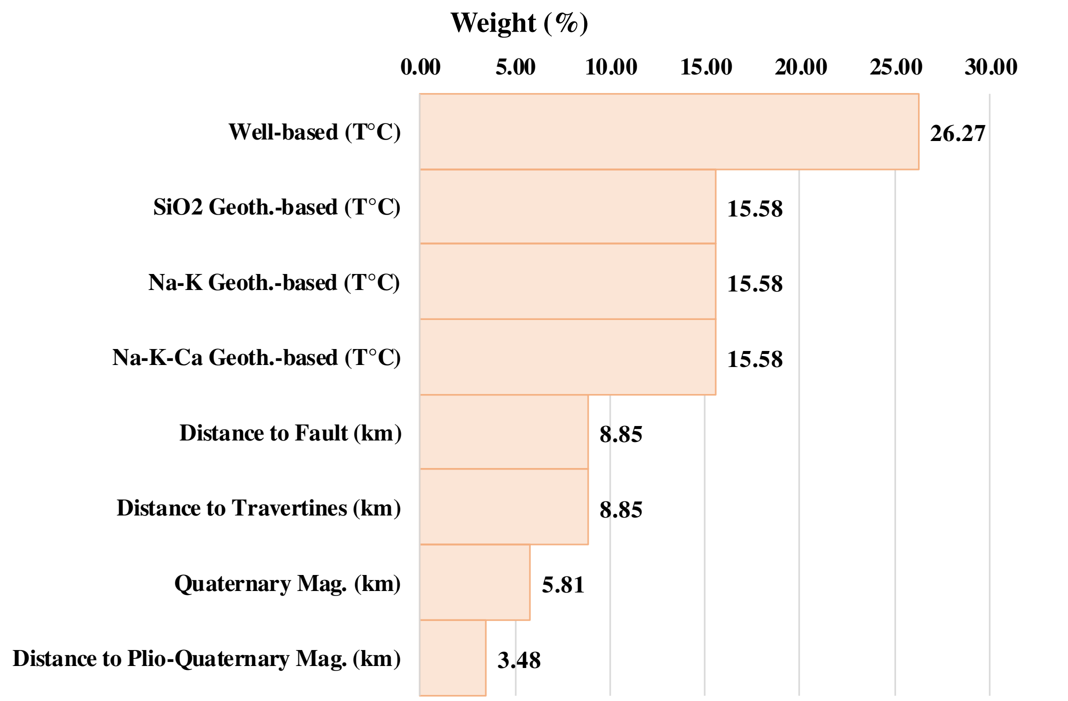

Figure 6.1. Comparison matrix and calculated weights for all categories (adapted from Goepel, 2013)

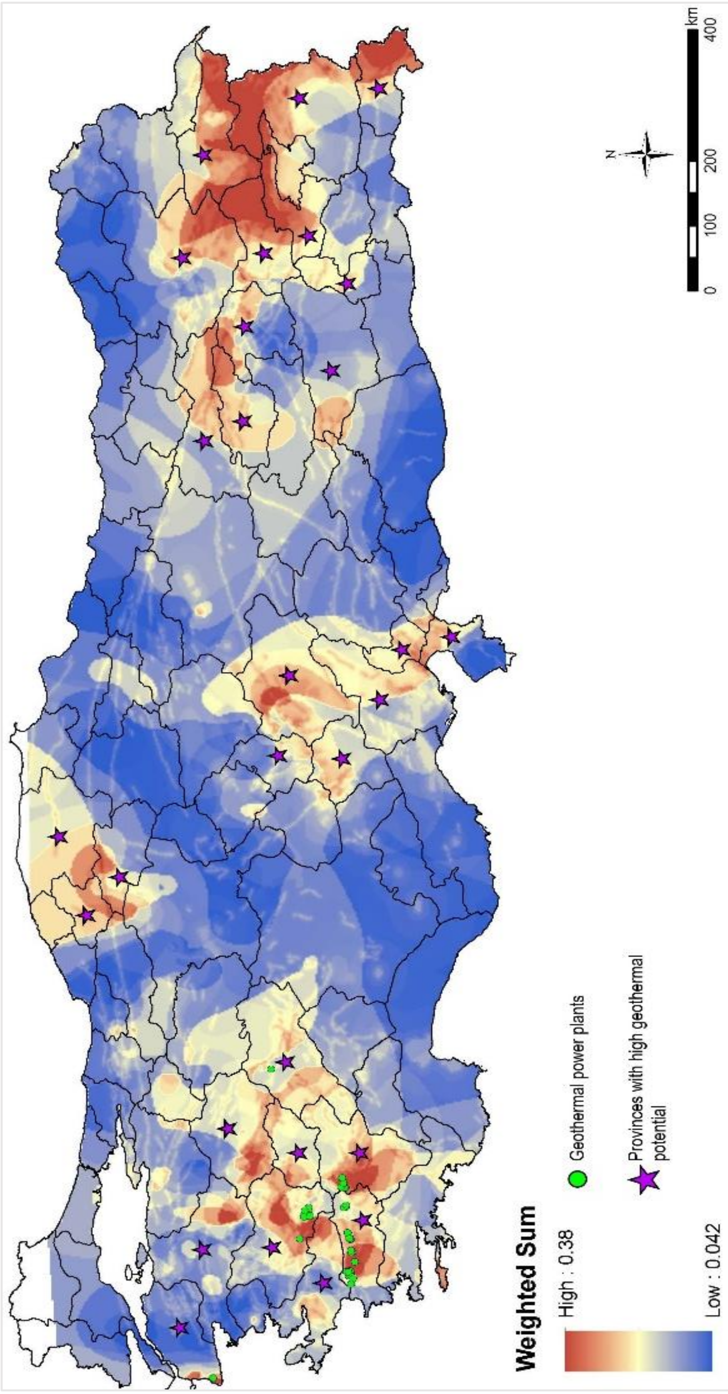

Figure 6.2. Probability map of geothermal potential in Turkey

High potential areas were determined by using the available data and analyses. The final map (Figure 6.2), estimating the most likely locations of high-temperature geothermal systems, is produced by combining temperature, geochemistry, fault and geology data. The study shows that promising areas are in correlation with the proven geothermal fields, particularly in Western Anatolia.

CHAPTER 7

CONCLUSION AND DISCUSSION

Spatial analysis with GIS and AHP were used in this study, to quantify the geochemical, tectonic and magmatic controls on geothermal systems and to find the probable potential areas in Turkey. For this purpose, AHP, weighted summation and Euclidean distance methods were applied. Based on this study, prospective areas were identified within the provinces of; Çanakkale, Balıkesir, Kütahya, Afyon, Denizli, Aydın, İzmir, Manisa and Uşak in the west; Kastamonu, Çankırı and Karabük in the north; Kayseri, Nevşehir, Niğde, Adana, Osmaniye and Hatay in the south; Erzincan, Tunceli, Bingöl, Diyarbakır, Batman, Muş, Bitlis, Erzurum, Ağrı, Van and Hakkari in the east.

Western provinces are well known with the proven geothermal fields and active extensional tectonics related dynamics. As presented in Table 2.1, all power plants in Turkey are located in Aydın, Denizli, Manisa, Çanakkale and Afyon provinces. Furthermore, a number of low-temperature geothermal fields have been discovered in Balıkesir, Kütahya, İzmir and Uşak regions.

Kastamonu, Çankırı and Karabük in the north have a similar situation as in the low-temperature fields of Balıkesir, Kütahya, İzmir and Uşak. Besides, there are numerous fields that are tendered out by the Special Provincial Administrations and still on the exploration phase in these provinces.

The status of the eastern and southern provinces is completely different than the other regions of Turkey. High prospects in these regions are controlled by the young magmatic fields and presence of travertines. However, most of the eastern and southern provinces may be unexplored due to lack of permeable reservoir rock and/or groundwater, which are the main constituents of a conventional geothermal system. Hot Dry Rock (HDR) provides an artificially fractured reservoir rock and circulating water by pumping from the surface. Circulating water is heated above the boiling temperature by the hot source rock and returned to the surface as steam for generating electricity. This system operates by injecting cold water from one borehole and returning the water to surface as superheated fluid through the second borehole. This system was first patented in 1973 by Potter (Potter et al., 1974).

Geothermal resources of Turkey can be classified as hydrothermal and hot rock resources. Current research and developments focus on the hydrothermal type (Korkmaz Basel et al., 2009). This study can be useful in future evaluations, especially for the unexplored hot rock type geothermal fields in eastern Turkey. However, more work should be performed for detailed exploration, and number of data points for geochemistry should be increased. Another limitation of this study is the evaluation of geothermometry results. Each reservoir has its own characteristics and should be interpreted within itself. Limited and dispersed data for the extensive region in this study resulted in inadequate interpretation of results. This situation is tried to be eliminated by means of AHP and using other sets of criteria. More accurate evaluations would depend on detailed geological, geochemical, geophysical and remote sensing studies.

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APPENDICES

A. Chemical Data and Temperature Calculations of Wells and Springs (MTA, 2005)

Spring or Well Name	Province	T (C)	Na^+ (mg/l)	K^+ (mg/l)	Ca^{++} (mg/l)	SiO_2 (mg/l)	A	B	C	D	E	F	G	H	I	Na/K ratio	J	K	L	M	N	O	P	log(√Ca/Na)+2.06	R
T-1	Çanakkale	174.0	22250.0	2125.0	3175.0	123.0	-	-	233.7	251.2	-	-	-	-	-	10.5	182.7	189.6	190.3	212.0	213.1	199.9	228.7	-0.5	224.3
T-2	Çanakkale	168.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T-3	Çanakkale	145.5	21500.0	2000.0	3848.0	98.0	-	-	220.6	240.0	-	-	-	-	-	10.8	179.9	186.7	187.7	209.9	210.9	197.8	226.6	-0.5	219.7
T-4	Çanakkale	164.6	26000.0	2400.0	4140.0	150.0	161.2	-	245.9	261.5	-	-	-	-	-	10.8	179.1	185.9	187.0	209.3	210.2	197.2	226.0	-0.5	222.5
Tuzla köyü doğu kaynağı	Çanakkale	97.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tuzla köyü kuzey kaynağı	Çanakkale	50.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
K-1	Çanakkale	75.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kestanbol	Çanakkale	73.0	5100.0	630.0	800.0	86.0	128.9	125.7	213.5	233.8	101.4	100.6	78.3	-	-	8.1	211.5	220.3	217.6	232.8	235.8	222.2	249.8	-0.2	224.0
Akçakeçili	Çanakkale	40.0	6032.0	405.0	753.0	88.0	130.2	126.8	214.7	234.8	102.7	101.8	79.5	-	-	14.9	148.3	153.4	157.6	186.1	185.1	172.6	202.4	-0.3	190.9
Ilıca kaynağı	Balıkesir	34.0	2.6	0.8	2.0	30.0	79.4	83.1	164.3	187.4	48.1	50.8	29.6	-	-	3.3	-	-	-	-	-	-	-	1.8	33.2
Bergama_1	İzmir	93.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bergama_2	İzmir	95.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bergama_3	İzmir	102.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bergama_4	İzmir	103.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bergama_5	İzmir	105.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bergama_6	İzmir	110.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bergama_7	İzmir	110.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bergama_8	İzmir	115.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bergama_9	İzmir	93.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nebiler	İzmir	57.0	265.0	4.2	12.0	-	-	-	-	-	-	-	-	-	-	63.1	-	-	60.9	103.8	97.5	87.1	118.4	0.2	92.4
Kaynarca	İzmir	98.0	540.0	35.0	25.0	175.0	171.0	160.8	255.9	269.8	148.6	143.8	121.0	-	-	15.4	145.2	150.1	154.6	183.7	182.4	170.0	199.9	0.0	176.0
Dikili kaplıcası	İzmir	73.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kocaoba	İzmir	78.0	310.0	11.0	118.0	80.0	125.1	122.5	209.7	230.4	97.2	96.7	-	-	-	28.2	97.7	100.4	108.8	145.7	141.8	130.3	161.2	0.6	75.3
Dikili_1	İzmir	59.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dikili_2	İzmir	72.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dikili_3	İzmir	73.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dikili_4	İzmir	74.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dikili_5	İzmir	51.0	562.0	33.0	12.0	92.0	132.6	128.8	217.1	237.0	105.4	104.3	81.9	-	-	17.0	136.6	141.0	146.3	177.0	175.2	162.9	193.1	-0.2	177.9
Dikili_6	İzmir	97.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dikili_7	İzmir	103.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dikili_8	İzmir	130.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dikili_9	İzmir	131.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dikili_10	İzmir	131.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dikili_11	İzmir	131.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
K-1	İzmir	130.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T-1	İzmir	130.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bademli kaplıcası	İzmir	55.0	575.0	33.0	10.0	85.0	128.3	125.2	212.9	233.2	100.7	99.9	77.7	-	-	17.4	134.6	139.0	144.5	175.5	173.6	161.4	191.6	-0.2	178.8
Ilıcaburun	İzmir	55.0	13000.0	450.0	534.0	3.0	-	-	79.8	96.0	-	-	-	-	-	28.9	96.0	98.6	107.1	144.3	140.3	128.8	159.8	-0.7	171.9
Izmir-Aliağa Ilıcaburnu-1	İzmir	60.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Izmir-Aliağa (SM-1)	İzmir	96.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Izmir-Aliağa (SM-2)	İzmir	96.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Izmir-Aliağa (SM-3)	İzmir	96.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reşadiye	İzmir	29.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bergama_Ilıca	İzmir	43.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bergama_Cardak	İzmir	58.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bergama_Dubek_1	İzmir	62.0	360.0	3.6	16.0	100.0	137.2	132.7	221.7	241.0	110.5	109.0	86.6	-	-	100.0	-	-	-	83.4	76.3	66.3	97.5	0.1	84.0
Bergama_Dubek_1	İzmir	62.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Güzellik kaplıcası	İzmir	37.0	375.0	5.4	10.0	51.0	102.7	103.4	187.5	210.0	72.9	74.1	52.3	-	-	69.4	43.9	44.6	56.0	99.4	92.9	82.6	113.9	0.0	109.3
Dibek mevkii kaynağı	İzmir	57.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sucahlı ılıcası-1	İzmir	29.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sucahlı ılıcası-2	İzmir	26.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mahmudiye ılıcası	İzmir	37.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Küçük Çetmi-1	Çanakkale	42.0	134.0	2.0	72.0	49.0	100.9	101.7	185.7	208.3	70.9	72.2	50.5	-	-	67.0	45.7	46.5	57.8	101.0	94.6	84.2	115.5	0.9	-
Küçük Çetmi-2	Çanakkale	39.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balikesir_1	Balıkesir	42.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Spring or Well Name	Province	T (C)	Na^{+} (mg/l)	K^{+} (mg/l)	Ca^{++} (mg/l)	SiO_2 (mg/l)	A	B	C	D	E	F	G	H	I	Na/K ratio	J	K	L	M	N	O	P	log(√Ca/Na)+2.06	R
Balikesir_2	Balıkesir	43.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balikesir_3	Balıkesir	45.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balikesir_4	Balıkesir	54.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balikesir_5	Balıkesir	55.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balikesir_6	Balıkesir	55.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balikesir_7	Balıkesir	61.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Demet-1	Balıkesir	40.0	272.0	6.9	31.0	32.0	82.1	85.4	167.0	190.1	50.9	53.4	-	-	-	39.4	75.7	77.5	87.3	127.2	122.1	111.1	142.3	0.4	88.0
Gure-1	Balıkesir	55.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gure-2	Balıkesir	33.0	57.0	4.8	82.8	76.0	122.4	120.2	207.0	228.0	94.2	93.9	71.8	-	-	11.9	169.8	176.0	178.1	202.4	202.7	189.8	218.9	1.3	41.8
GAT	Balıkesir	37.0	168.0	4.7	50.0	21.0	65.3	70.6	149.9	172.7	33.3	36.8	-	-	-	35.7	81.8	83.9	93.3	132.4	127.7	116.5	147.7	0.7	60.6
Güre kaynagi	Balıkesir	58.2	265.0	5.5	33.0	38.0	89.4	91.8	174.3	197.3	58.7	60.8	-	-	-	48.2	63.7	65.1	75.5	116.9	111.3	100.5	131.8	0.4	78.7
Pelitköy ılıcakaynağı	Balıkesir	26.0	140.0	4.8	64.0	23.0	68.8	73.7	153.5	176.4	36.9	40.2	-	-	-	29.2	95.3	97.9	106.4	143.7	139.7	128.2	159.2	0.8	54.7
Uyuz ılıca kaynağı	Balıkesir	31.0	840.0	21.0	76.0	36.0	87.1	89.8	172.0	195.0	56.2	58.4	37.1	-	-	40.0	74.8	76.5	86.4	126.4	121.3	110.3	141.5	0.1	128.8
Balikesir_7	Balıkesir	45.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balikesir_8	Balıkesir	49.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balikesir_9	Balıkesir	57.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balikesir_10	Balıkesir	57.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balikesir_11	Balıkesir	58.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balikesir_12	Balıkesir	58.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balikesir_13	Balıkesir	59.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ED-1	Balıkesir	60.0	199.0	8.0	18.0	38.4	89.9	92.2	174.8	197.8	59.1	61.2	-	-	-	24.9	106.7	109.7	117.4	153.1	149.6	137.9	168.7	0.4	139.1
ED-2	Balıkesir	47.0	255.0	4.2	47.0	35.0	85.9	88.7	170.8	193.8	54.9	57.2	-	-	-	60.7	50.9	51.8	62.9	105.6	99.4	88.9	120.3	0.5	62.6
ED-3	Balıkesir	59.0	227.0	4.2	38.0	50.0	101.8	102.6	186.6	209.2	71.9	73.2	-	-	-	54.0	57.2	58.4	69.1	111.2	105.3	94.7	126.0	0.5	65.7
Bostancıköy kaynakları	Balıkesir	40.0	166.0	4.4	72.0	32.0	82.1	85.4	167.0	190.1	50.9	53.4	-	-	-	37.7	78.4	80.3	89.9	129.5	124.6	113.5	144.7	0.8	51.6
Ilıca çeşmesi	Balıkesir	25.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bozören	Balıkesir	27.0	40.0	4.4	156.0	19.0	61.5	67.2	146.1	168.6	29.4	33.1	-	-	-	9.1	198.1	206.0	204.9	223.2	225.3	211.9	240.0	1.6	26.2
İvrindi kaynagi	Balıkesir	38.8	134.0	12.4	88.0	51.0	102.7	103.4	187.5	210.0	72.9	74.1	52.3	-	-	10.8	179.4	186.1	187.2	209.5	210.4	197.4	226.2	0.9	76.5
Pınarlıburun	Balıkesir	39.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gümeli	Balıkesir	28.8	23.0	4.6	88.0	34.0	84.6	87.6	169.6	192.6	53.6	56.0	34.7	-	-	5.0	-	-	-	-	-	-	-	1.7	32.1
Paşaköy kaplıcası	İzmir	47.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Menteşe	Manisa	57.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mentese-1	Manisa	65.0	390.0	21.0	38.0	73.0	120.3	118.4	205.0	226.1	91.9	91.8	69.7	-	-	18.6	129.3	133.4	139.3	171.3	169.1	157.0	187.3	0.3	157.4
Kocabaşlar	Çanakkale	36.0	164.0	1.2	112.0	14.0	50.5	57.4	134.5	156.4	-	-	-	-	-	136.7	-	-	-	70.8	63.2	53.6	84.6	0.9	-
Yenice_1	Çanakkale	83.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yenice_2	Çanakkale	83.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H-1	Çanakkale	58.0	186.0	5.4	20.0	71.0	118.9	117.2	203.5	224.8	90.4	90.4	68.3	-	-	34.4	84.2	86.3	95.6	134.4	129.8	118.6	149.7	0.4	85.3
Hıdırlar Ilıcası	Çanakkale	84.0	110.0	4.0	52.0	51.0	102.7	103.4	187.5	210.0	-	-	-	-	-	27.5	99.4	102.2	110.4	147.1	143.3	131.8	162.7	0.9	-
Ilıca Kuzeydoğu kaynağı	Çanakkale	40.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hıdırlar Uyuz Ilıcası	Çanakkale	87.0	200.0	7.5	16.0	84.0	127.7	124.7	212.3	232.6	100.0	99.3	-	-	-	26.7	101.6	104.5	112.6	148.9	145.2	133.6	164.5	0.4	136.9
Çan_1	Çanakkale	52.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Çan_2	Çanakkale	52.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Çan_3	Çanakkale	52.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Çan_4	Çanakkale	49.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Çan_5	Çanakkale	49.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Çan_6	Çanakkale	49.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Çan_7	Çanakkale	43.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Çan (Ç-1)	Çanakkale	44.0	540.0	140.0	180.0	24.0	70.4	75.2	155.2	178.2	38.7	41.9	-	-	-	3.9	-	-	-	-	-	-	-	0.5	240.3
Çan (Çan-2)	Çanakkale	49.0	475.0	24.0	252.0	33.0	83.4	86.5	168.3	191.4	52.2	54.7	-	-	-	19.8	124.2	128.0	134.4	167.2	164.7	152.7	183.1	0.6	89.2
93-1	Çanakkale	49.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
93-2	Çanakkale	42.0	315.0	18.0	154.0	33.0	83.4	86.5	168.3	191.4	52.2	54.7	-	-	-	17.5	134.3	138.6	144.1	175.2	173.3	161.0	191.3	0.7	85.9
Çan (Pazarköy)	Çanakkale	47.0	550.0	24.0	224.0	22.5	67.9	72.9	152.7	175.5	-	-	-	-	-	22.9	112.8	116.1	123.3	158.0	154.9	143.1	173.8	0.5	93.7
Çan-Etili-1	Çanakkale	59.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Etili (Alibeyköy)	Çanakkale	35.0	477.0	12.0	36.0	185.0	174.7	163.9	259.6	272.9	152.8	147.6	124.8	75.1	51.3	39.8	75.2	76.9	86.8	126.7	121.7	110.6	141.9	0.2	126.4
Kara Ilıca (Tepeköy)	Çanakkale	50.0	450.0	20.0	148.0	31.0	80.8	84.2	165.7	188.8	49.5	52.1	-	-	-	22.5	114.1	117.5	124.7	159.1	156.1	144.3	174.9	0.5	94.6
Bardakçılar (Ozancık)	Çanakkale	59.0	290.0	6.0	80.0	41.0	92.8	94.7	177.7	200.6	62.2	64.1	-	-	-	48.3	63.5	64.9	75.3	116.7	111.1	100.3	131.6	0.5	63.9

Spring or Well Name	Province	T (C)	Na^{+} (mg/l)	K^{+} (mg/l)	Ca^{++} (mg/l)	SiO_2 (mg/l)	A	B	C	D	E	F	G	H	I	Na/K ratio	J	K	L	M	N	O	P	log(√Ca/Na)+2.06	R
Külcüler	Çanakkale	35.0	198.0	3.5	40.0	43.0	94.9	96.6	179.8	202.6	64.5	66.2	44.7	-	-	56.6	54.7	55.8	66.7	109.0	103.0	92.4	123.7	0.6	57.9
Doğu kaynağı	Çanakkale	26.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kırkgeçit	Çanakkale	60.0	155.0	2.5	6.0	53.0	104.5	104.9	189.3	211.7	74.8	75.9	54.1	-	-	62.0	-	-	61.8	104.6	98.4	87.9	119.2	0.3	84.3
Gönen (G-8)	Balıkesir	70.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gönen (G-9)	Balıkesir	76.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gönen (G-10)	Balıkesir	72.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gönen (G-11)	Balıkesir	43.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gönen (G-1)	Balıkesir	82.0	460.0	24.0	46.0	68.0	116.7	115.4	201.4	222.9	88.0	88.2	-	-	-	19.2	126.7	130.7	136.9	169.2	166.9	154.8	185.2	0.2	157.0
Gönen (G-2)	Balıkesir	78.0	440.0	22.0	49.0	46.0	98.0	99.2	182.8	205.5	-	-	-	-	-	20.0	123.3	127.1	133.6	166.5	164.0	152.0	182.4	0.3	153.7
Gönen (G-3)	Balıkesir	78.0	460.0	26.2	48.0	80.0	125.1	122.5	209.7	230.4	97.2	96.7	-	-	-	17.6	134.0	138.3	143.8	175.0	173.1	160.8	191.0	0.2	161.0
Gönen (G-4/A)	Balıkesir	71.5	490.0	28.0	29.0	36.0	87.1	89.8	172.0	195.0	-	-	-	-	-	17.5	134.3	138.6	144.1	175.2	173.3	161.0	191.3	0.1	166.4
Gönen (G-6)	Balıkesir	84.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gönen (G-7)	Balıkesir	70.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gönen kaynak	Balıkesir	78.0	430.0	21.0	52.0	132.0	153.3	146.2	237.9	254.8	128.5	125.5	102.9	-	-	20.5	121.5	125.2	131.8	165.0	162.4	150.4	180.9	0.3	151.8
Ekşidere (Batı)	Balıkesir	43.0	1.4	1.6	40.0	24.0	70.4	75.2	155.2	178.2	38.7	41.9	-	-	-	0.9	-	-	-	-	-	-	-	2.7	-
Kızık	Balıkesir	50.0	260.0	15.0	83.0	34.0	84.6	87.6	169.6	192.6	53.6	56.0	-	-	-	17.3	135.1	139.5	144.9	175.8	174.0	161.7	191.9	0.6	91.6
Manyas_1	Balıkesir	42.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manyas_2	Balıkesir	58.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balya-Ilıca	Balıkesir	61.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balya-Ilıca Havuz	Balıkesir	60.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BK-1	Balıkesir	64.0	580.0	17.0	44.0	36.0	87.1	89.8	172.0	195.0	-	-	-	-	-	34.1	84.8	87.0	96.2	135.0	130.4	119.1	150.2	0.1	134.3
Kepekler-Kubbeli hamam	Balıkesir	58.0	570.0	13.0	56.0	58.0	108.9	108.6	193.6	215.7	79.5	80.3	58.4	-	-	43.8	69.2	70.8	80.9	121.7	116.3	105.4	136.6	0.2	121.7
Susurluk_1	Balıkesir	46.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dümbüldek- (D-1)	Bursa	51.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dümbüldek	Bursa	45.0	440.0	72.0	168.0	96.0	134.9	130.8	219.5	239.0	108.0	106.7	84.3	-	-	6.1	-	-	-	-	-	-	-	0.5	206.7
Bahariye	Bursa	44.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bekar	Bursa	34.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ekşisu	Bursa	28.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Susurluk_2	Balıkesir	70.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gökçedere	Balıkesir	26.0	6.9	1.0	112.0	8.0	32.2	40.9	114.0	134.2	-	-	-	-	-	6.9	231.4	241.4	236.2	246.6	251.0	237.1	263.8	2.2	-
Ömerköy	Balıkesir	31.0	66.0	5.4	58.0	24.0	70.4	75.2	155.2	178.2	38.7	41.9	-	-	-	12.2	166.9	173.0	175.4	200.3	200.4	187.5	216.8	1.1	52.8
Yıldız (Yellice)	Balıkesir	75.0	370.0	14.5	44.0	104.0	139.4	134.6	224.0	242.9	112.9	111.2	88.8	-	-	25.5	104.8	107.8	115.6	151.5	148.0	136.3	167.2	0.3	140.5
Eşeler ılıcası	Balıkesir	28.2	60.0	0.4	20.0	24.0	70.4	75.2	155.2	178.2	38.7	41.9	-	-	-	150.0	-	-	-	67.2	59.4	49.9	80.9	0.9	-
P-1	Balıkesir	53.0	380.0	24.0	18.0	15.0	53.0	59.6	137.0	159.1	-	-	-	-	-	15.8	142.9	147.6	152.4	181.9	180.5	168.1	198.1	0.1	171.3
P-2	Balıkesir	58.0	360.0	16.0	26.0	102.0	138.3	133.6	222.9	241.9	111.7	110.1	87.7	-	-	22.5	114.1	117.5	124.7	159.1	156.1	144.3	174.9	0.2	150.0
P-3	Balıkesir	58.5	290.0	22.4	32.8	69.0	117.5	116.0	202.1	223.5	88.8	88.9	66.9	-	-	12.9	161.4	167.1	170.0	196.1	195.8	183.1	212.5	0.4	171.9
1.Grup kaynaklar	Balıkesir	58.0	205.0	11.0	58.0	112.0	143.6	138.1	228.2	246.5	117.6	115.6	93.0	-	-	18.6	129.0	133.1	139.1	171.1	168.9	156.7	187.1	0.6	86.4
2.Grup kaynaklar	Balıkesir	37.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hisaralan	Balıkesir	98.5	300.0	35.0	21.0	120.0	147.6	141.5	232.2	250.0	122.1	119.7	97.1	-	-	8.6	204.8	213.1	211.3	228.0	230.6	217.1	244.9	0.2	199.5
Kepez	Balıkesir	86.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M. Esenöz Değirmeni	Balıkesir	56.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Çatak	Balıkesir	27.0	45.0	0.4	2.0	30.0	79.4	83.1	164.3	187.4	48.1	50.8	29.6	-	-	112.5	-	-	33.3	78.6	71.2	61.4	92.5	0.6	39.7
Sındırgı-Hisaralan_1	Balıkesir	98.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sındırgı-Hisaralan_2	Balıkesir	94.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sındırgı-Hisaralan_3	Balıkesir	96.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sındırgı-Hisaralan_4	Balıkesir	98.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sındırgı-Hisaralan_5	Balıkesir	89.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sındırgı-Hisaralan_6	Balıkesir	90.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sındırgı-Hisaralan_7	Balıkesir	90.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sındırgı-Hisaralan_8	Balıkesir	92.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sındırgı-Hisaralan_9	Balıkesir	92.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sındırgı-Hisaralan_10	Balıkesir	92.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sındırgı-Hisaralan_11	Balıkesir	92.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sındırgı-Hisaralan_12	Balıkesir	95.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sındırgı-Hisaralan_13	Balıkesir	95.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Spring or Well Name	Province	T (C)	Na^+ (mg/l)	K^+ (mg/l)	Ca^{++} (mg/l)	SiO_2 (mg/l)	A	B	C	D	E	F	G	H	I	Na/K ratio	J	K	L	M	N	O	P	log(√Ca/Na)+2.06	R
Sındırgı-Hisaralan_14	Balıkesir	98.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sındırgı-Hisaralan_15	Balıkesir	98.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sındırgı-Hisaralan_16	Balıkesir	98.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sındırgı-Hisaralan_17	Balıkesir	92.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HK-5	Balıkesir	70.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HK-6	Balıkesir	52.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HK-7	Balıkesir	94.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P-4	Balıkesir	56.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HK-1	Balıkesir	38.0	609.0	37.0	64.5	41.0	92.8	94.7	177.7	200.6	62.2	64.1	42.6	-	-	16.5	139.5	144.1	149.1	179.3	177.7	165.4	195.4	0.2	166.5
HK-2	Balıkesir	98.0	638.0	51.0	28.6	99.0	136.6	132.2	221.2	240.5	109.9	108.4	-	-	-	12.5	164.7	170.6	173.2	198.6	198.5	185.7	215.0	0.0	189.3
HK-3	Balıkesir	98.0	628.0	95.0	39.9	121.0	148.1	141.9	232.7	250.4	122.7	120.2	97.6	-	-	6.6	237.0	247.4	241.4	250.4	255.2	241.2	267.7	0.1	224.3
HK-4	Balıkesir	57.0	638.0	68.0	64.5	117.0	146.2	140.2	230.7	248.7	120.5	118.1	95.6	-	-	9.4	194.6	202.2	201.6	220.6	222.5	209.2	237.4	0.2	198.0
Hisarköy kaynak	Balıkesir	94.0	650.0	68.0	30.0	118.0	146.7	140.6	231.2	249.1	121.0	118.7	96.1	-	-	9.6	192.5	200.0	199.6	219.1	220.9	207.6	235.9	0.0	204.8
Emendere	Balıkesir	33.0	10.0	0.8	56.0	12.0	45.3	52.7	128.7	150.2	-	-	-	-	-	12.5	164.7	170.7	173.3	198.6	198.6	185.8	215.1	1.9	-
Mide suyu	Yalova	66.0	252.0	4.7	163.0	44.5	96.5	97.9	181.3	204.1	66.1	67.8	-	-	-	53.6	-	58.8	69.6	111.6	105.7	95.1	126.4	0.8	-
Kaplıca kaynağı	Yalova	52.0	294.0	202.0	282.0	135.0	154.7	147.3	239.3	256.0	130.0	126.9	104.3	55.0	-	1.5	-	-	-	-	-	-	-	0.8	-
Nuri Paşa kaynağı	Yalova	66.0	25.3	4.8	163.2	44.5	96.5	97.9	181.3	204.1	66.1	67.8	-	-	-	5.3	-	-	-	-	-	-	-	1.8	-
Gıcık kaynağı	Yalova	52.0	32.0	4.8	128.0	33.0	83.4	86.5	168.3	191.4	52.2	54.7	-	-	-	6.7	235.9	246.2	240.4	249.7	254.4	240.4	266.9	1.6	-
Küpeli kaynağı	Yalova	49.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MTA-1 Sondajı	Yalova	77.0	331.0	199.0	272.0	1.4	-	-	-	66.6	-	-	-	-	-	1.7	-	-	-	-	-	-	-	0.8	-
MTA-2 Sondajı	Yalova	68.0	420.0	30.0	2.1	61.5	111.7	111.1	196.4	218.3	82.6	83.1	-	-	-	14.0	154.0	159.3	163.0	190.4	189.7	177.1	206.8	-0.4	199.8
Keramet	Bursa	31.0	20.0	1.6	125.0	21.0	65.3	70.6	149.9	172.7	33.3	36.8	-	-	-	12.5	164.7	170.7	173.3	198.6	198.6	185.8	215.1	1.8	-
Yalova	Yalova	66.0	24.8	5.0	163.2	44.5	96.5	97.9	181.3	204.1	66.1	67.8	-	-	-	5.0	-	-	-	-	-	-	-	1.8	-
YT-1	Yalova	40.0	12.7	28.0	20.6	1.0	-	-	42.5	53.6	-	-	-	-	-	0.5	-	-	-	-	-	-	-	1.6	-
Gemlik - Terme	Bursa	36.0	11.0	0.6	56.0	18.0	59.5	65.5	144.0	166.5	-	31.1	-	-	-	18.3	130.4	134.5	140.4	172.1	170.0	157.8	188.1	1.9	-
Çekirge BÇ-2	Bursa	43.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kaynarca BK-1	Bursa	49.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kaynarca BK-2	Bursa	88.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vakıfbahçe	Bursa	49.5	27.0	4.1	70.0	46.0	98.0	99.2	182.8	205.5	67.8	69.3	47.6	-	-	6.6	236.5	246.9	241.0	250.1	254.9	240.9	267.3	1.6	-
Horhor (Kervansaray)	Bursa	42.0	24.2	4.1	70.3	24.3	70.9	75.6	155.7	178.7	39.2	42.4	-	-	-	5.9	-	-	-	-	-	-	-	1.6	-
U. Ü. Kükürtlü-1	Bursa	82.5	198.0	17.8	100.0	37.5	88.9	91.3	173.8	196.8	-	-	-	-	-	11.1	176.4	183.0	184.4	207.3	208.0	195.0	223.9	0.8	90.1
Gölcük-Yazlık_1	Kocaeli	32.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gölcük-Yazlık_2	Kocaeli	32.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gölcük-Yazlık_3	Kocaeli	41.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yazlıkköy kaplıca kaynağı	Kocaeli	30.5	77.0	0.2	4.0	16.0	55.3	61.7	139.5	161.7	-	26.9	-	-	-	385.0	-	-	-	34.7	-	-	47.5	0.5	-
Ahibaba kaynağı	Sakarya	26.5	335.0	23.0	189.0	16.0	55.3	61.7	139.5	161.7	22.9	26.9	-	-	-	14.6	150.3	155.5	159.5	187.7	186.7	174.2	204.0	0.7	90.4
Ilıcaköy kaynağı	Sakarya	41.0	3.5	5.0	127.0	32.0	82.1	85.4	167.0	190.1	50.9	53.4	-	-	-	0.7	-	-	-	-	-	-	-	2.6	-
Sarıot	Bolu	64.5	205.0	35.0	146.0	48.0	99.9	100.9	184.7	207.4	69.8	71.3	-	-	-	5.9	-	-	-	-	-	-	-	0.8	195.5
Mudurnu-Taşkesti	Bolu	62.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kuzuluk (K-13)	Sakarya	51.0	760.0	38.0	101.0	143.0	158.2	150.3	242.9	259.0	134.0	130.5	107.9	58.5	-	20.0	123.3	127.1	133.6	166.5	164.0	152.0	182.4	0.2	156.7
Kuzuluk kaynagi	Sakarya	82.0	730.0	28.0	45.0	36.0	87.1	89.8	172.0	195.0	-	-	-	-	-	26.1	103.2	106.1	114.1	150.3	146.6	135.0	165.9	0.0	149.8
K-1	Sakarya	84.0	780.0	36.0	41.0	161.0	165.6	156.4	250.4	265.3	142.4	138.2	115.5	-	-	21.7	117.0	120.6	127.5	161.5	158.6	146.7	177.3	0.0	160.6
K-2	Sakarya	84.0	780.0	38.0	36.0	148.0	160.3	152.0	245.0	260.8	136.4	132.7	110.0	-	-	20.5	121.3	125.0	131.6	164.9	162.2	150.2	180.8	-0.1	164.4
K-3	Sakarya	82.0	780.0	45.0	141.0	135.0	154.7	147.3	239.3	256.0	130.0	126.9	104.3	-	-	17.3	135.1	139.5	144.9	175.8	174.0	161.7	191.9	0.2	161.4
K-4	Sakarya	82.0	325.0	4.3	32.0	128.0	151.5	144.7	236.1	253.3	126.4	123.6	101.0	-	-	75.6	-	-	-	95.6	88.9	78.7	109.9	0.3	-
K-5	Sakarya	60.0	2000.0	436.0	25.2	25.0	72.0	76.6	156.9	179.8	-	-	-	-	-	4.6	-	-	-	-	-	-	-	-0.5	-
Mudurnu-Gürçam_1	Bolu	40.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mudurnu-Gürçam_2	Bolu	40.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Babas	Bolu	37.0	19.0	4.8	152.0	40.0	91.7	93.8	176.6	199.5	61.1	63.0	41.5	-	-	4.0	-	-	-	-	-	-	-	1.9	-
Bolu (B-1)	Bolu	40.0	481.0	17.0	371.0	20.0	63.4	69.0	148.0	170.7	-	35.0	-	-	-	28.3	97.4	100.1	108.5	145.5	141.5	130.0	161.0	0.7	69.6
Büyük Kaplıca	Bolu	42.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Küçük Kaplıca	Bolu	44.0	50.0	17.0	335.0	37.0	88.3	90.8	173.2	196.2	57.4	59.6	-	-	-	2.9	-	-	-	-	-	-	-	1.6	49.6
Çepni	Bolu	25.0	2.3	3.2	357.0	12.0	45.3	52.7	128.7	150.2	-	-	-	-	-	0.7	-	-	-	-	-	-	-	3.0	-
Efteni kaplıcası	Düzce	43.6	367.0	20.2	75.1	141.0	157.3	149.5	242.0	258.3	133.0	129.6	107.0	57.7	-	18.2	131.1	135.3	141.1	172.7	170.6	158.5	188.7	0.4	152.0
Değirmendere kaynağı	Düzce	26.5	46.7	2.8	16.6	10.0	39.3	47.3	122.1	143.0	-	-	-	-	-	16.7	138.4	142.9	148.0	178.4	176.7	164.4	194.5	1.0	54.5

Spring or Well Name	Province	T (C)	Na^+ (mg/l)	K^+ (mg/l)	Ca^{++} (mg/l)	SiO_2 (mg/l)	A	B	C	D	E	F	G	H	I	Na/K ratio	J	K	L	M	N	O	P	log(√Ca/Na)+2.06	R
Kaplıca kaynağı	Düzce	31.0	1960.0	42.0	69.0	59.0	109.7	109.3	194.4	216.5	80.4	81.1	59.2	-	-	46.7	65.6	67.0	77.3	118.5	113.0	102.1	133.4	-0.3	135.1
Sadağ	Bursa	64.5	220.0	6.8	103.0	72.0	119.6	117.8	204.3	225.5	91.2	91.1	69.0	-	-	32.4	88.3	90.6	99.6	137.9	133.5	122.2	153.2	0.7	59.9
Ağaçhisar	Bursa	40.0	15.0	3.2	252.0	32.0	82.1	85.4	167.0	190.1	50.9	53.4	-	-	-	4.7	-	-	-	-	-	-	-	2.1	-
Erkekler hamamı	Bursa	45.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bayanlar hamamı	Bursa	44.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ılyas Oruç'a ait hamam	Bursa	38.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Halil Bak hamamı I	Bursa	35.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Halil Bak hamamı II	Bursa	37.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Musa Oruç hamamı I	Bursa	37.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Musa Oruç hamamı II	Bursa	40.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oylat	Bursa	40.0	23.5	4.3	121.0	42.2	94.1	95.8	178.9	201.8	63.6	65.4	43.8	-	-	5.4	-	-	-	-	-	-	-	1.7	-
Karacakaya	Bursa	27.0	20.0	2.0	60.0	11.0	42.4	50.1	125.5	146.8	-	-	-	-	-	10.0	187.6	194.8	195.0	215.5	217.0	203.8	232.3	1.6	-
Inönü Ilıcası	Eskişehir	28.0	8.5	0.6	54.0	21.4	66.0	71.2	150.7	173.5	34.0	37.5	-	-	-	14.2	152.9	158.2	162.0	189.6	188.8	176.3	206.0	2.0	-
Pınarbaşı	Eskişehir	26.0	4.3	0.6	62.0	17.0	57.4	63.6	141.8	164.2	25.2	29.1	-	-	-	7.2	226.5	236.2	231.6	243.2	247.3	233.4	260.4	2.3	-
HR-1	Kütahya	41.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Çaltı	Bilecik	38.0	160.0	19.0	65.0	40.0	91.7	93.8	176.6	199.5	61.1	63.0	41.5	-	-	8.4	206.9	215.3	213.2	229.4	232.2	218.6	246.4	0.8	178.1
SK-1	Eskişehir	54.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SK-2	Eskişehir	43.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SK-3	Eskişehir	55.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SK-4	Eskişehir	53.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SK-5	Eskişehir	43.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sakarı Ilıca	Eskişehir	56.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ES-1	Eskişehir	40.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ES-2	Eskişehir	36.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ES-3	Eskişehir	45.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Erkekler hamamı	Eskişehir	45.0	17.0	3.0	40.0	26.0	73.6	77.9	158.5	181.5	42.0	45.0	-	-	-	5.7	-	-	-	-	-	-	-	1.6	-
Yeni hamam	Eskişehir	44.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Has hamamı	Eskişehir	44.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Şengül hamamı	Eskişehir	44.5	14.0	1.4	58.0	24.0	70.4	75.2	155.2	178.2	38.7	41.9	-	-	-	10.0	187.6	194.8	195.0	215.5	217.0	203.8	232.3	1.8	-
Kızılinler kaynağı	Eskişehir	38.0	128.0	6.4	60.0	40.0	91.7	93.8	176.6	199.5	61.1	63.0	41.5	-	-	20.0	123.3	127.1	133.6	166.5	164.0	152.0	182.4	0.8	63.4
Kadınlar hamamı	Kütahya	30.0	9.0	3.1	56.1	36.7	87.9	90.5	172.8	195.9	57.1	59.3	37.9	-	-	2.9	-	-	-	-	-	-	-	2.0	-
Harlek (erkekler)	Kütahya	41.0	10.0	5.0	60.9	35.7	86.7	89.5	171.6	194.7	55.8	58.1	36.7	-	-	2.0	-	-	-	-	-	-	-	2.0	-
Hasulas havuzu	Kütahya	41.0	13.9	3.3	55.2	46.0	98.0	99.2	182.8	205.5	67.8	69.3	47.6	-	-	4.2	-	-	-	-	-	-	-	1.8	-
KŞ-2 Well	Kütahya	29.0	26.0	4.4	43.2	10.0	39.3	47.3	122.1	143.0	-	-	-	-	-	5.9	-	-	-	-	-	-	-	1.5	44.1
Gökkurna-Harlek	Kütahya	41.0	1.3	4.9	77.7	46.3	98.3	99.5	183.1	205.8	68.1	69.6	47.9	-	-	0.3	-	-	-	-	-	-	-	2.9	-
HR-2	Kütahya	37.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kızılay kampı kaynağı	Eskişehir	30.0	22.0	2.0	64.0	23.5	69.6	74.4	154.4	177.3	37.8	41.1	-	-	-	11.0	177.5	184.2	185.5	208.2	208.9	195.9	224.8	1.6	-
Tayaygırı kaynağı I	Eskişehir	33.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tayaygırı kaynağı II	Eskişehir	32.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Güney kaplıcası	Eskişehir	30.0	28.0	2.2	56.0	25.0	72.0	76.6	156.9	179.8	40.3	43.5	-	-	-	12.7	163.0	168.8	171.6	197.3	197.1	184.4	213.8	1.5	-
Aşağılıca-1	Eskişehir	29.0	16.4	2.2	106.0	20.0	63.4	69.0	148.0	170.7	31.4	35.0	-	-	-	7.5	221.6	231.0	227.0	239.8	243.5	229.7	256.9	1.9	-
Aşağılıca-2	Eskişehir	29.0	153.0	17.6	72.3	30.0	79.4	83.1	164.3	187.4	48.1	50.8	29.6	-	-	8.7	203.2	211.4	209.7	226.8	229.3	215.8	243.7	0.8	94.3
Uyuz Hamamı	Eskişehir	30.0	40.0	7.0	124.0	75.0	121.7	119.6	206.3	227.4	93.5	93.2	71.1	-	-	5.7	-	-	-	-	-	-	-	1.5	41.6
Göbel	Kütahya	34.3	10.0	1.8	78.0	9.6	37.9	46.1	120.6	141.4	-	-	-	-	-	5.6	-	-	-	-	-	-	-	2.0	-
Kaynarca	Kütahya	47.0	15.0	2.6	75.0	1.0	-	-	42.5	53.6	-	-	-	-	-	5.8	-	-	-	-	-	-	-	1.8	-
Emet (E-1)	Kütahya	47.0	10.3	8.7	58.5	29.0	78.0	81.8	162.9	186.0	46.6	49.4	-	-	-	1.2	-	-	-	-	-	-	-	1.9	48.7
Emet (E-2)	Kütahya	47.0	11.9	10.6	73.0	35.0	85.9	88.7	170.8	193.8	54.9	57.2	-	-	-	1.1	-	-	-	-	-	-	-	1.9	51.4
Emet (E-3)	Kütahya	49.0	12.2	11.0	79.0	26.0	73.6	77.9	158.5	181.5	-	45.0	-	-	-	1.1	-	-	-	-	-	-	-	1.9	51.2
Emet (E-4)	Kütahya	39.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yeniceköy	Kütahya	43.0	340.0	71.0	204.0	30.0	79.4	83.1	164.3	187.4	48.1	50.8	-	-	-	4.8	-	-	-	-	-	-	-	0.7	214.4
Sefaköy-1	Kütahya	51.0	12.0	2.4	157.0	23.5	69.6	74.4	154.4	177.3	-	-	-	-	-	5.0	-	-	-	-	-	-	-	2.1	-
Sefaköy-2	Kütahya	40.0	12.0	2.4	152.0	26.0	73.6	77.9	158.5	181.5	42.0	45.0	-	-	-	5.0	-	-	-	-	-	-	-	2.1	-
Hamamköy	Kütahya	44.0	10.2	3.2	299.0	36.0	87.1	89.8	172.0	195.0	56.2	58.4	-	-	-	3.2	-	-	-	-	-	-	-	2.3	-
Yukarı Yoncaağaç-1	Kütahya	46.0	12.0	2.8	287.0	27.0	75.1	79.3	160.0	183.0	43.5	46.5	-	-	-	4.3	-	-	-	-	-	-	-	2.2	-
Yukarı Yoncaağaç-2	Kütahya	46.0	12.0	2.8	287.0	27.0	75.1	79.3	160.0	183.0	43.5	46.5	-	-	-	4.3	-	-	-	-	-	-	-	2.2	-

Spring or Well Name	Province	T (C)	Na^+ (mg/l)	K^+ (mg/l)	Ca^{++} (mg/l)	SiO_2 (mg/l)	A	B	C	D	E	F	G	H	I	Na/K ratio	J	K	L	M	N	O	P	log(√Ca/Na)+2.06	R
Eynal sıcak su kay.	Kütahya	96.0	490.0	54.0	5.5	131.0	152.9	145.8	237.5	254.5	128.0	125.0	102.4	-	-	9.1	198.3	206.2	205.1	223.3	225.5	212.1	240.2	-0.3	219.8
Çitgöl sıcak su kay.	Kütahya	83.0	340.0	44.0	34.0	151.0	161.6	153.1	246.3	261.9	137.8	134.0	111.3	-	-	7.7	217.2	226.2	222.9	236.7	240.1	226.4	253.8	0.3	203.4
Naşa sıcak su kay.	Kütahya	63.5	480.0	59.0	2.9	97.0	135.5	131.3	220.1	239.5	108.6	107.3	84.9	-	-	8.1	211.0	219.6	217.0	232.3	235.3	221.7	249.3	-0.4	233.6
Eynal (E-2)	Kütahya	158.0	470.0	51.0	6.0	50.0	-	-	186.6	209.2	-	-	-	-	-	9.2	196.6	204.3	203.5	222.1	224.1	210.7	238.9	-0.2	217.0
Eynal (E-3)	Kütahya	149.0	500.0	48.0	20.0	46.0	-	-	182.8	205.5	-	-	-	-	-	10.4	183.2	190.2	190.9	212.4	213.5	200.4	229.1	0.0	198.6
Eynal (E-4)	Kütahya	98.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eynal (E-5)	Kütahya	97.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eynal (E-6)	Kütahya	95.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eynal (EJ-1)	Kütahya	162.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eynal (EJ-2)	Kütahya	157.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Çitgöl (Ç-1)	Kütahya	105.1	315.0	35.0	49.0	56.0	107.2	107.2	191.9	214.1	-	-	-	-	-	9.0	199.2	207.2	206.0	224.0	226.2	212.8	240.9	0.4	189.5
Naşa (N-1)	Kütahya	42.0	126.0	7.0	56.0	28.0	76.6	80.6	161.5	184.5	45.1	48.0	-	-	-	18.0	131.9	136.1	141.8	173.3	171.3	159.1	189.4	0.8	67.4
Eynal (E-7)	Kütahya	52.0	397.0	28.8	32.0	234.0	190.9	177.0	276.1	286.4	171.5	164.5	141.7	91.7	66.7	13.8	155.4	160.8	164.4	191.5	190.9	178.3	207.9	0.2	174.3
Eynal (E-8)	Kütahya	92.0	409.0	612.0	33.0	165.0	167.2	157.7	252.0	266.6	144.2	139.8	117.1	-	-	0.7	-	-	-	-	-	-	-	0.2	-
Eynal (EJ-3)	Kütahya	93.0	400.0	393.0	5.6	165.0	167.2	157.7	252.0	266.6	144.2	139.8	117.1	-	-	1.0	-	-	-	-	-	-	-	-0.2	-
TRGM-1	Kütahya	52.0	213.0	23.0	27.6	19.0	61.5	67.2	146.1	168.6	-	-	-	-	-	9.3	196.0	203.8	203.0	221.7	223.7	210.3	238.5	0.5	186.0
Eynal (E-9)	Kütahya	98.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-1	Afyon	27.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-2	Afyon	27.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-3	Afyon	28.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-4	Afyon	28.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-5	Afyon	19.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-6	Afyon	68.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-7	Afyon	58.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-8	Afyon	42.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-9	Afyon	80.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-10	Afyon	70.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-11	Afyon	70.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-12	Afyon	76.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-13	Afyon	72.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-14	Afyon	78.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-15	Afyon	58.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-16	Afyon	60.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-17	Afyon	55.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-18	Afyon	44.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-19	Afyon	60.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-20	Afyon	76.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-21	Afyon	60.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-22	Afyon	57.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-23	Afyon	70.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-24	Afyon	80.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-25	Afyon	73.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-26	Afyon	57.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-27	Afyon	68.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-28	Afyon	60.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-29	Afyon	55.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-30	Afyon	63.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-31	Afyon	60.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-32	Afyon	75.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-33	Afyon	55.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-34	Afyon	70.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-35	Afyon	60.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-36	Afyon	70.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-37	Afyon	55.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-38	Afyon	47.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Spring or Well Name	Province	T (C)	Na^+ (mg/l)	K^+ (mg/l)	Ca^{++} (mg/l)	SiO_2 (mg/l)	A	B	C	D	E	F	G	H	I	Na/K ratio	J	K	L	M	N	O	P	log(√Ca/Na)+2.06	R
Afyon_Ihsaniye-39	Afyon	44.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-40	Afyon	75.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-41	Afyon	55.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-42	Afyon	60.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-43	Afyon	27.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-44	Afyon	70.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Ihsaniye-45	Afyon	70.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gazligol (G-1)	Afyon	69.0	900.0	76.0	72.0	48.0	99.9	100.9	184.7	207.4	69.8	71.3	-	-	-	11.8	170.1	176.3	178.4	202.6	202.9	190.0	219.2	0.0	190.2
Gazligol (G-2)	Afyon	51.0	900.0	76.0	76.0	26.0	73.6	77.9	158.5	181.5	42.0	45.0	-	-	-	11.8	170.1	176.3	178.4	202.6	202.9	190.0	219.2	0.0	189.6
Gazligol (G-3)	Afyon	74.0	770.0	75.0	2.5	61.0	111.3	110.7	196.0	218.0	82.1	82.7	-	-	-	10.3	184.8	191.8	192.3	213.5	214.7	201.6	230.2	-0.6	230.2
Gazligol (KH-3)	Afyon	68.0	940.0	80.0	37.0	36.0	87.1	89.8	172.0	195.0	-	-	-	-	-	11.8	170.8	177.1	179.1	203.2	203.5	190.6	219.8	-0.1	197.8
Kükürtlü Kaynağı	Afyon	54.0	954.9	84.3	71.8	64.0	113.7	112.8	198.4	220.1	84.7	85.1	63.1	-	-	11.3	174.5	181.0	182.6	205.9	206.5	193.5	222.5	0.0	193.8
Eski Hamam	Afyon	49.0	937.2	78.1	71.7	-	-	-	-	-	-	-	-	-	-	12.0	168.8	174.9	177.1	201.6	201.8	189.0	218.2	0.0	190.2
Yeni Hamam	Afyon	47.0	937.7	82.1	19.4	-	-	-	-	-	-	-	-	-	-	11.4	173.7	180.1	181.8	205.3	205.8	192.9	221.9	-0.3	205.9
Açık Hamam	Afyon	58.0	941.8	82.2	20.3	-	-	-	-	-	-	-	-	-	-	11.5	173.4	179.8	181.5	205.1	205.6	192.6	221.7	-0.3	205.3
R-240	Afyon	82.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R-260	Afyon	92.0	1940.0	120.0	186.0	105.0	139.9	135.0	224.5	243.4	113.5	111.8	89.3	-	-	16.2	141.1	145.7	150.6	180.5	179.0	166.6	196.7	-0.1	178.4
AF-1	Afyon	98.0	1584.0	120.0	103.0	71.0	118.9	117.2	203.5	224.8	-	-	-	-	-	13.2	159.5	165.1	168.3	194.7	194.3	181.6	211.1	-0.1	191.3
AF-3	Afyon	97.0	1525.0	110.0	59.1	88.0	130.2	126.8	214.7	234.8	102.7	101.8	-	-	-	13.9	154.9	160.3	163.9	191.1	190.5	177.9	207.5	-0.2	193.1
AF-4	Afyon	95.0	1600.0	124.0	110.0	107.0	141.0	135.9	225.6	244.3	114.7	112.9	90.4	-	-	12.9	161.7	167.4	170.4	196.3	196.1	183.3	212.7	-0.1	192.2
AF-5	Afyon	79.0	1350.0	100.0	134.0	59.0	109.7	109.3	194.4	216.5	80.4	81.1	-	-	-	13.5	157.4	162.9	166.3	193.0	192.5	179.9	209.4	0.0	184.6
AF-6	Afyon	92.0	1580.0	120.0	188.0	98.0	136.1	131.8	220.6	240.0	109.2	107.8	-	-	-	13.2	159.7	165.4	168.5	194.8	194.5	181.8	211.3	0.0	185.8
AF-7	Afyon	93.0	1600.0	128.0	68.0	111.0	143.1	137.7	227.7	246.1	117.1	115.0	92.5	-	-	12.5	164.7	170.7	173.3	198.6	198.6	185.8	215.1	-0.2	198.6
AF-8	Afyon	91.0	1540.0	124.0	210.0	58.0	108.9	108.6	193.6	215.7	-	-	-	-	-	12.4	165.4	171.3	173.9	199.1	199.1	186.3	215.6	0.0	187.5
AF-9	Afyon	49.5	900.0	16.0	124.0	120.0	147.6	141.5	232.2	250.0	122.1	119.7	97.1	48.1	-	56.3	55.0	56.1	67.0	109.3	103.3	92.7	124.0	0.2	99.2
AF-10	Afyon	96.0	1440.0	108.0	35.0	103.0	138.9	134.1	223.4	242.4	112.3	110.7	88.2	-	-	13.3	158.5	164.1	167.4	193.9	193.5	180.8	210.3	-0.3	199.3
AF-11	Afyon	99.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AF-12	Afyon	80.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AF-13	Afyon	81.0	1400.0	468.0	168.0	27.0	75.1	79.3	160.0	183.0	-	-	-	-	-	3.0	-	-	-	-	-	-	-	0.0	-
AF-14	Afyon	96.0	1656.0	120.0	165.0	28.0	76.6	-	161.5	184.5	-	-	-	-	-	13.8	155.3	160.7	164.3	191.5	190.8	178.2	207.8	-0.1	185.2
AF-15	Afyon	84.0	1702.0	324.0	183.0	19.0	-	-	146.1	168.6	-	-	-	-	-	5.3	-	-	-	-	-	-	-	0.0	245.2
AF-16	Afyon	96.0	1504.0	386.0	221.0	19.0	-	-	146.1	168.6	-	-	-	-	-	3.9	-	-	-	-	-	-	-	0.1	261.8
AF-17	Afyon	96.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AF-18	Afyon	98.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AF-19	Afyon	81.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AF-2	Afyon	98.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AF-20	Afyon	97.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AF-21	Afyon	91.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AF-22	Afyon	95.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AF-23	Afyon	90.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ömer Hamamı	Afyon	64.0	261.0	12.8	14.8	66.0	115.2	114.1	199.9	221.5	86.4	86.7	64.6	-	-	20.4	121.8	125.5	132.1	165.3	162.7	150.7	181.2	0.2	154.0
Gecek Hamamı	Afyon	64.0	1135.0	127.0	157.0	29.0	78.0	81.8	162.9	186.0	-	-	-	-	-	8.9	200.0	208.0	206.7	224.5	226.8	213.4	241.4	0.1	203.5
Kızık-Uyuz Hamamı	Afyon	71.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ihsaniye-Çakır	Afyon	38.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bayramgazi_1	Afyon	78.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bayramgazi_2	Afyon	73.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Inaz_1	Afyon	95.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Inaz_2	Afyon	93.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Inaz_3	Afyon	91.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Inaz_4	Afyon	96.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Inaz_5	Afyon	96.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Inaz_6	Afyon	74.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Inaz_7	Afyon	76.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Inaz_8	Afyon	48.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Afyon_1	Afyon	58.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Spring or Well Name	Province	T (C)	Na^{+} (mg/l)	K^{+} (mg/l)	Ca^{++} (mg/l)	SiO_2 (mg/l)	A	B	C	D	E	F	G	H	I	Na/K ratio	J	K	L	M	N	O	P	log(√Ca/Na)+2.06	R
Merkez-Köprülü_1	Afyon	36.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Köprülü_2	Afyon	55.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Inaz_9	Afyon	50.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Saraydüzü	Afyon	65.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Afyon_2	Afyon	55.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Inaz_10	Afyon	58.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Inaz_11	Afyon	42.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Inaz_12	Afyon	56.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Akçin	Afyon	43.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gözsüzlü	Afyon	56.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Çay_1	Afyon	48.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Çay_2	Afyon	48.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Afyon_Cobanlar_1	Afyon	56.0	310.0	34.2	306.0	35.0	85.9	88.7	170.8	193.8	54.9	57.2	-	-	-	9.1	198.4	206.3	205.2	223.4	225.6	212.2	240.3	0.8	92.1
Afyon_Cobanlar (Ç-2)	Afyon	53.0	407.0	61.5	318.6	10.0	-	47.3	122.1	143.0	-	-	-	-	-	6.6	236.8	247.2	241.3	250.3	255.1	241.1	267.6	0.7	194.1
Afyon_Cobanlar (Ç-1)	Afyon	49.0	358.0	41.6	299.0	29.5	78.7	82.4	163.6	186.7	47.3	50.1	-	-	-	8.6	204.4	212.6	210.8	227.6	230.2	216.7	244.6	0.7	177.7
H-1	Afyon	56.5	180.0	20.0	155.0	26.0	73.6	77.9	158.5	181.5	-	-	-	-	-	9.0	199.2	207.2	206.0	224.0	226.2	212.8	240.9	0.9	83.0
H-2	Afyon	50.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H-3	Afyon	41.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H-4	Afyon	56.0	587.0	69.1	115.0	40.0	91.7	93.8	176.6	199.5	61.1	63.0	-	-	-	8.5	205.9	214.2	212.2	228.7	231.4	217.9	245.7	0.3	196.6
H-1/A	Afyon	56.3	478.0	73.7	296.0	31.0	80.8	84.2	165.7	188.8	-	-	-	-	-	6.5	239.5	250.1	243.8	252.1	257.1	243.1	269.4	0.6	199.1
AÇ-1	Afyon	51.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AÇ-2	Afyon	56.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
K-1	Afyon	37.5	300.0	35.5	125.0	46.0	98.0	99.2	182.8	205.5	67.8	69.3	47.6	-	-	8.5	206.5	214.9	212.8	229.2	231.9	218.3	246.1	0.6	183.4
Heybeli Kaynakları	Afyon	50.0	437.4	43.4	70.7	96.0	134.9	130.8	219.5	239.0	108.0	106.7	84.3	-	-	10.1	186.8	193.9	194.2	214.9	216.3	203.1	231.7	0.3	185.9
Karaburun Kaynağı	Afyon	30.0	179.5	27.2	169.6	-	-	-	-	-	-	-	-	-	-	6.6	237.2	247.6	241.6	250.6	255.4	241.4	267.8	0.9	91.5
Çobanhamamı Kaynağı	Afyon	70.0	950.5	83.4	42.3	-	-	-	-	-	-	-	-	-	-	11.4	173.9	180.4	182.0	205.5	206.0	193.1	222.1	-0.1	198.5
Karaburun T. Kuzey koyu	Afyon	30.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gediz-Muratdağı	Kütahya	39.0	5.4	2.4	453.0	30.0	79.4	83.1	164.3	187.4	48.1	50.8	-	-	-	2.3	-	-	-	-	-	-	-	2.7	-
Uyuz hamamı	Kütahya	37.0	4.6	2.0	270.0	3.0	-	-	79.8	96.0	-	-	-	-	-	2.3	-	-	-	-	-	-	-	2.6	-
Kaynak	Uşak	40.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HB-2	Uşak	66.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HB-3	Uşak	71.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HB-4	Uşak	62.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Banaz Kızılcaören	Uşak	25.0	200.0	26.0	180.0	53.0	104.5	104.9	189.3	211.7	74.8	75.9	54.1	-	-	7.7	217.7	226.8	223.4	237.1	240.6	226.8	254.2	0.9	89.8
Ilıca kaynağı	Uşak	36.0	590.0	90.0	318.0	48.0	99.9	100.9	184.7	207.4	69.8	71.3	49.6	-	-	6.6	238.1	248.6	242.4	251.2	256.1	242.0	268.4	0.5	201.9
Sandıklı-Çift havuz	Afyon	69.0	251.1	20.1	150.0	61.0	111.3	110.7	196.0	218.0	82.1	82.7	-	-	-	12.5	164.8	170.7	173.3	198.7	198.6	185.8	215.1	0.7	87.7
Sandikli-Küçükastiler	Afyon	68.0	244.0	21.0	-	70.0	118.2	116.6	202.8	224.2	89.6	89.7	67.6	-	-	11.6	172.0	178.3	180.2	204.0	204.4	191.5	220.6	-	-
Sandıklı-Buğuluk hamamı	Afyon	76.0	237.8	20.5	175.2	69.0	117.5	116.0	202.1	223.5	88.8	88.9	-	-	-	11.6	172.1	178.5	180.3	204.2	204.6	191.6	220.7	0.8	84.2
Sandıklı-Turistik oteli	Afyon	70.0	239.8	19.8	-	64.0	113.7	112.8	198.4	220.1	84.7	85.1	-	-	-	12.1	167.8	173.9	176.2	200.9	201.1	188.2	217.5	-	-
Sandıklı-66	Afyon	69.0	258.9	20.0	116.6	56.0	107.2	107.2	191.9	214.1	77.7	78.5	-	-	-	12.9	161.4	167.1	170.1	196.1	195.8	183.1	212.5	0.7	93.7
Sandıklı-kadın çamurluk	Afyon	68.0	249.3	20.6	168.0	61.0	111.3	110.7	196.0	218.0	82.1	82.7	-	-	-	12.1	167.9	174.0	176.3	201.0	201.2	188.3	217.5	0.8	85.9
Sandıklı-büyük yüzme	Afyon	68.0	277.2	20.2	167.2	65.0	114.5	113.4	199.1	220.8	85.5	85.9	-	-	-	13.7	155.8	161.3	164.8	191.9	191.3	178.6	208.2	0.7	86.5
Sandıklı-Köprüaltı	Afyon	65.0	237.3	21.1	184.2	50.0	101.8	102.6	186.6	209.2	71.9	73.2	-	-	-	11.2	175.3	181.8	183.3	206.5	207.1	194.1	223.1	0.8	84.1
Sandıklı	Afyon	60.0	233.6	19.8	144.3	38.0	89.4	91.8	174.3	197.3	58.7	60.8	-	-	-	11.8	170.4	176.7	178.7	202.9	203.2	190.3	219.4	0.8	87.2
Sandıklı-Erkekler Ban.	Afyon	80.0	223.0	33.0	161.7	42.4	94.3	96.0	179.1	202.0	-	-	-	-	-	6.8	234.1	244.3	238.7	248.4	253.1	239.1	265.7	0.8	188.0
Sandıklı-Kükürtlü Ban.	Afyon	68.0	230.0	34.5	161.9	43.5	95.4	97.0	180.3	203.1	65.0	66.8	-	-	-	6.7	235.9	246.2	240.4	249.7	254.4	240.4	266.9	0.8	189.3
Sandıklı-Köprüaltı-Dereiçi	Afyon	68.0	222.0	34.3	162.0	42.6	94.5	96.2	179.4	202.2	64.0	65.8	-	-	-	6.5	239.8	250.4	244.0	252.3	257.4	243.3	269.6	0.8	190.3
Sandıklı-Madensuyu	Afyon	68.0	221.0	33.5	162.0	41.8	93.6	95.5	178.5	201.4	63.1	65.0	-	-	-	6.6	237.2	247.7	241.7	250.6	255.4	241.4	267.8	0.8	189.1
Sandıklı-Buhar ban.	Afyon	76.0	225.0	34.3	161.8	41.8	93.6	95.5	178.5	201.4	-	-	-	-	-	6.6	238.0	248.5	242.4	251.1	256.0	242.0	268.4	0.8	189.8
AFS-1	Afyon	70.5	770.0	39.0	164.0	64.0	113.7	112.8	198.4	220.1	84.7	85.1	-	-	-	19.7	124.4	128.2	134.6	167.3	164.9	152.8	183.3	0.3	153.6
AFS-2	Afyon	69.0	265.0	38.0	162.0	64.0	113.7	112.8	198.4	220.1	84.7	85.1	-	-	-	7.0	230.0	240.0	234.9	245.6	250.0	236.0	262.8	0.7	189.4
AFS-3	Afyon	65.0	63.6	9.3	58.3	10.0	-	-	122.1	143.0	-	-	-	-	-	6.8	232.5	242.6	237.3	247.4	251.9	237.9	264.6	1.1	68.3
AFS-4	Afyon	68.0	203.0	30.0	86.0	57.0	108.0	107.9	192.8	214.9	78.6	79.4	-	-	-	6.8	233.9	244.1	238.5	248.3	252.9	238.9	265.5	0.7	192.1
AFS-5	Afyon	68.5	240.0	31.2	152.0	-	-	-	-	-	-	-	-	-	-	7.7	217.7	226.8	223.4	237.1	240.6	226.8	254.2	0.8	182.7
AFS-6	Afyon	68.0	210.0	28.4	126.0	45.0	97.0	98.4	181.8	204.6	66.7	68.3	-	-	-	7.4	222.6	232.0	228.0	240.5	244.3	230.5	257.6	0.8	184.2

Spring or Well Name	Province	T (C)	Na^+ (mg/l)	K^+ (mg/l)	Ca^{++} (mg/l)	SiO_2 (mg/l)	A	B	C	D	E	F	G	H	I	Na/K ratio	J	K	L	M	N	O	P	log(√Ca/Na)+2.06	R
AFS-7/A	Afyon	70.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AFS-8	Afyon	54.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AFS-10	Afyon	70.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hamamçay Kaynakları	Afyon	70.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gediz-Abide Yeni kaynak 1	Kütahya	74.0	580.0	76.0	104.0	68.0	116.7	115.4	201.4	222.9	88.0	88.2	-	-	-	7.6	218.7	227.9	224.3	237.8	241.3	227.6	254.8	0.3	203.6
Buldanlı (Sarıkız)	Kütahya	74.0	580.0	74.0	100.0	71.0	118.9	117.2	203.5	224.8	90.4	90.4	-	-	-	7.8	215.4	224.4	221.2	235.5	238.8	225.1	252.5	0.3	202.4
Gediz-Abide Yeni kaynak 2	Kütahya	74.0	640.0	80.0	96.0	71.0	118.9	117.2	203.5	224.8	90.4	90.4	-	-	-	8.0	213.0	221.8	218.9	233.8	236.9	223.2	250.8	0.2	203.6
Hamamboğazı	Kütahya	76.0	500.0	70.0	75.0	60.0	110.5	110.0	195.2	217.2	81.3	81.9	-	-	-	7.1	226.9	236.7	232.0	243.5	247.6	233.8	260.7	0.3	208.0
Çamaşırhane	Kütahya	65.0	480.0	66.0	106.0	71.0	118.9	117.2	203.5	224.8	90.4	90.4	68.3	-	-	7.3	224.7	234.3	229.9	241.9	245.9	232.1	259.1	0.4	202.6
Fatmanım Çamuru	Kütahya	68.0	440.0	66.0	126.0	66.0	115.2	114.1	199.9	221.5	86.4	86.7	-	-	-	6.7	235.9	246.2	240.4	249.7	254.4	240.4	266.9	0.5	204.3
Buğlarca	Kütahya	70.0	510.0	54.0	141.0	64.0	113.7	112.8	198.4	220.1	84.7	85.1	63.1	-	-	9.4	193.8	201.4	200.9	220.1	221.9	208.6	236.9	0.4	185.9
GI-1/A	Kütahya	78.0	470.0	30.0	163.0	73.0	120.3	118.4	205.0	226.1	91.9	91.8	-	-	-	15.7	143.8	148.6	153.3	182.6	181.3	168.9	198.8	0.5	156.9
GI-2	Kütahya	97.0	569.0	47.0	222.0	68.0	116.7	115.4	201.4	222.9	-	-	-	-	-	12.1	167.9	174.0	176.3	201.0	201.1	188.3	217.5	0.5	170.5
GI-3	Kütahya	78.0	586.0	80.0	160.0	71.0	118.9	117.2	203.5	224.8	90.4	90.4	-	-	-	7.3	223.8	233.3	229.1	241.3	245.2	231.4	258.4	0.4	202.0
Eskihamam	Manisa	30.0	165.0	18.0	130.0	21.0	65.3	70.6	149.9	172.7	33.3	36.8	-	-	-	9.2	197.2	205.0	204.0	222.5	224.6	211.2	239.3	0.9	82.5
Eskihisar AS-3	Manisa	36.0	68.0	9.8	109.0	-	-	-	-	-	-	-	-	-	-	6.9	230.7	240.6	235.5	246.1	250.5	236.5	263.3	1.2	58.0
Demirci	Manisa	42.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eski hamam üstü	Manisa	40.0	1020.0	108.0	16.0	128.0	151.5	144.7	236.1	253.3	126.4	123.6	101.0	51.9	-	9.4	193.8	201.4	200.9	220.1	221.9	208.6	236.9	-0.3	221.5
Oniks Ocağı	Manisa	51.0	1020.0	106.0	60.0	150.0	161.2	152.7	245.9	261.5	137.4	133.6	110.9	61.5	-	9.6	191.8	199.3	198.9	218.6	220.3	207.0	235.4	-0.1	206.5
Demirci ılıcası	Manisa	49.0	950.0	104.0	69.0	73.0	120.3	118.4	205.0	226.1	91.9	91.8	69.7	-	-	9.1	197.6	205.4	204.4	222.8	224.9	211.5	239.6	0.0	206.8
Saraycık ılıcası	Manisa	55.0	550.0	108.0	40.0	132.0	153.3	146.2	237.9	254.8	128.5	125.5	102.9	53.7	-	5.1	-	-	-	-	-	-	-	0.1	238.8
Saraycık (S-1)	Manisa	64.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Saraycık (S-2)	Manisa	74.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Köprü tepe-1	Manisa	38.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Köprü tepe-2	Manisa	30.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fokurdak	Manisa	55.0	1020.0	84.0	26.0	82.0	126.4	123.6	211.0	231.5	98.6	98.0	75.7	-	-	12.1	167.6	173.7	176.0	200.7	200.9	188.0	217.3	-0.2	201.0
Emirhamamı-1	Manisa	56.0	960.0	80.0	34.0	103.0	138.9	134.1	223.4	242.4	112.3	110.7	88.2	-	-	12.0	168.8	174.9	177.1	201.6	201.8	189.0	218.2	-0.2	197.8
Emirhamamı-2	Manisa	58.0	940.0	82.0	45.0	105.0	139.9	135.0	224.5	243.4	113.5	111.8	89.3	-	-	11.5	173.3	179.7	181.5	205.0	205.5	192.6	221.6	-0.1	197.4
Geren çayı	Manisa	58.0	945.0	72.0	29.0	120.0	147.6	141.5	232.2	250.0	122.1	119.7	97.1	48.1	-	13.1	160.0	165.7	168.8	195.1	194.7	182.0	211.5	-0.2	193.9
Emirhamamı	Manisa	60.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gediz kenarı	Manisa	36.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Emir (E-1)	Manisa	65.0	863.0	100.0	114.0	91.0	132.0	128.3	216.5	236.4	104.7	103.7	81.3	-	-	8.6	204.0	212.3	210.5	227.4	229.9	216.5	244.3	0.2	203.3
Emir (E-2)	Manisa	163.0	975.0	112.0	179.0	94.0	-	-	218.3	238.0	-	-	-	-	-	8.7	203.0	211.2	209.6	226.7	229.2	215.7	243.6	0.2	200.7
Adsız Man1	Manisa	21.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Emirfakı	Uşak	38.0	250.0	33.0	763.0	33.0	83.4	86.5	168.3	191.4	52.2	54.7	33.5	-	-	7.6	219.6	228.8	225.1	238.4	242.0	228.2	255.5	1.1	68.5
Akbulak	Uşak	31.0	300.0	38.0	261.0	33.0	83.4	86.5	168.3	191.4	52.2	54.7	33.5	-	-	7.9	214.6	223.5	220.4	234.9	238.1	224.5	251.9	0.8	99.3
Örencik	Uşak	38.0	810.0	85.0	124.0	97.0	135.5	131.3	220.1	239.5	108.6	107.3	84.9	-	-	9.5	192.8	200.4	200.0	219.4	221.2	207.8	236.2	0.2	195.4
Ulubey Aksaz	Uşak	36.0	190.0	29.0	252.0	35.0	85.9	88.7	170.8	193.8	54.9	57.2	35.9	-	-	6.6	238.2	248.7	242.5	251.2	256.1	242.1	268.5	1.0	85.2
Aksaz-1	Uşak	37.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hasköy	Uşak	34.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Urganlı Kaynagi 1	Manisa	80.0	520.0	48.0	23.0	64.0	113.7	112.8	198.4	220.1	84.7	85.1	-	-	-	10.8	179.1	185.9	187.0	209.3	210.2	197.2	226.0	0.0	195.7
Urganlı Sera	Manisa	80.0	530.0	48.0	7.0	56.0	107.2	107.2	191.9	214.1	77.7	78.5	-	-	-	11.0	177.2	183.8	185.1	207.9	208.6	195.6	224.5	-0.2	206.7
Urganlı Musulcalı	Manisa	77.0	530.0	43.0	22.0	51.0	102.7	103.4	187.5	210.0	72.9	74.1	-	-	-	12.3	166.1	172.1	174.6	199.6	199.7	186.9	216.1	0.0	189.1
Urganlı Uyuz	Manisa	53.0	560.0	48.0	19.0	64.0	113.7	112.8	198.4	220.1	84.7	85.1	63.1	-	-	11.7	171.6	177.9	179.8	203.7	204.1	191.2	220.3	0.0	194.7
Urganlı Ana Kaynak	Manisa	64.5	520.0	46.0	12.0	62.0	112.1	111.4	196.8	218.7	83.0	83.5	-	-	-	11.3	174.8	181.2	182.8	206.1	206.7	193.7	222.7	-0.1	199.5
Urganlı Garkin Kaynagi	Manisa	77.0	503.0	65.0	44.0	53.0	104.5	104.9	189.3	211.7	74.8	75.9	-	-	-	7.7	217.0	226.1	222.7	236.6	240.0	226.3	253.6	0.2	208.6
Urganlı Kaynagi 2	Manisa	52.0	510.0	48.0	13.0	52.5	104.1	104.5	188.9	211.3	74.3	75.5	53.7	-	-	10.6	181.2	188.0	188.9	210.8	211.8	198.7	227.5	-0.1	202.0
Urganlı Kumkaldıran	Manisa	73.0	540.0	48.0	15.0	40.0	91.7	93.8	176.6	199.5	-	-	-	-	-	11.3	175.2	181.8	183.3	206.5	207.1	194.1	223.1	-0.1	198.4
Urganlı (U-1)	Manisa	63.0	509.0	41.8	16.7	31.0	80.8	84.2	165.7	188.8	-	-	-	-	-	12.2	167.3	173.4	175.7	200.5	200.7	187.8	217.1	0.0	191.6
Balçova Kaynagi	İzmir	65.0	239.0	41.3	19.2	-	-	-	-	-	-	-	-	-	-	5.8	-	-	-	-	-	-	-	0.3	219.9
Adsız Izm60	İzmir	41.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vardar kuyusu	İzmir	47.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bayındır-Dere. (Fatma H.)	İzmir	48.0	240.0	9.0	51.0	58.0	108.9	108.6	193.6	215.7	79.5	80.3	58.4	-	-	26.7	101.6	104.5	112.6	148.9	145.2	133.6	164.5	0.5	84.3
Dereköy sondajı	İzmir	42.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kayacık sondajı	İzmir	43.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Spring or Well Name	Province	T (C)	Na^+ (mg/l)	K^+ (mg/l)	Ca^{++} (mg/l)	SiO_2 (mg/l)	A	B	C	D	E	F	G	H	I	Na/K ratio	J	K	L	M	N	O	P	log(√Ca/Na)+2.06	R
Dere içi	Manisa	55.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gazino önü havuza akan	Manisa	89.0	316.0	32.0	32.0	220.0	186.5	173.5	271.7	282.8	166.5	159.9	137.1	87.2	-	9.9	189.0	196.3	196.3	216.5	218.1	204.8	233.3	0.3	188.3
Kurşunlu	Manisa	63.5	419.0	54.0	78.0	242.0	193.3	179.0	278.6	288.4	174.3	167.0	144.2	94.2	69.0	7.8	216.7	225.7	222.4	236.3	239.7	226.0	253.4	0.4	199.1
ıçme	Manisa	40.0	25.0	5.0	390.0	47.0	98.9	100.1	183.8	206.5	68.8	70.3	48.6	-	-	5.0	-	-	-	-	-	-	-	2.0	-
Kükürtlü	Manisa	43.0	98.0	8.0	292.0	30.0	79.4	83.1	164.3	187.4	48.1	50.8	-	-	-	12.3	166.7	172.7	175.2	200.1	200.2	187.3	216.6	1.3	38.0
Çelikli	Manisa	34.5	342.0	39.0	218.0	154.0	162.8	154.1	247.6	262.9	139.2	135.3	112.6	63.1	40.3	8.8	202.2	210.3	208.8	226.1	228.5	215.0	243.0	0.7	178.7
Sart (Çamur)	Manisa	50.0	198.0	24.0	29.0	72.0	119.6	117.8	204.3	225.5	91.2	91.1	69.0	-	-	8.3	209.3	217.9	215.5	231.2	234.0	220.5	248.1	0.5	190.6
Kurşunlu (K-1)	Manisa	96.0	410.0	47.0	40.0	149.0	160.8	152.4	245.5	261.2	136.9	133.2	110.5	-	-	8.7	202.8	211.0	209.3	226.5	229.0	215.5	243.4	0.2	198.3
Kurşunlu (K-2)	Manisa	96.0	410.0	50.0	18.0	138.0	156.0	148.4	240.7	257.1	131.5	128.3	105.6	-	-	8.2	210.0	218.6	216.1	231.7	234.6	221.0	248.7	0.1	210.0
Kurşunlu (K-3)	Manisa	96.0	355.0	42.0	10.0	128.0	151.5	144.7	236.1	253.3	126.4	123.6	101.0	-	-	8.5	206.5	214.8	212.8	229.1	231.8	218.3	246.1	0.0	211.2
SC-1	Manisa	168.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kurşunlu (K-4)	Manisa	58.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kurşunlu (K-5)	Manisa	83.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yener-1	Manisa	70.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dere içi	Manisa	55.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Horzumsazdere-Göbekli	Manisa	73.0	610.0	56.0	21.0	58.0	108.9	108.6	193.6	215.7	79.5	80.3	-	-	-	10.9	178.6	185.3	186.4	208.9	209.8	196.7	225.6	-0.1	199.3
Girme kaynakları	Manisa	74.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KD-1	Manisa	38.0	690.0	85.0	49.0	89.0	130.8	127.3	215.3	235.4	103.4	102.4	80.1	-	-	8.1	211.2	219.9	217.3	232.5	235.5	221.9	249.5	0.1	211.0
AK-1	Manisa	63.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KG-1	Manisa	182.0	1520.0	86.2	5.4	174.0	-	-	255.5	269.5	-	-	-	-	-	17.6	-	-	-	-	-	-	190.7	-0.8	202.2
AK-2	Manisa	213.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarıkız	Manisa	27.0	240.0	13.0	39.0	27.0	75.1	79.3	160.0	183.0	43.5	46.5	25.5	-	-	18.5	129.8	133.9	139.8	171.7	169.5	157.4	187.7	0.5	149.7
Veli çeşmesi	Manisa	26.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ilıca (Topan)	İzmir	57.0	6733.7	378.0	1202.3	13.0	-	55.1	131.7	153.4	-	-	-	-	-	17.8	132.8	137.0	142.7	174.0	172.0	159.8	190.1	-0.2	178.7
şifne	İzmir	42.0	8262.0	460.2	1136.0	12.0	45.3	52.7	128.7	150.2	-	-	-	-	-	18.0	132.1	136.4	142.0	173.5	171.5	159.3	189.5	-0.3	182.5
Yıldızburnu	İzmir	40.0	12440.0	794.0	962.0	1.0	-	-	42.5	53.6	-	-	-	-	-	15.7	143.8	148.6	153.3	182.6	181.3	168.9	198.8	-0.5	199.6
V Kamp	İzmir	40.0	11940.0	712.0	1075.0	1.0	-	-	42.5	53.6	-	-	-	-	-	16.8	137.9	142.4	147.6	178.0	176.3	164.0	194.2	-0.5	193.8
ILICA (I-1)	İzmir	56.0	10075.0	388.0	1551.0	47.0	98.9	100.1	183.8	206.5	68.8	70.3	-	-	-	26.0	103.5	106.5	114.4	150.5	146.9	135.3	166.1	-0.3	163.9
FY-1	İzmir	57.0	10.0	580.0	160.3	21.0	65.3	70.6	149.9	172.7	-	-	-	-	-	0.0	-	-	-	-	-	-	-	2.2	-
ILICA (I-2)	İzmir	57.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I-3	İzmir	56.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Çeşme_1	İzmir	39.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Çeşme_2	İzmir	48.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Çeşme_3	İzmir	57.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Çeşme_4	İzmir	57.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Çeşme_5	İzmir	57.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Çeşme_6	İzmir	58.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gülbahçe	İzmir	34.0	11790.0	592.0	1084.0	-	-	-	-	-	-	-	-	-	-	19.9	123.7	127.5	133.9	166.8	164.3	152.2	182.7	-0.5	183.8
Gülbahçe-1	İzmir	33.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cumalı (D-1)	İzmir	78.0	2750.0	254.0	235.0	93.0	133.2	129.3	217.7	237.5	106.1	104.9	82.5	-	-	10.8	179.2	185.9	187.0	209.4	210.3	197.2	226.0	-0.2	205.6
Doğanbey tuzlası	İzmir	89.0	8500.0	366.0	800.0	35.0	-	88.7	170.8	193.8	-	-	-	-	-	23.2	111.7	115.0	122.4	157.2	154.0	142.2	172.9	-0.4	172.4
Doğanbey ilçesi	İzmir	89.0	1810.0	155.0	418.0	49.0	100.9	101.7	185.7	208.3	-	-	-	-	-	11.7	171.5	177.8	179.7	203.7	204.0	191.1	220.2	0.1	187.6
Karakoç	İzmir	65.0	1290.0	90.0	180.0	54.0	105.4	105.7	190.2	212.5	75.8	76.8	-	-	-	14.3	151.8	157.0	160.9	188.8	187.9	175.4	205.1	0.1	177.8
Kızılağaç	İzmir	38.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Seferihisar SH-1	İzmir	107.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cumalı CM-1	İzmir	140.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tuzla TZ-1	İzmir	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CM-3	İzmir	153.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SD_1	İzmir	78.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SD_2	İzmir	85.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SD_3	İzmir	85.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SD_4	İzmir	120.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SD_5	İzmir	141.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SD_6	İzmir	150.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S-1	İzmir	124.0	417.0	37.2	1.4	156.0	163.6	154.8	248.4	263.6	140.2	136.1	-	-	-	11.2	175.6	182.1	183.6	206.7	207.4	194.4	223.4	-0.5	217.4

Spring or Well Name	Province	T (C)	Na^+ (mg/l)	K^+ (mg/l)	Ca^{++} (mg/l)	SiO_2 (mg/l)	A	B	C	D	E	F	G	H	I	Na/K ratio	J	K	L	M	N	O	P	log(√Ca/Na)+2.06	R
S-2	İzmir	102.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S-3A	İzmir	101.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-1	İzmir	115.0	235.0	20.0	36.0	87.0	129.6	126.3	214.1	234.3	-	-	-	-	-	11.8	170.8	177.1	179.1	203.2	203.5	190.6	219.8	0.5	172.5
B-2	İzmir	113.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-3	İzmir	111.0	345.0	30.0	61.0	-	-	-	-	-	-	-	-	-	-	11.5	173.0	179.4	181.2	204.8	205.3	192.3	221.4	0.4	175.7
B-4	İzmir	112.0	390.0	31.0	29.0	-	-	-	-	-	-	-	-	-	-	12.6	164.1	170.0	172.7	198.1	198.1	185.3	214.6	0.2	179.8
ND-1	İzmir	106.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-5	İzmir	114.0	400.0	28.0	12.0	-	-	-	-	-	-	-	-	-	-	14.3	152.1	157.4	161.2	189.0	188.2	175.6	205.4	0.0	181.3
B-6	İzmir	93.0	450.0	23.0	12.0	77.0	123.1	120.8	207.7	228.6	95.0	94.6	-	-	-	19.6	125.1	129.0	135.3	167.9	165.5	153.4	183.9	-0.1	166.8
B-7	İzmir	115.0	420.0	32.0	10.0	124.0	149.6	143.1	234.2	251.6	124.3	121.7	99.1	-	-	13.1	160.0	165.7	168.8	195.1	194.7	182.0	211.5	-0.1	188.6
B-8	İzmir	93.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-9	İzmir	122.0	440.0	31.0	8.0	109.0	142.1	136.8	226.6	245.2	-	-	-	-	-	14.2	152.7	158.0	161.8	189.5	188.7	176.1	205.8	-0.1	187.1
B-10	İzmir	114.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-11	İzmir	109.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BTF-1	İzmir	101.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BTF-2	İzmir	80.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BTF-3	İzmir	98.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BTF-4	İzmir	116.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BD-1	İzmir	140.0	395.0	24.0	27.0	270.0	201.4	185.5	286.8	295.0	183.8	175.5	152.6	-	-	16.5	139.5	144.1	149.1	179.3	177.7	165.4	195.4	0.2	166.5
BD-2	İzmir	133.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BD-3	İzmir	137.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BD-4	İzmir	131.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BD-5	İzmir	91.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BD-6	İzmir	98.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BD-7	İzmir	98.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BD-8	İzmir	128.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BD-9	İzmir	136.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BD-10	İzmir	87.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_1	İzmir	45.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_2	İzmir	48.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_3	İzmir	52.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_4	İzmir	60.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_5	İzmir	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_6	İzmir	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_7	İzmir	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_8	İzmir	105.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_9	İzmir	105.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_10	İzmir	105.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_11	İzmir	105.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_12	İzmir	105.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_13	İzmir	105.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_14	İzmir	112.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_15	İzmir	117.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_16	İzmir	118.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_17	İzmir	120.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_18	İzmir	120.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_19	İzmir	124.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_20	İzmir	124.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_21	İzmir	130.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_22	İzmir	130.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_23	İzmir	131.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_24	İzmir	135.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_25	İzmir	135.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_26	İzmir	135.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_27	İzmir	139.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Spring or Well Name	Province	T (C)	Na^+ (mg/l)	K^+ (mg/l)	Ca^{++} (mg/l)	SiO_2 (mg/l)	A	B	C	D	E	F	G	H	I	Na/K ratio	J	K	L	M	N	O	P	log(√Ca/Na)+2.06	R
Balçova_28	İzmir	140.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_29	İzmir	140.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_30	İzmir	140.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_31	İzmir	140.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_32	İzmir	140.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_33	İzmir	140.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_34	İzmir	140.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_35	İzmir	140.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balçova_36	İzmir	140.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Narlıdere-Yeniköy	İzmir	26.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Narlıdere-Ilıca	İzmir	60.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Narlıdere (N-1)	İzmir	95.0	400.0	15.0	12.0	100.0	137.2	132.7	221.7	241.0	110.5	109.0	-	-	-	26.7	101.6	104.5	112.6	148.9	145.2	133.6	164.5	0.0	149.7
ÖB-1	Aydın	203.0	1355.0	45.0	50.0	140.0	-	-	241.6	257.9	-	-	-	-	-	30.1	-	-	-	-	-	-	-	-0.2	151.9
ÖB-2	Aydın	232.0	1830.0	189.0	1.6	160.0	-	-	250.0	264.9	-	-	-	-	-	9.7	-	-	-	-	-	-	234.9	-1.1	260.0
ÖB-3	Aydın	232.0	1775.0	170.0	1.6	55.0	-	-	-	213.3	-	-	-	-	-	10.4	-	-	-	-	-	-	228.9	-1.1	253.7
ÖB-4	Aydın	217.0	1420.0	135.0	12.0	53.0	-	-	-	211.7	-	-	-	-	-	10.5	-	-	-	-	212.7	-	228.3	-0.6	224.8
ÖB-5	Aydın	225.0	1387.0	128.0	8.4	209.0	-	-	268.1	279.8	-	-	-	-	-	10.8	-	-	-	-	-	-	226.0	-0.6	226.2
ÖB-6	Aydın	224.0	1775.0	180.0	3.6	41.0	-	-	-	200.6	-	-	-	-	-	9.9	-	-	-	-	218.2	-	233.4	-0.9	248.0
ÖB-7	Aydın	227.0	1100.0	132.0	19.0	214.0	-	-	269.7	281.2	-	-	-	-	-	8.3	-	-	-	230.3	233.1	-	247.3	-0.3	229.5
ÖB-8	Aydın	219.9	1550.0	15.0	8.0	286.0	-	-	291.3	298.6	-	-	-	-	-	103.3	-	-	-	-	-	-	-	-0.7	-
ÖB-9	Aydın	223.8	1750.0	105.0	4.8	286.0	-	-	291.3	298.6	-	-	-	-	-	16.7	-	-	-	-	-	-	-	-0.8	209.7
Alangüllü-1	Aydın	58.0	1120.0	86.0	158.0	88.0	130.2	126.8	214.7	234.8	102.7	101.8	79.5	-	-	13.0	160.8	166.5	169.5	195.6	195.3	182.6	212.1	0.1	181.6
Alangüllü-2	Aydın	70.0	1085.0	78.0	23.4	71.0	118.9	117.2	203.5	224.8	90.4	90.4	-	-	-	13.9	154.6	160.0	163.6	190.9	190.2	177.6	207.3	-0.3	195.2
Bozköy spring	Aydın	62.0	1360.0	84.0	77.0	110.0	142.6	137.2	227.2	245.6	116.5	114.5	92.0	-	-	16.2	140.9	145.6	150.5	180.4	178.9	166.5	196.6	-0.1	179.8
Aydın Kaynagi	Aydın	62.0	82.0	88.0	124.0	48.0	99.9	100.9	184.7	207.4	69.8	71.3	-	-	-	0.9	-	-	-	-	-	-	-	1.2	-
Çamköy çamur	Aydın	92.0	1550.0	75.0	32.0	47.0	98.9	100.1	183.8	206.5	-	-	-	-	-	20.7	120.7	124.4	131.0	164.4	161.8	149.8	180.3	-0.4	176.9
Gümüşköy hamam	Aydın	38.7	640.0	44.0	113.0	100.0	137.2	132.7	221.7	241.0	110.5	109.0	86.6	38.0	-	14.5	150.5	155.6	159.7	187.8	186.8	174.3	204.1	0.3	168.9
Sazlıgöl	Aydın	27.0	349.0	32.5	362.5	-	-	-	-	-	-	-	-	-	-	10.7	180.0	186.8	187.8	210.0	211.0	197.9	226.7	0.8	87.8
AK-1	Aydın	26.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Davutlar Ilıca	Aydın	43.0	36.0	2.0	580.0	51.0	102.7	103.4	187.5	210.0	72.9	74.1	52.3	-	-	18.0	131.9	136.1	141.8	173.3	171.3	159.1	189.4	1.9	-
Davutlar	Aydın	42.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Adsız Ayd1	Aydın	41.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bataklık (Karina)	Aydın	26.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09/30434 (DSı)	Aydın	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09/30434/B (DSı)	Aydın	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ayter-1	Aydın	84.5	1560.0	144.0	60.0	64.0	113.7	112.8	198.4	220.1	84.7	85.1	-	-	-	10.8	179.1	185.9	187.0	209.3	210.2	197.2	226.0	-0.2	207.9
Ayter-2	Aydın	101.5	1080.0	128.0	22.0	75.0	121.7	119.6	206.3	227.4	-	-	-	-	-	8.4	206.7	215.1	213.0	229.3	232.0	218.5	246.2	-0.3	226.6
Yılmazköy (Y-1)	Aydın	142.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Imamköy	Aydın	38.0	51.0	84.0	90.0	43.0	94.9	96.6	179.8	202.6	64.5	66.2	44.7	-	-	0.6	-	-	-	-	-	-	-	1.3	-
Nardere	Aydın	37.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ilıcabaşı	Aydın	34.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AS-1	Aydın	167.0	1100.0	100.0	20.0	100.0	-	-	221.7	241.0	-	-	-	-	-	11.0	177.5	184.2	185.5	208.2	208.9	195.9	224.8	-0.3	211.1
AS-2	Aydın	172.0	1100.0	90.0	14.0	178.0	172.2	-	257.0	270.8	-	-	-	-	-	12.2	-	173.0	175.4	200.3	200.4	187.5	216.8	-0.4	208.3
Salavatlı	Aydın	40.5	45.0	3.6	104.0	43.0	94.9	96.6	179.8	202.6	64.5	66.2	44.7	-	-	12.5	164.7	170.7	173.3	198.6	198.6	185.8	215.1	1.4	-
Güvendik	Aydın	37.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malgaçemir	Aydın	30.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Seferihisar SH-2	İzmir	40.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ortakçı	Aydın	51.0	252.0	17.0	38.0	60.0	110.5	110.0	195.2	217.2	81.3	81.9	60.0	-	-	14.8	148.8	153.8	158.0	186.4	185.4	172.9	202.7	0.4	161.4
Sarayköy-Tırkaz_1	Denizli	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarayköy-Tırkaz_2	Denizli	110.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarayköy-Tırkaz_3	Denizli	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarayköy-Tırkaz_4	Denizli	120.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarayköy-Tırkaz_5	Denizli	85.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarayköy-Tırkaz_6	Denizli	85.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarayköy-Tırkaz_7	Denizli	85.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Spring or Well Name	Province	T (C)	Na^+ (mg/l)	K^+ (mg/l)	Ca^{++} (mg/l)	SiO_2 (mg/l)	A	B	C	D	E	F	G	H	I	Na/K ratio	J	K	L	M	N	O	P	log(√Ca/Na)+2.06	R
Sarayköy-Tırkaz_8	Denizli	85.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarayköy-Tırkaz_9	Denizli	85.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarayköy-Tırkaz_10	Denizli	85.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarayköy-Tırkaz_11	Denizli	120.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarayköy-Tekkeköyü_1	Denizli	72.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarayköy-Tekkeköyü_2	Denizli	72.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarayköy-Tekkeköyü_3	Denizli	72.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarayköy-Tekkeköyü_4	Denizli	90.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarayköy-Tekkeköyü_5	Denizli	90.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarayköy-Tekkeköyü_6	Denizli	84.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarayköy-Tekkeköyü_7	Denizli	62.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarayköy-Tekkeköyü_8	Denizli	84.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarayköy-Tekkeköyü_9	Denizli	72.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarayköy-Gerali	Denizli	120.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KD-1	Denizli	203.0	1468.0	174.3	2.8	227.0	-	-	273.9	284.6	-	-	-	-	-	8.4	206.9	215.3	213.2	229.4	232.2	218.6	246.4	-0.9	258.0
KD-1/A	Denizli	198.0	1252.0	132.8	0.9	-	-	-	-	-	-	-	-	-	-	9.4	194.0	201.7	201.1	220.2	222.1	208.8	237.1	-1.1	259.7
KD-2	Denizli	175.0	1225.0	108.0	10.7	277.5	203.4	187.1	288.9	296.7	186.2	177.6	-	-	-	11.3	174.4	180.9	182.5	205.8	206.4	193.4	222.4	-0.5	218.0
KD-3	Denizli	155.0	1261.2	124.5	2.0	-	-	-	-	-	-	-	-	-	-	10.1	186.2	193.4	193.7	214.5	215.9	202.7	231.3	-0.9	245.0
KD-4	Denizli	166.0	1253.8	131.5	1.7	260.0	198.6	183.2	284.0	292.7	180.5	172.5	-	-	-	9.5	192.8	200.3	199.9	219.3	221.1	207.8	236.1	-0.9	251.1
KD-111	Denizli	164.0	1040.0	90.0	3.2	-	-	-	-	-	-	-	-	-	-	11.6	172.5	178.9	180.7	204.4	204.9	191.9	221.0	-0.7	226.2
KD-6	Denizli	196.0	1220.0	116.0	1.0	430.0	238.9	215.2	326.4	325.7	228.7	215.3	-	-	-	10.5	-	-	-	211.6	212.7	199.6	228.3	-1.0	249.7
KD-9	Denizli	170.0	1120.0	49.8	6.9	248.0	195.1	180.4	280.4	289.9	176.4	168.9	-	-	-	22.5	-	-	-	-	-	-	174.9	-0.6	180.3
KD-8	Denizli	193.0	1492.0	88.0	18.0	-	-	-	-	-	-	-	-	-	-	17.0	-	-	-	-	-	-	193.4	-0.5	192.5
KD-12	Denizli	160.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KD-7	Denizli	208.0	1420.0	164.0	2.2	123.0	-	-	233.7	251.2	-	-	-	-	-	8.7	203.7	211.9	210.2	227.1	229.7	216.2	244.1	-0.9	258.1
KD-14	Denizli	210.2	1410.0	152.0	2.0	125.0	-	-	234.7	252.1	-	-	-	-	-	9.3	-	-	-	221.5	223.5	210.2	238.4	-0.9	254.0
KD-13	Denizli	201.4	1300.0	138.0	2.0	120.0	-	-	232.2	250.0	-	-	-	-	-	9.4	-	201.7	201.2	220.3	222.2	208.8	237.1	-0.9	250.9
KD-15	Denizli	209.4	1340.0	138.0	2.0	125.0	-	-	234.7	252.1	-	-	-	-	-	9.7	-	-	-	217.9	219.5	206.3	234.7	-0.9	249.4
KD-16	Denizli	207.0	1400.0	148.0	2.2	550.0	261.2	232.6	353.6	343.7	256.2	239.4	217.1	-	-	9.5	-	201.3	-	220.0	221.8	208.5	236.8	-0.9	251.2
KD-17	Denizli	157.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KD-22	Denizli	204.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KD-21	Denizli	205.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KD-20	Denizli	204.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KD-R1	Denizli	242.0	1556.0	245.0	2.7	416.0	-	-	323.2	323.4	-	-	-	-	-	6.4	242.3	253.1	246.4	254.1	259.3	245.1	271.3	-0.9	281.9
KD-R2	Denizli	204.5	1290.0	110.0	1.6	380.0	228.3	206.9	314.9	317.2	215.9	204.1	-	-	-	11.7	-	-	-	203.3	203.7	190.8	219.9	-0.9	237.9
Babacık	Denizli	65.0	860.0	113.0	266.0	136.0	155.1	147.7	239.8	256.4	130.5	127.4	104.7	-	-	7.6	219.0	228.2	224.6	238.0	241.6	227.8	255.1	0.3	202.3
Demirtaş	Denizli	100.0	650.0	46.0	50.0	198.0	179.3	167.6	264.3	276.7	158.0	152.4	129.5	-	-	14.1	153.1	158.4	162.2	189.8	189.0	176.4	206.1	0.1	177.8
Tekkeköy (TH-1)	Denizli	116.0	530.0	64.0	217.0	190.0	176.5	165.3	261.4	274.4	154.8	149.5	126.7	-	-	8.3	208.9	217.4	215.1	230.8	233.7	220.1	247.8	0.5	190.0
Tekkeköy (TH-2)	Denizli	168.0	525.0	60.0	210.0	192.0	177.2	165.9	262.2	275.0	-	-	-	-	-	8.8	202.4	210.6	209.0	226.3	228.7	215.2	243.2	0.5	187.0
Tekkehamamı (17 springs)	Denizli	99.0	995.0	95.0	16.0	120.0	147.6	141.5	232.2	250.0	122.1	119.7	97.1	-	-	10.5	182.7	189.6	190.3	211.9	213.0	199.9	228.6	-0.3	214.4
Inaltı Uyuz (4 springs)	Denizli	95.0	984.0	99.0	45.0	160.0	165.2	156.1	250.0	264.9	142.0	137.8	115.1	-	-	9.9	188.2	195.5	195.6	216.0	217.5	204.3	232.8	-0.1	206.8
Bölmekaya	Denizli	36.0	23.5	9.8	1.5	100.0	137.2	132.7	221.7	241.0	110.5	109.0	86.6	38.0	-	2.4	-	-	-	-	-	-	-	0.8	256.6
Efe	Denizli	25.0	-	-	100.2	18.0	59.5	65.5	144.0	166.5	27.3	31.1	-	-	-	-	-	-	-	-	-	-	-	-	-
KD-1	İzmir	35.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Akköy_1	Denizli	60.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Akköy_2	Denizli	60.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Buldan	Denizli	60.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YK-1	Denizli	57.0	477.0	108.0	134.0	40.0	91.7	93.8	176.6	199.5	61.1	63.0	-	-	-	4.4	-	-	-	-	-	-	-	0.4	231.5
YK-2	Denizli	67.0	478.0	107.0	122.0	37.0	88.3	90.8	173.2	196.2	57.4	59.6	-	-	-	4.5	-	-	-	-	-	-	-	0.4	231.9
YK-3	Denizli	36.0	122.0	21.9	177.0	23.0	68.8	73.7	153.5	176.4	36.9	40.2	-	-	-	5.6	-	-	-	-	-	-	-	1.1	78.8
Yenice (Çizmeli)	Denizli	40.8	260.0	42.0	300.0	100.0	137.2	132.7	221.7	241.0	110.5	109.0	86.6	38.0	-	6.2	-	-	-	-	-	-	-	0.9	97.8
Kamara	Denizli	27.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DG-1	Denizli	88.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DG-2	Denizli	73.0	245.0	50.5	106.0	73.1	120.4	118.5	205.0	226.2	92.0	91.9	-	-	-	4.9	-	-	-	-	-	-	-	0.7	213.6
DG-3	Denizli	66.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Spring or Well Name	Province	T (C)	Na^+ (mg/l)	K^+ (mg/l)	Ca^{++} (mg/l)	SiO_2 (mg/l)	A	B	C	D	E	F	G	H	I	Na/K ratio	J	K	L	M	N	O	P	log(√Ca/Na)+2.06	R
DG-5	Denizli	62.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gölemezli	Denizli	57.0	540.0	56.0	420.0	160.0	165.2	156.1	250.0	264.9	142.0	137.8	115.1	65.5	-	9.6	191.5	199.0	198.7	218.4	220.1	206.8	235.2	0.6	176.0
DG-4	Denizli	70.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Interoni	Denizli	50.0	119.0	20.0	475.0	56.0	107.2	107.2	191.9	214.1	77.7	78.5	56.7	-	-	6.0	-	-	-	-	-	-	-	1.3	55.7
Yukarı şanlı	Denizli	34.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Köyiçi Kaynak 1	Denizli	50.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Köyiçi Kaynak 2	Denizli	41.0	105.0	20.0	505.0	50.0	101.8	102.6	186.6	209.2	71.9	73.2	51.4	-	-	5.3	-	-	-	-	-	-	-	1.4	53.4
Hanife Sırtı	Denizli	27.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
La Fonten Motel	Denizli	34.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kırmızı su	Denizli	55.0	120.0	21.0	480.0	55.0	106.3	106.4	191.1	213.3	76.7	77.7	55.8	-	-	5.7	-	-	-	-	-	-	-	1.3	57.0
Denizli_1	Denizli	61.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Denizli_2	Denizli	61.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Denizli_3	Denizli	61.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Denizli_4	Denizli	35.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Denizli_5	Denizli	35.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Denizli_6	Denizli	35.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Denizli_7	Denizli	35.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Denizli_8	Denizli	35.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Beltes	Denizli	59.0	130.0	22.0	530.0	43.0	94.9	96.6	179.8	202.6	64.5	66.2	-	-	-	5.9	-	-	-	-	-	-	-	1.3	57.2
Özel ıdare	Denizli	34.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jandarma	Denizli	34.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Çocuk Bahçesi	Denizli	34.5	38.0	48.0	450.0	55.0	106.3	106.4	191.1	213.3	76.7	77.7	55.8	-	-	0.8	-	-	-	-	-	-	-	1.8	71.6
Beylerli-1	Denizli	39.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Beylerli	Denizli	31.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Karaada kaynağı	Muğla	32.0	12.0	791.0	685.0	1.0	-	-	42.5	53.6	-	-	-	-	-	0.0	-	-	-	-	-	-	-	2.4	-
Gölbaşı	Muğla	28.0	3461.0	336.0	320.0	1.0	-	-	42.5	53.6	-	-	-	-	-	10.3	184.4	191.5	192.0	213.2	214.5	201.3	230.0	-0.2	210.2
Ilıca	Muğla	26.0	6472.0	714.0	540.0	1.0	-	-	42.5	53.6	-	-	-	-	-	9.1	198.4	206.3	205.2	223.4	225.6	212.2	240.3	-0.4	226.1
Sultaniye kubbeli hamam	Muğla	41.1	4840.0	160.0	601.0	19.1	61.7	67.4	146.3	168.9	-	-	-	-	-	30.3	92.8	95.3	104.0	141.7	137.5	126.1	157.1	-0.2	152.2
Sultaniye küçük hamam	Muğla	40.9	9400.0	289.0	962.0	33.0	83.4	86.5	168.3	191.4	52.2	54.7	-	-	-	32.5	88.0	90.3	99.3	137.6	133.2	121.9	152.9	-0.4	155.6
Sultaniye içmece alt kısım	Muğla	41.1	8840.0	290.0	962.0	30.0	79.4	83.1	164.3	187.4	48.1	50.8	-	-	-	30.5	92.3	94.8	103.5	141.2	137.0	125.6	156.7	-0.4	157.7
Delibey girme	Muğla	37.5	8200.0	270.0	882.0	30.0	79.4	83.1	164.3	187.4	48.1	50.8	-	-	-	30.4	92.6	95.0	103.8	141.4	137.2	125.8	156.9	-0.4	157.4
Rıza çavuş girmesi-1	Muğla	39.0	8800.0	288.0	882.0	31.0	80.8	84.2	165.7	188.8	49.5	52.1	-	-	-	30.6	92.2	94.6	103.3	141.1	136.9	125.5	156.5	-0.4	158.2
Rıza çavuş girmesi-2	Muğla	39.0	8800.0	288.0	962.0	8.0	-	40.9	114.0	134.2	-	-	-	-	-	30.6	92.2	94.6	103.3	141.1	136.9	125.5	156.5	-0.4	157.5
Rıza çavuş girmesi-3	Muğla	34.0	5640.0	176.0	721.0	18.0	59.5	65.5	144.0	166.5	-	31.1	-	-	-	32.0	89.0	91.3	100.2	138.4	134.0	122.7	153.8	-0.3	150.4
Gelgirme	Muğla	37.0	7100.0	232.0	801.0	28.0	76.6	80.6	161.5	184.5	45.1	48.0	-	-	-	30.6	92.1	94.5	103.2	141.0	136.8	125.4	156.4	-0.3	155.5
Çürükardı	Muğla	29.0	4083.0	347.0	354.0	9.4	37.3	45.5	119.8	140.6	-	-	-	-	-	11.8	170.7	177.0	179.0	203.1	203.4	190.5	219.6	-0.3	204.5
Kokaksu	Zonguldak	27.0	9.0	2.0	305.0	28.0	76.6	80.6	161.5	184.5	45.1	48.0	26.9	-	-	4.5	-	-	-	-	-	-	-	2.3	-
Kozlu Ilısu	Zonguldak	29.5	12.0	2.0	240.0	31.0	80.8	84.2	165.7	188.8	49.5	52.1	30.9	-	-	6.0	-	-	-	-	-	-	-	2.2	-
Ilıca Mahallesi-1	Kastamonu	28.2	12.0	4.4	96.0	2.6	-	-	74.9	90.5	-	-	-	-	-	2.7	-	-	-	-	-	-	-	2.0	-
Ilıca Mahallesi-2	Kastamonu	28.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Seyhamamı	Ankara	43.0	235.0	47.0	52.0	-	-	-	-	-	-	-	-	-	-	5.0	-	-	-	-	-	-	-	0.5	218.3
Ç-1 (Çavundur)	Çankırı	54.0	2850.0	300.0	32.0	44.0	95.9	97.5	180.8	203.6	65.6	67.3	-	-	-	9.5	193.2	200.8	200.3	219.6	221.4	208.1	236.4	-0.6	236.2
A-1	Çankırı	28.0	23.5	6.0	19.0	108.0	141.5	136.4	226.1	244.7	115.3	113.4	90.9	42.2	-	3.9	-	-	-	-	-	-	-	1.3	67.6
Ç-1 (Çardaklı)	Çankırı	30.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Çavundur	Çankırı	38.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kösehamam	Çankırı	26.5	760.0	108.0	340.0	21.0	65.3	70.6	149.9	172.7	33.3	36.8	-	-	-	7.0	228.8	238.7	233.8	244.8	249.1	235.2	262.0	0.4	202.1
Akkaya	Karabük	35.0	700.0	96.0	212.0	53.0	104.5	104.9	189.3	211.7	74.8	75.9	54.1	-	-	7.3	224.3	233.9	229.6	241.7	245.6	231.8	258.8	0.4	203.0
Arkın	Karabük	26.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Karakoçaş	Çankırı	25.0	27.0	1.6	40.0	14.0	50.5	57.4	134.5	156.4	-	22.3	-	-	-	16.9	137.4	141.8	147.1	177.6	175.9	163.6	193.7	1.4	-
Kızılcahamam_1	Ankara	45.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kızılcahamam_2	Ankara	72.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kızılcahamam_3	Ankara	75.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kızılcahamam_4	Ankara	76.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kızılcahamam_5	Ankara	76.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kızılcahamam_6	Ankara	77.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Spring or Well Name	Province	T (C)	Na^+ (mg/l)	K^+ (mg/l)	Ca^{++} (mg/l)	SiO_2 (mg/l)	A	B	C	D	E	F	G	H	I	Na/K ratio	J	K	L	M	N	O	P	log(√Ca/Na)+2.06	R
MTA-1	Ankara	78.0	720.0	58.0	48.0	-	-	-	-	-	-	-	-	-	-	12.4	165.4	171.4	173.9	199.1	199.1	186.3	215.6	0.0	187.1
KHD-1	Ankara	86.0	680.0	66.0	40.0	64.0	113.7	112.8	198.4	220.1	84.7	85.1	-	-	-	10.3	184.4	191.4	192.0	213.2	214.4	201.3	229.9	0.0	198.4
MTA-7	Ankara	75.0	672.0	58.0	64.0	117.0	146.2	140.2	230.7	248.7	120.5	118.1	95.6	-	-	11.6	172.3	178.6	180.4	204.2	204.7	191.7	220.8	0.1	187.0
Acısu Gebeler kaynağı	Ankara	37.0	530.0	63.8	328.0	26.0	73.6	77.9	158.5	181.5	42.0	45.0	-	-	-	8.3	208.5	217.0	214.7	230.6	233.4	219.8	247.6	0.6	186.0
Kızılcahamam_7	Ankara	51.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aktaş	Bolu	25.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feruz	Ankara	26.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MH-1	Ankara	32.0	40.8	4.0	72.5	25.0	72.0	76.6	156.9	179.8	40.3	43.5	-	-	-	10.3	184.1	191.2	191.7	213.0	214.2	201.1	229.7	1.4	36.2
MH-1/A	Ankara	39.0	49.0	5.9	67.5	25.0	72.0	76.6	156.9	179.8	40.3	43.5	-	-	-	8.4	207.5	216.0	213.8	229.9	232.7	219.1	246.9	1.3	49.4
MH-1/B	Ankara	61.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Melikşah	Ankara	34.0	34.0	2.8	60.0	21.6	66.4	71.5	151.1	173.9	34.4	37.9	-	-	-	12.1	167.6	173.7	176.0	200.7	200.9	188.0	217.3	1.4	-
Kesenözü-Seben_1	Bolu	78.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kesenözü-Seben_2	Bolu	79.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kesenözü	Bolu	72.0	426.0	28.0	41.0	34.0	84.6	87.6	169.6	192.6	-	-	-	-	-	15.2	146.4	151.4	155.8	184.6	183.5	171.0	200.9	0.2	168.3
Dutlu	Ankara	51.0	1200.0	36.0	424.0	39.0	90.6	92.8	175.5	198.4	59.9	61.9	-	-	-	33.3	86.4	88.6	97.7	136.2	131.7	120.5	151.6	0.3	129.4
Beypazarı-Geyikpınarı_1	Ankara	22.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Beypazarı-Geyikpınarı_2	Ankara	22.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Beypazarı-Geyikpınarı_3	Ankara	22.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mağara Kaynağı	Ankara	46.0	1435.0	36.0	435.0	47.0	98.9	100.1	183.8	206.5	68.8	70.3	48.6	-	-	39.9	75.0	76.8	86.6	126.6	121.5	110.5	141.7	0.2	124.2
Travertenli kaynak	Ankara	51.0	1400.0	34.0	412.0	50.0	101.8	102.6	186.6	209.2	71.9	73.2	51.4	-	-	41.2	73.0	74.7	84.6	124.9	119.7	108.7	140.0	0.2	122.9
Erkek-kadın havuzu	Ankara	44.5	1398.0	33.0	478.0	49.0	100.9	101.7	185.7	208.3	70.9	72.2	50.5	-	-	42.4	71.3	72.9	83.0	123.4	118.2	107.2	138.5	0.3	98.1
Erkek-kadın hamamı	Ankara	51.5	1250.0	32.0	440.0	40.0	91.7	93.8	176.6	199.5	61.1	63.0	-	-	-	39.1	76.3	78.1	87.8	127.7	122.7	111.6	142.8	0.3	97.7
Erkekler içmece	Ankara	41.0	1400.0	36.0	475.0	39.0	90.6	92.8	175.5	198.4	59.9	61.9	40.4	-	-	38.9	76.5	78.4	88.1	127.9	122.9	111.8	143.0	0.3	124.3
Kadınlar içmece	Ankara	43.0	1550.0	36.0	442.0	49.0	100.9	101.7	185.7	208.3	70.9	72.2	50.5	-	-	43.1	70.3	71.9	82.0	122.6	117.3	106.4	137.6	0.2	122.0
Tahtalı hamam	Ankara	51.0	1380.0	36.0	440.0	49.0	100.9	101.7	185.7	208.3	70.9	72.2	50.5	-	-	38.3	77.4	79.3	89.0	128.7	123.7	112.6	143.8	0.2	125.2
Ayaş içmeceleri	Ankara	51.0	2500.0	32.4	480.0	68.0	116.7	115.4	201.4	222.9	88.0	88.2	66.1	-	-	77.2	-	-	50.8	94.6	87.9	77.7	109.0	0.0	104.8
Çoban hamamı	Ankara	52.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ayaş_1	Ankara	31.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Güdül_1	Ankara	58.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ayaş_2	Ankara	30.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ayaş (AK-1)	Ankara	31.0	75.0	4.3	35.0	49.0	100.9	101.7	185.7	208.3	70.9	72.2	50.5	-	-	17.4	134.6	138.9	144.4	175.4	173.5	161.3	191.5	1.0	57.1
Ayaş (AK-2)	Ankara	31.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Karakaya	Ankara	31.0	74.0	4.2	44.0	38.0	89.4	91.8	174.3	197.3	58.7	60.8	39.3	-	-	17.6	133.7	138.0	143.6	174.7	172.8	160.6	190.8	1.0	52.0
Malıköy-1	Ankara	28.5	1225.0	420.0	155.7	25.0	72.0	76.6	156.9	179.8	40.3	43.5	-	-	-	2.9	-	-	-	-	-	-	-	0.1	-
Ilıcapınar	Ankara	28.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarıoba	Ankara	33.0	107.0	5.2	126.0	22.0	67.1	72.2	151.8	174.6	35.1	38.5	-	-	-	20.6	121.1	124.8	131.4	164.7	162.1	150.1	180.6	1.1	42.1
Karacaahmet	Ankara	38.0	3500.0	76.0	431.0	79.0	124.4	121.9	209.0	229.8	96.4	96.0	73.8	-	-	46.1	66.3	67.8	78.1	119.1	113.7	102.8	134.1	-0.2	130.8
Hamamkarahisar	Eskişehir	35.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
G.Konak kaynak 1	Eskişehir	31.0	1.2	15.6	100.0	17.0	57.4	63.6	141.8	164.2	25.2	29.1	-	-	-	0.1	-	-	-	-	-	-	-	3.0	35.8
G.Konak kaynak 2	Eskişehir	30.0	1.1	16.0	95.0	21.0	65.3	70.6	149.9	172.7	33.3	36.8	-	-	-	0.1	-	-	-	-	-	-	-	3.0	36.6
G.Konak kaynak 3	Eskişehir	27.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
G.Konak kaynak 4	Eskişehir	27.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kürttaciri	Ankara	26.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Adsız Ank7	Ankara	44.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Adsız Ank8	Ankara	44.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1 Nolu Kuyu	Ankara	44.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/A Nolu Kuyu	Ankara	43.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3 Nolu Kuyu	Ankara	44.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4 Nolu Kuyu	Ankara	43.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Haymana kaynağı	Ankara	45.0	36.0	7.0	118.0	32.0	82.1	85.4	167.0	190.1	50.9	53.4	-	-	-	5.1	-	-	-	-	-	-	-	1.5	41.5
Uyuz hamamı	Ankara	34.0	32.0	5.9	124.0	26.0	73.6	77.9	158.5	181.5	42.0	45.0	-	-	-	5.4	-	-	-	-	-	-	-	1.6	35.3
Karahamzalı	Ankara	28.0	76.0	5.2	132.0	18.0	59.5	65.5	144.0	166.5	27.3	31.1	-	-	-	14.6	150.0	155.2	159.2	187.4	186.5	173.9	203.7	1.2	38.3
Sabanca	Ankara	27.0	490.0	17.2	124.0	32.0	82.1	85.4	167.0	190.1	50.9	53.4	32.2	-	-	28.5	97.0	99.6	108.0	145.1	141.1	129.6	160.6	0.4	94.5
Ilıcapınar	Konya	29.0	350.0	21.0	612.0	32.0	82.1	85.4	167.0	190.1	50.9	53.4	32.2	-	-	16.7	138.4	143.0	148.1	178.4	176.8	164.5	194.6	0.9	62.7
Eskimüshilsu	Konya	33.0	380.0	23.0	600.0	37.5	88.9	91.3	173.8	196.8	58.0	60.2	38.8	-	-	16.5	139.2	143.8	148.8	179.0	177.4	165.1	195.2	0.9	66.6

Spring or Well Name	Province	T (C)	Na^+ (mg/l)	K^+ (mg/l)	Ca^{++} (mg/l)	SiO_2 (mg/l)	A	B	C	D	E	F	G	H	I	Na/K ratio	J	K	L	M	N	O	P	$\log(\sqrt{Ca}/Na)+2.06$	R
MTA-1	Konya	42.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MTA-2	Konya	42.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acıgöl	Karaman	26.5	1656.0	392.0	7.0	2.6	-	-	74.9	90.5	-	-	-	-	-	4.2	-	-	-	-	-	-	-	-0.7	-
Ilgın kaynakları	Konya	49.0	45.0	9.6	130.0	41.0	92.8	94.7	177.7	200.6	62.2	64.1	-	-	-	4.7	-	-	-	-	-	-	-	1.5	50.3
SJ-1	Konya	41.6	58.0	8.8	68.0	22.0	67.1	72.2	151.8	174.6	-	38.5	-	-	-	6.6	237.4	247.8	241.8	250.7	255.5	241.5	267.9	1.2	62.6
SJ-2	Konya	41.6	63.0	2.4	60.0	30.0	79.4	83.1	164.3	187.4	48.1	50.8	-	-	-	26.3	102.8	105.6	113.6	149.9	146.2	134.6	165.5	1.1	-
SJ-2A	Konya	41.6	52.0	11.0	106.0	32.0	82.1	85.4	167.0	190.1	50.9	53.4	-	-	-	4.7	-	-	-	-	-	-	-	1.4	59.3
Ilgın-Çavuşçugöl 1	Konya	27.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ilgın-Çavuşçugöl 2	Konya	27.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ilgın-Çavuşçugöl 3	Konya	25.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ilgın-Çavuşçugöl 4	Konya	30.0	15.0	2.8	77.0	17.0	57.4	63.6	141.8	164.2	25.2	29.1	-	-	-	5.4	-	-	-	-	-	-	-	1.8	-
Köşkköy kaplıca kaynağı	Konya	35.0	33.0	2.8	210.0	42.0	93.9	95.7	178.7	201.6	63.4	65.2	43.6	-	-	11.8	170.5	176.8	178.8	203.0	203.3	190.4	219.5	1.7	-
Köşkköy (K-1)	Konya	35.0	40.0	1.6	216.0	32.0	82.1	85.4	167.0	190.1	50.9	53.4	32.2	-	-	25.0	106.3	109.3	117.1	152.8	149.3	137.6	168.4	1.6	-
Hüyük	Konya	39.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1. Kaynak	Konya	25.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Kaynak	Konya	26.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selçuklu-Yenice	Konya	37.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ilıca kaynağı	Konya	35.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yeşildağ Çamurluk sondajı	Konya	34.5	33.0	24.0	8.4	15.0	53.0	59.6	137.0	159.1	-	-	-	-	-	1.4	-	-	-	-	-	-	-	1.0	-
Seydişehir ılıca kaynağı (1)	Konya	32.0	17.6	3.3	103.4	15.0	53.0	59.6	137.0	159.1	-	-	-	-	-	5.3	-	-	-	-	-	-	-	1.8	-
Höyük tepenin GD	Konya	27.1	68.0	15.0	126.0	28.0	76.6	80.6	161.5	184.5	45.1	48.0	26.9	-	-	4.5	-	-	-	-	-	-	-	1.3	67.8
Savcılı ılıca	Kırşehir	34.8	110.0	1.0	6.0	60.0	110.5	110.0	195.2	217.2	81.3	81.9	60.0	-	-	110.0	-	-	34.3	79.5	72.2	62.3	93.5	0.4	52.7
Büyükboğa kaynağı	Kırşehir	34.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB-1	Kırşehir	35.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB-2	Kırşehir	34.5	106.0	1.0	4.4	51.0	102.7	103.4	187.5	210.0	72.9	74.1	52.3	-	-	106.0	-	-	36.0	81.0	73.7	63.9	95.0	0.4	58.2
SB-3	Kırşehir	25.0	104.0	1.1	13.0	47.0	98.9	100.1	183.8	206.5	68.8	70.3	48.6	-	-	94.5	28.9	29.1	41.1	85.8	78.7	68.7	99.9	0.6	40.8
SB-4	Kırşehir	19.0	104.0	1.3	5.6	50.0	101.8	102.6	186.6	209.2	71.9	73.2	51.4	-	-	80.0	36.8	37.3	49.0	93.0	86.3	76.1	107.3	0.4	61.0
SB-5	Kırşehir	20.0	106.0	1.0	4.4	51.0	102.7	103.4	187.5	210.0	72.9	74.1	52.3	-	-	106.0	23.7	23.8	36.0	81.0	73.7	63.9	95.0	0.4	58.2
Terme	Kırşehir	41.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Terme-1	Kırşehir	60.0	174.0	13.0	304.0	34.0	84.6	87.6	169.6	192.6	-	56.0	-	-	-	13.4	158.2	163.8	167.0	193.7	193.2	180.5	210.1	1.1	55.5
Terme-2	Kırşehir	50.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Terme-3	Kırşehir	40.0	100.0	7.7	240.0	27.0	75.1	79.3	160.0	183.0	43.5	46.5	-	-	-	13.0	161.1	166.8	169.8	195.8	195.6	182.8	212.3	1.3	40.5
Terme-4	Kırşehir	37.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Terme-5	Kırşehir	57.0	213.0	15.0	174.0	39.0	90.6	92.8	175.5	198.4	59.9	61.9	-	-	-	14.2	152.7	157.9	161.8	189.4	188.7	176.1	205.8	0.9	73.0
Terme-6	Kırşehir	56.0	190.0	6.4	265.0	47.0	98.9	100.1	183.8	206.5	68.8	70.3	-	-	-	29.7	94.1	96.6	105.3	142.7	138.6	127.2	158.2	1.0	-
Terme-7	Kırşehir	45.0	160.0	11.0	242.0	37.0	88.3	90.8	173.2	196.2	57.4	59.6	-	-	-	14.5	150.5	155.6	159.7	187.8	186.8	174.3	204.1	1.0	54.3
Terme-8	Kırşehir	32.0	55.0	3.9	95.0	42.0	93.9	95.7	178.7	201.6	63.4	65.2	43.6	-	-	14.1	153.3	158.6	162.4	189.9	189.2	176.6	206.3	1.3	33.9
Terme-12	Kırşehir	56.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Karakurt kaynağı	Kırşehir	50.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Türbe kaynağı	Kırşehir	31.0	68.0	8.0	192.0	47.0	98.9	100.1	183.8	206.5	68.8	70.3	48.6	-	-	8.5	205.8	214.2	212.2	228.7	231.3	217.8	245.6	1.4	42.1
Yarma kaynağı	Kırşehir	32.0	75.0	8.0	188.0	47.0	98.9	100.1	183.8	206.5	68.8	70.3	48.6	-	-	9.4	194.7	202.3	201.7	220.7	222.6	209.2	237.5	1.3	43.3
Karakurt-1	Kırşehir	51.0	72.0	11.0	135.0	52.0	103.6	104.1	188.4	210.9	73.9	75.0	53.2	-	-	6.5	238.3	248.8	242.6	251.3	256.2	242.2	268.6	1.3	57.8
Kıran köyü kuyusu	Kırşehir	34.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kaplıca kaynağı	Kayseri	41.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Açık kaynak	Kayseri	44.8	130.0	8.8	96.0	35.0	85.9	88.7	170.8	193.8	54.9	57.2	-	-	-	14.8	149.1	154.1	158.3	186.7	185.7	173.2	203.0	0.9	63.7
Kocasinan_1	Kayseri	39.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kocasinan_2	Kayseri	29.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sevincili maden suyu	Nevşehir	25.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gölbağları maden suyu	Nevşehir	26.5	740.0	37.0	103.0	131.0	152.9	145.8	237.5	254.5	128.0	125.0	102.4	53.3	31.1	20.0	123.3	127.1	133.6	166.5	164.0	152.0	182.4	0.2	156.1
Çiftgöz kaplıcası	Kayseri	34.5	22.5	3.6	79.0	25.0	72.0	76.6	156.9	179.8	40.3	43.5	-	-	-	6.3	-	-	-	-	-	-	-	1.7	-
Çiftgöz pompa	Kayseri	35.5	14.0	3.6	74.0	25.0	72.0	76.6	156.9	179.8	40.3	43.5	-	-	-	3.9	-	-	-	-	-	-	-	1.8	-
Tekgöz kaplıcası	Kayseri	41.0	15.3	3.6	88.0	25.0	72.0	76.6	156.9	179.8	40.3	43.5	-	-	-	4.3	-	-	-	-	-	-	-	1.8	-
Şelale sıcak suyu	Kayseri	30.0	16.8	2.4	68.0	27.0	75.1	79.3	160.0	183.0	43.5	46.5	25.5	-	-	7.0	229.5	239.4	234.4	245.3	249.6	235.7	262.5	1.8	-
H-1	Kayseri	32.0	16.0	2.2	56.0	25.0	72.0	76.6	156.9	179.8	40.3	43.5	-	-	-	7.3	224.7	234.3	229.9	241.9	245.9	232.1	259.1	1.7	-
H-2	Kayseri	32.0	18.0	2.7	58.0	23.0	68.8	73.7	153.5	176.4	36.9	40.2	-	-	-	6.7	235.9	246.2	240.4	249.7	254.4	240.4	266.9	1.7	-

Spring or Well Name	Province	T (C)	Na^+ (mg/l)	K^+ (mg/l)	Ca^{++} (mg/l)	SiO_2 (mg/l)	A	B	C	D	E	F	G	H	I	Na/K ratio	J	K	L	M	N	O	P	log(√Ca/Na)+2.06	R
Karakimse	Kayseri	25.5	7.0	0.8	48.0	20.0	63.4	69.0	148.0	170.7	31.4	35.0	-	-	-	8.8	202.4	210.6	209.0	226.3	228.7	215.2	243.2	2.1	-
KB-1	Kayseri	38.0	4537.0	235.0	838.0	98.0	136.1	131.8	220.6	240.0	109.2	107.8	85.4	36.9	-	19.3	126.2	130.1	136.3	168.8	166.4	154.3	184.7	-0.1	170.7
Adsız Kays1	Kayseri	41.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kuşçu	Kayseri	36.0	230.0	34.0	44.0	65.0	114.5	113.4	199.1	220.8	85.5	85.9	63.9	-	-	6.8	233.9	244.2	238.6	248.3	252.9	239.0	265.6	0.5	201.0
Yeşilhisar_1	Kayseri	15.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acıgöl_1	Nevşehir	44.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tuzlusu kaynağı	Aksaray	31.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acıköy yanındaki kaynak	Niğde	45.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acıköy içindeki kaynak	Niğde	29.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAR-1	Niğde	65.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MTA-1	Niğde	65.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MTA-2	Niğde	65.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MTA-3	Niğde	65.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ziga Sıcak su kaynakları	Aksaray	52.2	1160.0	150.0	309.0	47.0	98.9	100.1	183.8	206.5	68.8	70.3	48.6	-	-	7.7	217.1	226.1	222.8	236.6	240.1	226.3	253.7	0.2	205.8
Dere içi göl kaynağı	Aksaray	30.0	14.2	52.0	48.0	78.0	123.8	121.4	208.4	229.2	95.7	95.3	73.1	-	-	0.3	-	-	-	-	-	-	-	1.7	-
Göl kaynağı	Aksaray	36.0	46.0	186.0	28.0	131.0	152.9	145.8	237.5	254.5	128.0	125.0	102.4	53.3	31.1	0.2	-	-	-	-	-	-	-	1.1	-
Erkekler hamamı	Aksaray	36.4	11.0	7.1	56.0	54.0	105.4	105.7	190.2	212.5	75.8	76.8	55.0	-	-	1.5	-	-	-	-	-	-	-	1.9	44.6
Kadınlar hamamı	Aksaray	36.3	41.0	20.0	28.0	142.0	157.8	149.9	242.4	258.6	133.5	130.1	107.4	58.1	35.6	2.1	-	-	-	-	-	-	-	1.2	246.1
Çamrama pınar	Aksaray	26.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SK-2	Aksaray	44.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SK-3	Aksaray	25.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yaprakhisar sıcak su kay.	Aksaray	32.9	630.0	30.0	380.0	3.0	-	-	79.8	96.0	-	-	-	-	-	21.0	119.5	123.1	129.8	163.4	160.7	148.7	179.3	0.6	90.7
Derdalan kaplıca kaynağı	Niğde	29.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Büyükotel kaynağı	Niğde	52.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kükürtlü kaynağı	Niğde	53.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Çamaşırlık kaynağı	Niğde	50.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Çelikli kaynağı	Niğde	53.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ÇF-1	Niğde	44.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ÇF-2	Niğde	53.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kükürtlü kaynağı	Konya	28.0	11000.0	100.0	472.0	96.0	134.9	130.8	219.5	239.0	108.0	106.7	84.3	35.8	-	110.0	-	-	34.3	79.5	72.2	62.3	93.5	-0.6	110.2
Saraykent_1	Yozgat	80.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ihlara	Yozgat	39.0	71.0	20.0	48.0	88.0	130.2	126.8	214.7	234.8	102.7	101.8	79.5	-	-	3.6	-	-	-	-	-	-	-	1.0	99.5
Uyuz (Çamur) ılıcası	Yozgat	27.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Çalışkan ılıcası	Yozgat	32.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Karamağara 1	Yozgat	71.0	487.0	62.9	71.9	104.0	139.4	134.6	224.0	242.9	112.9	111.2	88.8	-	-	7.7	216.9	226.0	222.6	236.5	239.9	226.2	253.6	0.3	203.0
Karamağara 2	Yozgat	80.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Karamağara 3	Yozgat	75.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Karamağara 4	Yozgat	80.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bedirbaba kaynağı	Yozgat	47.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yeni Çeltek kaynağı	Yozgat	45.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Saray kaynağı	Yozgat	73.0	390.0	8.0	112.0	77.0	123.1	120.8	207.7	228.6	95.0	94.6	72.5	-	-	48.8	-	-	74.9	116.3	110.6	99.9	131.2	0.5	68.8
Köhne kaynağı	Yozgat	61.0	460.0	10.0	120.0	78.0	123.8	121.4	208.4	229.2	95.7	95.3	73.1	-	-	46.0	66.4	67.9	78.2	119.2	113.7	102.9	134.1	0.4	76.1
Sorgun (YS-1)	Yozgat	75.0	480.0	17.0	120.0	73.0	120.3	118.4	205.0	226.1	91.9	91.8	-	-	-	28.2	97.6	100.3	108.6	145.6	141.7	130.2	161.1	0.4	94.6
Sorgun (YS-3)	Yozgat	69.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sorgun (YS-4)	Yozgat	66.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gündoğan kaynağı	Sivas	26.5	83.0	2.0	0.8	-	-	-	-	-	-	-	-	-	-	41.5	72.5	74.2	84.2	124.5	119.3	108.3	139.6	0.1	126.7
Gündoğan Sondajı	Sivas	29.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kaplıca kaynağı	Tokat	44.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AS-1	Tokat	26.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AS-2	Tokat	51.0	320.0	12.0	100.0	40.0	91.7	93.8	176.6	199.5	61.1	63.0	-	-	-	26.7	101.6	104.5	112.6	148.9	145.2	133.6	164.5	0.6	82.1
AS-3	Tokat	53.0	880.0	32.0	108.0	96.0	134.9	130.8	219.5	239.0	108.0	106.7	84.3	-	-	27.5	99.4	102.2	110.4	147.1	143.3	131.8	162.7	0.1	143.5
AS-4	Tokat	20.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AS-5	Tokat	28.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sıcak Çermik Alanı	Sivas	35.0	220.0	39.0	164.0	27.0	75.1	79.3	160.0	183.0	43.5	46.5	-	-	-	5.6	-	-	-	-	-	-	-	0.8	197.9
Delikkaya Alanı	Sivas	37.0	50.0	8.0	89.0	27.0	75.1	79.3	160.0	183.0	43.5	46.5	-	-	-	6.3	-	-	-	-	-	-	-	1.3	53.2

Spring or Well Name	Province	T (C)	Na^+ (mg/l)	K^+ (mg/l)	Ca^{++} (mg/l)	SiO_2 (mg/l)	A	B	C	D	E	F	G	H	I	Na/K ratio	J	K	L	M	N	O	P	log(√Ca/Na)+2.06	R
Sarıkaya Alanı	Sivas	35.0	215.0	40.0	159.0	44.0	95.9	97.5	180.8	203.6	65.6	67.3	45.7	-	-	5.4	-	-	-	-	-	-	-	0.8	200.6
MTA-1	Sivas	46.5	213.0	40.0	121.0	27.0	75.1	79.3	160.0	183.0	43.5	46.5	-	-	-	5.3	-	-	-	-	-	-	-	0.8	203.7
DSİ-1	Sivas	49.0	210.0	40.0	178.0	27.0	75.1	79.3	160.0	183.0	43.5	46.5	-	-	-	5.3	-	-	-	-	-	-	-	0.9	200.4
DSİ-2	Sivas	49.0	240.0	44.0	125.0	27.0	75.1	79.3	160.0	183.0	43.5	46.5	-	-	-	5.5	-	-	-	-	-	-	-	0.7	204.3
MTA-2	Sivas	49.0	174.0	34.0	22.8	21.5	66.2	71.4	150.9	173.7	-	-	-	-	-	5.1	-	-	-	-	-	-	-	0.5	219.2
MTA-3	Sivas	48.0	200.0	36.0	30.4	27.7	76.1	80.2	161.0	184.1	44.6	47.5	-	-	-	5.6	-	-	-	-	-	-	-	0.5	213.9
MTA-4	Sivas	49.0	220.0	42.0	16.0	12.3	-	53.5	129.6	151.2	-	-	-	-	-	5.2	-	-	-	-	-	-	-	0.3	226.6
Eskiöz kaynağı	Sivas	32.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kaplıca kaynağı	Sivas	36.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Topakkaya kaynağı	Sivas	28.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ortaköy (OR-1)	Sivas	36.0	133.0	22.7	300.0	15.2	53.4	60.0	137.5	159.7	-	-	-	-	-	5.9	-	-	-	-	-	-	-	1.2	69.7
Sarıkaya_1	Yozgat	48.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarıkaya_2	Yozgat	60.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarıkaya_3	Yozgat	42.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarıkaya_4	Yozgat	51.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarıkaya_5	Yozgat	36.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarıkaya_6	Yozgat	25.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarıkaya_7	Yozgat	48.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarıkaya kaynağı	Yozgat	48.0	70.0	8.1	100.0	33.0	83.4	86.5	168.3	191.4	52.2	54.7	-	-	-	8.6	203.9	212.1	210.4	227.3	229.8	216.3	244.2	1.2	54.5
Uyuz kaynağı	Yozgat	46.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kaplıca kaynağı	Yozgat	29.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uzunlu-2	Yozgat	30.0	104.0	10.3	160.0	39.0	90.6	92.8	175.5	198.4	59.9	61.9	40.4	-	-	10.1	186.6	193.7	194.0	214.8	216.2	203.0	231.5	1.1	56.2
Yiğitler GB kaynağı	Nevşehir	39.0	488.0	8.2	294.0	49.0	100.9	101.7	185.7	208.3	70.9	72.2	50.5	-	-	59.5	52.0	52.9	64.0	106.6	100.4	89.9	121.2	0.6	52.8
Boğazlıyan_1	Yozgat	32.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boğazlıyan_2	Yozgat	32.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Büyük kaynak	Yozgat	40.5	600.0	14.0	286.0	46.0	98.0	99.2	182.8	205.5	67.8	69.3	47.6	-	-	42.9	70.6	72.2	82.3	122.8	117.5	106.6	137.8	0.5	71.3
Boğazlıyan (BB-1)	Yozgat	32.0	125.0	10.0	132.0	28.0	76.6	80.6	161.5	184.5	45.1	48.0	26.9	-	-	12.5	164.7	170.7	173.3	198.6	198.6	185.8	215.1	1.0	60.8
Boğazlıyan (BB-2)	Yozgat	46.0	410.0	11.0	289.0	30.0	79.4	83.1	164.3	187.4	48.1	50.8	-	-	-	37.3	79.2	81.1	90.7	130.2	125.3	114.2	145.3	0.7	59.9
Kozaklı_1	Nevşehir	45.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kozaklı_2	Nevşehir	68.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kozaklı_3	Nevşehir	70.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kozaklı_4	Nevşehir	82.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kozaklı_5	Nevşehir	92.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kozaklı_6	Nevşehir	92.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kozaklı_7	Nevşehir	92.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kozaklı_8	Nevşehir	93.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kozaklı_9	Nevşehir	93.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kozaklı_10	Nevşehir	93.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kozaklı_11	Nevşehir	93.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kozaklı_12	Nevşehir	93.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kozaklı_13	Nevşehir	93.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kozaklı_14	Nevşehir	93.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kozaklı_15	Nevşehir	93.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kozaklı_16	Nevşehir	93.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kozaklı_17	Nevşehir	93.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kozaklı_18	Nevşehir	93.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SSK-1	Nevşehir	93.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
K-1	Nevşehir	90.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uyuz (Güven) Aslanağzı	Yozgat	44.0	1878.0	39.0	681.0	29.1	78.2	82.0	163.1	186.1	46.7	49.5	-	-	-	48.2	63.7	65.1	75.6	116.9	111.3	100.5	131.8	0.2	99.2
Yerköy Güven (YK-1)	Yozgat	56.0	2100.0	60.0	821.0	30.0	79.4	83.1	164.3	187.4	48.1	50.8	-	-	-	35.0	83.2	85.3	94.6	133.6	128.9	117.7	148.8	0.2	130.6
Yerköy Uyuz Çamur	Yozgat	56.0	2900.0	70.0	1222.0	22.0	67.1	72.2	151.8	174.6	-	-	-	-	-	41.4	72.6	74.3	84.3	124.6	119.4	108.4	139.6	0.1	125.2
Yerköy_1	Yozgat	65.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mahmutlu küçük hamam	Kırşehir	70.0	819.0	50.8	242.0	58.0	108.9	108.6	193.6	215.7	79.5	80.3	-	-	-	16.1	141.3	146.0	150.9	180.7	179.2	166.8	196.9	0.3	161.4
Mahmutlu (Doğu) kaynağı	Kırşehir	64.0	1044.0	38.4	258.0	57.0	108.0	107.9	192.8	214.9	78.6	79.4	-	-	-	27.2	100.3	103.0	111.2	147.8	144.0	132.4	163.4	0.2	140.0
Mahmutlu (Batı) kaynağı	Kırşehir	64.0	940.0	35.8	260.0	58.0	108.9	108.6	193.6	215.7	79.5	80.3	-	-	-	26.3	102.7	105.6	113.6	149.8	146.2	134.6	165.4	0.3	139.9

Spring or Well Name	Province	T (C)	Na^+ (mg/l)	K^+ (mg/l)	Ca^{++} (mg/l)	SiO_2 (mg/l)	A	B	C	D	E	F	G	H	I	Na/K ratio	J	K	L	M	N	O	P	log(√Ca/Na)+2.06	R
Dere kenarı	Kırşehir	32.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SH-1/C	Samsun	54.0	143.0	6.4	14.0	33.0	83.4	86.5	168.3	191.4	52.2	54.7	-	-	-	22.3	114.7	118.1	125.2	159.6	156.6	144.7	175.4	0.5	96.5
SH-3	Samsun	53.0	146.0	8.4	84.0	34.0	84.6	87.6	169.6	192.6	53.6	56.0	-	-	-	17.4	134.8	139.2	144.7	175.6	173.8	161.5	191.7	0.9	66.2
SH-1	Samsun	54.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SH-4	Samsun	56.0	146.0	4.2	19.0	3.0	-	-	79.8	96.0	-	-	-	-	-	34.8	83.6	85.7	95.0	133.9	129.3	118.1	149.2	0.5	75.5
SH-5	Samsun	54.0	143.0	6.4	14.0	33.0	83.4	86.5	168.3	191.4	52.2	54.7	-	-	-	22.3	114.7	118.1	125.2	159.6	156.6	144.7	175.4	0.5	96.5
Hamamayağı kaynağı	Samsun	36.0	24.0	2.6	60.0	32.0	82.1	85.4	167.0	190.1	50.9	53.4	32.2	-	-	9.2	196.4	204.1	203.3	221.9	223.9	210.6	238.8	1.6	-
HH-1	Samsun	38.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SLH-1	Samsun	38.0	30.0	3.0	48.0	19.0	61.5	67.2	146.1	168.6	-	33.1	-	-	-	10.0	187.6	194.8	195.0	215.5	217.0	203.8	232.3	1.4	33.7
BK-2	Samsun	28.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gözlek_1	Amasya	38.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GS-1	Amasya	40.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GS-2	Amasya	40.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GS-3	Amasya	35.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gözlek	Amasya	39.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Terziköy-1	Amasya	37.2	43.0	4.5	66.0	38.0	89.4	91.8	174.3	197.3	58.7	60.8	39.3	-	-	9.6	192.5	200.1	199.7	219.2	220.9	207.6	236.0	1.3	41.6
Terziköy-2	Amasya	40.1	37.0	6.9	56.5	28.5	77.3	81.2	162.2	185.3	45.8	48.7	-	-	-	5.4	-	-	-	-	-	-	-	1.4	54.7
Ana kaynak	Amasya	37.0	35.0	4.2	73.0	18.0	59.5	65.5	144.0	166.5	-	-	-	-	-	8.3	208.1	216.6	214.4	230.3	233.1	219.6	247.3	1.4	36.4
Mahalle kaynağı	Amasya	32.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Güney kaynağı	Amasya	31.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Figani (F-1)	Çorum	37.0	46.0	4.2	33.0	26.0	73.6	77.9	158.5	181.5	42.0	45.0	-	-	-	11.0	178.0	184.7	185.9	208.5	209.3	196.3	225.1	1.2	52.9
Figani (F-2)	Çorum	37.0	39.0	3.2	29.0	26.0	73.6	77.9	158.5	181.5	42.0	45.0	-	-	-	12.2	167.2	173.3	175.6	200.5	200.6	187.7	217.0	1.2	46.3
Mecitözü	Çorum	37.0	41.0	4.0	37.0	19.0	61.5	67.2	146.1	168.6	-	33.1	-	-	-	10.3	184.9	192.0	192.5	213.6	214.9	201.7	230.3	1.2	48.4
Hamamözü_1	Amasya	42.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H-1	Amasya	42.5	36.0	1.0	32.0	28.0	76.6	80.6	161.5	184.5	45.1	48.0	-	-	-	36.0	81.4	83.4	92.8	132.0	127.3	116.1	147.3	1.3	-
Arkutbey	Amasya	40.0	60.0	1.0	32.0	26.0	73.6	77.9	158.5	181.5	42.0	45.0	-	-	-	60.0	51.5	52.5	63.5	106.2	100.0	89.5	120.8	1.0	-
Hamamlıçay (ÇH-1)	Çorum	30.0	60.0	3.2	55.0	13.0	48.0	55.1	131.7	153.4	-	-	-	-	-	18.8	128.5	132.6	138.6	170.7	168.4	156.3	186.7	1.2	38.8
Hamamlıçay (ÇH-2)	Çorum	28.5	52.0	1.9	45.6	10.0	39.3	47.3	122.1	143.0	-	-	-	-	-	27.4	99.8	102.5	110.8	147.4	143.6	132.0	163.0	1.2	27.8
Hamamlıçay	Çorum	30.0	48.0	1.6	58.0	3.5	-	-	85.1	102.0	-	-	-	-	-	30.0	93.4	95.9	104.6	142.1	138.0	126.6	157.6	1.3	-
Sarıyazı	Tokat	32.0	1460.0	4.2	80.0	31.0	80.8	84.2	165.7	188.8	49.5	52.1	30.9	-	-	347.6	-	-	-	37.9	-	-	50.8	-0.2	58.9
Ayvaz Ilıca kaynağı	Tokat	27.0	98.0	4.2	60.0	23.5	69.7	74.5	154.5	177.4	37.9	41.1	20.3	-	-	23.3	111.4	114.7	122.0	156.9	153.7	141.9	172.7	1.0	48.8
Niksar Korulu kaynağı	Tokat	26.0	920.0	16.0	74.0	-	-	-	-	-	-	-	-	-	-	57.5	53.8	54.8	65.8	108.2	102.2	91.6	122.9	0.0	115.3
Reşadiye Kaplıca kaynağı	Tokat	49.0	760.0	40.0	300.0	-	-	-	-	-	-	-	-	-	-	19.0	127.5	131.5	137.5	169.8	167.5	155.4	185.8	0.4	150.5
RSH-1	Tokat	46.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Akçaağıl kaynağı	Sivas	37.0	1650.0	44.0	41.0	141.0	157.3	149.5	242.0	258.3	133.0	129.6	107.0	57.7	35.2	37.5	78.8	80.7	90.3	129.8	124.9	113.8	145.0	-0.4	146.3
SA-1	Sivas	58.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kalkım	Sivas	29.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ekinözü	Kahramanmaraş	15.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez_Kmaras	Kahramanmaraş	41.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Ilıca	Kahramanmaraş	43.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dere kaynağı	Kahramanmaraş	44.0	17.0	1.3	33.7	-	-	-	-	-	-	-	-	-	-	13.1	160.4	166.1	169.1	195.3	195.0	182.3	211.8	1.6	-
Süleymanlı-1	Kahramanmaraş	43.5	13.0	1.2	54.0	12.0	45.3	52.7	128.7	150.2	-	-	-	-	-	10.8	179.1	185.9	187.0	209.3	210.2	197.2	226.0	1.8	-
Süleymanlı-2	Kahramanmaraş	43.0	13.0	1.2	48.0	-	-	-	-	-	-	-	-	-	-	10.8	179.1	185.9	187.0	209.3	210.2	197.2	226.0	1.8	-
Ilıca-3 (KI-3)	Kahramanmaraş	43.5	16.0	1.2	53.0	25.0	72.0	76.6	156.9	179.8	40.3	43.5	-	-	-	13.3	158.5	164.1	167.4	193.9	193.5	180.8	210.3	1.7	-
KI-4	Kahramanmaraş	49.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KI-5	Kahramanmaraş	49.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kartalköy ıçmecesi-1	Gaziantep	27.0	77.5	4.2	40.1	10.0	39.3	47.3	122.1	143.0	-	-	-	-	-	18.5	129.9	134.0	139.9	171.7	169.5	157.4	187.7	1.0	54.1
Kartalköy ıçmecesi-2	Gaziantep	27.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Haruniye	Osmaniye	33.0	108.0	9.4	378.0	10.0	39.3	47.3	122.1	143.0	-	-	-	-	-	11.5	173.1	179.5	181.2	204.9	205.4	192.4	221.5	1.3	38.5
SK-1	Osmaniye	33.8	94.0	10.0	248.0	43.0	94.9	96.6	179.8	202.6	64.5	66.2	44.7	-	-	9.4	194.4	202.0	201.4	220.5	222.3	209.0	237.3	1.3	46.3
Başlamış Içmecesi	Hatay	33.0	46.0	6.6	135.0	122.0	148.6	142.3	233.2	250.8	123.2	120.7	98.1	49.1	27.2	7.0	230.1	240.0	235.0	245.7	250.0	236.1	262.9	1.5	39.8
Erkekler hamamı	Hatay	32.0	265.0	56.0	20.0	146.0	159.5	151.3	244.2	260.1	135.5	131.9	109.2	59.8	37.2	4.7	-	-	-	-	-	-	-	0.3	235.1
Kadınlar hamamı	Hatay	31.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Koyuncuhöyük kaynağı	Hatay	33.0	88.0	8.8	176.0	58.0	108.9	108.6	193.6	215.7	79.5	80.3	58.4	-	-	10.0	187.6	194.8	195.0	215.5	217.0	203.8	232.3	1.2	48.5
Tahtaköprü	Hatay	27.0	38.0	0.7	56.0	6.0	23.6	33.0	103.9	123.0	-	-	-	-	-	54.3	57.0	58.1	68.9	111.0	105.1	94.4	125.7	1.4	-

Spring or Well Name	Province	T (C)	Na^+ (mg/l)	K^+ (mg/l)	Ca^{++} (mg/l)	SiO_2 (mg/l)	A	B	C	D	E	F	G	H	I	Na/K ratio	J	K	L	M	N	O	P	log(√Ca/Na)+2.06	R
Suluca-1	Hatay	33.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Çoraklı	Artvin	36.0	1900.0	49.0	3.0	-	-	-	-	-	-	-	-	-	-	38.8	76.7	78.5	88.3	128.1	123.1	112.0	143.2	-1.0	168.2
Deliklitaş çermiği	Ardahan	30.0	619.9	38.0	28.1	56.0	107.2	107.2	191.9	214.1	77.7	78.5	56.7	-	-	16.3	140.3	144.9	149.9	179.9	178.3	166.0	196.0	0.0	174.4
Kayabeyi çermiği	Ardahan	27.0	383.0	10.0	144.3	28.0	76.6	80.6	161.5	184.5	45.1	48.0	26.9	-	-	38.3	77.5	79.3	89.0	128.7	123.8	112.7	143.9	0.6	70.3
Susuz	Kars	26.0	931.0	18.8	62.8	103.0	138.9	134.1	223.4	242.4	112.3	110.7	88.2	39.6	-	49.5	62.1	63.4	74.0	115.5	109.8	99.1	130.4	0.0	122.6
Kötek	Kars	26.0	824.0	52.0	26.6	39.0	90.6	92.8	175.5	198.4	59.9	61.9	40.4	-	-	15.8	142.8	147.6	152.3	181.8	180.5	168.1	198.0	-0.1	181.6
Olur	Erzurum	37.0	109.0	1.3	3.4	28.0	76.6	80.6	161.5	184.5	45.1	48.0	-	-	-	83.8	34.6	35.0	46.8	91.0	84.1	74.0	105.2	0.3	71.6
Çermik	Erzurum	45.0	2230.0	145.0	5.4	84.0	127.7	124.7	212.3	232.6	100.0	99.3	77.0	-	-	15.4	145.5	150.4	154.8	183.9	182.7	170.2	200.1	-0.9	218.6
Uzunahmet	Erzurum	35.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PS-1A	Erzurum	42.0	570.0	41.0	104.0	403.0	233.3	210.8	320.2	321.2	221.9	209.3	186.7	136.9	108.6	13.9	154.6	160.0	163.6	190.9	190.3	177.7	207.3	0.3	169.9
PS-2	Erzurum	42.0	920.0	74.0	69.0	169.0	168.8	159.0	253.6	267.9	146.0	141.4	118.7	69.1	45.8	12.4	165.3	171.2	173.8	199.0	199.0	186.2	215.5	0.0	188.2
PS-3	Erzurum	40.0	850.0	60.0	15.0	143.0	158.2	150.3	242.9	259.0	134.0	130.5	107.9	58.5	-	14.2	152.9	158.2	162.0	189.6	188.8	176.3	206.0	-0.3	193.8
PS-4	Erzurum	43.0	2290.0	243.0	371.0	94.0	133.8	129.8	218.3	238.0	106.7	105.5	83.1	-	-	9.4	194.1	201.7	201.1	220.3	222.1	208.8	237.1	0.0	205.7
PS-5	Erzurum	39.0	700.0	81.2	163.0	57.0	108.0	107.9	192.8	214.9	78.6	79.4	57.5	-	-	8.6	204.2	212.4	210.6	227.5	230.0	216.6	244.4	0.3	195.7
Pasinler Asboğa	Erzurum	39.0	875.0	68.0	103.0	144.0	158.6	150.6	243.3	259.4	134.5	131.0	108.3	59.0	36.4	12.9	161.9	167.7	170.6	196.5	196.3	183.5	212.9	0.1	181.7
Kızılçermik	Erzurum	30.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Deliçermik	Erzurum	26.0	205.0	40.0	96.0	66.0	115.2	114.1	199.9	221.5	86.4	86.7	64.6	-	-	5.1	-	-	-	-	-	-	-	0.7	207.6
Büyük Çermik	Erzurum	29.0	341.0	82.5	57.7	101.0	137.8	133.2	222.3	241.5	111.1	109.5	87.1	38.5	-	4.1	-	-	-	-	-	-	-	0.4	238.0
Küçük Çermik	Erzurum	28.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yeşilyayla (Arzuti)	Erzurum	33.0	428.0	2.2	46.6	127.0	151.0	144.3	235.6	252.9	125.9	123.1	100.5	51.4	29.4	194.5	-	-	-	57.6	49.5	40.2	71.0	0.3	49.2
Ilıca (E-1)	Erzurum	39.0	350.0	5.6	245.0	103.0	138.9	134.1	223.4	242.4	112.3	110.7	88.2	39.6	-	62.5	49.4	50.2	61.4	104.3	98.0	87.5	118.9	0.7	42.8
Ilıca (E-1A)	Erzurum	39.0	1398.0	33.0	49.0	109.0	142.1	136.8	226.6	245.2	115.9	114.0	91.5	42.7	-	42.4	71.3	72.9	83.0	123.4	118.2	107.2	138.5	-0.2	136.9
Ilıca (E-2)	Erzurum	39.0	1381.0	56.3	48.5	105.0	139.9	135.0	224.5	243.4	113.5	111.8	89.3	40.7	-	24.5	107.7	110.8	118.4	153.9	150.5	138.8	169.6	-0.2	162.5
Kaplıca kaynağı	Erzurum	39.0	17.5	40.0	51.0	99.0	136.6	132.2	221.2	240.5	109.9	108.4	86.0	37.5	-	0.4	-	-	-	-	-	-	-	1.7	-
Istasyon kaynağı	Erzurum	36.0	1218.0	83.0	28.1	7.1	-	37.5	109.8	129.5	-	-	-	-	-	14.7	149.7	154.8	158.9	187.1	186.2	173.6	203.4	-0.3	192.6
Kazutlar (Kokmuşlar)	Erzurum	38.0	1233.0	49.4	36.6	127.0	151.0	144.3	235.6	252.9	125.9	123.1	100.5	51.4	-	25.0	106.4	109.4	117.2	152.9	149.4	137.7	168.5	-0.2	162.1
Kaynak 1	Rize	47.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kaynak 2	Rize	33.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AK-1	Rize	55.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AK-2	Rize	55.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AK-3	Rize	55.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yol kenarı açık	Rize	30.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dere kenarı	Rize	27.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ilıcaköy-1	Rize	60.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ilıcaköy-2	Rize	70.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kaynarpınar	Bingöl	40.0	609.0	84.0	89.0	91.0	132.0	128.3	216.5	236.4	104.7	103.7	81.3	-	-	7.3	225.1	234.7	230.3	242.2	246.2	232.4	259.3	0.3	209.3
Kortamın	Bingöl	28.0	452.0	38.0	64.0	43.0	94.9	96.6	179.8	202.6	64.5	66.2	44.7	-	-	11.9	169.6	175.8	177.9	202.3	202.5	189.7	218.8	0.3	178.3
Hacıyan - Gümeağan	Bingöl	68.0	350.0	62.0	37.0	114.0	144.6	139.0	229.2	247.4	118.8	116.6	94.1	-	-	5.6	-	-	-	-	-	-	-	0.3	222.7
Ilıpınar	Bingöl	29.0	3158.0	180.0	1154.0	8.6	34.5	42.9	116.6	137.1	-	-	-	-	-	17.5	134.1	138.4	143.9	175.0	173.1	160.9	191.1	0.1	166.7
Yukarı Alagöz	Muş	26.5	289.3	33.2	97.7	37.0	88.3	90.8	173.2	196.2	57.4	59.6	38.2	-	-	8.7	202.9	211.1	209.5	226.6	229.1	215.6	243.5	0.6	183.3
Aşağı Alagöz	Muş	29.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kaynarca Köyü kaynağı	Muş	32.0	199.2	37.5	158.2	70.0	118.2	116.6	202.8	224.2	89.6	89.7	67.6	-	-	5.3	-	-	-	-	-	-	-	0.9	199.9
Gümgüm Gölü	Muş	25.0	244.0	24.1	5.9	56.0	107.2	107.2	191.9	214.1	77.7	78.5	56.7	-	-	10.1	186.3	193.4	193.7	214.6	215.9	202.7	231.3	0.1	198.1
Derik (Abdurrahman Paşa)	Muş	25.0	39.9	6.3	77.8	50.0	101.8	102.6	186.6	209.2	71.9	73.2	51.4	-	-	6.3	-	-	-	-	-	-	-	1.4	47.0
Gökoğlan	Erzurum	33.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bingöl Kös (K-1)	Bingöl	41.0	225.0	7.0	204.0	30.0	79.4	83.1	164.3	187.4	48.1	50.8	-	-	-	32.1	88.8	91.1	100.0	138.3	133.9	122.5	153.6	0.9	48.1
Kös kaynakları	Bingöl	45.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hasköy	Bingöl	34.0	329.0	36.8	104.0	30.0	79.4	83.1	164.3	187.4	48.1	50.8	29.6	-	-	8.9	200.0	208.0	206.7	224.5	226.8	213.4	241.4	0.6	183.7
Sabırataşı (Harur)	Bingöl	49.0	1497.0	141.0	5.0	45.0	97.0	98.4	181.8	204.6	66.7	68.3	46.7	-	-	10.6	181.2	188.1	189.0	210.9	211.9	198.8	227.6	-0.8	235.1
Golan (EK-1)	Elazığ	41.0	254.0	76.0	494.0	38.0	89.4	91.8	174.3	197.3	58.7	60.8	39.3	-	-	3.3	-	-	-	-	-	-	-	1.0	221.7
Kaplıca mevkii ana kaynak	Elazığ	45.4	254.5	57.5	275.0	29.0	78.0	81.8	162.9	186.0	46.6	49.4	-	-	-	4.4	-	-	-	-	-	-	-	0.9	210.2
Nemrut kaynakları	Bitlis	59.5	350.0	38.0	38.0	205.0	181.6	169.5	266.7	278.7	160.8	154.8	132.0	82.1	57.9	9.2	196.6	204.4	203.5	222.1	224.1	210.8	239.0	0.3	192.6
Doğu kaynaklar	Bitlis	39.0	380.0	61.0	170.0	170.0	169.1	159.3	254.0	268.2	146.4	141.8	119.1	69.5	46.1	6.2	-	-	-	-	-	-	-	0.6	202.5
Orta kaynaklar	Bitlis	38.0	400.0	61.0	140.0	142.0	157.8	149.9	242.4	258.6	133.5	130.1	107.4	58.1	35.6	6.6	238.0	248.5	242.4	251.2	256.0	242.0	268.4	0.5	202.3
Batı kaynaklar	Bitlis	46.0	330.0	37.0	38.0	200.0	180.0	168.1	265.0	277.3	158.8	153.1	130.2	80.4	56.3	8.9	200.3	208.3	207.0	224.7	227.0	213.6	241.6	0.3	193.3

Spring or Well Name	Province	T (C)	Na^+ (mg/l)	K^+ (mg/l)	Ca^{++} (mg/l)	SiO_2 (mg/l)	A	B	C	D	E	F	G	H	I	Na/K ratio	J	K	L	M	N	O	P	log(√Ca/Na)+2.06	R
Batı kaynaklar_1	Bitlis	46.0	430.0	63.0	160.0	151.0	161.6	153.1	246.3	261.9	137.8	134.0	111.3	61.9	-	6.8	232.8	242.9	237.5	247.6	252.1	238.1	264.7	0.5	200.1
Germap	Bitlis	40.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Çaybağı kaynağı	Van	61.0	2500.0	204.0	19.6	92.0	132.6	128.8	217.1	237.0	105.4	104.3	81.9	-	-	12.3	166.7	172.7	175.1	200.1	200.1	187.3	216.6	-0.7	221.8
Özalp-Saray	Van	87.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Seyhan kaynağı	Van	25.0	24.0	0.3	164.0	9.0	35.9	44.2	118.3	138.9	-	-	-	-	-	80.0	36.8	37.3	49.0	93.0	86.3	76.1	107.3	1.8	-
Holi kaplıca kaynağı	Batman	83.0	256.0	26.0	287.0	56.0	107.2	107.2	191.9	214.1	-	78.5	-	-	-	9.8	189.3	196.6	196.6	216.8	218.3	205.1	233.5	0.9	82.0
Kaplıca kaynağı	Siirt	35.0	145.0	14.4	287.0	55.0	106.3	106.4	191.1	213.3	76.7	77.7	55.8	-	-	10.1	186.8	194.0	194.3	215.0	216.4	203.2	231.8	1.1	57.8
ıkinci kaynak	Siirt	35.0	145.0	14.4	282.0	70.0	118.2	116.6	202.8	224.2	89.6	89.7	67.6	-	-	10.1	186.8	194.0	194.3	215.0	216.4	203.2	231.8	1.1	58.1
Ilıca kaynağı	Siirt	33.9	630.0	13.0	146.0	176.0	171.4	161.2	256.3	270.1	149.0	144.2	121.4	71.7	48.2	48.5	63.4	64.7	75.2	116.6	111.0	100.2	131.5	0.3	83.9
Cempir ılısu kaynağı	Siirt	30.6	132.0	17.3	251.0	21.0	65.3	70.6	149.9	172.7	33.3	36.8	-	-	-	7.6	218.7	227.9	224.3	237.8	241.3	227.6	254.9	1.1	64.9
Lif ılısu kaynağı	Siirt	33.1	140.0	14.0	284.0	12.0	45.3	52.7	128.7	150.2	-	-	-	-	-	10.0	187.6	194.8	195.0	215.5	217.0	203.8	232.3	1.1	56.9
Germav (Ilısu) kaynağı	Mardin	63.5	68.0	32.0	286.0	39.0	90.6	92.8	175.5	198.4	59.9	61.9	-	-	-	2.1	-	-	-	-	-	-	-	1.5	74.4
Hısta sıcak su kaynağı	şırnak	63.5	69.4	18.0	324.0	37.0	88.3	90.8	173.2	196.2	57.4	59.6	-	-	-	3.9	-	-	-	-	-	-	-	1.5	-
MTA-3*(not tested)	Diyarbakır	60.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Karaali_1	şanlıurfa	28.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Karaali_2	şanlıurfa	40.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Karaali_3	şanlıurfa	41.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Urfa_1	şanlıurfa	42.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Urfa_2	şanlıurfa	44.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Urfa_3	şanlıurfa	47.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Karaali_4	şanlıurfa	48.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Urfa_4	şanlıurfa	48.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Karaali_5	şanlıurfa	48.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Karaali_6	şanlıurfa	48.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Urfa_5	şanlıurfa	49.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Karaali_7	şanlıurfa	49.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Merkez-Karaali_8	şanlıurfa	53.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Karaali-1	şanlıurfa	48.0	73.4	1.1	96.0	28.0	76.6	80.6	161.5	184.5	45.1	48.0	-	-	-	66.7	45.9	46.7	58.0	101.2	94.8	84.4	115.7	1.2	-
MTA-KA-1	şanlıurfa	39.2	64.2	11.7	48.1	21.4	66.0	71.2	150.7	173.5	34.0	37.5	-	-	-	5.5	-	-	-	-	-	-	-	1.1	79.7
MTA-KA-2	şanlıurfa	40.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MTA-KA-3	şanlıurfa	40.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MTA-1	Diyarbakır	51.0	205.0	22.9	36.0	62.0	112.1	111.4	196.8	218.7	83.0	83.5	61.6	-	-	9.0	199.8	207.8	206.6	224.4	226.7	213.2	241.3	0.5	184.7
MTA-2	Diyarbakır	50.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Çermik	Diyarbakır	50.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tutak Çermik	Ağrı	25.0	778.0	74.0	69.5	85.0	128.3	125.2	212.9	233.2	100.7	99.9	77.7	29.5	-	10.5	182.3	189.2	189.9	211.6	212.7	199.6	228.3	0.1	194.5
AD-1	Ağrı	70.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AD-2	Ağrı	70.0	148.0	76.6	143.0	45.8	97.8	99.1	182.6	205.3	67.5	69.1	-	-	-	1.9	-	-	-	-	-	-	-	1.0	261.9
MT-1	Ağrı	62.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MT-2	Ağrı	78.0	216.0	73.5	341.0	42.0	93.9	95.7	178.7	201.6	-	-	-	-	-	2.9	-	-	-	-	-	-	-	1.0	230.7
MT-3	Ağrı	76.0	231.0	63.5	310.0	42.0	93.9	95.7	178.7	201.6	-	-	-	-	-	3.6	-	-	-	-	-	-	-	0.9	219.2
MT-4	Ağrı	72.0	177.0	77.6	192.0	40.0	91.7	93.8	176.6	199.5	-	-	-	-	-	2.3	-	-	-	-	-	-	-	1.0	250.4
Köprü çermiği	Ağrı	59.0	170.0	48.0	440.0	41.0	92.8	94.7	177.7	200.6	62.2	64.1	-	-	-	3.5	-	-	-	-	-	-	-	1.2	88.5
Yılanlı çermiği	Ağrı	40.0	162.0	61.7	301.0	43.0	94.9	96.6	179.8	202.6	64.5	66.2	44.7	-	-	2.6	-	-	-	-	-	-	-	1.1	233.2
Tazekent çermiği	Ağrı	42.0	59.6	39.0	762.0	37.0	88.3	90.8	173.2	196.2	57.4	59.6	38.2	-	-	1.5	-	-	-	-	-	-	-	1.7	59.2
Davut çermiği	Ağrı	70.0	875.0	86.0	150.0	80.0	125.1	122.5	209.7	230.4	97.2	96.7	74.4	-	-	10.2	185.7	192.9	193.2	214.2	215.5	202.3	230.9	0.2	191.3
Gelereş Kaynakları	Ağrı	63.0	590.0	70.0	200.0	100.0	137.2	132.7	221.7	241.0	110.5	109.0	86.6	-	-	8.4	206.8	215.2	213.1	229.4	232.1	218.6	246.3	0.4	191.8
Kireçtepe	Ağrı	66.5	124.0	54.9	175.0	48.0	99.9	100.9	184.7	207.4	69.8	71.3	-	-	-	2.3	-	-	-	-	-	-	-	1.1	243.7
Hıdır çayırı	Ağrı	45.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibekli	Ağrı	45.0	118.0	97.0	133.0	39.0	90.6	92.8	175.5	198.4	59.9	61.9	40.4	-	-	1.2	-	-	-	-	-	-	-	1.1	-
Molla Kasım	Ağrı	68.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Şorköy (Taşkapı) kaynağı	Van	80.0	750.0	68.0	160.0	90.0	131.4	127.8	215.9	235.9	104.1	103.1	80.7	-	-	11.0	177.3	183.9	185.2	208.0	208.7	195.7	224.6	0.3	183.3
Hasanabdal kaynakları	Van	65.0	838.0	99.0	135.0	90.0	131.4	127.8	215.9	235.9	104.1	103.1	80.7	-	-	8.5	206.3	214.7	212.6	229.0	231.7	218.2	246.0	0.2	202.2
ZG-1	Van	80.0	830.0	74.0	96.0	109.0	142.1	136.8	226.6	245.2	115.9	114.0	91.5	-	-	11.2	175.5	182.1	183.6	206.7	207.3	194.3	223.3	0.1	189.0
ZD-1	Van	104.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZG-2	Van	92.0	773.0	110.0	36.9	95.0	134.3	130.3	218.9	238.5	107.3	106.1	-	-	-	7.0	229.0	238.9	234.0	245.0	249.2	235.3	262.1	0.0	225.7

Spring or Well Name	Province	T (C)	Na^+ (mg/l)	K^+ (mg/l)	Ca^{++} (mg/l)	SiO_2 (mg/l)	A	B	C	D	E	F	G	H	I	Na/K ratio	J	K	L	M	N	O	P	log(√Ca/Na)+2.06	R
ZG-3	Van	98.0	858.0	108.0	29.5	118.0	146.7	140.6	231.2	249.1	121.0	118.7	96.1	-	-	7.9	213.8	222.7	219.7	234.3	237.5	223.9	251.4	-0.1	222.4
Doğal kaptaj	Van	60.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Doğal kaptaj KD kay.grubu	Van	25.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ova kaynak grubu	Van	50.0	610.0	150.0	165.0	50.0	101.8	102.6	186.6	209.2	71.9	73.2	51.4	-	-	4.1	-	-	-	-	-	-	-	0.4	240.4
Ova kuzeydoğu kay. grubu	Van	31.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Buğulu kaynak	Van	37.0	95.0	27.2	66.4	6.9	-	36.8	108.8	128.4	-	-	-	-	-	3.5	-	-	-	-	-	-	-	1.0	219.3
Köprü-orta	Ağrı	54.0	184.0	57.8	186.0	31.0	80.8	84.2	165.7	188.8	49.5	52.1	-	-	-	3.2	-	-	-	-	-	-	-	0.9	228.5
Köprü-aşağı	Ağrı	54.0	173.0	58.0	208.0	31.0	80.8	84.2	165.7	188.8	49.5	52.1	-	-	-	3.0	-	-	-	-	-	-	-	1.0	230.3
Dutlu-Havuzaltı çeşme	Ankara	43.0	1315.0	34.0	496.0	57.0	108.0	107.9	192.8	214.9	78.6	79.4	57.5	-	-	38.7	76.9	78.7	88.4	128.2	123.2	112.1	143.3	0.3	97.6
Dutlu-müdiriyet yanı	Ankara	51.0	1390.0	33.0	470.0	63.0	112.9	112.1	197.6	219.4	83.9	84.3	62.3	-	-	42.1	71.6	73.3	83.3	123.7	118.5	107.5	138.8	0.3	98.5
Dutlu-dereiçi çesme	Ankara	44.5	1428.0	37.0	493.0	61.0	111.3	110.7	196.0	218.0	82.1	82.7	60.8	-	-	38.6	77.0	78.8	88.5	128.3	123.3	112.3	143.5	0.3	124.6
Kara Mustafa spring	Bursa	82.0	134.0	13.5	96.0	32.5	82.7	86.0	167.7	190.7	-	-	-	-	-	9.9	188.4	195.7	195.7	216.1	217.6	204.4	232.9	0.9	-
Kızıldere KD-5 Well	Denizli	200.0	1375.0	146.0	-	380.0	228.3	206.9	314.9	317.2	215.9	204.1	-	-	-	9.4	-	201.8	201.2	220.3	222.2	208.9	237.1	-	-
Tekkeköy Gerenlik gölü	Denizli	73.5	1000.0	94.0	29.5	210.0	183.3	170.9	268.4	280.1	162.7	156.6	133.7	83.8	-	10.6	181.0	187.9	188.8	210.7	211.7	198.6	227.4	-0.2	207.2
Sıcaksular WC	Eskişehir	41.0	15.0	2.0	36.0	26.0	73.6	77.9	158.5	181.5	42.0	45.0	-	-	-	7.5	220.8	230.2	226.3	239.3	243.0	229.2	256.4	1.7	-
Keçeciler Hamamı	Eskişehir	40.0	18.0	2.9	73.0	26.0	73.6	77.9	158.5	181.5	42.0	45.0	-	-	-	6.2	-	-	-	-	-	-	-	1.7	-
Beyaz Saray Hamamı	Eskişehir	40.0	15.0	1.6	53.0	51.0	102.7	103.4	187.5	210.0	72.9	74.1	52.3	-	-	9.4	194.7	202.3	201.7	220.7	222.6	209.2	237.5	1.7	-
Yüksekova-Sarıtaş	Hakkari	53.7	2040.0	203.0	38.8	104.0	139.4	134.6	224.0	242.9	112.9	111.2	88.8	-	-	10.0	187.1	194.3	194.5	215.2	216.6	203.4	231.9	-0.5	222.9
Sarıtaş-Gölebakan	Hakkari	39.2	2420.0	238.0	98.2	40.0	91.7	93.8	176.6	199.5	61.1	63.0	41.5	-	-	10.2	185.8	192.9	193.3	214.2	215.6	202.4	231.0	-0.3	215.9
Hamamat-Hamamköy-1	Hatay	37.5	165.0	21.0	150.0	36.0	87.1	89.8	172.0	195.0	56.2	58.4	37.1	-	-	7.9	215.1	224.1	221.0	235.3	238.6	224.9	252.3	0.9	84.4
Hamamat-Hamamköy-3	Hatay	37.9	270.0	23.4	152.0	41.0	92.8	94.7	177.7	200.6	62.2	64.1	42.6	-	-	11.5	172.7	179.0	180.8	204.5	205.0	192.1	221.1	0.7	93.5
Üçlü Çeşme	Mersin	37.5	2064.0	75.0	130.0	16.3	55.9	62.3	140.2	162.5	-	-	-	-	-	27.5	99.4	102.1	110.4	147.1	143.3	131.7	162.6	-0.2	155.3
Yeni Havuz	Mersin	38.0	2050.0	72.0	136.0	16.8	57.0	63.2	141.3	163.7	-	-	-	-	-	28.5	97.0	99.7	108.1	145.1	141.2	129.7	160.6	-0.2	153.2
Tavuk damı hamam	Mersin	36.0	1751.0	61.5	130.0	17.0	57.4	63.6	141.8	164.2	-	-	-	-	-	28.5	97.0	99.7	108.1	145.1	141.2	129.7	160.6	-0.1	151.1
Dikili-Madra (Çayiçi)	İzmir	57.0	293.0	2.2	16.1	-	-	-	-	-	-	-	-	-	-	133.2	-	-	-	71.8	64.2	54.6	85.6	0.2	66.0
Dikili-Bahçeliköy	İzmir	57.0	184.0	3.5	16.0	-	-	-	-	-	-	-	-	-	-	52.6	58.8	60.0	70.7	112.6	106.7	96.0	127.3	0.4	75.8
Kayabaşı kaplıca	Kastamonu	50.0	69.0	9.0	188.0	44.0	95.9	97.5	180.8	203.6	65.6	67.3	45.7	-	-	7.7	218.1	227.3	223.8	237.4	240.9	227.1	254.4	1.4	45.7
Bulamaçlı spring	Kilis	47.0	1215.0	98.8	97.0	81.0	125.8	123.0	210.3	230.9	97.9	97.3	75.1	-	-	12.3	166.3	172.3	174.8	199.8	199.9	187.0	216.3	0.0	190.9
Bulamaçlı ÇB-1 Well	Kilis	41.0	1346.0	104.2	195.4	71.0	118.9	117.2	203.5	224.8	90.4	90.4	68.3	-	-	12.9	161.6	167.3	170.3	196.2	196.0	183.2	212.7	0.1	183.5
Yeşildağ çamur	Konya	33.5	8.0	1.6	54.1	18.0	59.5	65.5	144.0	166.5	27.3	31.1	-	-	-	5.0	-	-	-	-	-	-	-	2.0	-
Nasa spring	Kütahya	64.0	395.0	42.0	39.0	123.0	149.1	142.7	233.7	251.2	123.8	121.2	98.6	-	-	9.4	194.3	201.9	201.3	220.4	222.3	209.0	237.3	0.3	193.5
Gediz Hot Spring	Kütahya	75.0	483.0	68.8	79.4	76.4	122.7	120.4	207.3	228.2	94.5	94.2	-	-	-	7.0	229.2	239.0	234.1	245.0	249.3	235.4	262.2	0.3	207.7
Yoncalı-1 Well	Kütahya	42.0	19.0	2.6	90.0	28.0	76.6	80.6	161.5	184.5	45.1	48.0	-	-	-	7.3	224.1	233.6	229.3	241.5	245.4	231.6	258.6	1.8	-
Yoncalı-2 Well	Kütahya	41.5	20.0	2.4	120.0	32.0	82.1	85.4	167.0	190.1	50.9	53.4	-	-	-	8.3	208.1	216.6	214.4	230.3	233.1	219.6	247.3	1.8	-
Yoncalı-3 Well	Kütahya	40.0	28.0	3.0	135.0	30.0	79.4	83.1	164.3	187.4	48.1	50.8	-	-	-	9.3	195.1	202.8	202.1	221.0	223.0	209.6	237.9	1.7	-
Günlüce kaplıcası	İzmir	39.0	110.0	96.0	139.0	13.0	48.0	55.1	131.7	153.4	-	-	-	-	-	1.1	-	-	-	-	-	-	-	1.1	-
Yoncalı-5 Well	Kütahya	41.0	59.0	6.9	76.8	9.0	35.9	44.2	118.3	138.9	-	-	-	-	-	8.6	205.1	213.4	211.5	228.2	230.8	217.3	245.1	1.2	53.3
Saraycık dere içi Sar-4	Manisa	55.0	1040.0	108.0	65.0	150.0	161.2	152.7	245.9	261.5	137.4	133.6	110.9	61.5	-	9.6	191.7	199.2	198.9	218.5	220.2	207.0	235.3	-0.1	206.1
Menteşe 2 Well	Manisa	65.0	310.0	178.0	42.0	72.0	119.6	117.8	204.3	225.5	91.2	91.1	69.0	-	-	1.7	-	-	-	-	-	-	-	0.4	-
Bozhüyük kaplıca	Afyon	37.0	148.0	19.0	175.0	68.0	116.7	115.4	201.4	222.9	88.0	88.2	66.1	-	-	7.8	216.2	225.2	221.9	236.0	239.4	225.7	253.1	1.0	76.5
Bozhüyük	Afyon	35.0	145.0	18.0	251.0	75.0	121.7	119.6	206.3	227.4	93.5	93.2	71.1	-	-	8.1	212.1	220.9	218.1	233.2	236.2	222.6	250.2	1.1	67.1
Kuzuluk K-11 Spring	Sakarya	51.0	810.0	38.0	73.0	135.0	154.7	147.3	239.3	256.0	130.0	126.9	104.3	55.0	-	21.3	118.3	121.9	128.7	162.5	159.7	147.8	178.3	0.1	157.3
Gelinyutan K-1	Sakarya	41.0	32.0	4.6	136.0	35.0	85.9	88.7	170.8	193.8	54.9	57.2	35.9	-	-	7.0	230.3	240.3	235.2	245.9	250.2	236.3	263.0	1.6	-
Hamamdere K-3	Sakarya	40.0	30.0	5.2	116.0	32.0	82.1	85.4	167.0	190.1	50.9	53.4	-	-	-	5.8	-	-	-	-	-	-	-	1.6	-
Bürmecidere K-4	Sakarya	37.0	30.0	5.1	132.0	28.0	76.6	80.6	161.5	184.5	45.1	48.0	-	-	-	5.9	-	-	-	-	-	-	-	1.6	-
Havza	Samsun	54.0	142.0	6.2	20.0	49.0	100.9	101.7	185.7	208.3	70.9	72.2	-	-	-	22.9	112.8	116.1	123.4	158.1	154.9	143.1	173.8	0.6	86.9
Billoris	Siirt	33.0	135.0	24.4	320.0	10.0	39.3	47.3	122.1	143.0	-	-	-	-	-	5.5	-	-	-	-	-	-	-	1.2	70.7
Delikkaya (DK-4)	Sivas	32.0	325.0	60.0	256.0	36.0	87.1	89.8	172.0	195.0	56.2	58.4	37.1	-	-	5.4	-	-	-	-	-	-	-	0.8	203.6
Delikkaya (DK-5)	Sivas	35.0	340.0	64.0	280.0	36.0	87.1	89.8	172.0	195.0	56.2	58.4	37.1	-	-	5.3	-	-	-	-	-	-	-	0.8	204.8
Delikkaya (DK-6)	Sivas	37.0	53.0	8.8	83.0	44.0	95.9	97.5	180.8	203.6	65.6	67.3	45.7	-	-	6.0	-	-	-	-	-	-	-	1.3	57.8
Niksar Ayvaz	Tokat	27.0	64.0	0.2	3.2	33.2	83.6	86.8	168.6	191.6	52.5	55.0	33.7	-	-	320.0	-	-	-	40.6	32.0	-	53.5	0.5	-
Tunceli-Mazgirt Bağın	Tunceli	45.4	2326.0	68.2	97.7	29.3	78.4	82.2	163.3	186.4	47.0	49.8	-	-	-	34.1	84.9	87.0	96.2	135.0	130.4	119.1	150.3	-0.3	149.3
SJ-3	Konya	49.0	49.0	5.4	66.0	33.0	83.4	86.5	168.3	191.4	52.2	54.7	-	-	-	9.1	198.3	206.2	205.1	223.3	225.5	212.1	240.2	1.3	47.7
Kadınlar Hamamı	Ağrı	65.0	850.0	88.0	150.0	80.0	125.1	122.5	209.7	230.4	97.2	96.7	74.4	-	-	9.7	191.4	198.8	198.6	218.3	220.0	206.7	235.1	0.2	193.7
Erciş Hasanabdal	Van	64.0	738.0	105.0	120.6	31.0	80.8	84.2	165.7	188.8	-	-	-	-	-	7.0	229.0	238.9	234.0	244.9	249.2	235.3	262.1	0.2	212.1

Spring or Well Name	Province	T (C)	Na^+ (mg/l)	K^+ (mg/l)	Ca^{++} (mg/l)	SiO_2 (mg/l)	A	B	C	D	E	F	G	H	I	Na/K ratio	J	K	L	M	N	O	P	log(√Ca/Na)+2.06	R
Başkale Çamlık	Van	37.0	761.0	191.0	11.3	17.0	57.4	63.6	141.8	164.2	-	-	-	-	-	4.0	-	-	-	-	-	-	-	-0.3	-
Boğazlıyan Uzunlu UZ-3	Yozgat	30.0	99.0	10.8	128.0	37.0	88.3	90.8	173.2	196.2	57.4	59.6	38.2	-	-	9.2	197.2	205.0	204.0	222.5	224.6	211.2	239.3	1.1	61.4
Armutlu Mide Suyu	Yalova	66.0	163.0	181.0	294.0	135.0	154.7	147.3	239.3	256.0	130.0	126.9	104.3	-	-	0.9	-	-	-	-	-	-	-	1.1	-
Armutlu Nuripaşa	Yalova	65.0	308.0	239.0	293.0	135.0	154.7	147.3	239.3	256.0	130.0	126.9	104.3	-	-	1.3	-	-	-	-	-	-	-	0.8	-

A	Quartz-no steam loss (Fournier, 1977)
B	Quartz-max steam loss (Fournier, 1977)
C	Quartz (Fournier & Potter, 1982)
D	Quartz (Arnorson, 1985)
E	Chalcedony (Fournier, 1977)
F	Chalcedony (Arnorson, 1983)
G	α-Christobalite (Fournier, 1977)
H	Opal-CT (β-Christobalite) (Fournier, 1977)
I	Amorph. Silica (Fournier, 1977)
J	(Truesdal, 1976)
K	(Tonani, 1980)
L	(Arnorsson et al., 1983)
M	(Arnorsson et al., 1983)
N	(Fournier, 1979)
O	(Nieva & Nieva, 1987)
P	(Giggenbach, 1988)
R	Na-K-Ca (Fournier & Truesdall, 1973)